

40 pect

POPULAR **Computing** WEEKLY

Only 40p.

21 - 27 February 1985

It's the best selling weekly

Vol 4 No 8

Troubled Acorn faces winding-up order

ACORN'S troubles intensified last week with a winding-up order brought against the company by one of its creditors.

Circuit board supplier, Circuit Techniques petitioned for the order because of unpaid bills dating from November last year thought to amount to around £19,000. The order issued by the High Court last Thursday will be served on Acorn in Cambridge this week, with a court hearing set for April 1.

There has still been no announcement by Acorn concerning its future, following the suspension of its shares

trading on February 6.

It is believed that the company together with its new financial advisors Close Brothers, held a meeting with the company's major creditors on Friday February 15.

However, the announcement of the long-awaited rescue plan to save the company has yet to be made.

One possible plan is thought to involve splitting Acorn into four separate companies dealing, respectively, with research and development, and the home computer business and education markets.

DOMARK has licensed the computer game rights for the next James Bond film, *From a View to a Kill*.

The programming is being done by Softstone, a company whose staff include ex-Ultimate programmers. When finished, the game will centre around arcade screens based closely on stunts used in the film in which
cont on p4 ▶



LET Show news-page 4

Profits let down for CBM as UK manager goes

COMMODORE has hit trouble with dismal financial results for the six month period to December 31 1984 and the resignation of its UK General Manager, Howard Stanworth.



UK General Manager, Howard Stanworth

last week with the departure of Howard Stanworth.

"He tendered his resignation during a meeting last week with Commodore's US president and chief executive, Marshall Smith," said a spokesman for the company. "His parting is amicable on both sides."

So far, no replacement has been appointed. Arthur Scott, Commodore UK's company secretary, is at present acting General Manager.

Net sales for the six-month were down, compared with 1983, from \$640,700 to \$582,900 and profits came down to less than half from \$74,400 to only \$30,900. Commodore's chairman Irving Gould blamed the strength of the dollar and said, "Fiscal 1985, which ends June 30 is clearly a transitional period for Commodore."

In the UK, the post-Christmas staffing shake-out at Commodore UK continued

**FREE
CASSETTE
LABELS
OFFER
- P6**



INSIDE ▶

DK'TRONICS AMSTRAD SOUND REVIEW ▶



VORTEX.
TAKING THE SPECTRUM
WORLD BY STORM.



• CYCLONE £6.95 TLL £5.95 • VORTEX ACTION GAMES • AVAILABLE AT ALL LEADING RETAILERS •

VORTEX SOFTWARE (SALES) LIMITED, VORTEX HOUSE, 24 KANSAS AVENUE, OFF SOUTH LANGWORTHY ROAD, SALFORD, M5 2GL

View

As we go to press there is still no announcement from Acorn – the UK's second biggest micro manufacturer – concerning its future, following the suspension of its shares two weeks ago. The only news has been bad – Circuit Techniques' winding-up order.

The longer Acorn remains in this state of limbo the less likely it is that the company will emerge largely intact.

One suggestion has been that Acorn should split into separate companies dealing with, respectively, the home, business and education markets. The fear is that Acorn's diversification out of the education sector – which accounts for over 60% of the company's turn-over – may have come too late. In the home market the Electron has not done well and a replacement for the BBC is needed. In the business market the ABC range is over-ambitious – even though Acorn's IBM-compatible offering is, from a technical stand point, a strong contender.

Acorn must look for example to Atari. Twelve months ago Atari was where Acorn is now – only being bigger it had further to fall. It was losing \$800m a year and its main product, the 800XL, like the BBC, was past its prime.

Jack Tramiel, the new Atari boss, in just a few months wielded the axe, trimming Atari to a sixth of its size at 250 half the size of Acorn – and its new ST machine is generating a great deal of excitement.

Can Acorn effect a similar turn-round? Under the control of Curry and Hauser, I'm not so sure. Acorn is the company they built up together from nothing and they are too close to it to be objective – especially when the cuts may need to be savage.

POPULAR Computing WEEKLY

Vol 4 No 8

Presents...

News > LET show news

4

Software Reviews > Upper Gumtree on the CBM 64 > Spectrum *Kung Fu* from Bug Byte

11

Hardware Review > Tony Kendle converses with the DK'Tronics Speech Synthesiser for the CPC 464

14

Streetlife > Graham Taylor – flowchart in hand – visits the interactive video company, Epic

17

Stargame > Cue up the keyboard for Snooker Strategy on the CBM 64 by Steve McCarthy

18

Spectrum > Extend your Basic with this m/c program by Robert Kirkland

21

Amstrad > Arrays and Sorts explained on the CPC 464 by Geoff Baldwin

24

1984 Popular Index > No more wading through the back issues – Volume 3 presented in glorious alphabetical order

27

The QL Page > No more microdrive blues – John Rainbow shows how to put your QL programs on tape

32

BBC and Electron > Boris Allen printing prettier than ever on the BBC B

34

Best of the Rest > Letters 6 > Open Forum 36 > Baud Walk 36 > Bookends 38 > Arcade Avenue 39 > Education Report 39 > Adventure Corner 40 > Top 10, Diary, Readers Chart 46 > New Releases 47 > This Week 47 > Puzzle, Ziggurat, Hackers 50

Futures...

Amstrad Star Game – Poker on the CPC 464 > Part Two of Adrian Warman's PBank for the CBM 64

Editor David Kelly News editor Christina Erskine Features editor Graham Taylor Software editor John Cook Production editor Lynne Constable Editorial secretary Geraldine Smyth Group advertisement manager David Lake Advertisement manager Alastair Macintosh Assistant advertisement manager Tom Watson Classified executive Diane Davis Advertising production Lucinda Lee Administration Theresa Lacy Managing editor Duncan Scot Publishing director Jenny Ireland. Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 Typeset by Publishers Reprographics Services Ltd, 4 Roger Street, London WC1. Printed by Greenaway Harrison, Sutton Road, Southend-on-sea, Essex. Distributed by S M Distribution, London SW9. Tel 01-274 8611, Telex 261643 © Sunshine Publications Ltd 1985.

ABC

56,052 copies sold every week
(Jan-June 1984 ABC).

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

Computer Trade Association Magazine of the Year

Domark
continued from page 1

the player takes the part of James Bond/Roger Moore. Domark also plans a music backing track for the game.

Initially, versions will be available for the Spectrum, Commodore 64 and Amstrad CPC 464, with an MSX version soon afterward.

With an eye on the US market, Domark is planning later implementations for the IBM PC and Apple II.

The program is expected to cost around the £10 mark.

Competition for Acorn

ACORN, if it survives its present serious problems, will face tough competition in the education market from Apple.

Apple has announced a UK schools discount scheme, called Our Kids Can't Wait, which offers a flat 50% discount on the Apple II model for schools and is accompanied by Summer 'teach-ins' for teachers.

Although Apple holds only around 5% of the UK schools market - compared with Acorn's approximate 60% - the company's aggressive price cutting policies have been a significant factor in Acorn's failure in both the US and Eire schools markets.

In the UK, with the government's half-price micro's in schools scheme at an end, Acorn has had to put together its own discount packages for education.

The emphasis has been placed on schools up-grading from the basic system, rather than buying for the first time. "Introductory offers for schools buying their first micro will give a 20-25% discount, there are various bulk packages of peripherals for schools wishing to up-grade from the basic system, and then complete packages, which vary according to the intended age range, which will carry a 30-40% discount," said an Acorn spokesman.

"For example a BBC B plus Econet plus a DFS with a second processor and 800K disc drive would sell for under £1,100 as opposed to the normal cost of around £1,800."

LET Show Report

OVER 200 companies exhibited at the LET micro trade show, held at Olympia in London from February 17-19.

The emphasis at the show was very much on new software products with many companies previewing programs not due out until Easter time.

Addictive Games showed a prototype version of its next game, *Stringer* for the Commodore 64. *Stringer* is an arcade game set in a hotel - the player must search the hotel rooms for items such as a camera and keys, while evading members of the hotel staff.

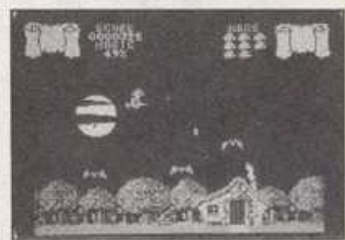
Gargoyle Games announced its conversion of *Tir Na Nog* for the C64 at £9.95, and also showed screens from its next game, *Dun Darach*. *Dun Darach* (Gaelic for Hill of the oak) features Cuchulainn's early days - Gargoyle's Greg Follis describes it as a *Tir Na Nog* 'prequel'. The game also features around 20 other animated characters with whom Cuchulainn must interact. Playing techniques are otherwise similar to *Tir Na Nog*. *Dun Darach* is set for a May release at £9.95 for the Spectrum and Amstrad CPC464. Gargoyle is also planning to release a program based on Lewis Carroll's *The Hunting of the Snark* in October 1985.

Still on the subject of follow-ups, Palace Software displayed its second program *Cauldron*, an arcade adven-

ture for the C64 and Spectrum at £7.99, which should be available in April or May.

Mikro-Gen's *Wally Week* character continues in similar vein in *Everyone's a Wally*, which also features people such as Wally's wife, Wilma, and son Herbert.

Llamasoft previewed *Mama*



Llama, Jeff Minter's latest hairy animal shoot-em-up.

Firebird showed the second of its 'Gold edition' games, *Buggy Blast*, Gremlin Graphics announced *Safebreaker*, and Argus had *Give My Regards to Broad Street*, based on the film of the same name and part of Argus's Mind Games series, up and running. Bug-Byte was showing the long-awaited *Automan* game, licensed from the TV programme.

Activision, hoping to consolidate the runaway success of *Ghostbusters*, launched no fewer than nine new titles, many of which were shown for the first time at CES last month.

Oric offers roll in

SEVERAL offers have already been made to the Oric receiver to buy the assets of the failed micro manufacturer.

Among those under discussion are those from a syndicate set up by ASN, exclusive distributors of the Oric machines in France, and a proposed purchase of assets by Barry Muncaster, a director and joint owner of software house Tansoft.

Muncaster resigned from his positions as managing director of both Oric and Edenspring just days before the receiver was called in at Oric (see *Popular Computing Weekly*, February 7).

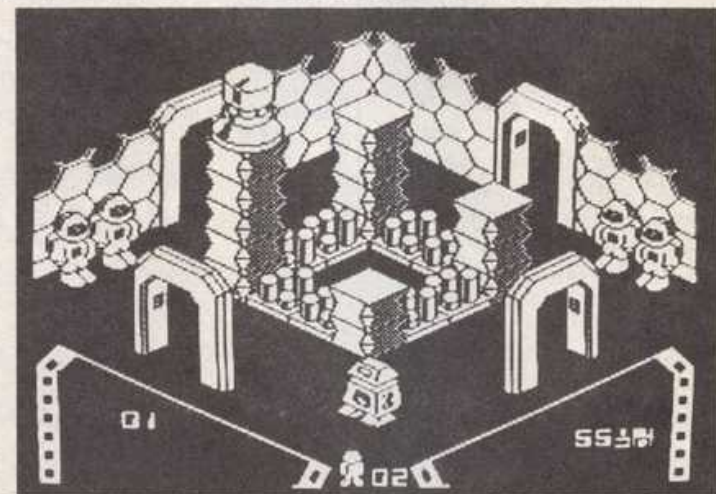
Barry Muncaster will know this week whether his offer has been accepted.

Muncaster has now taken over as head at Tansoft, and Bruce Everiss contract as managing director of Tansoft and marketing consultant for Oric was terminated last week.

"Bruce's role as a marketing consultant for Oric was at an end, and his job complete," said Barry Muncaster.

Commented Everiss: "I could see it coming. When Oric went down, Barry Muncaster came in to run Tansoft, and his style of doing things was very different from mine."

Alien 8 - Ultimate's newest



ALIEN 8 is the latest release from Ultimate Play the Game. The graphics and playing techniques are very similar to those of *Knight Lore*. In *Alien 8*, the player controls a robot on a spaceship, who must find a number of keys and use them to activate stores of cryonaughts held in suspended animation at locations aboard the craft.

Alien 8, for the Spectrum, costs £9.95. For a more detailed review, see page 47.

QL upgrades from Psion

SOFTWARE up-grades of the four Psion software packages bundled with the QL are expected to be available by the end of this week.

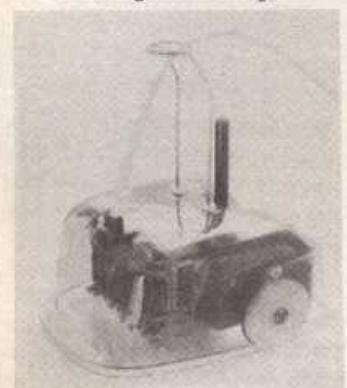
QLUB members will receive a free up-grade.

The four packages are considerably enhanced versions of *Quill*, *Archive*, *Easil* and *Abacus*, being written now in machine-code rather than in C. They are faster and being more compact they load in half the time and use up less memory. With *Quill*, for example, there is room after the package has loaded, for a 4½ page document to be held in Ram, rather than having to access the microdrives.

New robot from IGR

ZERO 2 is a new low-cost robot which can be interfaced to most home micros.

Developed by Intergalactic Robots (IGR) - a new company formed by computer journalist Robin Bradbeer - it is intended for both home and educational use with any micro offering an RS232 port.



Zero can be programmed from either Basic or, with schools in mind, from Logo any RS232 port. The basic robot, which comes in kit or fully-assembled form, has a two tone horn, a line follower, and a pen which may be

raised or lowered. Additional boards for the machine will add speech, 3-channel sound and obstacle detection.

The kit version of Zero 2 is £79.95 - ready-built it costs £99.95. Software to drive the robot from the Spectrum (with Interface 1) and BBC micros is available now. A Commodore 64 version of the software will follow.

IGR has arranged with Sinclair to have a bundled package of Zero 2 and Sinclair Logo available for £129.95. A similar arrangement has been made for Logotron Logo on the BBC (£149.95, available April).

C128 delay denied

SUGGESTIONS that the UK launch of Commodore's new C128 machine will be delayed until the late Summer have been firmly denied by the company.

Gail Wellington, Commodore's European Software

Development Manager commented: "It's still all on target for the late spring." "The C128 is going through the pilot production stage now, the machine shown at CES being a hand-built engineering model.

"The price for the C128 in the UK will depend on the strength of the dollar over the next few months, and we will not finalise the price until we are ready to go into full production."

Quest for the Fab Four

AN ADVENTURE game based on lyrics from Beatles songs is due out soon, from a company called Number 9 Software.

"The game is closely linked throughout with the songs," said Gary Marsh, who wrote the adventure called *Beatles Quest*.

"For instance, you can visit locations such as Strawberry Fields, Penny Lane and Eleanor Rigby's grave.

"The idea behind the plot is that you are a student of my-

New software for VTX5000

OWNERS of the VTX5000 modem for the Spectrum who wish to access 300 baud non-Prestel format ascii-type bulletin boards can now do so.

Specnet, available on cassette for £5.95, allows VTX5000 owners to communicate control characters to ascii boards and also save and load information from the boards to tape or microdrive.

Details from Stephen Adams, 1 Leswin Road, London N16 0L-254 1869.

thology studying the Four Kings of EMI, and you must collect twelve objects of interest and value to help you with your project.

Beatles Quest has been written using the *Quill*, and will initially be sold by mail-order for the Commodore 64, and later the Spectrum and Amstrad, at around £10. Details from Gary Marsh, 47 St George's Avenue West, Wolstanton, Newcastle-under-Lyme.

GOODE BYTE

SPECTRUM

GAME	RRP	OUR PRICE
DALEY THOMPSON	8.90	4.99
BEACHHEAD	7.95	5.95
WHITE LIGHTNING	14.95	10.35
SHERLOCK HOLMES	14.95	9.99
KNIGHTS LORE	9.95	6.75
UNDERWORLD	9.95	6.75
LORDS OF MIDNIGHT	9.95	5.95
DOOMDARKS REVENGE	9.95	5.95
PSYTRON	7.95	5.95
FRANK N. STEIN	5.95	4.50
MONTY MOLE	6.95	5.50
MATCHPOINT	7.95	6.75
* SCRABBLE	15.95	4.75
EDDIE KIDD JUMP	7.95	4.95
COMBAT LYNX	7.95	5.25
DARK STAR	7.95	4.75
JET SET WILLY	5.95	4.50
STAR STRIKE	5.95	4.50
TRAVEL WITH TRASHMAN	5.95	4.50
QUASIMODOUS REV.	6.90	4.90
TIR NA NOG	9.95	6.95
AIRWOLF	6.90	4.99
MATCH DAY	7.95	5.70
BLUE MAX	7.95	5.99
MONTY IS INNOCENT	6.95	5.35
TECHNICIAN TED	6.95	5.50
ZAXXON	7.95	5.85
* VU CALC	9.95	4.00
* VU FILE	9.95	4.00
* JACK AND BEANSTALK	5.95	2.75
GREAT SPACE RACE	14.95	9.99
* VALKYRIE 17	9.95	4.99
RAM TURBO INTERFACE		18.00
GIFT OF THE GODS	9.95	6.99
BOULDER DASH	7.95	5.95
GHOSTBUSTERS	9.95	6.99
BRIAN BLOODAXE	7.95	5.25
HEROES OF KHAN	5.50	3.95
ALIEN 8	9.95	7.25
ALL LEVEL 9	9.95	6.99
PROJECT FUTURE	6.95	5.50
SOFTWARE STAR	6.95	5.50

COMMODORE 64

GAME	RRP	OUR PRICE
GHOSTBUSTERS	10.95	8.25
SUICIDE EXPRESS	7.95	6.50
STRIP POKER	9.95	6.95
PSYTRON 64	7.95	5.25
TALES OF ARABIAN NIGHTS	7.00	3.75
BEACHHEAD	9.95	7.50
SOLO FLIGHT	14.95	10.50
DEATH STAR INTERCEPTOR	9.95	7.50
BRUCE LEE	9.95	7.50
NATO COMMANDER	9.95	7.50
SPIFFIRE ACE	9.95	7.50
MY CHESS II	11.95	8.25
QUASIMODOUS REVENGE	7.90	5.75
ZAXXON	9.95	7.50
SUMMER GAMES	14.95	10.25
SHERLOCK	14.95	10.50
PSI WARRIOR	9.95	4.49
RAID OVER MOSCOW	9.95	7.50
STAFF OF KARNATH	9.95	7.25
BLUE MAX	9.95	7.50
TAPPER	9.95	7.50
SELECT 1	12.49	8.50
SPY VS SPY	9.95	6.99
BOULDER DASH	8.95	7.25
DALEY THOMPSONS DECATH.	7.90	5.25
KONG'S REVENGE	7.90	5.75
FIGHTER PILOT	9.95	7.25
BREAKFEVER	7.00	4.95
COMBAT LYNX	8.95	6.95
CAD CAM WARRIOR	9.95	7.25
F15 STRIKE EAGLE	14.95	10.25
IMPOSSIBLE MISSION	8.95	6.75
EMPIRE OF KHAN	7.00	4.50
SHOOT THE RAPIDS	7.95	6.50
LORDS OF MIDNIGHT	9.95	5.99
INDIANA JONES	8.95	6.75
GRYPHON	7.95	6.25

ALL PRICES INCLUDE P&P

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

SEND CHEQUES/P.O. TO
GOODEBYTE PCW10
94 LEATHER LANE, LONDON EC1
(TEL: 01-404 4245)

D147

* DENOTES SPECIAL OFFER WHILE STOCKS LAST

PAINTBOX

FOR THE SINCLAIR QL

PAINTBOX II now ready for immediate delivery.

Superb graphics design program for the Sinclair QL. Options include, Hi-res screen DUMP to printer, eight sizes of TEXT freely mixed, ARCS, CIRCLES (eccentricity and rotation), full STIPPLE GENERATOR (don't guess with those 255 colours, mix them on screen and see the results), BOXES, TRIANGLES (right-angled or third point), LINES etc. You can even shrink whole screens to anything as small as a single pixel if you wish. Mistakes can even be corrected using the ERASE option, which erases the last thing you drew. Other options include FOLLOW for three dimensional line drawings etc and INK for continuous drawing in a specified colour. Fully menu driven and uses either cursor keys or joystick for drawing.

PAINTBOX can support fifty designs simultaneously on microdrive and will carry out automatic file name checks when saving/loading/deleting files.

After designing your picture, you can either send it to the printer, save it as a SCREEN, save it as a datafile to be loaded back into the program at a later date or to be loaded into one of your own programs. If you feel really lazy, PAINTBOX will even compile a superBASIC program of your design that will re-draw itself exactly as you drew it.

PRICE... £9.90 (or £4.90 if you send your own cartridge) inc P&P and manual. Early customers send £1 for update and new manual. Overseas customers please add £0.50. Trade enquiries welcome.

Send cheques payable to J + D SOFTWARE to:

J + D SOFTWARE
3 ALFRED ROAD, LOWTON
WARRINGTON

PD153

DISCO SCREEN

48K SPECTRUM

AT LAST SOMETHING COMPLETELY DIFFERENT

You've read the REVIEWS, now sample this compulsive Programme. You can really show off your Spectrum. There is just NO other programme like it.

Bring your Computer TO LIFE. Bring your MUSIC TO LIFE.

ADD A NEW DIMENSION to your MUSIC and your MICRO. A totally NEW EXPERIENCE. Your Spectrum actually LISTENS to your MUSIC, and REACTS to it. Watch as it takes the MOOD of the MUSIC. Be really fascinated as the screen BURST into a LIVING PANORAMA of MOVEMENT and COLOUR, while the computer magically responds to each note and rhythm. Whatever your taste in MUSIC, from Disco to Classical this Programme is for you. Select the DISCO version for those wild beats. Turn a boring gathering into a swinging party. Select the RELAX version for a SUPERB background as you enjoy those quieter moments.

ONE PURCHASE YOU WON'T REGRET

JUST £7.95 (Cassette) or £9.95 (Microdrive) incl.
Overseas orders add £1.00

ONLY AVAILABLE FROM:

ASH BYPRODUCTS, P.O. Box 510 Carless Av, BIRMINGHAM B17 9ES

PD156

Letters

Chicken and egg

In a recent editorial you stated that the 68000 was taking over from the Z80 and 6502 processors, and that British software houses were having difficulty in making the transition.

We feel we should point out that the lack of a wide range of software for the Sinclair QL is due almost entirely to the nature and small size of the User Base. For a proficient machine code programmer, learning to use a new Micro-processor takes at most two days. This should not be confused with learning about a new computer to its best advantage, which might take a couple of weeks.

As soon as a computer has achieved or looks like achieving sufficient sales to warrant production of programs then those programs will start to appear in quantity.

Andy Lawrie
Technical Director
Mikro-Gen
23a Station Road
Ashford, Middx

If you assume that software sells micros then what you propose is a circular chicken-and-egg argument - no sales equals no software equals no sales. How then is any new micro to survive?

I still think that the software companies which look set to stick around are the ones which take a more long term view.

Two days to learn a new processor? Mikro-Gen works fast.

A new version

Owners of the Sinclair QL who found my article *Dark Secrets of the QL Rom Revealed* useful may be interested in learning of the release of a new version of the QL Rom - 'JS' - which includes QDOS version 1.10.

In my program, included in Vol 3 No 38, simply alter Line 190 to read *TABULATE* 28194 and change Line 230 to *TABULATE* 28886 to reveal the runtime module addresses for all the keywords in your new Rom. There are 25 new keywords and, of course, all the other keywords have changed address.

COMMAND ROUTINE ADDRESSES

PRINT	30376	RUN	32164	STOP	32266	INPUT	30374
WINDOW	32638	BORDER	32676	INK	30154	STRIP	30158
PAPER	30162	BLOCK	32652	PAN	30196	SCROLL	30200
CSIZE	26274	FLASH	27564	UNDER	27558	OVER	27586
CURSOR	26310	AT	26324	SCALE	27638	POINT	27656
LINE	27674	ELLIPSE	27698	CIRCLE	27698	ARC	27778
POINT_R	27660	TURN	32408	TURNT0	32400	PENUP	32466
PENDOWN	32470	MOVE	32484	LIST	29824	OPEN	27464
CLOSE	27430	FORMAT	27252	COPY	27278	COPY_N	27282
DELETE	27110	DIR	27116	EXEC	26764	EXEC_W	26768
LBYTES	26886	SEXEC	26940	SBYTES	26944	SAVE	27500
MERGE	32202	MRUN	32212	LOAD	32244	LRUN	32250
NEW	32262	CLEAR	32152	OPEN_IN	27468	OPEN_NEW	27472
CLS	30192	CALL	26058	RECL	31436	RANDOMISE	31128
PAUSE	30280	POKE	30316	POKE_W	30324	POKE_L	30330
RAUD	25826	BEEP	25886	CONTINUE	32336	RETRY	32326
READ	26718	NET	30126	MODE	30096	RENUM	31524
DLINE	29794	SDATE	26524	ADATE	26504	LINE_R	27678
ELLIPSE_R	27702	CIRCLE_R	27702	ARC_R	27782	AUTO	31482
EDIT	31478	FILL	27528	WIDTH	32616	REPORT	32120
TRA	32344						

FUNCTION ROUTINE ADDRESSES

ACOS	32852	ACOT	32858	ASIN	32864	ATAN	32870
COS	32876	COT	32882	EXP	32888	LN	32894
LOG10	32900	SIN	32906	SORT	32912	TAN	32918
DEG	32924	RAD	32930	AND	33002	INT	33108
ABS	32962	P1	33090	PEEK	33132	PEEK_W	33140
PEEK_L	33150	RESPR	33186	EOF	33224	INKEY	33294
CHR\$	33382	CODE	33502	KEYROW	33646	BEEPING	33208
LEN	33480	DIMN	33542	DAY\$	33722	DATE	33622
DATE\$	33716	FILL\$	33400	VER\$	33266	ERR_NC	33808
ERR_NJ	33806	ERR_DM	33804	ERR_OR	33802	ERR_BO	33800
ERR_NO	33798	ERR_NF	33796	ERR_E1	33794	ERR_IU	33792
ERR_EF	33790	ERR_DF	33788	ERR_BN	33786	ERR_TE	33784
ERR_FF	33782	ERR_BP	33780	ERR_FE	33778	ERR_1P	33776
ERR_OV	33774	ERR_HI	33772	ERR_R0	33770	ERR_BL	33768
ERNUM	33882	ERLIN	33896				

The accompanying figure is an example print-out from the suitably modified program.

I hope this proves of use and interest to new 'JS' owners, like myself, and envious QL users still stuck with 'JM'

and even 'AH' versions as I was until my machine was given a retrospective upgrade whilst being repaired.

Alan Turnbull
Vicarage Road
Cale Green
Stockport

Free cassette labels special offer!



Wow! Fifteen of these attractive self-adhesive *Popular Computing Weekly* cassette labels are yours if you fill in the coupon below and sent it off to **Cassette Labels Offer, Popular Computing Weekly, 12-13 Little Newport Street, London WC2H 7PP, by 15 March 1985.**

Name:

Address:

.....

.....



Think again

Although I realise it must be very annoying for top programmers to see their latest program pirated, isn't it time that the so-called 'turbo-load' was stopped?

It's all very well stopping people from copying by putting on an anti-piracy device, but when it gets to the point when even the originals don't load surely it is time to think again.

A Woods
Andover

Old and obsolete

People should think twice before throwing out their old calculators and microcomputers.

Today's radios, calculators and especially computers will, I'm sure become tomorrow's collector's items - worth perhaps huge sums of money. In the future, people will then be able to look back and marvel at the antiquity of our present day technology.

I have now started to build up my own collection of old and obsolete microcomputers which can be picked up now for practically nothing, often in pristine condition.

Robert Sedgwick
Waltham
Grimsby

More C16 reviews

I think your comments regarding the lack of C16 software (February 7 issue) are quite unjustified.

My husband and I are building up a collection of C16 games and have 12 titles already, with another ten we want to buy.

Please stop saying there is a shortage of software and lets have a few more C16 program reviews.

Yvonne Thorpe
Essex

A Tony Crowther/Quicksilver Production

GRYPHON



Actual screen shots

Available exclusively from

QUICKSILVER

in association with The Wizard
Development Company Ltd.

Quicksilver Mail Order,

P.O. Box 6, Wimborne, Dorset BA21 7PY. Telephone (0202) 891744.

COMMODORE 64 • Disk £12.95 •
Cassette £7.95



It's a range of top quality software from Commodore designed to make the most of your Commodore 64's capabilities.

New packages will be introduced to the Gold Medallion range every so often, but only if they are really exceptional. They'll definitely be hard soft to beat. Miss any of them, and you really will be missing out.

Commodore
Gold
Medallion
Software

MUSIC MAKER

Whether you're an accomplished musician or an out-and-out beginner, Music Maker strikes exactly the right note.

No matter if you've never played a note before, so long as you can hum and you know your ABC, you can start to play famous popular tunes immediately.

And it won't be long before you appreciate Music Maker's many advanced capabilities: you can synthesise many

musical instruments, even create your own 'synth' electronic sounds, choose between monophonic or polyphonic play, summon up pre-programmed rhythms and bass accompaniments, and more.

Music Maker is the first in a series of packages which will fully exploit the Commodore 64's outstanding musical capabilities.

On disk or cassette, with music keyboard, a clear and concise manual, and song book, for just £29.95.

SPIRIT OF THE STONES

It's a treasure hunt for 41 real diamonds hidden somewhere on the Isle of Wight.

Only one man knows where they are, and he's not saying.

All that he has to say he's said already –



GOLD IF YOU YOU H

but in the form of riddles, clues and puzzles.

Solve the puzzles in the Spirit of the Stones program and you'll find it much easier to solve the puzzles in the Spirit of the Stones book.

Solve the puzzles in the book and one (or more) of the diamonds can be yours.

Whoever discovers a diamond can also claim his or her share of the Royalty Fund, which could grow to a maximum of £1 million. It's a game that's as entertaining as it can be rewarding.

On cassette or disk, £14.99.



INTERNATIONAL FOOTBALL

Already it's recognised as the best football game ever seen outside of Wembley.

It's startlingly life-like, and gives you near perfect control of the players.

You can kick the ball, dribble it, pass it,

MEDALLION. HAVEN'T GOT IT HAVEN'T GOT IT.

head it or even throw it in from the touch-line. And every time you belt the ball into the net, the crowd cheer wildly.



How often you score depends on how good you are, and also at what level you choose to play.



There are 9 levels you can play against the computer. Or you can play a friend.

International Football is a real test of skill, dexterity and speed. It is certain to drive you football crazy.

On cartridge, £14.99.

JACK ATTACK

There's no other game like it. It has been voted by the U.S. magazine 'Electronic Games Hotline' as a 'must buy.'

Jack Attack is about squashing heads. It's an

addictive game, a game of strategy and cunning. We can almost guarantee it will turn you into a head-case.

To stay alive, Jack must leap aside from collapsing bridges and crashing blocks, and at the same time he must

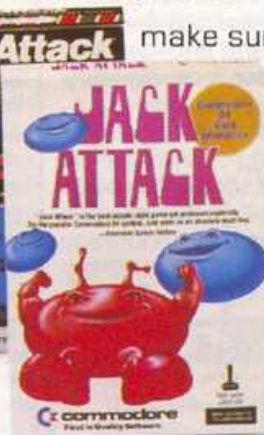


make sure he doesn't fall into the water... and drown.

And that's the easy bit. Because everywhere Jack goes he's dogged by jolly bouncing sadistic heads that are out to nut him.

He has to squash their heads before his is squashed.

And Jack can't afford to lose his head because we've only given him three, and when they've gone, he's gone...



Jack Attack is available for both the Commodore 16 and Plus/4. On cartridge £14.99.

commodore
HARD SOFT TO BEAT

**4 FREE
WAFERS
INCLUDING
SPECTRAL
WRITER WORD
PROCESSOR**

As a result of SMT's purchasing power, we are now able to offer the superb Rotronics Wafadrive data storage system for only £99.95*. But hurry! Stocks will not last long. You've read the reviews. Now's your best chance to buy!



ROTRONICS WAFADRIVE

SMT Special offer!

Wafadrive only £99.95*

*Plus VAT and £2.00 post and packing

Integrated System

The Wafadrive is a complete system which contains the micro interface, two 128K drives, RS232 and Centronics ports, all in one attractively-styled, compact unit. There is a minimum of connecting leads and no extra boxes to clutter the desk top. Like the majority of professional systems, the units are dual drive. This offers the optimum balance between system flexibility and cost. Built-in serial and parallel interfaces allow the direct connection of just about any popular printer.

Fast and Reliable

The Wafadrive achieves very fast loading and saving, but not at the expense of reliability. Extensive research and the use of high grade materials ensure that the Wafadrive will give years of dependable operation. Data integrity is on a par with

floppy disk. Three fully interchangeable blank wafers in three sizes – 128K, 64K and 16K – are also included. Low capacity wafers give faster access. They are therefore most suitable for program development applications. The high capacity wafers are suitable for more general data storage. Loading rate is well over ten times as fast as cassette!

Software

Armed with the comprehensive user manuals, blank wafers and superb Spectral Writer word processor, you'll have a professional system to be proud of. See the coupon below for details of the rapidly growing range of software to enable the

programmer and games player to exploit the Wafadrive system to the full.

Buy Now!

Cheap, reliable mass data storage for the Spectrum has finally arrived – make sure you benefit from SMT's special offer. Clip the coupon below and your order will receive immediate attention.

FOR USE WITH THE SINCLAIR SPECTRUM

Please send me (enter as appropriate):

- | | |
|---|----------------|
| <input type="checkbox"/> ROTRONICS Spectrum Wafadrive(s) | @ £117.24 each |
| <input type="checkbox"/> 16K wafer(s) | @ £3.45 each |
| <input type="checkbox"/> 64K wafer(s) | @ £3.65 each |
| <input type="checkbox"/> 128K wafer(s) | @ £3.95 each |
| <input type="checkbox"/> Heathrow/Nightlife II | @ £14.95 each |
| <input type="checkbox"/> Space Wars/Seiddab Attack/Luna Attack | @ £14.95 each |
| <input type="checkbox"/> Bear Boover/Wong's Loopy Laundry/World Cup | @ £9.95 each |
| <input type="checkbox"/> Starbike | @ £7.95 each |
| <input type="checkbox"/> The Artist | @ £9.95 each |
| <input type="checkbox"/> ZAP machine code | @ £19.95 each |
| <input type="checkbox"/> Sherlock | @ £14.95 each |
| <input type="checkbox"/> RS232 lead | @ £9.95 each |
| <input type="checkbox"/> Centronics lead | @ £9.95 each |

All prices include VAT and P&P

TOTAL £

- ☐ I enclose a cheque/PO* made payable to SMT
☐ debit my Access/Barclay card* account no.

(*delete as applicable)

Signature: _____

Name: _____

Address: _____

Send to (no stamp required): **SMT, FREEPOST, Greens Norton, Towcester, Northants, NN12 8BR**

Please allow 28 days for delivery.



SMT

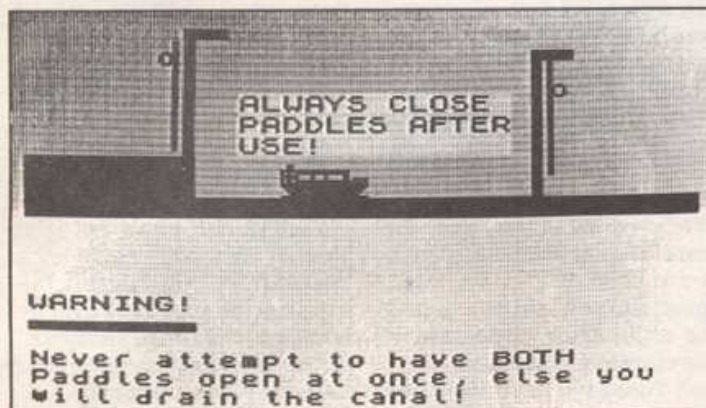
Reasoning

Program *Lock Keeper* **Price** £4.95 **Micro** Spectrum 48K
Supplier Deva Educational Software, 33 Upton Drive, Chester CH2 1BY

Does this educational program indicate that Deva expects a great revival in canal travel? Not really, but it uses the processes involved in operating a lock to encourage reasoning and ordering skills. For example, if you open both gates

option of the tutor program or the tests. The former runs through the procedures of lock keeping in a friendly fashion, with animate illustrations. Once the child understands this, the tests present six different situations and a menu to conduct them.

A percentage score follows each test and the inputs are well idiot-proofed, but in the end it is worthy rather than exciting. Perhaps if the tests could be replaced by a simulated journey with a race against time it would be more appealing, but sadly the educational software market is



the water flows straight through and you drain the canal.

While the theory behind this program seems sound enough, the implementation is unlikely to hold the attention of the average ten year old. The title screen gives the

seldom able to develop sophisticated offerings owing to its scale. A small company has put some hard work into this program but the end result lacks flair.

John Minson



Pot luck

Program *Steve Davis Snooker* **Micro** CPC 464 **Price** £7.95
Supplier CDS Micro Systems, Silver House, Silver Street, Doncaster, South Yorkshire DN1 1HL.

After all the fuss I made about how Amsoft's *Snooker* will compare to this version I am now in a position to say and the first point to make is that where Amsoft's game was too slow and difficult, this one is very very fast. I'm sure it's also easier (because the pockets are bigger). I found it much more enjoyable to play, and the pace certainly suits my temperament.

