

WIN THE NEW  
CPC-6128 AMSTRAD

# YOUR

Denmark	DKr.	36.00
France	Fr.	52.50
Germany	DM.	9.50
Greece	Dra.	310.00
Holland	DFI	8.30
Italy	L.	4300
New Zealand	NZ\$	3.70
Singapore	M\$	7.20
Spain	Pts	400.00
Switzerland	SFr.	7.50

£1

# COMPUTER

SEPTEMBER 1985

BRITAIN'S BIGGEST-SELLING

COMPUTER MAGAZINE

Vol. 5 No. 9

EXCLUSIVE!

AMSTRAD'S

BATTERING

RAM

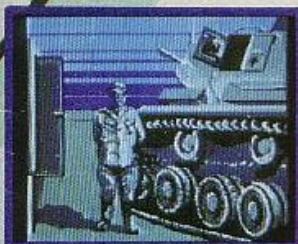
128K micro  
+ monitor  
+ disc drive  
+ CP/M = £300



Graphics - digitiser,  
pads and pens tested

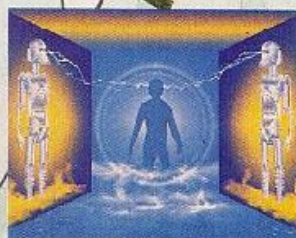
Spectrum Mad Caverns,  
Turtles and Pseudodisc

CBM-64 Snake, Macros and Rockfall



U.S. Gold's  
secrets

SCOOP!



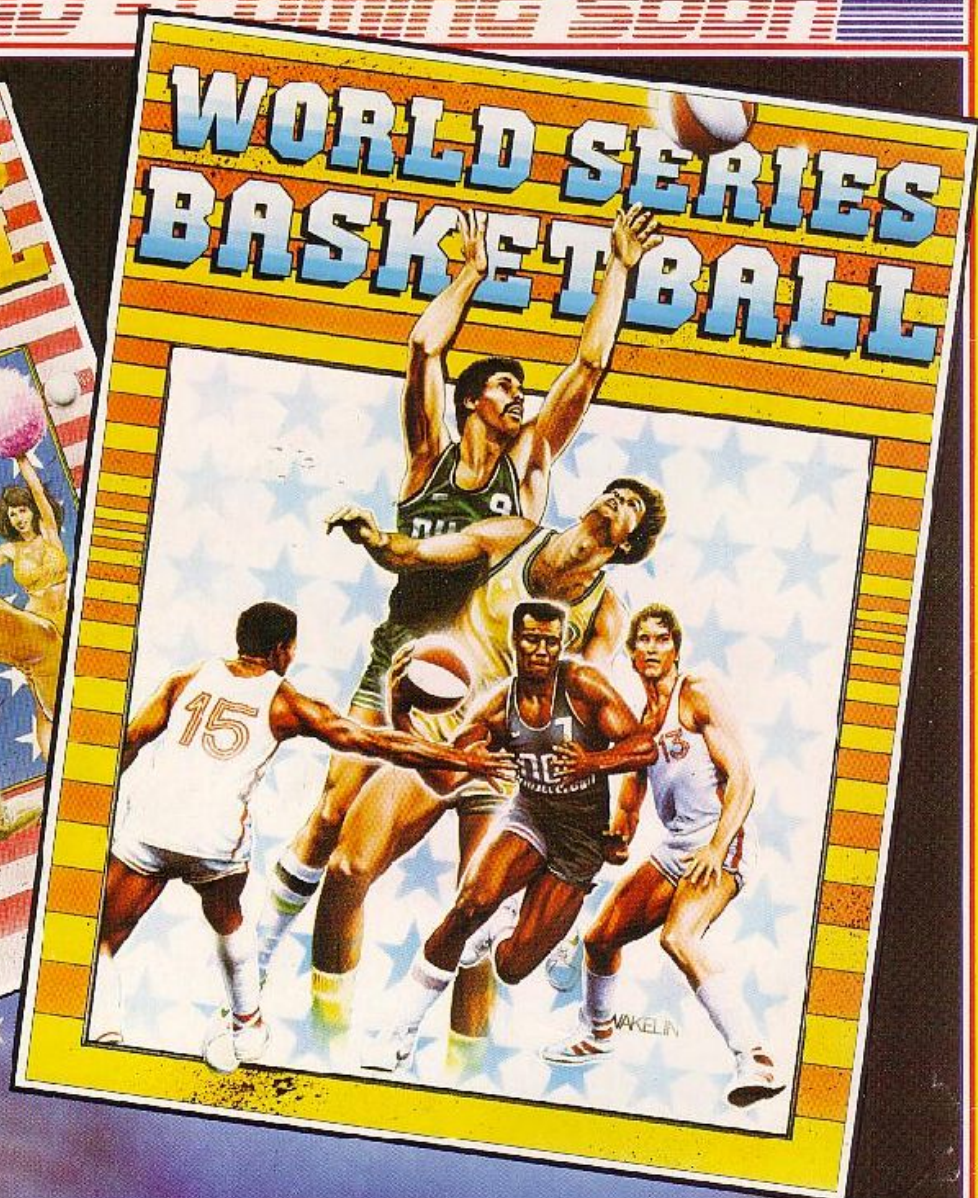
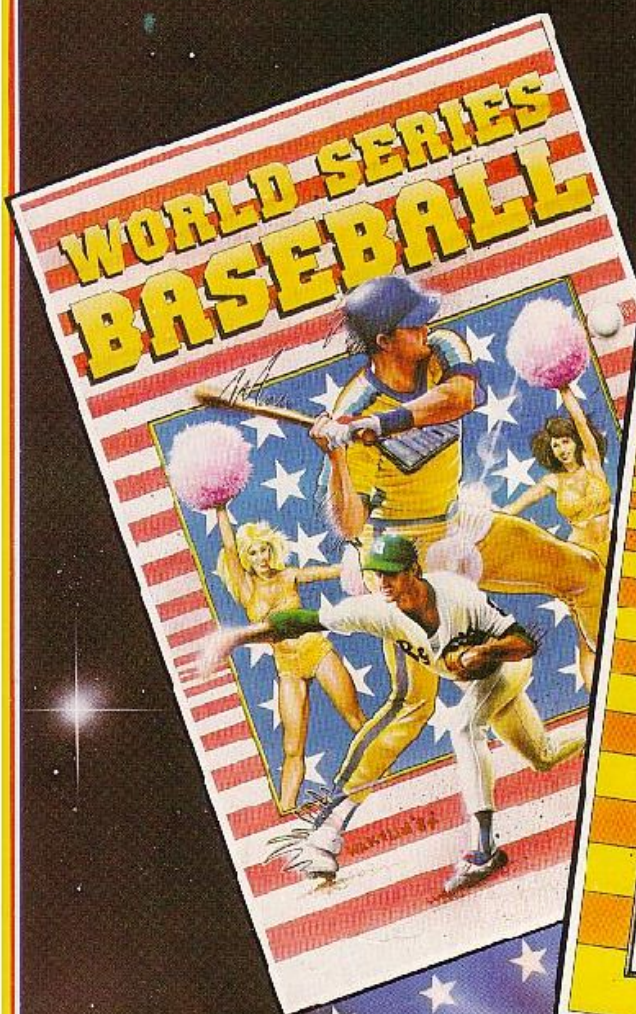
Be a  
Multi User  
Dungeon  
Wizard

WIN £800 of  
Philips monitors



24 SPECTRUM 16-95

AMSTRAD - COMING SOON



SCORE  
ANOTHER  
WORLD SERIES  
WINNER!



...the name  
of the game

Imagine Software is available from:  WHSMITH,  John Menzies, **WOOLWORTH**, LASKYS, Rumbelows, Greens,  
Spectrum Shops and all good dealers.

Imagine Software (1984) Limited • 6 Central Street • Manchester M2 5NS • Tel: 061 834 3939 • Telex: 669977

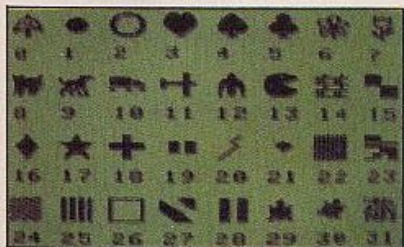


# YOUR COMPUTER *Contents*

SEPTEMBER 1985



Amstrad's battering ram: page 40.



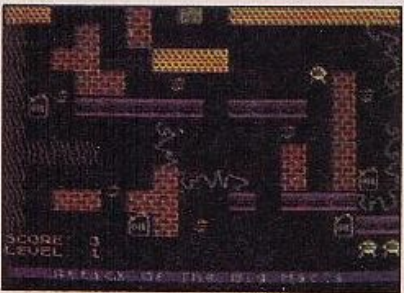
Education review: page 51.



Inside US Gold: page 56.



Philips monitor competition: page 63.



Mad Caverns: page 64.

**12 NEWS:** Eureka — Britain finds a European alternative to MSX: Commodore Amiga launch; Acorn reborn; Sinclair future; CBM-128 price £269; Pi-Man found.

**19 YOUR LETTERS:** Jumping out of For/Next loops — a professor writes; an enraged reader calls out: Kath to account; something fishy about Micronet 800?

**23 SOFTWARE SHORTLIST:** Memories of the UN police action in Korea relived in Mig Alley Ace; Frank Bruno and Rocco fight it out; Martex's stunning Highway Encounter.

**37 HARDWARE HITLIST:** Logotron sprite board for the BBC Micro; and Minor Miracle's modem featuring Databeeb communications package — all the add-ons and more.

**39 QUEST CORNER:** The classic adventure continues — Melbourne House's Mordon's Quest; roll up for the magical mystery tour with the Beale Quest.

**40 AMSTRAD'S BATTERING RAM:** Yee-hee! 128K micro plus disc plus monitor and CP/M — all this for only £300. Excited? Simon "Scoop" Beesley certainly is.

**43 AMSTRAD 6128 COMPETITION:** Win one of the new Amstrad machines exclusively reviewed in *Your Computer* this month. You saw it here first, remember.

**44 MUD — MULTI-USER DUNGEON:** Lee Paddon plunges into the modem dungeon; your chance to win a MUDpack — map, instructions — all you need to get into MUD.

**46 THE LIGHTPEN FANTASTIC** — graphics, lightpens, plotters. John Dawson scribbles away and introduces you to all the hardware you need for micro-doodling.

**51 EDUCATION — SWOTWARE AND THE PUPIL:** Smartest girl in school Josephine Adams delivers an end of term report on so-called educational software.

**56 INSIDE US GOLD:** Meirion Jones sneaks out with candid shots of Desert Fox, Winter Games, Goonies, Zorro and glimpses an Alternative Reality.

**60 SPECTRUM MIRA:** Allows you to do something you wouldn't normally be able to do — turns your Microdrive into more of a disc drive with random access.

**63 PHILIPS MONITOR:** Competition to win a £300 Philips CM-8533 as first prize to make life brighter.

**64 SPECTRUM MAD CAVERNS:** Karl Jeffery brings you another in our popular unofficial series of games that look like Boulderdash. Ten different screens.

**68 KING BURGER:** You must deal with a hostile fried egg called Freda

**72 BBC CORE WARS:** How to eat programs. Jon Cottrell.

**76 CBM-64 ROCK FALL:** Paul Hammond brings you a game in which you have to guide a little man around 10 caves, collecting diamonds, dodging rocks. A favourite.

**78 SPECTRUM TURTLES:** No more need you dream of blue turtles, Ian Collier has put flipper to keyboard and brought you a Logo graphics program for the Spectrum.

**80 CBM-64 MACRO-EDITOR:** Define simple one-line Basic routines to help in the development of a program. Geoff Hatto's blow to structured programming.

**82 AMSTRAD CPC-464 TIMEBOMB:** Another Amstrad exclusive. Arnold the Anarchist has blundered in his bomb-planting. C Turner lets you help the cause.

**84 TELSOFT:** Games on our exclusive modem service this month are: CBM-64 Snakes, Basic Macros, BBC Core Wars and King Burger and Spectrum Mad Caverns and Turtles.

**86 CBM-64 SNAKES:** Anders Gustafson unleashes nine screens of ophiuchan chaos, so lay off the rollmops and get stuck into some nice snake and egg.

**91 FIRST BYTES:** Languages, haywire programs and bluffs.

**93 RESPONSE FRAME:** Tim Harnell's postbag.

**95 SOFTWARE FILE:** Ten pages of readers' software; fun-packed programs for most home computers, including the Atari, Amstrad, Commodore, Spectrum and ZX-81.

**106 DATABASE:** Paul Bond rounds up local, national and international micro events — and supplies a list of essential phone numbers.



# DISCOVERY

## THE NEW DISC DRIVE SENSATION

At last Spectrum owners can choose a TRUE disc drive system for their computer, backed by REAL software support and available with the most comprehensive specification yet developed.

For just £199.95 Discovery offers a new level of performance and a combination of advanced features which make other fast storage systems for the Spectrum and Spectrum + look obsolete.

No wonder one leading computer magazine, Sinclair User, recommended Discovery in its latest guide to fast storage systems for the Spectrum.

Discovery has been designed to take no USER RAM from the Spectrum during the use of tape-based programs, it accepts the same commands as

'Interface I' allowing you to use many of the cassette programs designed for microdrive and we've even provided you with the firmware to use a super fast RAM DISC when you choose. Random Access Files are fully supported and formatting and back-up routines are included in ROM.

Add to all this a range of great software titles on the latest 3½" disc cartridges commissioned by Boots and you begin to see why we named it Discovery.

Discovery is available from larger branches of Boots and selected computer stores nationwide. For further details call us on 0737 65080 or post the coupon now.



THE VERY LATEST 250K JAPANESE 3½" DISC DRIVE



VIDEO MONITOR PORT



JOYSTICK INTERFACE



PERIPHERAL THROUGH CONNECTOR



**£199<sup>95</sup>**

**NO OTHER SYSTEM HAS SO MUCH TO OFFER AND ALL FOR ONLY £199.95**

Please rush me the following (ALL PRICES INCLUDE VAT & CARRIAGE)

☐ Discovery 1 unit(s) at £199.95 each

☐ Discovery 2 unit(s) at £329.95 each

I enclose a cheque for £\_\_\_\_\_ or please debit my credit card account with the amount of £\_\_\_\_\_

My Access ☐ Barclaycard ☐ (tick) no is \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Telephone \_\_\_\_\_

**Opus.**  
Opus Supplies Ltd.

To: Opus Supplies Ltd, 55 Ormside Way,  
Holmesthorpe Industrial Estate, Redhill, Surrey. 0737 65080



An *Andrew Spencer* / **elite** Joint Production

Previously available only from Commodore II K  
for the CBM64, the author Andrew Spencer and  
Elite now combine to bring you the 'spectacular'

COMING SOON

International

BASKETBALL

For SPECTRUM £5.99  
and AMSTRAD £5.99

### GAME FEATURES

- Furious non-stop action with one or two-player feature.
- Realistic animation with jump, block and steal manoeuvres. You can even jump and turn in mid-air before slamming the ball into the basket.
- Nine fierce skill levels from the utterly pathetic to the Harlem Globetrotter.
- Three fiery opponents with unique intelligent player characteristics.
- Multisection game, with end-of-match presentation sequence.
- Sequel to immensely successful International Soccer.



CBM64 SCREEN SHOT

International Basketball is from Andrew Spencer author of the 'Sensational Best-Seller' International Soccer.

Every single Elite product carries the unique 'Elite' Holographic sticker. Make sure your copy does. It's your guarantee of quality.

**Mail Order**  
Just send a cheque or P.O. payable to 'Elite' or quote your Visa number.

An *Andrew Spencer*

**elite**





# Rescue on Fractalus!™

Activision's 1st release  
from Lucasfilm Games™  
Hear what Jeff Minter says:

"One of my all-time favourites ...  
Stunning, solid 3-D visuals. The most  
amazing impression of flight through  
mountainous terrain.  
Look out for this one. I think it's ace."

ZZAP 64



## £9.99

Rescue on Fractalus! is a  
trade mark of Lucasfilm Games

## ACTIVISION

HOME COMPUTER SOFTWARE™

Available now on C64 Cassette and Disk, and AHC Cassette and Disk. Activision UK Ltd, 15 Harley House, Marylebone Road, London NW1. Tel: 01-935 1428.  
From selected branches of Boots, WH Smith, John Menzies, Lasky's, Spectrum, Rumbelows, Woolworth and good computer software stores everywhere.



# The best products, the best prices...

NO.	ITEM	RETAIL PRICE	OPENING PRICE
<b>COMPUTERS</b>			
1	ACORN BBC B INCL. SPEECH I/F	349.00	326.51
2	ACORN BBC B PLUS	495.00	464.84
3	ACORN BBC B + DFS + ECONET	469.00	436.77
4	ACORN ELECTRO4	125.00	120.69
5	APRICOT FIE	684.25	640.15
6	APRICOT FIF	1024.25	962.91
7	ASTRAD CP6640-COLOUR	349.00	326.31
8	ASTRAD CP6440-YMON	235.00	225.00
9	ASTRAD CP661-COLOUR	449.00	420.00
10	ASTRAD CP664-MOND	339.00	317.15
11	ENTERPRISE 64	179.95	166.35
12	ENTERPRISE 129-128K RAM	245.95	230.04
13	ENTERPRISE 501WARE PACK	19.95	16.66
14	MEMOTECH MTX 512 (64K RAM)	275.00	259.28
15	OSIGN ORGANISER	99.95	95.81
16	SINCLAIR MFC 1650 BOX	159.95	166.25
17	SINCLAIR SPECTRUM +	129.95	121.87
18	SPECTRUM + - SOFTWARE & PACK	14.95	10.99
19	SINCLAIR SL	399.00	372.28

21 NIDD VALLEY SOUND FOR SPECTRUM		14.95	15.95
<b>DATA RECORDERS</b>			
24	C-CHALLENGE PRINT 31 FOR SPECTRUM	69.95	64.95
25	ACORN FOR BBC S & ELECTRON	35.00	34.49
26	ATARI 5010 FOR 500/7000 KL	24.77	25.70
27	1530 12N FOR VIC20 & CBM64	44.99	42.09
28	1891 CE FOR C16 & PLS 4	44.99	42.09
29	OMEGA WITH AZITHUM TAPE	24.95	23.94
30	SAND SLIM 71	26.95	26.02
31	SANJO DRUM	44.95	44.95
32	SHADO BBC COMPAT. WITH LEAD	32.50	30.41
33	SHADO SUPER SAVER FOR C64	34.97	32.72

DATA RECORDER ACCESSORIES		
36	AUDIO PACK BBC CASS. LEAD	2.95 2.76
37	GEMINI CARRY CASE WITH 10 x C12	5.95 5.57
38	C12 STANDARD DATA CASSETTE	0.50 0.47
39	C15 STANDARD DATA CASSETTE	0.98 0.54
40	C12 MULTIPACK (5 CASSETTES)	1.95 1.82
41	C15 MULTIPACK (5 CASSETTES)	2.25 2.10

DISK DRIVES			
44	ACORN SINGLE	245.00	232.95
45	ACORN PLUS	490.00	444.00
46	ACORN PLUS 3	225.00	214.24
47	ATARI 1050	179.99	187.10
48	AMSTRAD	194.95	182.06
49	AMSTRAD 2ND DRIVE	145.95	158.00
50	COMMORE 181 SINGLE	175.00	160.12
51	QUANA CSX100 FOR BBC	109.95	102.84
52	QUANA CSX100 FOR BBC	95.95	93.51
53	QUANA CSX2000 FOR BBC	129.95	121.57
54	QUANA CSX400 FOR BBC	145.95	140.29
55	QUANA CSX100 FOR WGL	129.95	121.57
56	OPUS 3401 FOR BBC B	145.95	146.95
57	OPUS 3402 FOR BBC B	149.95	158.00
58	OPUS 3602 FOR BBC B	195.95	182.06

DISK DRIVES & INTERFACES		
61	ROTONICS WAFADRIVE	125.95 121.57
62	SINCLAIR EXPANSION PACK	95.95 93.51
63	2X MICRODRIVE	45.95 46.73
65	CBM44-ENTROPO QUICK DATA DRIVE	75.95 74.80
67	MSX QUICK DISC DRIVE	135.95 130.93

DISK INTERFACES		
70	ACORN DISC NET FILE ROM	20.60 19.27
71	ACORN DISC INTERFACE KIT	97.00 90.73
72	OPUS DUAL DENS. DISC I/F FOR BBC	99.95 93.51
73	DATAFAX DISC I/F FOR SPECTRUM	29.95 24.80

74	CUMANA QPS FOR BBC	75.95	74.80
75	CUMANA ELECTRON DISC I/F	114.95	107.54

**DISCS & ACCESSORIES**

78	ZX MICRODRIVE CARTRIDGE-SINGLE	1.99	1.99
79	ZX MICRODRIVE CARTRIDGE x 4	7.55	7.44
80	WAFADRIE 16K CARTRIDGE	3.50	3.27
81	WAFADRIE 64K CARTRIDGE	3.65	3.41
82	WAFADRIE 128K CARTRIDGE	3.95	3.70
83	WAFADRIE 256K CARTRIDGE	3.89	3.63
84	MICRODRIVE 20-STORAGE CASE	5.57	5.25
85	QUAMM DSD (80 TRACH x 10)	24.95	23.34
86	OPUS DSD 3 INCH DISHETTE	6.95	6.50
87	LEDA DISK CAR XIT LC103 SHLL	5.95	5.57
88	LEDA DISK CARC XIT LARGE	12.95	12.12

MONITORS		
91	AVT 12 IN. GREEN SCREEN MONITOR	107.95 102.86
92	COMMODORE 1702 14 INCH COLOUR	230.00 215.18
93	ETUO 12 IN. GREEN SCREEN	205.85 192.58
MONITORS-COLOUR		
95	FIDELITY CM14 14 IN. RGB COLOUR	199.95 187.06
96	MICROWITEC CUB 1451/IG3 FOR 8L	295.00 275.99
97	MICROWITEC CUB 1431/IS FOR BBC	245.00 232.95
98	PRISM CM14 FOR 8L	199.95 187.06

## HOW TO ORDER

Simply fill in the order coupon and send it with your payment to: ASF Direct Mail Discount, Unit G, Asf Grove Industries Park, Bognor Regis, West Sussex, PO22 9EL. Or if you prefer you can order by telephone using your ACCESS, VISA or DINERS CLUB card, ring 0243 823337 and ask for credit card sales. We will ask for your credit card number, name, address and what items you require from the list. Please give the product number and description when ordering.

All products are offered subject to availability and on 14 days approval. Please allow up to 28 days from receipt of your order. Callers are welcome from 9 to 5 for demos, advice or just to browse.

NO.	ITEM	RET/FL	OPENING PRICE
	MONITOR LEADS-INTERFACES		
101	AGF RGB INTERFACE FOR SPECTRUM	49.95	46.26
102	GL TO FIDELITY MONITOR LEAD	5.25	5.57
103	CM64 TO FIDELITY MONITOR LEAD	5.95	5.57

TELEVISIONS/COMPOSITE MONITORS			
106	SANYO CTP3132 14 INCH COLOUR	199.95	187.06
TELEVISIONS/RGB MONITORS			
109	TATUNG 14 INCH COLOUR	234.95	219.81

TELEVISIONS			
112	SINCLAIR 2 INCH FLAT SCREEN	99.95	93.51
113	SINCLAIR BATTERY PACK x 3 FOR TV	9.95	9.31
114	SINCLAIR POWER SUPPLY FOR TV	7.95	7.44

PRINTERS		
115	ALPHACOM 32 FOR SPECTRUM	79.95 74.80
116	AMSTRAD PRINTER FOR CPC464/644	199.00 186.17
117	AVT D100 DOT MATRIX CENTRONICS	265.00 247.92
118	BROTHER H55 CENTRONICS	149.95 140.29
119	BROTHER H65 2022	129.95 120.29
120	BROTHER EP44 THERMAL FS232	249.95 233.64
121	BROTHER R23S DAISYWHEEL	862.50 806.91
122	COMMODORE MPS801 FOR VIC2/C64	199.95 187.06
123	COMMODORE MCS901 COLOUR DOT	399.99 374.21
124	COMMODORE MCS901 FOR FS232	498.00 468.00
125	EPSON R830 CENTRONICS	249.00 235.95
126	AS ABOVE WITH TRACTOR FEED	285.00 266.43
127	SINCLAIR ZX PRINTER	39.95 37.38
128	TIMEX 204C FOR SPECTRUM	77.50 72.51

PRINTER ACCESSORIES			
131	BROTHER	HR25 TRACTOR FEED	103.50 96.03
132	BROTHER	HR25 SHEET FEEDER	253.00 236.49
133	BROTHER	HRS MAINS ADAPTOR	17.19 16.00

PRINTER INTERFACES/CABLES		
136	ACORN PLUS ONE	59.95
137	CHEETAH INTERFACE FOR IBM	59.95
138	AZTEC CBM64 CENTRONICS	29.90
139	CENTRONICS PRINTER CABLE FOR BBC	12.95
140	CENTRONICS CABLE FOR AMSTRAD	12.95
141	CENTRONICS CABLE FOR COLDESTAR MSX	19.95
142	CENTRONICS CABLE FOR MEMOTECH	14.95
143	CENTRONICS CABLE FOR ORION FOR CL	20.00
144	RS232C LEAD FOR GL	9.95
145	ZX INTERFACE / RS232C LEAD	9.95
146	RS232C CABLE FOR RCTRONICS WAFA	9.95
147	CENTRONICS CABLE FOR SOTRONICS	9.95

PRINTER I/F-CABLES FOR SPECTRUM		
150 KEMPSTON CENTRONICS INTERFACE E	39.95	37.38
151 DK'TRONICS CENTRONICS	39.95	37.38
152 9 INCH RIEBON CABLE	9.95	9.31

PRINTER PAPER		
155	BROTHER EP44 THERMAL (100x44)	5.25 4.91
156	BROTHER H45 THERMAL 30M ROLL	4.75 4.44
157	SINCLAIR FOR ZX PRINTER 5 ROLLS	11.95 11.18
158	ALPHACOM 32 & TIMEX 2040 5 ROLLS	7.49 7.01
159	11" x 9.5" TRACTOR FEED 2000 SHTS	13.05 12.21

RAM PACKS & EXPANSIONS		
162	AGE 44M FOR 81	99.90 93.19
163	AGE 256K UPGRADEABLE FOR 6L	198.00 184.67
164	AGE 512K FOR 8L	396.00 326.97
165	STONECHIP C16 16K	34.75 32.70
166	CHEETAH 32K FOR SPECTRUM 16K	39.95 37.38
167	CLRALAL MICROLOD FOR SPECTRUM	4.95 4.80
168	COMPUTER VILLAGE 16K FOR EBC	49.95 46.73

JOYSTICKS		
171	ACORN GAMES PADDLES (PAIR)	22.25 20.82
172	ALTRAPD JOYSTICK	14.90 13.99
173	SHAD JOYSTICKS FOR BBC (PAIR)	16.95 15.06
174	SPECTRAVIDEO GUICKSHO 1 FOR MSX	9.95 9.31
175	SPECTRAVIDEO GUICKSHO 1 FOR BBC	9.95 9.31
176	SPECTRAVIDEO GUICKSHO II	11.95 0.98

JOYSTICK INTERFACES		
179	ACF PROTOCOL 4	24.95 23.50
180	ACF PROTOCOL 3	19.95 16.95
181	CLSTOMCARI 5-PAK	3.95 3.49
182	FIRST BYTE ELECTRON J/S I/F	19.95 18.66

KEYBOARDS		
165	DK ELECTRONICS FOR SPECTRUM	29.95 28.02
166	SAGA FOR SPECTRUM	49.95 46.73
167	TIMEX FOR SPECTRUM	14.95 13.99

NO. ITEM	RETAIL PRICE	OPENING PRICE
<b>LIGHT PENS</b>		
196 STACK LIGHT PEN FOR BBC	28.00	26.20
197 COMBODONE 41 STACK LIGHT PEN	28.00	26.20
192 BK TRONICS SPECTRUM LIGHT PEN	19.75	18.56

SOUND & SPEECH UNITS		
195	ACORN SPEECH UPGRADE FOR B3C B	55.00 51.46
196	ACORN MUSIC SYNTH'R FOR B3C	199.00 186.17
197	CURRAH SPEECH FOR CBM41	21.25 20.54
198	CONDOBRO 44 MUSIC MAKER	29.75 28.02
199	CURRAH MICRODSEEK FOR SPECTRUM	21.25 17.39
200	DK TRONICS STEREO SPEECH-AMSTRAD	39.75 37.93

MODEMS			
203	PRISH VTX5000 FOR SPEC & SPEC+	49.95	44.37

PROTECTIVE COVERS			
206	BBC COMPUTER DUST COVER	6.15	6.33
207	COMMODORE 20/40 DUST COVER	4.75	4.94
208	COMMODORE 1530/1531 DATA REC.	2.75	2.76
209	COMMODORE 1541 DISK DRIVE COVER	3.75	3.70
210	SHUGART PROTECTUM DUST COVER	1.75	1.78

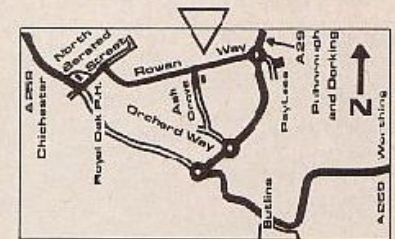
PSION ORGANISER SYSTEM		
213	PSION ORGANISER POCKET CALCULATOR	99.75 93.51
214	PSION 8K DATAPACK	12.75 12.12
215	PSION 16K DATAPACK	19.75 18.56
216	PSION FINANCE PROGRAM	29.75 20.02
217	PSION MATHS PROGRAM	29.75 28.32
218	PSION SCIENCE PROGRAM	29.75 28.32
219	PSION FORMATTER	44.75 42.35
220	PSION LINK UP	39.75 37.38

# X-tra special

NC.	ITEM	OPENING PRICE
X1	SPECTRUM 40K incl. SOFTWARE & PK Standard version, excellent value	88.75
X2	VISCOUNT CASSETTE RECORDER Asorted models-ideal data recorder	17.75
X3	LOK Z81 RAM PACK Low cost expansion for ZX81	15.75
X4	CASSET LIGHT RIFLE For Spectrum, Comm.64 or VIC20-please state	11.50
X5	STONECHIP KEYBOARD For Spectrum	26.15
X6	RE DIGITAL TRACER Transfer any images to the Spectrum	37.75



**we're here**




**... the rest is up to you.**

**Send to:** AGF Direct Mail Discount Unit G, Ashgrove Industrial Park, Bognor Regis, West Sussex.

QTY	NO.	ITEM	ITEM PRICE £	TOTAL £
			<b>FINAL TOTAL</b>	

Please tick appropriate box:-  
☐ I enclose a cheque Postal Order for £ .....  
☐ Please charge my Access Barclaycard Account No. .... exp. ....  
Signature \_\_\_\_\_  
From: MR MRS MISS \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
\_\_\_\_\_





# AND ON THE EIGHTH SUMMER

Experience the thrill of top international competition in your own home! Summer Games II brings it all to you with eight challenging new events. You and up to seven other contestants can compete in your favourite individual event or go for it all in the grand competition. Some events, like cycling, rowing and fencing even challenge you with realistic head-to-head competition.

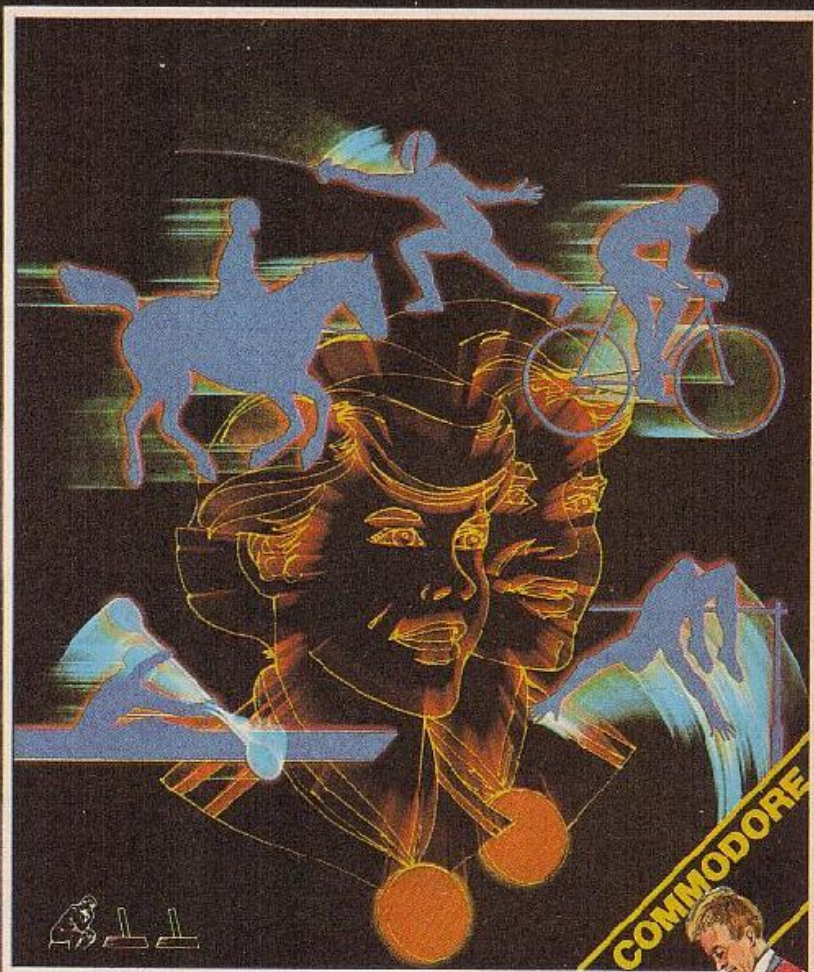
First, decide which of the 18 different countries you're going to represent. Then, in true Olympic fashion, you will need the proper strategy and mental toughness, not just speed and agility to excel in each of the eight events. That's why we included a feature that lets you practice each event until you're ready for the real competition.

Remember, it's not too early to get ready for 1988. With the right diet, proper training and lots of practice you just might make it. In the meantime, put on your sweatsuit, grab that joystick and let Summer Games II give you eight new ways to Go For The Gold!

- Includes Cycling, Fencing, Kayaking, Triple Jump, Rowing, High Jump, Javelin and Equestrian Events
- Opening, Closing and Awards Ceremony With National Anthems
- Compete Against The Computer or Your Friends
- Individual and Head-To-Head Competition
- One to Eight Players

**SUMMER GAMES II DOESN'T LOOK  
SET TO BECOME A CLASSIC—  
IT IS A CLASSIC!**

—ZZAP 64



ZZAP 64	
PRESENTATION.....	99%
GRAPHICS.....	97%
SOUND.....	96%
HOOKABILITY.....	98%
LASTABILITY.....	97%
VALUE.....	98%
OVERALL.....	97%



2

EPYX



# DAY EPYX CREATED...

# GAMES II



▲ Opening Ceremony  
▼ High Jump



Cycling ▶

Screen shots as seen on  
the Commodore 64

**AVAILABLE AUGUST**  
for Commodore 64/128

**CASSETTE £9.95**

**DISK £14.95**

Summer Games II now takes the Gold as the greatest sports simulation ever created for the 64.  
—Commodore User

Summer Games II is eight outstanding games rolled into one piece of software—100% value for money.