Unfortunately, there are one or two drawbacks to the CDS game that cloud the issue. Firstly, and less impor-

tantly, the CDS game has far less attention to detail with nowhere near as attractive on-screen scoring for instance. More crucial, though, is the fact that CDS appear to have given no consideration at all to the owners of the green screen monitor - not only did the Amsoft program allow the colours to be numbered on screen, but as you moved the cursor over a ball there was a message telling you which colour it was. CDS seem content to let you take pot luck (get it?) forcing you to nominate a colour before you line up the cursor.

In practice, the various colours are very difficult to distinguish in monochrome and many foul shots result. This may drive a significant proportion of potential buyers to the Amsoft game.

Tony Kendle



Deflated

Program *Guzzler* **Micro** Commodore 64 **Price** £7.95
Supplier Interceptor Micros, Lindon House, The Green, Tadley, Hants

This is another of those ridiculous maze games, with funny characters and hundreds of different screens. Don't get me wrong, some people will love *Guzzler*.

You are a mouse and, as mice are always hungry, it is your job to find food. The food is placed in various locked rooms around the maze, and you have to get a key to gain access, before you get to eat it. You must also avoid the meandering

Probbies, who are far more keen on eating you. After eating the food in one section, the mouse becomes fat and has to be guided to the edge of the maze to be deflated by Deflator Dennis.

Sometimes, when the going gets tough, you even need to use time bombs (ever seen a mouse carrying a time bomb? No, neither have I). If things are going well, Bonus Barry appears and can be caught for extra points.

Although *Guzzler* is quite fun to play, I feel that it lacks that original spark. If you haven't already got a maze game in your collection, then I suppose you could do worse than shell out for this one.

Tom Hussey



Martial art

Program *Kung Fu* **Price** £6.95 **Micro** Spectrum 48K
Supplier Bug Byte Software, 99-100 The Albany, Old Hall St, Liverpool, L3 9EP.

I loaded this program with trepidation, not that it would kick the keys from my Spectrum, but that it would be the silliest sport simulation yet. After all, what is Kung Fu without physical exertion, bones crunching and cries of 'Argh'?

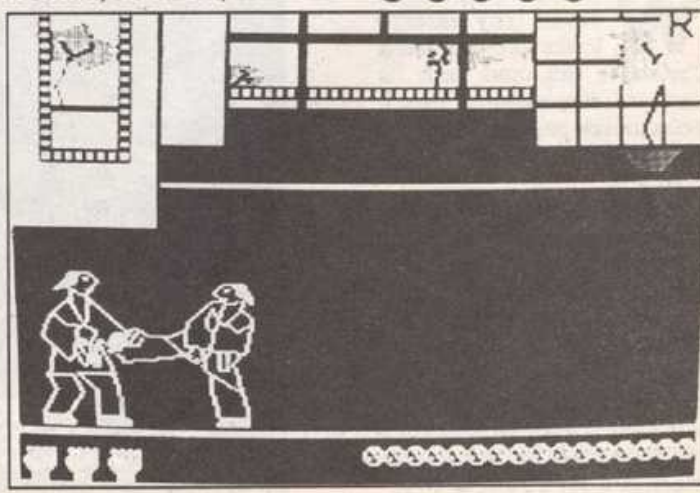
Sixty minutes later I was hooked. Backed by an incessant oriental tune my fighter, a full third of the screen tall and superbly animated, moved back and forth, trying to topple his computer operated opponent. With just two hand blows and two kicks he blocked, hesitated, found an

opportunity and struck. The opponent toppled and I gained my yellow belt.

To confirm my impression that the moves are accurately reproduced I left the arcade game and invited a karate green belt friend round to fight me on the two player option. She recognised the blows immediately and proceeded to deliver a nifty kick to the head of my man. Beginner's luck, or had her martial arts expertise actually helped?

Possibly only four moves will limit the program's life, but then again the one and two player options are quite different games, and the timing and precision needed are every bit as exacting as in arcade adventures. Forget the doubts; all I have to say is . . . Hai-ee-ahh!

John Minson



Powerful

Program *Arnor Z80 Assembler, Disassembler and Editor* **Price** £13.50 **Micro** CPC 464 **Supplier** Arnor Ltd. P.O. Box 619, London SE25 6JL.

Any program that called itself an assembler should be able to perform the same basic function - converting assembler to machine code. However the things that separate one version from another are the supporting utilities, the flexibility, and the ease of use, and this attempt by Arnor is easily the best that I have seen in those respects. It features a menu driven by disassembler and a memory lister in addition to the main editor and assembler, but the latter two are certainly the most important features. Each part can be loaded or omitted independently so that full use is made of the memory.

The assembler itself has many excellent features - allowing identifiers of any length and almost any form including the use of directives and mnemonics as labels, and allowing conditional assembly via nested *If*, *Else* and *Endif* so that the object code differs in response to variables such as available memory. The as-

sembler is two pass and different messages can be caused to appear on each pass and you are also given extensive control over the screen and printed output with various commands.

However, it really comes into its own by allowing mixing of assembler and Basic - the utility can reside in memory above your program and assembler language can be entered as lines of Basic, assembled using commands provided as system extensions and run from any point in the program without affecting basic variable storage. Provision is made for full parameter passing between the two languages.

The editor allows full screen editing with excellent cursor control, delete and insert functions and block loading, saving and printing. Although it has been designed to be used with the assembler, it can be used as a powerful editor for text and basic files saved in ASCII format - a truly superb feature that illustrates the care that has gone into this program. The documentation is good enough for most people's use and the company promise more utilities of a similar quality if this one does well - let's hope it does.

Tony Kendle



Deadly toys

Program *Toy Bizarre* **Micro** Spectrum 48K **Price** £7.99 **Supplier** Activision UK, 15 Harley House, Marylebone Road, London NW1.

With its bright red cover *Toy Bizarre* looks like a belated Christmas gift, and with its standard size cassette box it looks unlike previous lavishly produced Activision products.

The game itself unfortunately, considering its £7.99 price tag, wouldn't look out of place in a budget range.

Not that *Toy Bizarre* is bad - it just seems to come from One Million Years B. W. (Before Willie). It's a platform game set in a toy factory after midnight, with Merton as the latest in a long line of over-

worked individuals with silly names (sorry, all Mertons out there). He runs and jumps in an effort to stop balloons filling themselves at taps, meta-

Repellent

Program *Upper Gumtree* **Price** £6.95 **Micro** Commodore 64 **Supplier** Richard Shepherd Software, Eton House, 23-25 Elmshott Lane, Slough.

First we had the grimly hysterical world of *Urban Upstart* and now, once again courtesy of Richard Shepherd software, come the horrors of *Upper Gumtree*, the town where beans on toast used to be a big event. But that, of course, was before the Mad Professor arrived. Now nobody can call Upper Gumtree boring. Weird, potentially lethal and frequently repellent, yes. Boring, no.

The Prof is, naturally, after World domination and for some reason (well, he *is* mad) has picked UG as his base. Now sinister shapes patrol the night skies, the noses of the citizenry glow in the dark and Tuesdays have vanished completely. The Prof has a plot, but what can it be?

In quest of the answer I

found myself in a peaceful country lane with what I foolishly assumed to be two trusty companions, Emma and Wally. Emma's OK, but after being left to bleed to death in the first minute by an abusive Wally, I began to wonder about keeping company with a kleptomaniac.

Each route, once I had solved the initial problem, led to further danger including a murderous farmer, a fast-moving and extraordinarily persistent bull, rabid dogs and the very nasty effects of attempting to take refreshment in UG. Most locations start with a rapid illustration which then gives way to text and, in a nice touch, you can alter the text colours to your preference. And descriptions are often amusing, not least the "obligatory wood".

I found this more fun than *Upstart* and also more of a challenge. I still haven't figured out the plot, but now I've managed to distract the guard dogs. The Prof's megalomaniac days may be numbered.

Barbara Conway

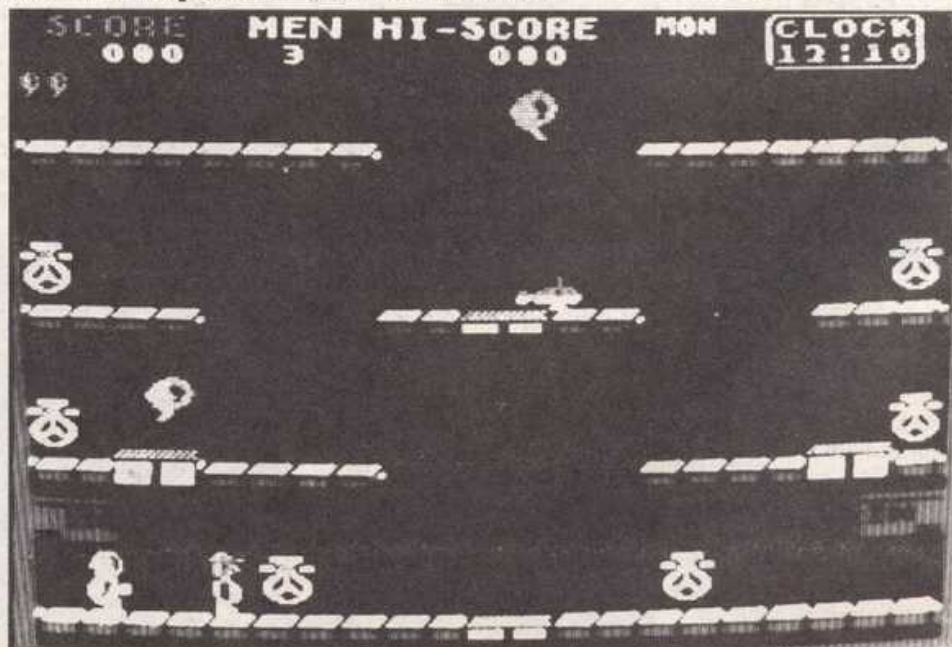


morphosing into deadly toys, then returning to their original state of balloonatic bliss (an unusual life-cycle here, unknown even to O-level biologists!) There's also Hefty Hilda, the roving menace, and Piston Platforms which propel anything on them upwards. Inevitably, each successive screen is more difficult than the last.

This can be enjoyable for a while as the screen fills and you race against time, but the program lacks finesse. The screen is soon full, luck plays too great a part and the graphics are nothing special.

All in all, a stocking filler at a big present price.

John Minson



The introduction of MSX Basic has quite simply revolutionized the use of home computers. From today most of the languages in common use will fade into the brickwork.

Up until now home computers have used different machine languages, so that games and peripherals have been totally incompatible, but the introduction of MSX Basic will allow all products to run on any of these new machines. The implications are awesome.

deserves an equally innovative book. And not surprisingly it's published by Penguin.

MSX BASIC REVEALED gives the reader vital programming skills for MSX, and a detailed examination of its potential uses. It is one of the first books in the field and is certainly the very best.

When you realise that present day language systems have had their chips, you'll realise the need for **MSX BASIC REVEALED**.



Receive your choice of any one of these five Sunshine Microcomputer books **free of charge** when you subscribe to **Popular Computing Weekly**. Sunshine Microcomputer books contain all the information you need to make full use of your Spectrum, QL, C64, Atari or BBC micro.

U.K.

1 year ☐ £19.95

☐ 1 year ☐ £ 9.98

Overseas

☐ £37.40 (airmail)

☐ £18.70 (airmail)

☐ I enclose a cheque or postal order made payable to **Sunshine Publications Ltd.**

☐ Please charge my Visa/Access card no:

Expiry date:.....

Signature:

Send my choice of Sunshine Microcomputer Book:

- ☐ Commodore 64 Adventures
- ☐ The Working Spectrum
- ☐ Developing Applications on the Sinclair QL
- ☐ Atari Adventures
- ☐ Making Music on the BBC Computer

Name:

Address:.....

Postcode: Country:

Return this coupon with your payment to:
PCW Subscriptions, 12-13 Little Newport Street, London WC2H 7PP, UK

PD15

Spoken word

Hardware Amstrad Speech
Synthesiser plus stereo Micro CPC
464 **Price** £39.95 **Supplier**
DK'Tronics Ltd, Unit 6, Shire Hill
Industrial Estate, Saffron Walden,
Essex.

I must confess that I've never been one to be greatly seduced by the appeal of computer speech, nor, having been used to the Spectrum's weedy bleeps, did I regard the CPC 464 as a machine that requires external amplification as a high priority. However, there can be no question that speech synthesisers, if they can sell in sufficient numbers to encourage software support, are popular peripherals and it is certainly nice to be able to hear the stereo effect of the sound channels without the rigmarole of plugging in the hi-fi, which always struck me as a retrograde step from the remarkable simplicity of the all-in-one single plug 464.

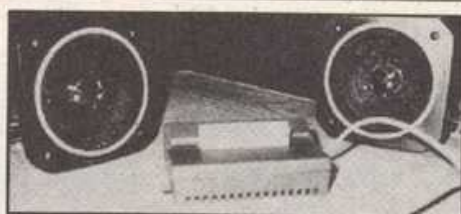
The package consists of two quite neat 'pod mounted' car speakers which connect to a small box, finished to match exactly with the main computer except for the DK'Tronics logo. This plugs snugly into the floppy disc edge connector and also sends a wire to the stereo sound output socket, together with a built-in

extension bus to allow further external peripherals to be plugged in. Fitting should be simple, involving just slotting the thing into the back.

However, the first try revealed an unsuspected fault in my computer - if you inspect the floppy disc edge connector you will see that it in fact consists of two halves separated by a slot, presumably to ensure that you don't plug things in upside down. On my machine this slot is self-evidently smaller than it should be and I could not get the speech box to fit without damaging the corresponding ridge on the interface. Having struggled for almost half an hour to sort this out I am now dreading having to remove the interface.

In place it acts as a permanent amplifier and stereo output for commercial games etc. It gains all its power from the computer and does not interfere with the inbuilt sound output if you choose to disconnect the speakers.

The speech part of the interface can be accessed from Basic or machine code at any time by sending the appropriate allelophone data to the out channel concerned. To help you do this there is a table of words showing their composition in allelophones. You can also control the speed at which the speech is output. Sound quality is appropriately robotic and bland but reasonably clear. However, once the accompanying, relocatable,



5K of software is loaded then the thing comes into its own. You are given eight new Basic commands for controlling the speech output and, as well as allelophones, you can now employ 'text to speech conversion' wherein you can direct a message that would normally be printed to any channel to be spoken.

Within minutes the big kids in our house had the 464 saying all sorts of outrageous things to the accompaniment of much hilarity and I can confirm that this system seemed to work even better than the allelophone method. I trust that there will be no problems from DK'Tronics about software copyright if people choose to include this in their own Basic programs. The speech commands are interrupt driven and there is a built-in buffer that holds some 45 seconds of speech.

In all this is a fun package that whilst appearing a bit frivolous in some ways, has been well implemented and has enough good features to make it worth the money.

Tony Kendle

SIMPLY CHEAPEST SOFTWARE CHECK THESE PRICES

SPECTRUM		OUR	SPECTRUM		OUR	COMMODORE		OUR	COMMODORE		OUR
RRP	PRICE		RRP	PRICE		RRP	PRICE		RRP	PRICE	
GHOSTBUSTERS	9.99	7.45	KNIGHTLORE	9.95	6.95	GHOSTBUSTERS	10.99	8.25	KOKO TONI WILF	6.99	5.30
DESIGNERS PENCIL	9.99	7.50	UNDERWURLDE	9.95	6.95	BRUCE LEE	9.95	7.45	FTBALL MANAGER	7.95	6.25
BLUE MAX	7.95	5.90	MATCH POINT	7.95	65.45	IMPOS MISSION	8.95	7.50	STELLAR 7	9.95	7.50
SKOOL DAZE	5.95	4.50	PYJAMARAMA	6.95	5.15	ONE TO ONE	9.95	7.75	BTTL NORMANDY	14.95	11.20
AIR WOLF	6.95	5.20	POTTY PIGEON	6.95	5.20	MONOPOLY	12.95	10.75	COMBAT LEADER	14.95	11.20
TIR NA NOB	9.95	6.90	GIFT FROM GODS	9.95	7.75	INDIANA JONES	9.95	7.45	ALL LEVEL 9 GAMES	95.95	7.45
MATCH DAY	7.95	5.65	WITCHES CLDRN	6.95	5.25	COMBAT LYNX	8.95	6.90	SLAP SHOT	8.95	6.60
HUNCHBACK II	6.90	4.90	KOKOTONI WILF	5.95	4.60	BOULDER DASH	8.95	7.20	ARCHON	11.95	8.95
BOULDER DASH	7.95	5.90	ASTRO NUT	5.95	4.55	SUICIDE EXPRESS	7.95	6.40	BBC		
DALEY'S DECATH.	6.90	4.95	MONTY MOLE	6.95	5.30	STAFF OF KARNATH	9.95	7.25	ELITE	14.95	11.50
BEACH HEAD	7.95	5.90	AVALON	7.95	6.45	SPY HUNTER	9.95	7.45	SABRE WOLF	9.95	7.50
T.L.L.	5.95	4.45	H'ROW AIR TRAFFIC	7.95	6.15	TAPPER	9.95	7.45	FTBALL MANAGER	7.95	6.20
FIGHTER PILOT	7.95	5.95	FTBALL MANAGER	6.95	5.55	CONGO BONGO	9.95	7.45	HOBBIT	14.95	10.50
FULL THROTTLE	6.95	5.70	ZAXXON	7.95	6.25	PYJAMARAMA	7.95	6.25	ALL LEVEL 9	9.95	7.45
ALL LEVEL 9	9.95	7.55	TECHNICIAN TED	5.95	4.45	FLIGHT PATH 737	7.95	6.25	KENSINGTON	12.95	9.95
PSYTRON	7.95	5.90	ALIEN 8	9.95	7.25	MANIC MINER	5.95	4.75	SON OF BLAGGER	7.95	6.20

ALL TAPES GUARANTEED GENUINE: FIRST CLASS DELIVERY SAME DAY AS ORDER RECEIVED

P&P. INC. IN PRICE UK: 75p PER TAPE EUROPE: £1 PER TAPE ELSEWHERE

SEND LARGE S.A.E. FOR FULL LIST (state machine), MSX, C16, AMSTRAD

WHEN ORDERING SEND CHEQUE/P.O. TO:

BARGAIN SOFTWARE (Dept PCW1)

10 MELODY COURT, STONEHILL ROAD ESTATE, LONDON W4 3AW

TEL: 01-995 2763

New - the official Spectrum Upgrade!

Turn your Spectrum into a Spectrum+ for just £20



- Professional full-size keyboard – includes 17 extra keys.
- Responsive typewriter-style action.
- Accepts all current Spectrum software and peripherals.
- Complete with 80-page User Guide and Companion Cassette.

Here's some exciting news for 48K Spectrum owners ... the official Spectrum Upgrade Kit.

The £20 Kit has everything you need to turn your Spectrum into the stylish new Spectrum+. You don't even need an understanding of electronics, just the ability to solder a few wires together! The leaflet in the kit gives clear, step by step instructions.

If you're not sure about doing it yourself, don't worry. Simply return your 48K Spectrum to Sinclair and for £30 we'll upgrade it for you.

Whichever you decide on, you'll also receive the new 80-page User Guide and Companion Cassette.

The bigger, better Spectrum keyboard

The Spectrum+ measures 12½" x 6". It has a large typewriter-style keyboard, with hard, moulded keys.

You'll find the new keyboard has a smooth, positive action – ideal for touch-typing, word processing, simulation programs, and extended programming sessions. Two retractable legs give a perfect typing position.

There are 58 keys in all, including 17 new keys. Programmers will be pleased to see dedicated punctuation keys, a space bar, and separate shift keys for graphics and extended modes. And a reset button allows you to clear a program from your computer's memory without disconnecting the power supply.

The official Spectrum Upgrade

Naturally your upgraded computer will accept all the peripherals in your Sinclair system - Interface 1, Microdrives and so on - as well as all

Spectrum software.

Just as important, new Spectrum software and peripherals will be designed with the Spectrum+ in mind. So the Sinclair upgrade adds stylish looks, new capabilities ... and new potential for the future.

Included – the new Spectrum+ User Guide and Companion Cassette

The new User Guide has over 80 pages of information, including a handy BASIC dictionary. The Companion Cassette provides an interactive tour of the new keyboard, and includes three entertaining arcade games.



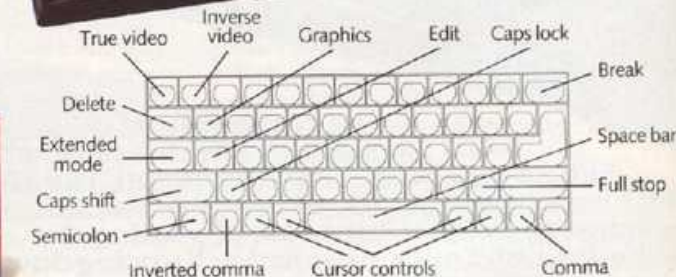
TO ORDER BY MAIL:

When ordering the Upgrade Service, send off your 48K Spectrum to the address below, carefully wrapped, together with the completed coupon and appropriate payment. (Please do not return the mains adaptor, manual or other ancillaries.) Your upgraded computer will be despatched to you within 10 days of receiving your order.

When ordering the Upgrade Kit, simply complete the coupon, enclosing the appropriate payment and post it to us at the address below. Please allow up to 28 days for delivery.

BY PHONE: Access or Barclaycard holders can call Camberley (0276) 685311 for personal attention, 9am to 5pm Monday to Friday. Only the Upgrade Kits can be ordered by phone.

Please note: the upgrade offer applies to working 48K Spectrum models in the UK only.



To: Sinclair Research Limited, Upgrade Dept., Stanhope Road, Camberley, Surrey, GU15 3PS.

All prices include VAT, post and packing, User Guide and Companion Cassette.

- ☐ Please send me the Spectrum+ Upgrade Kit. I enclose payment of £20.
OR
☐ Please upgrade my 48K Spectrum for me. I enclose my computer together with payment of £30.

I enclose a cheque/postal order

payable to Sinclair Research Limited for £

OR

Please charge my Access/Barclaycard no.

Signature _____

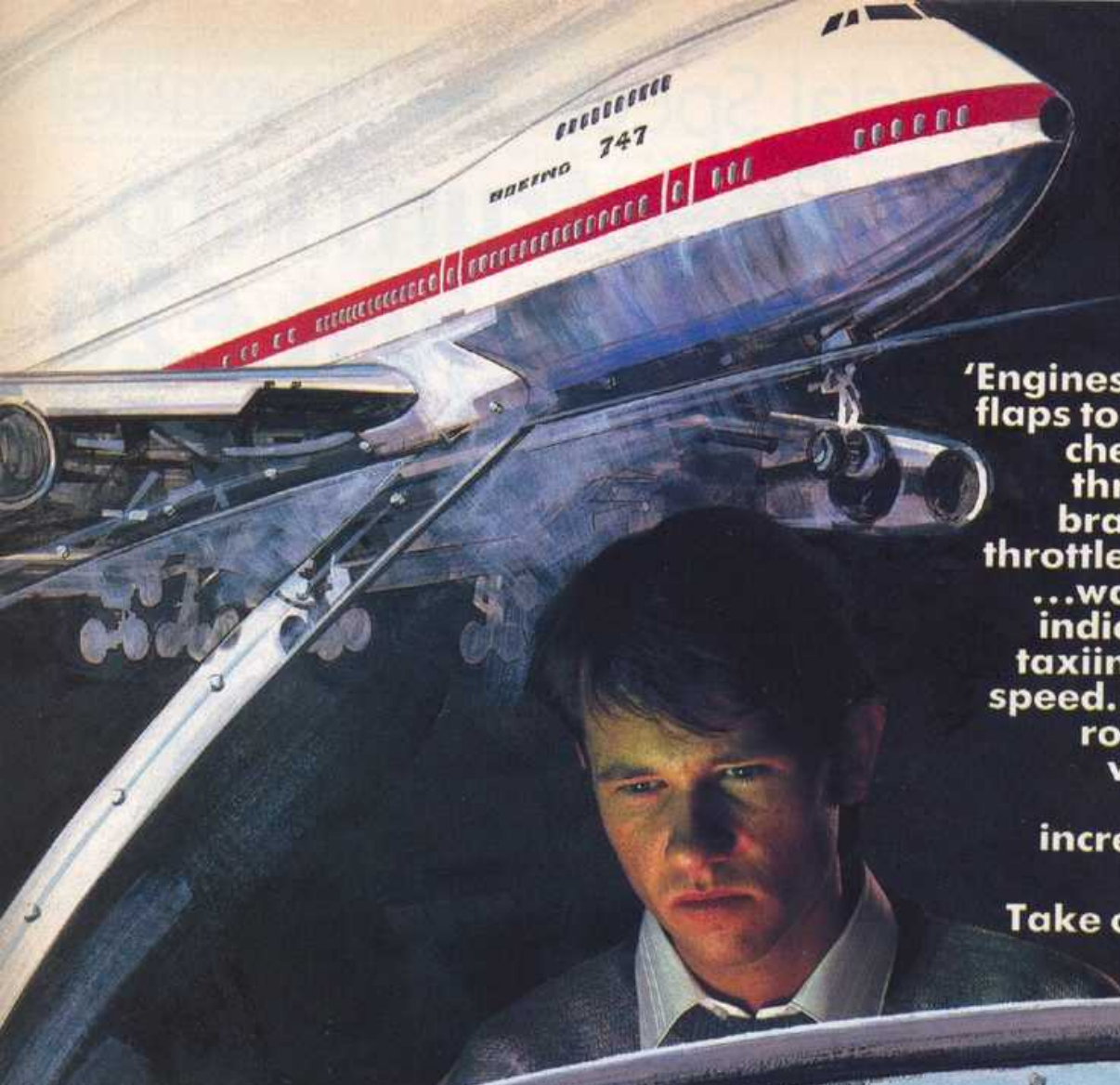
PLEASE PRINT

Name: Mr/Mrs/Ms _____

Address _____

Sinclair Research Limited,
Upgrade Department,
Stanhope Road, Camberley,
Surrey, GU15 3PS.

sinclair



**'Engines on...check...
flaps to 10 degrees...
check...increase
throttle, release
brakes. Increase
throttle to full power
...watch air speed
indicator. Aircraft
taxiing, increasing
speed...170 knots...
rotate, observe
vertical speed
indicator...
increase elevator
angle.
Take off achieved!'**

**The excitement of a
DACC 747 take off fires the adrenalin
like no other computer simulation. The 3D
pilot's view and full array of instrumentation
challenges you to take the role of piloting a
Jumbo Jet...and once in control and taxiing down
the runway, there's no turning back.
Take off achieved. Full flying control at your
fingertips and seven British Airports to fly to...the
drama of landing is waiting to unfold as you sit in
the hot seat of a 747 flight deck.**

Over 45 dials and indicators to control with simulated emergencies, systems failures, and audible alarms. Runways
visible in true perspective on take off and landing. Optional use of joysticks.
100% Machine Code on Commodore 64k and Spectrum 48k versions.
Also available for Dragon 32/64, Tandy C/C (32k), BBC Model B, Acorn Electron, Atari 400/600/800 (48k).
Cassette Price £9.95 including VAT and postage. Spectrum Price £27.95, Commodore on Disk Price £11.95.



747 FLIGHT SIMULATOR FROM DACC

**dacc
LIMITED**

To: DACC Ltd.
23 Waverley Road, Hindley,
Wigan, Lancashire WN2 3BN.

Name (BLOCK LETTERS) _____
Address _____
County _____ Postcode _____
Please send me copies of the DACC 747 Flight Simulator
at I enclose cheque/Postal Order for
the total of My computer is a _____
You may order by Access, either by post or 24hr. Telephone (0942) 522002.
Despatch within 48hrs. Please debit my Access account
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

The leaders in Flight Simulation.

All dealer enquiries to sole distributor: MICRO AIDS, Beech House, Hob Hey Lane, Culterthorpe, Warrington.
Tel: 092 576 2613/5930.

Epic proportions

Graham Taylor goes in search of interactive video and finds it in unexpected places.

Interactive video, it seems, is almost here, but then it has been almost here for several years now. It was almost here when the first Laserdisc arrived. It was even more almost here when *Dragon's Lair* didn't much wow them in the arcade.

Actually the truth is that interactive video has been around for ages, three or four years, in fact, and has reached a surprising degree of sophistication. Video images and narrative sequences can be freely mixed with computer graphics, scrolled, dissolved, mixed, matched and retrieved from Laserdisc in seconds. The equipment involved is largely standardised and relatively simple.

Epic is probably the biggest interactive video company in the country, one of the biggest in the world, but you won't find its product in the arcades or on sale in your local computer store. The chances are that you won't see its work at all, because interactive video has stopped being almost here and is instead wowing them in the wonderful world of industrial communications, more specifically, training material and point of sale information.

Head of the interactive video department at Epic is Mike Huddart and I talked to him about his work. "It began when Eric Parslow, the founder of the company, saw the system at work in America. Epic was already involved in ordinary training videos and he saw how the system could be used to improve that process immeasurably."

Over the years Epic has produced a system for IBM to help them inform their dealers about ranges, a system for Rolls Royce to help its trainees and workers learn how to assemble and inspect aero engines, EETPU, the engineering union

has a system which introduces traditionally trained workers to the mysteries of solid state physics, and the Manpower Services Commission is installing a system of interactive video into 42 special information points within selected Job Centres.

Mike described the ideas behind this last project. "It is intended to help people visiting the Job Centre find out more about the services at a basic level - so that they know what kind of things the staff can help them with." There are also technical reasons why the Job Centre project is interesting: "The Manpower Services Commission is using it as a test for the two main rival systems - the Phillips Laservision and the Thorn UHD (ultra high density)."

Nearly all of Epic's work is based on one of these two systems at the disc end. I asked Mike about the systems. "The laserdisc can contain up to 37 minutes of continuous film sequence or 54,000 individual still frames. The Thorn system can have over an hour's worth of film or 30,000 frames."

Wasn't 37 minutes a very short time limit? "Actually no, we can make use of that 37 minutes of film sequence, so that the EETPU course, for example, lasts four days. It's a matter of careful design - after all, in an instruction video there are going to be sections where you simply require someone to read a screenful of text, which means one still image can use up a minute or so of time."

The computer end of the system is, within limits, not too important. Epic has utilised the IBM PC and the BBC amongst others. "We use a BBC on the EETPU project and it's perfectly adequate - the advantage of the BBC is that its signal is highly suitable for TV."

As you might imagine the process of

making an interactive video is fairly complex and time consuming. "In a typical piece there might be 40-50 major branch points and many more lesser ones where different sequences of computer graphics, text, video images may be required. Each piece has to be originated: programming has to be worked out, computer graphics prepared, still shots have to be professionally taken and filmed sequences recorded."

"You need a multidisciplinary team - in the case of a training video you need an expert on the subject. You must work out, in consultation with the client, the aims and objectives of the work and how to best put it over. You need audio-visual specialists who can create strong images and who know how to use effects like dissolves, and you need systems analysts who work in a more disciplined way in using computer systems correctly. At the very least it's a computer team plus a video team. Finally you need a project leader who can pull together the two disciplines."

Actually, looking at Epic's work it becomes apparent just how sophisticated the system has already become.

A piece is being developed for IBM which uses a touch screen television - different sections of the TV screen producing different results: one part accesses help information, another lets you look at traditional information on each subject, and so on.

The idea is that the end result will be available for IBM dealers for use in the showrooms. "There are quite a few places where videos are shown to interest customers in products and services, but who looks at them? With this system people can choose the sections they are most interested in."

The end result is an impressive mixture of scrolling film screens with computer graphics. Whatever you think of IBM, you find yourself playing with the system and wanting to see more. "Sometimes we have to explain to our clients that the system is capable of far more than simply chopping up bits of tape and accessing them quickly."

"For example, the IBM program does more. Even that shows a sophisticated advert where you decide what products you want to know more about. Every time a section is kept by the computer and filed appropriately it means that the dealer can know exactly what products his customers are most interested in." Technology for video interaction is largely with us, but Mike sees the main problems as those of human skill. "I would say that, certainly for Epic's purposes, the technology is more or less with us for most things we want to do. It's more a matter of acquiring the skills and techniques to use it properly and effectively. There can be a tendency to make the whole thing more sophisticated and complex than it needs to be. We have to remember what the end result is supposed to be."



Snooker Strategy

Straighten that bow-tie as you type in this Snooker Strategy program for the CBM64 by Steve McCarthy

Ever thought of yourself as a budding Steve Davis? Or maybe cutting a more debonair stride as a Cliff Thorburnite? The trouble is that you don't know which end of a cue to grab hold of and it's difficult to fit a billiard table into

the box room. However, these problems are solved with Snooker Strategy, a two-player game for the Commodore 64.

Sitting back in your chair, you select the ball to be potted – none of this straining over the green baize business – as you

build up your break, or play a sneaky one to snooker your opponent. . . . What's more, you don't have to wear a dinner suit.