—Computer Gamer



Equestrian ▲  
Kayaking ▼



## TRY THESE OTHER GREAT GAMES FROM EPYX

SUMMER GAMES



IMPOSSIBLE MISSION



PITSTOP II



PITSTOP II

BREAKDANCE



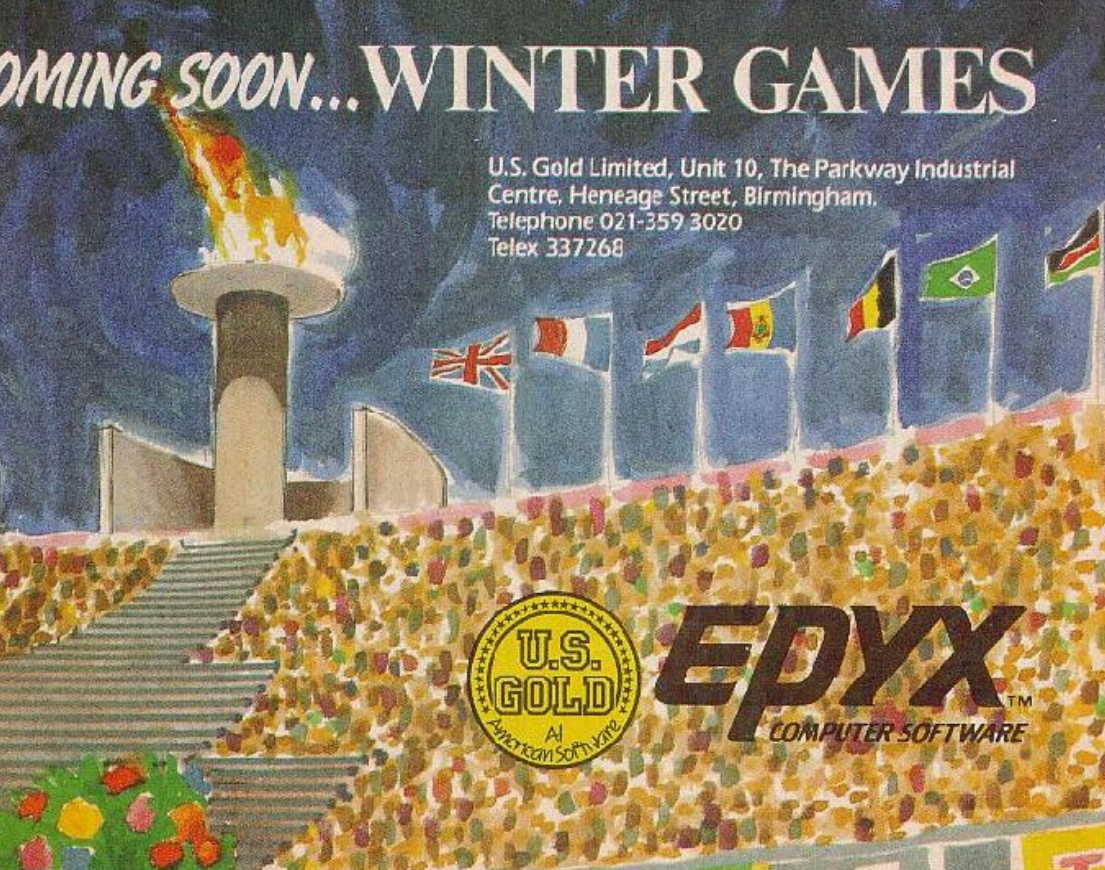
BREAKDANCE

## AND COMING SOON... WINTER GAMES

U.S. Gold Limited, Unit 10, The Parkway Industrial  
Centre, Heneage Street, Birmingham.  
Telephone 021-359 3020  
Telex 337268



**EPYX**  
COMPUTER SOFTWARE





# The English Computer Shop

WILLEM OGIERPLEIN 2  
B-2000 ANTWERPEN  
Tel. 03/233 59 C6

GRETRYSTRAAT 31  
1000 BRUSSEL  
Tel. 02/218 60 25

**Schneider**  
AMSTRAD

**sinclair**

**apricot**

**ACORN**  
COMPUTER

## EEN BRIT MET BIT!

## MAIL ORDER PROTECTION SCHEME

If you order goods from Mail Order advertisements in this magazine and pay by post in advance of delivery, *Your Computer* will consider you for compensation if the Advertiser should become insolvent or bankrupt, provided that:

- (1) You have not received the goods or had your money returned; and
- (2) You write to the Publisher of *Your Computer* summarising the situation not earlier than 28 days from the day you sent your order and not later than two months from that day.

Please do not wait until the last moment to inform us. When you write, we will tell you how to make your claims and what evidence of payment is required.

We guarantee to meet claims from readers made in accordance with the above procedure as soon as possible after the Advertiser has been declared bankrupt or insolvent.

This guarantee covers only advance payment sent in direct response to an advertisement in this magazine not, for example, payment made in response to catalogues etc., received as a result of answering such advertisements. Classified advertisements are excluded.

# Special Reader Offer!

**£17.95**  
INCLUDES POST,  
PACKING &  
VAT

...the Duraplug  
Mains Filter  
Adaptor...

The Duraplug Mains Filter Adaptor is an essential, yet inexpensive, item for any user of sensitive electronic equipment in the office or home. Plugged into an ordinary wall socket it provides adequate protection against distortions in the mains supply, 'laundrying' noise and spikes out of the current and preventing digital circuits from misbehaving.

...the end of the  
line for spikes!



To: Your Computer Offer, Room 807, Quadrant House, Sutton,  
Surrey SM2 5AS

Please send me the following:

Quantity.....Duraplug Mains Filter Adaptor(s) @ £17.95 each  
incl. p&p and VAT.

I enclose my cheque value £..... made payable to  
YOUR COMPUTER OFFER.

NAME.....

ADDRESS.....

.....

.....



SHOP OPEN 9AM TO 5PM MONDAY TO SATURDAY MAIL ORDER OPEN 9AM TO 8PM MONDAY TO SATURDAY  
ALL PRICES INCLUDE VAT AND DELIVERY

## YOUR COMPUTER, SEPTEMBER 1985 11



# PROSECUTING SOFTLIFTERS

EX-CHIEF SUPERINTENDENT Bob Hay, billed as the man who helped crack the Iranian Embassy siege, police the Grunwick dispute and quell Sikh unrest in Southall, now faces his toughest case. Software piracy.

He's head of the special unit set up by the Federation Against Software Theft (FAST) to root out infringers of program copyright wherever they lurk. His weapon is the tough new legislation just enacted by Parliament. It will leave software thieves open to punishment identical to the stiff crackdown that hit video pirates a couple of years ago.

If the Copyright (Computer Software) Amendment Act works out as intended, program counterfeiters — already driven out of the video industry — will have to go back to selling Mexican-built "Cartier" watches.

Although the biggest deterrents are reserved for the commercial forgers — up to two years' inside and unlimited fines — anyone selling, exhibiting or even possessing illegal copies could be stung for up to £2,000 or locked up for a maximum of two months, or both.

Thanks to the new Act and the activities of FAST the mood against petty copiers has changed. In last year's anti-piracy campaign software supremo Geoff Brown of US Gold said they should be hanged. Now that the software houses have the power of the Act at their disposal they are aware that the criminal remedy is not always the best option.

People must realise that most copying takes money away from the industry — and that will lead to a loss of software choice and a loss of jobs. In the meantime games houses will have to take whatever action they can to make petty copying as difficult as possible — using protection devices or hardware solutions like Mikro-Gen's Mikro-Plus Interface.

But until computer users become more aware of the damage that making and swapping copies does, it will continue to be a drain on the market. As former Chief Super Bob Hay puts it, the loss of money to producers and retailers is the same whether you shoplift £500 of goods or softlift £500 of games.

Let's hope for the sake of all of us who enjoy computing that the Act will be as effective as its video equivalent. Film companies estimate that video copying is down a massive 60 percent on two years ago.

Editor: TOBY WOLPE; Assistant Editor: MEIRION JONES; Production Editor: IAN VALLEY; Software Editor: SIMON BEESLEY; Commercial Software Editor: PAUL BOND; Editorial Assistant: LEE IADON; Editorial Secretary: LYNN DAWSON. Editorial: 01-661 3144. Advertisement Manager: NICK RATNIEK 01-361 3127; Assistant Advertisement Manager: KEN WALFORD 01-661 8548; Senior Sales Executive: JULIAN BIDLAK 01-661 8458; Advertisement Executive: KAY FLBIN 01-661 8484; Northern Office: GEOFF PARKER 061 872 8861; Advertisement Secretary: MAXINE GILL; Classified: SUSAN PLATT 01-361 3036; Publisher: GAVIN HOWE; Group Advertisement Manager: SHOBHAN GAJJAR. Your Computer, Room 1221, Quadrant House, The Quadrant, Sutton Surrey SM2 5AS. © Business Press International Ltd 1985. Printed in Great Britain for the proprietors Business Press International Ltd, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Tel: 01-661 3500, Telex/grams: 892044 BIPRESG ISSN 0263-0889. Printed by Riverside Press Ltd, Whitstable, Kent, and typeset by Instep Ltd, London EC1. Subscriptions: U.K. £14 for 12 issues. ABC 131, 759 July-December, 1984.



"It's OK by me." — Royal assent for piracy bill.

## P-DAY FOR PIRATES

SEPTEMBER 16 is P-Day. That's the date when the tough new penalties against piracy come into force.

They are the punishment that anyone charged under the Copyright (Computer Software) Amendment Act will face.

The Act became law in July and

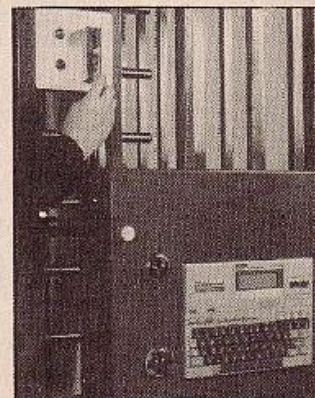
aims to hammer all illegal copying of computer software for gain. Summary offences like selling, possessing or exhibiting illegal copies can be hit with fines up to £2,000 or two months' imprisonment or both. Indictable offences can carry up to two years' prison and unlimited fines.

## Late kick-off

DESPITE ALL ASSURANCES that tough new measures would be introduced following the Brussels disaster, the football season looks like it will kick off without any computerised anti-hooligan entry card systems in place.

The Sperry identify card system, backed by former-Liverpool star Emlyn Hughes, is now no longer being pushed by the company. Sperry had a good response from soccer clubs — Chelsea signed up for a partial system and then pulled out when it was clear that it couldn't be installed in time. But there's been a complete lack of interest from the football authorities.

With the Government pushing hard for entry systems to be installed, but offering no money to help with the expense, the major



Epson's cut-price entry.

stumbling block still seems to be cost.

One answer could be a low-cost system like PASS UK, Epson's identity-check scheme, based on a HX-20 portable.



# ARRIVA AMIGA!

## Commodore's 16-blitter

COMMODORE'S ANSWER to the Atari ST, the Amiga, looks like being the one machine everyone will want to own — if they can afford it. Like the ST the Amiga is built around the 68000 processor and has a Macintosh style operating system — written by UK company Metacompo — with icons and windows under mouse control.

Unlike its rival, the Amiga is multitasking — it can run more than one program at once. But it is the machine's graphics facility that puts the opposition in the shade. A graphics chip coupled to a high speed bit image manipulator, a blitter, allows the Amiga to draw, shift and transform shapes on screen at a much faster rate than it could with the processor alone.

You can animate figures with just a few lines of code. There are two different types of sprites and a high resolution of 600x200 with 16 colours. The graphics chip is one of the three custom chips that make all the difference to the Amiga. They also give it a very sophisticated sound capability over four channels.

The stock machine comes with



Enter the Amiga.

a 380K 3.5in. disc drive, 128K Rom and 256K Ram expandable to 512K. When it arrives in this country it could cost as much as £1,250. On top of this owners will need to spend at least £300 more on a high res colour monitor. At

these prices you might expect forthcoming software to be mainly business applications. But the graphics potential is so great that software houses are said to be equally enthusiastic about writing games for the Amiga.

## Robcom's CBM-64 cartridge speed up

BUY A COMMODORE! On yer bike. Look, you've got to buy a Centronics interface, extra basic, a tape turbo loader and a new disk filing system, I mean, that lot'll set you back nearly as much as the machine itself.

Well, not anymore. Robcom's new range of cartridges contain all this and more without even whipping any of the precious user memory. From the basic package at £24.95, right the way up to the all bells and whistles Turbo 50 at £39.95, these packages offer exceptional value for money.

## Atari 260ST Tramiel's back in town

ATARI'S JACK Tramiel is returning to these shores in September with the 260ST. The same month the 520 will go on sale to the general public in a package including computer, 500K disc drive, 12 in. black and white monitor and mouse with Gem Write, Gem Paint, Atari Logo and Atari Basic for £750. Over 100 STs are already being used by software houses like Ocean, Firebird and Llamasoft as they race to be first with product for the Atari.

Jack's sprat — the 260ST.



# CLIVE-PLUS IS A TV REPAIR MAN



Has Bill Jeffrey more in store for the Spectrum?

SINCLAIR sources do not deny the existence of a 128K Spectrum with a proper sound chip — the AY-38910 used in the Amstrad, MSX and so on. Meanwhile

Robert Maxwell's takeover of Sinclair should be completed by the middle of this month and a new chief executive — Bill Jeffrey — to replace Sir Clive has been

appointed. Hoover has still not served the writ for £1.5 million against Sir Clive which was issued a month ago in connection with the C5 electric tricycle project.

Bill Jeffrey was head of radar and navigation sales for Mars Electronics until March when he became managing director of Sinclair TV and Communications. Since then the fabled flat screen TV has at last started to appear in the shops in numbers.

Bill Jeffrey would not be specific about future plans for a 128K Spectrum or for next year's portable but he says "we have very exciting plans for the future with our existing products as well as some new ones."

## Not for you

WE PRINTED the wrong number for Micro Pride in the August Joystick Jury. The right number is 0206 304957.



# ALLWAY MARKETING

Locate your keys instantly with the electronic  
**KEY LOCATOR**

ONLY  
**£6.95**  
inc p&p



AS SEEN AND HEARD ON TV AND RADIO. Sounds magical? It is! This innovative product from Allway Marketing - THE KEY LOCATOR - finds lost keys in an instant. Just whistle or clap your hands and it will respond with a beep beep! It works so well it is able to function even if keys are left in a drawer, under clothes or even under the carpet if you are within a range of 12 metres. The Key Locator comes attractively packaged in a gift box.

Please accept my order for ..... Key Locator(s)  
at £6.95 each inclusive of p&p

Name .....  
BLOCK CAPITALS PLEASE

Address .....

Please send your cheques/postal orders made payable to:  
**Allway Marketing, Dept PCW**  
41a Lorne Road, Forest Gate, London E7 0LJ  
Tel: 01-519 3841

TRADE ENQUIRIES WELCOME

VC9

# CALDEW BUSINESS COMPUTER SYSTEMS

Spectrum Plus.....	119.95
BBC Model B.....	335.00
BBC Model BC.....	380.00
Acorn Electron.....	99.00
Electron Starter Pack.....	143.00
Electron + 1 Interface.....	56.00
Electron + 3 Interface.....	199.00
Acorn Data Recorder.....	28.95
6502 2nd Processor.....	191.99
Speech Interface Kit.....	49.99
ZEO 2nd Processor.....	340.00
Torch 280 Disk Pack.....	719.00
Prestel Adaptor.....	120.00
CSX100 Disk Drive.....	105.00
CSX200 Disk Drive.....	139.99
CSX400 Disk Drive.....	164.00
12" Novex M/tors amber/green.....	99.99
12" Philips Green monitors.....	82.99
14" Grundig Tvmnitor.....	249.99
Epson FX80 Printer.....	428.00
Epson RX80 FT Printer.....	272.00
Epson FX100 Printer.....	543.00
Juki 6'00 Jaisv Wheel.....	419.00
Brother M-1009 Printer.....	189.99
ATPL Sidewise ROM Board.....	46.99
Reven 20K Expansion Board.....	63.99
Quickshot 1 Joystick.....	8.95
Gunshot Joystick.....	7.95
Commodore 1541 Disk Drive.....	189.00

\*\* All Prices include VAT\*\*

Software over 500 separate titles in stock: Commodore 64, Spectrum, Electron, BBC, C16, Amstrad, Memotech, Vic 20, Atari

\*Including at least £1 off all Chart titles\*

Add £1.50 (P&P) per item to all orders and forward with address. Send stamped addressed envelope for detailed hardware and software price lists, with genuine reductions on all items.

Delivers - software: 48 hours  
- hardware: 7 days

**161 DENTON STREET  
DENTON HOLME, CARLISLE**

# POOLSWINNER

THE ULTIMATE POOLS PREDICTION PROGRAM

- **MASSIVE DATABASE** Poolswinner is a sophisticated Pools predictor aid. It comes complete with the largest database available - 22000 matches over 10 years. The database updates automatically as results come in.
- **PREDICTS** Not just SCOREDRAWS, but AWAYS, 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 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** Tapes supplied with conversion instructions.
- **PRINTER SUPPORT** Full hard copy printout of data if you have a printer.



Boxed, with detailed instruction booklet

AVAILABLE FOR Spectrum (48K), Commodore 64 VIC20 (~16K), AMSTRAD, BBC B, Atari (48K), ZX81 (16K), Dragon, Apple II, ELECTRON

**PRICE £15.00 (all inclusive)**

**NOW AVAILABLE**

**FIXGEN 85/6**

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 1985/86. 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)**

## COURSEWINNER v3 THE PUNTERS COMPUTER PROGRAM

You can develop and test your own unique winning system by adjusting the analysis formula, or use the program in simple mode. Coursewinner V3 uses statistical analysis of major factors including past form, speed ratings, course statistics, prize money, weight, going, trainer and jockey form etc, etc. It outputs most likely winners, good long odds bets, forecasts, tricast etc. The database includes vital course statistics for all British courses. You can update the database - never goes out of date.

AVAILABLE FOR Spectrum (48K), Commodore 64, BBC (B), AMSTRAD, Atari (16K), Apple II

**PRICE £15.00 (all inclusive) includes Flat AND National Hunt versions.**

**NOT JUST A TIPSTER PROGRAM**, Coursewinner V3 can be used by experts and occasional punters alike.



phone 24 hrs



SOFTWARE



phone 24 hrs

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

(Send for full list of our software)

# REPRINTS

## a ready made sales aid

If you are interested in a particular article or advertisement in this publication, why not take advantage of our reprint service.

We offer an excellent reasonably priced service, (minimum order 250 copies).

For further details and a quotation contact:

**KAYE JONES ON 01-661 3779**



# DIARY

SIR CLIVE'S just back from Mensa's annual bash for those who think they are geniuses. At last year's conference he predicted a world in which people would have to retire in their forties. This year he celebrated his 45th birthday with Maxwell taking over his company and Bill Jeffrey taking over his job. I hope nobody said anything about self-fulfilling prophecies.

INFOCOM who did so well with Hitch Hiker have started sending out interactive press releases. The first page congratulates you on opening the right envelope and by page 2 offers choices such as — if you are patient proceed to page 3, if you are not logical proceed to page 4. 4 asks if you are really sure you should have done this before sending you to page 3 or 13. 13 just tells you off for not having any patience before sending you back to 3.

TWO OF OUR rival magazines which we will call Unclear User and Crass — have been having a little legal tangle after Crass made an unsubstantiated suggestion that User might give good reviews on the basis of which software houses placed most advertising. User sent a writ winging over to Crass which forced them to rip the offending pages out of all their issues. Fortunately for User that Imagine refugee Bruce Everiss did not force them to rip up their issues a few months earlier when User printed something about Bruce which Mr Everiss and his lawyer believed was damaging. Instead he accepted an apology and a right to reply in the next issue.

A LITTLE BIRD in a software house rings to tell me that he has been rung up by an ad rep from a magazine — not Crass or Unclear User — and offered a colour page of advertising for nearly £1,000. He refuses so the ad rep drops his price eventually to £500 but the little bird will still not book space. The rep pauses for a second then plays his trump card. "All right £450 — and we'll make your program our game of the month."

*Elsie Dee*

# BAILING OUT Olivetti runs the RISC

ACORN IS STILL alive and kicking thanks to another cash infusion from Olivetti and some spectacular progress from the research and development teams which has produced a cheap fast new 32-bit chip.

Olivetti now owns 80 percent of Acorn under a deal which has cost Olivetti £4 million, the BBC £2 million in unpaid royalties, and Acorn's other creditors £8 million in bad debts. Brian Long will now take over as managing director with Alex Uboldi helping out temporarily pushing Hermann Hauser and Chris Curry yet further down the pecking order behind Chairman Alex Reid. Briar has been recruited from the Canada Development Investment Corporation.

Meanwhile the stripped down company — down from 450 to 275 staff — has managed to launch a new work station while R&D has announced details of a Reduced Instruction Set Chip.

Companies like IBM have been racing to produce RISCs — which use a small number of instructions in combination rather than having an exhaustive list of specific operations.

This makes the chip smaller — hence cheaper and faster than the



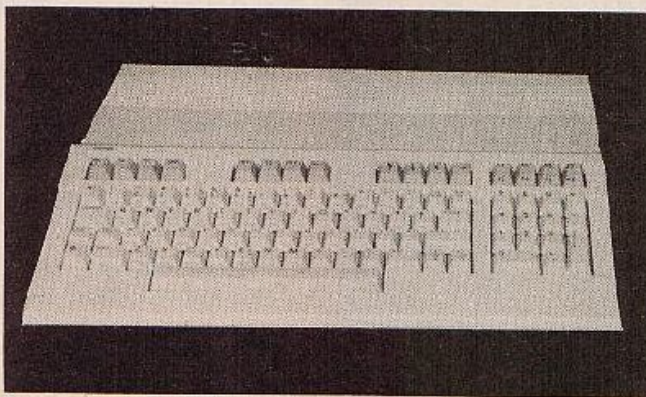
Workstation launch shows Acorn is back in business.

existing 32-bit processors.

It will be some time before can incorporate the RISC technology in future models. At the moment they still hope to be able to sell

BBC B Pluses at over £400 — when Amstrad can sell a complete 128K system including monitor, disc drive and printer for little more.

# 128 GUNFIGHT AT THE UK CORRAL



Commodore 128 pitches in at £269.

ENTERPRISE is finding Commodore a tough opponent in the 128K micro war. Commodore is pricing the 128 at £269 and releasing it now with a plan to spend £5 million advertising the

CBM128 as the perfect machine for class of 82/83 who bought a Spectrum or CBM 64 and now want to upgrade.

Commodore is discounting fears that "clever" software which makes unorthodox use of the 64's video chips may not be fully compatible. So far few American software houses are making use of the 128 mode — preferring to write for the 3 million 64s rather than bring out specific versions for the initially small number of 128s. But the real threat to Commodore, Enterprise and Atari in the 128 stakes is the new Amstrad CPC 6128 — (exclusive review page 40) at £300 including drive and monitor.



# Free Games!

Yes...place an order for our Spectrum or Commodore 64 Magazine and we will send you one of the above games **absolutely free**. We will also enrol you in our Discount Software Club enabling you to purchase software at huge savings over shop prices. We offer all the latest titles at substantial discounts such as, **Frank Bruno's Boxing** at £3.95 (saving £3.00), **Frankie Goes to Hollywood** at £6.95 (saving another £3.00) or **Spy Versus Spy** at £6.95 (saving yet another £3.00). We also have a number of older titles at even bigger discounts, such as, **Attack of the Mutant Camels** for the Commodore at £2.95 or **Zip Zap** for the Spectrum at just 95p. In all we have over 200 titles available for your computer.

## Six magazines a year

A subscription of just £5.00 will bring you six Magazines a year through the post. Each magazine is packed with reviews of all the latest software, reader's game playing tips, competitions to enter, our reviewer's personal choices and a summary of how the other magazines rate the new releases.

## Hardware and utilities supplement

In September, every subscriber to the magazine gets a 32-page review of some of the more popular titles — such as word processing software — and hardware including joysticks and Spectrum interfaces.

## Hotline keeps you up to date

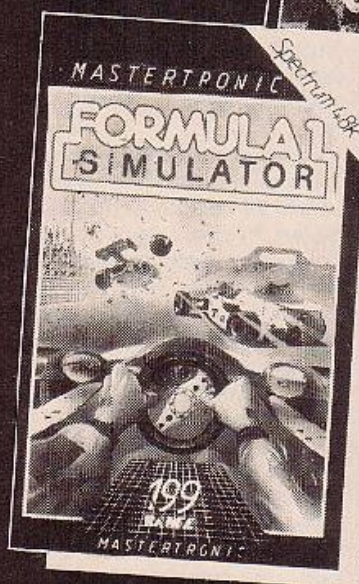
Subscribers to the magazine can phone our 24 hour Hotline for up to the minute news of the latest releases. A three minute recording, updated weekly, details the new titles and their prices. Club members may order by phone too!

## Easy ordering

You can order from our substantial range as and when you like. There are no minimum order requirements — you don't *have* to buy anything at all. When you do order we do our best to despatch your goods within a week — often quicker.

# Mr. Software

KELVIN HOJSE  
TOTTERIDGE AVENUE  
HIGH WYCOMBE  
HP13 6XG  
(0494) 450586



**Don't take our word**  
Here's what some of our subscribers say:-

"Congratulations on a great Club with superb service."

*Christopher Woods,  
Geneva, Switzerland.*

"I am very pleased at your quick response. I know that the enclosed order will be dealt with quickly and efficiently as always."

*J. Mann, Wallsend, Staffs.*

"Many congratulations on your excellent Club, may it prosper greatly."

*Mark A. P. Colebrook, Tenerife, Canary Isles.*

"I think your Spectrum Club is sensational, terrific — who else could offer such bargains."

*David Barrows, Northampton.*

(Original letters available for inspection.)

## SUBSCRIPTION FORM

C 9/85

I wish to become a subscriber to the Mr Software:

- ☐ Spectrum Magazine  
☐ Commodore 64 Magazine

for the next 12 months, for which I enclose £5\*. (£10 if you want both mags.) I understand you will send me your most recent Club Magazine by return and that if I'm not completely satisfied within two weeks I can return the game & magazine for a refund. I would like as my FREE game:-

- ☐ Finders Keepers (Spectrum/C-64) ☐ Formula One (Spectrum Only) ☐ Kik Start (C-64 only)

Name (BLOCK CAPS) .....

Address .....

Postcode..... Cheque/Postal Order No .....

Or charge my Access/Visa account

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

(\*£5 applies to UK & BFPO only. Other rates are £7 Europe, £9 USA & Middle East, £12 Australia, Far East & S. Africa.)



## UPDATE

OLD GAMES for new, conversions are a good way for games publishers strapped for cash to make a quick buck or two. They are also nice little earners for the small software houses given the spade work of conversion whilst the original program's authors go on to pastures new.

U.S. Gold is going for the Amstrad in a big way. *Beach Head II*, *Pole Position*, *Up 'n' Down*, *Buck Rogers*, *Congo Bongo*, *Dambusters* and *Bounty Bob Strikes Back* are amongst the games due to have the dust knocked off them. The even older *Beach Head* is opening several new fronts on the Amstrad, BBC, Electron and Enterprise.

Following the success of the Softac compilation, Virgin has decided to pull together a tape containing a number of titles from various software houses. Called *Now Games*, just to make sure no-one thinks they're buying a compilation LP, it contains *Lords of Midnight*, *Everyone's a Wally*, *Strangeloop*, *Brian Bloodaxe*, *The Arabian Nights* and *Falcon Patrol II*.

Virgin is promising to bring the pizzazz and advertising clout normally associated with music compilations to this new venture. They may not be alone in the field for long however. U.S. Gold is also busy compiling.

Virgin has also revamped and relaunched *Sorcery*, bigger and better they say, on the Commodore, presumably with an Amstrad version hard on its heels. This follows up Software Project's successful relaunch of *Jet Set Willy* by cramming nearly twice as many rooms in it. Is this a trend other platform adventure hits will follow?

CCS has converted *Amnham* for the Amstrad. For £9.95 you can go a bridge too far. Also Palace are bringing out *Cauldron* for the same machine. Never one to miss a bandwagon when they see one, Firebird are getting in to the conversion market with old Ultimate hits. *Underworld* and *Sabrewulf*, as well as revamping their Silver range to include some new Isomorphic (à la Alien 8) games.

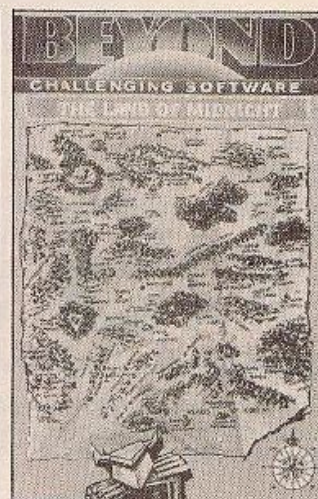
# IRON HEROES

## Beyond Superman at Denton

IS IT A BIRD? Is it a plane? You'll be seeing a lot of this sort of thing when First Star's Superman game is released for distribution in the UK by Beyond. But though it's a graphically strong arcade action game, Beyond are even more fired up about the home-grown products.

Sequels are well to the fore — though Eye of the Moon scheduled to retail at £9.95 on the Spectrum has been delayed. The final part of the Tolkienesque *Lords of Midnight* trilogy, it would have been cast more in the mould of an adventure with less emphasis on strategy.

Follow-up to icon-driven Shacowire is called *Enigmaforce* and features Zark, Sylk, Maul and the lovely Serena — "We put her in because it seemed a bit one-sided otherwise," say programmers at Denton Designs. Set in a complex on Sylk's home planet, it moves beyond mere icon control, insofar as you can do a mindprobe and "become your character", going round the screen performing various tasks. Sounds like a game



Beyond *Lords of Midnight*.

that could really take you out of yourself. Not bad at £9.95 on Spectrum and Commodore 64.

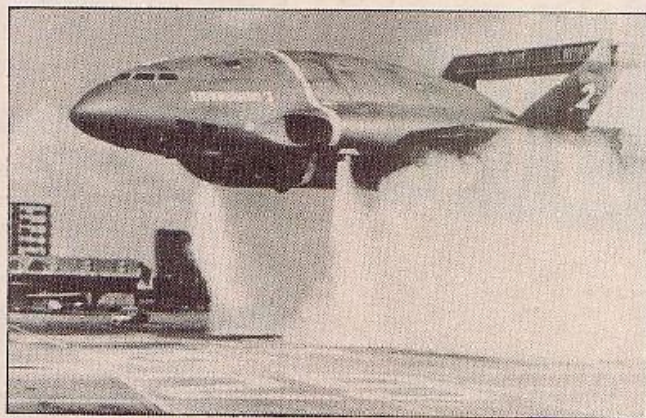
Liverpool trendsetters Denton are also working on a futuristic — and violent — sports game for Beyond, tentatively called *Iron Heroes*. "Rather than take a sport and turn it into a computer game, we took a computer game and

turned it into a sport". The result, an all-action graphic game will also be out at £9.95 for Spectrum and CBM-64, this time on Beyond's new Monolith label.

Billed as a 10-hour Megathon, *Quake Minus One* has certainly got programmers Mike Singleton and Warren Foulkes so bogged down that Beyond have been forced to shelve long-awaited *Lords of Midnight* sequel *Eye of the Moon*. In *Quake*, the Robot Liberation Front demand freedom of thought and association for droids. They seize control of the Titan Undersea Power Station and hold humanity to ransom. With animated landscaping or "Actionscape", Beyond are confident that this game, along with all their new titles present techniques which will set the trend for 1986 computer games.

The game that people in the know are really excited about is *Nexus*, it's even got its own label — called *Nexus*. So good they named it twice, this will be a graphics adventure along similar lines to *Enigmaforce* with digitised graphics and maximum payability.

## NO STRINGS ON FIREBIRD



Thunderbirds are go again.

STAND BY for action — Firebird, British Telecom's leisure software house, has bought the rights to '60s TV puppet series *Thunderbirds*. The series is a favourite of Firebird supremos Herbert Wright and Phil Pratt. "It's my

favourite, too", says Gerry Anderson, creator not only of *Thunderbirds*, but *Stingray*, *Supercar*, *Fireball XL5* and, currently, *Terrahawks*. CRL computerised the latter in a small way — "but this is the first major one".

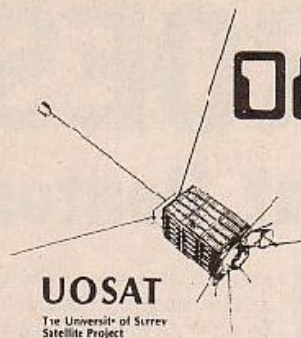
## Filmation II the Ultimate sensation

SKELETONS with rotting flesh waiting, prowling — not Saturday night in Milton Keynes but the village of Nightshade, location of Ultimate's new "Advanced Home Computer: Action Adventure Simulation". Utilising *Filmation II*, a technique ensuring fast smooth action, the £9.95 game for 48K Spectrum emerges along with Blackwyche for CBM-64.

## Novagen's Mercenary

Freedom of choice is the keynote of Novagen's 3D vector graphic games, billed as a cross between *Elite* and *Solo Flight*. But don't let that put you off as word has it that these are some of the latest-moving wire-frame graphics around as the mercenary searches planet Targ looking for energy crystals.





# DATA FROM SPACE!



Don't just play games  
on your computer—use REAL  
DATA from SPACE!

ASTRID receives from UOSAT satellites:-  
★ News Bulletins on spacecraft matters.  
★ Operating schedule of UOSAT.  
★ Satellite Status.  
★ Experimental Data.  
★ Messages on the Electronic Mailbox System  
★ Orbit Information  
★ Digitaler Speech Telemetry.  
★ CCD Television Camera Signals.

## ASTRID

Automatic Satellite Telemetry Receiver & Information Decoder

ASTRID is a COMPLETE Satellite receiving and decoding package that allows data from UOSAT Satellites to be displayed on home computers via a serial interface, (ASCII format 1 start 7 data 1 even parity & 2 stop bits). The system is fully tested and ready to operate and comprises: Receiver/Decoder/Power Supply Unit/Aerial/Feeder/Test Tape/Connecting Leads/Instruction Manual.

ASTRID operates FULLY AUTOMATICALLY—using the remote control on your tape recorder—for those night time passes!

ASTRID is only available from the manufacturers. Please send cheque or postal order (or use your Barclaycard or Access number) for £144.00 + £5.00 carriage to MM Microwave Ltd, Thornton Road Industrial Estate, Pickering, N. Yorks. YO18 7JB. Tel: 0751 75455.



UOSAT Satellites are designed and built by the University of Surrey to encourage a deeper understanding of the rapidly expanding industries of space technology, electronics and computing.

BEWARE...  
SHE'S COMING...

# TWISTER

The mother of harlots

## System 3 Software

### YOU CAN'T MISS THIS! UP TO 75% DISCOUNT

On top computer software and accessories  
when you join our club

For example:	RRP	FDD Price
SIX GAME VALUE PACK (C64, SPECTRUM, VIC 20)	14.95	3.75
SELECTION OF COMMODORE DISK SOFTWARE	9.95	2.50
SELECTIONS OF SOFTWARE FOR ALL MACHINES (SPECTRUM, C64, C16, VIC 20, ATARI, BBC, AMSTRAD)	7.95	1.95
PLUS ACCESSORIES...		
JOYSTICKS (ATARI TYPE)	9.95	2.50
JOYSTICK INTERFACES (BBC & SPECTRUM)	10.95	5.50
LIGHT PENS (SPECTRUM & COMMODORE 64)	19.95	12.95

PLUS MANY MORE LOW PRICE BARGAINS!!  
We carry stocks of 1000s of top games including U.S. GOLD, OCEAN, MELBOURNE HOUSE, ETC. ETC., all at prices TOO LOW TO PRINT! and available ONLY to Club Members.

\*\*\*\*\* SO JOIN NOW \*\*\*\*\*

Here's what you get...

#### SILVER MEMBERSHIP — (12 months) — £1.50

- ★ 12 MONTHS MEMBERSHIP
- ★ OUR COMPLETE CATALOGUE OF PRODUCTS AND SPECIAL OFFERS REGULARLY UP-DATED FOR ONE YEAR
- ★ £1.00 VOUCHER TO SPEND ON ANY CLUB PURCHASE
- ★ INTRODUCE-A-FRIEND PACK — ACTUALLY EARNS YOU A £1.00 VOUCHER FOR EVERY FRIEND YOU INTRODUCE (many of our members are earning £££s!)
- ★ MEMBERSHIP CERTIFICATE
- ★ NO POST OR PACKING CHARGES

#### GOLD MEMBERSHIP — (life membership) — £5.00

- ★ GOLD MEMBERS RECEIVE ALL THE BENEFITS OF SILVER MEMBERS BUT ALSO RECEIVE THE FOLLOWING
- ★ AUTOMATIC INCLUSION IN OUR MONTHLY PRIZE DRAW
- ★ ADVANCE INFORMATION ON FORTHCOMING OFFERS
- ★ EXTRA, EXTRA DISCOUNT ON CERTAIN TOP TITLES!
- ★ PRIORITY SERVICE
- ★ NO POST OR PACKING CHARGES

Here's what you do...

Send your name, address and computer type together with a cheque or postal order for either £1.50 (Silver) or £5.00 (Gold) — made payable to 'FLIX' to:

FLIX DIRECT DISCOUNT CLUB  
FREEPOST : CONGLETON : CHESHIRE : CW12 1BR  
(no stamp required)

WE GUARANTEE ALL SOFTWARE TO BE ORIGINALS



# POP★ TOPS

## TOP 20

1	Hyper Sports	Imagine	Sp
2	Shadow Fire	Beyond	Sp/64
3	Dur Durach	Gargoyle	Sp
4	Way of the Exploding Fist	Melbourne House	64
5	Don't buy this	Firebird	Sp
6	Cauldron	Palace	Sp
7	Grand National	Elite	Sp
8	Softball	Ethiopia Appeal	Sp
9	Rocky	Firebird	Sp
10	Arnhem	CCS	Sp
11	Desert Burner	Sparklers	Sp
12	Graham Gocche's Test Cricket	Audlogenic	64
13	The Fourth Protocol	Hutchinson	Sp
14	Nodes of Yesod	Odin	Sp
15	The Rocky Horror Show	CRL	Sp
16	World Series Baseball	Imagine	Sp
17	Quackshot	Sparklers	Sp
18	Starion	Melbourne House	Sp
19	Thing on a String	Gremlin	64
20	View to a Kill	Demark	Sp

Source: WH Smith  
Sp = Spectrum; 64 = C64; 64 = C64

## TOP 3 BY MACHINE

1	Rockman	M. Tronic	Vc
2	Doodlebug	M. Tronic	Vc
3	R.I.P.	M. Tronic	Vc
1	Action Biker	M. Tronic	64
2	Kikstart	M. Tronic	64
3	Way of the Exploding Fist	Melbourne House	64
1	Action Biker	M. Tronic	Sp
2	Hyper Sports	Imagine	Sp
3	Fencers Keepers	M. Tronic	Sp
1	Rep-on	Superior Software	Bc
2	Lode Runner	Project's Acorn	Bc
3	Revs	Acorn	Bc
1	Airwolf	Elite	At
2	Drop Zone	US Gold	At
3	Brute Lee	US Gold	At
1	Sword of Destiny	Gremlin	16
2	BMX Racers	M. Tronic	*16
3	Airwolf	Elite	16
1	Rep-on	Superior	El
2	Overdrive	Superior	El
3	Football Manager	Addictive	El
1	Mordons	Melbourne	Am
2	Quest	Quest	Am
3	Dun Durach	Gargoyle	Am
1	Rocky Horror Show	Computer Rentals	Am
1	Fencers Keepers	M. Tronic	Ms
2	Chiller	M. Tronic	Ms
3	Crazy Golf	M. Micro	Ms

Source: Wahlers Software  
Vc = Vic 20; 64 = C64; 64 = C64;  
Sp = Spectrum; Bc = BBC;  
At = Atari; 16 = C64; 16 = C64;  
El = Electron; Am = Amstrad;  
Ms = MSX.