Type it in, and remember . . . we all had to start somewhere. Now where did I put that chalk. . . .

```
10 POKES3280,5:POKES3281,5:HK=0:DIMF%(1)
R%=INT(RND*(-1)):GOSUB14000
15 DIMA%(6),S%(1),BK(1),DF(8),EF(1)
16 REM CLR SCREEN,RVS ON,GRAY 1,RVS OFF
20 PRINT "J":TAB(3):@THE COMMODORE 64 SNOOKER TOURNAMENT@
30 GOSUB1000
34 REM HOME,4*CRSR DOWN,ORANGE
35 PRINT "*****";
39 REM RVS ON,WHITE,RVS OFF,CYAN,GRAY 1,RVS ON,WHITE,RVS OFF
40 PRINT "2#PLAYER 1#FRAMES" "1#FRAMES2#PLAYER 2#";
44 REM BLUE,YELLOW,BROWN,BLUE,RED
45 PRINT "SCORE BREAK:"
46 BREAK SCORE:PRINTTAB(11)"HIGHEST BREAK:"
49 REM ORANGE
50 GOSUB1500:PRINT":
50 GOSUB1510:GOSUB1520:GOSUB1530
99 REM HOME,5*CRSR DOWN,BLACK,RVS ON,WHITE,RVS OFF
100 IFP%THENPRINT "*****PLAYER 1#TAB(72)"2#PLAYER 2#":GOTO120
109 REM HOME,5*CRSR DOWN,RVS ON,WHITE,RVS OFF,BLACK
110 PRINT "*****PLAYER 1#TAB(72)"2#PLAYER 2#":
119 REM HOME,9*CRSR DOWN,GRAY 3,
120 PRINT "*****PRESS A KEY (1-9) TO SELECT OBJECT BALL."
129 REM HOME,11*CRSR DOWN,BLACK
130 PRINT "*****1=RED, 2-7=COLOUR, 8=PLAY A SNOOKER,
9=PLAY OUT OF SNOOKER"
150 GETK:IFK#("1"OR"8")GOTO150
159 REM HOME,9*CRSR DOWN
160 PRINT "*****":FORN=1TO4:PRINTC%:NEXT
163 REM HOME,18*CRSR DOWN:HOME,22*CRSR DOWN
164 PRINT "*****C%";
165 PRINT "*****C%";
167 IF(SH%1)AND(K#("9"))THEN9000
168 IF(ABS(S%(0)-S%(1))<7)AND(BK=21)AND(K#("8"))THEN9100
169 IFK#("9")ANDSN=0THEN5200
175 ONVAL(K#)GOTO180,300,400,500,600,700,800,900,950
180 IFBK=15THENGOSUB2000:GOTO180
190 FV%=4:IF BK(P%)=0THEN210
200 IF LPOT%<2THEN2010
```

```
210 PV%=1:GOTO2110
300 IFBK=16THEN3100
305 FV%=4:IF(BK%16)AND(LPOT%1)THEN2010
310 PV%=2:GOTO2110
400 IFBK=17THEN3100
405 FV%=4:IF(BK%17)AND(LPOT%1)AND(LPOT%2)THENGOTO2010
410 PV%=3:GOTO2110
500 IFBK=18THEN3100
505 FV%=4:IF(BK%18)AND(LPOT%1)AND(LPOT%3)THENGOTO2010
510 PV%=4:GOTO2110
600 IFBK=19THEN3100
605 FV%=5:IF(BK%19)AND(LPOT%1)AND(LPOT%4)THENGOTO2010
610 PV%=5:GOTO2110
700 IFBK=20THEN3100
705 FV%=6:IF(BK%20)AND(LPOT%1)AND(LPOT%5)THENGOTO2010
710 PV%=6:GOTO2110
800 IFBK=21THEN3100
805 FV%=7:IF(BK%21)AND(LPOT%1)AND(LPOT%6)THENGOTO2010
810 PV%=7:GOTO2110
900 FV%=VAL(MID$(P#,BK,1)):IFFV%<4THENFV%=4
910 GOTO2110
950 PV%=VAL(MID$(P#,BK,1)):FV%=PV%:IFFV%<4THENFV%=4
960 GOTO2110
1000 RESTORE FORN=0TO5:READA%(N):NEXT
1005 FORN=0TO5:READB%(N):NEXT
1010 DATARED,YELLOW,GREEN,BROWN,BLUE,PINK,BLACK
1011 DATAPPPFMP,PPPFMS,PPMFPS,PPPFMS,PPMFMS,PPMFMS,PPMFMS,
MNSSSF,HPFFRR
1020 B$="*****":P$="1111111111111234567"
1025 C$=" "
1029 REM HOME,2*CRSR DOWN,RED,YELLOW,PURPLE,BROWN
1030 PRINT "*****TAB(10)LEFT$(B$,15)"MID$(B$,16,1)
"*****MID$(B$,17,1)"MID$(B$,18,1)";
1039 REM BLUE,LT. RED,BLACK
1040 PRINT "*****MID$(B$,19,1)"MID$(B$,20,1)"MID$(B$,21,1)";
1049 REM WHITE
```



```

1050 PRINTTAB(10) "P: PZ=0: SNZ=0: BNZ=1: SZ(0)=0: SX(1)=0: BX(0)=0:
BX(1)=0: RETURN
1499 REM HOME, 7*CRSR DOWN, YELLOW, GRAY 1
1500 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
1509 REM HOME, 5*CRSR DOWN, CYANGRAY 1
1510 PRINT "SPC(15)FZ(0)TAB(60)" "FX(1): RETURN
1519 REM HOME, 6*CRSR DOWN
1520 PRINT "SPC(15)"
1524 REM HOME, 6*CRSR DOWN, YELLOW, BROWN
1525 PRINT "SPC(15)BX(0)TAB(20)" "BX(1): RETURN
1529 REM HOME, 7*CRSR DOWN, RED
1530 PRINT "SPC(25)HBX: IFHBX=0 THEN E$(0)=" "E$(1)="
" :GOTO1550
1535 IFBZ(0)=HBX THEN E$(0)="<": E$(1)=" " :GOTO1550
1540 IFBZ(1)=HBX THEN E$(0)=" " : E$(1)=">"
1549 REM HOME, 7*CRSR DOWN, WHITE
1550 PRINT "SPC(0)E$(0)SPC(21)E$(1): RETURN
2000 S1=8: S2=147: DUR=100: GOSUB12000
2006 REM HOME, 22*CRSR DOWN, RVS ON, RED, RVS OFF
2007 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
PLEASE RESELECT. " : RETURN
2009 REM HOME, 22*CRSR DOWN, RVS ON, RED, CRSR LEFT
2010 IFABS(SX(0)-SX(1))<7 AND(BNZ=21) THEN1000
2011 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
IFPZ=1 THEN2013
2012 PRINT "2" : SX(1)=SX(1)+FVZ: PZ=1: BX(0)=0: GOTO2014
2013 PRINT "1" : SX(0)=SX(0)+FVZ: PZ=0: BX(1)=0
2014 GOSUB1520: GOSUB1500: SNZ=0: LPOTZ=0
2015 S1=8: S2=147: DUR=100: GOSUB12000
2020 GOTO100
2110 R=INT(RND(1)*6)+1: Z$=MID$(DEFVAL(K$)-1, R, 1): IFZ$="H" THEN3000
2130 IF Z$="P" THEN4000
2140 IF Z$="F" THEN2010
2150 IF Z$="S" THEN5000
2160 IFZ$="H" THEN7000
2170 IFZ$="R" THEN8000
3000 S1=8: S2=147: DUR=100: GOSUB12000
3005 LPOTZ=0: BX(PZ)=0: PZ=ABS(PZ-0)
3009 REM HOME, 18*CRSR DOWN, RVS ON, BLUE, RVS OFF
3010 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
GOSUB1520: GOTO100
3100 S1=8: S2=147: DUR=100: GOSUB12000
3109 REM HOME, 22*CRSR DOWN, RVS ON, RED
3110 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
BALL POTTED-PLEASE " :
3120 PRINT "RESELECT" : GOTO100
4000 S1=68: S2=149: DUR=100: GOSUB12000
4001 IF(LPOTZ=1) AND(BNZ=16) THENLPOTZ=PVZ: GOTO4005
4004 LPOTZ=PVZ: IFPVZ=VAL(MID$(P$, BNZ, 1)) THENBNZ=BNZ+1
4005 SNZ=0: BX(PZ)=BX(PZ)+PVZ: SX(PZ)=SX(PZ)+PVZ
4006 IFBZ(PZ)=HBX THENHBZ=BX(PZ): GOSUB1530
4007 REM HOME, 2*CRSR DOWN
4008 PRINT "SPC(10)LEFT$(C$, BNZ-1)
4010 GOSUB1500: GOSUB1520
4019 REM HOME, 18*CRSR DOWN, RVS ON, BLUE, RVS OFF
4020 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
IFBNZ=22 THEN10000
4030 GOTO100
6000 IFABS(SX(0)-SX(1))<7 ANDBNZ=21 THEN2110
6005 S1=34: S2=75: DUR=100: GOSUB12000
6010 SNZ=1: BX(PZ)=0: GOSUB1520: LPOTZ=0: PZ=ABS(PZ-0)
6019 REM HOME, 18*CRSR DOWN, RVS ON, BLUE
6020 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
YOU'RE SNOOKERED ON " :
6029 REM RVS OFF
6030 PRINT$(VAL(MID$(P$, BNZ, 1))-1) " BALL " : GOTO100
7000 S1=34: S2=75: DUR=100: GOSUB12000
7005 LPOTZ=0: SNZ=0: BX(PZ)=0: GOSUB1520: PZ=ABS(PZ-0)
7009 REM HOME, 18*CRSR DOWN, RVS ON, BLUE, RVS OFF
7010 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
BALL IS HIT " : GOTO100
8000 IFABS(SX(0)-SX(1))<7 AND(BNZ=21) THEN11000
8001 S1=8: S2=147: DUR=100: GOSUB12000
8004 REM HOME, 22*CRSR DOWN, RVS ON, RED, CRSR LEFT
8005 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
FOUL-"FVZ" " : TO PLAYER " :
IFPZ=1 THEN8012
8011 PRINT "2 & REPLAY" : SX(1)=SX(1)+FVZ: BX(0)=0: GOTO8013
8012 PRINT "1 & REPLAY" : SX(0)=SX(0)+FVZ: BX(1)=0
8013 GOSUB1520: GOSUB1500: LPOTZ=0: GOTO100
9000 S1=8: S2=147: DUR=100: GOSUB12000
9004 REM HOME, 22*CRSR DOWN, RVS ON, RED, RVS OFF
9005 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
YOU'RE SNOOKERED AND MUST
PLAY OUT OF IT " : GOTO100
9100 S1=8: S2=147: DUR=100: GOSUB12000
9104 REM HOME, 22*CRSR DOWN, RVS ON, RED, RVS OFF
9105 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
YOU CAN'T PLAY A
SNOOKER-BLACK BALL GAME " : GOTO100
9200 S1=8: S2=147: DUR=100: GOSUB12000
9204 REM HOME, 22*CRSR DOWN, RVS ON, RED, RVS OFF
9205 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
YOU ARE NOT SNOOKERED. " :
GOTO100
9999 REM HOME, 9*CRSR DOWN, BLACK
10000 S1=68: S2=149: DUR=100: GOSUB12000
10001 IFSX(0)=SX(1) THEN13000
10002 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
FRAME TO PLAYER " : IFSX(0)=SX(1)
THENPRINT "1" : FX(0)=FX(0)+1: GOTO10010
10005 PRINT "2" : FX(1)=FX(1)+1
10010 GOSUB1510
10019 REM HOME, 11*CRSR DOWN, WHITE
10020 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
PRESS=1=ANOTHER FRAME,
2=2 NEW PLAYERS, 3=5UP"
10030 GETK$: IFK$="1" ORK$="3" THEN10030
10040 IFK$="3" THENEND
10050 IFK$="1" THENGOTO20
10060 IFK$="2" THENRUN
10099 REM HOME, 9*CRSR DOWN, BLACK
11000 S1=68: S2=149: DUR=100: GOSUB12000
11002 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
FOUL-FRAME TO PLAYER " :
11005 IFPZ=0 THENPRINT "2" : FX(1)=FX(1)+1: GOTO10010
11010 PRINT "1" : FX(0)=FX(0)+1: GOTO10010
12000 S1=54272: GOSUB12020: POKES1+6, 120: POKES4296,
15: POKES4273, S1: POKES4272+62
12010 POKES1+4, 17: FORN=1 TO DUR: NEXT
12020 FORN=SITOSI+24: POKEN, 0: NEXT: RETURN
13000 BNZ=21: PZ=ABS(PZ-0)
13009 REM HOME, 22*CRSR DOWN, RVS ON, RED
13010 PRINT "SPC(15)FZ(0)TAB(33)" "SX(1): RETURN
DRAW - BLACK RESPOTTED"
13019 REM HOME, 2*CRSR DOWN, BLACK
13020 PRINT "SPC(10)RIGHT$(B$, 1)
13029 REM HOME, 2*CRSR DOWN, BLACK
13030 PRINT "SPC(10)LEFT$(C$, 20): GOTO100
14000 REM CLR SCREEN, BLACK
14001 PRINT "DO YOU REQUIRE INSTRUCTIONS? Y/N"
14010 GETK$: IFK$="Y" THEN14010
14020 IFK$="N" THEN RETURN
14029 REM CLR SCREEN
14030 PRINT "THIS GAME FOLLOWS THE GENERAL RULES OF SNOOKER,
THE BALLS AVAILABLE",
14040 PRINT "AND THEIR VALUES ARE DISPLAYED AT THE TOP OF THE
SCREEN." : PRINT: PRINT
14050 PRINT "PRESS A KEY AS INDICATED TO SELECT THE BALL
YOU WANT TO TRY TO HIT (TH):"
14060 PRINT "E OBJECT BALL", " : PRINT "THE RESULT OF YOUR STROKE
IS THEN DISPLAYED."
14070 PRINT "IF YOU MISS, PLAY PASSES TO THE OTHER PLAYER.
IF YOU POT THE BALL, "
14080 PRINT "YOU GAIN THE POINTS VALUE OF THAT BALL AND MUST
PLAY ANOTHER SHOT."
14090 PRINT "IF A SNOOKER IS LAYED, PLAY PASSES TO THE OTHER
PLAYER WHO MUST PLAY"
14100 PRINT "OUT OF IT (KEY 9). THE "
14110 PRINT "THE POINTS VALUE GOES",
14120 PRINT "TO THE OTHER PLAYER AND PLAY TRANSFERS."
14130 PRINT "BALLS MUST BE POTTED IN THE ORDER RED, COLOUR, RED,
COLOUR UNTIL ALL "
14130 PRINT "REDS ARE POTTED, AND THEN THE COLOURS IN ORDER." :
GOSUB15000
14139 REM CLR SCREEN
14140 PRINT "A SNOOKER MAY BE ATTEMPTED BY SELECTING KEY 8.
THE RESULT MAY BE A "
14150 PRINT "SNOOKER, FOULOR MISS AND PLAY CONTINUES AS NORMAL."
14160 PRINT "IF A SNOOKER IS LAYED, THE OPPONENT MUSTPLAY
OUT OF IT (KEY 9). THE "
14170 PRINT "FOLLOWING RESULTS MAY ENSUE:"
14179 REM RVS ON, RVS OFF
14180 PRINT "PRINT "HIT " BALL IS HIT AND PLAY TRANSFERS."
14189 REM RVS ON, RVS OFF
14190 PRINT "PRINT "POT " BALL IS POTTED AND SAME PLAYER
CONTINUES WITH HIS BREAK." : PRINT
14199 REM RVS ON, RVS OFF
14200 PRINT "FOUL " POINTS VALUE OF BALL ON WHICH SNOOKER
WAS LAYED ARE AWARDED",
14210 PRINT "TO OPPONENT AND PLAY TRANSFERS."
14219 REM RVS ON, RVS OFF
14220 PRINT "PRINT "FOUL & REPLAY " POINTS VALUE OF BALL ON
WHICH SNOOKER WAS LAYED ARE",
14230 PRINT "AWARDED TO OPPONENT AND SAME PLAYER CONTINUES TO
TRY TO PLAY OUT OF",
14240 PRINT "SNOOKER." : GOSUB15000
14249 REM CLR SCREEN
14250 PRINT "IF ONLY THE BLACK REMAINS AND THERE ARE 7 OR LESS
POINTS BETWEEN THE "
14260 PRINT "TWO SCORES, A SNOOKER MAY NOT BE LAYED, AND THE
FRAME IS FORFEITED "
14270 PRINT "IF A PLAYER'S STROKE RESULTS IN A FOUL."
14279 REM 2*CRSR DOWN
14280 PRINT "DO YOU WISH TO SEE INSTRUCTIONS AGAIN?-
Y/N" : GOTO14010
14999 REM RVS ON
15000 PRINT "PRESS ANY KEY TO CONTINUE."
15010 GETK$: IFK$="Y" THEN15010
15020 RETURN

```

Four unputdownable books to make your Commodore unswitchoffable

Discover all the Commodore Books that will really help you get the most from your C16, Plus 4 'or good old 64...' follow the flow to find out the best buys for you and your Commodore...



First, what's your computer?

This way for Commodore 64 owners... and to three great books

This way for the new C16 and Plus4... and your beginners' guide

Now, what's your interest?

Like to learn Logo, the language that's beyond mere BASIC?

If you want to make music, look no further...

Here's how to program and play your 64 like a fine instrument

And here your 64's a synthesized sound centre

Brian Lloyd has written the definitive book for everyone starting to use the superb new Commodore C16 and Plus4 micros. You'll soon be able to get programming in BASIC, and at the end of a great read, you'll be well on your way to producing hi-res graphics and doing some very neat disk file handling, for instance, all without getting defeated by needless technicalities. The Commodore C16/Plus4 Companion is a must for every owner and user, and it's only £5.95.



Inside every Commodore C64 sits SID, the unique and very powerful sound Interface Device. Understand and make good use of SID and you've got a wonderfully musical micro. Ian Waugh's book lets you use SID to the fullest, with programs to produce chorus, echo, polyphony, even sound effects. Start playing around with your 64, and let it make music for you. The book's only £6.95, too.



Concentrating on the Commodore C64 as a controller or peripheral to other music-making goodies, Mark Jenkins — technical editor of Melody Maker — has produced a superb new book that lets you into all the secrets of the 64's very powerful sound generation system. At only £6.95, its novel approach is a must for both musicians and micro enthusiasts.



There's no doubt that everyone's talking about Logo — and here's your chance as a Commodore 64 owner to discover what all the fuss is about. Logo helps you liberate the real potential of your 64, creating great sounds, super graphics and the most effective sprites you've ever seen. Once you've used Logo, there's no going back to Basic! Boris Allen's book will cost you just £6.95



All these latest Sunshine Books are available from your local bookshop, from W H Smiths and John Menzies, and also direct by post from Sunshine.

See your bookseller and reserve your copy today, or complete and send this special direct order coupon.

To: Sunshine Books,
12-13 Little Newport Street, London WC2H 7PP
Please send me the following book(s) for the Commodore:

_____ copies of the Commodore C16/Plus4 Companion at £5.95 + 60p p&p each

_____ copies of Building with Logo on the Commodore 64 at £6.95 + 60p p&p each

_____ copies of Commodore C64 Music at £6.95 + 60p p&p each

_____ copies of Electronic Music on the Commodore 64 at £6.95 + 60p p&p each

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

☐ Please charge my Access/Visa card

No. _____ Valid from _____ expires end _____

Signed: _____

Name: _____

Address: _____

Dealer enquiries: 01-437 4343.

At your command

Extend your repertoire of Basic commands with this program
by Robert Kirkland

This program adds 14 extra commands to the Spectrum's Basic without any extra hardware. It consists of a block of machine code which is placed at address 62700 and is 2600 bytes in length.

When the code has been entered it should be saved to tape or microdrive. If you have a microdrive then you could save a short program called *run* which loads in the code after clearing space for it. (NB. It is very important that Ramtop is altered to allow space for the code or it will be corrupted.)

To activate the new commands you have to call a machine code routine at address 65285, and this all must be put at the beginning of any programs which use the extra commands.

Extra Commands

All of the commands are prefixed by an asterisk and the keyword is typed in full. In statements numeric expressions can be used to replace numbers.

Mem - Prints out the amount of memory left for programming.

Delete x,y - Deletes all Basic lines *x* and *y* inclusive.

Renum x,y - Renumbers a Basic program starting at *x* in increments of *y*.

Wash x - Changes all of the screen colours to attribute *x*.

Scroll - This statement must be followed by a single letter which indicates which direction to *Scroll* the screen in, and whether to *Scroll* by a pixel or a character. L or R for left or right; V or A for up or down. Lower case indicates pixel movement, upper case character movement.

Sound a,b,c,d - Produces a sound which can rise or fall with varying pitch and in using this it is possible to produce some respectable sound FX. *a* is the length of note, *b* is the starting pitch, *c* is the rate at which the note alters a high value causes it to alter slowly, *d* should have a value of 1 or 0. A 1 produces a rising note and 0 produces a falling note. All of the parameters should be in the range 0-255.

Exp d - produces an explosion sound, *d* is the duration and should be in the range 0-65535.

Laser - Produces a sound like a laser gun. No parameters.

Disable - Disables a break key.

Enable - Enables the break key after disable statement.

On Error Goto - After this statement an error will not cause the program to stop but a jump is made to line *n*.

On x:Goto a,b,c,... Expression *x* should evaluate to an integer and then a jump is made to the *x*th line number after the *Goto*. (NB. In this command the *Goto* keyword is used.)

Call n - A call is made to a machine code routine at address *n*.

Poke x,y - This allows you to poke a 16-bit number into two addresses the first being *x*.

Goto x,y - *Goto* line *x* statement *y*.

If an error occurs when a program is being run or when a line fails a syntax check, then the computer jumps to an address where the error is displayed. This address is stored in Ram in the machine stack and is pointed to by the system variable *Err Sp*. So if this address in the machine stack is altered, then when one of the new commands is encountered, instead of an error occurring the machine code routine is called and the command can be executed. If the error is not caused by one of the new commands or if there is an error in one of the other commands then the error routine is called.

If you find typing in long listings difficult (who doesn't!) then cassette copies of the program are available from me for just £1.95, at 18 Thame Park Road, Thame, Oxon.

```

5 REM HEX CHECKER
10 LET C=62700
20 FOR J=1 TO 255
30 LET Z$=""
40 LET C1=C
50 FOR I=1 TO 9
60 LET X=PEEK C
70 LET W=INT (X/16)
80 LET X$=CHR$ (W+48+(7*(W>9)))
90 LET Y=X-(INT (X/16))*16
100 LET X$=X$+CHR$ (Y+48+(7*(Y>9)))
110 LET Z$=Z$+X$+" "
120 LET C=C+1
130 NEXT I
140 LPRINT C1;" ";Z$ (TO 26)
150 NEXT J

```

```

5 REM HEX LOADER
10 LET C=62700
20 FOR J=1 TO 255
30 LET Z$=""
40 LET C1=C
50 FOR I=1 TO 9
60 INPUT "HEX NUMBER "; LINE X
70 LET W$=X$(2)
80 LET X=(CODE W$)-48-(7*(W$>"9"))
90 LET Y$=X$(1)
100 LET X=X+((CODE Y$)-48-(7*(Y$>"9")))*16
110 LET Z$=Z$+X$+" "
115 POKE C,X
120 LET C=C+1
130 NEXT I
140 PRINT C1;" ";Z$ (TO 26)
150 NEXT J

```

```

62700: FD CB 47 7D 0E 47 4E 02
62701: 10 FE 1D 3A 00 46 10 21
62702: 0C 13 3A 28 00 46 14 23
62703: 00 00 3A 28 00 46 14 23
62704: 3A 3A 3A 28 00 46 14 23
62705: 01 7E 00 15 00 46 14 23
62706: CB 47 7E 00 15 00 46 14 23
62707: FD 0C CB 47 7E 00 15 00 46 14 23
62708: FD 13 7D 0E 47 4E 02
62709: 0D A7 11 7E 00 46 14 23
62710: 47 7E 00 46 14 23
62711: BE CB 47 7E 00 46 14 23
62712: CB 47 7E 00 46 14 23
62713: 00 00 3A 28 00 46 14 23
62714: 00 00 3A 28 00 46 14 23
62715: 00 00 3A 28 00 46 14 23
62716: 00 00 3A 28 00 46 14 23
62717: 00 00 3A 28 00 46 14 23
62718: 00 00 3A 28 00 46 14 23
62719: 00 00 3A 28 00 46 14 23
62720: 00 00 3A 28 00 46 14 23
62721: 00 00 3A 28 00 46 14 23
62722: 00 00 3A 28 00 46 14 23
62723: 00 00 3A 28 00 46 14 23
62724: 00 00 3A 28 00 46 14 23
62725: 00 00 3A 28 00 46 14 23
62726: 00 00 3A 28 00 46 14 23
62727: 00 00 3A 28 00 46 14 23
62728: 00 00 3A 28 00 46 14 23
62729: 00 00 3A 28 00 46 14 23
62730: 00 00 3A 28 00 46 14 23
62731: 00 00 3A 28 00 46 14 23
62732: 00 00 3A 28 00 46 14 23
62733: 00 00 3A 28 00 46 14 23
62734: 00 00 3A 28 00 46 14 23
62735: 00 00 3A 28 00 46 14 23
62736: 00 00 3A 28 00 46 14 23
62737: 00 00 3A 28 00 46 14 23
62738: 00 00 3A 28 00 46 14 23
62739: 00 00 3A 28 00 46 14 23
62740: 00 00 3A 28 00 46 14 23
62741: 00 00 3A 28 00 46 14 23
62742: 00 00 3A 28 00 46 14 23
62743: 00 00 3A 28 00 46 14 23
62744: 00 00 3A 28 00 46 14 23
62745: 00 00 3A 28 00 46 14 23
62746: 00 00 3A 28 00 46 14 23
62747: 00 00 3A 28 00 46 14 23
62748: 00 00 3A 28 00 46 14 23
62749: 00 00 3A 28 00 46 14 23
62750: 00 00 3A 28 00 46 14 23
62751: 00 00 3A 28 00 46 14 23
62752: 00 00 3A 28 00 46 14 23
62753: 00 00 3A 28 00 46 14 23
62754: 00 00 3A 28 00 46 14 23
62755: 00 00 3A 28 00 46 14 23
62756: 00 00 3A 28 00 46 14 23
62757: 00 00 3A 28 00 46 14 23
62758: 00 00 3A 28 00 46 14 23
62759: 00 00 3A 28 00 46 14 23
62760: 00 00 3A 28 00 46 14 23
62761: 00 00 3A 28 00 46 14 23
62762: 00 00 3A 28 00 46 14 23
62763: 00 00 3A 28 00 46 14 23
62764: 00 00 3A 28 00 46 14 23
62765: 00 00 3A 28 00 46 14 23
62766: 00 00 3A 28 00 46 14 23
62767: 00 00 3A 28 00 46 14 23
62768: 00 00 3A 28 00 46 14 23
62769: 00 00 3A 28 00 46 14 23
62770: 00 00 3A 28 00 46 14 23
62771: 00 00 3A 28 00 46 14 23
62772: 00 00 3A 28 00 46 14 23
62773: 00 00 3A 28 00 46 14 23
62774: 00 00 3A 28 00 46 14 23
62775: 00 00 3A 28 00 46 14 23
62776: 00 00 3A 28 00 46 14 23
62777: 00 00 3A 28 00 46 14 23
62778: 00 00 3A 28 00 46 14 23
62779: 00 00 3A 28 00 46 14 23
62780: 00 00 3A 28 00 46 14 23
62781: 00 00 3A 28 00 46 14 23
62782: 00 00 3A 28 00 46 14 23
62783: 00 00 3A 28 00 46 14 23
62784: 00 00 3A 28 00 46 14 23
62785: 00 00 3A 28 00 46 14 23
62786: 00 00 3A 28 00 46 14 23
62787: 00 00 3A 28 00 46 14 23
62788: 00 00 3A 28 00 46 14 23
62789: 00 00 3A 28 00 46 14 23
62790: 00 00 3A 28 00 46 14 23
62791: 00 00 3A 28 00 46 14 23
62792: 00 00 3A 28 00 46 14 23
62793: 00 00 3A 28 00 46 14 23
62794: 00 00 3A 28 00 46 14 23
62795: 00 00 3A 28 00 46 14 23
62796: 00 00 3A 28 00 46 14 23
62797: 00 00 3A 28 00 46 14 23
62798: 00 00 3A 28 00 46 14 23
62799: 00 00 3A 28 00 46 14 23
62800: 00 00 3A 28 00 46 14 23

```

[illegible][illegible]

Eureka!

HERE'S WHAT YOU'VE SAID...

Dear Sir,

Wimborne,
Dorset, BH22 0EY

I must congratulate you on a marvellous game, we purchased Eureka direct from you way back in October, & the whole family have had many amusing hours playing it. Eureka is tremendous value for money, considering there are 5 games included in the price. We have purchased other games recently of round about the £10 mark which we have considered to be daylight robbery! & the interest value has lasted about 1 hour! So congratulations again, keep up the good work!

Yours faithfully,

J. Smart (Mrs)

HERE'S WHAT IT IS...

The storylines travel through five time zones of our history - Prehistoric, Roman Empire, Medieval Britain, Colditz and the Caribbean, where you come face to face with the evil Hugo Von Berg. He is holding us all to ransom and demands to be made Emperor of the World, otherwise he will destroy it. A secret telephone number direct to the British Prime Minister has been specially installed for you to ring when you have worked out the code which will save us all. You must find this code and decipher the telephone number.

The new **Eureka!** Hotline number is: **01-879 1166**

We wish you all the best of luck in your search and to help you on your way, will send you a FREE Guide to Adventure Games (no clues to the £25,000 though!) if you send in a stamp plus your name and address to us.

Happy searching!

DOMARK LTD, 204 WORPLE ROAD, LONDON SW20 8PN

SPECTRUM
48K

£14.95

Eureka!

£14.95

COMMODORE
64

ENGLISH, FRENCH AND (SOON!) GERMAN VERSIONS AVAILABLE FROM
ALL GOOD SOFTWARE SHOPS OR FROM US ON 01-947 5624

Tied up with strings

Arrays and sorts de-mystified on the CPC464 by **Geoff Baldwin**

For many people taking their first tentative steps into the wonderful world of computer programming, the most difficult aspect to comprehend is the dimensioned array. Although at first, arrays seem complicated, they really are quite easy to understand.

The main reason for using arrays is to keep related data in a program together in one easy to manipulate block. For example, if you were writing a program to store names and addresses, it would be very difficult to handle the information if each item of data for the whole list of names and addresses were stored in the same string. It would be even more difficult to use a different string to store each name and each address.

The solution is to use one string and dimension it; for example, `Dim A$(5,2)`. This means dimension `A$ 5 x 2`. What you have to do is imagine a tray, partitioned off into five sections by two sections, into which you can put information to be stored as shown in Fig 1.

From Fig 1, you will see that `A$` has been given two dimensions, if you like, a vertical dimension of five and a horizontal dimension of two. From the diagram you will also see that if we examine `A$(3,1)` this would give us "HARRY" and `A$(3,2)` gives us "CARDIFF". Each element of the array is capable of storing more than the odd word as in Fig 1. You could have a full name in `A$(3,1)` and a complete address in `A$(3,2)`. Try the program in Fig 2 out for yourself.

The next program enables you to input five names and addresses one after the other, then prints them out in the order that you input them. This is fine if you only wish to sort a few names and addresses but for a long list it would be better if the program could sort and display them either in alphabetical order either by the names or the addresses.

Sorting strings or string arrays is another area of programming that requires a little thought. Practically everybody can look at a short list of names and mentally sort them into alphabetical order, but when it comes to a long list, say 40 or more, it starts to get difficult. When you have a list of 500 or more it then becomes almost impossible to do mentally and very time consuming to do at all by hand. Tasks like this are where the computer begins to show its tremendous speed and power.

When we sort a list of names, we generally start at the top of the list and sort out the A's, then the B's, then the C's and so on, then we sort the A's into order, the word's second letter, then the third letter, etc etc. The computer on the other hand, being a totally inhuman

beast, can compare whole words, even whole sentences. When sorting words, for instance, it compares logically, looking at each word at a time and compares it with another, then decides which is the greater or lesser of the two.

The program in Fig 3 sets up a simple one dimension array, asks for 10 words or names, sorts them into alphabetical order then displays them. The way in which it does this is to compare the first word with the second, if the first word is greater than the second, the computer exchanges their respective positions in the list, then goes on to compare the second word with the third. If the third word is greater than the second, the computer will leave the words in the same positions and proceed to compare the third word with the fourth and so on to the end of the list. It then goes through the whole list to see if it's in order, if not it starts again moving words down the list

one place at a time, until the task is completed. This method is called a bubble sort. Although there are other methods this is the simplest albeit slowest method. Type in the short program and try it for yourself by typing in ten words or names. Then try typing in ten words that are very similar like Mary, Mark, Marion, Market etc, and see the results.

The next thing to try is sort a two dimension array. The program in Fig 4 does this. The first part, as in the previous listing, sets up the array and requests the inputs. The second part sorts the array. Lines 50-60 allow you to choose whether the list is sorted by Name or Address. Lines 140-150 give you the option of entering new data or re-sort the existing data.

Do have a play with the example listings given. Then see if you can write your own programs to incorporate the ideas; a proper address file or a file of your record collection perhaps.

Although the listings in this article were written for the Amstrad CPC 464, they have purposely been kept in simple Basic so that with few exceptions they can be typed into almost any machine. Have fun!

Fig 1

10 DIM A\$(5,2)

	1	2		1	2
1	A\$(1,1)	A\$(1,2)	1	TOM	LONDON
2	A\$(2,1)	A\$(2,2)	2	DICK	LEEDS
3	A\$(3,1)	A\$(3,2)	3	HARRY	CARDIFF
4	A\$(4,1)	A\$(4,2)	4	BILL	GLASGOW
5	A\$(5,1)	A\$(5,2)	5	MARY	OXFORD

Fig 2

```

10 DIM A$(5,2)
20 FOR Y=1 TO 5
30 INPUT "NAME "; A$(Y,1): INPUT "ADDRESS "; A$(Y,2)
40 NEXT
100 FOR Y=1 TO 5
110 PRINT A$(Y,1): TAB (8): A$(Y,2)
120 NEXT

```

Fig 3

```

10 DIM A$(10)
20 FOR y=1 TO 10
30 INPUT "WORD "; A$(y)
40 NEXT
50 GOSUB 200
100 FOR y=1 TO 10
110 PRINT A$(y)
120 NEXT
130 STOP
200 y=1
210 IF A$(y) > A$(y+1) THEN b$=a$(y) ELSE 230
220 A$(y)=A$(y+1):A$(y+1)=b$
225 A$(y+1)=b$
230 y=y+1
240 IF y <= 9 THEN 210
250 GOSUB 270
260 IF FLAG=1 THEN 200 ELSE RETURN
270 FLAG=0
280 FOR V=1 TO (y-1)
290 IF A$(v) > A$(v+1) THEN FLAG=1
300 NEXT

```

Fig 4

```

10 DIM A$(5,2): DIM B$(1,2)
20 FOR V=1 TO 5
30 INPUT "NAME ";A$(Y,1):INPUT "ADDRESS ";
A$(Y,2)
40 NEXT
50 INPUT "ORDER BY NAME (1) OR ORDER BY
ADDRESS (2) PLEASE SELECT ";X
60 IF X <1 OR X>2 THEN 50
70 PRINT
80 GOSUB 190
90 FOR Y=1 TO 5
100 PRINT A$(Y,1); TAB (20);A$(Y,2)
110 NEXT
120 PRINT
130 INPUT " INPUT A NEW SET OF DATA (1) OR
RE-SORT EXISTING DATA (2) ";A
140 PRINT
150 IF A<1 OR A >2 THEN 130
160 IF A=1 THEN RUN
170 IF A=2 THEN GOTO 50
180 STOP
190 '***** SORT ROUTINE
*****
200 Y=1
210 IF A$(Y,X)>A$(Y+1,X) THEN GOTO 220
ELSE 250
220 FOR V=1 TO 2:B$(1,V)=A$(Y,V):NEXT
230 FOR V=1 TO 2:A$(Y,V)=A$(Y+1,V):NEXT
240 FOR V=1 TO 2:A$(Y+1,V)=B$(1,V):NEXT
250 Y=Y+1
260 IF Y<5 THEN GOTO 210
270 GOSUB 300
280 IF FLAG=1 THEN GOTO 190
290 RETURN
300 FLAG=0
310 FOR V=1 TO 4
320 IF A$(V,X)>A$(V+1,X) THEN FLAG=1
330 NEXT
340 RETURN

```

POWERFUL UTILITIES

AMSTRAD SPEEDMASTER
FAST LOAD UTILITY
Fed up with waiting for programs to load? Speedmaster is the answer. Convert all your software to load at double speed (choice of save speeds) 100% successful. Incorporates a sophisticated header reader. An invaluable piece of software.
ONLY £7.95

B.B.C.
TAPE TO DISC UTILITY
A very useful utility to help shift those stubborn tape programs onto your own discs. Produces a shift code to relocate the memory position of programs to suit the DFS workspace.
ONLY £9.95

ATARI
TAPE TO DISC UTILITY
A dual purpose program that allows single stage boot programs to be shifted onto disc. Very easy to use with menu options. Includes output to tape. Works on all models.
ONLY £9.95

COMMODORE 64

THE BEST RANGE OF UTILITIES FOR THE 64. WRITTEN BY PROFESSIONALS—SOLD BY PROFESSIONALS

DISC DIRECTOR
At last a really powerful disc copier and utility program. Incorporates a range of powerful programs. Includes "Fastcopy" takes just four minutes to read and write a whole disc. "Error copy" automatically reads and writes all error types, now you can make a security back up of those expensive business programs. "Quickdisc" more than halves disc loading time. "File copier" allows selective copying from disc directory. "Track & Sector" a slower but very thorough program. Also includes the following useful utilities. Menu maker, Index, Retitle, Rename, Scratcher, Disc to Tape and Tidy. If you have a 1541 you must have Disc Director. Supplied on disc with full instructions.
ONLY £29.95

QUICKDISC
Incorporating Menu Maker
Speed up your 1541 disc drive with this new program. Loads most programs at more than double the normal speed. A flexible package that allows you to incorporate a menu and fast loading on your own discs. Also includes a file exchanger for programs put on disc with "Discos" (THE tape to disc utility), another way of making fast load programs. A must for all disc drive users.
ONLY £11.95

FASTBACK
Fast Load Utility
Convert your slow loading software to high speed load with Fastback. The most sophisticated program of its type allows you to produce "turbo" loading versions of most single and multipart software that load independently of Fastback. Simple to use no programming skill needed. Example: Load "The Hobbit" or "Mistic Miner" in 150 secs. Tried and trusted (over 2000 sold).
A very professional program.
ONLY £9.95

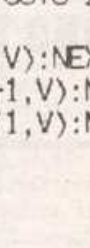
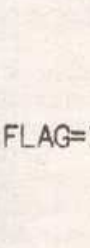
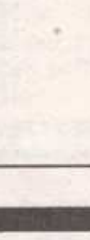
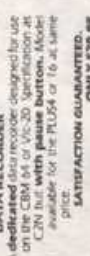
DISCO
THE TAPE TO DISC UTILITY
We guarantee that this is the best tape to disc utility on the market. Very easy to use no programming knowledge needed. Automatically handles device numbers and multi part programs. Programs auto load and run transferred and can also be made to fastload with Quickdisc. Handy for making your own disc programs auto run.
ONLY £9.95

DOUBLER
The amazing new cassette port adaptor for the 64, with special software. Requires access to two cassette units but is 100% successful, even with "fast" loaders. They said it couldn't be done.
ONLY £12.95

ROCKET
Fed up waiting for programs to load and save? Rocket is a utility for the programmer, speeds up loading and saving by about 8 times while still allowing for normal speed operations. Does not affect the speed of BASIC as no wedge is used. Programs can also be saved with high speed system to reload independently. A must for serious programmers who have no disc drive.
ONLY £7.95

BIGMOUTH
The superb new speech synthesis program for the 64. Uses "speak" as a basic command. Very easy to use. Can be incorporated into your basic programs. Words are entered in phonetic English, ie, spelt as they sound. Therefore vocabulary is unlimited. Great fun and good for educational purposes.
ONLY £7.95

COMMODORE CONNEXION
Connect any "Centronics" type printer to your 64. Price includes lead and software on cassette with special disc conversion program.
Simple to use and very reasonably priced.
ONLY £14.95



3M SCOTCH DISCS
S.S.D.D.
LIFETIME GUARANTEE
BOX OF TEN

MADE IN THE U.S.A.
SPECTRUM COMPATIBLE FOR BBC ELECTRONICS
SPECTRUM COMPATIBLE FOR VIC 20, ORIC, DRAGON
SPECTRUM COMPATIBLE FOR ATARI 400, 800, 1000, 1200, 1300, 1600, 2600, 2800, 3800, 4000, 4200, 4400, 4600, 4800, 5000, 5200, 5400, 5600, 5800, 6000, 6200, 6400, 6600, 6800, 7000, 7200, 7400, 7600, 7800, 8000, 8200, 8400, 8600, 8800, 9000, 9200, 9400, 9600, 9800, 10000, 10200, 10400, 10600, 10800, 11000, 11200, 11400, 11600, 11800, 12000, 12200, 12400, 12600, 12800, 13000, 13200, 13400, 13600, 13800, 14000, 14200, 14400, 14600, 14800, 15000, 15200, 15400, 15600, 15800, 16000, 16200, 16400, 16600, 16800, 17000, 17200, 17400, 17600, 17800, 18000, 18200, 18400, 18600, 18800, 19000, 19200, 19400, 19600, 19800, 20000, 20200, 20400, 20600, 20800, 21000, 21200, 21400, 21600, 21800, 22000, 22200, 22400, 22600, 22800, 23000, 23200, 23400, 23600, 23800, 24000, 24200, 24400, 24600, 24800, 25000, 25200, 25400, 25600, 25800, 26000, 26200, 26400, 26600, 26800, 27000, 27200, 27400, 27600, 27800, 28000, 28200, 28400, 28600, 28800, 29000, 29200, 29400, 29600, 29800, 30000, 30200, 30400, 30600, 30800, 31000, 31200, 31400, 31600, 31800, 32000, 32200, 32400, 32600, 32800, 33000, 33200, 33400, 33600, 33800, 34000, 34200, 34400, 34600, 34800, 35000, 35200, 35400, 35600, 35800, 36000, 36200, 36400, 36600, 36800, 37000, 37200, 37400, 37600, 37800, 38000, 38200, 38400, 38600, 38800, 39000, 39200, 39400, 39600, 39800, 40000, 40200, 40400, 40600, 40800, 41000, 41200, 41400, 41600, 41800, 42000, 42200, 42400, 42600, 42800, 43000, 43200, 43400, 43600, 43800, 44000, 44200, 44400, 44600, 44800, 45000, 45200, 45400, 45600, 45800, 46000, 46200, 46400, 46600, 46800, 47000, 47200, 47400, 47600, 47800, 48000, 48200, 48400, 48600, 48800, 49000, 49200, 49400, 49600, 49800, 50000, 50200, 50400, 50600, 50800, 51000, 51200, 51400, 51600, 51800, 52000, 52200, 52400, 52600, 52800, 53000, 53200, 53400, 53600, 53800, 54000, 54200, 54400, 54600, 54800, 55000, 55200, 55400, 55600, 55800, 56000, 56200, 56400, 56600, 56800, 57000, 57200, 57400, 57600, 57800, 58000, 58200, 58400, 58600, 58800, 59000, 59200, 59400, 59600, 59800, 60000, 60200, 60400, 60600, 60800, 61000, 61200, 61400, 61600, 61800, 62000, 62200, 62400, 62600, 62800, 63000, 63200, 63400, 63600, 63800, 64000, 64200, 64400, 64600, 64800, 65000, 65200, 65400, 65600, 65800, 66000, 66200, 66400, 66600, 66800, 67000, 67200, 67400, 67600, 67800, 68000, 68200, 68400, 68600, 68800, 69000, 69200, 69400, 69600, 69800, 70000, 70200, 70400, 70600, 70800, 71000, 71200, 71400, 71600, 71800, 72000, 72200, 72400, 72600, 72800, 73000, 73200, 73400, 73600, 73800, 74000, 74200, 74400, 74600, 74800, 75000, 75200, 75400, 75600, 75800, 76000, 76200, 76400, 76600, 76800, 77000, 77200, 77400, 77600, 77800, 78000, 78200, 78400, 78600, 78800, 79000, 79200, 79400, 79600, 79800, 80000, 80200, 80400, 80600, 80800, 81000, 81200, 81400, 81600, 81800, 82000, 82200, 82400, 82600, 82800, 83000, 83200, 83400, 83600, 83800, 84000, 84200, 84400, 84600, 84800, 85000, 85200, 85400, 85600, 85800, 86000, 86200, 86400, 86600, 86800, 87000, 87200, 87400, 87600, 87800, 88000, 88200, 88400, 88600, 88800, 89000, 89200, 89400, 89600, 89800, 90000, 90200, 90400, 90600, 90800, 91000, 91200, 91400, 91600, 91800, 92000, 92200, 92400, 92600, 92800, 93000, 93200, 93400, 93600, 93800, 94000, 94200, 94400, 94600, 94800, 95000, 95200, 95400, 95600, 95800, 96000, 96200, 96400, 96600, 96800, 97000, 97200, 97400, 97600, 97800, 98000, 98200, 98400, 98600, 98800, 99000, 99200, 99400, 99600, 99800, 100000, 100200, 100400, 100600, 100800, 101000, 101200, 101400, 101600, 101800, 102000, 102200, 102400, 102600, 102800, 103000, 103200, 103400, 103600, 103800, 104000, 104200, 104400, 104600, 104800, 105000, 105200, 105400, 105600, 105800, 106000, 106200, 106400, 106600, 106800, 107000, 107200, 107400, 107600, 107800, 108000, 108200, 108400, 108600, 108800, 109000, 109200, 109400, 109600, 109800, 110000, 110200, 110400, 110600, 110800, 111000, 111200, 111400, 111600, 111800, 112000, 112200, 112400, 112600, 112800, 113000, 113200, 113400, 113600, 113800, 114000, 114200, 114400, 114600, 114800, 115000, 115200, 115400, 115600, 115800, 116000, 116200, 116400, 116600, 116800, 117000, 117200, 117400, 117600, 117800, 118000, 118200, 118400, 118600, 118800, 119000, 119200, 119400, 119600, 119800, 120000, 120200, 120400, 120600, 120800, 121000, 121200, 121400, 121600, 121800, 122000, 122200, 122400, 122600, 122800, 123000, 123200, 123400, 123600, 123800, 124000, 124200, 124400, 124600, 124800, 125000, 125200, 125400, 125600, 125800, 126000, 126200, 126400, 126600, 126800, 127000, 127200, 127400, 127600, 127800, 128000, 128200, 128400, 128600, 128800, 129000, 129200, 129400, 129600, 129800, 130000, 130200, 130400, 130600, 130800, 131000, 131200, 131400, 131600, 131800, 132000, 132200, 132400, 132600, 132800, 133000, 133200, 133400, 133600, 133800, 134000, 134200, 134400, 134600, 134800, 135000, 135200, 135400, 135600, 135800, 136000, 136200, 136400, 136600, 136800, 137000, 137200, 137400, 137600, 137800, 138000, 138200, 138400, 138600, 138800, 139000, 139200, 139400, 139600, 139800, 140000, 140200, 140400, 140600, 140800, 141000, 141200, 141400, 141600, 141800, 142000, 142200, 142400, 142600, 142800, 143000, 143200, 143400, 143600, 143800, 144000, 144200, 144400, 144600, 144800, 145000, 145200, 145400, 145600, 145800, 146000, 146200, 146400, 146600, 146800, 147000, 147200, 147400, 147600, 147800, 148000, 148200, 148400, 148600, 148800, 149000, 149200, 149400, 149600, 149800, 150000, 150200, 150400, 150600, 150800, 151000, 151200, 151400, 151600, 151800, 152000, 152200, 152400, 152600, 152800, 153000, 153200, 153400, 153600, 153800, 154000, 154200, 154400, 154600, 154800, 155000, 155200, 155400, 155600, 155800, 156000, 156200, 156400, 156600, 156800, 157000, 157200, 157400, 157600, 157800, 158000, 158200, 158400, 158600, 158800, 159000, 159200, 159400, 159600, 159800, 160000, 160200, 160400, 160600, 160800, 161000, 161200, 161400, 161600, 161800, 162000, 162200, 162400, 162600, 162800, 163000, 163200, 163400, 163600, 163800, 164000, 164200, 164400, 164600, 164800, 165000, 165200, 165400, 165600, 165800, 166000, 166200, 166400, 166600, 166800, 167000, 167200, 167400, 167600, 167800, 168000, 168200, 168400, 168600, 168800, 169000, 169200, 169400, 169600, 169800, 170000, 170200, 170400, 170600, 170800, 171000, 171200, 171400, 171600, 171800, 172000, 172200, 172400, 172600, 172800, 173000, 173200, 173400, 173600, 173800, 174000, 174200, 174400, 174600, 174800, 175000, 175200, 175400, 175600, 175800, 176000, 176200, 176400, 176600, 176800, 177000, 177200, 177400, 177600, 177800, 178000, 178200, 178400, 178600, 178800, 179000, 179200, 179400, 179600, 179800, 180000, 180200, 180400, 180600, 180800, 181000, 181200, 181400, 181600, 181800, 182000, 182200, 182400, 182600, 182800, 183000, 183200, 183400, 183600, 183800, 184000, 184200, 184400, 184600, 184800, 185000, 185200, 185400, 185600, 185800, 186000, 186200, 186400, 186600, 186800, 187000, 187200, 187400, 187600, 187800, 188000, 188200, 188400, 188600, 188800, 189000, 189200, 189400, 189600, 189800, 190000, 190200, 190400, 190600, 190800, 191000, 191200, 191400, 191600, 191800, 192000, 192200, 192400, 192600, 192800, 193000, 193200, 193400, 193600, 193800, 194000, 194200, 194400, 194600, 194800, 195000, 195200, 195400, 195600, 195800, 196000, 196200, 196400, 196600, 196800, 197000, 197200, 197400, 197600, 197800, 198000, 198200, 198400, 198600, 198800, 199000, 199200, 199400, 199600, 199800, 200000, 200200, 200400, 200600, 200800, 201000, 201200, 201400, 201600, 201800, 202000, 202200, 202400, 202600, 202800, 203000, 203200, 203400, 203600, 203800, 204000, 204200, 204400, 204600, 204800, 205000, 205200, 205400, 205600, 205800, 206000, 206200, 206400, 206600, 206800, 207000, 207200, 207400, 207600, 207800, 208000, 208200, 208400, 208600, 208800, 209000, 209200, 209400, 209600, 209800, 210000, 210200, 210400, 210600, 210800, 211000, 211200, 211400, 211600, 211800, 212000, 212200, 212400, 212600, 212800, 213000, 213200, 213400, 213600, 213800, 214000, 214200, 214400, 214600, 214800, 215000, 215200, 215400, 215600, 215800, 216000, 216200, 216400, 216600, 216800, 217000, 217200, 217400, 217600, 217800, 218000, 218200, 218400, 218600, 218800, 219000, 219200, 219400, 219600, 219800, 220000, 220200, 220400, 220600, 220800, 221000, 221200, 221400, 221600, 221800, 222000, 222200, 222400, 222600, 222800, 223000, 223200, 223400, 223600, 223800, 224000, 224200, 224400, 224600, 224800, 225000, 225200, 225400, 225600, 225800, 226000, 226200, 226400, 226600, 226800, 227000, 227200, 227400, 227600, 227800, 228000, 228200, 228400, 228600, 228800, 229000, 229200, 229400, 229600, 229800, 230000, 230200, 230400, 230600, 230800, 231000, 231200, 231400, 231600, 231800, 232000, 232200, 232400, 232600, 232800, 233000, 233200, 233400, 233600, 233800, 234000, 234200, 234400, 234600, 234800, 235000, 235200, 235400, 235600, 235800, 236000, 236200, 236400, 236600, 236800, 237000, 237200, 237400, 237600, 237800, 238000, 238200, 238400, 238600, 238800, 239000, 239200, 239400, 239600, 239800, 240000, 240200, 240400, 240600, 240800, 241000, 241200, 241400, 241600, 241800, 242000, 242200, 242400, 242600, 242800, 243000, 243200, 243400, 243600, 243800, 244000, 244200, 244400, 244600, 244800, 245000, 245200, 245400, 245600, 245800, 246000, 246200, 246400, 246600, 246800, 247000, 247200, 247400, 247600, 247800, 248000, 248200, 248400, 248600, 248800, 249000, 249200, 249400, 249600, 249800, 250000, 250200, 250400, 250600, 250800, 251000, 251200, 251400, 251600, 251800, 252000, 252200, 252400, 252600, 252800, 253000, 253200, 253400, 253600, 253800, 254000, 254200, 254400, 254600, 254800, 255000, 255200, 255400, 255600, 255800, 256000, 256200, 256400, 2566

PRINTER BARGAINS

VAT AND CARRIAGE INCLUDED

Shinwa CPA80	£219	Brother M1009	£178
Smith Corona TP-1	£209	Mannesmann Tally MT80	£219
Epson RX80FT	£254	Kaga Taxan KP810	£299

INTERFACE/CABLES

QL serial	£11	QL parallel	£35	Amstrad parallel	£12
Spectrum interface 1 serial	£12	Spectrum parallel	£35		
BBC, Dragon, Oric etc	£12	Trippler CBM 20/64	£45		

QL BARGAINS

VAT AND CARRIAGE INCLUDED

Computamate Disc Interface, Fully tried Qudos	£149
Computamate Book Dual Drive Disc System	£499
Computamate 1.5m Dual Drive Disc System	£569
QL computer	£379
10 cartridges + box for 20	£24
4 cartridges	£7.50
Microvitic CUB 1451/DQ3 monitor	£259
Prism QL 14 monitor	£199

STRONG COMPUTER SYSTEMS

Bryn Cottage, Peniel, Carmarthen, Dyfed, SA32 7DJ.
Telephone: 0267 231246 for assistance!!!!

PD47A

SUNARO

AMSTRAD	SPECTRUM	CBM64	
Forest Worlds End	5.25	Great Space Race	12.75
Message Andromeda	5.25	Ghostbusters	9.75
Jewels of Babylon	5.25	Space Shuttle	8.75
Steve Davis Snooker	6.95	Fort Apocalypse	8.75
Fightpath 737	6.25	F15 Strike Eagle	13.25
Manic Miner	6.25	Zaxxon	8.75
House of Usher	7.85	Beach Head	8.75
Erk the Viking	8.75	Raid Over Moscow	8.75
Er Bert	5.25	Eureka	13.25
Fruity Frank	5.25	Suicide Express	6.95
Roland Ahoy	7.85	Combat Lynx	7.85
Fantasia Diamond	7.85	Hunchback II	6.95
Gem of Stradus	7.85	Lords of Midnight	8.75
Sultans Maze	7.85	Buggy Blast	5.25
Hunter Killer	7.85	Pottery Pigeon	5.25
Code Name Matt	7.85	Staff of Karnath	8.75
Hunchback	6.25	Blue Max	8.75
Fruit Machine	7.85	Underworld	11.50
Tasword 464	17.50	Sabre Wulf	7.85
Tasprint 464	8.75	Kong Strikes Back	26.95
Software Star	6.95	Monty is Innocent	13.25
Technician Ted	6.95		
Centre Court	6.95		
Snooker	7.95		
Roland in the Caves	7.85		
Star Commander	7.85		
Quackjack	7.85		
Blagger	6.95		

Postage & VAT included
Send cheque/PO to:
SUNARO SOFTWARE
(PCWS), PO BOX 78
MACCLESFIELD
Ches SK10 3PF

50p OFF NEXT PURCHASE VOUCHER WITH EVERY ORDER



PERFORMANCE
UTILITY SYSTEMS
FOR THE COMMODORE 64

SPEECH SYNTHESIS FOR THE 64
An amazing microspeech programme for the 64 it is so easy to use, absolutely no user knowledge required. Simply load and command your 64 to say anything CLEARLY. (No allophone tables!) you can also write it into your basic programmes. No hardware required.
A very professional tool. **£9.95 inc.**

XR64
INVESTED IN A DISC DRIVE?
Then you will need the XR64 to convert your tape based software onto disc. Exceptionally easy to use, transfer most (normal speed) software to disc. With full inst. **£8.95 inc.**

XRIO DATA THRUSTER
THE 50 DISC DRIVE ALTERNATIVE
Load your programmes at 10 times normal speed, (actually faster than the 1541). Designed for the Commodore 64, DATA-THRUSTER is a highly sophisticated machine code programme that will convert all software to an advanced "TURBO" type loading.
Exceptionally easy to use (no user knowledge reqd.) **£8.95 inc.**

XR PRO-SPRITE
FOR PROFESSIONAL GRAPHICS
At XR we have developed the pro-sprite, the ultimate graphics tool for the basic programmer. Utilizing the 64's maximum potential from the 8 sprites, it defines multi and single colours, expansion change, colour reversal, sprites to memory, data statements etc. etc.
Exceptionally easy to use, with full inst. **£9.95 inc.**

XR DISC LASER
DISC DRIVE FAST LOADER
This is a superb utility for anyone with the 1541 disc drive, converts most disc programmes to double speed loading, also will read and write a new disc (copy) in less than 4 minutes.
Exceptionally easy to use. **£8.95 inc.**

XR64
INVESTED IN A DISC DRIVE?
Then you will need the XR64 to convert your tape based software onto disc. Exceptionally easy to use, transfer most (normal speed) software to disc. With full inst. **£8.95 inc.**

XR64
INVESTED IN A DISC DRIVE?
Then you will need the XR64 to convert your tape based software onto disc. Exceptionally easy to use, transfer most (normal speed) software to disc. With full inst. **£8.95 inc.**

£5
£5 VOUCHER OFF ANY XR PURCHASE BEFORE 28th MARCH 1985 ONLY ONE (ORIGINAL) VOUCHER PER ORDER

PLEASE SEND ME VERBOL • XRIO • DISC-LASER • PRO-SPRITE • XR64
I ENCLOSE P.O./CHEQUE FOR
NAME _____
ADDRESS _____
CODE _____

XR CONSULTANTS, 38 HIGH ST.
BANSBURY, OXON, OX16 8ET

SOFT INSIGHT

DISCOUNT SOFTWARE

SPECTRUM	RRP	OUR PRICE	PROJECT FUTURE	5.95	5.40	IMPOSSIBLE MISSION	8.95	5.70
SHERLOCK HOLMES	14.95	10.40	KUNG FU	6.95	4.90	QUO VADIS	9.95	7.20
SPACE SHUTTLE	7.95	6.20	MATCHDAY	7.95	5.65	ALL INTERCEPTOR	7.00	5.40
ZOMBIE ZOMBIE	6.95	5.20	GIFT FROM THE GODS	9.95	7.20	PSI WARRIOR	9.99	7.40
LOAD RUNNER	6.95	5.20	HUNCHBACK II	6.90	4.85	SHERLOCK HOLMES	14.95	10.40
FALL GUY	6.95	5.20	QUASIMODOUS REVENGE	6.90	4.85	SUICIDE EXPRESS	7.95	6.20
STAR STRIKE	6.95	4.50	ZAXXON	7.95	5.90	EUREKA	14.95	10.40
AIR WOLF	6.95	5.20	BRIAN BLOODAXE	6.95	5.40	PYJAMARAMA	7.95	5.90
SKY RANGER	6.95	5.20	ERIC BRISTOW'S DARTS	6.95	5.40	SLAPSHOT	8.95	7.00
SON OF BLAGGER	6.95	5.20	MONTY IS INNOCENT	6.95	5.40	GHOSTBUSTERS	10.95	8.40
DALEY'S DECATHLON	6.90	5.20	ALIEN 8	9.95	7.20	FIGHTER PILOT	9.95	7.40
BLACK STAR	7.95	4.90	AMSTRAD			CAD CAM WARRIOR	9.95	7.40
BLUE MAX	7.95	5.90	HUNCHBACK	7.95	6.50	WHITE LIGHTNING	19.95	14.95
ALL LEVEL 9 GAMES	9.99	7.20	BLAGGER	7.95	6.50	HUNCHBACK II	7.90	5.85
TIR NA NOG	9.95	6.90	STEVE DAVIS SNOOKER	7.95	6.40	KONG STRIKES BACK	7.90	5.85
RACKPACKERS	7.50	4.90	MANIC MINER	8.95	7.50	EDDIE KID	7.95	5.85
WHITE LIGHTNING	14.95	10.40	ALL LEVEL 9 GAMES	9.99	7.60	MATCH POINT	7.95	5.85
RAID OVER MOSCOW	7.95	5.90	PYJAMARAMA/CHESS	12.95	9.50	SPY VS SPY	9.95	7.40
STEVE DAVIS SNOOKER	7.95	5.90	SORCERY	8.95	7.00	CASTLE OF TERROR	9.95	7.40
EUREKA	14.95	11.05	COMMODORE			INDIANA JONES	9.95	7.40
UNDERWORLD	9.95	6.90	ALL OF US GOLD	9.95	7.40	F15 STRIKE EAGLE	14.95	10.40
KNIGHT LORE	9.95	6.90	STAFF OF KARNATH	9.95	7.20	SPY HUNTER	9.95	7.40
GHOSTBUSTERS	9.99	7.40	THE PENCIL	14.95	11.50	GRYPHON	7.95	6.50
CYCLONE	6.95	4.70	ALL ACTIVISION	9.95	7.20	LORDS OF MIDNIGHT	9.95	6.90
PITFALL 2	7.99	5.90	ALL LEVEL 9	9.99	7.20			
BRUCE LEE	7.99	5.90	DALEY'S DECATHLON	7.95	5.40			
SKOOL DAZE	5.95	4.45	PSYTRON	7.95	5.40			
BOULDERDASH	6.95	5.90	SUMMER GAMES	14.95	10.40			
TOY BIZZARE	7.99	6.20	GAMES CREATOR	12.95	10.00			

LOAD & RUN

"HELLO YOUNG LOVER'S
WHEREVER YOU ARE..."

Well micro lover's anyway, we've been so overwhelmed by your requirements for presents for your micros that we've had no time to arrange anymore discounts, keep watching!

If you think we've forgotten you don't despair we're still here (physically if not in mind) and catching up fast!

If you've never heard of us (WHAT!) then find out now, send a stamped addressed envelope to:

LOAD & RUN, PO BOX 123
Dartford DA1 5AA

THE MAIL ORDER SPECIALISTS PD157

POPULAR Computing WEEKLY

★ CLASSIFIEDS ★

★ Popular Computing Weekly was voted magazine of the year by the C.T.A.

★ It has the highest Audit Bureau of Circulation figure of any weekly home computer magazine, currently 56,052 copies weekly.

★ It has a classified section that is now required reading for everyone with an interest in small micros, or who wants to buy or sell: SOFTWARE ★ UTILITIES ★ ACCESSORIES ★ SERVICES ★ HARDWARE ★ HIRING ★ CLUBS ★ RECRUITMENT ★

★ £6 per SCC semi-display, 25p per word lineage.

★ 6 day copy date.

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

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



Index 1984 Volume 3

General

Acorn Video, 46, 14
 Activision, 38, 12
 Addictive Games, 19, 13
 Andromeda Software, 11, 12
 Basicode, 7, 18, 8, 20, 11, 43
 BBC,
 DIL sockets, 6, 49
 Multi-coloured graphics characters, 36, 45
 Old and New commands, 13, 9
 Bearcat Compuscan Scanner Radio, 12, 43
 Beyond Software, 27, 12
 Bulletin Boards, 20, 26
 CES Show report, 3, 7, 24, 19, 25, 12
 Chip Shop, 9, 13
 Commodore 64,
 Disc drives,
 relative files, 15, 23
 sequential access, 14, 36
 Error recovery, 39, 41
 Graphics drawing, 37, 27
 Input command, 3, 31
 Manual bug, 10, 7
 Poke tips, 34, 40
 Rom/Ram overlap, 36, 34
 SID chip, 20, 34
 Thief-proof programs, 13, 24
 Commodore Plus/4 Rom software, 38, 22
 Commodore UK, 1, 13
 Communication studies, 36, 12
 Compunet, 47, 14
 CRL, 16, 13
 Crystal Computing, 4, 13
 CX5, 44, 18
 Domsday Book, 28, 12
 Dragon 32,
 Assembly language, 14, 28, 15, 34, 16, 27, 17, 23, 18, 29, 19, 23, 29, 32, 30, 24, 31, 28, 32, 25, 33, 25
 Booting a disc, 8, 26
 Break disable, 20, 47
 DOS cartridge, 6, 25
 Game programming, 11, 24, 12, 24, 13, 19
 High resolution graphics, 26, 21
 Unifile, 10, 26
 Usr command, 9, 25
 Family Leisure Centre, 6, 13
 Five Ways Software, 15, 13
 Fords, Dagenham, 49, 34
 Gargoyle Games, 48, 12
 Gremlin Graphics, 40, 12
 Guild of Software Houses, 23, 14
 Hughes, Stuart, 2, 13
 Intergalactic Robots, 32, 12
 Leisure Genius, 12, 13
 Locomotive Software, 18, 12
 Lynx keyboard debug, 6, 19
 Mastertronic, 29, 12
 Micro training programme, 43, 10
 Microprocessors, 22, 13
 History, 21, 12
 Registers, 9, 20, 10, 18
 Microradio index, 15, 51
 Morse tapper routine, 1, 47
 Motorola, 10, 13
 MUD, 35, 12
 Networking, 20, 26, 21, 19, 31, 14
 Packet radio, 2, 45
 Psion, 8, 12
 QL,
 AH and JM version, 32, 21
 Listing to ZX printer, 34, 21
 Merge tips, 39, 7
 Microdrive program verification, 30, 23, 35, 7
 Microdrive tips, 37, 23
 Missing Ram, 50, 28
 Psion Archive, 24, 22
 Rom tabulation, 38, 30
 Structured programming, 31, 21
 Superbasic Rom, 21, 28, 22, 23
 Superbasic tips, 37, 7
 User-defined graphics, 36, 23
 Quest, 45, 19
 Radio frequency tuned circuits, 14, 20
 Red Shift, 13, 13
 Review of the year, 51, 20
 SAM, 22, 13
 SARUG, 24, 39
 Siel, 37, 12
 6502 processor, 9, 20, 10, 18
 68000/68008 processors, 11, 19, 12, 19, 13, 29
 Software agents, 34, 13
 Software Farm, 33, 12
 Software Projects, 14, 12
 Spectrum,
 Beep command tips, 31, 7
 Keyboard scanning, 29, 41
 Large letters, 1, 53
 Line 0 poke, 38, 45
 Load tips, 32, 41
 Machine code adventurers, 28, 20, 29, 20, 30, 20, 31, 25, 32, 29
 Microdrive Cat command, 8, 24, 13, 9
 Poke tips, 15, 57, 19, 7
 Rem use tips, 10, 22
 RS232 output port, 33, 20
 Screens tip, 16, 49
 System 15000, 41, 14
 Tansoft, 50, 16
 Topo, 7, 13
 Tryptych Publishing, 30, 12
 UK MSX working group, 26, 12
 Vic 20,
 Expander tips, 15, 57
 Free command, 20, 7
 Poke tips, 18, 7, 22, 41, 25, 7, 35, 45
 Save tip, 18, 7
 User defined graphics, 24, 49
 Waite, Barry, 10, 13
 WH Smiths, 17, 13
 Z80 processor, 9, 20, 10, 18
 Ziggurat,
 A changing world, 29, 51
 A fab review, 25, 59

A fast buck, 31, 51
 A vested interest, 1, 63
 Alien logic, 49, 102
 An awkward challenge, 11, 59
 Bardic logic, 48, 70
 Bigger and better, 4, 63
 Brought to book, 20, 59
 Chance confusion, 43, 70
 Creative pastimes, 8, 59
 Data protection, 36, 55
 Dull as ditchwater, 3, 67
 50 forward, 40, 70
 Flatland, 34, 51
 Freeware, 33, 51
 Grown-up's MSX, 45, 78
 Inverted snobbery, 47, 70
 Is it education?, 16, 59
 Kettle of fish, 2, 59
 Lack of attitude, 41, 62
 Mainframe power, 24, 59
 Micro treatment, 44, 78
 MoD discretion, 10, 55
 Money talk, 23, 59
 Mr Floppy comes to town, 22, 51
 MSX context, 51, 78
 Name of the game, 30, 51
 Nightmare world, 50, 70
 No excuse, 6, 59
 Plug-compatible, 5, 59
 Restricted supply, 9, 63
 Smell, touch . . . , 38, 62
 Software piracy rampant, 12, 63
 Software registry, 19, 59
 Strategy, 32, 51
 Tacky tries, 46, 70
 The lurid screen, 27, 55
 The outer limits, 17, 55, 18, 59
 The right question, 35, 55
 The tail waggles, 28, 55
 Thinking Logo, 28, 51
 Ultimate goal, 14, 63
 Video nasties, 13, 63
 Water importance, 37, 62
 What a life, 21, 55
 Whizz kids, 7, 55
 Worthy fo note, 15, 71
 Write on, Rom, 39, 70
 X-ray masking, 42, 70

Colour demo, 48, 43
 Scribble, 43, 35
 Sound experiment, 37, 35
 Aquarius
 Utilities,
 Machine-code animation, 1, 16
 Sprite designer, 4, 18
 BBC micro
 Education,
 Biology quiz, 50, 36
 Charts, 41, 38
 Cube root, 11, 41
 Equations balancer, 17, 34
 Equation solver, 41, 40
 Heat calculations, 10, 34, 11, 28
 Line of best fit, 23, 35
 Moles, 44, 43
 Projectile simulation, 47, 40
 Ray diagrams, 19, 24
 Recorder tutor, 14, 30
 Time tutor, 39, 45
 Games,
 Balloonist, 1, 10
 Beetle Drive, 1, 24
 Brickie, 25, 10
 Cannibal Island, 40, 48
 Cattapilla, 43, 14
 Follow, 6, 10
 Horse Racing, 4, 30
 Hot Drop, 8, 10
 Jaws, 34, 10
 Little Meanies, 20, 41
 Lunar Man, 13, 29
 Mastermind, 3, 37
 Meteors, 27, 40
 Noughts and Crosses, 25, 29
 Pacman's Revenge, 37, 43
 Pole Position, 14, 10
 Pontoon, 6, 37
 Scissors, 46, 45
 Sea Attack, 9, 10
 Tennis, 9, 28
 Train Shuffle, 51, 12
 Word Puzzle, 15, 29
 Yahtzee, 38, 8
 Ye Olde Castle, 17, 10
 Utilities,
 Animator, 1, 39
 Bubble sort, 16, 20
 Character designer, 29, 25, 30, 28
 Cricles, 30, 37
 Converter, 38, 41
 Envelope designer, 33, 31, 34, 32
 Epson user defined graphics, 49, 54
 Filekeeper, 26, 25, 27, 31, 28, 26
 Function keys, 8, 36, 7, 39
 Graphic compression, 42, 39
 Key blepper, 17, 38, 20, 7
 Keyword input, 46, 34
 Memory, 33, 37
 Multi-coloured characters, 7, 26
 Shadow, 7, 37
 Sorting, 7, 37
 The Box, 26, 37
 Word processor, 45, 56

Programs

Amstrad CPC464

Games,
 Battleships, 46, 10
 Helicopter fury, 40, 14
 Nellie's Anagrams, 41, 35
 Pairs, 51, 48
 Utilities,
 Circle, 42, 52
 Graphics extension, 50, 44, 51, 30
 Hex converter, 50, 48
 Line feed, 49, 78
 Memory search, 51, 57
 Microfile, 46, 40, 47, 36
 Rom hex dump, 49, 64
 Miscellaneous,
 Animated fans, 39, 32

Index 1984 Volume 3

- Miscellaneous,
 Beeb graphics, 2, 27
 Bumble graphics, 1, 37
 Catalogue, 40, 51
 Characters, 9, 43
 Chess clock, 23, 39
 Colour blindness test, 18, 30
 Computer art, 36, 31, 37, 29
 Deep mid winter, 51, 35
 Encryption, 25, 35
 Financial calculator, 45, 46
 Graphics pad, 12, 26, 13, 26
 Kaleidoscope, 24, 30
 Meteor visibility, 35, 31
 Metronome, 15, 43
 Moving graphics, 39, 53
 Music, 5, 40
 Music procedure, 6, 30
 Origami, 29, 36
 Oscilloscope, 38, 35
 Paintbox, 31, 31, 32, 31
 Planetary movement, 22, 21
 Polar co-ordinates, 34, 31
 Programmable timer switch, 16, 29
 7 segment display, 8, 19
 Spectra, 26, 35
 Spiral, 16, 43
 Stopwatch, 1, 41
 Timetable printer, 3, 27
 Video indexer, 48, 30
- Commodore 16
 Banker, 48, 40
- Commodore 64
 Educational,
 Chemistry revision, 23, 28
 Maclaurin's theorem, 38, 37
 Mathematical characters, 24, 27
 Matrix inversion, 25, 27
 Standard deviation, 13, 43
- Games,
 Astro Link, 48, 10
 Deathcap, 30, 10
 Dustbin Dan, 24, 10
 Four in a row, 49, 75
 Fruity, 21, 10
 Hot Dog, 7, 31
 Land of Giants, 43, 48
 Mad Maze, 42, 16
 Pacman, 18, 10
 Skill Trap, 11, 10
 The Stow, 32, 10
 The Vortex, 17, 31
 Turbo Track, 36, 10
 Wall of Doom, 39, 10
- Utilities,
 Basic auto loader, 8, 29
 Beep routine, 19, 30
 Bitmap, 13, 37
 Bootstrap writer, 13, 24
 Character editor, 41, 26
 Character generator, 31, 23
 Cursor plot routine, 46, 38
 Diss-64, 28, 31
 Easy machine code, 22, 30, 24, 7
 Envelope shaper, 5, 28
 Function keys, 38, 40
 Machine-code interpreter, 42, 44
- Machine-code monitor, 1, 28
 Memory scan, 50, 50
 Menu selection program, 34, 28, 35, 34
 Multicolour sprite generator, 29, 30
 Multiplication, 40, 39
 Parallel printer routine, 49, 49
 Resequencer, 21, 32
 Retrieve, 47, 45
 Rom/Ram data transfer, 2, 34
 Sprite creator, 10, 31
 Sprite editor, 9, 36
 Sprites, joystick moving, 4, 38
 Structured listings, 44, 40
 Windows, 32, 22, 33, 22
 Word processor, 26, 32, 27, 34
- Miscellaneous,
 Clock, 28, 34
 Doodle, 39, 50
 Interrupted periodic key cipher, 30, 31
 Merry Christmas, 51, 46
 Music synthesiser, 18, 36
 Painter, 6, 26
 Psychedelia, 50, 32
 SID chip demo, 11, 30, 12, 30
 Sound effects, 45, 42
 Sounds, 12, 39
 Typewriter, 23, 38
- Dragon 32
 Games,
 Ballooning, 26, 10
 Bi-Plane, 4, 10
 Dice Game, 14, 41
 Formula 2, 1, 22
 Hangman, 17, 37
 Lunar Module, 49, 16
 Meteor Storm, 2, 41
 Pontoon, 8, 39
 Rainbow Towers, 3, 23
 Santa's Present Catch, 51, 38
 Snakes, 13, 10
 Solitaire, 18, 10
 Steer, 3, 49
 Submarine Mission, 11, 37
 Tank Attack, 33, 35
 Wordgame, 5, 40
- Utilities,
 Character display program, 48, 37
 Clock, 4, 26
 CPG-115 screen dump, 23, 41
 Disc file program, 5, 34
 Epson graphics dump, 20, 30
 File copy, 23, 22
 Filing program, 49, 45
 High-resolution character designer, 36, 26
 High-resolution screen dump, 38, 26
 I/O error trapping, 35, 25
 Keyboard reading routine, 7, 24
 List speed control, 28, 24
 List format, 28, 34
 Merge, 25, 41
 PMode 4 character set, 22, 26
- Record screen and recall, 29, 35
 Screen to printer copy, 27, 26
 Scroll protect routine, 42, 55
 Scroll routine, 45, 49, 47, 33
 Single-key entry, 34, 25
 Sound, 40, 43
 Tandy convert, 34, 36
 Timer, 48, 44
 Title screen routine, 4, 41
- Miscellaneous,
 Barchart, 46, 46
 Birthday cake, 42, 35
 Chord organ, 25, 25
 Colours, 15, 39
 Crypto, 8, 35
 Draw and print, 2, 24
 Joystick draw, 20, 40
 Message, 44, 57
 Music keyboard, 24, 24
 Rotator, 36, 36
 Starburst, 26, 38
 Stitcher, 38, 39
 Typing tutor, 19, 38
- Electron
 Miscellaneous,
 Absolute magnitude, 43, 38
 Dice, 4, 47
- Jupiter Ace, Loader, 9, 45
 Lynx, Attack, 2, 45
 Memotech MTX
 Miscellaneous,
 Graphics, 14, 47
 Poly tunnels, 22, 36
- Oric
 Education,
 Chemistry, 16, 41
- Games,
 Breakout, 14, 42
 Slide, 37, 10
 Turf Luck, 29, 10
- Utilities,
 Inspector, 30, 34
 Tape loader, 40, 52
 Tape player, 41, 42
- QL
 Games,
 Dragon Slayer, 45, 16
 Reptile's Revenge, 28, 10
- Utilities,
 Beep command, 27, 22
 Boot program, 41, 30
 Call/bug correction routine, 48, 34
 Character set, 41, 44
 Clock, 29, 23
 Disassembler, 42, 30, 43, 43
 Enhanced input routine, 49, 60
 File copy, 28, 23
 File housekeeping, 46, 26
 Graphics designer, 39, 35
 Microdrive utilities, 33, 28
 Pretty print routine, 45, 39
 Quill utility, 37, 23
 Sound editor, 48, 50
 Spectrum/QL program converter, 44, 47
 String search and replace, 40, 34
- Trace utility, 35, 23
 Windows, 43, 51
- Miscellaneous,
 Biorhythms, 51, 43
 Clock, 44, 53
- Spectrum
 Educational,
 Correlation coefficient, 10, 37
 Elements, 26, 22
 Equation converter, 49, 42
 Function plotter, 42, 54
 Mean, median and mode, 10, 39
 Newton's laws of motion, 2, 21, 6, 7
 Newton's third law, 3, 18
 Pulley - Attwood's machine, 38, 24
 Three unknowns, 21, 37
- Games,
 Air Sea Battle, 22, 10
 Alien Raid, 33, 10
 Astrocrash, 35, 10
 Bandit, 5, 10
 Bingo, 1, 31
 Chasm, 27, 10
 Cobra, 24, 39
 Communicator, 3, 45
 Cryonics Cave, 30, 34
 Delta Queen, 31, 10
 Dodgem, 11, 39
 Draughts, 3, 12
 Fighter, 39, 52
 Gang Wars, 41, 10
 Gone Fishing, 22, 23
 Gravitar, 50, 12
 In Flight, 12, 10
 Life, 34, 22, 38, 7
 Maze 'n' Chase, 5, 39
 Millipede, 4, 41
 Mine Aliens, 3, 41
 Mucroid Run, 11, 22, 12, 22, 13, 22
 Nasties, 17, 39
 Noughts and Crosses, 2, 10
 Othello, 19, 10
 Porter, 47, 10
 Quack Attack, 24, 35
 Robot, 13, 37
 Rombug, 21, 40
 Showdown, 10, 10
 Spider Attack, 45, 53
 Stunt, 6, 35
 Superman, 8, 37
 Tank Battle, 16, 10
 3D Maze, 2, 42
 Time-A-Climber, 23, 10
 Trun, 40, 53
 Z-Fred, 7, 10, 11, 7
- Utilities,
 Back to Basic, 15, 43
 Basiccode lister, 8, 20
 Beeper code, 7, 21
 Bubble sort, 37, 24
 Character generator, 16, 24, 19, 7
 Clear screen, 33, 37
 Data read, 51, 57
 Display address finder, 35, 21
 Extended Basic, 19, 28, 39, 26