## "GOOD VALUE"

YOUR NEWS story in the June issue about the new Acorn BBC B+ complains at the £499 price tag but if you consider what you get for £499 it is a different matter:

BBC Micro Model B	£330
Aires B20 Board	£100
Rcm Expansion Board	£ 55
Acorn DFNS 1.2	£100
TOTAL	£585

Your basic BBC B has five Rom slots of 16K each, whereas the BBC B+ has six Rom slots of 32K each giving an extra 1.2K of Rom space! However in the BBC 3 you lose two 16K Rom slots for the Basic and O.S. Roms leaving you with only 48K of Rom space. In the BBC B+ you lose one 32K Rom slot leaving you with 160K of Rom space! Secondly, the DFS is the new 2.1 version with a 1770 controller chip. There is also an extra 12K of Ram space which nobody at Acorn can decide what to do with, but no doubt somebody will find a use for it.

Buying a BBC+ saves you £85 on the price of upgrading a BBC B. This must be considered a bargain and not, as one reviewer claimed, £170 for an extra 32K Ram. I give it an A+ not a D-!

Chris Arms,  
Stockport,  
Cheshire.

## MICRONETTING

I RECENTLY won a Prism VTX 5000 Modem in a competition organised by British Telecom. Since then the strings of G.T.'s Micronet 800 have been slowly but relentlessly closing around me.

It is true that by using the downloader program published in *Your Computer* I have been able to receive a number of excellent programs on your Telnet service. But where do we go from there? To download six programs took less than an hour, even though it was spread over two days because of the staggered transmission times. Now I can expect, at most, two or three new programs each month from Telnet. This would mean that the modem was used for about five or six hours each year.

So why not join Micronet 800? "One pound a month and the cost of a local telephone call" is B.T.'s advertising slogan. What is not mentioned is the fact that you must take out a year's subscription which is subject to V.A.T. As a youngster, some years ago, I was persuaded by a man on the local market into paying half-a-crown for an envelope into which I had seen him place a gold watch. It turned out that my envelope contained a pack of razor blades worth six old pence. Since then I have been very wary of people who want to sell me something without letting me see it first, particularly when it is going to cost me £59.80 plus telephone charges.

So who needs Micronet 800 when there are all those independent bulletin boards waiting to welcome me? Surely the VTX 5000 instruction manual would give me the information I required? Oh dear! The manual deals

# YOUR Letters



exclusively with accessing Micronet 800. The answer was obviously to write to Prism and ask for more details. Just to be sure I also wrote to the firm Modem House who were advertising use: to user and bulletin board software for the VTX 5000. The day after sending the letters I read that both the manufacturers of the modem and Prism were defunct and that Modem House had taken over the distribution. So what arrived through the post from Modem House? Yes, you guessed it, more advertising material for Micronet 800.

A visit to the local library provided a list of bulletin board telephone numbers and the disturbing information that most of them operated on a 300/300 baud system. The VTX 5000 operates on a 1200/75 system. I also found that I would need special software and would in some cases have to pay to access the 1200/75 system that existed. What is more most of these operators seemed to be located at the other end of the country. What price the "cost of a local call"?

R. Houston,  
St. Helens,  
Merseyside.

## "QL IS OK"

HAVING JUST READ the July edition of *Your Computer*, and flicked the pages to the Atari review, I have a question to ask. Quite simply it is: Why does Kathleen Peel despise the QL? Since this excellent machine appeared on the market, she has been giving the machine a hell of a slating. In any reviews or comparisons of machines in your magazine, I have always been impressed by how fair the writer has been in picking out the good points, but also the bad ones. Kathleen Peel, however, seems to be extremely happy to pick out only the bad points of the QL. For example, in the review in the July 1984 edition:

"... loading times, these figures are

Your Computer now has its own Prestel Mailbox. Our number is 019991800. If you have any program enquiries send us a message. We will try and give you an answer within a few days.

in no way good enough". "There are a number of notable omissions from the list of keywords, the ones I found most irritating were On Error and Rename". "The output was extremely difficult to format..."

The list could go on and on, but these are just three. I have chosen at random. In the Microdrive loading times section, she said that the Microdrives were just not comparable with disc drives. This is a rather stupid statement as Microdrives are only designed to load and save programs faster than cassette! All "tape drives" are slower than discs! As for the omissions of the two keywords, all I can say is "so what?". I use a Beeb at school for my A level computer science course, and I have only used "On Error" a handful of times and "Rename" only once. Their omissions from the machine appears to me as being no great loss.

In the Atari review, she says in the Opposition box: "Adequate software". "Adding a black and white monitor and 512K Ram expansion takes you up to £800". "On that basis, not worth thinking about".

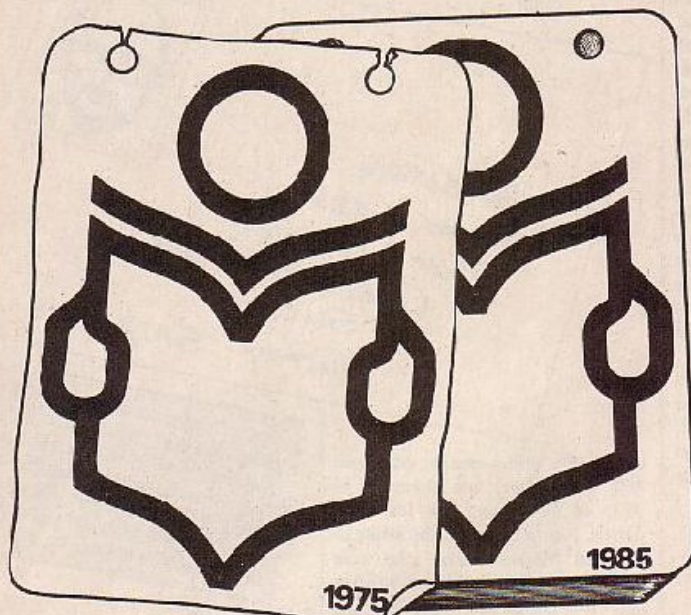
Good God! She rates machines such as the IBM PC, Apple Macintosh and Apricot FII higher than the QL! How on earth can you compare a £400 machine with those costing over £600! OK, I admit it, I myself think the Atari ST range will be tough competition, but it has taken Uncle Clive's QL to give the computer industry the kick in the groin needed to get home computers out of the old 8-bit forest. Let's all face it, if the QL had been an 8-bit machine, the new STs and the Commodore Amiga would probably be

(continued on page 21)



# Adult Literacy

## -the first decade



For help with Reading and Writing ☎ 01-405 4017

In 1975 the adult literacy campaign was launched to help the 2,000,000 adults who had difficulty with reading and writing.

By 1985 350,000 adults had received help with literacy.

For further information  
Adult Literacy & Basic Skills Unit  
PO Box 213 London WC1V 7ET

HER FANTASIES  
WILL OBSESS YOU...

# TWISTER

The mother of Harlots

## System 3 Software

### RSD Connections Ltd

MONITOR LEADS	RIBBON CABLE (price per ft)	SPECTRUM EX. LEADS
BBC to Microvite £2.20	Grey £0.13	6 inch extensions cable £11.50
TV to Computer £1.25	9-way £0.13	M to F £14.75
Green to Screen £2.95	10-way £0.15	12 inch extensions cable £14.75
BBC to Fidelity etc £4.95	14-way £0.10	M to F £11.50
QL to Fidelity etc £4.95	15-way £0.20	
Commodore to Fidelity etc £4.95	16-way £0.22	
Photo to Photo £1.25	20-way £0.30	
BBC to Ferguson £2.50	24-way £0.36	
QL to Microvite £2.50	26-way £0.40	
QL to mono monitor £1.50	28-way £0.45	
BBC to Sanyo/Kaja £5.95	34-way £0.60	
BNC to BNC £2.95	37-way £0.65	
Commodore to Ferguson £2.50	50-way £0.70	
BBC to Hitachi £2.50	50-way £0.95	
Sanyo to Fidelity etc £6.60	60-way £1.10	
MSX to Ferguson £2.50	64-way £1.25	
QL to Ferguson £2.50		
EDGE CONNECTORS	D C CONNECTORS	TELEPHONE CONNS
2 x 23-way (2XB1) £1.85	Solder Socket Male £1.00	Surface master £1.75
2 x 28-way (Spectrum) £7.10	9-way £0.75	jack socket £1.50
DOLBY SIDED PLUG BOARD	15-way £0.95	Surface ext socket £1.50
2K-81 23-way £1.25	15-way £1.50	Dual output register £1.25
Spectrum 23-way £1.60	37-way £2.40	Line jack card 3mr £1.85
ADDITIONAL IDC	HOODS £6.95	4 core cable per metre £0.48
20-way Card Edge In £1.25		All surface mits shunted B approved
DISK DRIVE LEADS		
Dual disk drive power lead £4.50		
Dual disk drive lead 1m £10.25		
Single disk drive power lead £2.75		
Single disk drive lead 1m £7.25		
Disk drive ext lead 1m £7.25		
Amstrad 2nd drive 1/2mm £6.95		
CASSETTE LEADS		
BBC to cassette £2.25		
Dragon to cassette £1.25		
Spectrum to cassette £1.25		
BBC Quadram cassette £2.25		
Amstrad to cassette £2.20		
PRINTER LEADS		
ALL 1 METRE LENGTH		
BBC £19.95		
BBC serial £18.95		
AMSTRAD £6.75		
MEMOTECH £2.75		
ENVS £IN £2.75		
IBM PC £6.75		
SPECTRUM interface one to RS 232 £9.75		
ATAP £15.25		
MSX £13.95		
APRIOT £15.20		
DRAGON £9.95		
QL £0.75		
ANY COMBINATION OF LEADS MADE TO ORDER		
CONNECTORS IDC	SPECTRUM DRIVES	IDC D CONNECTORS
Card Trans 2 Row £0.90	RS232 WAPA lead 1m £10.50	3-way Male £2.40
Loop PCB Socket £1.20	Centronics WAPA lead 1m £10.50	16-way £3.20
0-way £1.00	Micro Ext. lead 12" £6.00	25-way £3.10
4-way £1.00		37-way £5.50
6-way £1.20		
20-way £1.90		
26-way £2.40		
34-way £3.10		
40-way £3.40		
50-way £1.85		
60-way £1.85		
80-way £2.80		

TRADE ENQUIRIES WELCOME

75p P&P IN U.K. Access & Visa accepted. Add 15% VAT to all orders

Cheques made payable to

RSD Connections Ltd, Dept YC9

PO Box 1, Ware, Herts.

Tel: 0920 5285





# IN ★ TOUCH

## How to write for Your Computer

We called this magazine *Your Computer* precisely because we welcome your views, tips and hints and even your criticisms of machines and software in general. Here's how you go about getting your name into print. Your article should be typed, double-spaced, on A4 paper. A name and address on each sheet would help. Don't forget to tell us which machine it runs on. With programs please include a cassette or disc and some indication of how long it is. Please put what machine it's for on the envelope. Don't forget full instructions to us how to load and list your program and how to enter it for the readers.

The article must be submitted exclusively to *Your Computer*. We pay £35 per published page — that's as it appears in the magazine and includes illustrations.

## Telsoft

Telsoft is *Your Computer's* software downloading service. Any program for the Spectrum or the BBC — and soon the Commodore — which has a telephone symbol next to it is available on the service. Both 1200 and 300 baud speeds are catered for. For more details call Colchester (0206) 8068. No more lonely nights typing in endless pages of hex digits.

## Message service

You can get messages to us in two ways. Either use the Frestel Telex Link to 892034 BISPRES G or you can use our very own modem, day or night on 01-861 8976. The modem is V21, 300 baud, even parity, 10 bits per character. You simply transmit in upper case "YRC" — our address code, and wait for the acceptance code "+ + + STF GO". Then off you go. Don't forget to tell us who it's for. Sign off with "NNNN" — again in upper case.

(continued from page 19)

8-bitters also. I do not as yet own a QL, but I am considering it among a list of others, and so far it is top of the list.

What I would like to read now is Kathleen Peel's review of the BBC B+. Almost certainly it would be along the lines of "excellent value for your £500, On Error and Rename commands supplied, 54K Ram, built in DFS".

It would probably not mention the fact that at £399 the existing BBC B is considered over-priced, nor the fact that the machine is still 8-bit, nor the fact that some existing disc-based games may not run because of a difference in the chips used.

If it weren't for Uncle Clive and his innovations, we'd all be sitting out here waiting eagerly for the sixteenth "..." version of our 8-bit machines, wishing someone would be brave and go into 16 or 32 bits for a change ...  
*Colin Grant,  
Newcastle upon Tyne.*

## HATCHED FILL

THE HATCH FILL routine for the Spectrum, in the August issue of *Your Computer* by A.J. Renton, is a very useful routine. I would like to point out that it is not necessary to use the first User Defined Graphic each time.

The routine uses the byte value at address 23675 which points to the first UDG — see manual — and is normally set at 38. By Poking this address with another value the routine can be made

# YOUR Letters

to use any of the UDGs. The value Poked needs to be divisible by eight to capture the first byte of the UDG but intermediate values may be Poked to vary the choice of patterns. For example

### POKE 23675,93

will produce a hatched pattern using the last three bytes of graphic "A" and the first five bytes of graphic "B".

Extra patterns can be produced by calling the routine more than once with 23675 Poked with different values each time. As an extra bonus any eight byte sequence in the Spectrum memory can be printed as a pattern by Poking 23675 and 23676 with suitable values to point at the required address.

To avoid complications reset the variable area to normal when not using the Hatch routine, i.e.

POKE 23675, 88: POKE 23676, 255.

*Keith Selby,  
Old Coulsdon,  
Surrey.*

## SPRITE DESIGN

IN R. Newman's Spectrum Sprites program that appeared in the June 1985 issue of *Your Computer*, there is a sprite designing program. Unfortunately, due to the use of the In command, it has been rendered unusable by model 3 owners. Up until now that is. The secret is to take 64 from any In results. Therefore to alter the sprite designer to run on a model 3 Spectrum.

Line	Appears in Frog as:	Change to
3060	255	191
3065	251	187
3080	251	187
3080	243	179
3080	235	171
3085	254	190
3090	239	175
3100	251	187
3105	247	183
3110	239	175
3115	243	179
3120	235	171

For example:

3100 If a = 251 THEN LET X2=X1+  
(X1 15) should be  
3100 If a = 187 THEN LET X2=X1+  
(X1 15)

*Jon Ross,  
Bognor Regis,  
Sussex.*

## A CHILDS' VIEW OF LOOPING THE LOOP

I SIMPLY cannot let Geoffrey Childs' letter in the July issue stand uncorrected.

The first thing that a beginner should learn about loops is that you should not jump into them. Jumping out of them is not only legal but often necessary, as when searching an array for some target element.

It is true that many versions of Basic cause problems when one jumps out of a loop. However, this is a bug in Basic — see my article, "A Bug in Basic", which appeared in the American magazine *BYTE*, January 1981. It is not in Fortran, Pascal, C, or other higher-level languages.

The line L = 10 which Childs cites is a line which, although it is allowed in Basic — which does not check such things — violates a rule of almost every other higher level language; namely, that in a loop for "variable" from "minimum" to "maximum" one must not change the values of either "variable" or "maximum" inside the loop; if one does, then unpredictable behaviour may result.

If you have a version of Basic with the bug, the best way to avoid it is to "write out" your For

loops without the For statement. That is, instead of

For I = M TO N:code:NEXT I,  
write  
I = M:"label" code:I = I + 1:IF  
I <= N THEN "label".

Instead of  
FOR I = M TO N STEP J:code:  
NEXT I  
write

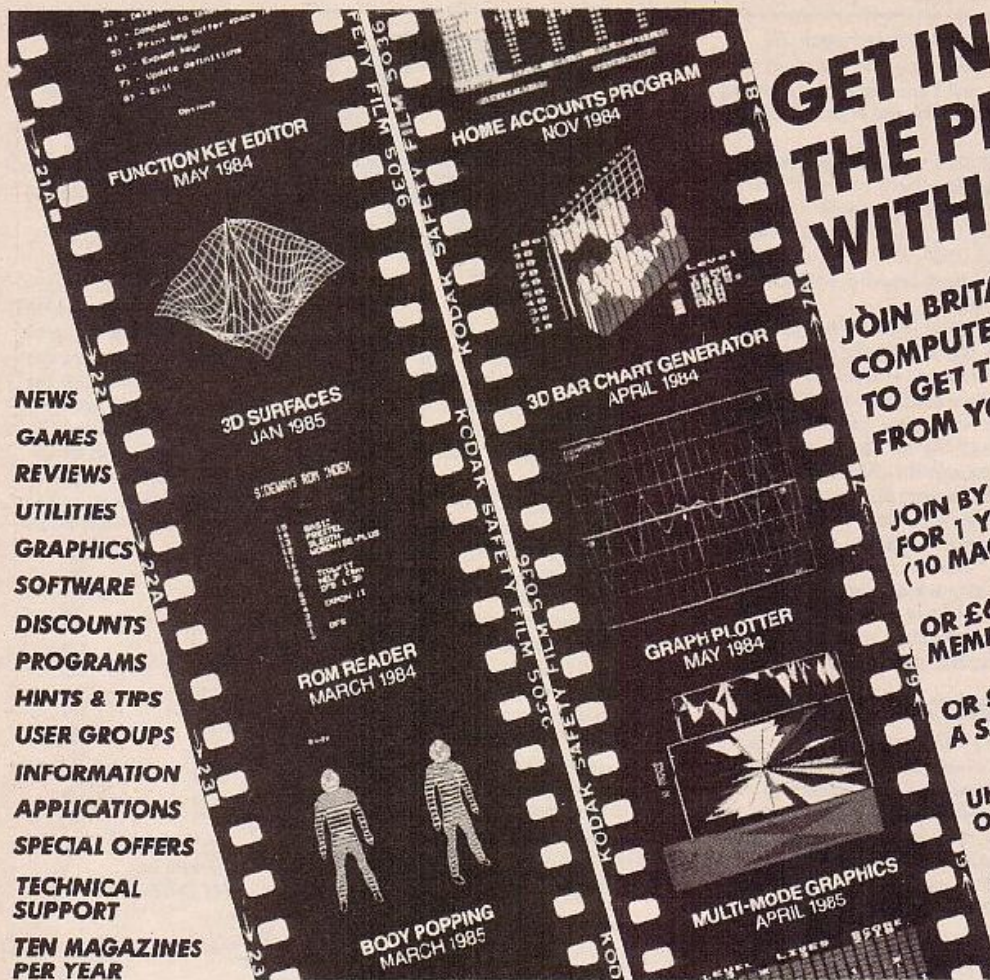
I = M:"label" code: I = I + J:IF  
I <= N THEN "label".

It's true that if you do this you are using an extra Goto statement. But if you're avoiding Goto statement, use Pascal in the first place, or Simons Basic.

*Douglas Maurer,  
George Washington University,  
USA.*







# GET IN THE PICTURE WITH BEEBUG

JOIN BRITAIN'S LARGEST  
COMPUTER USER GROUP  
TO GET THE MOST  
FROM YOUR BBC MICRO

JOIN BY SENDING £11.90  
FOR 1 YEAR MEMBERSHIP  
(10 MAGAZINES)

OR £6.40 for 6 MONTHS  
MEMBERSHIP (5 MAGAZINES).

OR SEND £1.00 FOR  
A SAMPLE ISSUE (UK ONLY)

UK ONLY -  
OVERSEAS PRICES ON APPLICATION

MAKE CHEQUES PAYABLE TO  
BEEBUG DEPT  
PO BOX 109 HIGH WYCOMBE  
BUCKS.

NEWS  
GAMES  
REVIEWS  
UTILITIES  
GRAPHICS  
SOFTWARE  
DISCOUNTS  
PROGRAMS  
HINTS & TIPS  
USER GROUPS  
INFORMATION  
APPLICATIONS  
SPECIAL OFFERS  
TECHNICAL  
SUPPORT  
TEN MAGAZINES  
PER YEAR

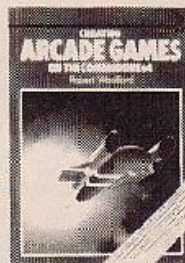
YOUR MIND WILL BE  
POSSESSED BY...

# TWISTER

The mother of harlots

System 3 Software

## CREATE C64 ARCADE GAMES!



Now you can learn how arcade games are created from scratch. Step-by-step, in easy-to-understand detail, commercial software developer Robert Woolford lets you into the secrets of the professionals.

You'll discover how to think up ideas for arcade games on the 64, and then learn how to turn those ideas into fast-moving, challenging, marketable software.

You'll discover how the experts make their programs run more quickly. You'll be shown how to maximise the real-time interaction between the machine and the player, to ensure the highest possible level of excitement is created by the games. Sample programs are included throughout the text, so techniques can be seen in action as they are described.

The book also includes a fully annotated, complete arcade game listing.

Creating Arcade Games on the Commodore 64 by Robert Woolford (ISBN 0 907563 75 9) is £7.95, and is available at most book and computer stores, or directly from the publishers, post free:

Interface Publications Ltd., Dept YC,  
9-11 Kensington High Street,  
London W8 5NP

(Trade only: WHSD Leicester)



Interface



# Star★ chart

## KEY

- ★★★★★ Best of its type
- ★★★★ Very good
- ★★★ Good
- ★★ Average
- ★ Below par

## Frankie Goes To Hollywood

CBM-64  
Ocean  
Adventure  
£9.95

★★★★★

Extensively previewed in our June issue, the game has deigned to come on to the market at last, but it's just as good and revolutionary as when we raved about it last time. You have to solve a murder mystery and strive to become a complete person. The music is excellent and the use of window graphics is superb. Frankie Goes To Hollywood may be last year's model as a band, but the game will definitely run and run.

## Repton

BBC  
Superior Software  
Arcade Adventure  
£9.95

★★★

Just as every Western is said to be a variation on one of seven basic plots, so new computer games usually just ring the changes on a handful of familiar game concepts. Repton is a case in point. It contains elements of Dig-Dug, Boulderdash, and maze games, wrapped up in an arcade adventure format.

The game is also on an impressively large scale. There are 12 levels and on each the screen scrolls in four directions over an area 16 times its size. You have to tunnel through the earth collecting diamonds. But as you do so you dislodge boulders which invariably tumble down to trap you or seal off a vital passage.

Fortunately at any point in the game you can consult a map.

All these features add up to produce a highly playable game.

# SOFTWARE

## Mig Alley Ace

■ CBM-64  
■ U.S. Gold  
■ Simulator  
■ £15

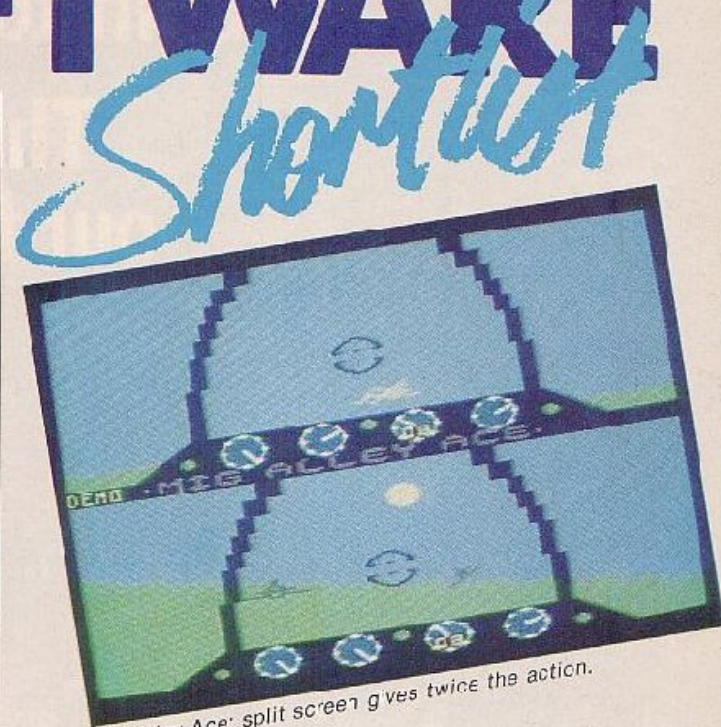
★★★★★

THERE'S ONLY one thing better than blowing away a computer-controlled plane and that's blowing away a plane controlled by a human opponent. Introduce the element of competition in a computer game, and you're on to a winner. No more arguments about high scores made at one in the morning after five hours play, in Mig Alley Ace reputations are made where it counts: head to head.

The game is all about air combat over Korea. The name comes from the area between the Yalu river and the 38th parallel; it was a place where a pilot picked his fights carefully, if you didn't like the odds, you get the hell out, at least the pilots that survived did.

In the game, the screen is split into two, each half giving an out of the cockpit view with some rudimentary instruments. Each player uses a joystick to control his aircraft, plus keyboard controls for throttle and bail out.

There are three different ways you can play the game: single player for practice, two player co-operative or head to head. You can add computer controlled aircraft to taste: if you're feeling sadistic you can gang up on the computer two to one. After you've decided the sides, there are five



Mig Alley Ace: split screen gives twice the action.

scenarios to choose from including choosing bombers, fighters or transports, altitude, night or day.

Each side starts off with three lives, which are lost if you crash, get shot down or bail out unsuccessfully. You get points for planes shot down depending on the difficulty level you set yourself: the harder the task, the more points you get. So much for the bald facts, what's it like to play? My favourite is head to head with an extra computer controlled wingman each.

The game makes no pretence of simulating flying a Sabre or Mig, it concentrates on the all-important matter of getting your opponent in your sights and keeping him there long enough to

blow him away. Whilst not detailed, it is superbly accurate. From tight turning on the edge of a stall to aiming off with your cannon to allow for gravity and the enemy's movement.

It's unfortunate that player one can only operate his throttle if player two is prepared to let go of his joystick.

Another problem is getting used to the way other planes are displayed. This is fairly rudimentary and is based on their respective ranges and attitudes.

This is a game that will instantly appeal to the simulator buff. For the novice, it's going to be a rough, one-way ride to oblivion, at least to start with. But persevere, and find out if you've got "the right stuff".

## ... BEHIND THE SCREENS ... BEHIND THE SCREENS

IF YOU'RE LOOKING for a flight simulator, then look no further than Microprose. A small outfit set up two years ago, they've built up a solid reputation under the driving force of ex-fighter pilot "Wild Bill" Stealey and now have over eight per cent of the U.S. market.

Andy Hollis met Bill when they both worked for General Instrument Corporation and, soon after Bill formed the company with Sid Meyer, Andy started moonlighting for the company, working on Mig Alley for the Atari. "I first got interested in computers at college whilst majoring in mathematics. I got an Atari video console and really got hooked on Breakout. It's been downhill ever

since. Mig Alley was always a compromise between realism and playability.

"I wanted it to be fun to play but still make the fighters handle accurately. I used plenty of ideas from Sid Meyer and his work on Helicat Ace."

Andy Hollis: "It's been downhill ever since."



But Mig Alley was a far greater challenge — over three times as much mathematics was required to get the planes moving relative to one another. "My current favourite game is the one I'm working on right now. It's called Gunship. I really don't get much time to fool around with the other stuff that's on the market." Gunship promises to break new ground in simulator graphics with realistic motion of buildings as you skim along the tree tops.

Andy wouldn't reveal if he'd ever succeeded in shooting down his fighter pilot boss but then it pays to let your company president win now and again.

Lee Padden



# All MSX computers are built to the same standard.

## That's what makes our first one different.



At Pioneer we've never believed in following the crowd. We prefer them to be one step behind us.

And with our innovative reputation in Hi-Fi and In-Car Entertainment, people tend to demand rather special things from us. Our new PX-7 home computer is just that.

It has all the benefits you'd expect from a standard MSX home computer, but with a few added talents.

No other home computer enables you to create your own art and animation like the PX-7.

Up to 16 different colours are available and by using the optional PX-TB7 graphics tablet you can create illustrations, shapes and various backgrounds. Then store up to eight of these shapes with their respective animation programmes in the computer memory.

**Moving Pictures.** Use the PX-7 in conjunction with a video or LaserDisc\* player to superimpose your graphics, creations or titles onto a moving video picture. The PX-7 can also produce stereo sound with three different voice patterns over eight octaves and superimpose them over other sound sources.

**Video control.** When used in conjunction with our SD-26 component television and LD-700 LaserDisc\* player, the PX-7 has the added versatility of being able to understand and control the complete system.

So if you're looking for a home computer that's versatile, talented and one step ahead of the crowd, remember there's only one. The Pioneer PX-7.

Phone 01-200 0200 for your nearest PX-7 dealer.



**PIONEER®**  
The future of sound and vision.

**\*LaserDisc**  
is a trademark of Pioneer  
Electronic Corporation.



The LaserVision trademark  
certifies compatibility with  
other laser optical video  
products bearing the mark.



# Star★ chart

## Southern Belle

Spectrum 48K  
Hewson Consultants  
Simulator  
£7.95

★★★★

The golden age of steam is dragged kicking and screaming into the digital age of the micro. All aboard, the whistle blows, and the mighty Southern Belle pulls out of Victoria on its way to Brighton with you at the controls.

You take the part of an engineer, with the computer holding your hand to start off with; as your confidence grows, you can take on harder and harder runs, and use more of the controls. What will make this game a huge hit with the steam fraternity is the "chrome", with perspective line drawings of all major trackside features. Unique idea, superbly executed.

## War Zone

Amstrad  
CCS  
Wargame  
£7.95

★★★

Capable conversion of the Spectrum game, abstract war game, you versus computer with artillery, tanks and infantry. Move, fire and melee in an attempt to invade the enemy heartland before he does the same to you.

## April Showers

BBC  
Bevan Technology  
Dodge about  
£2.50

★★★

You are a cloud — well, why not. Your task for the day is to avoid evaporating by crashing into other clouds and raindrops, whilst keeping a delicate little bloom from wilting under the barrage of the hot sun and hordes of umbrellas. If you manage to fend off the offending umbrellas, on to the next day. The graphics are colourful with some nice touches, like the pair of eyes in the cloud which look in the direction it's moving.

## Beach-head II

■ CBM-64  
■ US Gold  
■ Combat simulation  
■ £14.95

★★★

STORIES FOR BOYS — in the tradition of War Picture Library comic books, the soldiers in this follow-up to US Gold's blockbuster Beach-head cry "Argh", "I'm hid" and "Medic!" when they get blown away.

Beach-head II is a two-player game, which you can play against another human, or the computer.

The first scenario, "Attack", pits a detachment of chopper-borne paratroops versus the dictator's machine gun emplacement. If you are in command of the attacking force, you start off controlling the helicopter. Make sure you don't come in too low, or you'll kill your troops when you drop them — this is done by pressing the fire-button. They hide behind a wall with three gaps in it. Both sides of the gaps flash periodically, and if you hit the fire-button, troops move out in pairs from that side. Usually one soldier seems to be under your control, while the other has a mind of his own, and acts as a decoy.

One man may throw himself over the second wall while another emerges from the sole central gap in this wall to make a frontal assault

## Great American Cross Country Road Race

■ CBM-64  
■ Activision  
■ Road racing  
■ £9.95

★★★

THIS MAY BE THE computer game with the longest name in the world. It may be, as one American newspaper has it "Cannonball Run on a Home computer". Burt Reynolds may have his doubts. At first glance the main game is a little like Audiogenic's Talladega. But there is plenty of geographical and chronological variation — it gets darker as the day wears on, and some nice additions.

You can, for example, race from San Francisco to Washington, Los Angeles to New York, Seattle to Miami, or there is even a U.S. tour. Once you have selected a route the map screen pops up, allowing you to check where you're going and what the weather is going to be like. So if you drive up on the Range, Minnesota way, you tend to

# SOFTWARE

## Shortlist



with hard grenades.

In the second scenario, "Rescue", some pretty bizarre things appear to be going on, but basically, if you were in control of the troops before, you should now have control of the machine gun emplacement. Your job is to cover your hostages as they escape from the Dictator's fortress.

The third scenario "Escape" involves flying a helicopter up a roadway with things firing at you.

An enjoyable game which should keep the kids away from tearing the legs off insects or teaching the cat to fly, but for my money the first scenario is the one which will get played most. £14.95 on disc, £9.95 on cassette.

Paul Bond



Longest race: longest name.

get snow, but other scenarios take you through desert and plains.

You have a certain amount of time to complete each leg of a race. If you go too fast you attract the attention of the highway patrol and get flagged down. Also you must keep your eye on the gear shift: as the RPM increases, the car's engine whine gets higher — if you let the tachometer reading get too high without slowing down and shifting gears — the engine blows, and you have to "push" it to the next gas station, using the fire button.

The facility to down-load games so that you can build up a file of fields to race against is a nice touch. A nasty touch is that it's very easy to drive past gas stations you really wanted to stop at. People playing the forthcoming European Road Race from the same company will doubtless have a "Sacre bleu!" option for this eventuality.

Paul Bond

## Juggernaut

■ Spectrum  
■ CRL  
■ Truck simulator  
■ £7.95

★★★

TIME TO dig out them Farou Young records and settle down to a little silicon truckin' on the Spectrum. Believe it or not this is an articulated lorry simulator. Better yet, it's icon-driven.

The entry screen is divided into two sections — driving information at the top and five icons at the bottom. The driving display has dashboard data like fuel, speed, distance travelled and time elapsed, together with a stylised steering wheel and joystick. There are some traffic lights represented here, too — points are given against you for jumping traffic lights, speeding and damage done to the lorry.

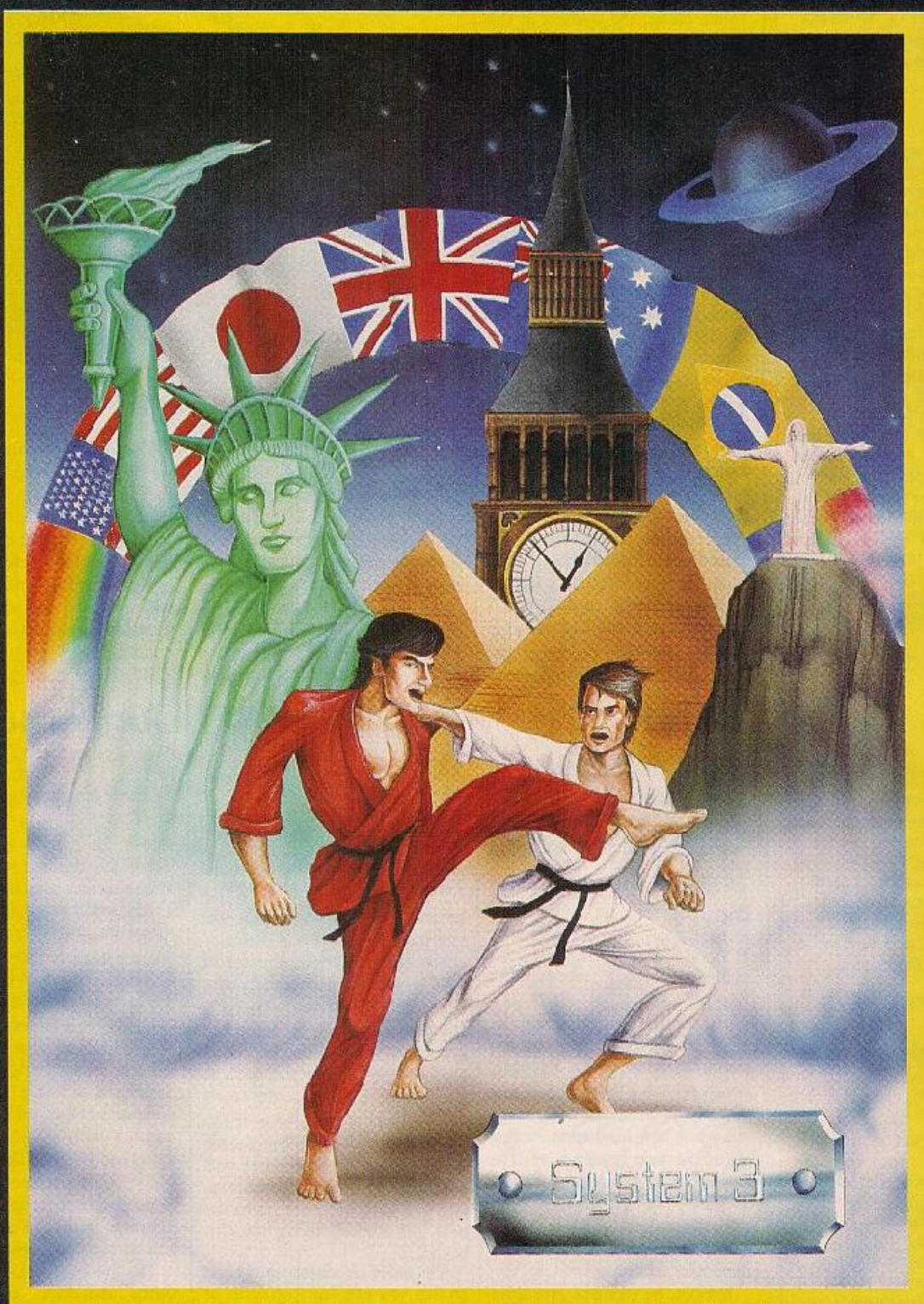
The five icons enable you to re-define the keys, see hi-score, practice, change the size of your lorry or just drive.