Index 1984 Volume 3

Fast cassette loading, 20, 28
Flash, 44, 58
Graph plot, 23, 30
Help utility, 4, 21
Input, 5, 45
Instring function, 50, 40
Keyboard routines, 2, 19
Large letters, 4, 7
Larger screen, 43, 31
Machine code aid, 9, 42
colour, attributes, border, 1, 18
plotter, 18, 24
Microdrive loader, 48, 28
map, 42, 28
Mirror image, 5, 7
Pixel by pixel movement, 21, 22
Screen copy, 7, 36
design, 21, 39
editor/word processor, 40, 29
section save, 27, 24
Scroller, 15, 38
Scrolling, 47, 44
Seikosha GP-250X screen
dump, 17, 20
64 print code, 14, 24
Smooth scrolling, 41, 29
Variable, 15, 43
Word processor, 5, 22, 17, 26
Miscellaneous,
Animated loading screen, 46, 30
Balancer, 1, 47
Big draw, 28, 35
Carols, 51, 53
CB talker, 45, 36
Colour codes, 12, 37
Currency conversion, 18, 39
Days, 45, 58
Designer, 20, 39
Doodle, 44, 33
Draw, 31, 35
Energy bills, 25, 20
Floating point calculator, 6, 22
4-stroke, 14, 43
Geiger-Marsden experiment, 18, 27
Geometric, 28, 36
Graphics for the Quill, 22, 18
Logo, 19, 38
Manic Miner new titles, 18, 43
Orange, 4, 49
Organ emulator, 15, 26
Patterns, 11, 43
Popular logo plotter, 23, 7
Pie charts, 49, 80
Polaris the North Star, 3, 20
Psychiatrist, 26, 36
Radio alphabet, 26, 36
Rates, 13, 35
Reactimer, 16, 37
Revcounter, 35, 38
Sandy shore, 32, 35
Shop sign, 19, 40
Sleigh ride, 51, 29
Sound FX, 25, 35
Star navigation, 3, 20
Text editor, 24, 21

3D graphics, 37, 38
3D rotator, 9, 23
Top ten, 44, 55
Word test, 36, 24
Xmas holly, 51, 54
Vic 20
Educational,
Areas, 34, 35
Matrices, 43, 53
Mean, 31, 34
Moles, 37, 39
Quadratics, 15, 38
Games,
Base Attack, 50, 52
Citadel, 17, 39
Dog run, 15, 45
Falcon Fighter, 21, 35
Fred, 47, 49
Gardener, 23, 37
Grab, 44, 14
Grave Robber, 10, 38
Las Vegas, 2, 39
Letter Puzzle, 5, 43
Mastermind, 7, 35
Monkey, 1, 31
Moonflight, 4, 43
Moonlander, 27, 37
Scrap Yard, 32, 36
Shoot a Star, 29, 34
Space Sweeper, 12, 35
Space Walk, 8, 36
Stock Market, 1, 45
Sub Strike, 14, 45
UFO Attack, 47, 46
Vic Connection, 20, 10
Wipe Out, 41, 43
Utilities,
Alphasoft, 18, 40
Character drawer, 19, 37
Colour utility, 33, 36
Key bleep, 22, 35
Memory probe, 46, 44
Screen fill, 49, 72
Miscellaneous,
Calendar, 48, 46
Cos graph, 15, 21
Demo, 9, 40
Hall of fame, 8, 36
Halley's comet, 20, 43
Map plotter, 15, 21
Shopping list, 42, 51
3D graphics, 16, 37
Typing practice, 42, 53
ZX81
Educational,
Fractions, 24, 37
Games,
Frogger, 4, 45
Fruit Machine, 16, 39
Nine Hole Golf, 6, 41
Russian Roulette, 18, 41
Triple, 3, 43
Miscellaneous,
Binary, 35, 40
Program list, 5, 18
Sort, 18, 49
Strobe, 33, 37

Hardware

Acorn ABC, 39, 20
Acorn Electron Plus 1 Expansion
Unit, 35, 14
Amstrad DDI-1 Disc Drive, 48, 14
Amstrad Micro, 16, 16
BBC E00 DFS, 35, 14
BBC Prestel Adaptor, 32, 20
Brother M-1009 job-matrix printer, 40, 17
Casio MT-200 keyboard, 27, 16
Commodore C16, 40, 20
Commodore Music Maker, 48, 15
Commodore Plus/4, 37, 16
Compunet modem, 40, 17
Concept Keyboard, 34, 15
Datafix Disc Interface, 49, 40
Echo 1 music keyboard, 42, 19
Economatics Buggy, 1, 14
Ferguson TX portable colour
monitor, 47, 8
Lo Profile keyboard, 38, 14
Microdrive storage box, 45, 33
Micrographic Interface MW350,
38, 14
Microsight 1, 46, 22
MSX,
Canon V-20, 50, 21
Goldstar FC, 50, 21
HX-10, 44, 20
JVC HC-7, 50, 22
Mitsubishi ML F80, 50, 21
Sanyo MPC 100, 50, 21
Sony HB-75, 50, 22
Toshiba HX-10, 50, 22
Musicom ML-10 Centronics Inter-
face, 39, 23
Oric disc drive, 19, 20
Penman plotter, 51, 14
Psion Organiser, 39, 23
QL, 3, 14, 20, 16
parallel printer interface, 26, 31
RAT controller, 36, 17
Saga 1 Emperor, 49, 40
Sakata SCP-800 plotter, 51, 14
Siel MK800, 49, 36
Sinclair flat screen TV, 13, 16
Spectrum on-off power switch,
45, 33
Spectrum Plus, 43, 19
Spectrum video adapter, 47, 8
Tatung Einstein, 42, 12
Touchmaster pad, 45, 30
Trojan light pen, 33, 15
Turboprint/GT, 46, 22
Ultradrive, 36, 17
Wafadrive joystick adaptor lead,
41, 19
WH Smith games network, 15, 19
XP memory expansion system,
50, 18
Yamaha YIS803, 10, 14

Software

Admiral Graf Spee, 31, 19
Air Traffic Control, 38, 20

Alien Break In, 35, 17
Alien Dropout, 24, 13
Alpha-Beth, 40, 23
American Football, 40, 25, 46, 16
Amstrad-Draw, 41, 21
Ancipital, 44, 25
Answer Back Junior Quiz, 35, 17
Aquanaut, 23, 21
Arena 3000, 32, 18
Arnold Goes To Somewhere
Else, 51, 23
Astronomer, 36, 18
Athlete, 29, 17
Atom Smasher, 35, 19, 37, 21
Attack on Windscaie, 23, 20
Author, 25, 17
Autocalc 64, 32, 17
Automania, 34, 19
Aviator, 23, 20
BBC Micro Utilities, 47, 17
Backtrack, 43, 75
Bandits at 3 O'clock, 22, 16
Battle for Midway, 37, 21
Battlecars, 50, 26
Bear George, 38, 20
Beebul, 48, 17
Bewarehouse, 48, 17
Black Hawk, 51, 27
Block-Buster, 34, 17
Blocker, 35, 18
Bongo, 34, 18
Borzak, 24, 13
Boulder Dash, 48, 17
Boxer, 45, 24
Boxing, 41, 23
Bristles, 48, 18
Bumble Bee, 41, 21
Bumpers, 31, 17
Caesar the Cat, 30, 17
Can You Speel, 33, 18
Carnival, 26, 17
Carousel, 21, 17
Castle Assault, 46, 16
Castle of Dreams, 30, 17
Castle of Gems, 43, 27
Catastrophes, 49, 26
Cavelon, 24, 13
Character Generator, 23, 20
Chess, 25, 16
Chiller, 42, 25
Chocolate Factory, The, 28, 17
Chuckie Egg, 27, 19
Colditz, 22, 17
Colony 7, 25, 16
Complete Machine Code Tutor,
27, 18, 34, 18
Computer Scrabble, 37, 20
Constellation, 25, 16
Country Cottages, 44, 27
Crib, 31, 19
Crusoe, 34, 18
Cuthbert in the Jungle, 27, 18
Cybertron Mission, 27, 19
Dallas, 22, 17
Danger Ranger, 27, 18
Darts, 26, 17
Dbug, 46, 18
Death Chase 5000, 28, 18
Dix Mille, 31, 17

Index 1984 Volume 3

- Doodle, 42, 23
 Doomdark' Revenge, 50, 26
 Dr Watson Series - BBC Assembly Language Course, 28, 16
 Dragon World, 42, 25
 Drogna, 45, 26
 Dune Rider, 34, 17
 Eagle, 19, 21
 Ebony Tower, 36, 20
 Echo Art, 28, 17
 Eddie Kidd Jump Challenge, 44, 25
 Editor/Assembler - Version 2.1, 26, 18
 Elite, 41, 22
 Empires, 37, 20
 Enigma, 26, 19
 Eric and the Floaters, 28, 17
 Estimator Racer, 50, 25
 Evil Dead, The, 33, 18
 Eye of Bain, 39, 16
 Falcon Patrol II, 36, 20
 Fall of Rome, The, 23, 21
 Final Mission, The, 41, 22
 Fire Rescue, 46, 17
 Flip & Flop, 41, 21
 Football Manager, 33, 18
 Forecaster, 40, 23
 Forth Compiler, 19, 21
 Frac Attack, 29, 15
 Frank n Stein, 36, 19
 Fred, 46, 16
 Freefall, 21, 16
 French Revision Level, 38, 19
 Fruit Machine, 51, 27
 Full Throttle, 31, 18
 G4IDE Microsystems Slow Scan TV program, 21, 39
 Galaxy Raiders, 36, 20
 Gate Crasher, 37, 22
 Gauntlet, 46, 18
 Gems of Stradus, 34, 18
 General, Spectrum, 9, 16
 Geography - Environmental Studies, 50, 25
 Ghostbusters, 47, 17
 Ghouls, 35, 19
 Gilligan's Gold, 37, 21
 Gisburn's Castle, 33, 18
 Go Sprite, 30, 17
 Graphics Editor, 42, 23
 Graphs, 22, 17
 Grasp, 45, 25
 Ground Zero, 32, 18
 Harrier Attack, 31, 19
 Heathrow, 20, 13
 Henry IV Part I, 49, 22
 Hercules, 33, 19
 Here and there with the Mr Men, 45, 26
 Heroes of Karn, 43, 25
 Hi Bouncer, 32, 17
 Highway Code, 38, 20
 Horace Goes Skiing, 21, 16, 29, 15
 Horselord, The, 45, 25
 Hot Shoe, 47, 18
 Hperaction, 40, 24
 In the Beginning, 26, 17
 Interdictor Pilot, 48, 18
 Jack and the Beanstalk, 49, 24
 Jackpot, 31, 19
 Jet Pac, 43, 26
 Jet Power Pack, 23, 20
 Jolly Roger, 33, 17
 Joystick Art, 36, 18
 Jump for your Life, 37, 22
 Jungle Trouble, 27, 19
 Kamakaze, 19, 12
 Kensington, 45, 24
 Kentilla, 42, 25
 Key to Time, The, 43, 27
 King Arthur's Quest, 43, 26
 Kingdom of Klein, 27, 18
 Knight Lore, 48, 17
 Know Your Own Personality, 47, 16
 Kokotoni Wilf, 40, 25
 Laser Reflex, 32, 19
 Laser Warp, 30, 16
 Lazy Jones, 41, 22
 Les Flics, 27, 20
 Lingo, 43, 27
 MacMan's Magic Mirror, 49, 26
 Macbeth, 51, 23
 Mad Monty, 26, 17
 Magic Micro Mission, 51, 23
 Magic Roundabout, The, 46, 18
 Match Point, 49, 32
 Matrix, 24, 12
 Megagalactic Llamas, 30, 18
 Merlin, 37, 22
 Message from Andromeda, 26, 19
 Micro-Prolog, 15, 17
 Microdrive Utility, 31, 18
 Microgo, 40, 24
 Millionaire, 19, 20
 Mined-Out, 36, 19
 Mini Office, 39, 16
 Missile Strike, 30, 16
 Mode 80, 31, 17
 Molecule, 22, 16
 Moonlight Magic, 41, 21
 Monsters and Magic, 23, 21
 Monty Mole, 33, 19
 Moons of Tantalus, 33, 17
 Mr Dig, 33, 17
 Mr Robot, 42, 25
 Mr Wiz, 30, 17
 Multifile, 25, 17
 Music Master, 40, 23
 My First Adventure, 32, 18
 New Wheels John?, 46, 18
 Nightmare Maze, 40, 25
 1984, 27, 20
 Noah, 41, 22
 Noguard 32 + Connect 4, 30, 16
 Number Painter, 50, 24
 Oh Mummy, 34, 19
 Olympics 84, 24, 12
 Operation Safras, 29, 16
 Oracle's Cave, 35, 18
 Orc Attack, 28, 18
 Orpheus in the Underworld, 50, 24
 Ossie, 28, 16
 Overdrive, 48, 18
 Pacman, 27, 20
 Paint Pic, 34, 17
 Panorama (H), 32, 19
 Pascal 4T, 27, 20
 Payroll Plus, 50, 26
 Pengi, 25, 17
 Pengo, 34, 19
 Percy Penguin, 49, 26
 Perils of Percy Penguin, 50, 26
 Photon Disassembler, 28, 18
 Physics O-level Revision, 37, 21
 Pi'-in-'ere, 48, 25
 Pit, The, 30, 16
 Pitfall, 35, 18
 Pitfall II: Lost Caverns, 51, 27
 Poker, 29, 17
 Polly Pigeon, 47, 16
 Poster Paster, 39, 17, 46, 17
 Program Generator, 26, 18
 Psi-Spy, 22, 17
 Psytron, 21, 16
 QL 68K Operating System, 44, 28
 QL Abacus, 25, 23
 QL Assembler, 46, 17, 48, 18
 QL BCPL, 47, 20
 QL Forth, 50, 25
 QL Lisp, 47, 20
 QL Machine code Editor/Assembler, 49, 22
 QL Pascal, 47, 20
 QL Quill, 23, 24
 Racing League, 43, 25
 Random Access Mailing, 39, 16
 Rapsallion, 37, 21
 Readright, 29, 16
 Red Meanie, 26, 18
 Red Sky over Accrington, 43, 75
 Report Program Generator, 26, 18
 Return to Eden, 44, 24
 River Raid, 42, 24
 Rogue Ship, 37, 22
 Room Lord, 36, 20
 Rubble Trouble, 42, 24
 SOS, 38, 19
 Science 1, 28, 17
 Scrabble, 43, 26
 Screwball, 28, 16
 Scuba Attack, 45, 25
 Secret River, The, 47, 17
 Se-Kaa of Assiah, 49, 24
 Select 1, 44, 25
 Shaken Not Stirred, 35, 18
 Sherlock, 47, 18
 Show Crazy, 49, 24
 Shuttle Shock, 45, 26
 Simonsoft Sprites, 32, 19
 Simple Business Accounts, 37, 20
 Sinbad, 39, 17
 Skooldaze, 51, 27
 Skramble, 24, 13
 Slinky, 25, 16
 Slurpy, 21, 16
 Smash and Grab, 36, 18, 49, 24
 Snooker, 25, 17
 Solar System, The, 26, 18
 Son of Bagger, 40, 24
 Space Commando, 32, 18
 Space Pilot, 51, 24
 Space Professor, 43, 26
 Space Station Alpha, 38, 19
 Spectrosim, 31, 18
 Spectrum Assembler and Debugger, 45, 25
 Spectrum Sound Effects, 35, 17
 Spectrum Sprites, 26, 19
 Spirit of the Stones, 44, 24
 Sports Hero, 47, 16
 Spy School, 35, 19
 Star Avenger, 42, 23
 Star Striker, 32, 17
 Star Trader, 29, 16, 44, 25
 Star Trooper, 27, 19
 Starseeker, 35, 19
 Starwatcher, 39, 16
 Stock Car, 28, 18, 42, 23
 Storyline, The, 28, 16
 Stylograph/Mailmerge/Spell Check, 34, 17
 Styx, 46, 16
 Suicide Express, 40, 24
 Sultans Maze, 32, 17
 Summer Games, 39, 17
 Supabasic, 43, 27
 Superbowl, 29, 15
 Supercode II, 30, 18
 Tales of the Arabian Nights, 30, 17
 Tank Duel, 29, 17
 Tasword 464, 44, 27
 The Complete Machine Code Tutor, 34, 18
 3D Speed Duel, 21, 17
 Titanic, 22, 16
 Tower of Despair, 51, 23
 Traffic, 42, 24
 Trans Express, 21, 17
 Trollie Wallie, 36, 19, 44, 27
 Turbo, 19, 20
 Turtle Jump, 34, 19
 Uncle Claude, 36, 18
 Underwilde, 47, 18
 VIP Terminal, 49, 32
 Vagan Attack, 36, 19
 Valkyrie 17, 40, 23
 Velnor's Lair, 38, 20
 Wallie Goes to Rhymeland, 24, 12
 Warpl, 44, 24
 Waster, The, 33, 17
 West, 33, 19
 Wheeler Dealer, 22, 16
 Where's my Bones, 26, 19
 Witch's Cauldron, 50, 24
 Wizard's Challenge, 23, 21
 Wordgame, 31, 17
 Wrath of Magra, 47, 16
 Xanadu Cottage, 36, 20
 Yacht Race, 49, 22
 ZX81 Forth, 11, 16
 Zany Kong Junior, 49, 26, 51, 24
 Zedis, 45, 24
 Zenji, 42, 24
 Zeus 64, 41, 23
 Ziggurat, 44, 27
 Zim Sala Birn, 51, 24

Index entries are listed by issue number and then page, ie, Echo Art 28, 17 is found on page 17 of issue 28.

POOLSWINNER

THE ULTIMATE POOLS PREDICTION PROGRAM

- **MASSIVE DATABASE** Poolswinner is a sophisticated Pools prediction aid. It comes complete with the largest database available - 23000 matches over 10 years. The database updates automatically as results come in.
- **PREDICTS** Not just SCOREDRAWS, but ALWAYS, HOMES and NO SCORES.
- **SUCCESSFUL** SELEC guarantee that Poolswinner performs significantly better than chance.
- **ADAPTABLE** Probabilities are given on every fixture - choose as many selections as you need for your bet. The precise prediction formula can be set by the user - you can develop and test your own unique method.
- **SIMPLE DATA ENTRY** All English and Scottish team names are in the program. Simply type in the reference numbers from the screen. Or use FIXGEN to produce fixture list automatically (see below).
- **DISC/MICRODRIVE COMPATIBLE** All versions (except Apple and IBM) are supplied on tape, with simple instructions for conversion to disc/microdrive operation. (This seasons results are supplied with the package so that predictions can start immediately.)



Boxed, with detailed instruction booklet

AVAILABLE FOR Spectrum (48K), Commodore 64, VIC 20 (+16K), AMSTRAD CPC 464, BBC B, Atari (48K), ZX81 (16K), Dragon, Apple II, IBM pc

PRICE £15.00 (all inclusive)



FIXGEN 84/5

AT LAST! No more struggling for hours to get the fixture list into the computer. FIXGEN has been programmed with all English and Scottish fixtures for 1984/5. Simply type in the date, and the full fixture list is generated in seconds. Fully compatible with Poolswinner.

POOLSWINNER with FIXGEN £16.50 (all inclusive)
Fixgen alone £5.50



COURSEWINNER v3
THE PUNTERS COMPUTER PROGRAM

Coursewinner is designed to allow you to develop and test your own unique winning system. Using information from daily newspapers or 'Sporting Life', the most important factors can be input and analysed. The program is supplied with a database detailing best trainers and jockeys, and effect of the draw for all British courses. (Flat & National Hunt.)

AVAILABLE FOR Spectrum (48K), Commodore 64, BBC (B), Dragon, Atari (48K), Apple II

PRICE £12.50 (all inclusive)

AVAILABLE (RETURN OF POST) FROM...



phone 24 hrs



phone 24 hrs



phone 24 hrs

37 COUNCILLOR LANE, CHEADLE, CHESHIRE. ☎ 061-428 7425

FREE SOFTWARE FOR LIFE!



New Gold Star life membership of The Software Library is your key to a vast treasure trove of tapes costing up to £18 each. They are yours whenever you want them, three at a time... and a full week's rental won't ever cost you a penny in hire fees!

Only the original Software Library has the resources to make such an amazing offer - free software for life! Our ten megabyte computer ensures fast service; our illustrated, descriptive catalogue makes it fun to choose from over 80 top arcade games, 124 Adventures, simulations and other games, and over 120 great utilities and serious applications; 65% are for the Spectrum, the rest divided between Commodore 64 and ZX81. New releases are constantly being added. Joining this money-saving scheme should cost you £24; as an introductory offer, you can join this month at half price - £12. From then on, you can take away three tapes from our shop whenever you wish; or if you order by post, all we ask is 30p post/packing per tape. The rental is perfectly free in either case.

What's more, you can sell your surplus software to other members (we have over 5,000!) and recoup the cost of membership in no time at all. We offer huge discounts on peripherals and tapes... and so much more. Phone us now on 0730 892732, quoting your Access number, or return the coupon without delay!



GUARANTEED to save you more than any other software library scheme!

SOFTWARE LIBRARY FARNHAM ROAD, LISS, HANTS GU33 6JU

Please enrol me at the introductory offer, and send my membership pack by return.

NAME..... I enclose cheque/P.O. for £

ADDRESS.....



OVERSEAS: join here for £18, or join one of our foreign branches: Postfach 7909, 4800 Bielefeld, W. Germany; Jacobemitslaan 75, B-2400 Mol, Belgium (also covers Holland); 122 S Circular Road, Dublin 8; Peder Lykkesvej 31, 2520 Copenhagen S; Box 1789, Manzini, Swaziland. France & Italy soon. Branch terms vary. All software hired with supplier's permission. PCWV.



NEW

- Commodore 64 -

TURBO-BREAKER

AT LAST, Transfer Turbo games to Disk Blank screen, Flashing and picture screen turbos by most software houses Easy to use.....£10.95

***** TURBO-SAVER *****

Make easy Turbo back up copies of your slow load games, no user knowledge needed, easy to use.....£8.00

***** TRANSFER - MK2 *****

Transfer most slow load games to Disk Simple to use, and needs no user knowledge, or skill.....£8.00

***** DISK - TURBO *****

Make your disk games load faster, 45secs instead of 2mins, does no harm to your drive.....£8.00

***** DISKOPY *****

A Selective disk copier, fast and very easy to use.....£7.00

***** DISK - DOCTOR *****

A Disk editor, alter any part of the disk, recover a scratched file £8.00

ARROW MICRO SERVICES

20 Portmeadow Walk
London SE2

PD100

WITH OVER 30 ORIGINAL GAMES AND PUZZLES

THE TIMES

Book of Computer Puzzles & Games for the Commodore 64

THE TIMES

Book of Computer Puzzles & Games for the Sinclair Spectrum

These compelling and stimulating books will provide endless thought-provoking entertainment. Compiled by Robin Bradbeer and Harold Gale.

£6.95. Published by Sidgwick & Jackson, 1 Tavistock Chambers, Bloomsbury Way, London WC1 in association with Times Books Limited.

Quantum Cassette

The one we've all been waiting for – put your QL programs on tape with **John Rainbow**

One of the unfortunate failings of the QL was once said to be its heavy reliance on microdrives, but now all that has changed, well at least if you are fortunate to own a Spectrum (48/16K) & Interface one.

This program was written through necessity, due to the high price tag on microdrives (even through they have come down) and doubts on their reliability. I like to keep only the most often used QL software on microdrive and keep all my other valuables backed up on cheap audio tapes, occasionally pulling them off tape and back to microdrive with the *QLtaper* and *Staper* programs listed here.

Inside each routine I have tried to keep to the same networking arrangements as used in earlier volumes of *Popular* so as not to confuse unduly, although there is of course nothing wrong in changing.

Down to the basics then. *Staper* is to be programmed on the Spectrum (I used the MK III version), and *QLtaper* on the QL (I have used the AH version). However, there is no guarantee that it will work on all the different combinations of the two, but it's well worth trying.

QLtaper is designed to copy Microdrive files (of about 33K in length using a 48K Spectrum) on to audio cassette tape. Moreover, if *QLtaper* has been stored on Mdv1 then it can copy itself on to audio tape. Further, for those that have Spectrum wordprocessors, then they may be able to edit Superbasic programs, ASCII Assembly listings, etc, on the Spectrum and, when ready, use *Staper* to put them back on to

Microdrive. In this way, they can save from not buying the expensive QL Editors.

Staper is designed to copy back on to the QL the Microdrive files that had been recorded on tape, or one that is still in the Spectrum's memory. (Make sure that there is a formatted microdrive in Mdv1.)

The mode of operation should be straightforward. Type in *Staper* on to the Spectrum, and *QLtaper* on to the QL and save *QLtaper* on Mdv1. A network lead (eg, the one you use for loading/saving) may then be connected between the righthand side net socket on the Spectrum and the righthand side socket of the QL. When you are satisfied that these leads are firmly in place both programs may be run: incidentally, if you forget to plug in the net leads, or if a socket/Interface I is faulty, the QL will give a *Not Found* error. On a more important note, remember not to switch off any of the computers whilst data is passing between them, else you risk damage to their network interfaces!

By now, both machines will be asking questions. The answers that you give them are, of course, dependent on what you wish to do, and when answered, they will keep you informed of their progress. Three points that should be kept in mind are:

- 1) If you break into the programs whilst they are networking, remember to close the opened channels before restarting.
- 2) Although actual data transfer is surprisingly quick, opening and closing channels are surprisingly slow. Give

the QL's Microdrive a chance to stop spinning before sending it a file from the Spectrum.

- 3) Data transfer takes place in shortish bursts so there maybe intervals when you think the computer has crashed. This is quite usual for larger files, it is because the network is buffered. Remember if in doubt, press *break*. . . don't pull the plug!

The first question that can be answered is the Spectrum's "Is the QL ready?", just give a 'Y' and *Enter*.

The QL may be answered next, and will instruct you what to do. First try saving *QLtaper* on to audio tape. If all is well, the Spectrum should very shortly give its *End of File* message. Continue by giving *Goto 280* and store it on tape. Now continue by sending it back to the QL's Mdv1 (remember point 2).

If the Spectrum ever gives the message *Outsized the Spectrum's Memory*, then the user should find ways to separate the large file into smaller ones that can be copied with and, when brought back, these could be recombined. In the case of Superbasic programs, this is easy. Just load the QL with the program from Microdrive and give the following as direct commands on the QL: *Net 5* (Enter), *Open #6, Net.10* (Enter) *List #6 line.no to line.no* (Enter) (where the line nos, indicate an interval of Superbasic, see below). Finally, *Close #6*

The full Superbasic syntax of the list command (as shown on page 33 of the User guide) can be used as shown above, to create individual blocks that can be saved directly in turn on cassette.

Sorry! In last week's issue the listing for Malcolm Scorer's *Othello* program was inadvertently printed on pages 30 and 31. In addition, on page 30, the last 46 lines of the left hand column (from 00 score) and the last 10 lines of the right-hand column (from 50 For i=1..) must be deleted. Apologies for the confusion.

```

QLTAPER
100 REMark Copyright J.D.RAINBOW
110 CLS #0
120 CLS
130 PRINT "QL TAPE RECORDER Program,"
140 PRINT "Copyright J.D. RAINBOW"
150 PRINT "REMEMBER NOT TO SWITCH OFF DURING NET"
160 PRINT "/////"
170 INPUT " Mdv1 prog. To or From tape
(T/F)? >":W$
180 IF W$="f" OR W$="F" THEN GO TO 330
190 IF W$="t" OR W$="T" THEN GO TO 210
200 GO TO 170
210 CLS #0
220 INPUT #0:"Program Name from Mdv1's directory?
>":name$
230 PRINT #0,"The QL is now ready,
plug in the net,"
240 PRINT #0,"Answer 'T' to the Specy's question"
250 INPUT #0,"'To or From..' Then press QL's
ENTER":H$
260 NET 5
270 OPEN_IN #6,neto_10
280 PRINT #0,"Sending:"
290 COPY "mdv1_"&name$ TO neto_10
300 CLS #0
310 PRINT #0, "Job Complete"
320 GO TO 120
330 INPUT #0:"Program Name for Mdv1's directory?
>":name$
340 PRINT #0,"Answer 'F' to the Specy's question"
350 NET 2
360 OPEN_IN #4,neti_1
370 OPEN_NEW #5,"mdv1_"&name$
380 REMark Accessing Mdv1
390 PRINT #0,"Wait until MDV1 has stoped spinning,
then it's ready & waiting for Specy"
400 REPEAT access
410 IF EOF(#4) THEN EXIT access
420 LET dec$=INKEY$(#4)
430 IF CODE(dec$)=0 THEN GO TO 450
440 IF CODE(dec$)<>13 THEN PRINT #5, dec$;
450 END REPEAT access
460 CLOSE #4
470 CLOSE #5
480 CLS #0
490 PRINT #0,"Program "&name$!"is now
on Microdrive one"
500 COPY "MDV1_"&name$ TO SCR
510 GO TO 130

```

STAPER

```

10 REM Copyright J.D.Rainbow
20 CLS : REM Program STAPER
30 REM Just in case it's open
40 CLOSE #6
50 PRINT AT 10,13:"QL ON TAPE"
60 PRINT AT 12,11: J.D.RAINBOW"
70 PRINT AT 20,1:"IF MESSAGE""END OF FILE"
"OCCURS,"
80 PRINT AT 21,1;"JUST GIVE A""GOTO 280"
"DIRECTLY"
90 INPUT "Is the Ql ready (Y/N)? >": LINE q$
100 REM Wait until ready routine
110 IF q$="N" OR q$="n" THEN GO TO 10
120 INPUT "Program To or From Tape(T/F)?":
LINE j$
130 REM Main Menu
140 IF j$="F" OR j$="f" THEN GO TO 420
150 REM Make enough room
160 CLEAR 32499
170 LET LO=32499
180 LET HI=PEEK 23732+256*PEEK 23733
190 LET OFFSET=3
200 FORMAT "N";10
210 OPEN #6:"N";5
220 FOR Y=LO TO HI
230 LET A$=INKEY$#6
240 IF CODE A$=0 THEN GO TO 230
250 POKE Y, CODE A$
260 NEXT Y
270 PRINT "OUTSIZED THE SPECTRUM'S MEMORY!"
280 INPUT "Program Name? >": LINE n$
290 SAVE N$CODE LO+OFFSET, Y-LO

```

```

300 PRINT "VERIFYING"
310 VERIFY N$CODE LO+OFFSET
320 PRINT "CHECKING": POKE 23692,255
330 FOR C=LO+OFFSET TO Y
340 IF PEEK C=0 THEN GO TO 390
350 LET P$=CHR$ PEEK C
360 IF CODE P$=10 THEN LET P$=CHR$ 13
370 LPRINT P$;
380 NEXT C
390 INPUT "CURRENT BUFFER BACK TO QL (Y/N)?":
LINE G$
400 REM Final Verify or from tape?
410 IF G$="Y" OR G$="y" THEN GO TO 460
420 CLEAR 32499
430 INPUT "Name of program from tape? >":
LINE t$
440 LOAD t$CODE
450 LET OFFSET=3: LET LO=32499: LET Y=PEEK
23732+256*PEEK 23733: GO TO 320
460 INPUT "ATTACH NET LEAD(RIGHT HAND NETS)
THEN, WHEN QL'S READY & WAITING,PRESS THE
SPECTRUM'S ENTER": LINE R$: CLOSE #4
470 FORMAT "N";1
480 OPEN #4:"N";2
490 FOR L=32499 TO PEEK 23732+256*PEEK 23733
500 LET K=PEEK L
510 IF K=0 THEN GO TO 540
520 PRINT #4;CHR$ K
530 NEXT L
540 CLS
550 CLOSE #4
560 PRINT "JOB COMPLETE"
570 GO TO 120

```

UNBEATABLE VALUE

ibico LTR-1 LETTER QUALITY PRINTER

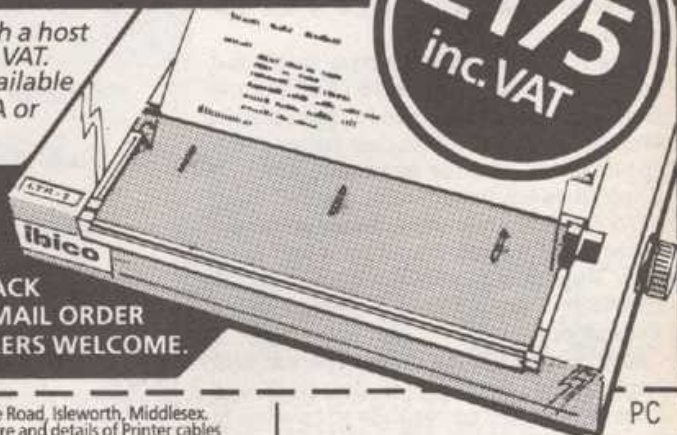
A compact (12" x 2½" x 8"), letter quality printer from Ibico with a host of outstanding features at the unbelievable price of £175.00 inc. VAT. Plugs straight into most computers, with optional interface available for Commodore 64 and Sinclair Spectrum. Compatible with BBC A or B and any computer with parallel interface.

- Prints 12 characters per second Elite type (12 characters per inch)
- Bi-directional printing • Logic seeking • Plain paper — uses your letterheading • Up to A4 size paper
- Instant change ink roller
- 96 characters, full UK ASCII code
- 80 columns • Separate power switch • On/off pilot lamp

ibico

IBICO LIMITED, 181 SPRING GROVE ROAD,
ISLEWORTH, MIDDLESEX
TEL: 01-568 2379 Telex: 934364

FULL 12 MONTHS
PARTS & LABOUR
GUARANTEE. FULL
21-DAY MONEY BACK
GUARANTEE FOR MAIL ORDER
CUSTOMERS. CALLERS WELCOME.



£175
inc. VAT

To: Ibico Ltd., 181 Spring Grove Road, Isleworth, Middlesex.
Please send Ibico LTR-1 literature and details of Printer cables
and interfaces.

Please supply:

- | | |
|---|---------|
| Ibico LTR-1 letter quality printer | £175.00 |
| Printer cable for BBC A or B | £9.95 |
| Interface for Commodore 64 | £25.95 |
| Interface for Sinclair Spectrum | £39.95 |

I enclose a cheque/P.O. for £.....
(Plus £4.50 for postage and packing)

Please debit my Access/Barclaycard Card: Expiry
No: date

or telephone your credit card order

ALL PRICES INCLUDE VAT

Name:

Address:

.....

.....

Post Code

Tel. No.:

Printing pretty

Boris Allen takes you on a whistle-stop tour of the Epson Printer in Printing Pretty

The flexibility of modern printers is well known. The most common style of printer is that derived from the Epson marque. Not only are Epson printers the most popular individual make of printer, but also dot matrix printers are increasingly providing Epson emulation modes. The key to these modes are the Epson escape sequences, which are the means by which the operation of the printers are controlled via the input channel.

Figure 1 shows a specimen of the Epson (emphasized) standard Pica font, Figure 2 shows an example of the Epson proportional font, and the final example (Figure 3) shows the proportional font with the width of the space reduced by half. The first two styles are produced by standard means, and the third style requires some redesign of the existing standard proportional font.

The standard Epson dot matrix printers have a 2K Ram buffer, which can be used to smooth the printing of text with ordinary fonts (eg Figures 1 or 2). If the buffer is de-selected (by setting Dip switch 1-4 Off) then the different standard fonts can be loaded into that portion of memory. As the fonts are now in malleable Ram, rather than stored in unchanging Rom, the shapes of the characters can be redefined.

To prepare the printer for a character set in Rom, therefore, two sequences have to be followed: first the character sets have to be loaded into the Ram; and, second, the character sets in Ram have to be selected. The sequences are known as 'escape' sequences because the first character in each sequence is the *Esc* character.

The ASCII code for 'Escape' is 27, and the ASCII code for 'O' is 48 (ASCII is the American Standard Code for Information Interchange). ASCII codes have many applications, and for example, in Basic, Chr\$(48) is equivalent to 'O' (in BBC Basic VDU 48). A further experiment is to hold down the *Ctrl* key whilst pressing the / key. Depending on the computer, the reaction is equivalent to pressing the *Escape* key.

The purpose of this short diversion is to explain the meaning of the next two lines, which are commands to be sent to the printer:

```
Lprint Chr$(27);":";Chr$(0);Chr$(0);
Chr$(0);L print Chr$(27);"%" ;Chr$(1);
Chr$(0)
```

The first line is a sequence of five characters. There are an escape (ASCII code 27), a colon (:), and three examples of the character which has an ASCII code of zero. (The ASCII character of 0, corresponds to a control code produced by *Ctrl-@*.) These five characters comprise

the escape sequence which loads copies of the ordinary fonts into the 2K Ram buffer.

The second line is comprised of four characters: the escape, the percentage sign (%), the ASCII character with a code of one (*Ctrl-A*), and the ASCII character corresponding to zero. This sequence selects the character set which has been downloaded into Ram for use by the printer. Those with access to Epson manuals should compare the above lines to the sequences given in the manuals for *Esc* and *Esc % 1*.

I am not trying to attempt give a course of instruction in use of the Epson series of printers, and so in this section I can only give the outline of procedures of redefining characters. My task is made even easier because I am redefining the space character.

The redefinition of characters for the Epson series is accomplished by use of

the *Esc* and escape sequence (termed the 'download character definition' by Epson).

The lower case letter 'i' is a very narrow letter, which in the proportional font (Figure 2) is not set in space (in comparison in the word 'limited' in Figure 1, the first i is especially isolated). In the Epson documentation, the escape sequence for downloading character definitions (ESC &) is given as

LPrint

```
Chr$(27);"&";Chr$(0);Chr$(n);Chr$(m);
Chr$(a);Chr$(p1);Chr$(p2);...Chr$(p11);
where the 'p' values are numbers calculated to produce the appropriate pattern of dots to redefine the space, to half size,
LPrint Chr$(27);"&";Chr$(0);" ";Chr$(5);
For I=1 To 11: LPrint Chr$(0);: Next I
```

Between ';' and '"'; there are two spaces. To understand the full workings of this redefinition one needs to consult the Epson documentation.

I have provided two programs: the first uses a Microsoft style of Basic, and the other uses BBC Basic.

Whoops... in last week's issue the listings for *S Alg's Matrices* program was inadvertently printed on pages 27 and 28.

Fig 1

The flexibility of modern printers
The most common style of printer
EPSON marque. Not only are EPSON
individual make of printer, but
increasingly providing EPSON emu

Fig 3

The flexibility of modern printers is well known.
The most common style of printer is that derived
EPSON marque. Not only are EPSON printers the
individual make of printer, but also dot matrix printers
increasingly providing EPSON emulation modes. 1
these modes are the EPSON 'escape sequences', v

Fig 2

The flexibility of modern printers is well known.
The most common style of printer is that derived
EPSON marque. Not only are EPSON printers the
individual make of printer, but also dot matrix printers
increasingly providing EPSON emulation modes. T

MICROSOFT BASIC CONTROL OF PRINTER BBC BASIC CONTROL OF PRINTER

```

10 LPRINT CHR$(27); ":"; CHR$(0); 10 VDU 1,27, 1,58, 1,0, 1,0, 1,0
CHR$(0); CHR$(0); : REM download character set
: REM download character set 20 VDU 1,27, 1,37, 1,1, 1,0
20 LPRINT CHR$(27); "%"; CHR$(1); : REM select downloaded character
CHR$(0) set
: REM select downloaded character 30 VDU 1,27, 1,38, 1,0, 1,32,
set 1,32, 1,5
30 LPRINT CHR$(27); "&"; CHR$(0); : REM selection of space for
" "; CHR$(5); modification, and setting right
: REM selection of space for column to 5
modification, and setting right 40 FOR I=1 TO 11 : VDU 1,0 :
column to 5 NEXT I
40 FOR I=1 TO 11 : LPRINT : REM definition of space
CHR$(0); : 50 VDU 1,27, 1,112, 1,49
NEXT I : REM set proportional mode
: REM definition of space 60 VDU 1,12
50 LPRINT CHR$(27); "p1" : REM new page
: REM set proportional mode
60 LPRINT CHR$(12)
: REM new page

```

To others, it's an Amstrad CPC 464, but to you it's



The Workforce

The new Amstrad CPC 464 has set new standards of performance and price for home micros. But this great machine isn't confined just to games. David Lawrence and Simon Lane have written *The Working Amstrad* to help you put your CPC 464 to good work, quickly and easily. Inside you'll discover a whole library of applications programs and handy subroutines, all ready for immediate use, and with full, easy-to-follow explanations.

You'll be able to get your Amstrad working away on your home finances, on creating great graphics, on useful information storage and retrieval applications, on educational projects, and lots more. With music and in colour! *The Working Amstrad* costs just £5.95 from all good bookshops and micro dealers. Or use this order direct

Get your Amstrad working!

To: Sunshine Books, 12-13 Little Newport Street, London WC2H 7PP
Please send me _____ copies of *The Working Amstrad*
at £5.95 + 50p P&P each

☐ I enclose a cheque for £_____ payable to Sunshine Books
☐ Charge £_____ to my credit card: ☐ Access ☐ Visa

Number: _____ Expires on: _____

Signed: _____

Name: _____

Address: _____

Open Forum

We are always actively seeking programs for publication - either for Open Forum, the machine pages or Star Game. When sending in a program for consideration, a clear program listing should be sent, together with, wherever possible, a saved copy on cassette. Documentation - usually not more than 1000 words - should start with a general description of the program, what it does, and then some detail of how the program itself is constructed. We pay very competitive rates, according to the length and nature of the program and the quality of the accompanying documentation.

Balloon burster

on Dragon

The idea of this game is to burst five balloons with the point of your dart.

Full instructions are given in the program.

Program Notes

10-260 Setting up graphics
270-340 Test for keys and hit

350-390 Draw dart
400-490 Draw and move balloon
500 Balloon hit
510-560 Endings
570-600 Graphics
610-690 Instructions

```
10 POKE 65495,0
20 GOSUB 610
30 PMODE4,1:PCLS:Q=0
40 DIM A$(35),A(50),B(50),C(50),D(50),E(
50),F(50)
50 CIRCLE(10,10),10,1
60 CIRCLE(14,14),3,1
70 PAINT(10,10),1,1
80 DRAW"BM10,20F3D1G3D1F3"
90 GET(0,0)-(20,32),D,G
100 PCLS
110 DRAW"BM10,10NU10NESNL10NGSND10NF5NR1
0NH5"
120 GET(0,0)-(20,20),F,G
130 PCLS
140 FORX=1TO35:READ A$(X):NEXTX
150 GOTO 200
160 FORX=1TO35:FORY=1TO11:Z$=MID$(A$(X),
Y,1):IF Z$="0" THEN Z=0 ELSE Z=1
```

```
170 IF Z=1 THEN PSET(X,Y) ELSE PRESET(X,
Y)
180 NEXT:NEXT
190 RETURN
200 GOSUB 160:GET(0,0)-(35,11),A,G
210 FORX=1TO10:READ A$(X):NEXTX
220 GOSUB 160
230 GET(0,0)-(35,11),B,G
240 SCREEN1,1
250 PCLS
260 X=90
270 GOTO 400
280 IF PEEK(341)=223 THEN X=X-5
290 IF PEEK(342)=223 THEN X=X+5
300 IF X>180 THEN X=180
310 IF X<0 THEN X=0
320 IF PPOINT(39,X+5)=5 OR PPOINT(39,X+5
)=5 THEN GOSUB 500
330 IF RND(5)=1 AND Q=0 THEN GOSUB 410
```

Baud Walk



American Peoplelink

Regular readers of these columns will have read of the American Databases, *The Source* and *Compuserve* which can be accessed surprisingly cheaply via Packet Switch Stream. Just before Christmas, I was privileged to witness the birth of a new, cheaper alternative to these services: *American Peoplelink*.

Peoplelink is interesting, in that it is priced cheaper than its current rivals to the Ameri-

can *Videotex* throne. Aimed more at the 'man in the street', it costs just \$2.95 an hour to access (as compared with the 6-7 dollars an hour that *Compuserve* and *The Source* charge). Added to these charges, (for users in the UK), is the cost of PSS, or the more expensive option of direct mail, access, which works out at £8 and £37 respectively, (assuming 'cheap rate' calls).

Peoplelink is based around two Tandem mainframe computers located in Chicago. Running in parallel, they can support around 150 to 200 simultaneous users, which, although sounding very few in number, can actually service upward of 5,000 subscribers, provided, of course, they don't all log-on at the same time!

Users of *Prestel* may be interested to know that, in spite of the fact that there are currently 47,000 subscribers, only 700-800 are actually

logged on at the same time. Once these ratios are applied to *Networking*, it's easy to see why databases, such as *Peoplelink* can be started with as little as 50,000. In fact, because of provisions for expansion, *Peoplelink* cost the financiers around \$100,000 to launch. Because of the relatively low start-up costs (to them, that is), they are offering 'founder member' subscriptions for just \$15, and \$2.95 an hour connect fees.

There are surcharges for 1200 baud and peak-time usage (Monday to Friday, 9am through to 6pm), but this still keeps the rates very competitive. I understand that, until April of this year, founder members may dial direct to Chicago, and 'connect fees' are waived. If you haven't got a PSS account, and can stomach a short dialled direct Transatlantic call, then for an admission fee of \$15, it will allow you to sample the delights of American

databasing, although, at \$37 per hour direct-dial rates, PSS soon becomes a much cheaper alternative to an irate British Telecom Accounts Manager!

For more information on *American Peoplelink*, write to: Jules Millman, American People-Link, Arlington Ridge Office Centre, 3215 N. Frontage Road, Suite 1505, Arlington Heights, IL 60004, USA. Telephone 0101 312 870 5200. *Prestel* and *Telecom Gold* Users may send mail to the UK collection points: *Prestel* 01 999 5800. *Telecom Gold* 84: TCC014.

Robin Wilkinson

Baud Walk is a new weekly column with news on networking, databases, reviews of modems and software and points of contact for information.

Any readers with experience of networking are asked to send their experiences or news of services to Robin Wilkinson, *Baud Walk Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD. He can also be contacted on *Prestel* mailbox 019993727.

DEMONS OF TOPAZ



100% GRAPHIC EXPLORATION



A game of distinction  from British Telecom.

WELLINGTON HOUSE, UPPER ST. MARTIN'S LANE,
LONDON WC2H 9DL. TEL: 01-379 6755/5626

COMMODORE 64

**GOLD
EDITION
£5.95**

Open Forum

```

340 RETURN
350 SCREEN1,1:PUT(0,X)-(35,X+11),A,PSET:
FORWA=1TO50:NEXTWA:PUT(0,X)-(35,X+11),C,
PSET
360 GOSUB 280
370 PUT(0,X)-(35,X+11),B,PSET:FORWA=1TO5
0:NEXTWA:PUT(0,X)-(35,X+11),C,PSET
380 GOSUB 280
390 RETURN
400 GOSUB 350
410 Q=1:A=235:B=RND(158):BI=-RND(10)
420 PUT(A,B)-(A+20,B+32),D,PSET
430 GOSUB 350
440 PUT(A,B)-(A+20,B+32),E,PSET
450 A=A-8
460 B=B+BI
470 IF B<0 OR B>158 THEN BI=-BI:GOTO460
480 IF A<0 THEN 550
490 GOTO 420
500 PUT(A,B)-(A+20,B+20),F,PSET:PLAY"10
001CDEFGAB02CDEFGAB03CDEFGAB04CDEFGAB05C
DEFGAB":PCLS:Q=0:BH=BH+1:IF BH=5 THEN 51
0 ELSE 250
510 CLS:PRINT"00000000CONGRATULATIONS000
00000"
520 PRINT"YOU BURST ALL FIVE BALLOONS!"
530 PRINT:PRINT"WANT ANOTHER GO?"
540 INPUT A$:IF A$="Y" THEN GOTO 250
550 CLS:PRINT"YOU MISSED IT!":PRINT:PRI
NT"HARD LUCK!":GOTO530
560 GOTO 560
570 DATA 00000100000,001111111100,1111111

```

```

1111,11111111111,11111111111,11111111111
,01111111110,001111111100,00001110000,000
00100000
580 DATA 00000100000,00000100000,0000010
0000,00000100000,00000100000,00000100000
,00001110000,00001110000,00001110000,000
01110000
590 DATA 00001110000,00001110000,0000111
0000,00001110000,00001110000,00011111000
,00001110000,00001110000,00001110000,000
00100000,00000100000,00000100000,0000010
0000,00000100000,00000100000
600 DATA 00000100000,00001110000,0001111
1000,00111111100,00111111100,00011111000
,00011111000,00001110000,00001110000,000
00100000
610 PMODE 4,1:PCLS:SCREEN1,1:CIRCLE(128,
96),80,1
620 PAINT(128,96),1,1
630 FORX=1TO100:NEXTX:PLAY"01T255L255CC"
640 PCLS:DRAW"BM128,96NU50ND50NL50NR50NE
40NF40NH40NG40"
650 FORX=1TO100:NEXTX:PCLS
660 CLS:PRINTSTRING$(32,"*");
670 PRINT"*****BALLOON**BURSTER*****
**";
680 PRINTSTRING$(32,"*");
690 PRINT:PRINT"YOU CONTROL A DART WITH
THE UP AND DOWN ARROW KEYS. YOU MUST
HIT FIVE BALLOONS WITH THE POINT OF YOUR
DART,AND POP THEM. IF YOU MISS ONE,
THE GAME IS OVER":RETURN

```

Book Ends



Book *The Complete MSX Programmers Guide* **Price** £14.95 **Micro** Any MSX **Supplier** Melbourne House, Castle Yard, Richmond, Surrey.

I doubt that the five-hundred plus, plastic bound pages of this book will be the standard for computer books, but the standardisation of MSX computers probably made it commercially viable.

Whether any programmer's guide can be complete is questionable, but this one certainly tries to provide a comprehensive catalogue of the tools of the MSX Basic writer's trade. It starts with a succession of short chapters, each introducing several new keywords and most ending

with an exercise or two.

Once the fundamentals have been established and practised you'll be ready to move on to the *Advanced Programming Guide*, 130 pages of Boolean Algebra, Advanced Graphic Techniques, Cartridge Slot Mechanism and more.

The second half of the book consists mainly of a reference section which makes an alphabetical journey through all the keywords with descriptions, syntax and hints. After which those with some previous knowledge of machine code will find a useful introduction to the Operating System.

All told this is an impressively - dare I say it? - complete guide to this range of micros. However, it's probably best suited to those with some programming knowledge already as the style is a

trifle dry and technical which could, I suspect, confuse the complete novice. Those who prefer the no-frills approach should find it invaluable though.

John Minson



Book *Electronic Music on the Commodore 64* **Price** £6.95 **Micro** Commodore 64 **Supplier** Sunshine Books, 12-13 Little Newport Street, London WC2H 7PP.

Budding Thomas Dolbys would do well to take note of Mark Jenkins', (*Melody Maker's* technical editor) guide to the C64 and music. He writes for both programmers with little musical knowledge and budding Mo-

zarts who've outgrown their Steinways but don't know a *Peek* from a *Poke*. Both extremes of this broad spectrum would probably need some additional information, though the physics of sound is dealt with efficiently.

The book's four sections examine handling the *Sid* chip, with listings; commercial music-making software; hardware and finally the *Midi* standard of interfacing instruments and micro. This gives it a segmented appearance, but Mark Jenkins obviously knows his stuff.

While those with merely passing curiosity will probably only find the first quarter of real value, enthusiasts should find its usefulness increases in relation to their desire to experiment and tackle technicalities... and to the size of their wallets!

John Minson

Arcade Avenue



Dark Star

Paul Ledger of Leeds writes a super letter full of Pokes including a new one for Moon Alert - "Type in 10 Poke 23693,0 : cls : Load "" Screens\$: Load "" Code 24576 : Poke 42404,n : Print U\$ 26624 (where n is the number of lives - 255 gives lives). For Imagine's *Arcadia* Poke 25776,0; *Hunchback* Poke 26888,0; *Kosmic Kanga* Poke 36212,0; *Tranz Am* - Break in after main block of code has loaded ant type 'Poke 25446,0 : Continue' (enter)."

Paul also sends these high scores - *Knight Lore* 48%, *Decathlon* Day 1 376,410 Day 2 294,615.

Now then all, Dragon owners sit up and pay attention. First of all comes a letter from Paul Thompson of Bracknell who has these high scores - *Hungry Horace* 100,102; *Time Bandit* 18,850; *Manic Miner* 2,200.

Paul goes on to enthuse about the game *Time Bandit*, available from Microdeal, which "has over 300 screens and is brilliant - recommended to all Dragon owners". This brings me along nicely to a letter from Mark A. Blease of Oron Software who begins with the very true statement that "there are more and more high quality games appearing for the Dragon. That is why we are setting up the *Dragon Games Users Group*. Our aim is to cater for Dragon owners who will receive our two-monthly newsletter, *Dragon Software* which will include reviews of over 30 games as well as a page for members to exchange information and tips. Members will receive 15-20% off all software which can mean great savings. Write to Mark c/o Oron Software, 64 Prince Street, Rochdale, Lancs. OL16 5LJ.

Mr A. R. Wedge of Enfield has written in praise of the

Dragon-Design game *Dark Star*, "the best blast'em to bits game on the Spectrum". The good news is that Amstrad owners will also soon be able to enjoy this arcade masterpiece which will be some compensation for the news that the expected conversion of *Halls of the Things* has hit a snag and will be delayed. However, existing fans of Halls, and I know that there are many, will be very excited to hear that soon, perhaps by the time you read this, *Return of The Things* for the Spectrum will be in the shops. The game has a playing area of 32 times the size of Halls, includes the original tower where Halls was set within its landscape, has much nastier monsters (if that is possible).

Mr Wedge also gives these suggestions to type into the high score sheets for some unusual replies - Crystal, Tony Bridge, *Jet Set Willy*, MSX, Spectrum, sex, nothing (just press enter), spectacle,

Matthew Smith, Ultimate, help and certain other four letter words. He also sends out a plea to hackers to find the password for the mystery game on the *Dark Star* tape called *Spectacles*. This is echoed by Stuart Young of Glasgow. Well, I am reliably informed that the clues necessary to find the password are held in the *Dark Star* program, but if nobody manages to find it fairly soon the password will be released.

Tony Kendle

Game Wizard Entry Form

Micro
Game 1 score:
Game 2 score:
Game 3 score:
Name
Address
.....
Your signature
Witness's signature

Games Wizard Competition

Play the games, send in your high scores on the form and you could become The Games Wizard.

	Commodore	BBC	Spectrum	Amstrad
Game 1 Suicide Express	Elite	Technician Ted	Sorcery	
Game 2 Beach Head	Jet Pac	3D Star Strike	Splat!	
Game 3 Shoot the Rapids	Chuckie Egg	Cyclone	Manic Miner	

Micro Education



Glowing eyes

A few weeks ago London's Barbican Centre was home to a computer exhibition which most people probably never even noticed. Under 18's were not admitted, which was ironic because its topic was Hi-Technology and Computers in Education.

Of all the areas into which the micro has spread its chips, education is probably the least glamorous. Though many home computers are bought with the good inten-

tion of 'educating', most end up used for zapping. Considering the standard of some educational software this is hardly surprising.

The exhibition proved something of an eye-opener, though, in terms of the high quality of most of the educational software now being produced.

Inevitable there were almost enough turtles to fill a zoo, Logo being the language that's synonymous with programming for the young. Acorn has an implementation on two 16K Roms, Open Logo, while at the other end of the spectrum, Honeyfold Software announced a disc or cassette version for the same micro for only £16. Handsomest turtle award goes to the Valiant with its see through case and glowing LED eyes.

The Teach Robot mechanical arm, with movement in six

axes, has obvious potential for class projects. Older students can also investigate computer architecture via the patchboard system of logic gate tutors by Limrose.

While all the exhibits mentioned so far are concerned with developing computer literacy and skills, the micro also has a place in teaching other subjects.

Duckworth was demonstrating a somewhat bizarre tutor for the recorder. It comes complete with the 'electronic recorder' resembling a twelve-inch ruler with sensitive pads to mark the holes; touching them generates a note which can be displayed.

One eye-catching stand belonged to Polydron, a construction system using brightly coloured, flat plastic triangles and squares to develop an understanding of 3-D geometry in the young.

Those who buy *Espionage*, an adventure game set in the oil business, may not realise that it is just part of a teaching system which also has a classroom package, and that the two interlink. This development from Modular Resources is one I hope to return to in a future column.

Finally, there are alternative ways of addressing your micro, ranging from the AMX mouse for the BBC, with its Macintosh style icons, to the Star Devices touch tablet and its overlays.

John Minson

Micro Education is an occasional column dealing with all things micro in the education world. We would like to hear from anyone with something to say about computers in schools and education. Send your letters or details of new products to John Minson, c/o *Popular Computer Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

Tony Bridge's Adventure Corner



Never look back

The Village Underworld is another Quill'd adventure from a new software firm, the quaintly-named Orpheus Never Look Back. On first glance, this is just another adventure, with not much about it to warrant rushing out to buy it. But look a little closer. . .

You start, standing before a village hall, beside the open boot of your car, where you must return all your treasures for scoring – but before entering, try a bit of exploring. Around the village hall lies the village, and you can wander around, mapping as you go. So far, so ordinary. But now, you come across an extensive farm, and eventually stumble across the opening to an underground maze. Fortunately, the route through the maze is posted right at the start, in the form of a very simple code (the directions being those on the cursor keys), so it is quite simple to get through.

Starting again at the first location, go on, *Open Door* and then *Enter Door*. You will be confronted with the entrance hall. Going West leads to a stage, upon which you can see some sliding controls. Go to the back of the stage and you will find a Fur Coat. Return to the stage. Now, there must be something to do with those controls – and sure enough, after some manipulating, a hole in the stage opens. This leads to a freezing Meat Factory (ah, a Fur Coat!). Proceeding further, you will eventually come across a lift. Calling the lift and then pressing the correct button will whisk you to one of six floors. One of the floors contains the solution to a puzzle contained on the floor level, another floor holds a *Treasure*, and a

couple more remain enigmas (for the moment).

This is my favourite type of game – a rather uninspiring start, full of the old cliches, gradually opening, like a lotus blossom, to reveal an inventive and imaginative test of skill. Advanced adventures will probably polish this one off in a couple of sittings, but there is still quite a lot of depth to the game, and someone looking for a bit of practice will welcome the reasonably-priced (£4.95) *Village Underworld* (written by Keith Parrock): Orpheus (Hallarch) Ltd The Smithy, Unit 10, Church Farm Hatley St. George, Nr Sandy, Beds.

We don't often get to see adventures for younger players, and it's even rarer to come across a good one. Actually, I don't know if *Jack in Magicland*, from Turtle Software was designed as a kid's adventure, but it would certainly make a good one.

Again, it is Quill'd, and the display is what we have come to expect. Using the Quill utility, it is essential to use a bit of imagination in the layout and pace of the game, if a 'formula adventure' is to be avoided. There are many ways of doing this – I'm glad to say that Jack, while playing much like other Quill'd efforts, plays in a slightly different way.

But to set the scene. . . "You have been an idle, lazy boy and your mother was very reluctant to entrust you with so important a task" This task is to sell off the family cow – sounds familiar, doesn't it? Of course, it's *Jack and The Beanstalk* on the Spectrum.

The adventure is rather like a multiple choice test – or one of the Jackson/Livingstone 'paragraph' books. Each location boasts a screenful of text, some of which is descriptive, and some of which is atmospheric action. For example, (here, you are for one reason or another the size of a microbe):

"You see a huge lake, and as you look around a tremendous ball of water drips from a leaking tap in the far corner. It is no place for you, but as you turn to go the door behind slams shut. *You Are Trapped*. If I were you I would start swimming, because a spider the size of an octopus has just seen you! Will you *FIGHT* or *SWIM*?"

In this case, if you *SWIM*, you get sucked down the plug-hole, and if you

FIGHT, the Spider is too big for you, and you have to swim anyway, although you end up in a different place. Although there are a lot of rather tense situations in Jack, there is no overt violence, and the player almost always has a way out of trouble. In fact, the most trouble that I got into while playing the game was getting very hungry. There is a nice juicy apple, but being extremely small at this point, the problem is to somehow cut into it.

All in all, I like *Jack in Magicland*. Though I said it was for younger players (because of the scenario and this-or-that approach to the problems), the adventure is a tough one, quite hard enough for the more experienced. The locations are varied and interesting, and these and the several monsters, giants and other fairy-tale characters you meet will keep you slogging away to the end. Turtle Software, 40 School Road, Finstock, Oxford OX7 3DJ.

Interceptor Micros have taken the Amstrad CPC 464 in hand, and produced a little number for it called *Jewels of Babylon*. You'll know that the machine has its own monitor, so software writers are encouraged to provide snappy graphics in their games – and JOB is no exception, having some of the nicest pictures that I've seen in an adventure. They are drawn with great style and owe a lot to the best comic art, each picture having a black frame with the occasional palm leaf draped over the frame.

I only had a few minutes at the adventure, so didn't, I assume, see more than a small number of the locations and puzzles (there weren't many of those), but several people have written to say that it is a good one. Peter Brown, for example, says that it is superb, though he can't progress much further than the beach area. You Spectrum owners will be glad to know that *Jewels of Babylon* is available for their micro – get stuck in!

Finally, let me tell you a couple of bits of news that might interest some of you. *Valkyrie 17*, the only adventure that is a total Red Herring, is now released for the Commodore 64 at £9.99.

Tower of Despair, from Games Workshop, has been causing a lot of Despair to the authors, Mike McKeown and Russell Clarke. They've been so inundated with phone calls begging for help, that they've got together and written a Help Sheet, which can be obtained if you send a SAE to Mail Order Dept., Games Workshop, 27/29 Sunbeam Rd, London NW10.

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

Adventure Helpline

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

Fill in the coupon, explaining your prob-

lem, send it to us, and a fellow adventurer may be able to help.

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

Adventure..... on (Micro).....
Problem.....
Name.....
Address.....

CLASSIFIED

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

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

GAMES SOFTWARE

IT'S SNOW-JOKE. A different kind of adventure for the Spectrum or BBC. Puzzles, humour, mystery. £3 inc P&P, Mythsoft, 84 Elland Rd, Brighouse, W. Yorks HD6 2QR.

PHASE FOUR COMPUTERS

FOR THE VERY BEST IN SOFTWARE AND HARDWARE
FAST DELIVERY ON ALL THE TOP GAMES FOR ALL HOME MICROS.

SPECIAL OFFER

Quickshot Mark II Joystick £9.25
On/Off switch for Spectrum £4.75
* phone or send S.A.E. for price list and details of our brand new software club. Over 1000 titles with up to 30% off R.R.P. (All prices inc. V.A.T. and P&P)
PLUS free membership *

Send cheque/PO to:

PHASE FOUR COMPUTERS
REAR PREMISES, 4 SHIELDS ROAD, BYKER,
NEWCASTLE UPON TYNE NE8 1DR
TEL: TYNESIDE (081) 278 2023 24 HRS.
PL154

CHALLENGE 'MANDY' TO A GAME OF

★ ★ STRIP PONTOON ★ ★ FOR 48K SPECTRUM AND SPECTRUM

If you win enough, she strips off item by item in superb high-res graphics. Special introductory offer of only £2.99. P&P free.

Send cheque/PO to:
HIGH VOLTAGE
16 Bridge Rd, Park Gate,
Hants SO3 7AE
PL152

LEISUREDOME

COMPUTER GAMES (Originals)
Send SAE for details

**PO BOX 1
BENFLEET
ESSEX SS7 1SN**
PL999

AMSTRAD SUPPLIES CO

Send now for full details of Amstrad Software and Products.

Amaco PO Box 18
Whitstable, Kent CT5 1TJ
PL130

AMAZING OFFER!

VIC 20, CBM 84 GAMES
For £1.50

Pay after delivery, write:

STARGATE
P.O. BOX 1520
DUBLIN 4
PL160

SOFTWARE FOR THE SINCLAIR QL

CHOMPER — a version of Pacman, with ghosts, extra power pills, etc. £10.
ZFRED — A version of Qbert. Paint the Pyramid before the snake and balls kill you. £10.
GOLF — A full simulation of an 18-hole course, bunkers, water, club selection, etc. £10.
STRANDED — you are stranded on a hostile planet. Can you reach the transporter before you are killed? £10.
SHOOT 'EM UP — a fast multi-levelled invaders variant, 20+ different levels. £10.
CRYSTAL COLLECTOR — Explore the caverns of the planet of Renaga Searching for the precious Cylon 7 crystals. Watch out for the monsters. £10.
PROGRAMS — 1-20 programs on microdrive cartridge only £15.
O-LEVEL REVISION courses in the following subjects — physics, chemistry, biology, French, history, mathematics, geography. £10.

All the above prices include the cartridge.
Enquiries welcome (SAE please).
Cheques/POs to: **NEW HORIZONS SOFTWARE**,
FOUR WINDS, CWM LANE, ROGERSTONE, NEW-
PORT, GWENT NP1 9AF.
PL151

SPECIAL OFFER FOR ATARI

400/600/800 OWNERS

Hire your first two games FREE from our extensive range of software. Up to the minute releases available. Apply Now! We now have Atari hardware for sale at discount prices. Moderns suitable for Atari computers now for sale. For further details send sae to:

CHARWOOD GAMES
27 WARWICK AVENUE
QUORN, LOUGHBOROUGH
LEICESTERSHIRE
TEL: 0509 412604
PL180

DISCOUNT PRICES FOR SPECTRUM GAMES

Special low price on Knight Lore Underworld, Sabre Wolf only £7.25 each. Firebirds only £2.20 cheque/PO to: **Regal, 3 Huntly Suite, Broadway Court, Peterborough.**
Many games for Spectrum also educational and business tapes and books.
SAE FOR LISTS
PL146

ASTROLOGY—ATARI

Be your own astrologer! Full range of accurate, fascinating prog by:

S.A.C. Software,
Firdell, Langdon Lawn Close,
Hythe, Southampton,
(SAE please for details)
PL131

SOFTWARE

HOME ACCOUNTS. Put your house in order! Comprehensive coverage of bank accounts, credit cards, HP, etc, inbuilt accuracy check. Projects cash flow for any period. Available for CBM64, Vic 20, BBC & Electron £8.45. Free details from: Discus Software, Freepost Windmill Hill, Brixham TQ5 9BR. Tel: 080 45 55532.

RECREATIONAL SOFTWARE at realistic prices for 32K BBC-B. Latest releases in Cards and traditional games series include WHIST, £6.45; DRAUGHTS, £6.45 and DARTS, £4.50. also music series offers complete performance BACH Brandenburg Concertos No 3 in G, No 6 in B flat, Toccata & Fugue in Dm, £5.50 each. DotSoft PO Box 46 Hitchin, Herts SG4 0XQ.

CALC ELECTRIC A PRACTICAL APPLICATION FOR YOUR MICRO

Calc electric measures the electrical consumption and electrical running cost of your whole home, office, or even individual appliance. Tests may be run for long periods; then power and costs may be displayed as graphs. System is ready to use in minutes and requires no electrical connection to mains. Includes interface, sensor and program cassette. Available on Commodore 64 now; other micros soon. Cheques, POs for £24.95 (all inclusive), to:

ETALON 26 High Street
Merstham Surrey RH1 3EA
or SAE for details
PL150

TAXMAN

PAYING TOO MUCH TAX?

Should you and your wife be taxed separately? Beat the Taxman with this utility. INPUT, EDIT, CALCULATE TAX, PRINTOUT & SAVE. BBC B or Electron, state which, on cassette. £9.95 inc p&p from **Sterling Software, 11 Redhill Close Tingley, Wakefield WF3 1HL.**
PL152

EDUCATIONAL SOFTWARE

EDUCATIONAL SOFTWARE. Most home computers. For your free 24-page brochure, send to Jander Software, Edgbaston House, Broad Street, Birmingham.

A-LEVEL PHYSICS. Multichoice examination revision program by former university lecturer. Based on proven grammar school teaching methods. 48K Spectrum version £5.95. cheques/P.O. to: Dr J. A. Hughes, 50 Leach Lane, St Helens, Merseyside WA9 4PU.

MATHEMATICS

Program for evaluating, expanding, factorizing and simplifying algebra expressions, solving equations and manipulating formulae, with step-by-step display of all workings, now nearing completion. Extensions to calculus, including indefinite integration projected. Now running on ZX81+64K, and convertible to any domestic micro of user-available capacity > = 48K

Enquiries to:

P.R.H TURVEY
22 Crownstone Rd
LONDON SW2 1LP
PL153

AMSTRAD SUPPLIES CO

Send now for full details of Amstrad Software and Products.

Amaco PO Box 19
Whitstable, Kent CT5 1TJ
PL130

TELEX YOUR CLASSIFIED COPY TO:

**296275
SUNGRY**
H45

CLASSIFIED ADVERTISING RATES:

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

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

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

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

Here's my classified ad.

(Please write your copy in capital letters on the lines below.)

Please continue on a separate sheet of paper

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

Name

Address

Telephone

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



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

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



HA2

DEALERS

MICROLINK

SPECIAL OFFER PRINTERS

JP100A £185 + V.A.T. JP130A £215 + V.A.T. JP136A £375 + V.A.T. MSX Quick Disk Drive £138 + V.A.T.
Look no further - only a phone call away for the most competitive link between the manufacturer and the customer in printers, computers, software, monitors, etc.

Tel: LISS (0730) 895296/895273

(TRADE ENQS WELCOME)

PL70

ACCESSORIES

BLANK COMPUTER CASSETTES

	10s	50s	100s	
C10s	£3.65	£14.00	£25.00	} Inc P&P C.O.D. Service Av 65p Extra
C15s	£3.85	£14.15	£26.00	
C20s	£4.00	£14.30	£27.00	

UK HOME COMPUTERS, 82 Churchward Ave. Swindon Wilts
24 Hr Phone Service 0793 695034

PL140

BANISH CRASHES due to dirty mains.
Four-way socket with spike suppression, £14.95. Quantec electronics, 87 Station Road, Ashington, Northumberland. Tel: 0670 854431.

HINTS AND POKES BROCHURE No 1 hundreds of tips on top arcade and adventure games. Send £1 to C. B. Dinneen, 15 Gordon St, Gorton, Manchester M18 8SL.

BLANK CASSETTES

C10 £3.95 for 10, £32 for 100
C15 £4.05 for 10, £33 for 100 inc. p+p
FULLY GUARANTEED
Also, professional quality metal spool tapes. Send cheque/PO to:

G.R.P., 369 Mile End Road,
London E3 4QS. Tel: 01-980 1186
ACCESS & VISA ORDERS BY PHONE PL49

BARGAIN DISKS - 5 1/4" INTRODUCTORY OFFER

	10	50	100
SS/DD	£15.50	£ 72	£133
DS/D	£19.50	£ 92	£178
SS/DD	£20.50	£ 97	£188
DS/DD	£24.50	£117	£223

All inc. prices. No extra cost.
Fully guaranteed.

ABACOM COMPUTER SUPPLIES
225, WALTON ROAD, WOKING, SURREY GU21 5EF
PL156

AMSTRAD

AMSTRAD ASSEMBLER

COMPLETE WITH: DISASSEMBLER AND FULL SCREEN EDITOR
(By the author of Beebug's 'EXMON')

OUTSTANDING FEATURES INCLUDE:

- * FREELY MIXED BASIC/MACHINE CODE - used with editor for ideal debugging
- * PROFESSIONAL 80-COLUMN DISPLAY
- * COLOURS IN 40-COLUMN MODE
- * NESTED CONDITIONAL ASSEMBLY
- * UNRESTRICTED LABEL NAMES - EVEN MNEMONICS CAN BE USED
- * FULL FEATURE, MENU-DRIVEN SCREEN EDITOR. Commands available include: Move cursor character/line/page. Insert mode on/off. Forward/backwards delete. Insert/delete line. Move/copy/delete block. Set tabs. String search and replace. Print text/block. Load/save all or part of text. Catalogue of files.
- * DISASSEMBLE OR HEX DUMP ANY PART OF RAM OR ANY ROM ON SCREEN OR PRINTER
- * EXPRESSION EVALUATION, plus a directory of commands - directives second to none

COMPETITIVE PRICE

£13.50 (inc. p+p)

ARNOLD LTD (Dept P)

P.O. Box 619

London SE25 6JL

—TRADE ENQUIRIES WELCOME—

PL66

AMSTRAD SUPPLIES CO

Send now for full details of Amstrad Software and Products.

Amco PO Box 19
Whitstable, Kent CT8 1TJ PL139

CAMEL/AMSTRAD CPC464

GRASP. The Graph and Function plotter for business, student projects, and hobbies. Hardcopy to MX80 (Epson) or compatible. £8.50.

TOOLBOX. the programmer's utility that is revolutionising use of the Amstrad. Screen Drawing, Sprite creation, Cassette file back-up, and M/C monitor all on one tape. Still at only £4.95!