A nice idea, could have been more smoothly implemented for this price, and a third and a fourth gear would have made it a useful driving simulator. But still, loads of fun, so keep on trucking, CRL.

Paul Bond



# INTERNATIONAL KARATE



**..And you thought  
you'd seen a Karate game**

As you know, like the Martial Arts, Perfection  
is the only accepted standard, so play nothing  
until you play — SYSTEM 3's — INTERNATIONAL KARATE

For the Spectrum,  
C.64, Amstrad and  
all 48k Ataris at ONLY

**£6.50**

SYSTEM 3 SOFTWARE. SOUTHBANK HOUSE, BLACK PRINCE ROAD. LONDON SE1 TEL: 01-735 8171. Ex. 68



# Star★ chart

## 3D Voice Chess

Amstrad  
CP Software  
Chess Game  
£12.95

★★★

Amstrad conversion of successful Spectrum game, this version also features "speech" and a 3D perspective view of the game like the recent Ps on QL chess game. After you've turned the sound down to get rid of the speech, it plays a competent, if rather uninspired game. Book openings, hints and editing are available with seven levels of play.

## Grand Prix Rally II

Amstrad  
Amsoft  
Motor racing  
£8.95

★★

On a planet long ago lived a race of people so amazingly primitive they thought Pole Position was a really neat game. Well, this is worse. Take Pole Position, throw out most of the scenery, most of the cars, the smooth scrolling and the time/speed display and you get the idea of this one. Only for those sincerely desperate to burn some rubber on their Amstrad. One shudders to think what the first bite at the cherry must have been like.

## Cryptomania

BBC B  
Black Knight  
Arcade type adventure  
£6.95

★★

Armed with a laser, you traverse a crypt's tight-fitting passages in search of four keys to freedom. However, there are more complex crypts and hideous nasties beyond which they'll try their best to hinder you. The graphics are clear but simple and a little originality would have helped, but interesting to play if only to find out what's in the next crypt.

## Rocco

■ Spectrum  
■ Gremlin Graphics  
■ Boxing simulation  
■ £7.95

★★★

"I COULD HAVE been a contender!" you may feel tempted to echo Marlon Brando's words in *On the Waterfront* as you stumble bloodied but unbowed away from the keyboard.

Not exactly good clean fun, Rocco consists of punching four different boxers in your struggle to become champion of the world. The graphics are excellent, even if it is a little disturbing to see this sort of thing portrayed in such gruesome detail. However, this game is certainly a feather in Gremlin Graphics' cap.

The game, originally produced by Dynamic Software, has fallen foul of Sylvester Stallone insofar as it was originally named Rocky — but you don't argue with copyright or Rambo, it would seem.

To beat your opponent, you must knock him down three times. So much simpler than the comparable Frank Bruno game and much more satisfyingly brutal for those used to having large amounts of sand kicked in their faces.

Paul Bond

## Frank Bruno's Boxing

■ CBM-64  
■ Elite Systems  
■ Sport simulation  
■ £8.95

★★★

YOU CAN DUCK, dodge left, dodge right as well as larding right and left punches on your opponent's jaw. When the KO sign is flashing you can land a right hook/uppercut depending on whether your guard is up or down. Whether you make body blows or head blows is determined in the same way.

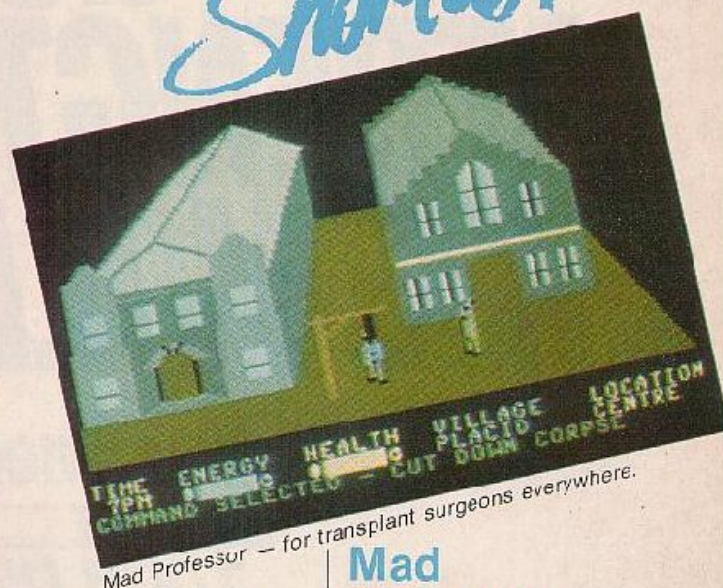
All of which makes Frank Bruno's boxing technically a more sophisticated game than Rocco, the other contender in the boxing stakes this month. If you win the bout you get a secret code which enables you to go on and load in the next boxer. You have to take on

Frank Bruno: Well, Harry...



# SOFTWARE

## Shortlist



Mad Professor — for transplant surgeons everywhere.

## Mad Professor

■ CBM-64  
■ Creative Sparks  
■ Arcade adventure  
■ £7.95

★★★

THIS IS AN adventure game for people who hate adventure games. You don't have to key in a wide variety of commands only to be told that you died of hunger and thirst while still on the first screen. By pushing the joystick forward and back you scroll through the commands necessary to the particular part of the scenario that you are inhabiting. Push the joystick left and press the fire button to execute the command. You'd have to be a real dummy to die on the first screen of this game. The graphics may not be exactly luxurious, but they're a passable 3-D.

You wake up in your castle, Schloss Strudelberg — where you as Franz Johann Blockenspiel the Mad Doctor are free to carry on with your gruesome hobby, reanimation of dead tissue with a view to constructing an artificial human.

There is a map screen showing the layout of the village near your castle: there are six main areas; the castle, the dwellings, Lightning Hill — a good place to zap some energy into your necro-android — the village centre near the police station, the forest and the graveyard.

The aim of the game is obviously fairly unpleasant. Of course you can construct a fair amount of your creature from dead

(continued on page 29)

Rocco: Don't mess with Rocky



eight boxers as opposed to the four in Gremlin's Rocco in order to become heavyweight champion of the world. Each of the boxers has a different fighting style.

Yet somehow the game doesn't succeed graphically in the way Rocco does. Punches don't produce the same squelching effect on your opponent, and your first opponent the Canadian Crusher, could be anything from a gorilla to a barrage balloon.

The screen is divided into two main sections. The upper half shows fight time, score and bonus — together with Bruno's status. The lower half shows a perspective view of the ring. It's fairly easy to defeat the Canadian Crusher, sometimes you can knock him out with just left and right jabs. I'm not totally convinced about the difference between head blows and body blows. It seems to be largely a random piece of luck if your blows have any effect.

The eight boxers are all fantasy characters laden with boring old national stereotyping. Ravioli Mafiosi (Italy) knows all the dirty tricks and uses them without a care in the world. That's not going to endear us to any computer users in Turin, is it?

Paul Bond



# GUTS. STRENGTH. SPEED. THE WILL TO WIN.

*You'll need 'em all.*

**TOUR DE FRANCE**



The world's no. 1 cycle race deserves the world's no. 1 sports software. Here it is. The fabulous Tour de France.

Strive to win as many of the 16 stages as you can to win the most famous jersey in the world. The yellow jersey.

Just like our block-busting Decathlon, Tour de France gives you the chance to combine joystick skills with sheer physical strength and mental tenacity to win through to become the outright winner.



**ACTIVISION**  
HOME COMPUTER SOFTWARE™

AVAILABLE ON COMMODORE C64 CASSETTE AND DISK. ACTIVISION UK LTD., 15 HARLEY HOUSE, MARYLEBONE ROAD, LONDON NW1, TEL: 01-935 1428. FROM SELECTED BRANCHES OF: BOOTS, WH SMITH, JOHN MENZIES, LASKY'S, SPECTRUM, RUMBLEOWS, WOOLWORTH AND GOOD COMPUTER SOFTWARE STORES EVERYWHERE.



# Star★ chart

## Confidential

Spectrum  
Radars Games  
£6.95

★ ★ ★

Another Quilod adventure, Confidential casts you in the role of a private investigator in a small coastal town.

The adventure has some neat touches. The persistent ringing tone in your office — the Craig Adams Detective Agency — at the start of the game is one. Others include the attractively presented text, with use of some small graphics, and the inclusion of a detailed street map.

You are called out to the home of a woman who badly needs your assistance. Getting there is not too difficult provided you don't try to walk the eight or so miles. Once you've arrived at the distraught lady's house, you'll discover that this is going to be a search for a missing husband.

An enjoyable adventure but not an easy game to solve.

## St Crippens

Spectrum  
Sparklers  
Adventure  
£2.50

★ ★ ★

Value for money from Creative Sparks again. Their low price good-quality software range now includes a game which might be interpreted as a searing indictment of the effect of government cuts on hospitals. So bad are things at St Crippens that you would rather escape from the hospital than risk treatment. Pursued by nurses, matrons, porters and even creatures from the genetic engineering lab, you must find your clothes so you can slip past the security guards.

Contact with the staff and patients gradually debilitates you to the point where you end up on crutches. Then you die. Simple but well-executed graphics, and dashed tricky to play using the cursor keys.

(continued from page 27)

bodies, hanged men and so on, but sooner or later you will have to knock someone off, take them back to the schloss and dismember them. You can't use too many parts from the same dead body or the resultant thing will be uncontrollable. Best not to knock someone off in a crowded pub because the villagers will attack.

You steer your character around the screen using the joystick, and if you are in a position to attack a villager, the relevant command will appear and if you think it is wise you can start in on a little mayhem. Then you will find it easy to get the command "carry body" and thence back to the castle for a little home surgery. Best to use the underground passage way — there's one from the castle to the pub, for example, otherwise the villagers will cease to be placid.

Once you've got your cadaver together and energised it, you present it to the people at the village hall. If you're lucky, the villagers will have about the thing from the grave and hail you as genius. If they don't dig it, they'll bury you. The game has a potentially monstrous appeal and will be enjoyed by transplant surgeons everywhere.

Paul Bono

Mad Prof: a little home surgery.



## Thing On A Spring

■ CBM-64  
■ Gremlin Graphics  
■ Arcade adventure  
■ £7.95

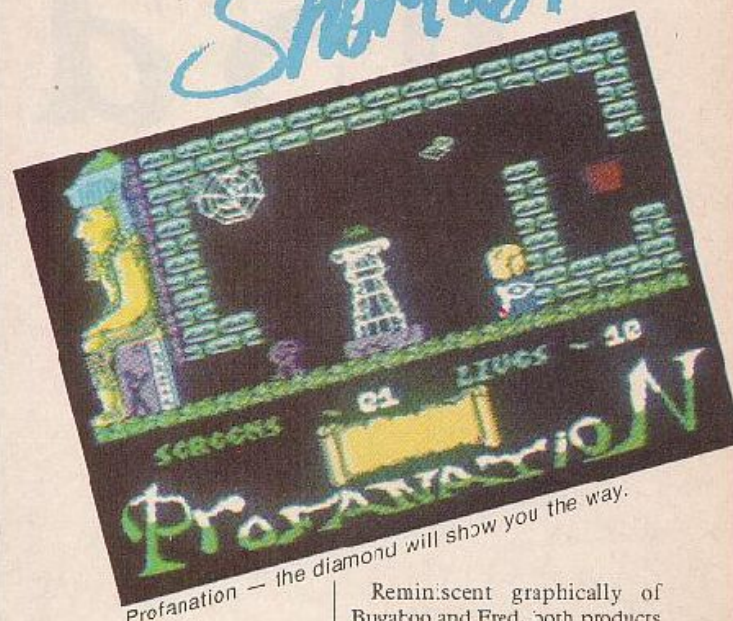
★ ★ ★

A REALLY PROMISING program from Gremlin Graphics, showing that with or without Tony Crewther they are capable of still coming up with the goods — maybe not great innovation but still a game that is pleasant to look at and absorbing to play.

Since the Evil Goblin is lousing things up as per usual, our hero — Thing On A Spring — has hopped into the enemy's underground factory to save the world. An appealing little fellow, he has to bounce on and off various platforms and conveyor belts to achieve his goal. But this is no simple platform game-cum-shoot-'em-up.

# SOFTWARE

## Shortlist



Profanation — the diamond will show you the way.

## Profanation

■ Spectrum  
■ Gremlin Graphics  
■ Arcade adventure  
■ £7.95

★ ★ ★

PROFANATION is certainly the name of the game here, since the idea of easing you into the game gently is not the idea. So you will be tempted to use all sorts of naughty words as you signally fail to get your little purple blob to jump past the acid drip on the first screen.



Thing On A Spring: catchy tune, now catch the goblin.

In order to use certain parts of the screen, you must first acquire the five control boxes. These take the form of little parcels lying about in fairly inaccessible places.

Apart from this, there are nine pieces of jigsaw to collect. When assembled, these provide the vital clue to the extinction of the afore-said Evil Goblin.

There are four floors to work through and by the end of the game you should know how to trap the Evil Goblin. Either way the catchy musical soundtrack will be firmly embedded in your brain.

Paul Bond

Reminiscent graphically of Bugatoo and Fred, both products of those immortal Spaniards Paco and Paco, and with names like Victor Ruiz, Florentine Petrejo, Santiago, Morga B and Snacho on the credit list, we leave you to draw your own conclusions, i.e. they have nothing to do with Paco e Paco except being Spanish. You have to discover the secret of Abu Simbel, the ancient Egyptian temple and free Johnny Jones from the spell.

Since this is just about the most fiendishly difficult platform-style game that you are ever going to meet, or want to meet, you will be doing an awful lot of tooth-gritting. You have to learn that you don't need to stand vertically on top of objects. Wait, calculate and think before you act, hints the program at the beginning — it also hints that "The diamond will show you the way".

This means that on one of the screens there is a diamond. You should note the colour of the gem as at another point in the game you will encounter a screen with five coloured squares on it. You must touch the square that is the same colour as the diamond if you want to progress further. Otherwise things get very profane indeed.

Graphics are pleasantly executed — as you yourself are from time to time — and the purple blob which is Johnny Jones has a whimsical way of looking around and grinning while waiting for the next move. Could be a distant relative of Roland Rat. All in all, one of the best games I've ever had to work in.

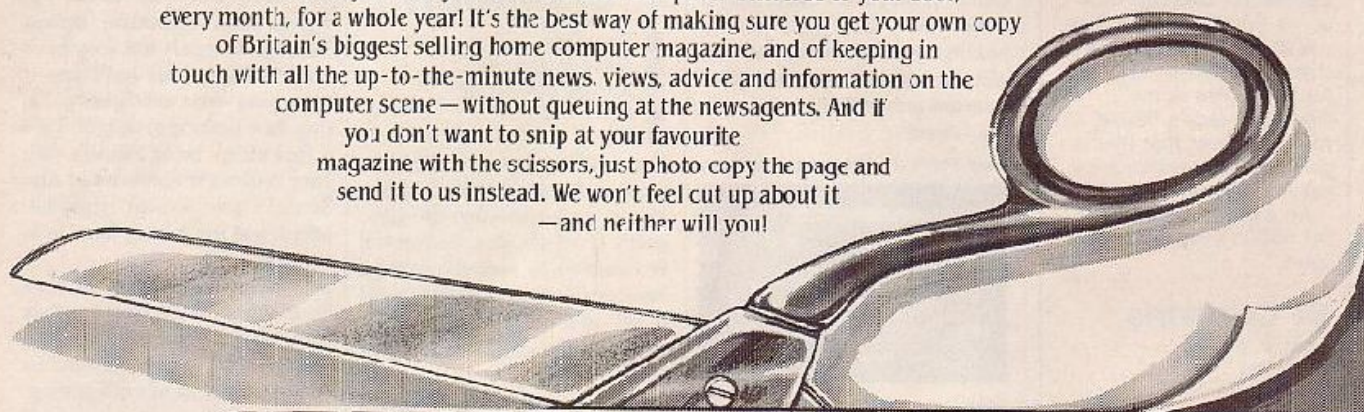
Paul Bond

(continued on page 31)



# It's a snip.

For only £14.00 you can have Your Computer delivered to your door, every month, for a whole year! It's the best way of making sure you get your own copy of Britain's biggest selling home computer magazine, and of keeping in touch with all the up-to-the-minute news, views, advice and information on the computer scene — without queuing at the newsagents. And if you don't want to snip at your favourite magazine with the scissors, just photo copy the page and send it to us instead. We won't feel cut up about it — and neither will you!



## YOUR COMPUTER

Please send me YOUR COMPUTER each month for 12 months.

A. I enclose cheque/PC to the value of £14.00 (UK), £22.50 (Overseas). Cheques should be made payable to Business Press International Ltd. Air mail rates available on request.

B. Please debit my credit card account:

Enter number:

(please tick)

Access ☐ Barclaycard/Visa ☐ Diners Club ☐ American Express ☐

Signed  Date

## SUBSCRIPTION ORDER FORM

NAME:

ADDRESS:

Job Title (if any)

Type of Business (if any)

Do you own a computer? Yes ☐ No ☐

Do you have access to a computer? Yes ☐ No ☐

If so please state type

Please return to: Your Computer, Subscription Manager,  
Business Press International Ltd., Oakfield House,  
Perrymount Road, HAYWARDS HEATH, Sussex RH16 3DH.

# YOUR COMPUTER



# Star★ chart

## Paws

Spectrum  
Artic  
Maze game  
£7.95

★ ★ ★

Just when you thought it was safe to change the cat tray — Artic have come back into the games market. In this setting of feline ferocity, you as the top cat have to get all your kittens together before the local dogs attempt a final solution to the caterwauling problem. So you scour the maze looking for the little ones and battling with any dogs you encounter. You can despatch canines by spitting fur balls at them. Not as pretty as Caesar the Cat but might appeal to Spectrum owners whose cats sit on the machine because it is the warmest place in the house.

## Glass

Spectrum  
Quicksilver  
Shoot 'em-up  
£7.99

★ ★ ★

Stunning graphics, but a prolonged opening sequence of blasting away at different aliens zooming towards you might put some people off. There are, however, three cities to attain. Also the gigantic megaships which crawl across the screen periodically become more numerous as the game progresses. Usual witty comments about what your status in the galaxy should be — like "Commodore owner".

## Aabatron

BBC  
Bevan Technology  
Shoot 'em-up  
£2.50

★ ★ ★

Good, safe familiar territory here. 20 screens, lots of action, colour and noise, indiscriminate destruction, touching just about anything kills you, variable speeds from boring to suicidal. Good, clear, harmless fun. Mildly addictive and good value.

(continued from page 29)

## Highway Encounter

■ Spectrum  
■ Vortex Software  
■ 3D shoot 'em-up  
■ £7.95

★ ★ ★ ★

ZONE ZERO is your goal. You have to take five Vortons there. And they in turn are trundling the world's most advanced weapons system, the pyramid shaped Lasertron in front of them. You have to get past marauding aliens, floating mines and abandoned oil drums to destroy the invader stronghold.

The screen gives a Zaxxon-esque three-quarter overhead view of a futuristic highway leading through the hydroponic fields, oxygen forests and fish-farms of the future. You start in zone 3C with a main Vorton and four auto-Vortons, plus of course your Lasertron. Your job is to troop along like a convoy of lorries carrying nuclear waste through the city at dead of night.

With the joystick or keyboard you control the main Vorton who is basically in the role of Sunday school teacher/shepherd rather than manic Dalek schoolchildren on a nature walk. They will charge along with their deadly toy until they run into something.

The best plan seems to be to stall the gang behind some oil drums

## Rupert and the Toy-maker's Party

■ CBM-64 and Spectrum  
■ Quicksilver  
■ Arcade adventure  
■ £7.99

★ ★ ★

RUPERT'S CHUMS are holding a wild party — oodles of curiant buns and lashings of pop. But getting the ancient teddy bear there on time is going to be no picnic.

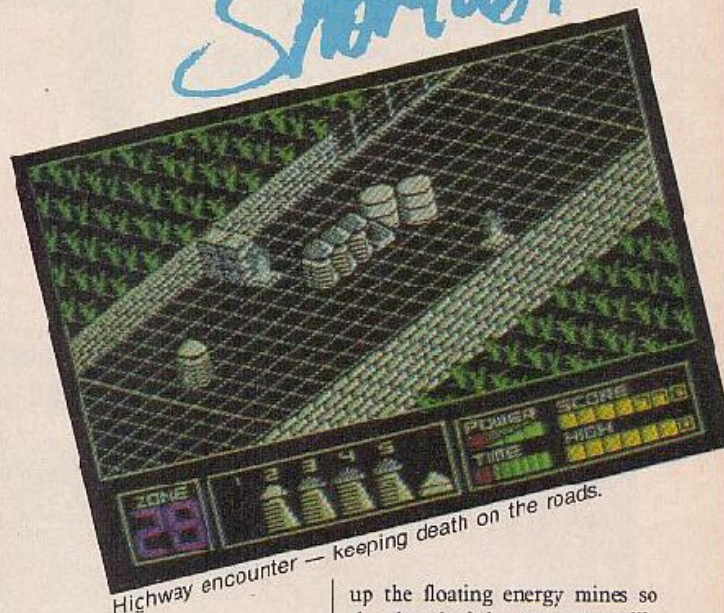
You have to manoeuvre the geriatric Rupert through seven screens of great graphics to what are presumably his sixty-fifth birthday celebrations. Rupert's first computer escapade is played out in and around the toymaker's castle.

The toymaker himself never puts in an appearance but there are plenty of his products about — most of the toys are out of control and aiming to make a nasty mess of the cuddly bear. But animal lovers shouldn't worry; no nasty incidents of mammal mangled in clockwork. The worst that happens is that Rupert takes a tumble and after six of those the game ends.

Toymaker's Party is a platform

# SOFTWARE

## Shortlist



Highway encounter — keeping death on the roads.

then nip through the zones and take out the various hornswogglers, squiggles, mouffs and hostile ice-hockey pucks that assail you. Most of these creatures defy description, but are well-designed down to a gleaming reflection on the road.

There is plenty of opportunity for doing strategic things like moving oil drums around to box

up the floating energy mines so that they don't hurt your crocodile of chumbles once they start charging down the highway.

At the base of the screen the display tells you which zone you are in, how many Vortons are left, and displays power, score, time left and high score.

A game for control freaks and Dalek and droid lovers everywhere.

Paul Bond

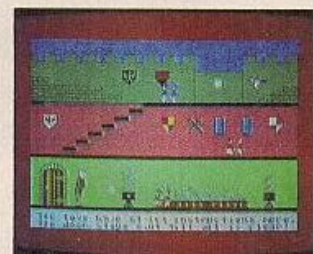
## The Scout Steps Out

■ Amstrad  
■ Amsoft  
■ Platform  
■ £8.95

★ ★ ★

TO CALL THE Scout Steps Out a platform game may be a trifle unfair. Only a few of the game's 13 screens contain platforms and there is not a conveyor belt or crumbling ledge in sight. Instead you may have to swim underwater, pick your way through a forest in search of mushrooms, or dodge the keepers in a park. Other exotic locations include an animated circuit diagram and a rain-swept block of flats.

You start off at base camp where Be prepared — Scout Steps Out.



Rupert gate-crashes a wild party.

game with the action viewed from the side. You have to get Rupert to collect the party invitations pinned to the walls to progress to the home and buns.

He hops and jumps energetically over an assortment of runaway jack-in-the-boxes, toy soldiers and trains, and can hitch a lift to safety on the back of magpies and toy aeroplanes. Be careful in the later stages — toys that were benign become killers and what were dangerous gadgets suddenly become Rupert's allies.

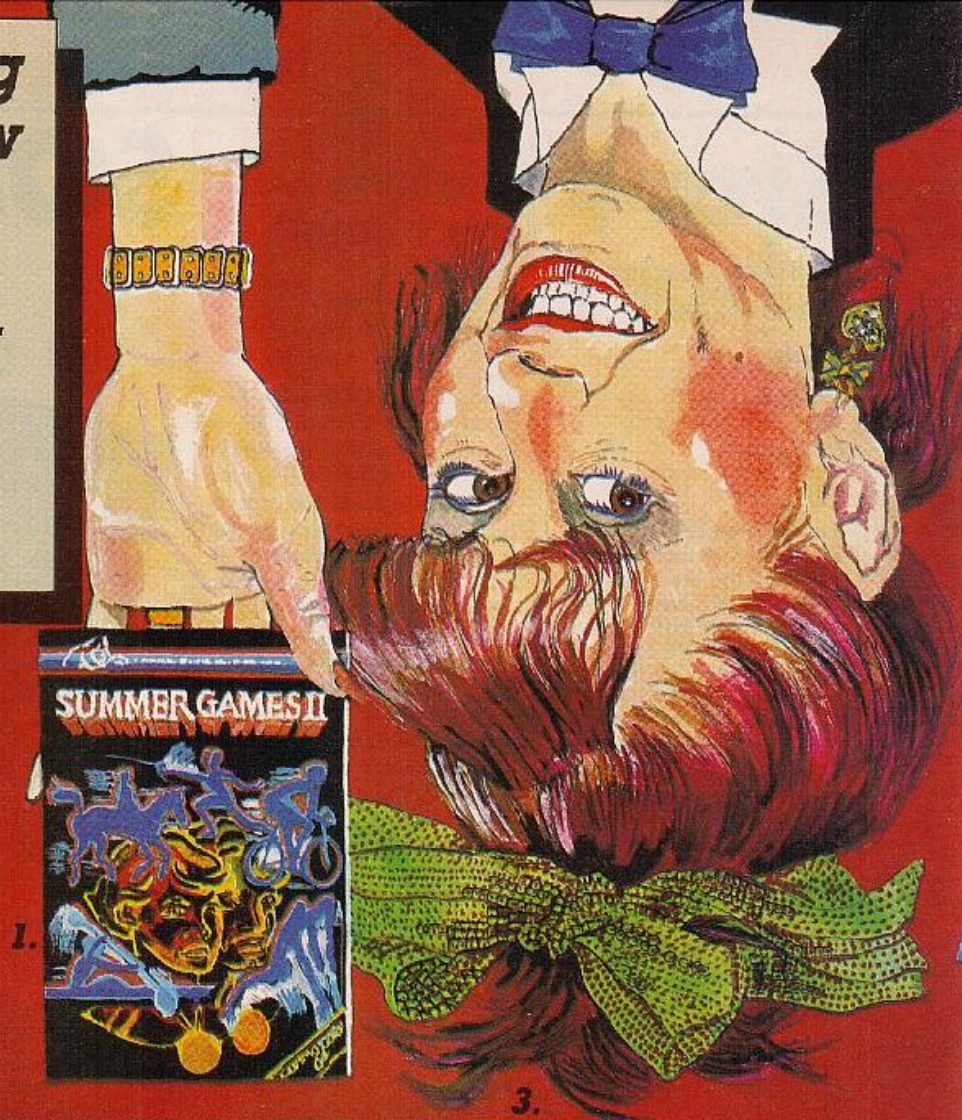
The setting for this game may be out of the nursery, but it's good clean fun to play and the graphics and music are as good as any you'll find in a CBM-64 platform adventure.

Toby Wolfe

(continued on page 34)



**After picking  
14 of the new  
releases,  
our Mystery  
Microgamer  
has finally  
flipped  
over two...**



## 'Three of a kind, O.

### My really brill two:

**1. Summer Games II**  
from US Gold. I'm a  
value freak and a closet  
athlete and now I can  
play in my silver lurex  
tracksuit!

**2. Sparklers Special**  
from Sparklers – 'cause  
this way I get four  
absolutely triff games  
for the price of one!

**3. Just Mystery Me!**

### My pick of Arcade and Adventure

## GLADIATOR

by Microgen

This is Roman arena 'Hail Caesar stuff'.  
Slay or be slain in 15 very gory contests.  
Plus gambling for your life. Even worse than a  
series with Lenry Henry. Well, almost.  
Spectrum 48K

£7.95

## DYNAMITE DAN

by Mirrorsoft

I warn you – your mind and everything else –  
is going to be *blown*! I mean boom, boom.  
Believe me, these are horribly impossible  
puzzles, only so good. And really special  
graphics that keep you jumping all the way  
through.

Spectrum 48K  
Amstrad

£6.95  
£7.95

## Quake

MINUS

by Manclith

You look like a  
recruit for the Robot Liberation Front – they  
only take weirdos like us! All we have to do is  
demolish the undersea Titan power plant and  
sort of bust up the world with quakes and  
tidal waves. OK yz?

Commodore 64

£9.95

## TERRORMOLINOS

by Melbourne House

This is the Costa Blanca gone stark staring  
bonkers. To survive the disasters of this  
utterly ugh family holiday you have to enter a  
saucy postcard world. To escape, you have to  
look snappy – literally – by bringing back  
10 photos that prove you were there!

Versions for most machines

£7.95

**THORN EMI Computer Software**

International Micro Software Division



## Something for you armchair athletes **TOUR DE FRANCE**

by Activision

After 16 grueling Stages round scenic France, you may never face a saddle or a yellow jersey again. If you're certain your joystick skills are 'formidable' - get pedaling!  
Commodore 64 £9.95

## INTERNATIONAL BASKETBALL

by Elite

Are you ready to jump, block and steal? Twist in mid-air? Go for basket after basket against 3 opponents through 9 skill levels from the utterly pathetic to Harlem Globetrotter? You are?

Spectrum and Amstrad £5.99

## SPOT THE BALL

by Creative Sparks

Two sports classics in one pack, but you only play one at a time, right? There's soccer and snooker, there's shooting and potting. Both need skill and timing plus a joystick plus 32K ram. Now go spot the ball!

Atari 32K £8.95

## SUMMER GAMES II

by US Gold

Stage your own Olympics! With 1-8 players and eight events, practice sessions *before* the real thing, then Ceremonies, National Anthems - the lot! You'll be as flakers as me after cycling, fencing, kyaking, high and triple-jumping, rowing, javelin and riding. Really, really good.

Commodore 64 £9.95

## It's 'bats-out-of-hell' time!



by Database

They call this flight simulation - *stimulation* more like! You get 3D on the graphics and 6G on the aerobatics. RAF pilots helped write this program.

For most micros.  
Cassette £8.95  
Disk versions £11.95 and £12.95

## ARNHEM

by CCS

This is actually more risky than a Harrods Sale - really. Just like 1944 in the second world war, you're in a tactical wargame, parachuting behind enemy lines to snaffle vital bridges and let the Allied Forces through. 1 or 2 can play.

Spectrum 48K + £8.95  
Amstrad version £9.95

## Super plays for rainy days!

### SOUTHERN BELLE

by Lewson Consultants

Bet you can't get your steam train through 24 stations with enough water and coal left to get you to Brighton on time. What with signals, tunnels and other snags, by the time you arrive you'll be steaming!

Spectrum ZX 48K £7.95

## Trivia

by Anirog

This is a quiz! The computer rolls the dice and asks the questions in 6 categories - one or two of which even bone-heads can answer. Nearly 2000 questions and most of them really silly.

Versions for most machines £9.95

## Win

### IDENTIFY THIS MONTH'S MYSTERY MICRO- GAMER AND WIN A 2-PACK PROGRAM PRIZE - TEN MUST BE WON!

If you know her name, send this coupon back to us, not later than 7th September 1985. The first ten correct entries drawn will each receive *Summer Games II* and *Sparklers Special*.

say the Mystery Microgamer is

Send me your latest 'full list of software programs

Name

Machine

Address

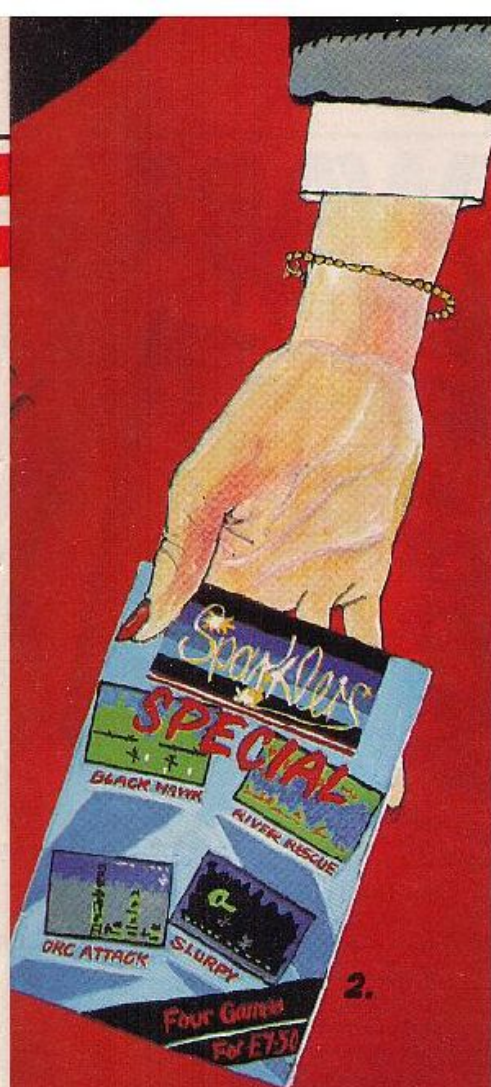
Postcode

CVG 2

Send to: Thorn EMI Computer Software, Mystery Microgamer Competition, Thomson House, 296 Farnborough Road, Farnborough, Hants. GU14 7NU.

Stephen Martin,  
London  
Ian Williams,  
Caernarfon  
J.R. Barnsley,  
Stafford  
Nick Withey,  
Swindon  
Jonathan Maycock,  
Newcastle upon Tyne  
D. Kirby,  
Greenford  
Geoff Bedford,  
Mellor  
Christian Mead,  
High Wycombe  
Lee J. Gomm,  
Berkhamstead  
Patrick Oliver,  
Birmingham

Last month's  
Mystery  
Microgamer  
was  
Kenny  
Everett  
10 prizes  
are on the  
way



## K ya?'

## JUGGERNAUT

by CRL

From the micro-makers of the Rocky Horror Show comes this 'rocky road show'. You drive a giant articulated lorry through roads and blockages you won't believe.

Spectrum 48K £7.95

## SPARKLERS SPECIAL

by Sparklers

How did they cram so much in? Like *Slurpy* the greedy-guts who guzzles Glowbugs and other similar yuk. Like *Orc Attack* with you defending your castle against plebs. Like *Black Hawk* the ultimate combat plane with 30 levels of play. And like *River Rescue* with you in the speedboat trying to save scientists, as if you'd bother!

Commodore 64 4 games £7.50  
Spectrum 48K



# Star★ chart

## Desert Burner

Spectrum  
Creative Sparks  
Shoot-em-up  
£2.50

★★★

Another implementation of the ever-popular moon-buggy genre. You have to leap over various obstacles whilst keeping an eye on the various things flying around crucking things at you. However, this version combines this with speed control which varies the length of the jump. This makes the process of jumping over things a great deal more fraught. Too fast and you won't come down in time for the next jump, too slow and you won't get over. All in all a good little pot-boiler.

## Metabolis

Spectrum  
Gremi Graphics  
Arcade adventure  
£6.95

★★★

You are a bird. The Kremins metamorphosed you, so you have to find the serum room to get back to human form. There is a wizard who cures you of all ills. You need a licence to kill as well. Interesting and quite humorous graphics.

## Nick Faldo Plays The Open

Spectrum  
Argus  
£9.99

★★★

Icons are all the rage these days and are well to the fore in what is probably one of the best golf simulations around.

The icons at the base of the screen allow you to choose clubs and control, force and direction of shot. You have a caddy who doesn't tell you what to do, but says things like "OK" in a little speech bubble if you're making sensible decisions. Not a golfer myself, but the accompanying booklet is informative and should appeal to learners of the ancient game.

(continued from page 31)

your troop of scouts is bivouacked. The game tells you that your mission is to be a good moral example to your troop. Translated into playing action this means finding the route that will take you to the next screen and picking up objects along the way. As each screen is crowded with a different set of life-forms, all of them hostile, this is no easy task. But if you can get back to screen one there is a large bowl of cornflakes which will restore any lives lost.

The authors, Dave Rogers and Colin Hogg, are regular *Your Computer* contributors; and if you have ever keyed in one of their programs, you will know that their games have a highly original flavour. What makes this one special is its graphics. Almost every screen has some pleasingly inventive touches, while the wet scenes in particular are a maritime marvel: rolling waves, rotting octopuses, and some superbly convincing sound effects.

Simon Beesley

## Dynamite Dan

■ Spectrum  
■ Mirrorsoft  
■ Platform game  
■ £6.95

★★★

THERE is certainly plenty here on the menu: eggs, cocktails, fruit, cheese, cake, ice cream, tea, soup — certainly the greatest variety of cuisine ever encountered by anyone trying to stay alive in an arcade adventure game.

Plenty of interesting things to pick up as well — credit card, deodorant, test tube, oxygen, dynamite — of course — and the top secret plans.