FLEXIFRIEND. Simply the better home budgeting program. £7.50.
Prices inc p+p Cheques/POs to:

CAMEL MICROS

Wellpark, Willes Ave, Exeter EX2 8BE
Tel: 0392 211892 PL148

AMSTRAD SUPPLIES CO

Send now for full details of Amstrad Software and Products.

Amco PO Box 19
Whitstable, Kent CT8 1TJ PL139

THIS SPACE FOR SALE

£18

TELEPHONE:
PCW CLASSIFIED
01-437 4343 Ext 206 HA1

FOR HIRE

BUSINESS & COMPUTER SERVICES are also computer consultants specialising in small (and very small) businesses. Write or phone us at 294a Caledonian Road, London N1 1BA. Tel: 01-607 0157

TO HIRE a computer from Spectrum 48K upwards, please phone or write to: Business & Computer Services, 294a Caledonian Road, London N1 1BA. Tel: 01-607 0157 or 01-997 8457.

UTILITIES

PLUS 64

The Commodore 64 Companion

A suite of superb software/hardware which places the C64 far beyond its rivals - even the Plus 4. Unique **UPGRADE** package included:

TOOL-KIT gives these extra essential programming tools found on more expensive computers. New Basic KEYWORDS, uses NO basic memory.

SOUND/GRAPHICS KIT releases the full potential of hi-res graphics/music/sound/graphics manipulation and more. KEYWORDS, uses NO basic memory.

COMBINED-KIT NEW commands include: old, trace, find, renumber (shift), block delete, defined memory save, print at, auto-line, merge, auto-run, disks, restore to line, copy screens, inverse, on, border, paper, etc. many key repeat, beep, plot, lines, tones, circle, line, chord, sprite, volume, filter wave and many more.

MCARTRIDGE CODE-KIT gives the tools for beginner and expert which lets you LEARN about, EXPERIMENT with, and programme in mode. Contains assembler, 2 monitors, disassembler, super intelligent memory transfer AND PROGRAMME PROTECTION. Hardware/software that removes crashed programmes and also stops programmes for modification etc.

SOUND-KIT On screen manipulation of the functions of the advanced sound synthesiser. Create your own sound effects with ease.

SPRITE-KIT Create Hi-Res/Multicolour Sprites quickly and simply. Save them to machine code OR automatically convert to data statements for inserting into your own programmes.

ANIMATION mode lets you create animated characters easily. JUST A BRIEF description of this user friendly, integrated package which is THE indispensable accessory. ONLY £14.95 (cash) £17.95 (hbk). (Overseas orders add £1 p.p.)

REKORDAKIT

Commodore 64/Commodore 16/Plus 4

NEAR your Datassette Performing. Keep it in top condition. Simple to use plug-in device which reproduces audio output and a TEST/INFORMATION TAPE to ensure tape heads are correctly set. ONLY £7.95 (your computer). Cheque/PO to:

ASH BYPRODUCTS

PO Box 570, Carlisle Avenue, BIRMINGHAM B17 9EB PL157

FOR ZX SPECTRUM

A complete suite of new routines
NEW menu-driven, autorun program includes integrated routines to: LOAD, Print Catalog, ERASE files or Print Filespace on cartridges. Intelligent batch FORMAT routine. Batch Autocopy of master program. Expert Microdrive Troubleshooter.
NEW Microdrive routines to MERGE with Masterfile and Tasword Two. Memo, Action Masterfile formats free with cartridge version.

INCREDIBLE VALUE for only: Cartridge £8.95, Cassette £5.95, incl. VAT and P&P within UK.

MONITOR Ltd. 526, Watford Way, London NW7. Tel: 01-906 0911 PL141

AMSTRAD TAPE UTILITY

Convert all your slow loading software up to four times faster. Easy to use, choice of 4 speeds, removes protection, works with all known software, very reliable.
Only £4.95 + free header reader

SIREN SOFTWARE

76 Bridge Street,
Manchester M3 2RJ PL147

USE BTX 5000 on Bulletin boards! "Specnet" program £5.95. "Spectrum" for any hardware RS232 board, £5.95 (both full facilities, down/up load, microdrive/tape, send control chr\$). Stephen Adams, 1 Leswin Road, London N16 7NL. Tel: 01-254 1869.

ATARI. Looking for those hard to find utilities? I have them. SAE for details: Stock, 15 Woodbrooke Road, Birmingham B30 1KE.

KWIKLOAD

For the 48K Spectrum

This amazing utility package allows Spectrum cassette programs to load 3 times the normal speed.

★ Sabre Wulf loads in 125 seconds ★★

★ Mugsy loads in 135 seconds ★★

The new 16 page manual explains how to convert most commercial software - £4.95 inc. or send SAE for further details.

FORAITS SOFTWARE

32 Gladstone Road, Hockley
Essex SS5 4BT
Foraits Software normally traded as Data View PL122

SERVICES

TO ADVERTISE YOUR SERVICES IN THIS SECTION CALL; P.C.W. CLASSIFIED ON 01-437 4343.

MICRO-SERU

The home computer repair specialist in Scotland
BBC, SPECTRUM, VIC 20 AND ALL PERIPHERALS. 3 MONTH WARRANTY ON ALL REPAIRS.

UNIT 4, Denny Workspace,
Denny, Scotland FK6 6DW.
Tel: Denny (0324) 823468 PL38

SINCLAIR SERVICE CENTRE

We have the spares for all repairs to:
Spectrum, ZX81, ZX ram pack.
Spectrum £10.00 plus parts
ZX81 £7.50 plus parts
ZX ram pack £7.50 plus parts
All units repaired to original standard using genuine Sinclair spares by our H.N.C. Qualified staff. Also, available Spectrum Memory update 16K-48K fitted by us, first class post and packing.
S.A.E. enquiries to:-

QUANTUM

33 City Arcade, Coventry CV1 5HX
or phone Coventry (0203) 24632 PL61

BBC SPECTRUM REPAIRS

* Spectrum repairs £18.50 inc. parts insurance and p.p.
* BBC B repairs £18.50 + parts, insurance and p.p.
Send your computer with cheque or P.O. for £18.50 and description of fault to:

SUREDATA (PCW)

Computer Service
45 Wychwood Avenue, Edgeware,
Middx.
Tel: 01-951 0124 PL53

SPECTRUM REPAIRS GUARANTEED SIX MONTHS

Expertly repaired and thoroughly overhauled by professional computer engineers using only top grade components. Manufacturers recommended modifications are fitted and all units are fully guaranteed for six months, £20.00 All inclusive.

MP ELECTRONICS

The Laurels,
Wendling, Dereham, Norfolk.
Tel: 0362 87327 PL47

SPECTRUM REPAIRS

We expertly repair Spectrums for £17 inclusive of parts, labour and return postage. Spectrums upgraded to 48K for £34 including post.

R. A. ELECTRONICS

50 Kimberley Road, Lowestoft, Suffolk.
Tel: (0502) 66289 PL45

CHILTERN COMPUTER CENTRE REPAIR SERVICE

Spectrum £18 + £1.60 P&P
CBM 64/Vic 20 £20 + Parts & Postage
BBC £20 + Parts & Postage
We give 3 months' warranty on replaced parts.

SPECTRUMS UPGRADED FOR £30

SAVE 50% ON THE REPAIRS TO YOUR COMPUTER WHEN YOU JOIN OUR REPAIR CLUB. WRITE OR TELEPHONE NOW FOR DETAILS.

Send your computer with details of fault and cheque or P.O. to:

CHILTERN COMPUTER CENTRE
76B Dallow Road
Luton, Beds LU1 1LY
Tel: 0582 455684

OVERSEAS ENQUIRIES WELCOME PL129

INSURE YOUR COMPUTER against costly repair bills and theft prices from only £12.60.

S.A.E. for details to:

BLACK COUNTRY COMPUTING
9 FIELD CLOSE, PELSALL WALSALL,
W. MIDLANDS WS4 1DX PL156

SPECTRUM REPAIRS by fully qualified electronic engineers £12 including p&p, insurance etc, fast and reliable service. Basiga electronics, 4 cherrywood, Chadderton, Oldham. Tel: 061-652 2165.

Computer Repair Centre

Have you got problems with your computer? Then call us for:

Commodore, BBC, Spectrum, Dragon

Mail order or call in

Enfield Communications
135 High Street, Ponders End, Middx
Tel: 01-805 7772 PL143

T.V. SERVICES OF CAMBRIDGE LTD REPAIRS - SPECTRUM ZX81

Fast reliable repairs by experienced engineers, having serviced Sinclair computers since the introduction of the ZX80. Our price is inclusive of all parts, labour, postage and VAT irrespective of fault. No hidden charges.
Spectrum £18.75, ZX81 £11.50, 16K Ram £9.95.
*While-you-wait service available.

Call or send with Cheque or P.O. to:
TV SERVICES OF CAMBRIDGE LTD.
French's Road, Cambridge CB4 3NP
Tel: 0223 311371 PL111

SINCLAIR COMPUTER REPAIRS

SPECTRUM £17.50
ZX PRINTER £18.50

Inc. parts, p.p. and return insurance. Spectrums upgraded to 48K for £28. At present we cannot upgrade issue one. We like to take care of your computer - please pack carefully - and send with cheque or P.O. to:
I.T. (WESTERN) ELECTRONICS
97 Newtown, Trowbridge,
Wilt BA14 0BB.
Tel: 02214 64074 PL54

HEMEL COMPUTER CENTRE LTD.

For fast reliable repair service, send your 16/48K Spectrum computer to us.
We will repair and return for £20 + £1.60 p&p.
Also BBC, Commodore, Atari and Dragon service.

Hemel Computer Centre Ltd.
52 High Street,
Hemel Hempstead,
Herts HP1 3AF.
Tel: 0442 212436 PL60

COMPUTER REPAIRS IN SOUTHEND

SPECTRUM, BBC, ELECTRON,
CBM 64, VIC 20

MINNIE MICRO ELECTRONICS
12 Eastern Esplanade, Southend

Tel: 0702 62033/615809
Open 7 days a Week PL119

Faulty Spectrum Ramco-Mecina

a We will repair your Spectrum correctly
b Test your Spectrum for 24 hours
c Find any other hidden faults and repair these free of charge

Send unit with cheque/PO for £18.75 to:
Ramco-Mecina, Dept S, 34 Murray Street,
Salford 7, Manchester M7 9DU
(NO CALLERS AT PREMISES)
Tel: 061 792 2260 PL120

COMMODORE REPAIRS by Commodore approved engineers. Vic 20 Modulators £6.50, Vic 20 from £14.50, CBM64 etc. for more details write or tell: G. C. Bunce & Son, 36B Burlington road, Burnham, Bucks SL1 7BQ. Tel: 06286 61696.

AMSTRAD SUPPLIES CO

Send now for full details of Amstrad Software and Products.

Ameco PO Box 19
Whitstable, Kent CT5 1TJ PL139

FAST SPECTRUM and BBC REPAIRS

AVERAGE £15

MANCOMP LTD.



FIRST CO.
IN ALL U.K. TO
INTRODUCE WHILE-U-
WAIT SERVICE. NOW
FIRST TO OFFER AN
INTERNATIONAL
REPAIR SERVICE.

- MOST SPECTRUMS REPAIRED IN 45 MINS.
- PLEASE PHONE FOR APPOINTMENT FIRST.
- OR PHONE/SEND SPECTRUM FOR FREE ESTIMATES. ENC £1.80 (U.K. I.O.M. EIRE. C.I.) £6.50 (EUROPE/SCANDANAVIA)
- NO HIDDEN HANDLING CHARGES.
- 24 HR TURNAROUND.
- EVERY MICRO INSURED FOR RETURN JOURNEY.
- OPEN TILL 7 P.M. MON-SAT.

"I have come across a firm that will be more than willing to advise you as to how to remedy your problem. They are called MANCOMP, and as well as repairing faulty Spectrums, are also quite willing to discuss your problems with you, and offer reasonably cheap, and (more importantly) correct cures"

PHIL ROGERS 'PEEK & POKE'
"POPULAR COMPUTING WEEKLY"
JAN 1985. (VOL IV NO 1)

Deutscher Express-Dienst

Auf Bitten unserer deutschen Kunden bieten wir jetzt einen Reparatur-Eildienst zum Festpreis von £35.00 (einschl. Porto und Verpackung).

Sie senden Ihren SPECTRUM und £35.00 per Euroscheck (ohne Netzstromgerät oder Kabel).

Stecken Sie Ihren Brief in einen Umschlag aussen am Paket.

Wir bessern Ihren SPECTRUM am gleichen Tag aus, an dem wir ihn erhalten.

Sie sollten Ihren SPECTRUM innerhalb von 6 Tagen zurückerhalten.

Für dringende Reparaturen berechnen wir Ihnen einen Zuschlag von £8.00 zur Rücklieferung innerhalb 48 Stunden, überall in der Bundesrepublik.

Für Bildungstätigkeiten und Schulen gelten Sonderpreise.

Wir suchen Techniker für unsere geplante deutsche Niederlassung, die wir ausbilden und bitten um Zuschriften von Interessenten.

MANCOMP LTD. (DEPT PCW)
PRINTWORKS LANE,
MANCHESTER M19 3JP
061-224 1888

FAST COMPUTER REPAIRS

VIDEO VAULT INTERNATIONAL 10★ REPAIR SERVICE

Spectrums repaired for £19.95 inc. Parts, Insurance and P & P No Hidden Extras. BBC, Commodore 64, Vic 20, Atari. Quoted for.

Are you fed up with waiting weeks for your Home Computer to be repaired!!! Why not try the Experts, we offer a full repair service on any Home Computer. All repairs carry a full 3 months guarantee, plus on every Spectrum repaired we send you a free game worth £5.95 for your enjoyment and pleasure.

- ★ While you wait Service by Professional Computer Engineers.
- ★ 3 Months written guarantee on all repairs.
- ★ International repair company.
- ★ All computers sent by mail order turned around in 24 hrs.
- ★ Most Spectrums repaired within 45 minutes.
- ★ All Micros insured for return journey.
- ★ Open 7 days a week.
- ★ School repairs undertaken-discounts available.
- ★ Free software with each Spectrum repaired worth £5.95.
- ★ Over 8 years experience working with computers.

ONLY GENUINE SINCLAIR PARTS USED.
Phone today for your free estimate or send your computer to us with £1.75 (UK EIRE I.O.M. C.I.) or £6.50 (Europe/Scandinavia) we will contact you the same day by phone or 1st class Mail should you require quotation first.

TRADE ENQUIRIES MOST WELCOME. ACCESS WELCOMED
VIDEO VAULT INTERNATIONAL LTD (DEPT R2) THE LOGICAL CHOICE

Video Vault

Telephone: Glossop (STD 04574) 66555.
140 High St. West, Glossop, Derbyshire, England.

FREE GAME WORTH
£5.95 WITH
EACH SPECTRUM
REPAIR

QL SOFTWARE

DataManagement QL software - leading the way

SMUTL - (C10) - Possibly the last word in Basic programming utilities. Constant readout of: Line No & Statement/Data Line & Statement/ Dynamic Basic Size. Full SuperBasic speed control via the Basic Editor. 4 formats for all Screens and tapes. No more wondering where things go wrong. This tells you exactly where you are at all times.

MBACKUP - (C10) - An independent, fast & reliable backup system. Mv or Disk. File additions, overwrites and file sizes fully displayed.

TERMINAL - (C12.50) - A superb full featured terminal package. Full protocol control and ability to recall previous sessions. Job control, clock and alarm modules, together with Piping for mv and printer. Full mv and disk control without exiting copy, delete or save to files. Monitor version only.

CHARGEN - (C10) - A very comprehensive character generating package. Includes extra functions for SuperBasic to control your creations. Fonts can be saved to disk or mv for recall and use. No copyright restriction on the subsequent publication using these features.

SBEXTRAS - (C5) - Many extra features and procedures to add to SuperBasic. Includes full job control, dynamic file access with byte or variable GET/PUT, LENGTH, REMAINDER, QUOTIENT, HEX, DEC and many more.

FM - (C12.50) - A full feature file management package. If you need to do it to a file, this will do it for you. Supports disks/mv, wildcard and formatted printing to help your library control.

All the above are 100% m-language, multi-tasking and will run independently under DOS. Prices shown include VAT & p&p, but add £1.90 per order for a mv cartridge.

Cheques or POs to:
DataManagement, 12 Larch Way, Hestry, York YO3 8JU
or telephone 0954 790351 anytime for our latest list, which is
growing daily.
Have you written any good QL software. We are looking for the best
software and are prepared to pay the best royalties.
Coming soon:
FED - a full feature file editor; DeAssem (if you don't know what it is -
you won't need any! Next list - to keep those printers beautiful and
many, many more. Write or phone for your list - NOW. PL118

3 QL GAMES - £4.95

SHOOT-EM UP, LANDER, MOON LANDER,
68000 ASSEMBLER - £12.95, TERMINAL
EMULATOR - £15.00, CHEQUES/POs to:
Q CODE
42 SWINBURNE ROAD, ABINGDON, OXON
OX14 2HD PL159
TEL: 0235 280559 anytime

COURSES

Required: COMPUTER INSTRUCTORS

Instructors required to teach on: BBC,
COMMODORE 64 machines, teaching to
small groups of children.
Residential and non-residential centres in
England, Scotland and Wales.
Easier and Summer vacations, 16th-23rd
Feb. 1985, in Wales.

CAMP BEAUMONT

9 West Street, Godmanchester
Huntingdon, Cambs PE18 8HG
Tel: 0480 56123 (24 hrs) PL127

LEARN TO USE COMPUTERS AT: COMPUTER WORKSHOP

Details: 01-778 9080 PL112

DUPLICATION

HIGH-SPEED CASSETTE DUPLICATION

- * Full-colour laminated inlay cards
- * Cassette labels
- * Artwork
- * Blank cassettes

A comprehensive range of professional
services at probably the lowest prices in
the U.K.
High-speed loading of programs at up to
10 times the normal speed available for
some computers at no extra charge.
Write or telephone for full details.

LOGICOPY

GOLDSTAR HOUSE
198/200 QUEENSWOOD DRIVE,
LEEDS LS6 3ND
Tel for details: 0532 788758
PL145

DATA DUPLICATION and BLANK CASSETTES M.G. COPIES

Burnwood, Walsall, West Midlands
Tel: 0543 480887 or 0543 875375 (24 hrs)
PL130

Dear Reader, my name is Simon Stable. I
specialise in real-time data-duplication for
most cassette based micros. Disc copying for
BBC 40/80 (protection available). Dot-matrix
printed labels blanks. Blank Cassettes.

FAST TURAROUND 0869 252831 COMPETITIVE PRICES
P.L. FREEPOST, 48 WESTEND, LAUNTON, OXON OX8 812PL37

"DATATAPES" for highest quality
blanks and data duplication, call now for
a sample quote. You'll find us very
competitive. The Midland Railway Grain
Warehouse, No. 2 Derby Street, Burton
Upon Trent, Staffs. Tel: 0283 38199.

WANTED



is seeking authors for new titles to add
to its highly original and successful
book range. Experienced and first time
authors are invited to submit manu-
script, ideas or fields of interest.
Full details of what we can offer from
David Lawrence, Book Editor, Sun-
shine, 12-13 Little Newport Street, London
WC2R 3LD.
Sunshine Publishers of Popular Com-
puting and Dragon User. PL31

PROGRAMMERS

SOFTWARE REQUIRED FOR AMSTRAD, C16, ENTERPRISE & QL

Games, educational programs, utilities
and business software packages will be
evaluated for international marketing and
distribution by one of the UK's most estab-
lished software houses.

Send to: Richard Holmes,
Silversoft, London House,
271-273 King Street,
Hammersmith, London W6
or telephone for further
information on 01-748 4125.
PL149

MAKE YOUR PROGRAMS MAKE MONEY!

If you have a game, utility
or application to sell, with a view
to publishing (particularly
CBM64 or BBC B) phone
JOHN COOK ON:
01-437 4343 PL40

!! PROGRAMMERS !!

Programs urgently required, cash ad-
vances paid. We pay all production and
advertising costs. For instant attention
without obligations, send copy and in-
structions or write for further details.

Independent Software, Goldstar House,
198-200 Queenswood Drive, Leeds LS6
3ND. PL52

OXFORD DIGITAL ENTERPRISES

requires two freelance pro-
grammers, one to work on the
CBM64, the other on the Ap-
ple II C/E. Excellent program-
ming skills are essential and
will attract the highest rates.
Contact:

0865 69913

or

PO Box 191 Oxford

PL161

SPECTRUM PROGRAMMERS - earn ex-
tra income! we require quality business/
utility software for our new catalogue.
Send tapes or SAE for details to SD
Micro-Systems, PO Box 24 Hitchin,
Herts.

FOR SALE

BBC second processor 6502 64K, DFNS.
Hi-Basic chips, manual and leads, un-
wanted present, bargain, £130. Wanted
Acorn DFS kit. Tel: 0222 615595 (Cardiff)
BARGAIN 5 1/4" diskettes. Used but guar-
anteed reliable, 10 for £28, or 100 for
£60, good as new, £1 each. Tel: Woking
71563 (Surrey).

AMSTRAD supercharger load utility. Su-
percharger will convert all your soft-
ware to up to 4000 Baud. Choice of four
speeds. 100% successful, includes
header reader. Only £5.50 including p&p
to: G&L Software, 60 Pondmoor Road,
Bracknell, Berkshire.

HARDWARE

OKI MICROLINE PRINTERS, Dyneer
Daisywheels and monitors, 3M discs.
unbeatable prices. SAE lists. Quantec
Electronics, 87, Station Road,
Ashington, Northumberland. Tel: 0670
854431.

MAGAZINES



DRAGON USER

To make the most of your Dragon you
need **Dragon User** - the independent
magazine for Dragon owners. To make
sure that you receive a copy of Dragon
User regularly subscribe direct to us. A
year's subscription costs £10 for 12 issues
(overseas rates available on application).
Send a cheque or postal order made
payable to Dragon User, and accompa-
nied by your name and address, to Dragon
User, Subscription Department, Oakfield
House, Perrymount Road, Haywards
Heath, Sussex RH16 3DH. PL32

AMSTRAD SUPPLIES CO.

Send now for full details of Amstrad Software and
Products.
Amaco PO Box 19
Whitstable, Kent CT5 1TJ PL139

Computer Swap 01-437 4343

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

Ataris for Sale

ATARI 600XL + keyboard, cassette re-
corder, joystick, leads + manual.
Games. VGC, £150, 1 year old. Tel:
Caterham 45921.

ATARI 822 PRINTER, some 400/800 s/w,
CBM joystick + 2 CBM cassettes. Tel:
01-837 7783.

ATARI 400 (48K) basic, joysticks, man-
uals, sell for £70 also Analog mag Sept
1984 issue (£2.50). Tel: David 01-948
6654 (eves) only.

ATARI 600XL with tape deck and joys-
ticks, many tapes, mostly arcade, +
four cartridges. Still under guarantee.
Cost over £400 sell for £150 ono. Tel:
Abson 2346 after 6pm (Bristol).

ATARI 800XL, 1010 recorder, Quickshot
joystick, 'Your Atari Computer' book &
manuals. All one month old. Perfect
condition, unwanted present. £100. Tel:
Earl Shilton 45358 (Leicester area).

ATARI VIDEO COMPUTER SYSTEM
complete with paddles, joysticks, power
supply etc. Six cartridges and extra
Spectravideo joystick. Tel: 061 430 2118.
ATARI ROMS, DISCS AND CASSETTES
for sale or will exchange for Spectrum.
Also Atari 822 printer £75 ono for bar-
gains. Tel: 021-747 3618 (B'ham) ask for
Nigel.

SALE Atari 600XL, £60, Apple III, Disc
drive, £85. Wanted QL Assembler, TI
Logo 2, Atari Logo, QL Pascal. For sale
QL McGraw Assembler, Apple II soft-
ware. Tel: 021-742 1969.

ZORK I ATARI disk, hardly used, still in
original packings. Unwanted Christmas
present. Worth £30, bargain at £10. Also
for sale Atari VCS cartridges £5 each.
Tel: 01-794 1744.

ATARI VCS FOR SALE. Good condition
with paddles and joysticks with nine
games. Donkey Kong, space invaders
etc. Will sell separately only, £100, bar-
gain. Games about £6 each. Tel: 01-590
5041.

For Sale

TRS-80 Model 1 48K, disc drive, lower
case, hi-res, mods, monitor, custom
desk, smaldos, ajedit, zen, pascal,
games, all documentation, circuit dia-
grams, textbooks, £500. Star dot matrix
printer. £100. Tel: Harlow 28218.

MEMOTECH MTX512 for quick sale £150
ono. Tel: 01-807 5427.

TRS 80 Tandy, dual disk 48K £1000 S/W
inc LDOS s/script, Visicalc profile III s/
ledger, p/ledger, payroll, business
graphics advance graphics assembler.
£900. Tel: 0346 32683.

AMSTRAD CPC 64, with colour monitor.
Boxed as new. Still under g/tee and s/
ware books and mags. £295 ono. Ascot
24200.

48K Oric Atmos, boxed vgc £60 or s/w
£40 mags and leads ono £100 offers. Tel:
Dursley 47852.

ALPHACOM 32 printer under guarantee
£40 ono. Compatible tape recorder £8.
130 mags £10 and s/w inc. Tinegate. Tel:
Chelmsford (0245) 380731.

16-BIT Powertran cortex mark I with
RS232 for sale excellent condition £190
ono Tel: South Ockendon (0708) 854745.

INTERFACE one, microdrive £65,
Currah speech £15, ZX printer £18,
games worth £120 sell for £60. Tel: 0507
604628 after 5.30pm (Peter) 23 Elm
Drive, Louth, Lincs LN11 0DG.

CURRAH speech, tape and booklet plus
kong very good condition £25. Tel: S.
Smith, 20 Craighenhill Road, Kilncadzow,
Carlisle, Lanarkshire, Scotland ML8
4QT. No charge for postall

INTERFACE one and six microdrive car-
tridges used only one unwanted Xmas
gift £80. Also ZX printer and paper 25.
Tel: Dornoch (0862) 610546.

PORTABLE b/w television (monitor) 6
months old £25. Tel: 01-771 3488.

AMSTRAD CPC464 system, modulator,
books, joystick, cover, clubs, basic tutor
etc. Cost £400 and £500 software. Buy-
ing a C5 so £399 bags the lot. Local
enquiries welcome. Tel: 041-649 0037
after 6pm (Glasgow area).

Acorn for Sale

BBC B 1.2 o/s Prism 1000 modem +
ROM for Micronet + Prestel, various s/
w £275. Tel: John 0622 679513.

BBC B + disc filing system, single sided
80 track disc drive, joystick, all excellent
condition. games inc Elite + Plantoid,
d/cover, disc storage box. £499 o.n.o. Tel:
Tel: 041 334 8681 after 6pm.

BBC B excellent condition, still boxed,
joystick, original s/w. £210 o.n.o. Tel:
Deeside 815 028 Ciywd.

BBC B o/s 1.2 + Acorn DFS + 200K
Teac drive + joystick + cassette,
leads, £150 s/w inc Elite music system
+ blank discs. £520 o.n.o. Tel: 061 336
0987 eves.

ACORN ELECTRON + tape recorder,
£60 original s/w, complete with leads
etc. £170 o.n.o. Tel: 0742 585 377.

ACORN ELECTRON + Plus I interface, Acorn data recorder, Acorn joystick + s/w, magazines + books. £300. Tel: 01-902 5036.

BBC + data recorder, dust cover + lots of games. £340 o.n.o. Tel: Theydon 2935.

ACORN ELECTRON, first byte, joystick interface, data recorder, 12 games inc. Elite + magazines. £140 or swap for 1050 Atari disc drive. Tel: 01-791 0136 after 8pm.

ACORN ELECTRON with Plus I joystick and £80 s/w in original packaging, retail £340. Bargain at £190. Tel: 05827 61572.

BBC MODEL B with Acorn joysticks, lots of games software and computer magazines. £295. Tel: Chelmsford 0245 50432.

ACORN ELECTRON v.g.c inc. £40 original s/w. £130. Tel: 0777 871522.

ELECTRON + tape deck + many games + three books + joystick + first byte interface. £200. Peter. Tel: 0642 551049 after 4pm.

BBC B 1-20s + joystick and many games. One year old, mint condition, £300, no offers. Tel: 0506/842709 week-ends only.

SPARE ACORN DFS kit for sale, fitted. First come, first served. Also repairs welcome. Tel 01-521 0077.

ACORN ELECTRON FOR SALE, £100. Tel Tunbridge Wells 39606 between 8.30am and 5pm Mon to Fri, ask for Wendy Hunter.

BBC MODEL A, 32k Ram advanced user guide, £30 worth of software, £290 ono. RS232 teletype, offers. Casiotone MT70, electronic keyboard, £125 ono. Tel: Wisbech (0945) 61546.

SWAP Acorn Electron, leads, manuals and £100 of software for Commodore 64 and software, 25 Oxwich Road, Mochdre, Colwyn Bay, Cwyd.

ACORN ELECTRON + £100 s/w, offers £150. Write: C. Wilkes, 14 Stadium Close, Holbrooks, Coventry.

BBC 1 YEAR OLD + disc drive + DFS Computer Bag, discs, tape recorder, original s/w, inc Elite mags and manuals. £495. Tel: 0633 896263.

ACORN ELECTRON + tape recorder + £100 s/w, £130 ono. Tel: Sheffield (0742) 585377.

BBC B 1.2 O/S, Data recorder, wordwise, Beeb Calc, Books, s/w, £280 offers. Tel: Aldershot 27252 (day), Yatley 878825 (eves).

BBC COMPUTER games, originals only £3.50 or swap; cassette or disc. Printmaster Rom (Utilises printer capabilities fully) only £18.00 ono. Plus many others. Tel: 0246 823464 before 6pm (Mr Blake).

BBC Model B 1.2 o/s + tape recorder, leads, joysticks. Micro user mags, 1-22. C/W white Knight Mark II, Football Manager, and many more. Superb condition, £305. Tel tottington 6969 (Lancs area).

BBC SOFTWARE Zalaga Mr EE1 Son of Bagger, Jet Pac, Missile Base, Space Fighter, Star Striker, Galaxy Wars, £4 each. Wanted Ram/Rom board. Tel 0829 51076 after 5pm.

Spectrums for Sale

SPECTRUM SOFTWARE. Great Space Race, Automania, Pyramic, Lords of Midnight, Sabre Wulf, Espionage Island, Crusin, Swordfight at Midnight. All for £40, will separate. Tel Basildon 0268 21465 after 6pm.

ORIGINAL SOFTWARE for Spectrum: Knight Lore, Decathlon, Return to Eden, All, as new, for £14 or split. Also ten rolls ZX printer paper for £7. Tel: 01-467 2136.

SPECTRUM 48K + tape recorder + Interface 2 + joystick + software worth at least £300. Many recent titles. Swap for Atari 800XL and disc drive or sell for £220 ono. Tel: 01-680 1304.

SPECTRUM 48K + tape recorder. Software including Dark Star, Android 2, £90. Tel Littlehampton 713763.

48K SPECTRUM, printer, live original cassettes, cassette recorder, books, blank tapes, all leads, manuals etc. Mint condition, ideal for starters, £110 ono. Write to: Chris Hall 51, Clevely Park, Belfast.

SPECTRUM 48K inc FOS keyboard + 16 games + Currah Speed Unit, microdrive + spare cartridge. Interface I programmable j/sticks, I/F Q/shot j/stick II, data recorder, lightpen unit, books. £265. Tel: 01-771 34488 (after 8).

48K SPECTRUM, some books + software, Jetset Willy, Vahalla, etc. Excellent condition. Will consider any offer. Buyer collects. Tel: 0425 57409 (after 4pm).

48K SPECTRUM with database, Kempston joystick interface Quickshot I joystick. 6 months guarantee. Worth £175, sell £115. Split goods. Tel: Ansoosh 01-998 8117 after 5pm.

ZX SPECTRUM 48K, books on machine code etc. Lots of games also member of National Software Library. Tel: 061-430 2118.

48K SPECTRUM excellent condition plus many original games and books valued at £150 sell for £110 o.n.o. Also computer compatible cassette recorder. Excellent condition sell for £20. Phone 0268 45739.

48K SPECTRUM 13 months old and over £190 of software. Sell for £100. Phone 459 4621. Original games only.

48K SPECTRUM, Interface one, microdrive, printer, £120 of software, Currah Speech, Kempston joystick interface. Sell for £250. Tel: 0507 604628 after 5.30pm (Peter), 23 Elm Drive, Louth, Lincs.

SPECTRUM 48K Kempston j/stick interface, 62 games inc. Wunderwulde, K/Lore, Pitfall II, Match Day, G/Busters, Gift From The Gods, manuals. Excellent condition. £130 o.n.o. Tel: Thanet 21870. Swap for excellent condition CBM64.

SPECTRUM 48K issue III Alphacom 32 Printer, £130 o.n.o. Will split and some games. Amers. 02403 4735.

SPECTRUM 48K Saga keyboard interface, microdrive cartridge, Fuller master unit, joysticks interface, printer rolls.

£500. Books, software, extras, £230 o.n.o. Phone Langport 250580.

48K SPECTRUM + F.D.S. keyboard + Fuller master unit + Kempston joystick interface + £250 latest software + mags. Total worth £500. Sell for £210. Tel: 0742 556659 after 4pm.

SPECTRUM 48K, over £60 of software, still boxed, perfect condition. £80. Tel: Grantham 64809.

SPECTRUM SOFTWARE, Space Raiders, Mined-Out, Push Off, £2.00 each. Spectron, Ughl, Cyclone, Lerm Programs, 007 Spy, Kempston, Pogo, Masterfile Ver 9, Frenzy, Combat Lynx, £3.00 each. Buyer pays postage. Originals. 0734 697095.

SPECTRUM SOFTWARE, all originals including Brian Bloodaxe, Underwulde, Knight Lore, Tir-Na-Nog, Boulder Dash, Sherlock, Gift From The Gods, Starstrike, Skooldaze, Booty. Tel: 021-459 5505 after 5pm.

48K SPECTRUM £75. Microdrive + interface I, 2 cartridges £50. Lightpen £15. Kempston interface £8. Sound amplifier £5. Carrycase £8. 103 St Lukes Road, Southend-on-Sea, Essex SS2 4AE.

LARGE selection Spectrum books less than half price. Tel: 07605 402.

Commodores for Sale

CBM64 as new with box. 11 months warranty to go. £165 o.n.o. Gerard, 12 Warbeck Road, Shepherds Bush, London W12 8NT. Tel: 01-743 7809.

CBM64 SOFTWARE. The Quill £9. Space Shuttle (Activision) £6. Sheep in Space £4. High Noon £4. Suicide Express £4. DT Decathlon £4. Tel: Andrew on Frinton (02566) 2451.

COMMODORE SOFTWARE to swap or sell all originals, all half-price. Tel Grimsby 74584 and ask for Martin. All tape.

CBM64 s/w for sale. Many titles (originals) inc. U.S. Games eg. Popeye to B. Bail, 160 Kiln Lane, St Helen's, Merseyside WA10 4RB.

CBM64 with C2N cassette rec. + j/stick, + £70 s/w. Sell £150. Tel: Basildon 25412 (after 6.30).

CBM64 + original s/w for sale/swap inc. Simon's Basic, Pascal, + games. Tel: 01-570 2045.

BREAKING 'PET' (COMMODORE) COMPUTER for spares. Most parts still available. Tel: 0244 675717 for details (evenings or weekends).

16K VIC 20 SOFTWARE, League soccer, 747 Pilot, 3D, Time Trek, Skyhawk, Golf, Time Machine, Strategic Advance, Laser Zone, Jetpac, £2.50 each or £16 the Lot. Tel 061 483 3910.

VIC 20 + C2N, joystick, mags, £100 s/w. Intro to Basic I. Sell £150. Tel: 01-478 6782.

VIC-20 SALE, including hardware, software, books, magazines etc. All at very reasonable prices. Send a SAE for a large list to Vic sale, 16 Gleeson Drive, Orpington, Kent BR6 9LJ.

VIC-20 with cassette recorder. 16k Switchable Ram pack, Quick shot 2 joystick. Intro to Basic I, games, mags, £116. Tel 0702 540452.

CBM 64, disc drive. Cassette player, mags, Quickshot II, assembly course, machine code books, 5 Infocom adventure, plus software worth £500 on disc and cassette. Will swap for Apple IIE or sell. Cash either way. Tel 031 669 5203 after 8.30pm.

VIC-20 + C2N, three tapes, two intro books, £70. Tel 01-459 0302.

CBM 64 original software, Hobbit, £5, Valhalla £5, Ghostbusters 25, Flight Path 737 £4, Colossus Chess £5, DFM Database £10. Write to: L. J. Woodford, 16 Well-Spring Terrace, Pontymister, Gwent, NP1 6BE. Also 1 pair paddles £5 (Commodore) new.

CBM 64 + C2N tape recorder + Quickshot interface joystick, s/w, mags. Offers over £200. Tel: 0738 84494.

CBM 1520 4 colour printer plotter, new, unused. £50; or offers. Tel: Aldershot 27252 (day), Yatley 878825 (even.).

VIC 20 16k, expansion pack £12. VIC 20 PCB (working) £25. Amateur T.V. converter £20. Tel: Romford 46948.

CMB 64 s/w, Simon's Basic, Easyscript etc. T199/4A computer + s/w + speech synthesiser. Intellevision videogame. Casio MT70 keyboard. Tel: 01-570 2045.

BARGAIN VIC 20 F/S 9 games, cassette recorder. Only £85. Tel Asshin after 5pm 01-840 2356.

CBM 64 plus C2N recorder, carrying case. Hardly used as new. 1984 gift worth £250. Sell for £200. Tel: 01-499 4795 office hours.

CBM 64 games for sale. Over £350's worth. Sell separately plus £60 for 1541 disk drive. Write to Graeme McNicolli, 11 Westerton Avenue, Broughty Ferry, Dundee, or phone 0382 730751.

VIC 20 C2N tape 16 switchable introduction to Basic Part I, Quickshot Deluxe, s/w, mags, green Philips monitor. £200. Tel: Stanford-le-Hope 644491.

CBM 64 software: F/Forest, S/Pipeline, Caesar/C, Kong, M/Buggy, Hunchback, Mr Wimpy, Attack Mutant Camels, Revenge Mutant/C, H/Bover, D/Diamonds, Gridtrap, C/Balloon, Siren/C, Galazions, M/Dick, Aquaplane, Z2E S/Lander, Seawolf, Lazarian, paddles, Z3E. Phone: 593 6579.

CBM PET 8032 with RAM-based utilities and Commodore 2031 disc drive, £425 ono. Tel: Swindon 850470.



COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP or telephone 01-437 4343.

All software offered through computer swap must be in original condition and for private sale only.

It cannot be swapped.
Warning: It is illegal to advertise pirated software.

COMPUTER SWAP

Please write your copy in capital letters on the lines below.

Name

Address

Telephone

- Vic 20**
- (1) Perils of Willy (Software Projects)
 - (5) Flight 015 (Craig Communications)
 - (-) Max (Anirog)
 - (2) Duck Shoot (Master Tronic)
 - (3) Snooker (Visions)
 - (8) Tank Commander (Thorn EMI)
 - (6) Sub Commander (Thorn EMI)
 - (10) Mickey the Brick (Firebird)
 - (-) Krazy Kong (Interceptor)
 - (7) Jet Pac (Ultimate)
- (Compiled by Websters Software)

- Commodore 64**
- (1) Ghostbusters (Activision)
 - (3) Booty (Firebird)
 - (-) Monopoly (Leisure Genius)
 - (2) D. T. Decathlon (Ocean)
 - (8) Kong Strikes Back (Ocean)
 - (-) Scrabble (Leisure Genius)
 - (7) Hunchback II (Ocean)
 - (8) Fighter Pilot (Digital Integration)
 - (9) Raid over Moscow (US Gold)
 - (5) Chiller (Mastertronic)
- (Compiled by Websters Software)

- Spectrum**
- (-) Booty (Firebird)
 - (2) Match Day (Ocean)
 - (1) Ghostbusters (Activision)
 - (-) Cyclone (Vortex)
 - (3) D. T. Decathlon (Ocean)
 - (8) Kong Strikes Back (Ocean)
 - (7) Snooker (S. Davies) (CDS)
 - (6) Gift from the Gods (Ocean)
 - (-) Football Manager (Addictive)
 - (-) Blockbusters (Macsen)
- (Compiled by Websters Software)

- Dragon 32**
- (2) Manic Miner (Software Projects)
 - (4) Dragon Chess (Oasis)
 - (1) Hunchback (Ocean)
 - (3) Chuckie Egg (A&F)
 - (8) Mr Dig (Microdeal)
 - (6) Mystery of Java Star (Shards)
 - (-) 'O' level Maths (Microdeal)
 - (5) Cuthbert in Space (Microdeal)
 - (-) Advanced Basic Tutor (Ampal Soft)
 - (-) Buzzard Bait (Microdeal)
- (Compiled by Websters Software)

- BBC B**
- (1) Scrabble (Leisure Genius)
 - (-) Football Manager (Addictive)
 - (-) Manic Miner (Software Projects)
 - (10) Frak (Aardvark)
 - (9) Jet Pac (Ultimate)
 - (5) Mr EE (Micropower)
 - (-) Mini Office (Database)
 - (4) Pole Position (Atari)
 - (-) Horse Lord (Century)
 - (3) Sim (Visions)
- (Compiled by Websters Software)

- Atari**
- (2) Zaxxon (Centresoft)
 - (4) Attack of Mutant Camels (Llamasoft)
 - (4) Solo Flight (Centresoft)
 - (6) O'Reillys Mine (Centresoft)
 - (3) Encounter (Hi-Tech)
 - (9) Diamonds (E/Soft)
 - (5) Gridrunner (Llamasoft)
 - (8) Space Invaders (Atari)
 - (10) Sleepy Jack (English)
 - (-) Krazy Copter (English)
- (Compiled by Websters Software)

- Amstrad**
- (-) Grand Prix Driver (Ansoft)
 - (1) Flight Path 737 (Anirog)
 - (2) Snooker (S. Davies) (CDS)
 - (7) Hunchback (Ocean)
 - (6) Manic Miner (Software Projects)
 - (4) Ghoul (Micropower)
 - (9) Forest at Worlds End (Interceptor)
 - (8) Code Name Matt (Ansoft)
 - (3) Football Manager (Addictive)
 - (8) Monster Chase (Romik)
 - (-) Admiral Graff Spey (Ansoft)
- (Compiled by Websters Software)

Event	Dates	Venue	Admission	Organisers
Brixham Computer Club Show	Mar 2	Northcliffe Hotel North Furzeham Rd Brixham Devon	50p adults 30p children	Brixham Computer Club 080 45 59224
Second 6809 Colour Show	Mar 30-31 10.00am-6.00pm	Royal Horticultural Hall Westminster, London SW1	£2.50 adults £1.50 children	Computer Marketplace 01-930 1612
Northern Computer Show	April 16-18 10.00am-6.00pm	Belle Vue Manchester	Free in advance from organisers	Reed Exhibitions 01-643 8040
Apple 85	May 9-10 10.00am-6.00pm May 11 10.00am-4.00pm	Novotel London W6	Free in advance from organisers	Database Publications 061-456 8383
Electron & BBC Micro User Show	May 9-11 10.00am-6.00pm May 12 10.00am-4.00pm	New Horticultural Halls London SW1	£3.00 adults £2.00 children	Database Publications 061-456 8383

Readers' Chart No 12

- | | | |
|----|--|-------------------|
| 1 | (2) Knight Lore (<i>Spectrum</i>) | Ultimate |
| 2 | (1) Ghostbusters (<i>Spectrum/C64</i>) | Activision |
| 3 | (8) Underwulde (<i>Spectrum</i>) | Ultimate |
| 4 | (3) Manic Miner
(<i>Spectrum/C64/Amstrad/MSX/Dragon</i>) | Software Projects |
| 5 | (9) Football Manager (<i>Spectrum/C64/BBC/Electron/Oric/Atmos/Dragon/Vic20/ZX81</i>) | Addictive Games |
| 6 | (-) Elite (<i>BBC/Electron</i>) | Acornsoft |
| 7 | (7) Daley Thompson's Decathlon (<i>Spectrum/C64</i>) | Ocean |
| 8 | (-) Hunchback II (<i>Spectrum/C64</i>) | Ocean |
| 9 | (5) Pyjamarama (<i>Spectrum/C64/Amstrad</i>) | Mikro-Gen |
| 10 | (-) Match Day (<i>Spectrum/C64</i>) | Ocean |

Now voting on week 14 – £25 to win

Each week *Popular* is compiling its own special software top ten chart – compiled by YOU.

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever – but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's chart, published above.

You can still vote in the chart without making up a slogan – but you won't be in with a chance of winning the prize.

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to: Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

Voting for Week 14 closes at 2pm on Wednesday February 27 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.

Name	My top 3: Voting Week 14
Address	1.....
.....	2.....
.....	3.....
My phrase is:	

New Releases

REVISION

One of the very few items of software in the educational field to be universally acclaimed were the Penguin Shakespeare Study software programs. Now the range has additional titles, *Julius Caesar* and *Romeo and Juliet*.

Put simply what the packages do is provide a near instantaneous way of cross-referencing on the texts. For example, choosing Romeo as the starting point the computer would then point out significant themes in the text relating to Romeo and suggest cross themes which would develop ideas about and around the character.

Whilst the programming is well error trapped and efficient, the really creative part comes in the way the references are chosen and interwoven. The whole idea is necessarily selective, but that only reflects the nature of 'O' levels which are themselves heavily categorised and fixed in their range.

If you are studying 'O' level English what you have in the Penguin range is a series of programs that might be genu-

inely useful - unlike almost every other piece of software intended for education I've ever come across.

Program *Romeo and Juliet*
Price £7.95
Micro Spectrum
Supplier Penguin
Harmondsworth
Middlesex

EXPENSIVE

You may well have seen, in the months prior to Christmas, a number of ads for the Tatung Einstein micro - a strange machine with around 80K memory and a built in 3" floppy disc drive. Although it was reviewed quite favourably in *Popular*, quite honestly it has largely been forgotten since.

Well, the machine, which Tatung claims has sold around 20,000 which is not disastrous, has finally got some games software. However, the big problem with Tatung software is that like many machines the first offerings are hardly pushing the machine to its limits but they cost well over £10 a time being on disc (at least I assume that's the explanation).

I picked out *Chuckie Egg* since it is a highly regarded game, has been issued on many machines, and thus would be somewhat representative of what Tatung Einstein games would be like.

For the two people who don't know, *Chuckie Egg* is a platform and ladders game where a little egg collector leaps about, up ladders and along platforms to collect eggs. Get the lot and on you go to the next, more difficult, screen.

So, to the Einstein version. It faithfully recreates the game in every detail and graphically I'd say it falls somewhere between the Spectrum and the Commodore, ie, the sprites don't flicker and change colour but they seem a little more finely drawn than the usual Commodore efforts. The sound is very nice, the built-in speaker is pretty powerful and the volume and punchiness definitely add something.

The end result is at least as good as the Spectrum version and represents not a bad start for the machine but then you discover it costs £12.95! This tends to transform one's opinion somewhat - I realise having everything disc-based is most of the problem, but at a time when Tatung are still trying to get proper software backing for the machine, it won't do. My suggestion would be to put two games of this quality on one disc and keep the price the same.

Program *Chuckie Egg*
Price £12.95
Micro Einstein
Supplier Tatung
Stafford Park 10
Telford
Shropshire

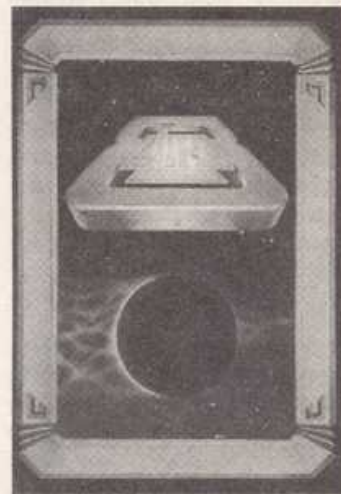
CLOCKWORK

Rumours about *Alien 8* abounded since before Christmas when the first ads appeared; 'more mega than *Knight Lore*' was the hushed claim. It's here and it's certainly amazing but, perhaps not surprisingly but still a little disappointingly, *Alien 8* is a redesigned *Knight Lore*.

It's all here; the brilliant 3D graphics, the disappearing

stairways, the crumbling blocks, things to pick up which might help you jump various obstacles and the two-tone colours.

The setting is a space ship and you play a little robot that has to wander around replac-

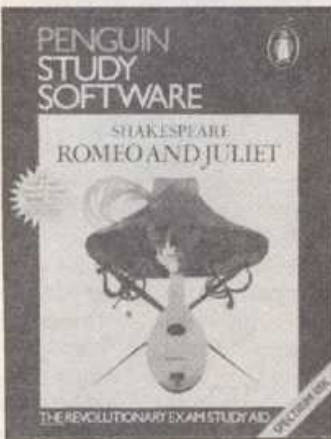


ing thermolex valves and activating armies of cryogenically suspended figures. The ship must be fully activated before you reach landfall, indicated by a timer.

Although solving the 3D puzzles to get through the rooms is possibly even more difficult than usual, so far I haven't found much by way of other life forms - only some clockwork mice that are animated so brilliantly they move just like... well... clockwork mice.

So it's *Knight Lore* again with a few extras, better graphic design and it'll sell massively. I guess given the inventive genius of *Knight Lore*, they can do it again.

Program *Alien 8*
Price £9.95
Micro Spectrum
Supplier Ultimate



This Week

Program	Type	Micro	Price	Supplier	Program	Type	Micro	Price	Supplier
Angellique	Ad	Amstrad	£6.50	Nemesis	3Dtime Trek	Arc	C16	£6.95	Anirog
Defend or Die	Arc	Amstrad	£7.95	Alligata	Flight Path 737	Arc	C16	£6.95	Anirog
Battle for Midway	S	Amstrad	£9.95	PSS	Hypercircuit	Arc	C16	£6.95	Anirog
Interdictor Pilot	S	Amstrad	£17.95	Supersoft	Skramble	Arc	C16	£6.95	Anirog
Stockmarket	S	Amstrad	£7.95	Amsoft	Star Commander	Arc	C16	£6.95	Anirog
Music Composer	Ut	Amstrad	£9.95	Kuma	Xargon Wars	Arc	C16	£6.99	Gremlin Graphic
Soldier of Fortune	Arc	Atari	£7.95	English	Zodiac	Arc	C16	£6.95	Anirog
Colossus Chess	S	Atari	£9.95	English	Berks	Arc	C16/Plus 4	£6.95	CRL
Arabian Nights	Arc	BBC	£6.99	Interceptor	Castle of Jasoom	Ad	Commodore 64	£12.95	Commodore 64
Laser Attack	Arc	BBC	£5.00	Viking Software	Dungeons of Ba	Ad	Commodore 64	£12.95	Quicksilver
Orpheus	Arc	BBC	£6.90	A + F	Gryphon	Arc	Commodore 64	£7.95	Quicksilver
Whist	S	BBC	£6.45	Dotsoft	Parky + Yellow Sub	Arc	Commodore 64	£6.95	Cheetah Soft
					Pastfinder	Arc	Commodore 64	£9.95	Activision

New Releases

SCREEN TWO

More from US Gold, although this particular piece of gold looks a bit tarnished to me. *Congo Bongo* is a two screen game which is a mixture of *Donkey Kong*, *Qbert* and on the second screen, a 3D version of *Frogger*.

The program has a jungle/safari theme, with a little man who must be guided around dodging monkeys, coconuts, rivers etc. Screen one has the little man jumping from plateau to plateau watching for falling coconuts and monkeys and trying to reach the top-most level.

If he makes it, the game screen changes to a river in which are swimming, various jungle animals on whose backs the little man must jump to reach the other side. Fish snap, lilies shrink, rhinos rage, the graphics are all good and I was thoroughly bored by it.

Program *Congo Bongo*
Price £9.95
Micro Commodore 64



Supplier US Gold
Unit 10
The Parkway
Industrial Centre
Birmingham

GO WEST

Go is a Japanese game of strategy that is a national sport in the home country and has many devoted followers here. Like many of the classic games, Go is essentially simple but can be played to an astonishing level of skill and complexity.

Microgo 1 was first implemented on the BBC after winning a competition to find the best computer Go player. A version is now available for the Commodore 64.

Quite apart from the skill of the computer player and the quality of the graphics this program has a virtue which many other game implementations lack - it'll show you how to play the game properly. A beginners mode allows you to play a game with running commentary on the current state of play and on screen annotations of the dangerous areas - the key element of Go is one of territory capture and the program will reveal vulnerable board positions.

All in all if you like Go then you'll simply have to buy the program. If you've never heard of it, but enjoy computerised board games, buy it anyway on the off chance.

Program *Microgo 1*
Price £9.95
Micro Commodore 64
Supplier Edge Computers,
3 Junction Road,
Reading,
Berks RG1 5SA.

Pick of
the week

CUT AND THRUST



One of the most inventive and humorous arcade games ever must be *Spy vs Spy* for the Commodore 64. It is also one of the very few spin-offs that really captures some of the flavour of the original - in this case the famous Mad cartoons featuring two spys - one black, one white - whose viciousness, ruthlessness and total devotion to each other's destruction reveals them to be brothers under the skin (well, hat and coat actually).

The screen is divided into two sections, each giving an edge-on, 3D perspective view of the room currently occupied by each spy. As the spy moves so the room changes. In each room are hidden objects which each spy requires such as Briefcase, Passport, etc, and these must be found and collected - finding them all enables an escape to be made.

However, the really amazing part of the game is the way each spy can lay a number of traps for the other; bombs, trip wires, lethal buckets of water, etc. These are positioned using the joystick. The knack then becomes to watch what the other spy is doing so that you know where his traps are laid and

can disarm them. It is worth remembering where your own traps are placed lest you commit Hari-Kari. This turns the game into a kind of manic strategy game.

Whilst you can play against the computer quite satisfactorily, the best comes with a human opponent as you both try to outwit one another - a laugh a minute.

Program *Spy vs Spy*
Price £9.95
Micro Commodore
Supplier Beyond
Farndon Road
Market
Harborough
Leics LE16 9NR

FLOWER SHOW

Macmillan, whose educational software released with Sinclair has been, in the past, one of the few bright spots in an incredibly dull educational software horizon, has re-

leased six new programs.

Previous Macmillan software has taken the bold step of providing material for the 12+ age range - it was very successful indeed. With programs like *Glider*, educational material was provided for a more sophisticated age range

This Week

Here + There Mr Men	Ed	Commodore 64	£7.95	Mirrorsoft	Snapple Hopper	Ed	Spectrum	£5.95	Macmillan
Hi Bouncer	Ed	Commodore 64	£6.95	Mirrorsoft	Space Scan	Ed	Spectrum	£5.95	Macmillan
Star Seeker	Ed	Commodore 64	£6.95	Mirrorsoft	Sunflower Number				
Word Games Mr Men	Ed	Commodore 64	£7.95	Mirrorsoft	Show	Ed	Spectrum	£5.95	Macmillan
Murder on the Zind	S	Commodore 64	£11.95	Ariolasoft	Tops and Tails	Ed	Spectrum	£5.95	Macmillan
Screaming Abdabs	Arc	Dragon	£6.90	A + F	Turntaking	Ed	Spectrum	£5.95	Learning Proces
Snowman	Arc	MSX	£7.95	Quicksilva	Psychodelia	Ut	Spectrum	£6.00	Llamosoft
Deep Sea	Arc	Spectrum	£3.00	Falcon	Spectrum Graph				
Alpha Beth	Ed	Spectrum	£9.90	A + F	Machine	Ut	Spectrum	£13.95	McGraw Hill
Castles and Clowns	Ed	Spectrum	£5.95	Macmillan					
Julius Caesar	Ed	Spectrum	£7.95	Penguin					
Quiztimer	Ed	Spectrum	£5.95	Macmillan					
Romeo and Juliet	Ed	Spectrum	£7.95	Penguin					

Key: Ad - adventure. S - strategy-simulation
Arc - arcade. Ut - Utility
Ed - education.

that was actually useful.

Most other companies had concentrated on earlier age ranges and had made a hash of this. The new Macmillan software is for the earlier age ranges and it's interesting to see how the company has tackled this area.

The *Sunflower Number Show* uses, like most other educational software, the dubious drill and routine method of firing question after question and noting right and wrong answers graphically. The questions are all on maths and the theme is one of making plants grow, ie, right answers add another leaf, wrong ones bring a nasty looking weevil or poison ivy that bit closer.

However, this program has a major virtue over others which are superficially similar - it is beautifully and expertly programmed. The idea that educational software

effects, eg, when you successfully 'grow' a flower it blooms pleasingly and a little bird flies across the screen and lands on the words "well done" chirping enthusiastically. The animation of the bird is excellent; even the beak moves and it is this kind of detail that is going to make a child want to continue with the program.

The above, coupled with the fact that there are many different variations on the theme of plants growing, makes this program light years ahead of most other, apparently similar, offerings. What's true of this program appears to be true of all the other programs in the series and no fraudulent beefed-up price because it's 'serious' either.

Other educational software companies take note.

Program *The Sunflower Number Show*
Price £5.95
Micro Spectrum
Supplier Macmillan
 4 Little Essex Street
 London WC2R 3LF

THINGIES

Activision, still flushed with the success of *Ghostbusters*, is shortly to issue a new Commodore title, *Pastfinder*, which, whilst unlikely to reach *Ghostbusters*' level of fame, is nevertheless an excellent program.

While it's a fairly straight arcade game, in that you need lots of quick reaction to dodge things, hit things, collect things, there are a number of features that lift it well beyond the run of the mill.



The viewpoint is one I have rarely seen before. You look down on the action but from slightly behind the scenes. The plot involves moving your well, spaceship it's not, so so let's call it a thingy and have done with it, through a strange landscape - a map option gives you some idea of where you are and where else you can go. There are objects to be collected, places to refuel your thingy and, if you're lucky extra thingies to be found.

I won't describe the whole plot, but it has a lot to do with ancient civilisations and radiation.

Pastfinder is well worth buying, but while any other company would be putting this out for £7.95 or even £6.95, the Activision price is £9.95. It is too much and detracts from a highly recommendable game.

Program *Pastfinder*
Price £9.95
Micro Commodore 64
Supplier Activision
 15 Harley House
 Marylebone Road
 London NW1 5HE

MINTER MAGIC

About *Psychodelia* a lot has been said already. As a program it has probably done more for the sales of early Pink Floyd records than LSD, OZ or Afghan coats ever did. Described by Jeff Minter as a Light Synthesizer (and that is as good a term as any) basically you get to create amazing flowing geometrical bursts of colour on your computer using the joystick.

The news that a version of the program was going to become available on the Spectrum was greeted by me with trepidation; yukky blotches of sickly colours where attributes clashed wildly, smears of ugly hues mingling like tomato ketchup and egg yoke in a sickly mess.

But no! It doesn't happen! Except for the reduced number of colours, the Spectrum version of *Psychodelia* is in no way inferior to the Commodore version and so can be recommended to space cadets everywhere.

Program *Psychodelia*
Price £6.00
Micro Spectrum
Supplier Llamasoft
 49 Mount Pleasant
 Tadley
 Hants

Compiled by Graham Taylor

New Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

SUNFLOWER

SHOW

288 Spectrum 48K
 Macmillan Software

requires as deft a programming touch as the latest megagame is an important one.

The *Sunflower Number Show* uses smooth scrolling and sprites for its graphic

This Week

A + F, Unit 8 Canal Side Indust Estat, Woodbine St East, Rochdale, Lancs LL16 5LB. 0706 341111. **Activision**, 15 Harley House, Marylebone Road, London NW1. 01-486 7588. **Alligata**, 1 Orange Street, Sheffield S1 4DW. 0742 755796. **Amsoft**, Brentwood House, 169 Kings Road, Brentwood, Essex. 0277 230222. **Anirog**, Victoria Industrial Park, Victoria Road, Dartford, Kent DA1 5AJ. 0322 92513. **Ariolasoft**, Retail CRL, CRL House, 9 Kings Yard, Carpenter's Road, London E15 2HD. 01-533 2918. **Cheetah Soft**, 24 Ray Street, London EC1R 3DJ. 01-833 4909. **Dotsoft**, PO Box 48, Hitchin, Herts SG4 0XQ. **English**, Box 43, Manchester M60 3AD. 061 835 1358. **Falcon**, C/O Dept 1-8 Wittering Walk, Hornchurch, Essex RM12 6NS. **Gremlin Graphic**, Alpha House, 10 Carver Street, Sheffield S1 4FS. 0742 753423. **Interceptor**, Interceptor Micro's, Lindon House, The Green, Tadley Hampshire. 07356 71145. **Kuma**, Kuma Computers, 12 Horseshoe Park,

Pangbourne RG8 7JW. 07357 4335. **Learning Process**, 38 Homedale House, 3 Brunswick Road, Sutton SM1 4DG. **Llamasoft**, 49 Mount Pleasant, Tadley, Hants. 073 564478. **Macmillan**, Macmillan Information Systems, 4 Little Essex Street, London WC2R 3LF. 01-836 6633. **McGraw Hill**, McGraw Hill Book Company, Maidenhead, Berks. **Mirrorsoft**, Mirror Group, Holborn Circus, London EC1P 1DQ. 01-353 0246. **Nemesis**, 10 Carlow Road, Ringstead, Kettering, Northants NN14 4DW. **PSS**, 452 Stoney Stanton Road, Coventry CV6 5DG. 0203 667556. **Penguin**, 536 King's Road, London SW10 0BR. 01-759 1984. **Quicksilver**, Palmerston Park House, 13 Palmerston Road, Southampton, Hampshire SO1 1LL. 0703 20169. **Supersoft**, Winchester House, Canning Road, Wealdstone, Harrow, Middlesex HA3 7SJ. 01-861 1166. **Viking Software**, 58 Central Avenue, Syston, Leicester LE7 8EE.



Immense power

What next, after the silicon chip? The laser computer? Two things limit the power of conventional computers – the maximum size of components (on chip transistors principally) that can be built and, secondly, how fast the chips can be made to work.

Silicon components still have a long way to go before reaching their limit of size and speed, but nothing can be done to alter their inherent slowness. This is a result of the finite speed of which electrons travel through a semiconductor. A typical switching speed or an on-chip transistor is somewhere around 50 millionth of a second.

Now, however, a team of scientists at Herriot Watt university in Edinburgh – with a radical new approach – have succeeded in decreasing this operation by a factor of 20,000. Not by discovering some faster semiconductor, but by a completely new idea that could revolutionise the computer.

Ever since the valve machines of the 1950's we have tended to consider computers as intrinsically electronic devices. Why should they be? Computers consist of a large number of simple decision making elements such as *And* and *Or* gates which, up until now, have been constructed from electronic switching transistors. The Herriot Watt team, however, have created an *optical* equivalent of the transistor using super-fast laser light rather than electricity.

This 'transphaser', as it is known consists of an ultra-thin crystal whose faces have been given a mirror finish. Laser light striking the first face of the crystal is initially prevented from passing through. However, when a second, far

less powerful 'modulating' laser beam is also aimed at the face, the slightly greater power causes the crystal to change its properties and the laser light passes through virtually unhindered. It is then relatively simple to adjust the optical transistor principle to create such devices as *Or* gates directly, rather than from a group of transistors.

Micro-electronic components require extremely complicated manufacturing techniques to make them as small as they are. Optical devices, however, are little more complex to make than a common mirror and the size of each component is determined only by how accurately the laser beam can be focused.

Conventional electronic devices are dedicated to one task only (say an *And* gate). Not so optical ones, they can change their identity depending only on the relative powers of the two beams fed into them.

Finally, beams of electrons in a silicon chip travelling close to each other can interact, which means that the signals in electronic circuits must be fed along conducting, insulated wires. Laser light beams, on the other hand, do not interact however close they are.

Such a 'transphaser' offers, also, the near ideal properties for parallel processing. Not, that is, the 'gross' kind used by today's super-computers, where fairly large chunks of a problem are allocated to individual processors. Instead 'true' parallel processing could be possible, where a single signal can be operated on simultaneously by many gates and where each gate can communicate with a multitude of others. Something like the way the human brain works!

Transphasors, with their super-fast speed and parallel processing possibilities, offer the promise – albeit some way in the future – of computers with immense power.

However, the devices are still in their experimental phase of development. Not least amongst the problems is the design of a completely new computer logic and architecture...

Glen Counsell

Every alternative

Puzzle No 146

The ornamental lake at Burlingham Hall is rectangular in shape.

"The length and breadth are each an exact number of yards," explained the 14th baronet to his weekend houseguests, "as are the diagonals across the lake."

As the party was kept indoors due to particularly wet weather, it was proposed that, given the above information and the fact that the width was 144 yards, each guest should try to determine the size of the lake.

Unfortunately, there is more than one possible answer from the data given, and each guest came forward with a different possibility.

How many guests were there at Burlingham Hall if, between them, they accounted for every possible alternative.

Solution to Puzzle No 141

Thirteen deals are needed with a standard pack. If four extra cards are added then 18 deals are required.

```
10 DIM CARD(52)
20 DIM DEAL(4,13)
30 K=1
40 FOR N=1 TO 52
50 CARD(N)=N
60 NEXT N
70 C=1
80 FOR N=13 TO 1 STEP -1
90 FOR M=1 TO 4
100 DEAL(M,N)=CARD(C)
110 C=C+1
120 NEXT M
130 NEXT N
140 FOR M=1 TO 4
150 FOR N=1 TO 13
160 CARD((M-1)*13+N)=DEAL(M,N)
170 NEXT N
180 NEXT M
190 FOR F=1 TO 52
200 IF CARD(F)<>F THEN 240
210 NEXT F
220 PRINT "PACK IS RESTORED AFTER ";K;" DEALS"
230 END
240 K=K+1
250 GOTO 70
```

The program sets up two arrays – one to record the order of the cards, and the other as they are dealt out. The cards are numbered from 1 to 52 and their relative positions can be checked as their order in the pack alters. Remember that the first card dealt in the first deal will be the 13th card dealt in the second.

Winner of Puzzle 141

The winner of Puzzle 141 is Dr P S Story of Rochester, Kent who receives £10.

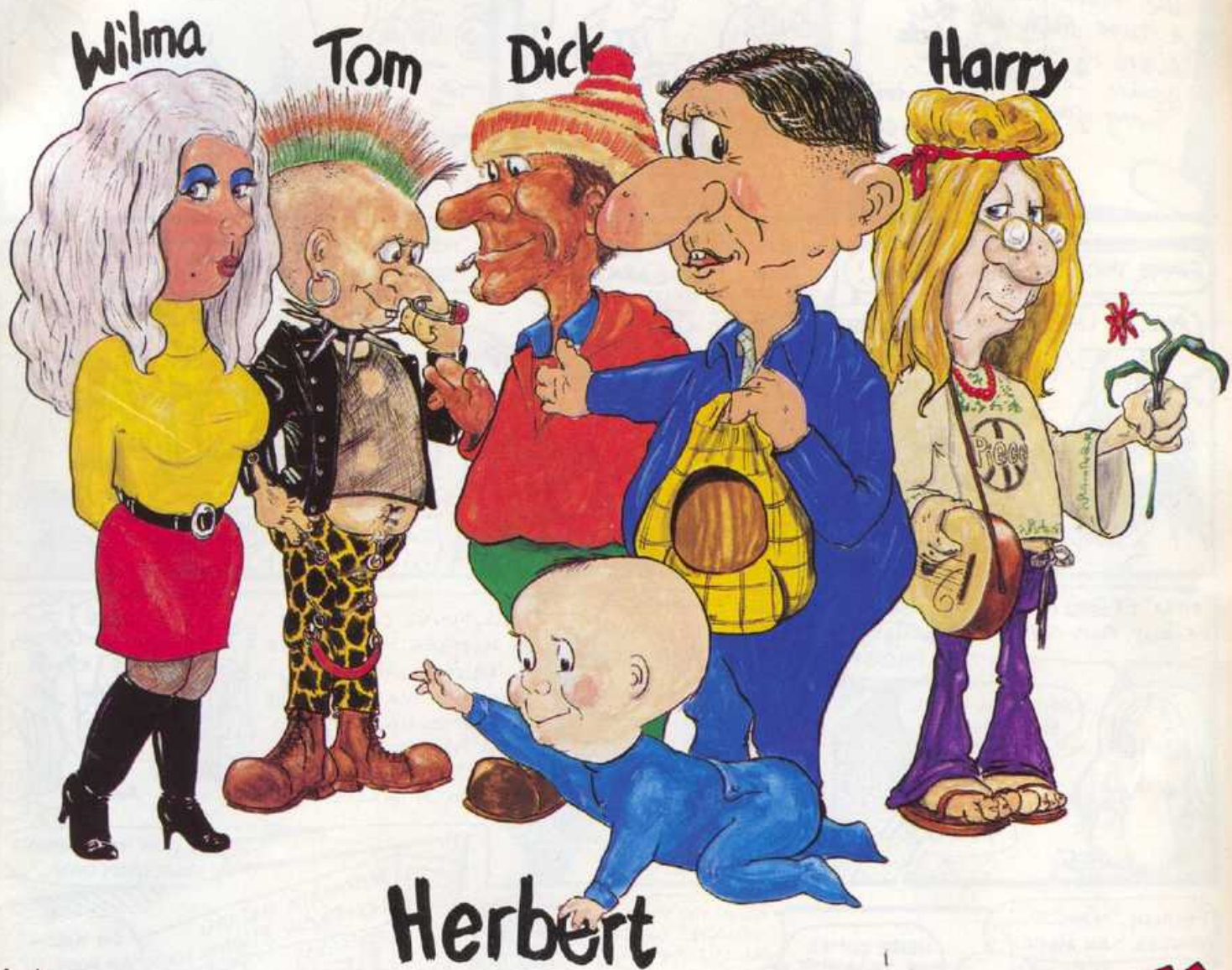
Rules

The closing date for Puzzle No 146 is March 8.

The Hackers



Meet the Gang!



“Everyone's a Wally”

1ST EVER MULTI-ROLE ARCADE ADVENTURE

Includes Hit Single on reverse “Everyone's A Wally” performed by Mike Berry

Spectrum 48K £9.95

Commodore 64 £9.95

Available shortly on Amstrad CPC 464

MIKRO-GEN

44 The Broadway, Bracknell, Berks. 0344 427317

*Lady Blair Smith
Chef Pi*

Dear Piana
We're glad you and
your pals have enjoyed
"10-Pack".
We have decided to do
a tune with all the
stars of the individule
games to promote it.
Sorry you can't come too!
Love, Mumdie.
TT TT

OH YEAH?

EVERYONE HERE?
ALL EXCEPT RASTAPIMAN.
HE'S BRINGING THE TRANSPORT

LET'S TICK OFF THE
REGISTER THEN

THESE LEGS ARE POORLY
DRAWN, BUT I'M TIRED (G-E)

ALL RIGHT. GET IN LINE.

NOW THEN. ONE: "PI-IN-ERE": BURT!

'ERE
FIRST BUG
'ERE
SECOND BUG
'ERE

GAME TWO: "CRUSOE": CRUSOE!

AYE, MY LADY! BOX OF ASSORTED
WIGGLY (UGA) SPIDERS

HERE
HERE
YEP

THREE: "DARTZ": TUBBY
O'BESE, OONCLE ARNOLD
TO REPRESENT.

YUR
AYOOP, LASS

FOUR: "NEW WHEELS, JOHN?"
SWETTIBITZ REPRESENTING

SME, LUV

FIVE: "MORRIS MEETS
THE BIKERS" ALL
HERE?

BEEP
BEEP

HERE

SIX: "PI-BALLED": THAT'S BURT
AGAIN, PLUS SID SNAKE. YESS
MISSSS

AND THE BALL
BROTHERS

BOING
BOING

SEVEN: "PI-EYED":
THAT'S YOU, PIMAN!

AND LOTS OF
GRATIS BOOZE!

Graham
Evans

WELL, YOU'VE GOT TO BE
IN NUMBER NINE, WHICH
IS "OLYMPIANIA"...AND
PRIOR TO THAT, WE HAVE
"PIROMANIA", WHICH, AS
WELL AS YOU, STARS CYRIL
THE PINK ELEPHANT AND
FIREMAN WALTER HOSE.

HOSE HERE

CYRIL AT YOUR SERVICE
YOUR LADYSHIP.

FINALLY, "YAKZEE"
YAKZEE YAK HERE?

YAH
HUMBER
SLUVANT,
KIDY
CRAIK!

HERE COMES
OUR TRANSPORT.
I THINK!

TOOT

AACH! YOU SILLY
SAUSAGE! WE CAN'T
ALL PILE ONTO A
CS!

TOOT

AUTOMATA UK LTD
"10-PACK" PROMO TOUR
HEY FOLKS!!
DEUS EX MACHINA
MAIL ORDER FOR
SPECTRUM & SINCLAIR
£10 INCL.

AH KNOW!
AH HOOK UP
DE TRELLUH!
GOOD PLASHE
FO' ADVUT
TOO, MWAN!

NEW! '10 PACK' £58's worth of Automata's 48K Spectrum software ONLY £10
'10 PACK' includes the following:- Morris Meets the Bikers, New Wheels John?, Olympimania,
Pi-Balled, Pi-Eyed, Crusoe, Piromania, Pi-in'ere, Dartz, Yakzee. All on 1 great cassette!!
'GO TO JAIL' The classic property trading game where your 48K Spectrum can play! £6
'PIMANIA' The CULT adventure for the 48K Spectrum with a £6,000 prize to be won! £10
'DEUS EX MACHINA' Commodore 64 (cassette) £10 -or- 48K Sinclair Spectrum. £10
'MORRIS MEETS THE BIKERS' NEW RELEASE FOR THE AMSTRAD CPC464! Arcade Action! £6

I enclose the right money, or debit my ACCESS/VISA Card. My Card number is Expiry Date.....

Card holder's signature Card holder's name Tel. Number.....

Card holder's address

Post Code

NO EXTRAS! All our prices include VAT and Postage & Package. 24 hr.-CREDIT CARD HOT LINE (0705) 735242.
Send your order and payment to: AUTOMATA U.K. LTD. 27 HIGHLAND ROAD, PORTSMOUTH, HANTS. PO4 9DA, ENGLAND.