As Dynamite Dan you must thwart the plans of Donna and Blitzer (gedditt?) as they try to take over the world. The top secret plans are for a super psychon mega-ray; Dynamite Dan must garner eight sticks of dynamite so he can bust into the safe where the plans are kept. As you guide the prospective paterman in his odyssey, plenty of ugly insects, acrobatic hydrae and other nasties assail him.

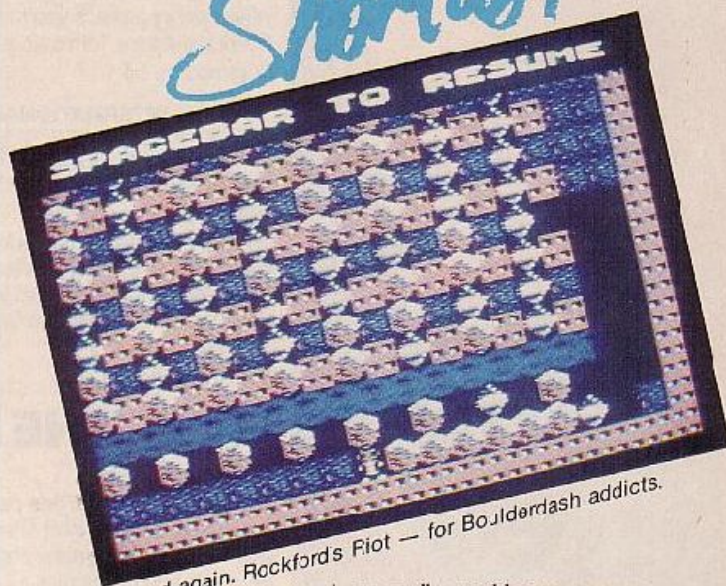
You should also beware of attacks of negative buoyancy — Dan can't swim — warning beeps indicate imminent starvation.

An interesting permutation on the theme is the use of trampolines at strategic points in the game — you can bounce around to your heart's content.

Paul Bond

# SOFTWARE

## Shortlist



Stoned again. Rockford's Riot — for Boulderdash addicts.

## Rockford's Riot

■ CDM 64/Spectrum  
■ Monolith  
■ Excavation game  
■ £9.95

★★★★★

INSTANT RELAPSE. Just when you thought you had licked your addiction to Boulderdash — easily the most potent game of 1984 — someone offers you a go at its sequel, Rockford's Riot. Pretty soon you dislodge a boulder, triggering off an avalanche. It gives you your first rush and the craving for more returns. To make matters worse, Monolith has included a copy of Boulderdash on the other side of the tape.

Rockford's Riot uses the same ingredients — boulders, jewels, amoebas, butterflies, fireflies, enchanted walls — but presents a brand new set of problems. There are 16 levels or caves as the cassette inlay calls them. In each cave you

can scroll smoothly over an area at least six times the screen size. And in each you have to collect a given number of jewels within a time limit. But beyond this common factor there is enormous variety so that each level could almost be described as a separate game.

Take cave B for example. Amoebas are oozing out from the tops of three large vats. So you must first shift boulders to seal them in. If you succeed the amoebas turn into jewels. Then you have to dash down to the bottom of the vats, unplug them, and when the avalanche of boulders has settled, collect 75 jewels before time runs out.

Collecting jewels is a problem in itself. They are invariably embedded in a pile of boulders. As the game simulates perfectly the physics of rock falls, you only have to extract one for the whole lot to come tumbling down. When it is accompanied — as it is on the CBM-64 — by a distant booming this provides one of the most satisfying experiences in computer gaming.

Simon Beesley

Save the world with Dynamite Dan: Mirrorsoft's explosive action.





### ROTRONICS DX-85 DOT MATRIX PRINTER

- 100 cps, 30 column
- Italics, condensed, expanded
- Centronics

ONLY  
**£199.95**  
(Serial add £18.00)  
(Commodore add £34.00)



ONLY  
**£24.95**

### STONECHIP BARGAIN BASEMENT

Spectrum Keyboard	£24.95
Spectrum prog joystick i/i	£12.95
Prog plus Kempston joystick vface	£16.95
16K expansion for ZX81	£9.95
Echo amplifier	£6.95
Vixen Motherboard	£14.95
Commodore cassette vface lead	£4.95
VIC20 Programmers	£9.95
Ad Cartridge	
VIC20 Programmers	£7.95
Aid ROM	
Lucky Dip 6 Spectrum programs	£2.95

### Rotronics DR2301 Data Recorder

- Audio and data
- Suits all home micros
- Direct VIC 20 and CEM 64 connection



ONLY  
**£27.95**  
(26" x 15" £31.95)

### Rotronics Portable Case

- 23" x 15" cubed foam
- Holds Spectrum or VIC 20/CEM 64
- Components work in situ

All prices include VAT and p. + p. Please make your cheque/PO payable to SMT. Or quote Access/Barclaycard number. Write your name and address clearly. Please allow 28 days for delivery. SMT, FREEPOST, Greens Norton, Towcester, Northants, NN12 8BR



## SJB DISKS LIMITED

### BLANK DISKS

Top Quality 5¼" Bulk Packed Disks

Supplied in 10's with a FREE Plastic Library Case, Labels etc.

10 Single Sided/Double Density*	ONLY <b>£13.95</b>
10 Double Sided/Double Density*	ONLY <b>£17.95</b>
50 Single Sided/Double Density* (Supplied with a Perspex Storage Box)	ONLY <b>£59.95</b>
50 Double Sided/Double Density* (Supplied with a Perspex Storage Box)	ONLY <b>£74.95</b>

★ **LIFETIME WARRANTY** ★

★ **FREE FAST DELIVERY** ★

All prices are inclusive of V.A.T.  
Delivery **FREE** throughout the U.K.

3" & 3½" Disks also available

Bulk Orders, Export Enquiries & Educational Enquiries Welcome

\* Double density is the equivalent of 40/80 track

Please Send Cheques/Postal Orders to:-

SJB DISKS LIMITED (Dept YC1)

11 Oundle Drive, Nottingham, NG8 1BN  
Telephone (0602) 782310



## Self Adhesive Cassette & Disk Labels

- ★ 3" & 3½" COMPACT DISK LABELS
- ★ SINCLAIR MICRODRIVE LABELS  
(ON TRACTOR FEED BACKING PAPER)
- ★ 24 HOUR SERVICE FROM STOCK

**CASSETTE LABELS ON A4 SHEETS** - White only, suitable for printing by offset litho or photocopying: 100 labels - £3.50; 200 - £6.00; 500 - £12.00; 1000 - £21.85

**CASSETTE LABELS IN ROLLS** - Complete with tractor feed backing paper for overprinting by computer printer. Available white or tinted blue, pink, green, orange, yellow, grey, peach, or cream. Minimum order 500 labels.  
WHITE: 500 - £14.66; 1000 - £20.70; TINTED: 500 - £16.90; 1000 - £24.15

**DISK LABELS** - All labels are on tractor feed rolls with tints as above.  
95 x 36 mm. WHITE: 500 - £12.75; 1000 - £17.75; TINTED: 500 - £15.20; 1000 - £24.65

**3" & 3½" COMPACT DISK LABELS** - 70 x 63 mm. white or tints as above.  
WHITE: 500 - £15.55; 1000 - £22.05; TINTED: 500 - £21.35; 1000 - £31.05

**SINCLAIR MICRODRIVE LABELS** - Side label 28 x 19 mm., Spine label 31 x 5 mm. Labels laid out side by side on tractor feed backing paper.  
WHITE: 1000 - £12.15; 2000 - £18.72; TINTED: 1000 - £16.64; 2000 - £32.52

**PRICES INC. VAT & CARRIAGE. SEND STAMP FOR SAMPLES & PRICE LIST WITH DETAILS OF QUANTITY DISCOUNTS.**

*Industrial  
Process*

UNIT A4, SMEED-DEAN CENTRE  
EUROLINK INDUSTRIAL ESTATE  
SITTINGBOURNE, KENT ME10 3RN  
Sittingbourne (0795) 28425 - 24 hrs

SELF ADHESIVE COMPUTER LABELS -

*Superfast*



## THE MICRO WORKSHOP MICRO COMPUTER SPECIALISTS

(Spectrum Group Member)

Software and hardware over the counter for  
Sinclair Spectrum, BBC, CBM-64, Memotech,  
Amstrad, Einstein, etc.

- |             |              |
|-------------|--------------|
| * COMPUTERS | * RAMPACKS   |
| * JOYSTICKS | * BOOKS      |
| * KEYBOARDS | * DISCS      |
| * TAPES     | * LIGHT PENS |

\* COMPONENTS \*

Educational/Business Programs available.

Located directly opposite Epsom Main Line  
Station. Visit us or ring for friendly service. See  
and try before you buy.

★ In house programming ★

Overseas/Export orders welcome

**12 STATION APPROACH  
EPSOM, SURREY.  
EPSOM 21533**



## "...a jewel of Spectrum programming..."

(Popular Computing Weekly)



£8.50  
INCL. VAT & P&P

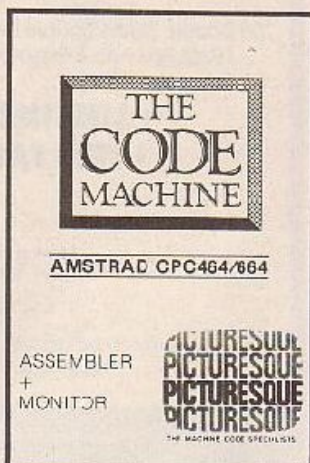


£7.50  
INCL. VAT & P&P

## ...now for AMSTRAD 464/664

- \* Assembler & Monitor in one package
- \* Many new features
- \* Fully relocatable
- \* Supplied on cassette — back up option to Disc
- \* Fully Disc compatible
- \* Plus much more

£19.95



AMSTRAD CPC464/664

ASSEMBLER  
+  
MONITOR

Fast Mail Order from:

Send SAE for full details

PICTURESQUE (Dept YC), 6 Corkscrew Hill, West Wickham, Kent

## BETA BASIC 3.0

SPECTRUM 48K

SINCLAIR USER, JAN. 85 (ABOUT RELEASE 1.8) "HAS ESTABLISHED ITSELF AS THE STANDARD EXTENDED BASIC FOR THE SPECTRUM...TURNS SINCLAIR BASIC FROM A GOOD VERSION OF THE LANGUAGE TO A FANTASTIC ONE." NOW, WITH RELEASE 3.0, BETA BASIC BECOMES PROBABLY THE MOST POWERFUL BASIC AVAILABLE ON ANY 8-BIT MICRO!

- \* PROCEDURES - a terrific implementation that lets you extend your Basic! No PROC keyword is needed; e.g. you can use commands like: swap a,b or draw box 10,20,5 or addup b1 sum. With parameter passing by value or by reference (including arrays), LOCAL variables and recursion.
- \* Up to 128 WINDOWS with their own attributes and character size.
- \* ANY CHARACTER SIZE (giving from 1 to 64 or more chars/line).
- \* LISTINGS with optional automatic indentation of loops, procedures, IF, etc. Works on existing Spectrum Basic programs too!
- \* KEYWORDS (including the Spectrum Basic ones) can all be entered by typing them in full or by the "single entry" method, or both in the same line.
- \* A full range of TOOLKIT commands. \* EXCEPTIONAL ARRAY and STRING handling.
- \* Many powerful GRAPHICS commands. \* EXCELLENT EDITOR - fast and convenient.
- \* MICRODRIVE commands are improved and much easier to use.
- \* OTHER FEATURES, new or improved, are too many to fully list! DO - LOOP structure with WHILE, UNTIL and EXIT IF; ALTER, AUTO, BREAK, CLEAR, CLOCK, CONTROL, DEF KEY, DPOKE, DRAW TO, EDIT, ELSE, FILL, GET, JOIN, KEYIN, multi-LET, LIST & slicer, LIST DATA, ON, ON ERROR, OVER 2, POKE strings, POP, READ LINE, REF, ROLL, SCROLL, SPLIT, TRACE, USING, Faster GOTOS, GOSUBS and FOR-NEXT loops.
- \* 25 POWERFUL FUNCTIONS: AND, OR, XOR, DEC, HEX\$, BINS, fast SINE, COS, RNDM, CHARS, NUMBER, DPEEK, EOF, FILLED INARRAY, INSTRING, ITEM, LENGTH, MEMOVS, MEM, MOD, SCRNS, SHIFTS, STRINGS, TIMES, USNGS
- \* Spectrum Basic compatible - you can run existing programs. Transferable to Microdrive, Wafadrive and other special versions available.
- \* Comprehensive A5-size manual. More than 80 pages, packed with examples.
- \* To show you the power of Beta Basic's excellent procedures, we include on each tape a FREE TURTLE GRAPHICS package!
- \* Upgrades to Release 1.8 customers: If you bought direct from us, there is no need to return your cassette - just quote the (approximate) original purchase date with your order; otherwise return your cassette and name your supplier. The upgrade price of £6.95 (£7.50 overseas) includes a new manual. Release 1.8 remains available, at a reduced price of £5.95 (£6.50 overseas).
- \* TRANSFORM your Spectrum with BETA BASIC 3.0 for just £14.95 inclusive! (£15.50 overseas). Or if you want to know more about the program, send us an S.A.E.

(TICK AS APPROPRIATE) PLEASE SEND ME:

- ☐ BETA BASIC 3.0. PAYMENT OF £14.95 (OR £15.50 OVERSEAS) IS ENCLOSED.
- ☐ BETA BASIC 3.0 UPGRADE. PAYMENT OF £6.95 (OR £7.50 OVERSEAS) IS ENCLOSED.
- ☐ BETA BASIC 1.8. PAYMENT OF £5.95 (OR £6.50 OVERSEAS) IS ENCLOSED.
- ☐ MORE INFORMATION OR I HAVE/DO NOT HAVE RELEASE 1.8 ALREADY.

A STAMPED ADDRESSED ENVELOPE IS ENCLOSED.

**BETA**  
SOFT

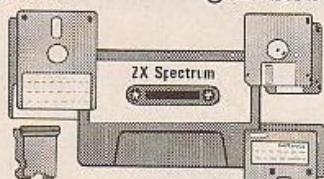
92 OXFORD RD.  
MOSELEY  
BIRMINGHAM  
B13 9SQ

# ROMANTIC ROBOT present

## New! TRANS-EXPRESS 85.2

The only fully automatic and professional utility for transferring Spectrum programs from:

- ① CARTRIDGE to CARTRIDGE or DISC to DISC or WAFFER to WAFFER
- ② TAPE to CARTRIDGE or DISC or WAFFER
- ③ TAPE to TAPE
- ④ CARTRIDGE to TAPE



"An ingenious piece of software." PCN  
"..... Features ..... Performance" PCN  
"A valuable utility for microdrive users." Sinclair User  
"HIGHLY RECOMMENDED." PCN

NEW! Part ② now fully automatic - you just START/STOP the tape-transfers, modifies, relocates, re-structures & helps to RUN also hyper-turbo, headlocks, extra long (including 40K) parts, etc.  
The best possible success ratio, the easiest & fastest in use.

## Wiggler

A CRASH SMASH



A novelty maze arcade game. Superb graphics and action. An extensive map, over 250 locations, full of features and creatures unseen as yet. New, funny, addictive, compelling.

Plus a bonus on side B:

'A WINNER.' PC Weekly  
'A Star Game.' PCN

THE BOOKS OF JUPITER

## New! MUSIC TYPEWRITER 85



COMPLETE MUSIC SYSTEM FOR THE ZX SPECTRUM

"A very professional piece of programming, easy to use, excellent screen presentation, error trapping and helpful prompts." ZX Computing  
"Extremely user friendly, lets you get started within minutes." Cross  
"The notation has to be seen to be believed." Your Spectrum  
"Quite many expensive professional systems to shame!" Great fun! The Listener  
"If you are interested in music and own a computer then get it." ZX Computing

NEW! Sheet music quality printout on dot matrix printers. NEW!  
Microdrive compatible

NEW SUPPLEMENT for £1.95 - DATA CONVERTER to use music in your own programs - MICRODRIVER puts MT onto microdrives. NEW!

Please send SAE for details.		Trade enquiries welcome.		Deliveries normally by return.	
I enclose a cheque/PO for £..... (European orders please add £1 overseas £2)		Please send me (tick as applicable) WRIGGLER		£ 5.95 <input type="checkbox"/>	
or debit my <input type="checkbox"/> <input type="checkbox"/> No <input type="checkbox"/>		MUSIC TYPEWRITER £ 9.95 <input type="checkbox"/>		MT Supplement £ 4.95 <input type="checkbox"/>	
Name..... Card expiry.....		TRANS-EXPRESS:		part ③ only £ 5.50 <input type="checkbox"/>	
Address.....		all parts on tape £ 9.95 <input type="checkbox"/>		or cartridge £ 14.95 <input type="checkbox"/>	
Signature..... Date.....		①+② on tape £ 7.50 <input type="checkbox"/>		or Rotronics wafer £ 12.95 <input type="checkbox"/>	
		Updates of TRANS-EXPRESS or MUSIC TYPEWRITER		£ 3.50 <input type="checkbox"/>	
		TRANS-EXPRESS upgrades from tape to cartridge		£ 6.95 <input type="checkbox"/>	

ROMANTIC ROBOT 77 Dyne Road London NW6 7DR

24 hrs ☐ ☐ orders 01-625 9463 ☐ YC



## ADD-ON EXTRA

### Amstrad SSA-1

Speech Synthesiser  
Amstrad  
£29.95

Hot on the heels of the CK Tronics unit reviewed in June, this is the "official" version. As it uses the same chip, and most of the commands do similar things, there isn't a great deal to choose between the two.

However, this version makes "legal" calls and so is compatible with all past and any future add-ons.

### Hyper Shot

Game Controller  
Various  
£9.95

Joystick just so much twisted plastic? Still after that elusive four-minute mile? Well, for sports enthusiasts everywhere, Korami has brought out a box with three hopelessly very robust buttons which simulate left, right and fire joystick movements. Plug into any Atari-style joystick port. Available direct from Korami on 01-429 2446.

### Discovery 1

Disc System  
Spectrum  
£199.95

Granted the Spectrum owner's reluctance to buy a peripheral that costs more than the original system, does the Discovery add up? For your money you get: a disc drive, a printer port, a joystick port, a built-in power supply and a monitor output.

The disc system is excellent. The single-sided drive gives you 80K formatted capacity. It is compatible with all Microdrive commands, but also has a full complement of "proper" disc commands. These include random access files as well as a Ram disc system where an area of memory is set aside and acts like a fast disc.

Blank 3 1/2 in. discs are widely available, and are rugged and reliable. A fast disc drive with a powerful operating system. But will it tempt the budget-minded Spectrum owners? Available from Boots.

# HARDWARE

## Databeeb

■ BBC  
■ Miracle Technology  
■ £25

IF YOU FANCY breaking into the world of micro communications, you'll need three things: a computer, a modem, and, perhaps most importantly, the software. Along with the usual Prestel and Bulletin Board software, Databeeb has facilities for controlling the company's Minor Miracles modem, in much the same way as the ZROM works for the Demon.

However, there are major differences. Databeeb uses the User port to control the modem, leaving the RS-423 port free for data handling. It also has BABT approval! The modem can be upgraded to get the most out of the new Rom. Auto answer, auto dial and mode selection upgrades are available. The whole lot, modem with all the extras and Databeeb, comes to around £200. But this is a piece of kit designed up to specification rather than down to cost.

If you are looking at Databeeb as a Comms Rom for any modem, it compares well with Pace's Commstar, its main rival. In Prestel mode, the last 16 pages are stored in Ram and the user can select eight others. These can be redisplayed and then treated as

## Logotron Sprite Board

■ BBC Micro  
■ Logotron Sprite Board  
■ £179.95 — or £239.95  
bundled with Logotron  
Logo. There is a discount  
for schools

THERE'S MORE to Logo, say Logo enthusiasts, than turtles. And indeed there's more to turtles than plotting those familiar geometrical patterns. With Logotron's sprite board, you can even write a game.

The board comes in a small metal box which links via a ribbon to the BBC's 1MHz bus and by a second cable to the power connector.

You activate it by selecting Logo and loading a .long — &4300 bytes — file, whereupon you're prompted to switch to the sprite screen. This you do by plugging your monitor into the sprite board, which now directly provides the video for your screen — there's a



The Databeeb: — software on a Comms Rom for any modem.

though they were the current frame for routing purposes.

Unfortunately, no off-line message editor is provided, and a printer dump is available for text only. The operating system can be accessed at any time by pressing the copy key. The bulletin board type software has the usual facilities to direct output to printer and/or disc.

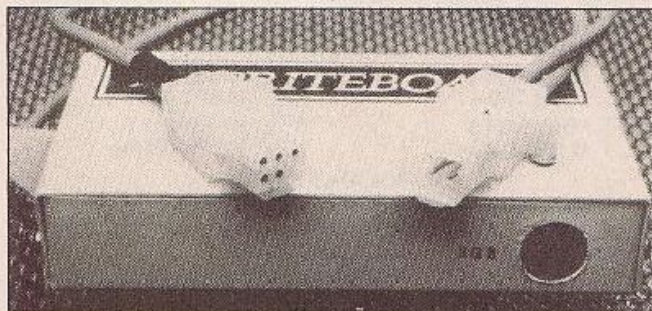
40 and 80 column modes are available, and the various commands are displayed optionally at the bottom of the screen. File transfer uses the X-modem format of Commstar. The software supports X-on X-off

protocols, local echo, line feeds and a variety of data formats are provided.

All the modem's functions are available through "star" commands, which means writing simple bulletin boards, doing unattended downloading, or even a little hacking should not tax anyone's basic programming skills.

If you've got a Miracle modem, and are thinking about upgrades then this is a good starting point. For anyone else, there is little to choose between this and Commstar. It's really a matter of personal taste.

Lee Padon



Logotron Sprite Board — write games without learning code.

choice, RGB, composite PAL or plain ordinary uhf TV signal.

The result of this is a sort of super-Mode 2 screen with 16 colours, including dark and light shades. At your disposal now are 32 sprites masquerading as turtles, each of them capable of assuming any of 64 shapes. There's a selection ready-made: a lorry, a tulip, a dog, a cross and so on; and of course a profusion of turtles, both realistic and symbolic. To define your own shapes, you can call up an excellent built-in editor.

And to animate them you can

draw or nearly 50 new Logo commands. You can whizz turtles around the screen, manipulate them independently or together, detect collisions and fill this or that with colour. So in theory you could write your own Frak! without having to learn machine code.

All great fun, and educationally very sound if rather expensive. But the software wouldn't run with my non-Acom disc interface. And the computers I tried wouldn't always power-up correctly with the board connected. Check before you buy.

Richard Lambley



# HISOFT

## High Quality Microcomputer Software

**FONT 464** is an easy-to-use program enabling you to design, edit, and save your own characters and graphics for simple use in BASIC programs. There are 6 pre-designed fonts and sophisticated printer-driving software which allows high-resolution screen dumps and letter writing on Epson compatibles or the DMPI.

**DEVPAK** is a complete machine code development package. It is the second one that many people buy, because after the first one they know what to look for! The front panel debugger is the only way to really see programs in action, and assembly from multiple source files is fast enough to satisfy its most demanding users - ourselves.

**ULTRAKIT** is the most powerful interactive toolkit yet for ZX BASIC. All the features you will ever need:

AUTO BREAK COPY DELETE EDIT FIND  
CRAB HIDE INFORM JOIN KEY LOSE  
MOVE NUMBER ONERROR PUT  
QSEPARATE RAMTOP SUBSTITUTE  
TRACE UPDATE VARIABLES WARN  
CRUNCH1 CRUNCH2 REMKIL PACKER  
MAP UCASE LCASE CTIME ATIME  
ALARM PRINTER KMODE RESET and  
much more. It comes with a FREE tape  
header reader.

**C** combines high-level structuring with direct control over the machine, all at compiled speed. Our compiler is now available from good retailers, and has proved extremely popular. It supports all statement types (plus inline code) and over 40 operators whilst char, int, unsigned and combinations using pointers, arrays, structures, unions, functions, and typedef are all allowed data types. External and static variables can have initializers, whilst auto variables support recursion. There are six preprocessor directives and over 60 library functions with a selective inclusion scheme.

**MON QL** is our latest product and our first on the QL; it was written by Andy Pernell, who has a great deal of experience on the QL. It is similar in style to the well-known MON 'front panel' in DEVPAK and includes additions like job control and multi-tasking support. It also catches system exceptions and includes fixes for QDOS.

**Pascal** is a valuable educational and development tool as well as running typically 40 times faster than a BASIC equivalent. Our compiler is an almost full implementation which compiles direct to machine code (no slow P-codes). Multiple file inclusion allows very large programs to be compiled.

Product Price Table

	Pascal £	DEVPAK £	C £	ULTRAKIT £	FONT 464 £
ZX Spectrum	25-00	14-00	25-00	9-45	
Amstrad CPC464	29-95	21-95			7-95
MSX	29-95	19-95			
CP/M-80	39-95	39-95			
Sharp	39-95	25-00			
Sinclair QL		19-95 (MON QL)			

All prices are for cassette versions (except CP/M and QL) and include VAT and p&p in the UK. Please contact us for export orders, disc formats or detailed technical information packs. All products are available by mail order; please send a cheque or Postal Order. Sorry, we do not accept credit cards.

# HISOFT

180 High Street North,  
Dunstable, Beds. LU6 1AT  
Telephone (0582) 696421

## STOPP!!! 60-80% RABATT!!!

VI KAN NU ERBJUDA ER ENGELSKA KONKURSLAGER TILL ABSOLUTA BOTTENPRISER!!!

PROGRAM FINNS FRÅN BLA. FÖLJANDE TILLVERKARE:

A&F, ARTIC, BUGBYTE, CDS, CRL, CRYSTAL, DKTRONICS, HI TECH, IMAGE, LOTHORIEN, MICROMAN, MICROMEGA, MOGUL, PIIPPS, OCEAN, QUICKSILVA, R. SHEPARD, SINCLAIR, SOFTEK, VIRGIN, VISIONS, VORTEX, ULTIMATE, PSS, LLAMASOFT, ALLIGATA, RABBIT, SOFTEK, SOLAR, STATESOFT, ANIROG, MICRODEAL.

- |   |   |
|---|---|
| <input type="checkbox"/> FYNDPAKET 1<br>5 SPEL, <b>199:-</b>  | <input type="checkbox"/> FYNDPAKET 2<br>10 SPEL, <b>379:-</b> |
| <input type="checkbox"/> FYNDPAKET 3<br>15 SPEL, <b>549:-</b> | <input type="checkbox"/> FYNDPAKET 4<br>20 SPEL, <b>699:-</b> |

TILL FÖLJANDE DATOR

- |                                   |                                 |                                 |                                |
|-----------------------------------|---------------------------------|---------------------------------|--------------------------------|
| <input type="checkbox"/> SPECTRUM | <input type="checkbox"/> VIC-20 | <input type="checkbox"/> VIC-64 | <input type="checkbox"/> ATARI |
| <input type="checkbox"/> ZX-81    | <input type="checkbox"/> DRAGON | <input type="checkbox"/> ORIC   | <input type="checkbox"/> BBC   |

EXTRA!!!

VID BESTÄLLNING INOM 10 DAGAR ERHÅLLER DU GRATIS SUCCÉ-KASSETTEN "SPELDORADO".

(8 ST SVENSKA MASKINKODSSPEL. VÄRDE 149:-.)

MOMS & PORTO INGÅR, INGET TILLKOMMER.  
OBS!!! ENDAST ORIGINALKASSETTER!!!

NAMN .....  
ADRESS .....  
POSTADRESS .....  
TELEFON .....

VI ÄR EN AV SKANDINAVIENS STÖRSTA DISTRIBUTÖRER  
AV HEMDATORPROGRAM MED DE LÅGSTA PRISERNA.

VID KATALOGBESTÄLLNING V.G. ANGEDATORSORT OCH BIFOGA 5 -  
FÖR PORTOT.

SWESCOT  
BOX 213  
121 02 JOHANNESHOV  
SVERIGE  
08-39 27 00

## ADVANCED Z80 MACHINE CODE



A new authoritative guide, for those who want to improve their Z80 machine code programming skills to a genuinely professional level, has just been published by Interface, at £12.95.

If you already know the fundamentals of programming in Z80 machine code, and now want to expand your skills, to tackle advanced, serious and practical program development, then this is the book for you.

*Advanced Z80 Machine Code Programming*, by William Nitschke, fills a serious gap in the literature on programming the Z80. Rather than dealing with the elementary concepts of Z80 architecture, this new book discusses the material you now need to know to advance your skills. The core of the book looks at popular programming applications. Starting with the basics of organising information, generating arrays and tables, block moving, shifting and erasing, string manipulation, data compression and command tables, it moves on to advanced applications like word and sentence decoding. Games programming is then examined in detail, including three-dimensional maze generation, animated graphics and the development and coding of arcade games, and the synthesis of speech and sound effects. There is also a complete set of 'undocumented' Z80 instructions.

You can buy *Advanced Z80 Machine Code Programming* by William Nitschke (ISBN 0 907563 90 2) at £12.95 from most book and computer stores, or direct from the publisher, post free, at:

**Interface Publications Ltd., Dept YC,  
9-11 Kensington High Street,  
London W8 5NP**

(Trade only: WHSD Leicester)

# Interface



# NEWS o a e o r s s u t t t t h h

## The crystal ball

Melbourne House has now brought out a new and vastly improved version of The Hobbit on disc for BBC B owners. As well as having an increased number of locations, the game features graphics for the first time for Beeb owners — over 50 different screens of them.

The BBC B disc version costs £17.95. A superb disc version is already available at the same price for the CBM 64. Tape versions cost £14.95 and include BBC B, Commodore 64, Spectrum, Oric/Atmos, MSX and Amstrad micros. Only one thing to say — when can we expect an Atari version?

Great news for Infocom addicts — a new adventure called Wishbringer has just been released.

## A helping hand

Fulvio Cerlesia, an Italian devotee of English adventures, has called again, this time to request help with Adventure International's Gremlins (his phone bill must be colossal!).

Cannot kill all the gremlins?  
METS YSTN EVEH TNIM  
EHTP ART  
Want some more assistance?

SNIL MERG PUWO LBNE  
HTST NEVR EVOS ETAL  
PLAT EMDL EW  
Don't know the essential kit?

EPIP SAGD NA(P UTUC)  
XOB LIAM

Some players are puzzled in Acornsoft's

Philosopher's Quest:

Fortunallis won't open?

TELU MAYB UREH TBUR

Can't get out of the whale?

HTOO TEHT GNIT TEQE

FOFE BDOO WTFI RDTH

GIL

Yours against ghosts and gremlins,  
Hugo North.

# QUEST

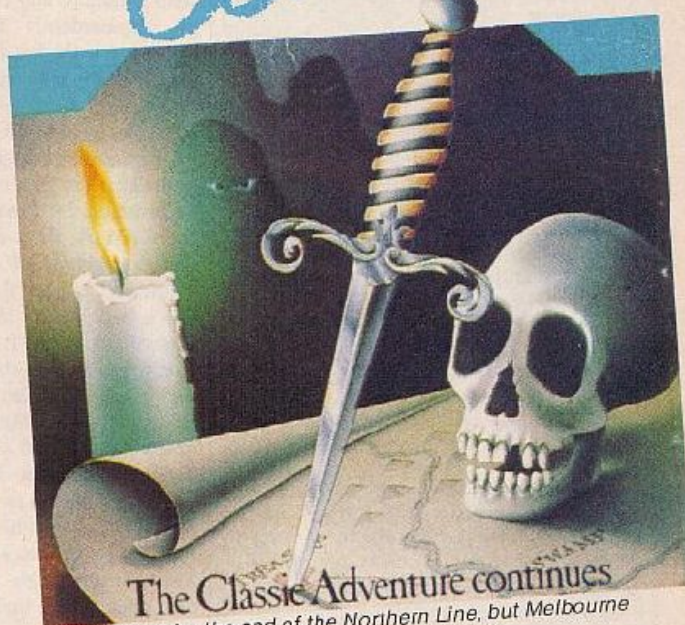
Our man with the brass lamp and the key to a thousand mysteries sheds light on new adventure programs. Lost? Never fear, Hugo North is here.

## Mordon's Quest

■ Spectrum/CBM-64/Amstrad  
■ Melbourne House  
■ £6.95

FROM JOHN JONES-STEELE, the author of Melbourne House's popular Classic Adventure, comes this superb new text adventure. It has over 150 locations, a vocabulary of more than 400 words and uses clever text-compressor techniques.

You begin in the master bedroom of a house, having just fallen out of a four-poster bed. Mordon, one of the seven Lords of Realities, soon appears to tell



The Classic Adventure continues  
Not the hunt for the end of the Northern Line, but Melbourne House's latest adventure — Mordon's Quest.

you that a power-crazed Lord has broken up a life-controlling machine and dispersed its seven component parts through time and space. Your task is to seek out the pieces and return them to the house.

Armed with a blanket, torch and transporter unit, you're soon in a jungle where the quest begins

in earnest. Quicksand, a carnivorous plant which can't be killed — it's a protected species! — and a pygmy's hut — complete with AA, plate and knife symbols — are the first of many challenging problems.

With its detailed atmospheric text and touches of humour, Mordon's Quest guarantees many hours of stimulating pleasure.

## Beatle Quest

■ CBM-64  
■ Number 9 Software  
■ £9.95

PREPARE YOURSELF for a trip back to the Swinging Sixties — the Fab Four have just made their first-ever authorised appearance in an adventure.

Beatle Quest is a Quilled text adventure which revolves around a wide selection of lyrics from the Beatles' songs. Much of the fun comes from spotting them. The game contains over 150 locations, 60 objects and 200 messages. You must amass 1,000 points by solving puzzles, collecting items and completing certain actions.

The quest begins in a bedsitter where a strange but beautiful girl is asleep on the divan bed. Tempting as it might be, trying to awake her with a kiss results in a deadly embrace and it's goodbye, goodbye, goodbye.

Out in the street, those shops



Magical mystery tour — Number 9's Beatle Quest.

that are not closed for the half-day merit further exploration. You'll need to find a certain object fairly quickly because your body soon starts to tremble and vibrate. Unless you obtain this vital nutrient, you'll end up as dead as surely as if you had been waloped with Maxwell's silver hammer.

The text abounds with reference to the songs. For example, in a lonely side street you can't help wondering where all the lonely people come from, where do they all belong. A dental surgery is owned by a Dr Kobert.

Down at the railway station, a sign informs you that the "one after 909 has been cancelled".

Asking for help is answered with "you'll get by with a little help from your friends" while attempting to do something impossible is met by "Oh... you can't do that".

If most or all of these allusions mean nothing to you, then you won't get much out of the game unless you brush up on the Beatles' songs first. For those still steeped in Beatlemania, the quest offers a tough but nostalgically enjoyable experience.



# CP/M — PLUS OR MINUS?

One of the earliest microcomputer disc operating systems, CP/M runs on hundreds of different makes of computer. Z-80 versions are known as CP/M-80, in contrast to CP/M-83 or CP/M-68 which run on 16-bit processors.

Originally written — by Digital Research's Gary Kildall — to fit on micros with only a limited amount of Ram, it has remained a relatively unfriendly system to work with. Some CP/M commands are cumbersome to use; while, far from being friendly, its error messages are often downright hostile.

But the crucial point about CP/M is that it can be implemented on almost any Z-80 micro and its software is portable. Programs written for one CP/M machine will run on any CP/M machine.

There is a vast range of application software running under CP/M. Because the system has been around for so long and on so many machines there are literally thousands of programs available to the CP/M user.

Two qualifications need to be added here. First business software is not cheap. Home computer owners who are used to paying, at the most, £50 for a word processor on Rom will be staggered to find that some of the best-selling CP/M programs can cost several hundred pounds. Second, buying a CP/M program involves more than just choosing the right package. You need to find a distributor who can supply software on 3in. discs and in the Amstrad's disc format. You will also have to customise CP/M software to work with the 6128's screen and keyboard configuration.

However, as it turns out, neither of these problems looms large. Anyone seriously committed to using a micro to help run a small business should be prepared to spend as much on software as the hardware itself. And apart from CP/M classics like Wordstar, dBase II, and Supercalc, there is a considerable amount of software that comes a lot cheaper.

Customising a program to work with a particular computer is mainly a matter of telling it what the machine's screen parameters and control codes are. Amstrad has made the task easy by setting the 6128 up to emulate a VT-52 terminal. Most CP/M software comes with an installation program which includes an option for this widely-used type of terminal. On top of this there is already a number of distributors — Timatic Systems and Honeysoft in particular — who supply CP/M programs tailored for the Amstrad on 3in. discs.

Business applications apart, one of CP/M's other attractions is that it supports compilers for almost every known computer language. You can even run the Z-80 version of BBC Basic on it. Quite a few languages are also in the CP/M User Group's large Software Library. Its contents include assemblers, word processors, text adventures, communications software, music files, and hundreds of miscellaneous disc utilities. Most importantly, it is in the public domain. In other words, except for a small copying charge, it is all free.

THE AMSTRAD 464 was launched in June last year at about the same time as the bug-free QLs began to hit the streets. 15 months later only 50,000 QLs have been sold while the Amstrad has established itself as one of the three best-selling home computers in Britain. How is it that in a year when almost every other micro manufacturer folded or flourished, Amstrad has flourished?

Undoubtedly one reason is that the 464 comes with a monitor and built-in cassette recorder at an unprecedentedly low price. But equally important is the fact that, although its design is not especially advanced, it scores highly in almost every department — graphics, sound, Basic, construction, and I/O connections.

This computer is largely free of the quirks and omissions that flaw most other micros: a tacky keyboard on the Spectrum, antiquated Basic on the CEM-64, bugs on the QL and Oric, the memory-starved BBC, and so on.

Amstrad followed the 464 with the 664, which has a built-in 3in. disc drive in place of the cassette recorder. It has a few extra Basic commands such as the graphics command Fill, and sacrifices 1,280 bytes Ram to the disc operating system. But its major difference is the ability to run CP/M 2.2, which is supplied partly on disc and partly on Rom. The idea behind providing CP/M is to widen the machine's scope for attracting business users.

Just a few months after the launch of the 664, the company has now produced another computer with a built-in disc drive, the 6128. This comes with a total 128K Ram and runs an enhanced version of CP/M 2.2, CP/M Plus. It is still software compatible with the earlier models.

Although the 6128 offers more than the 664 — which will be quietly dropped from production — it costs less: £299 with a monochrome monitor, £399 with a colour monitor. If you are not fussy about picture quality you can buy a £30 modulator and use the monochrome unit with a colour TV.

Originally Amstrad announced that the 6128 was solely for the American market. It is not hard to guess why the company has delayed the announcement of the machine's U.K. launch until the last minute. But it is tough if you have just spent £449 on a 664.

In appearance the 6128 is more or less the same as the 664. Amstrad has sensibly repositioned the cursor keys at the front of the keyboard and the overall height has been reduced. At the back there is the same array of ports as on the earlier model — a Centronics-style printer interface, an expansion port, and a socket for a second disc drive. Also unchanged at the side are the cassette and joystick ports together with a stereo jack for sound output.

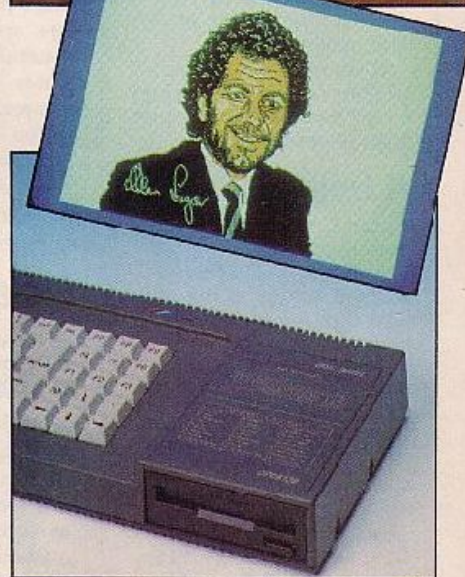
Apart from the addition of CP/M Plus and another 64K Ram the machine's specification is the same as the 664's. Based around a Z-80A processor running at 4MHz, it carries 128K Ram and 48K Rom. The Basic interpreter and the operating system are held in 32K of the Rom, while the remaining 16K contains Amsdos and a small part of CP/M. Amsdos is Amstrad's own disc operating system which serves as an alternative to CP/M.

The two systems coexist peacefully, reflecting the 6128's dual nature both as a small business machine and a home computer. Basic is switched out when CP/M is running so you cannot then

# AMS



Alan Sugar, the machine by the man and below, the man by the machine. Bottom, close-up on the 6128's 3in. disc drive — capacity 180K.



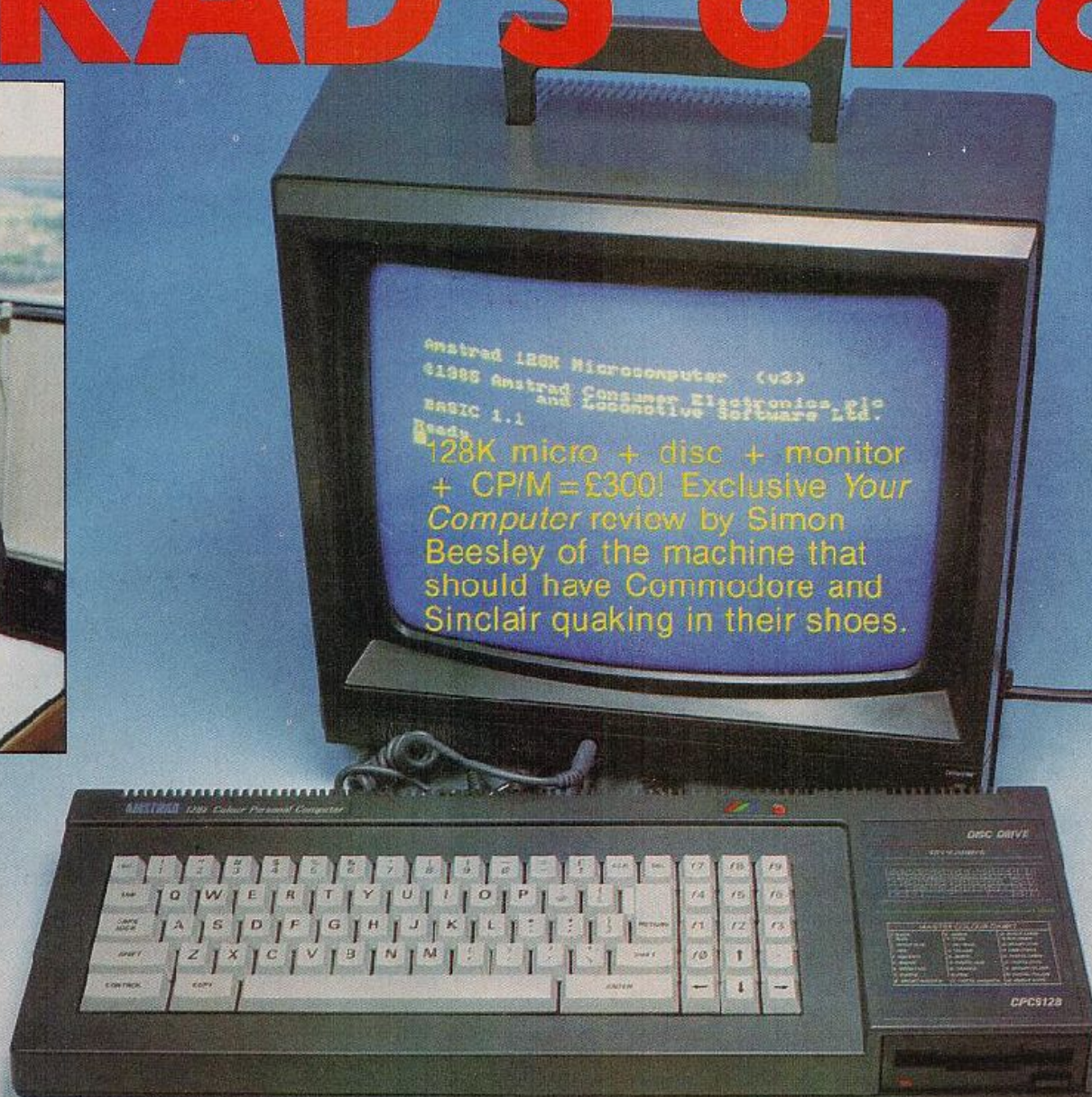
load or save Basic programs. If you are using Amsdos you need to run CP/M to format discs, back up and copy files; otherwise you can ignore it.

When Amsdos was first introduced Amstrad described it as a fast cassette system. You might expect a disc operating system to be rather more than this. And, indeed, as disc operating systems go Amsdos is fairly rudimentary. There is no facility for creating random-access files and only a limited spread of disc commands. Still, what it does offer is probably quite adequate for the average user's purposes.

Some people have berated Amstrad for choosing 3in. disc drives rather than the more common 3.5in. drives. But the 3in. discs have



# AMSTRAD'S 6128



## BATTERING RAM

a respectable capacity of 180K on each side, and you can always add a 3.5in. or 5.25in. as a second drive.

Two discs are supplied with the machine. Along with CP/M Plus and its accompanying disc utilities, they hold a useful collection of programming utilities, a full 48K version of DR Logo, and GSX, a Graphics System Extension designed to let CP/M programs handle graphics. For good measure Amstrad has also thrown in the software that went with the 664 — CP/M 2.2 and a stripped-down version of DR Logo.

GSX is the 8-bit forerunner of Digital Research's GEM. Introduced a bit late in the day, so far it has had little success. With the notable exceptions of DR Graph and DR Draw not much

software has been written for it. If someone were to add the 8-bit equivalent of GEM Desktop, GSX could give the Amstrad icons and windows in CP/M. But the result would probably be rather slow.

Another of the disc programs, Bank Manager, demonstrates some extra Basic commands which make use of the spare 64K Ram. As an 8-bit microprocessor the Z-80A can only address 64K of memory. So the 128K Ram is not organised as one block of contiguous memory, but as two banks of 64K, only one of which can be accessed at a time. You could not, for example, run a Basic program larger than 64K.

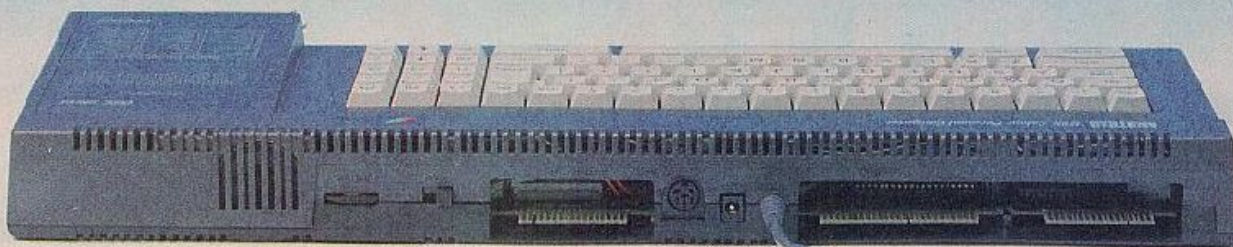
Two of the commands supplied by Bank Manager allow Basic programmers to store and

display up to five screen images. The others use the second memory bank as a filing system. What these commands do not provide is a facility for storing programs, or variables as on the Commodore 128. No doubt machine-code programmers will find all sorts of interesting applications for the extra Ram; and, possibly, commercial games writers will be able to exploit it. But by and large it is not of much benefit if you are working in Basic.

In fact the main reason for giving the 6128 128K is to allow it to run CP/M Plus, which is designed to take advantage of bank-switched memory. One of the problems with running CP/M 2.2 on the 464 and 664 is that it leaves

(continued on next page)





(continued from previous page)

only 39K Ram for programs — not enough for most heavyweight CP/M packages like Wordstar.

By contrast CP/M Plus sits in one of the two banks of 64K Ram and loads programs into the other. In this way it makes 61K Ram available for programs, which is more than enough for any 8-bit CP/M program.

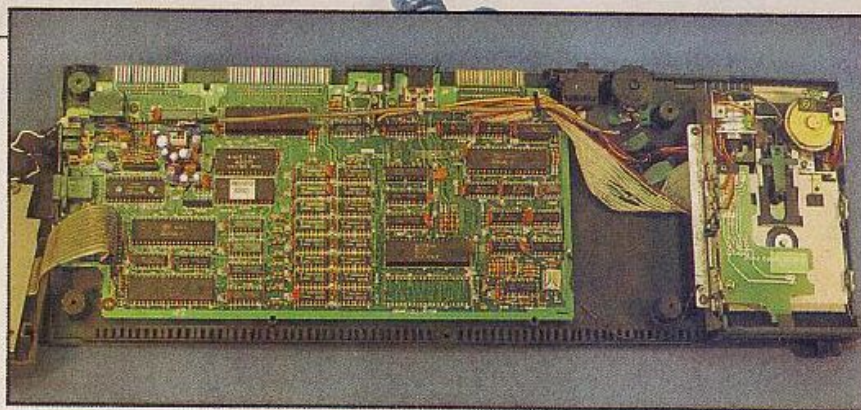
CP/M Plus takes up around 21K and represents a substantial improvement on the earlier 8K version. Not only is it faster in loading and saving to disc, but it is also easier to work with. Thus you can give it multiple commands on a line, recall previous commands, and edit lines. Along with a number of other enhanced features there is also a provision for switching to different national character sets — German or American, for example.

None of these features will interest people who use the 6128 as a home computer: pure and simple — the sort of owner, say, who has moved up from a Spectrum. CP/M programs cannot, of course, take advantage of the Amstrad's graphics or sound. With the exception of text adventures, most CP/M games are of the sort that date back to the dawn of microcomputing — Tic-Tac-Toe, Ping Pong and the like.

So, leaving CP/M and the extra 64K aside, it is worth considering how the 6128 matches up against the opposition on the home computer front.

Amstrad Basic is almost as extensive as BBC Basic, and only a fraction slower. Among its special features are commands to harness interrupts from Basic — Every and After — and the facility for defining up to eight text windows, and one for graphics. As on the BBC, the operating system is unusually accessible via a large number of jump blocks — or vectors — in Ram. Extending Basic is easily done by defining Resident System Extensions — RSXs — to act as new commands.

There are three graphics modes which are well



World processing — top, how the 6128 interfaces with the outer world. The bare bones — middle, what the 6128 is like inside, and bottom, the fully-clothed machine.

supported by Basic graphics commands. At the lowest resolution, 160 by 200 in Mode 2, you have a choice of 15 colours from a palette of 27. The highest resolution is 640 by 200 or 80 columns by 40 rows of text. Again, the machine's graphics are only equalled by the BBC Micro.

Sound is supplied through the internal speaker by the AY-3-8192 chip, as found in MSX machines and dozens of other micros. It is not quite as powerful as the CBM-64's chip but still gives three voices with full envelope definition.

Another plus is the facility for switching out the Basic Rom and adding alternative 16K Roms which plug into an external sideways Rom card. Once again this is also available on the BBC. Where the Amstrad scores over the BBC is in providing over twice the amount of user Ram. And it is also a lot cheaper.

Instead of sharing 64K between Rom and Ram, it switches Rom and Ram in and out of the same memory space. The screen memory and operating system work space take 21K of one of the two Ram banks, leaving the user 43K to play with.

The only serious rival to the 6128 at this price level is the new Commodore 128. Like the Amstrad the CBM-128 offers CP/M Plus and 128K Ram. It can also run CBM-64 software. Although there is already a large amount of games software for the Amstrad it does not begin to compare with the range of CBM-64 software.

Set against this factor is the Amstrad's price advantage. The stock CBM-128 is expected to cost around £270. To kit it out with a monitor and disc drive will cost you twice as much. Both machines probably represent the final flowering of 8-bit micros, a species now reaching the end of its term. But in terms of value for money the 6128 is the best buy on the market. ■

## CONCLUSIONS

■ The Amstrad 6128 is exceptionally good value. Add the cost of a printer and you have a complete system for around £500, equally suitable for home computing and small-scale business purposes.

■ CP/M Plus together with 128K Ram give the 6128 an important advantage over the 664: It can run the entire range of 8-bit CP/M software.

■ CP/M and the extra Ram are of less interest to home computer users. But features like its excellent Basic and graphics are enough to make

the 6128 superior to most other home computers on the market; and, to clinch the matter, it comes with a disc drive and monitor.

■ There is already a substantial amount of games software for the Amstrad and its software support looks likely to improve as more companies include Amstrad versions of their new releases.

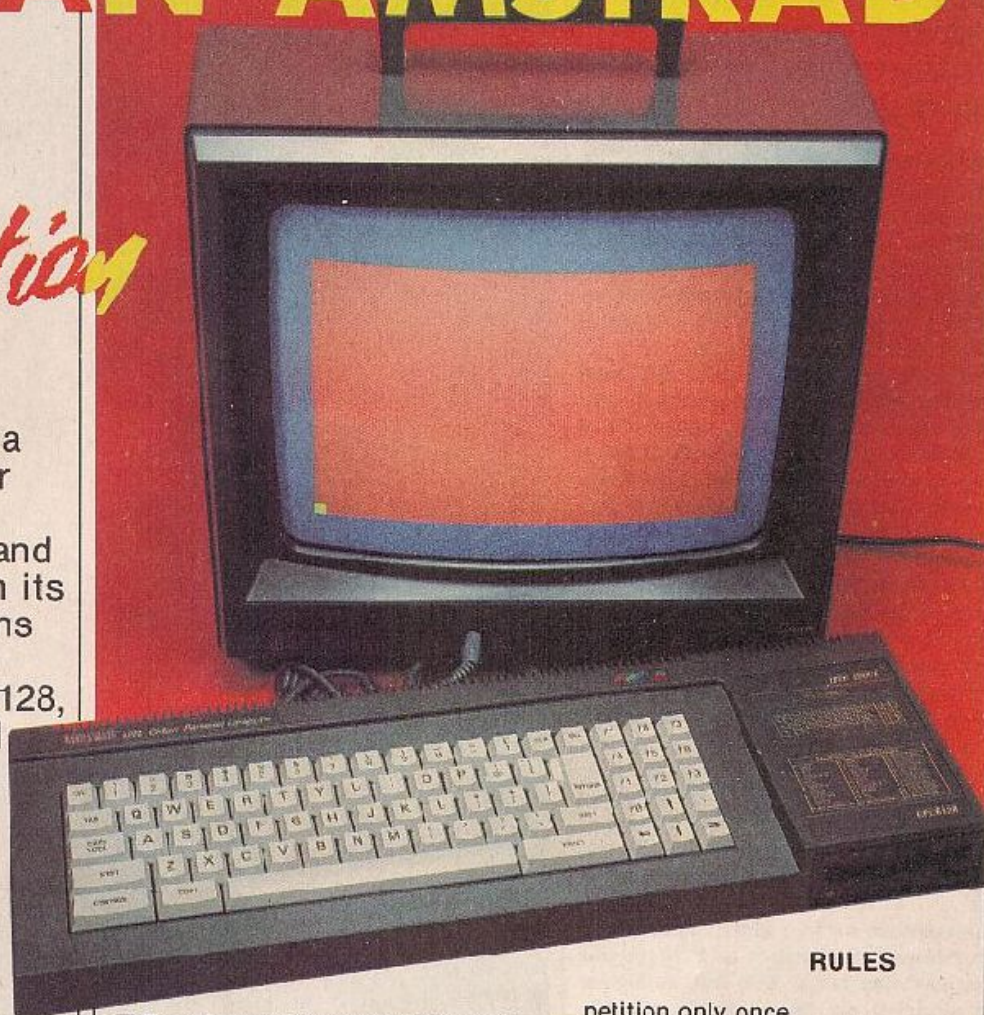
■ The 6128's only rival at the moment is the CBM 128. But although the Amstrad cannot match the CBM 128 for games software, the 6128's monitor and disc drive give it a decisive edge.



# WIN AN AMSTRAD 6128

## Competition

Your chance to win a 128K microcomputer plus disc drive plus monitor — all this, and it can run CP/M with its wealth of applications software too! It can only be Amstrad's 6128, exclusively reviewed this month. All you have to do is put yourself in the place of someone writing a book entitled "1001 uses of a disc drive". Dream up one thing you might use your disc drive for — it can be serious or silly — and send us a description and/or a drawing of your idea.



### RULES

- The winner of the competition will be the person who, in the view of the editor, comes up with the most amusing or original use for a disc drive.
- The name of the winner will be printed in the December issue of *Your Computer*.
- All entries must arrive at the *Your Computer* offices by the last working day in September 1985.
- Each person may enter the competition only once.
- Entries to the competition cannot be acknowledged.
- No employees of Business Press International or their relatives may enter the competition.
- The decision of the editor is final.
- No correspondence on the result of the competition will be entered into.
- Business Press International assumes no responsibility or liability for any complaints arising from this competition.

## YOUR COMPUTER COMPETITION

Don't forget to enclose this coupon, or a photocopy of it, when you send in your idea for an original use for a disc drive to 6128 Competition, *Your Computer*, Room L221, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS.

Name \_\_\_\_\_

Address \_\_\_\_\_

Idea (written or drawn, use extra space if necessary) \_\_\_\_\_

6128



Lee Paddon enters the dank and mysterious depths of a Telecom mainframe and discovers the eerie world of MUD.

HOW DO YOU recognise a Wizard? Not as you might have thought by the pointy hat, billowing gown and flowing white beard. More reliable pointers are bleary bloodshot eyes, a tendency to fall asleep, and a phone bill as big as Boris Becker's pay cheques. All these are sure signs that he is up to his eyes in MUD, or to give it its full title Multi User Dungeon.

Night after night poring over a hot modem have taken their toll. Adventure games have been around since Crowther & Woods discovered that you could do something more exciting with a computer than scare old ladies out of their wits by sending them gas bills for three million quid. They wrote *Classic Adventure* and thus a genre of computer games was born. The genre must now be relegated to the status of SUD, or single user dungeon. These are basically passive, and once you have solved them, however long that might take, they are consigned to the bin.

What they lack is interaction. Picking up the gem in the treasure room will always produce the same result. With MUD, all this goes out the window. It won't be just you down there. Along with the usual perils, monsters and prizes there will be up to a hundred others trying to help or hinder you. So how do you get into MUD? Your first step is to get yourself a MUD pack.

This contains a map, a security card with ID and password, instructions and 30 credits, enough for three hours. After that, its 20p per unit which lasts six minutes. Armed with this, your micro, a modem and some software suitable



# MUD CHALLENGE

## MUD: once upon a time . . .

MUD was originally written by Roy Trubshaw at Essex University about five years ago. Ever since then it has undergone expansion and revision under the watchful eye of Richard Bartle. It quickly became a cult with the students of the university, and began to take off nationally when Essex installed PSS facilities for the computer.

Despite access hours that meant becoming virtually nocturnal, it has become an obsession for many, some Wizards clocking up many hundreds of hours on line. As with any cult, myths have grown up around the game.

There was a craze for a time of combining MUD and Trivial Pursuit, with Wizards shouting out the questions, and right answers being rewarded with snippets of useful information. There was even a MUD wedding, between Kate, a las

Margaret Lawton from Liverpool and Frobozz the Wizard. All the other characters were invited, the Christmas box was raided for suitable bunting and the wine flowed.

After the celebrations Kate & Frobozz retired to the Wizard's Chamber, and what interaction occurred thereafter is unknown.

The new improved MUD has been developed by Richard Bartle. It had first to be converted from the Dec it ran on at Essex into Mudcl, which made it machine independent, and then vastly enlarged and improved. MUD veterans will find at least some of the new MUD familiar, it incorporates the old dungeon. As time goes on, further improvements and enlargements are planned.

If you are an adventure freak, then you won't want to miss out on MUD, it'll knock the froth off your SUDS.

for accessing bulletin boards, you are all set to descend into the depths.

If this seems like an expensive way to play adventures, perhaps a brief run down on the specification might convince you otherwise. The labyrinth consists of over 1,000 locations and over 60 commands are initially available. On first entering MUD, you are a novice, your ultimate aim is to make the grade of Wizard. To make your way to the top you need experience points. You get these for killing monsters and finding treasures. You also get points for killing any fellow adventurers that you might find hanging about the place, and this is where the interactive nature of MUD starts to come into its own.

When you are in the dungeon you can ask which other players are logged on to the system. When you meet them it's up to you how you approach them. Exchange hints, team up, or just beat the hell out of each other. Another breed of animal you may meet on your travels is a mobile. This will seem like another player, you



# M.U.D.

## MULTI USER DUNGEON

will even be able to have an Eliza style conversation with it.

As time goes on, your experience and powers will grow. There are 60 different spells which are available to you from the word go; however, you will have little chance of successfully casting them. As your level increases, so does your chance of casting a successful spell, until you reach the ultimate level of Wizard/Witch where you are virtually immortal and all-powerful. Once you attain these dizzy heights, life becomes more a question of wielding absolute power, deciding which of the pitifully struggling Novices and Champions you will favour.

This whole anarchic system is policed by the Arch Wizards, alias the Sys-ops who keep an eye out for maverick Wizards going insane with power, and also the odd common-or-garden hacker. The ultimate in Wizard luxury is some software from Jez, author of the *Demon Zrom*. This gives you a separate window giving information over any player the Wizard is tracking.

Another attractive aspect of MUD is the user-friendliness of the system, and the successful creation of atmosphere by the text descriptions of locations — very much in the spirit of *Dungeons and Dragons* (TM).

MUD is due to hit the fan after its official launch at the PCW show. Even better news is that it won't cost you a thing, apart from the phone costs. It will be available between 6pm

and 8am weekdays and all day at weekends. This trial period will end on November 5th when the most successful MUD slingers will be invited down to the London Dungeon for a MUD spectacular.

These are promised as regular events and basically the system is locked so that no one can get in out, and then battle is joined. When the dust clears the survivor staggers out victorious. The bad news is that after the November 5th spectacular, every one will be busted down to novice level, and the battle commences in earnest, at the full rates.

Simon Dally, managing director of Multi-User Entertainments (MUSE) who market MUD worldwide, hopes that this initial trial period will get people hooked on MUD and also get any remaining bugs out of the system. Initially the system will be run from London, and there are no plans at the moment to make a Packet Switch gateway available, so would-be Wizards from the provinces might find things a bit expensive.

Simon Dally sees a rosey future for this new concept in computer games. "Our Muc development language — Muddl — will allow anyone to come to us with an idea for an interactive type of game, and Muddl will allow us to implement it quickly and cheaply. We are certainly a long way ahead of the States where Megawars III, a rather limited interactive game, is going down well, and we have high hopes of selling MUD to the Americans."

# NGE

### RULES

- The winner of the competition will be the person who, in the view of the editor, comes up with the most amusing or clever idea for a new interactive type of game.
- The name of the winner will be printed in the December issue of *Your Computer*.
- All entries must arrive at the *Your Computer* offices by the last working day in September 1985.
- Each person may enter the competition only once.
- Entries to the competition cannot be acknowledged.
- No employees of BPI or their relatives may enter the competition.
- The decision of the editor is final.
- No correspondence on the result of the competition will be entered into.
- BPI assumes no responsibility or liability for any complaints arising from this competition.

## MUD COMPETITION

This month's prize is a MUD pack, plus on-line tuition from an arch Wizard on the arcane mysteries of the game. Thus equipped, you will be ready to take on nine other champions at the first MUD spectacular on an all expenses paid trip to the London Dungeon on November 5. Once there, the system will be locked, and the entrances sealed until one champion emerges triumphant. The prize for this champion of champions will be either 100 free hours of MUD'ing, or £100 cash, with free MUD time for the runners-up. For the runners-up of the *Your Computer* competition, there will be prizes from Firebird's popular Silver range of software. In return, all we ask you to do is sketch out a scenario for a new adventure which would exploit the interactive features of MUD. You must explain what features of your adventure would require the players to interact with one another. Don't forget, you'll need a computer, a modem, and appropriate bulletin board style software to play MUD.

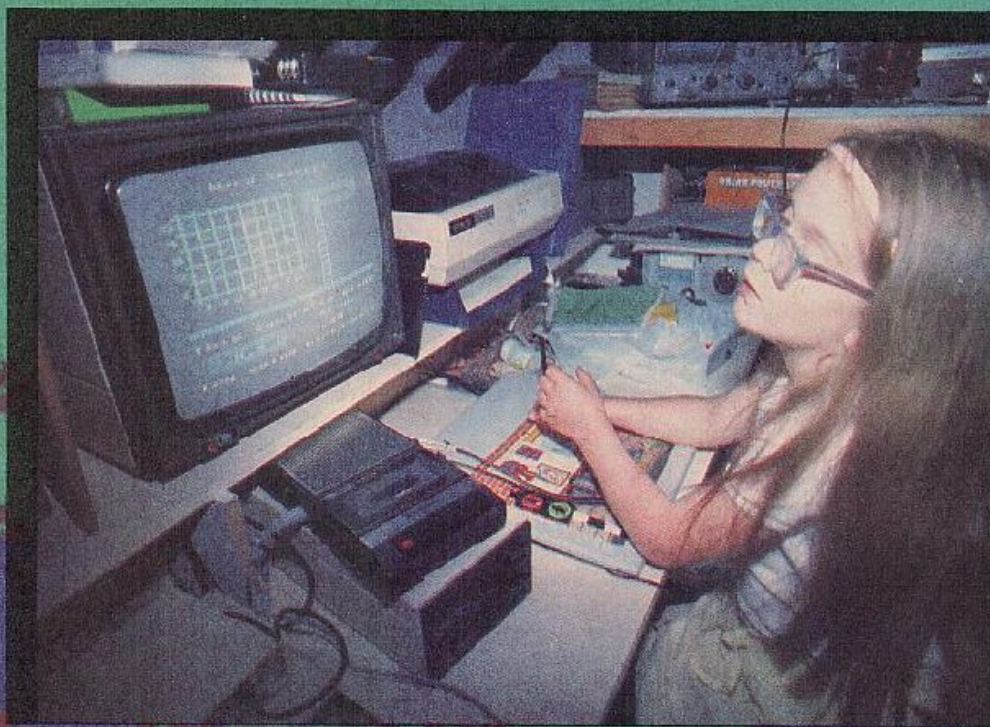
Don't forget to enclose this coupon, or a photocopy of it, when you send in your idea, which can be written or drawn or both, to *Your Computer*, Room L221, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS.

Name \_\_\_\_\_

Address \_\_\_\_\_

Written or drawn idea for new interactive adventure — use extra paper if necessary.





# GRAPHICS PADS.. PENS.. DIGITISER

John Dawson trips the light pens fantastic, plus graphics pads and a budget digitiser.

ANIMATED AND still computer generated pictures are used in feature films, commercials, cartoons and advertisements. Computer assisted design is big business for architects, engineers and large computer software houses. There is a vast range of diagrams, pictures, plans and shapes that can be drawn for different purposes.

You may want to draw a two dimensional chart using bars, lines, pie segments or symbols, a circuit diagram for a piece of electronic equipment, a printed circuit board layout, a three dimensional plan for a house extension or an engineering blueprint to give to a toolmaker.

**Graphpad** is a graphics pad which can measure the position of a stylus in two axes and

return the X and Y co-ordinates to the computer. The version of Graphpad that I examined was intended for use with the BBC micro but other versions, with different software, can be used with a number of other machines. The pad draws its power from the BBC microcomputer.

## Comfortable to use

The Graphpad weighs only one kilogram and is 14 by 10.25in. with an effective drawing area of approximately 10.5 by 7.5in. The drawing area is a little smaller than a piece of A4 paper and that can be very convenient for transferring diagrams to the computer. One lead from the

pad is connected to the user port of the BBC microcomputer and a second lead runs from the left hand side of the pad to a lightweight stylus or pen.

The pen is comfortable to use and has a metal tip which presses on to the perspex overlying the surface of the graphics pad. The manufacturers suggest that you should place this sheet on the surface of the graphics pad for the best results. There is a microswitch inside the body of the pen and the cursor appears on the screen of the computer VDU when the tip is pressed. If you press the pen tip when it is not pressed down on to the pad the cursor moves randomly on the screen.



British Micro supplies three programs on disc to accompany the graphics tablet. The first prints the X and Y co-ordinates of the pen on the VDU screen and the second program is a general purpose drawing program with commands to draw lines, rectangles, triangles, circles and freehand lines.

You can fill any enclosed shape or the background, draw lines in three different widths, save and load drawings to disc or tape and print a drawing in positive or negative using a screen dump routine for the Epson MX and FX series printers. The third part of the software is called a "CAD" program.

CAD stands for Computer Assisted Design. Flexible manufacturing systems are just beginning to appear in which computer assisted design is the first part of the process. After drawing something that is to be manufactured, a new washing machine for example, on the screen of a computer, it should be possible to check the strength of various components or the validity of the electrical wiring diagram using a separate computer program.

When the design has been confirmed, the computer should generate instructions to be sent to numerically controlled machine tools that will press metal panels, machine rotors and wind armatures for electric motors, weld sections of the case and lay wires in a wiring jig to form the cable harness. By changing the program that's sent from the CAD computer the product can, in theory, be turned from a washing machine into a dish washer or tumble dryer.

The Graphpad CAD program is not a competitor for the Automatic Dishwasher Designer Award 1986. It is actually quite disappointing for all you can do is design a series of shapes on a 16 by 16 grid, place these into a number of pigeonholes and then arrange the scaled down shapes on the screen linking them with lines. It is not possible to alter the scale of the shapes once they have been defined, nor can you add text to the diagram for labels or titles. Despite being able to place a grid pattern on the VDU to help with the alignment of various shapes, I found it quite difficult to drag the shapes or icons to precisely where I wanted them.

I liked the Graphpad hardware for its neat, robust design and the drawing program worked well. There is a listing of the drawing program at the back of the instruction manual and it should be easy to extend or modify this to suit your own requirements. The CAD program was disappointing.

The sensitive area of the Touchmaster graphics pad is exactly the same size as a piece of A4 paper. The Touchmaster is self powered by its own mains plug/transformer and must contain a dedicated microprocessor. Both serial and parallel ports are fitted to the back of the case and there is a socket for a foot switch as well. The short handbook supplied with the pad shows how it can be connected to popular machines such as the BBC micro, CBM-64, Dragon 32/64, Spectrum and Vic-20.

In the case of the BBC micro, a lead connects the touch pad to the RS-423 serial port. Unlike the other touch pads and light pens, the Touchmaster outputs X and Y co-ordinates as information that can be read as the equivalent of a key stroke in a Basic program. All you need to include in your programs are the following

Basic instructions:

```
10 *FX 2,1
20 *FX 7,7
30 *FX 21,1
40 IF (GET AND &7F) <64 THEN 40
50 X = GET*64 + GET
60 Y = GET*64 + GET
```

That's really not very difficult. Accessing the RS-423 serial port is also easy in machine code if you need the whole system to run faster than is possible in Basic. Interfacing the Touchmaster is very easy and the use of the serial port may well avoid clashes with other peripherals — it is at least easier to plug and unplug leads to the serial socket than to the user port. The resolution of the Touchmaster pad is not stated in the user instructions.

Multipaint was supplied on cassette. It works well and is a lot of fun to use. Probably it's the best simple drawing program that I've found for the BBC. The program is written in Basic and can be modified to suit your own needs. Unfortunately, I couldn't get Simon's Squares to load but Word Search entranced my six year old younger daughter. The program requires concentration and as good a memory as you can manage.

The instructions contain a couple of mistakes but the bright overlay for the touch pad works well with the screen display. Spellcopter was less successful, partly because the program requires a fiddly attention to the exact positioning of the helicopter carrying the letter you have to drop into place.

## Pad has two switches

The Saga Bitmap is made in West Germany and plugs into an analogue-to-digital interface designed for use with the Kempston joystick on the Spectrum computer. The sensitive area is smaller than the other two pads — 5ins. by 3.75ins. — but this didn't seem to make it more difficult to position the cursor where I wanted. The pad has two switches on the left hand side of the case that are used to tell the computer when you have a choice from a menu or set the cursor correctly in place.

The Touchmaster pad is set up with two soft "keys" at the bottom right side of the drawing area when you are using Multipaint and the Graphpad device requires you to press keys on the computer keyboard. I preferred the Touchmaster approach because you can concentrate on the pad and the screen without being distracted by the keyboard or a separate switch. Nevertheless I liked the consistency and feel of the Bitmap pad while I was using it with the Saga Style program.

Style can be used with either the Bitmap or a joystick. The program can be transferred to a Microdrive. It has all the usual facilities for drawing lines, rays — multiple lines from a single point — circles, triangles, boxes, freehand shapes and freehand points. You can fill any enclosed shape and can unfill the shape if you make a mistake.

The most advanced facility allows you to zoom into a section of the picture, alter individual pixels and then zoom out again. Other utilities provide for solid or shaded fill, localised or universal colour changes and two different brush types.

The Touchmaster Multipaint program has more brush styles and widths and will draw regular polygons with between three and nine

## EQUIPMENT AND SOFTWARE MANUFACTURERS

### GRAPHPAD BBC

Supplied with:  
XY coordinates program  
Drawing package  
CAD program

British Micro, Penfold Works, Imperial Way, WATFORD, Hertfordshire WD2 4YY  
Telephone: 0923 48222

### TOUCHMASTER BBC, Spectrum, CBM-64, Vic 20, Dragon

Supplied with:  
Multipaint drawing package  
Also supplied for review:  
Spellcopter, Simon's Squares,  
Word Search

Touchmaster Ltd, P.O. Box 3, Port Talbot, West Glamorgan SA13 1WH  
Telephone: 0656 744770

### SAGA GRAPHICS PAD Spectrum

Also supplied for review:  
Style

Saga Systems Limited, 2 Eye Road, WOKING, Surrey GU21 4JT  
Telephone: 04862 22977

### DATAPEN BBC, Spectrum

Supplied with:  
SKETCH — Drawing program  
SHAPE  
INTRO

Also included for review:  
DEFINE — Sprite designer and animator  
BRITAIN — Map of the UK with questions and lightpen answers  
CIRKWIK — a program for drawing electronic circuit diagrams  
Datapen Microtechnology Limited, Kingsclere Road, OVERTON, Hampshire RG25 3JB  
Telephone: 0256 77084

### PLOTMATE BBC

Supplied with:  
Main system disc and utilities  
Demonstration character set and 'enter data and plot program'  
Vibrating string displacements  
Rainfall chart  
Function keys reminder  
Map of Britain

Also supplied for review:  
LINCAD — Technical drawing package  
LINTRONIC — Electronic circuit diagram plotting program  
LINCHART — Bar and pie chart program for plotting flat and 'solid' charts

Linear Graphics Limited, 28 Purdeys Way, ROCHFORD, Essex SS4 1NE  
Telephone: 0702 541664/5

### ANIROG SUPER SKETCH PAD CBM-64

Supplied with:  
Super Sketch starter kit  
ANIROG, Unit 10, Victoria Industrial Park, Victoria Road, DARTFORD, Kent DA1 5AJ  
Telephone: 0322 92513/6

### LEONARDO Spectrum

Graphics package  
Creative Sparks, Thorn EMI Software



sides. These things apart, the two programs are very similar. Unlike Graphpad, neither will dump a drawing to a printer.

**The Anirog Super Sketch — Model G2100** works on different principles to the graphics pads that I have described so far. A long arm protrudes over the drawing area from a housing at the top of the pad. The position of the stylus at the end of the arm is calculated from the rotation of two potentiometers inside the housing. The arm has a geared track underneath and this provides information about how far the stylus is up or down the pad while the rotation of the arm provides the other signal. Buttons on the top housing can be used to Select a function from a menu displayed on the VDU, "Lift" the pen from the pad — electronically at least — and return to the Menu. The software supplied with the Anirog sketch pad works well and has a couple of unique features.

"Undo" will erase the work you have done since the menu was last displayed and "Mirror", "Quad" and "Flip" will split the screen and copy what you are doing either to the other side, into the three other quarters, or from top to bottom. That's a good way to achieve symmetrical drawings and the undo command is much easier to use than the erase functions in most of the other packages.

I didn't like the mechanism in the Anirog sketch pad particularly after using the Bitmap and Touchmaster graphics pads. I would be concerned about wear developing in the gear mechanism that turns the potentiometers and the steadiness that you might appear to gain from the arm as opposed to the free pen didn't help my two children to draw straighter lines.

However, the Anirog sketch pad works perfectly well and the drawing package is perfectly adequate for designing pictures and saving them on tape or disc. The manual suggests that photographing the screen is one way of reproducing what you have created.

### Well made unit

A light pen is a device which detects when the spot of light on a scanning visual display unit — an ordinary TV or monitor — has passed underneath the sensor. In conjunction with software or hardware, the CRTC chip in the BBC micro, the position of the lightpen on the screen can be determined and the information fed into a program running in the computer.

The **RH Lightpen** is a well made unit. The body of the pen is a slim, comfortable to hold, cylinder with a red LED at the back of the pen — facing the user — and a tapering nozzle at the front. A flexible lead connects the pen to a metal cased unit that connects in turn to the analogue port of the BBC microcomputer.

The software included with the RH Lightpen consists of a number of procedures that can be incorporated into your own programs in addition to two good games which are played with the lightpen. The drawing routine works in Mode 0 and is much simpler than the software provided with other products. However, RH Electronics also produce a program known as Art Master.

Two versions of the **Datapen** were sent for review. One connects to the A to D port on the BBC microcomputer and the other is connected to a socket which plugs into the bus on the back of the Spectrum. It is not possible to plug

another unit on to the back of the Datapen connector — it must be the last item in the stack. The Spectrum version of the pen can be used with both the 16K and 48K computers although the programs to save a picture to tape and load it back in again have to be loaded separately if you have the 16K machine.

A lot of software was supplied with the Datapen. You can create teletext screens, animate sprites — this is great fun — play a quiz about the British Isles and draw pictures. Cirkwik is a disc based program that allows you to create circuit diagrams for electronic, hydraulic or pneumatic circuits, flow diagrams or any other drawing that requires only symbols and lines drawn at rightangles.

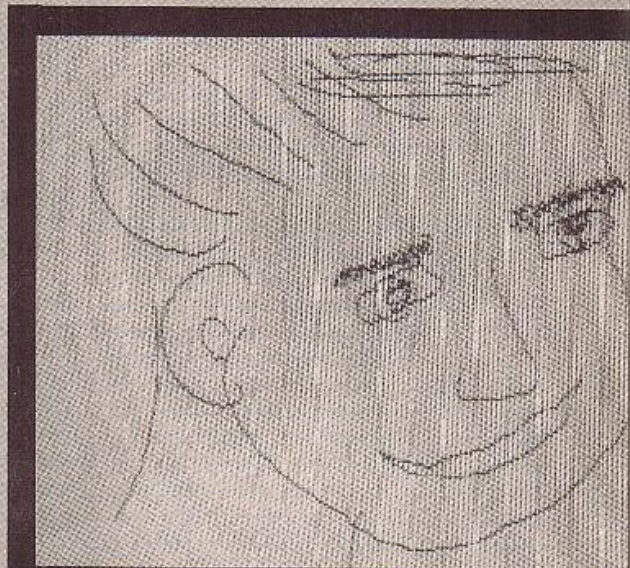
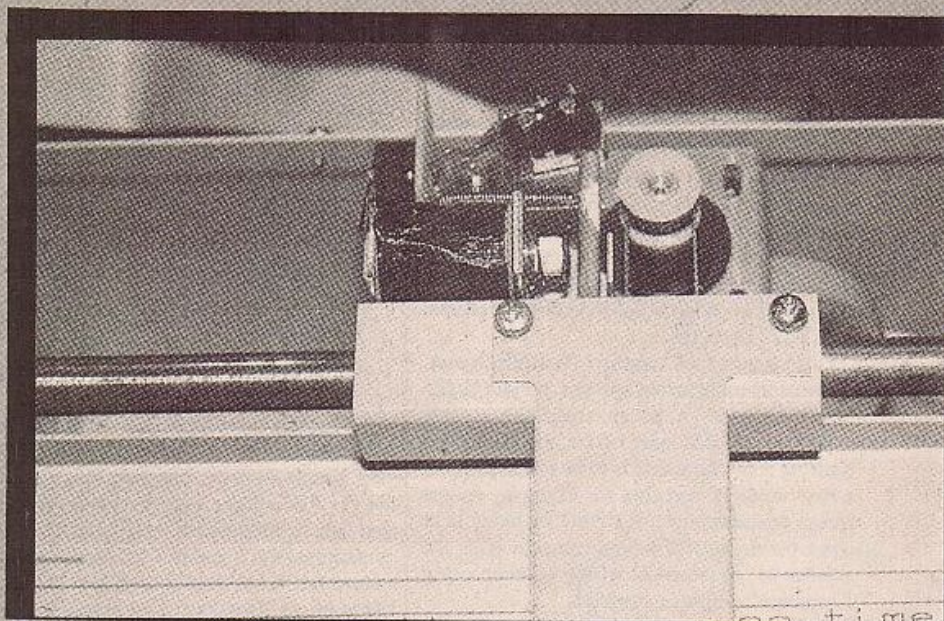
Multiple screens can be linked together to produce a diagram four screens wide by two screens high and up to 640 different symbols can be used in the course of preparing a diagram. Cirkwik is really rather like a graphics

word processor in which symbols are placed in position and linked by lines. If you charge one symbol in the symbol table, each occurrence of the symbol in the diagram will also be altered.

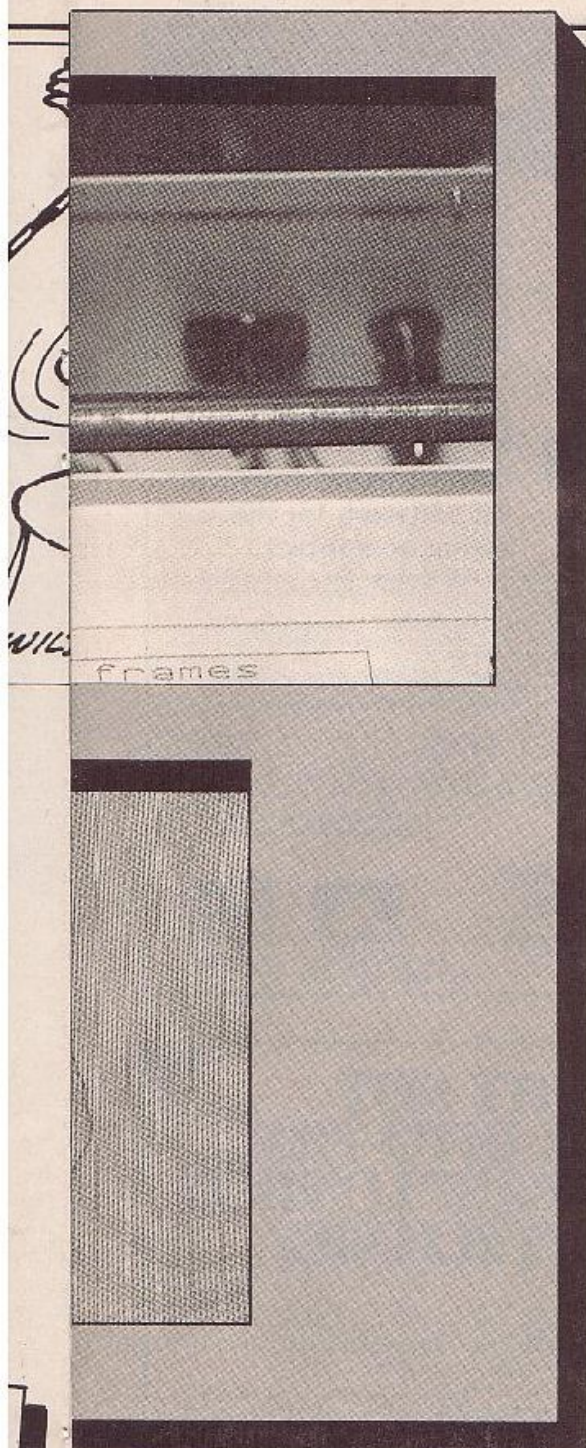
The **Plotmate** plotter is a delight to use. It is a flatbed plotter where the pen is moved in two dimensions. Other machines, the Epson HI-80 for example, move the pen in one dimension and the paper in the other. The Plotmate will handle card or thick paper that will stop the Epson dead in its tracks. The penalty is the Plotmate's greater size — 15 by 14 by 6.5in.

The Plotmate is very solidly constructed with a steel case that will take a lot of wear and tear. The plotting mechanism reminds me of the standard of manufacture you find inside a commercial Qume or Diablo daisywheel printer — intended for continuous use over prolonged periods. Despite this reassuringly massive feel, the Plotmate weighs only 6.5 Kilograms.

There's so much you can do with the Plot-







mate that it's impossible to cover it all in part of one article. I hope to write about the Plotmate in much more detail later in the autumn. However, for the moment here is a selection of the facilities that come with the basic machine:

- The VDU 23,255 instruction can change the logical colour on the VDU and can be used to prompt the user to change the pen colour in the Plotmate. Black, Red, Green, Brown, Blue and Violet pens are available.
- Text can be plotted in different sizes, orientations — up, down, left to right and right to left — and four different slants — italics. The VDU 23,255 instruction accepts parameters to modify the character height, character width, character slant, character orientation, pen speed, shading and broken line patterns and scale. One more parameter controls functions such as up-

side down plotting, setting the plotter or gin and toggling the colour change prompts.

- You can fill triangles and other blocks quite automatically with either solid colour or a large variety of less dense or broken lines.

Plotmate gets its data by intercepting the commands in the OSWRCH channel and sending them on afterwards to the BBC micro operating system. One version of the plotter driver is designed to be located just below the Mode 4 screen RAM, another leaves more room for your Basic program but does not permit simultaneous plotting on screen and to the Plotmate.

You can run the Plotmate driver with the second processor leaving all the secondary Ram free for your programs. The Plotmate driver can be loaded from within a Basic program when you require it by simply changing HIMEM and using the instruction

\*RUN H.PLTIMATE

Finally, you can directly access routine to move the pen, and generally control the plotter in both Basic and machine code.

The figures show how a screen display can be transferred to the plotter. The programs to produce both diagrams are standard Acornsoft software from the Creative Graphics and Graphs and Charts packages run with Plotmate in operation. The map of Great Britain and the circuit diagram were produced by demonstration programs supplied with the plotter.

The **Print Technik Digitiser** is a small box that plugs into the user port of the CBM-64 computer. The digitiser works by sampling a number of video frames and building up a picture in four levels of brightness in the computer memory. The stored picture is 256 by 256 points in size and 150 by 200 points are visible on screen at any one time.

You can assign different colours to each of the grey levels and can run a separate program to resolve 16 levels of brightness for special purposes. Once a picture has been acquired by the digitiser, the device can be disconnected from the computer and the image manipulated by the software alone.

The image can be dumped to black/white and colour dot matrix printers and may also be 'edited' using a light pen. Another program in the package will detect a change in the digitised image and sound an alarm if certain parameters are exceeded. The **Print Technik** digitiser was easy to set up using a Panasonic A2 camera and Panasonic NV 180B video recorder as the signal source.

The pictures were clear although the camera and the object must both be kept stationary as the digitising process takes three or four seconds to complete. It's very clever and a lot of fun.

There is one graphics package for the Spectrum that doesn't cost a lot of money and is more sophisticated than the other drawing software included in this review. **Leonardo** can draw in three dimensions and has a 'programmed draw' facility for drawing patterns, shapes, singly or repetitively, with scale expansion, translation or rotation. The rotation increment can be set to any number of degrees unlike many other programs which cope only with right-angle changes. **Leonardo** will work with the keyboard alone or any of the popular Spectrum joysticks.

## PRINT TECHNIK VIDEO

### DIGITISER

CBM-64

Supplied with:

Program suite to capture video picture, edit the picture, store picture on disc, dump a picture to dot matrix printer

CRL Group PLC, CRL House, 9 Kings Yard, Carpenters Road, LONDON E15 2HD

Telephone: 01-533 2918

## R H ELECTRONICS LIGHT PEN BBC

Supplied with:

Light pen utilities  
Draughts game  
Kwartet game  
Mode 3 free hand drawing program  
Swan — Mode 2 picture

R H Electronics (Salce) Limited, Chesterton Mill, Frenchs Road, CAMBRIDGE CB4 3NP

Telephone: 0223 311290

## COMPUTER ART AND GRAPHICS —

How to program with personal computers

Written by Axel Bruck

Published by Paul Petzold Limited  
London (1984) ISBN 0-946970-06-8

## CONCLUSIONS

■ A lot of software has been written for onscreen graphics displays on most of the popular microcomputers. Plotmate can use those programs directly to transfer data from the BBC screen to the plotter.

■ Graphics tablets or pads have been available for some time for minicomputers and big, serious jobs. Until recently they came with big, serious prices attached to them so the Graphpad, Touchmaster and Bimap are all good value for money as peripherals.

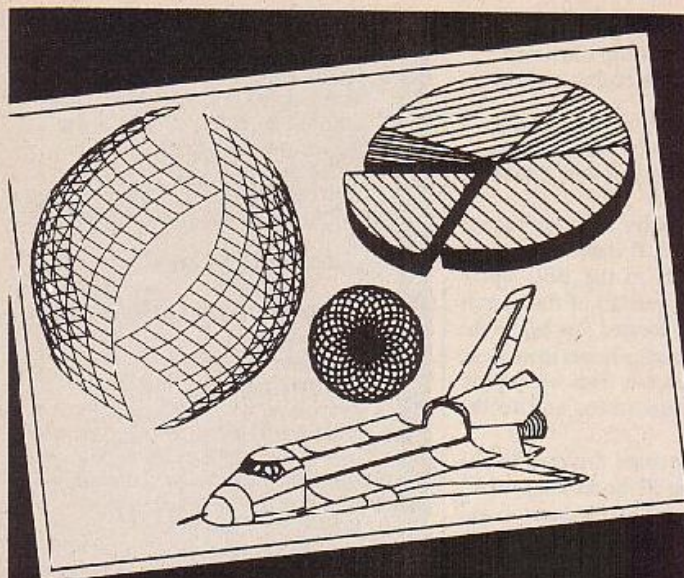
■ **Leonardo** is the best drawing and painting program for the Spectrum and you don't even need a joystick or a graphics pad.

■ Axel Bruck's book *Computer Art and Graphics* is superb. It illustrates magnificently how a computer can be used to draw complex repetitive patterns that appear to have depth and perspective. The explanation and programs in the book can be adapted to draw and plot almost any shape. But that is done by entering figures that describe the various lines and movements necessary to construct the shape. None of the software included in this review will allow you to draw a diagram in three dimensions on the computer's screen with either a graphics pad or a light pen and then rotate or scale the figure to suit your needs.

■ The video digitiser could be useful for preparing sales literature or catalogues where you want to include a picture of a piece of equipment or a logo into the middle of a text. It is certainly great fun to play with but remember you'll need a standard source of video signals, an ordinary video camera for example, to feed the device.

■ For my purposes I would buy an R H Electronics lightpen or the Graphpad or Touchmaster graphics pad and couple that to the Plotmate, writing the software to manipulate the data with the help of Axel Bruck's book.





## All this can happen when you Plotmate your micro

Plotmate is new. Excitingly new.

It's a rugged, responsive flatbed plotter with a lot of built-in magic.

You can use it to create fantastic patterns. Some small as a postage stamp. Or big as an A2 poster.

It'll produce overhead transparencies for you. And all dimensions of graphs, diagrams and charts.

It'll also prepare maps. Then put the contours in. And that's only part of it.

You should see its repertoire of characters—a whole sci-fi population for you to manipulate.

Plotmate software accepts all the colour, vector, character and graphics commands of your **BBC micro**.

You just plug it in and away you go. All for less than £300.\*

Phone 0702 541664

for details.

Get Plotmating soon.



# PL+MATE

**LINEAR GRAPHICS LIMITED**

28 Purdeys Way, Purdeys Industrial Estate, Rochford, Essex.  
Telephone: 0702 541664. Telex: 595701 Ref 356

\*exc VAT

## Educational Software **LCL**

### BBC Micro

Tape, 40/80 track Disc, Econet compatible.

### ZX Spectrum

Commodore 64

### Electron

unexpanded Vic

ZX81 • Apple • PET

NEC PC8201A

Dragon (book only)

All software for the above computers.



**MEGA MATHS** (BBC, Electron). 24 program step-by-step, A-level course of 105 topics for mature beginners, A-level students and Micro Maths users. (2 discs/tapes + 2 books.) £24.00.

**MICRO ENGLISH** (BBC, Electron). Complete English Language self-tuition and revision course to O-Level, of 24 programs. Includes "speak-and-spell" real speech (no extras required). £24.00.

**MICRO MATHS** 24 program revision or self-tuition course to O-Level. Includes 59 Topics plus two books. £24.00.

**ANIMATED ARITHMETIC** Teaches using moving colour pictures (not words). Ages 3-8. £6.50 (disc £7.50).

**BRAINTEASERS** Book of IQ tests and puzzle programs. £5.95. "...excellent" EDUCATIONAL COMPUTING.

\*Immediate dispatch: Micro Maths, Micro English, Mega Maths and Master Maths. Phone or send orders or requests for free glossy colour catalogue to:

**LCL** DEPT. Y.

Word leaders in educational software (distributors in 24 countries.)

26 Avondale Ave.  
Staines, Middx.

Tel: 0784 58771

24 hrs. Orders



TRADE DISCOUNTS  
NEW HOTLINE SERVICE

\*AS SEEN ON\*  
TV

## WHY NOT LOOK INTO THE NORTH EAST LONDON POLYTECHNIC?

Why not look into what NELP has to offer? When you open our Guide for Applicants you will find over 150 full-time, sandwich, part-time and special courses available to students seeking higher education to degree, diploma/certificate and professional level.

Our schools and departments offer courses in the areas of Arts and Social Sciences, Business, Management, Engineering and Science while in our school for Independent

Study students can plan their own individual programmes leading to DipHE or BA/BSc or Masters level.

Our Guide for Applicants contains full details of our range of courses.

Why not send for it now?

The Assistant Registrar,  
North East London  
Polytechnic  
Longbridge Road,  
Dagenham,  
Essex RM8 2AS  
Tel. 01-590 7722.

The Assistant Registrar,  
North East London  
Polytechnic  
Romford Road,  
London E15 4LZ.  
Tel. 01-590 7722.

## NELP

Postel no. \*2113411 #





# EDUCATION: REPLACING TEACHER

Software or swotware? Josephine Adams' end of term report reviews the class.

WHAT MAKES A good piece of educational software? Ask 20 different people and you'll get 20 different answers. To the parent, it has to help their child: be better scholars and get a better job. To teachers it adds something to their task that would otherwise be difficult, impractical, or even impossible. To the kids, it makes what is usually boring a bit more fun. To the supplier, well, the educational label can give an indifferent program credibility and so possibly greater sales. But unfortunately to most people, it means very little at all!

1981 marks the beginning of the computers in education boom. With government help, schools started to equip with micros, namely, the BBC — plus the Research Machines' 380-Z and 480-Z with a few Spectrums to boot.

Unfortunately, the software of that era did more than anything to put teachers off using computers — not that many of them were keen anyway. Chalk and talk could achieve much better results than most educational software of the day. In retrospect, it was asking too much for it to have been otherwise.

Programs performed on screen what the teacher did in class — except not as well. The dreaded drill and practice program dominated: the computer asks a question, the children answer it and, if they're lucky, receive a graphical reward sequence — a big screen tick.

But the situation has improved, dramatically. Over the past year or so, teachers and suppliers have got together to develop some very exciting applications.

Lessons have been learned: the computer can do some things well — not everything — and these areas have been exploited. Where educational software has succeeded, the results have been spectacular.

Consider these examples: remedial English. The mechanical ability to write is not there so the creative expression has dried up and the desire to learn with it. Enter word processing. Perfect hard copy every time thanks to a few basic functions — insert, delete, search and replace. The BBC Micro, currently the standard machine in education, supports quite a few good word processors, though none better than Computer Concepts' Wordwise Plus.

Or, history. How can you get a real feel for life in the Viking era? Enter the historical simulation. Decisions have to be made based on conditions of the time — the outcomes of which have no less significance in the 20th century than they did in the 10th. In case you're wondering, there is in fact a wonderful program from Fearnleaf called *The Vikings*.

Let's stay with the humanities and take a look at geography. One of the best collections comes from BBC Publications, called *Introducing*



Logotron Logo and sprite creation. Top, arcade graphics using simple Logo commands. Middle, this Logo can handle up to 32 sprites at a time. Bottom, multiplying cats.

(continued on next page)

## WARNING: COMPUTER STUDIES CAN DAMAGE YOUR FUTURE!

One: a home computer is not really going to help youngsters get a job because all they want to do is play games. Nothing wrong with that: there are some marvellous games around and the entertainment aspect of the computer at home is its main appeal.

Two: computer studies as taught in the majority of schools is almost completely irrelevant to what goes on in the real world. That, I hasten to add, is not the fault of the teachers but the exam boards. Whether the O or A level computer studies candidates go into higher education or employment, they will have to unlearn what they have acquired so far and then tackle what is being asked of them.

Employers rarely want Basic programmers; they want people skilled in Cobol, Fortran and assembly language. Universities and polytechnics don't give a hoot for Babbage; they demand a working knowledge of Winchester hard-disc systems, protocols for computer communication, user-friendly software interfaces.

Three: social interaction, organisational skills, people management are all more important than the vast amount of technical knowledge believed to be necessary when working with computers. A number of educationalists are becoming rightly concerned with the computer junkies, the increasingly common place of youngsters becoming hooked and ignoring everything else in life. If you can't communicate effectively with other people, you will be seriously hindered in your

working life, whatever you choose to do.

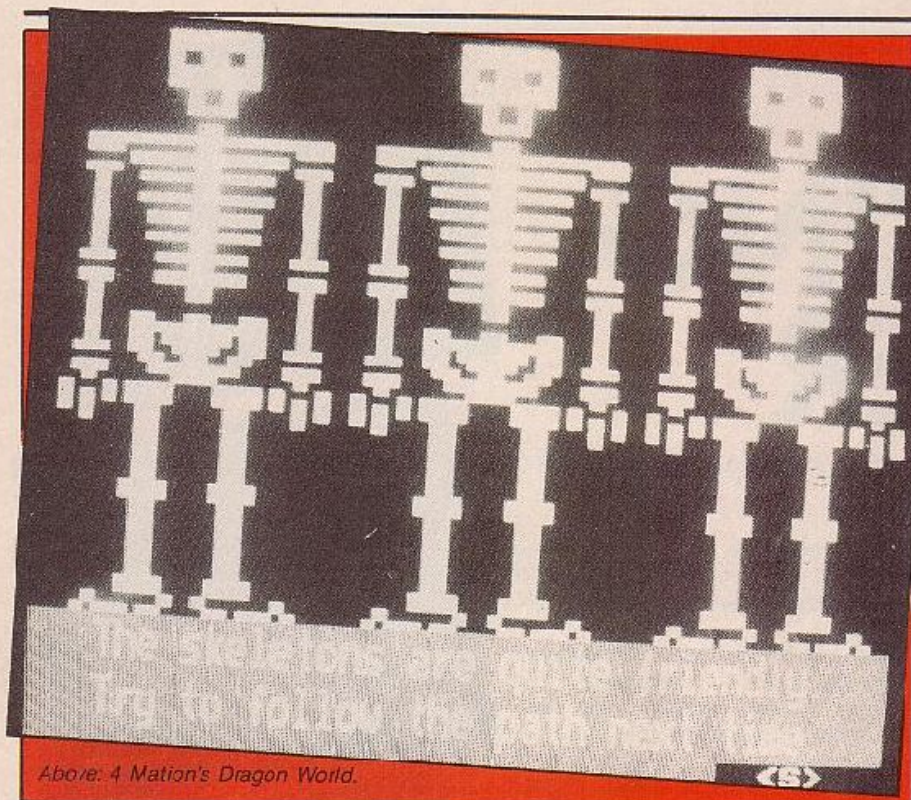
This is not meant to be pessimistic, just cautious. High expectations more often than not end up as disappointments.

One step in the right direction is the increasing number of training centres of one description or another which attempt to meet specific needs above and beyond conventional educational institutions. ITECs (Information Technology Centres) are springing up all over the country and provide courses for predominantly unqualified 16 and 17 year olds in various aspects of computers from worddata editing to word processing.

Within schools themselves, an initiative has been introduced by the DES to cater for the broad range of skills required within the hi-tech industries ranging from computer-aided design to electronic engineering. This is the so-called TVEI scheme or Technical and Vocational Education Initiative.

A skills shortage undoubtedly exists where jobs remain unfilled because so far inadequate attention has been paid to meeting industry's requirements. Those jobs are not for programmers but for creative technical people: I've seen many primary school children with the potential to meet those needs, if only Rank Xerox, ICL and others can wait 10 years or so!





Above: 4Mation's Dragon World.

(continued from previous page)

Geography. Four programs take you through different aspects of the subject via simulations of a nomadic lifestyle, an expedition to Everest, a river journey and an airline flight all first-class learning material.

Maths has always been considered an appropriate subject for the computer. For the early years of school, there are a couple of outstanding programs that are a must for any primary school software library. The first is called Maths with a Story (BBC Publications); the second is Cars — Maths in Motion from a highly respected educational software supplier, The Cambridgeshire Software House.

But computer assisted learning aside, there are new opportunities for learning that the computer and its software have created. This is the real breakthrough.

One example, and perhaps the best, is Logo. All the common home computers have an implementation of Logo though the better ones are Logotron Logo for the BBC Micro and Atari Logo.

Logo basically offers the young computer user the chance to explore for themselves the world of maths, programming, computer graphics and control. In school, it can form the basis of a year's work; at home, it means hours and hours of fun — much more so than the average game. And it's very educational!

Another example is information handling. Success in this world depends on the individual's ability to manipulate information not to store it: to find it, collect, retrieve and interrogate it. It is here that being able to use a computer may help its user to get a good job.

Forget programming, systems analysis and computer science; computers will soon be able to do all that for themselves. What is important is the information handling skill — the heart of the information technology boom.

It is here too that the computer fits most comfortably into other, more familiar, areas of classroom activity. Kids go out daily to survey

traffic, wildlife, the eating habits of classmates and a thousand other things as part of normal project work. The creation of a database on the computer of information they have gathered can help this kind of project work but it is also a marvellous learning opportunity in its own right.

Two of the best educational database packages are Quest from the Advisory Unit of Computer Based Education (AUCBE) in Hatfield and Inform from the Nottinghamshire Computer Education Centre. The first runs on RML micros, the second on the Beeb.

In the primary school, adventures have proved to be enormously successful learning aids. Children work together in groups, share decision making responsibilities, delegate tasks — all very important aspects of a later, working life and things all too often neglected in exam-dominated syllabuses.

The spin-offs too are tremendous — creative and written work, even drama and music. With



an average ratio of 20 kids to one computer, these associated activities are extremely important. The maestro in this field is 4Mation Educational Resources: little has generated as much enthusiasm or fun as Flowers of Crystal and Dragon World.

Another good example of an educational adventure is GSN's program called Merlin's Magical Shop. Within the package, you'll be

hard-pressed to find the software. There's so much additional resource material, teaching suggestions, children's worksheets, documentation, etc. Really makes you feel you're getting your money's worth.

Helping to appreciate the natural world may be the last thing you would imagine the micro being any good at. But there are two brilliant pieces of software that do just that — Osprey from Bourne Educational Software and Suburban Fox from Ginn & Co.

In one, you just protect the precariously small osprey population in the highlands of Scotland from threats ranging from nosy tourists to natural predators. You really begin to understand what conservation is all about and what it's like to be an osprey. Suburban Fox takes the process even further — you take on the role of a fox: you live, breathe and survive as a fox.

All the software monitored so far is purely educational in the sense that it was designed for use in the classroom. But what about home education?

Well, home education software took off in the boom period when millions were rushing out to Laskys and W H Smith to buy their Commodore 64s or Spectrums. Making learning fun made money for suppliers like Mirrorsoft, Longman and Macmillan who all brought out some pretty good programs.

Other names also cashed in on the market with predominantly early learning games for the seven to 12 age group. A few braved the exam revision market like Collins and Penguin, but the majority of material was for the younger age group.

One of the few companies to remain successful in this field is ASK. Time Trucker, Podd and the latest in the line — Pazzzzz — are all top quality programs. There are plenty of others too. There are versions of ASK software for most micros and at a reasonable price.

A couple of other good examples of, er, well, interesting software are Bodyworks and Fantastic Voyage. Remember the pop-up body book with the flapping lungs? Well, Bodyworks is an adaptation of that written in conjunction with Jonathan Miller. Available for the Spectrum, the graphics are tremendous. Both apply to Fantastic Voyage too — a similar program to Bodyworks but with much more of a game approach. Both will undoubtedly spur budding biologists to greater heights.

This represents but a small selection of what is on the shelves that is good and worth buying. But what will the next generation of educational software bring? One thing is for sure, it will have to be good to sell. Teachers and parents will soon acquire the confidence to discard what they know is rubbish and to demand what they know to be good; not only in terms of software but curricular and applications too.

Curriculum development — changes in what is taught in schools — is a slow, slow process. For the computer to be utilised to the full, the curriculum must change. It's beginning to happen slowly but surely in the form of new courses and qualifications. Take for example the diploma in microcomputer applications which is now being offered at a number of schools and colleges.

From Babbage and Basic, we've come to viewdata and spreadsheets — practical useful subjects with a real application to the outside world: a rare enough thing in schools. Courses of this type



have identified and addressed particular needs in the commercial world and in the pupils themselves. They are modular by design and combine applications such as word processing, database, financial analysis, graphics, videotex, etc., and upon successful completion are worth much more than the average clutch of O levels and CSEs. They also demand a new approach to educational software.

This brings us neatly to one of the major new developments within the educational field and elsewhere — the availability of cheap 16-bit computers. This combats two of the restrictions of current activities. The first is that working on machines like the RM Nimbus and Apricot FIE has direct relevance to industry where the same if not very similar machines are being used. So when you learn about word processing or databases, you're learning on the same machines with the same software as is in commercial use.

Also, writing decent, interesting and extensive educational software on the BBC Micro is not easy, as any software house will tell you. The machine is just not up to it. But with whizz-bang 16-bit graphics, speed and performance, developers will really be able to get their teeth into applications.

16-bit computing with its icon technology, high-speed graphics, large memory capacity and most important, ease of use, adds up to better software, better applications and a better learning environment.

What look like being the final push from MEP — the quango set up in 1981 to oversee educational computing — is in the area of 16-bit educational software development. Recently, a contract worth £25,000 was awarded to ASK to develop material for use in schools. If the company's present range of programs is anything to go by, the end result should be pretty good.

There are many scenarios for the school of the future but one of the most feasible is the increased amount of time pupils will study at home. A micro at home connected by phone to a larger computer elsewhere is a realistic possibility for home study. Many students with special educational needs use this kind of set up to undergo study because they simply can't attend school or college. If this became commonplace, we'd really see some advances in home education software.

#### Software and Suppliers

*Wordwise Plus* Computer Concepts, Gaddesden Place, Hemel Hempstead, Herts. HP2 6EX, BBC micro, £56.35, Rom.  
*The Viking*, Fernleaf Educational Software, Fernleaf House, 31 Old Road West, Gravesend, Kent DA11 0LH. £35.95, introducing *Geography*, BBC Publications, 35 Marylebone High Street, London W1M 4AA, BBC micro, £17.40 disc

*Maths with a Story*, BBC Publications (see address above), BBC micro, £9.95 cassette  
*Cars — Maths in Motion*, Cambridgeshire Software House, The Town Hall, St Ives, Huntingdon, Cambs. PE17 4AL, BBC micro, £18 cassette and disc

*Logotron Logo*, Logotron Ltd, 5 Granby Street, Loughborough, Leics. LE11 4DJ, BBC micro, £39 Rom chip

*Atari Logo*, Atari UK Ltd

*Quest (QuestC)*, AUCBE, Endymion Road, Hatfield, Herts. AL10 380 Z and 480-Z, £10 disc

*inform*, Nottinghamshire Computer

Education Centre, Eaton Hall, Retford, Notts. BBC micro, £15 (check) disc

*Flowers of Crystal*, 4Mation Educational Resources, Linden Lea, Rock Park, Barnstaple, Devon EX32 9AQ BBC micro and 480-Z(?), £16 cassette £17.65 disc

*Dragon World*, 4Mation Educational Resources (see address above), BBC micro, RML version in preparation, £16 cassette, £17.65 disc

*Merlin's Magical Shop*, GSN, Manchester University Press, Oxford Road, Manchester M13 9PL, BBC micro and 480-Z, £25 disc

*Osprey*, Bourne Educational Software, Bourne House, The Hundred, Romsey, Hants SO5 8BY, £11.95, disc

*Surburban Fox*, Ginn & Co. Ltd, Prebendal

House, Farson's Fee, Aylesbury, Bucks. HP20 2QX. £30

*Podd*, ASK Ltd, London House, 68 Upper Richmond Road, London SW15 2RP. BBC micro, £9.95 cassette

*Time Trucker*, ASK Ltd (see address above), Commodore 64, £7.95 cassette

*Pazzazz*, ASK Ltd, (see address above), Commodore 64 and BBC micro, cassette

*Boddyworks*, Genesis Productions Ltd, 30

Great Portland Street, London W1N 5AD,

Spectrum, £14.95 cassette

*Fantastic Voyage*, Quicksilver Ltd, Carlton Lodge, 16 Carlton Crescent, Southampton,

Hants. SO1 2EJ, Spectrum, £6.95 cassette

NOMAD

Can you keep your  
cattle alive in the  
Sahel of West Africa?




(c) AUCBE 1984  
 British Broadcasting Corporation  
 Press SPACE for explanation

Above: Introducing Geography. Below: ASK's Time Trucker.



PRESS RETURN OR  
FIRE TO LOAD.



	02:45 03:15		02:20 03:00
	03:15 03:45		03:20 04:00
	03:30 04:00		02:35 03:10

£00

11	12	1
10		2
9	—	3
8		4
7	6	5
		A.M.



· THE NEW AMSTRAD CPC 664 WITH BUILT-IN DISC DRIVE



· THE NEW AMSTRAD CPC 664 ·

· AVAILABLE AT BOOTS · COMET · CURRYS · DIXONS · GREENS · JOHN MENZIES · RUMBELOWS



# THE LOW COST COMPUTER FOR HOME AND BUSINESS •

If you know anything about computers you'll know that disc drives are up to fifty times faster than cassette when you're loading and saving programs. In fact, a disc drive makes computing faster, more reliable, more efficient and more fun. But up till now the only way to gain these advantages for a home computer was to buy a separate disc drive attachment. Now Amstrad are pleased to announce the first complete home computer with built-in disc drive: The Amstrad CPC 664.

And when you buy a CPC 664 you'll find it's not just the disc drive that's built-in.

You'll get everything you need, including a monitor (green screen or full colour). We'll even give you a free CPM and Logo disc, so all you do is plug in and you're in business.

## BUSINESS OR • PLEASURE •

Although a disc drive will make games more fun (and there are loads of them to choose from) it also makes the CPC 664 a serious proposition for the business user.

There are accounting, word-processing, spread-sheet and data-base programs (to name but a few).

Amsoft Business Control, is a complete suite of programs for integrated sales invoicing, stock control and sales ledger for around £99. (Requires an additional FD-1 disc drive around £159 and DL-2 cable around £7).

business more efficient and effective by providing access to the famous range of CP/M\* software.



WITH COLOUR MONITOR AROUND

• £449 •



WITH GREEN SCREEN AROUND

• £339 •

# THE HOME COMPUTER THAT MEANS BUSINESS.

## HIGH PERFORMANCE • LOW COST •

The one thing you won't need a computer to work out is that the Amstrad CPC 664 represents outstanding value for money.

You only have to check the cost of buying all the elements separately (64K computer, disc-drive, monitor) to realise that the Amstrad package is very hard to beat.

With a green screen monitor the cost is just £339. With a full colour screen it costs £449. And after you've saved money on the price of the computer itself, you go on saving on the price of software.

There are hundreds of programs for business or pleasure available on disc (and cassette) to CPC 664 users. Many from Amsoft, others from other



Wordprocessing with Amword can improve the productivity of everyone from unskilled typist to trained secretary. Around £23.95.

famous-name software houses. Few will cost you more than £49 and most will cost you considerably less.

## AN EXPANDING • SYSTEM •

There is a complete range of peripherals available to CPC 664 users which plug directly into the built-in interfaces.

These include a joystick, additional disc drive (to double your on-line storage) and the Amstrad DMP-1 dot-matrix printer. (There's also a cassette interface so that you can use CPC 464 programs on tape). And there are many more peripherals from Amstrad and other manufacturers which can be used to enhance the CPC 664.

## • AMSTRAD USER CLUB •

Join the optional Amstrad User Club and we'll keep you informed with our monthly user magazine, and information on all software as it is introduced. Your membership details



Figure analysis made easy with Microspread. An easy to use spreadsheet with pull-down menus and a wide range of mathematical options. Around £49.

will be recorded on your personal club card, which entitles members to various privileges and offers.



Please send me more information

Name \_\_\_\_\_

Address \_\_\_\_\_

# Amstrad CPC 664

Amstrad, P.O. Box 462, Brentwood, Essex CM14 4EF

YC/654/4

\*CP/M is a trademark of Digital Research Inc.



WITH JUST four full-time staff you could call U.S. Gold a Mickey Mouse company. And now that Geoff Brown has acquired the rights to Walt Disney productions — outbidding multi-billion dollar corporations like British Telecom along the way he just might agree with you.

In a year and a half since Geoff and Anne Brown formed U.S. Gold they have launched one title every ten days, selling a million cassettes and taking much the biggest share of the British software market. Even their bitterest critics, and they have many 'they like to knock success' claims Geoff "success breeds jealousy", admit that the invasion of American software has forced up the minimum acceptable standard for programs.

Geoff, a former Maths teacher and mainframe programmer, was running Centresoft importing mainly Atari games from America since 1981, when he realised that there was a wealth of Commodore 64 software over there and every chance that the 64 was going to be the main games machine over here. What was keeping American software out was not its quality but its price.

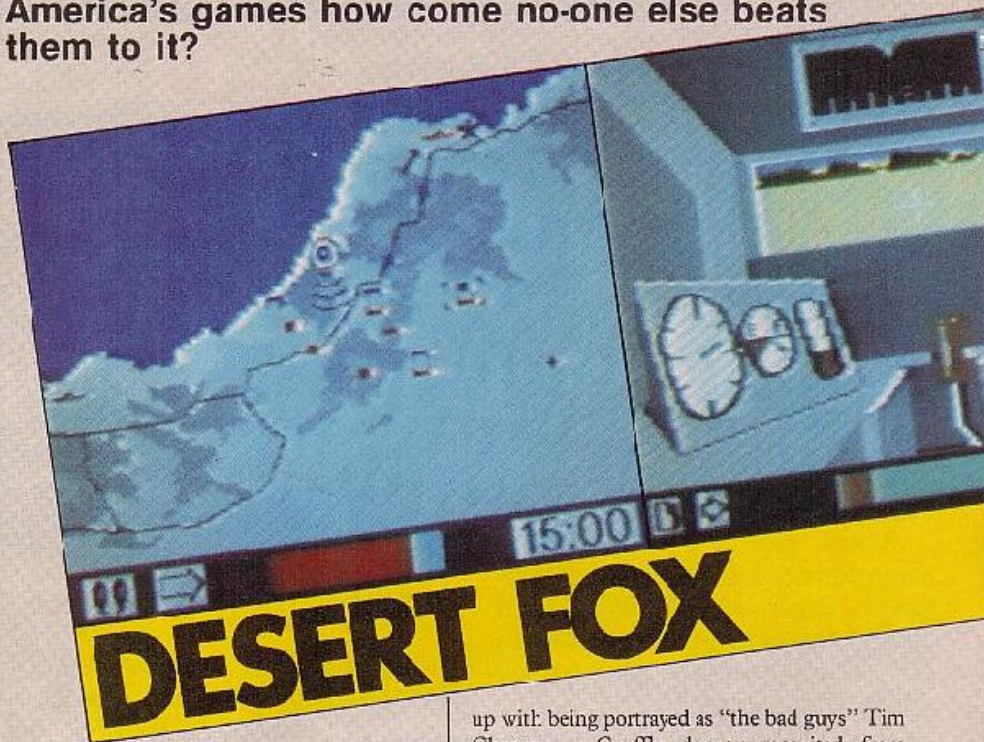
The Atari 400/800 which Geoff still believes was a "brilliant machine way ahead of its time" never sold well over here because much of the software was only available on disc and usually cost £35 a time. No-one doubted that games like Pole Position and Zaxxon were the best on any micro but people were not prepared to pay high American prices out of low British wages especially when they could buy games for the Spectrum at £5 and £6.

Geoff used his experience of negotiating licensing deals to persuade American houses to let him repackage into cassette format and reprice at around £10 so he could go for the mass market. This was the thinking behind the creation of U.S. Gold in April 1984, then he brought in Ocean to write Spectrum, Amstrad and BBC conversions of the 64 hits.

Companies like Datasoft, Sega, Microprose, Strategic Simulations and Access were all signed up on a first refusal option. Datasoft's strengths were its existing product list including the Atari-soft titles and its ability to sign up films and personalities. Microprose specialised in simulations like F-15 Strike Eagle while Epyx wrote the technically brilliant Impossible Mission which not only won awards but also stayed in the charts for six months. Sega could offer proven hits from its arcade operation such as Spyhunter, and earlier Buck Rogers and Zaxxon.

# INSIDE

**Sneak screen shots of the next batch of games from Britain's biggest selling software house. If it's so simple for U.S. Gold to scoop the best of America's games how come no-one else beats them to it?**



But it was Access that put U.S. Gold on the map with Beachhead and the controversial Raid over Moscow, which ended up being condemned in the House of Commons, not so much for the game itself which was a well written if unimaginative shoot-em-up but for the American originated advertising copy which was so full of cold war cliches that it could have come from the Ronald Reagan Storybook.

At any rate the publicity did no harm to the sales and despite assertions that U.S. Gold is fed

up with being portrayed as "the bad guys" Tim Chaney — Geoff's deputy recruited from Commodore early this year reveals in the company's spaghetti western image. "We're like a war machine" he swaggers "we don't have competitors we only have adversaries — we're out to crush them." Nevertheless Geoff and Tim have a high regard for the other top software houses.

Ocean are almost part of the family as is Gremlin Graphics which Tim calls a "boutique-type company" — literally downstairs from U.S. Gold and controlled by the Browns. But Geoff also admires Beyond and Ultimate, "a

## WINTER GAMES

With Summer Games II already on the starting blocks U.S. Gold's counting on Epyx's

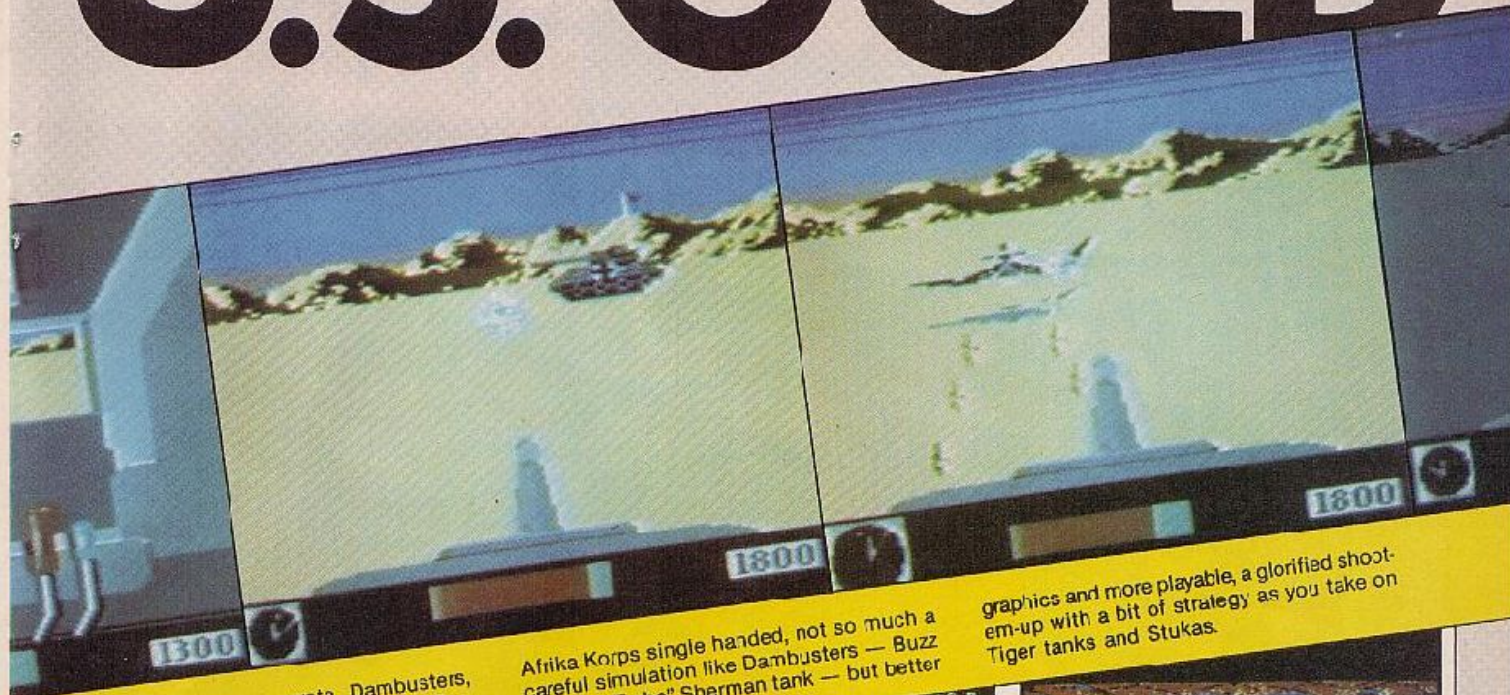
Winter Games to bring in the bread after Christmas. Summer Games I was eclipsed

by Daley Thompson's Decathlon but since then Epyx has made its mark with Impossible Mission. Winter Games again uses a decathlon approach where you have to compete in a series of disciplines such as the ski jump and cross country skiing.





# U.S. GOLD



From the team that wrote Dambusters, Sydney Development, comes Desert Fox. This time you are Buzz Baxter taking on the

Afrika Korps single handed, not so much a careful simulation like Dambusters — Buzz drives a "Turbo" Sherman tank — but better

graphics and more playable, a glorified shoot-em-up with a bit of strategy as you take on Tiger tanks and Stukas.

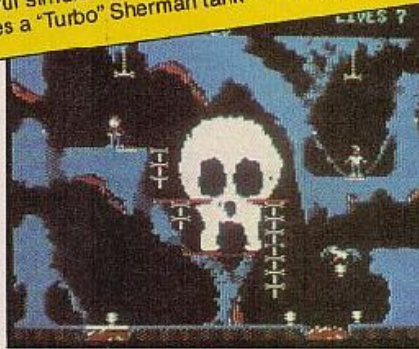
fantastic company but they're in a different part of the market — they concentrate on arcade adventures and keeps an eye on the sleepers — middle-ranking software houses with big corporations behind them — like Robert Maxwell's Mirrorsoft and British Telecom's Firebird.

When he is wearing his Centresoft hat Geoff tries out most of the games that he plans to distribute to see if they are up to scratch "although I don't look at a new Ultimate game — I take it". He is remarkably free with his praise for other houses' games — both he and Tim feel that Boulderdash was great — should have been a number one hit, and still relish old favourites like International Soccer and Matchpoint.

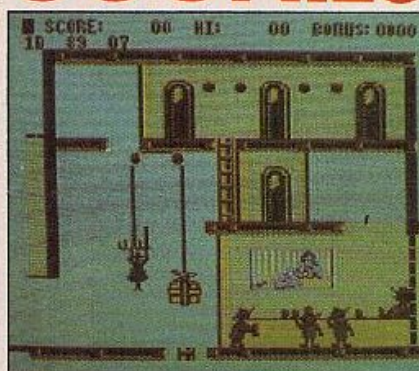
Naturally Geoff still hankers after old Atari classics and Tim prefers the Commodore 64. He believes that programmers have stretched the capabilities of the 64 to the limit now "but you can still get new tunes from an old violin".

They can appreciate the technical skill involved in a well-written Spectrum game but they don't use the machine for games playing themselves — whereas hits from the States can turn them back into addicts. "We stayed up till two in the morning when Aztec Challenge arrived to try to finish it". When Tim enthuses about Dropzone as being "like going into a china shop and smashing everything" and scars around the room you worry for a moment in case the elegant Scandinavian reading light is about to find out the risks of living on a war machine's desk.

Critics have suggested that U.S. Gold pays  
(continued on page 59)



## GOONIES



Alternative Reality is a quirky mixed text and graphics adventure with a slightly hippy feel — well it does come from Paracise Programming — as you steer your way through a three-dimensional maze to the Betelgeuse sales. Philip Price wrote the game with excellent music from Gary Gilbertson.

## ALTERNATIVE REALITY



Goonies may look like an ordinary platform game to you but based on Spielberg's latest blockbuster, Geoff Drown hopes it will be this year's Ghostbusters.

## ZORRO

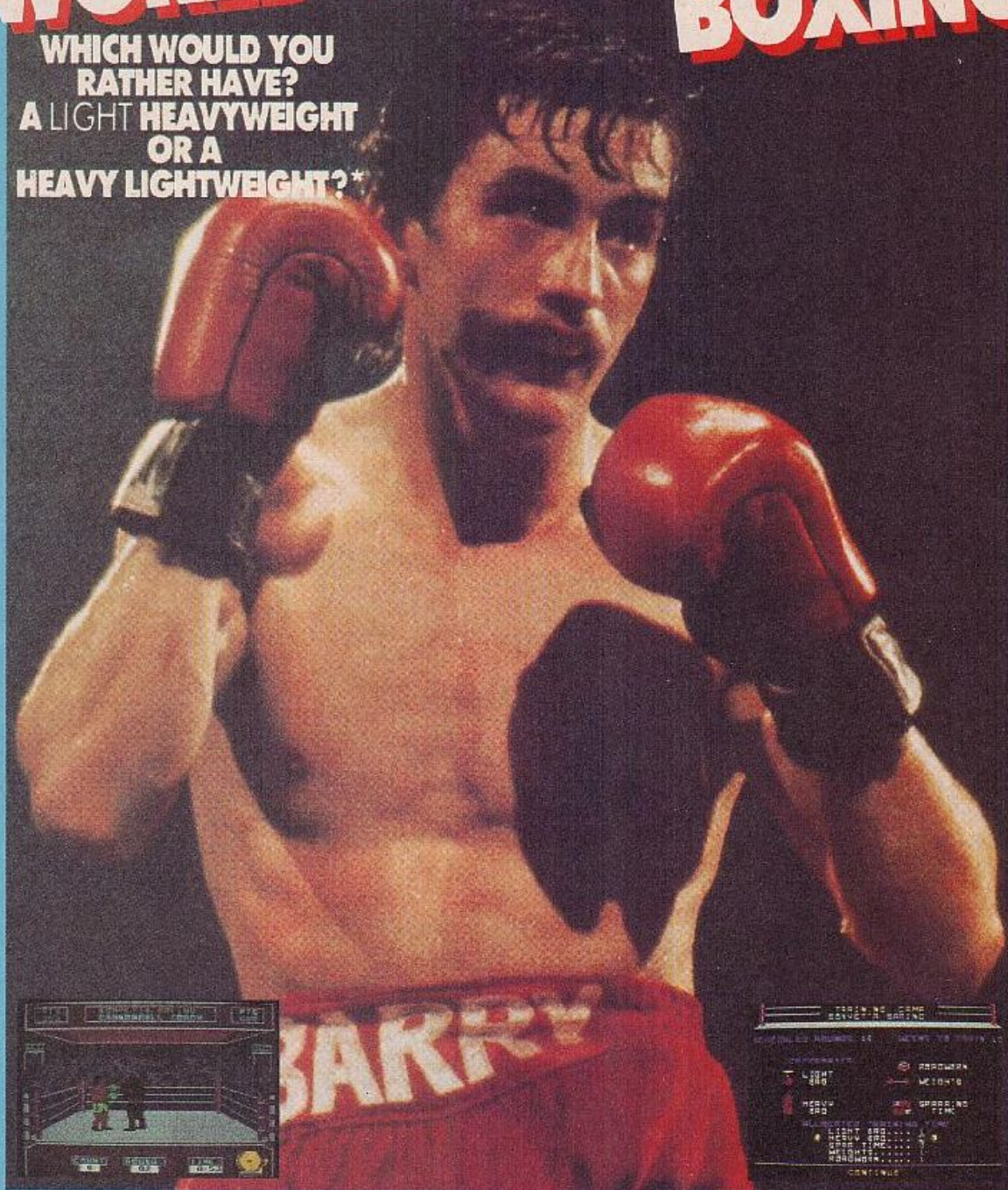
Zorro lets you swashbuckle like Douglas Fairbanks Senior. As champion of the common people you swordfight your way across screen after screen of oppressors.





# BARRY McGUIGAN WORLD CHAMPIONSHIP BOXING

WHICH WOULD YOU  
RATHER HAVE?  
A LIGHT HEAVYWEIGHT  
OR A  
HEAVY LIGHTWEIGHT?\*



Barry McGuigan World Championship Boxing. The first computer boxing game to give you 'real-life' action with all the style and strategy of the big fight.

Round One. You're up against 19 top boxers including, the champ himself, Barry McGuigan. You'd better box clever to beat these boys.

Round Two. You're aiming for the title. Time to create your very own boxing partner. You decide how he looks, how he fights. You put him through his paces to build up stamina and endurance.

Round Three. What a fight! What a champ! It's a knock-out!

\*We know he is the best featherweight, but we thought it was a good line.

*Sport*

ACTIVISION  
HOME COMPUTER SOFTWARE



# INSIDE U.S. GOLD



## BOXING

(continued from page 57)

the Americans too high a price for the rights to their software but Geoff points out that money up front is only part of the business —

otherwise the likes of CBS could have simply bought success with its superior financial resources. Geoff uses a network of talent spotters in the U.S.A. so he can concentrate resources on suitable programs. Given Gold's track record on promoting and selling he can offer a relatively accurate forecast of what a program should sell. Sliding scale payments safeguard against dollar/pound exchange rate fluctuations.

Geoff often buys the rights to programs from

ing facilities and the option to create your own boxer, but its light hearted approach to the noble art of self defence will not go down well on the Old Kent Road.

houses with a proven record when they are little more than ideas. Sydney Development Corporation, the Canadian — oddly enough — programmers who wrote Dambusters only had to show a game plan for Geoff to sign up Dambusters II. In the meantime, Sydney's Desert Fox is ready for launch.

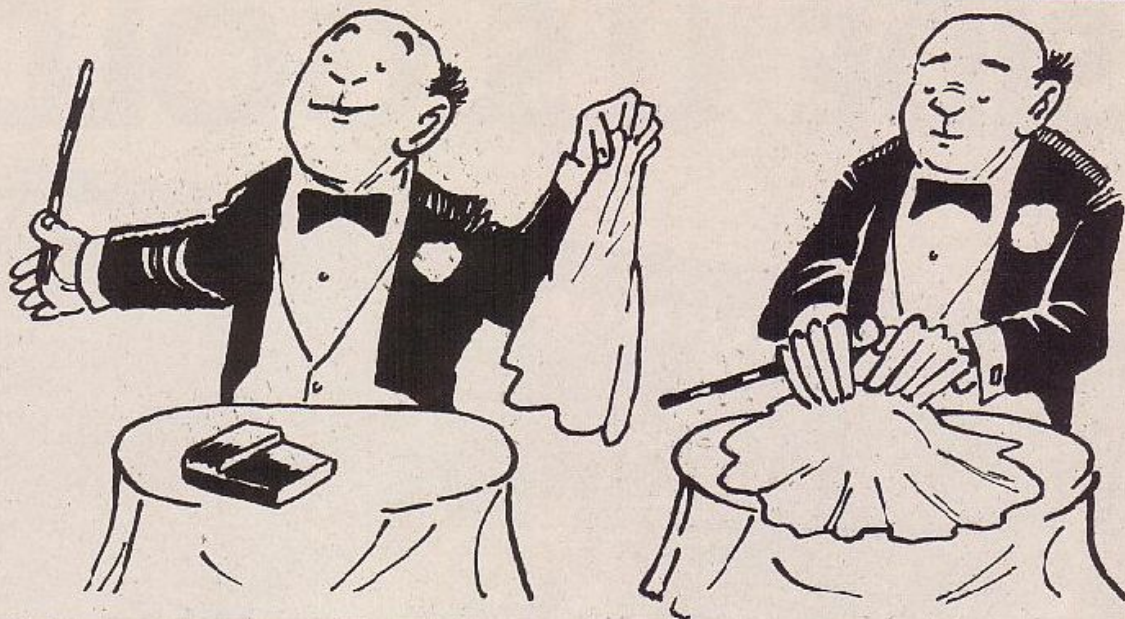
Geoff's personal preference for shoot-'em-ups has not blinded him to the growing market for simulations, and Microprose run by gung ho Bill Stealey. "I'm selling these games to men. If you haven't got the right stuff I don't want to know" is his trump card. Already F-15 Strike Eagle, Nato Commander, Solo Flight and Kennedy Approach have made their mark. Now Crusade in Europe and Decision in the Desert are on their way under U.S. Gold's new Transatlantic Simulations label, with a hefty £20 price tag.

But sequels and conversions are the name of the game at the moment. After Beachhead II "blood and guts on a computer" comes Pole Position II, and Summer Games II. U.S. Gold should keep its tape duplicators, Ablex in Telford, running flat out over the next few months and there are plans for merchandising deals in other areas "why not Zaxxon soap?" he asks, but Geoff is not complacent. "There is no divine right of U.S. Gold to be successful. There is no masterplan, we were successful by accident with hard work and a few gambles. It's pressure — but it's better than working down a coalmine".

When companies produce a game that flops he believes they should "send them to the crusher" rather than sell them off cheap — and he thinks that if and when U.S. Gold makes a serious error the press will suggest he deserves a similar fate — "look at Clive Sinclair, all that he's done for the industry, the moment he makes a mistake the headlines are 'IDIOT', 'FINISHED'. I get tired of being knocked."







ONE OF the main restrictions of the Sinclair Microdrive system is that it is only possible to access data files from Basic which imposes a severe restriction on database and other similar applications which access data files. For example, changing a record in a data file involves opening a new file, copying the preceding records from the old to the new, writing the altered record to the new file, copying the rest of the old file, deleting the original file and renaming the new file as the old file.

Even this last is not straightforward as Sinclair Basic lacks a Rename command. In practice, the following code illustrates the type of subroutine that would be required to alter the nth record of a file of 100 records called "data" in which each record is 24 bytes long. The new nth record is in the string n\$.

```

9000REM Alter a record (Sinclair
  BASIC)
9010OPEN#5:"m":1:"data"
9020OPEN#6:"m":1:"new.data"
9030IF n=1 THEN GOTO 9070
9040FOR p=1 TO n-1
9050INPUT#5: LINE x$: PRINT#6:
x$
9060NEXT p
9070INPUT#5: LINE x$: PRINT#6:
n$: REM write new record
9080IF n=100 THEN GOTO 9120
9090FOR p=n+1 TO 100
9100INPUT#5: LINE x$: PRINT#6:
x$
9110NEXT p
9120CLOSE#5: CLOSE#6
9130ERASE "m":1:"data"
9140MOVE "m":1:"new.data" TO "
m":1:"data"
9150ERASE "m":1:"new.data"
9160RETURN
  
```

It should be clear that this is both tortuous and very slow as it involves many operations of the microdrive which also causes increased wear and tear on the cartridge and drive. MIRA solves these problems by providing Sinclair Basic with three new commands which together allow the maintenance of random access files similar to those available on micros such as the BBC with disc interface.

The new commands (RND #, Point #, Restore #) are all obtained by using existing Sinclair keywords but in new contexts. The use

and syntax of the new commands and the theory behind their implementation are explained below but first, as an example, the above subroutine re-written using the MIRA commands.

Note that a 24 byte record occupies 25 bytes in the file because of the inclusion of a carriage return (CHR\$ 13).

```

9000REM Alter a Record (MIRA)
9010OPEN#5:"m":1:"data" : RND#5
9020POINT#5,25*(n-1) : PRINT#5:
n$
9030RESTORE#5
9040RETURN
  
```

The first of the new commands, RND followed by a stream of identifier (e.g.: #5) causes the file attached to the given stream to be declared as a random access file. The file must already have been opened with the standard Open # command and must be a "read" file.

The RND command cannot be used to create or open a file. In the example above, the file "data" would originally need to have been set up with code such as:

```

100DIM x$(24)
110OPEN#5:"m":1:"data"
120FOR p=1 TO 100 : PRINT#5:x$
: NEXT p
130CLOSE#5
  
```

Point followed by a stream identifier and a numeric expression separated by a comma (e.g. Point #5, n) moves the internal pointer of the file attached to the given stream to the nth byte of the file, where the next Input #, Print #, or Inkey\$ # will take place, provided that the file has been opened with Open # and made random with RND #.

An error will be generated if you try to move the pointer outside the limits of the file. The Basic loader program for MIRA — listing 1 — also defines a function, FN p(x), which returns the current value of the internal pointer of the file attached to stream x — e.g. LET pos=FN p(5). For what it's worth, this will work with any "read" file, not just a random access one.

Restore followed by a stream identifier (e.g. #5) closes the random access file attached to the given stream. Restore # must be used in preference to Close # to correctly close a file that

Figure 1. Microdrive channel structure.

Byte	Length	Description			
0	2	"output" routine			
2	2	"input" routine	42	2	unused (see text)
4	1	channel specifier "M"	44	10	10 bytes of cartridge name
5	2	shadow Rom output	54	1	header checksum
7	2	shadow Rom input	5	12	12 bytes of data pre-amble
9	2	length of this Chans area (595)	67	1	bit 0—reset—not a header
11	2	current buffer position (0-512)			bit 1—reset—not end of file
13	1	position of record in file (0-255)			set—end of file
14	10	10 bytes of filename			bit 2—reset—a Print file
24	1	bit 0—reset—"read" file set—"write" file			set—not a Print file
25	1	bits 1-7—unused (all reset)			
2	2	drive number (1-8)			file
28	12	drive map location	68	1	bits 3-7 unused (all reset)
		12 bytes of header	69	2	record number (0-255)
40	1	pre-amble			number of bytes in record (0-512)
		bit 0—set to signal header	71	10	10 bytes of filename
41	1	bits 1-7—unused	81	1	checksum
		sector number (0-255)	82	5-2	buffer data
			594	1	data checksum





YOUR COMPUTER, SEPTEMBER 1985 61





THE PIONEERS OF ROM SOFTWARE FOR THE AMSTRAD NOW PRESENT

## \* PROTEXT \* WORD PROCESSOR

TO THE ARNOR STANDARDS

- SPEED** - TOUCH TYPING SPEED & SUPER-FAST SCREEN HANDLING
- SIMPLICITY** - SO EASY TO USE & INCLUDES COMPREHENSIVE HELP FACILITIES
- POWER** - SO MANY FEATURES... LOAD, MERGE, SAVE, POWERFUL FIND & REPLACE, COJNT, CATALOGUE, INSERT, DELETE, WORD-WRAP, JUSTIFY, BLOCK COMMANDS, TABS, MARKERS, MARGINS, FORMATTING, HEADERS & FOOTERS, FULL/EASY PRINTING, QUICK COMMAND ENTRY FOR EXPERIENCED USERS, DIRECT ACCESS TO DISC/EXTERNAL COMMANDS.

NEED WE GO ON?

\*REMEMBER\* Protext is available in Tape/Disc/Eprom or AD1 Cartridge

\*REMEMBER ALSO\* "If this is their editor, I wait with baited breath for their word processor..."  
(ACU JUNE '85)

## THE PROFESSIONAL TEXT EDITOR AT A SENSIBLE PRICE:-

FOR PROTEXT (P) OR MAXAM (M) ON CFC 464

ALL  
ENGS,  
CREDIT CARD  
SALES ETC  
01-588-5223

ROM + AD1 CARTRIDGE (code AD1P or AD1M)	£49.95
15K EPROM ALONE (code EP or EM)	£39.95
DISCS/DP or DM	£26.95
CASSETTES/CP or CM	£19.95

For the CPC 664: Please quote AD2P, AD2M and add £5. EPROMS DISCS & CASSETTES are the same code and prices as the CPC 464.

Trade & Overseas Orders Welcomed

leaves  
40K  
TEXT  
SPACE

SEND LARGE SAE FOR FULL CATALOGUES

# TURN PRO TODAY!!

## \* UTOPIA \* £29.95

BASIC UTILITIES ROM  
(Prod Code EU)

40K  
USER  
RAM

Beebug's 'TOOLKIT' is the standard utilities ROM for the BBC Micro and has sold thousands of copies. Now the author has written an Amstrad version. Available only on ROM the program contains numerous Basic Programming AIDS including search/replace within Basic program, listing basic variables, moving basic lines, load, save, verify, type, dump, format, copy and much more.  
**ALL INCL PRICE £29.95**

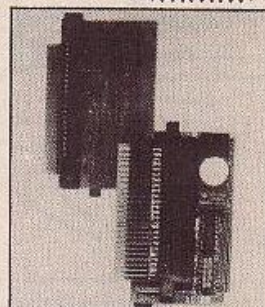
AND GREAT NEWS FOR MACHINE-CODE ENTHUSIASTS:

### MAXAM

IN CARTRIDGE NOW ONLY £49.95 incl VAT, p&p  
NOW ALSO AVAILABLE IN ROM ALONE FOR ONLY £39.95  
ALL VERSIONS NOW CONTAIN FULL SPECIFICATION  
DISC £26.95 TAPE £19.95

### PRESS COMMENT

"Innovative device this article finished on the JRNCR editor... will worth the money" - **AMSTRAD COMPUTER USER**  
"Assemblers... look no further ARNOR is the best I have seen" - **COMPUTING W.T. AMSTRAD**  
"Absolute magic! - ARNOR must be 'the market leonards'" - **POPULAR COMPUTING WEEKLY**  
"Quite Special... difficult to match" - **COMPUTING TODAY**  
"ARNOR are to be congratulated on a superb job... definitely the best!" - **HOME COMPUTING WEEKLY**  
"A product no serious AMSTRAD user can afford to be without" - **YOUR COMPUTER**



AD1 ROM CARTRIDGE

IN GOOD COMPUTER STORES EVERYWHERE - OR DIRECT.....

PLEASE SEND ME

PRODUCT CODE

(PRICE)

I enclose Cheque/PO for £  
(PAYABLE ARNOR LTD)

OR

Please debit my Access/Visa

Card No

Total £

NAME

SIGNATURE

ADDRESS

ALL TRADE/CREDIT CARD SALES, ENQUIRIES ETC 01-668 6223

SEND TO ARNOR Ltd Dept Y, THE STUDIO, LEDBURY PLACE, CROYDON, SURREY CR9 1ET

### BUSINESS COMPUTERS

Apricot F1E £637 (E814) £650, Apricot F1 £884 (E870) £839, Epson DX6 C800 (D872) C882, Commodore PC10 £1595 (E1564) £1684, Commodore PC20 £2573 (E2485) £2685, Sanyo MBC 775 £1923 (E1899) £1959, Canon A200C £1809 (E1586) £1886, Sanyo MBC550 £723 (E680) £709, Sanyo MBC550-2 £879 (E839) £1038, Sanyo MBC550-2 £1343 (E1322) £1422.

### ORIC AND SINCLAIR COMPUTERS



MCP-0 One printer/plotter £109 (E110) £122, Sinclair pocket TV £97 (E95) £101, Sinclair QL Computer £374 (E335) £386, QL Floppy disc interface £107 (E103) £105, 3.5" disc drive to suit this interface £177 (E176) £186, Sinclair Spectrum Plus Computer £8K £123 (E121) £147, Original 48K Sinclair Spectrum £89 (E95) £116, Kit to upgrade the Spectrum to Spectrum Plus £30 (E30) £40, Microdrive £49 (E50) £60, RS232 interface £49 (E50) £60, Special offer: Microdrive Interface 1 + 4 cartridges £97 (E99) £107, Blank microdrive cart (dies £2.50) £3, Spectrum floppy disc interface (see Cumana disc section for available disc drives) £97 (E99) £99, Interface 2 £20.45 (E20) £24, 32K memory upgrade kit for 16K spectrum (issue 2 and 3 only) £31 (E28) £30, Spectrum Centronics printer interface £46 (E42) £47, ZX printer has been replaced by the Alpscan £7 (E7) £69, ZX31 computer £36 (E36) £45.

### COMMODORE COMPUTERS

Commodore 64 £101 (E101) £109, Curvilinear to allow most ordinary mono cassette recorders to be used with the Vic 20 and the Commodore 64 £9.79 (E9) £11, Commodore cassette recorder £45 (E44) £50, Centronics printer interface for Vic 20 and the Commodore 64 £45 (E41) £40, Disc drive £191 (E181) £217.

### SWANLEY ELECTRONICS

The computer Export Specialists

Dept. YC, 32 Goldsel Rd., Swanley, Kent BR8 8EZ, England

Tel: SWANLEY (0322) 64851

Official notice welcome. UK prices are shown first and include post and VAT. The second price in brackets is for export customers in Europe and includes insured airmail postage. The third price is for export customers outside Europe including Australia etc and includes insured airmail postage.

### AMSTRAD, ATARI, ENTERPRISE AND MSX COMPUTERS

Amstrad 464 Colour £342 (E348) £360, Amstrad 464 Green £232 (E247) £207, Amstrad 664 Colour £439 (E431) £481, Amstrad 664 Green £331 (E332) £382, Atari 130XE computer £158 (E163) £193, Atari 520S computer £634 (E616) £696, Atari 800XL computer + recorder £120 (E123) £143, Atari 800X Computer + disc drive £229 (E230) £260, Atari date recorder £34 (E37) £47, Atari disc drive £177 (E171) £195, Atari 1020 printer £93 (E99) £115, Enterprise 64 computer £172 (E170) £190, Enterprise 128 £233 (E239) £249, Goldstar MSX £138 (E136) £158.

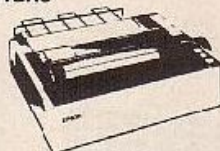
### ACORN COMPUTERS

Acorn Electron £113 (E119) £139, BBC Model B with free speech kit £345 (E333) £373, New 64K BBC Model B Plus with double density disc interface £497 (E484) £514, Acorn disc kit + DMS £97 (E95) £100, See below for suitable disc drives, Colour monitor £180 (E228) £268.

### CUMANA DISC DRIVES

To suit disc interfaces of Sinclair Spectrum and BBC B, 5 1/4" 40 track single sided (117) £120 £180, 40 tr. double sided £149 (E149) £179, 80 tr. ds £166 (E166) £196, Dual 40 tr ss £209 (E211) £251, 40 tr ds £285 (E283) £323, 80 tr. ds £307 (E304) £344.

### PRINTERS



New Epson LX80 £249 (E249) £283, Tractor for LX82 £25 (E33) £52, MCP40 4 Colour printer/plotter £109 (E110) £122, Brother HB5 £148 (E132) £184, Brother M1009 £201 (E203) £234, Shinwa CT1 CPA80 £218 (E222) £250, Cannon PW1080A £309 (E306) £356, Brother FP22 £135 (E124) £144, Brother EP44 £212 (E208) £228.

## EXPERT SYSTEMS ON YOUR MICRO!

Now you can explore the exciting world of Artificial Intelligence in action, with the latest book from top-selling computer author, Tim Hartnell.



Exploring Expert Systems on your Microcomputer

makes Expert Systems accessible to you in a way which has never been done before. With machine-specific listings for SPECTRUM+ and SPECTRUM, AMSTRAD, BBC MICRO, COMMODORE 64, and all MSX machines, plus any machine furnished with Microsoft BASIC, Tim's new book opens up the world of Expert Systems in a direct, practical way.

The book discusses, in some detail, the most successful Expert Systems developed to date (including PROSPECTOR, MYCIN and DENDRAL) and shows how the field has developed over the past decade. Ready-to-run Expert Systems programs in the book include AUTO MECHANIC and MEDIC (to give yourself a quick 'stress check'). The major Expert System in the book delights in the name of FUZZY RTA. This program uses fuzzy logic within the framework of an Expert System shell to produce a genuinely useful expert on just about any subject you choose, from chicken sexing through to medical diagnosis and weather forecasting. You'll also be given the chance to explore the languages which dominate the Artificial Intelligence and Expert Systems worlds. The book contains BASIC emulators of PROLOG and LISP so you can get them up and running on your computer, without having to actually buy the languages.

Exploring Expert Systems on your Microcomputer, by Tim Hartnell (ISBN 0 907563 74 0), is £7.95, and is available from most book and computer stores, or you can get it direct by mail, post free, from the publishers:

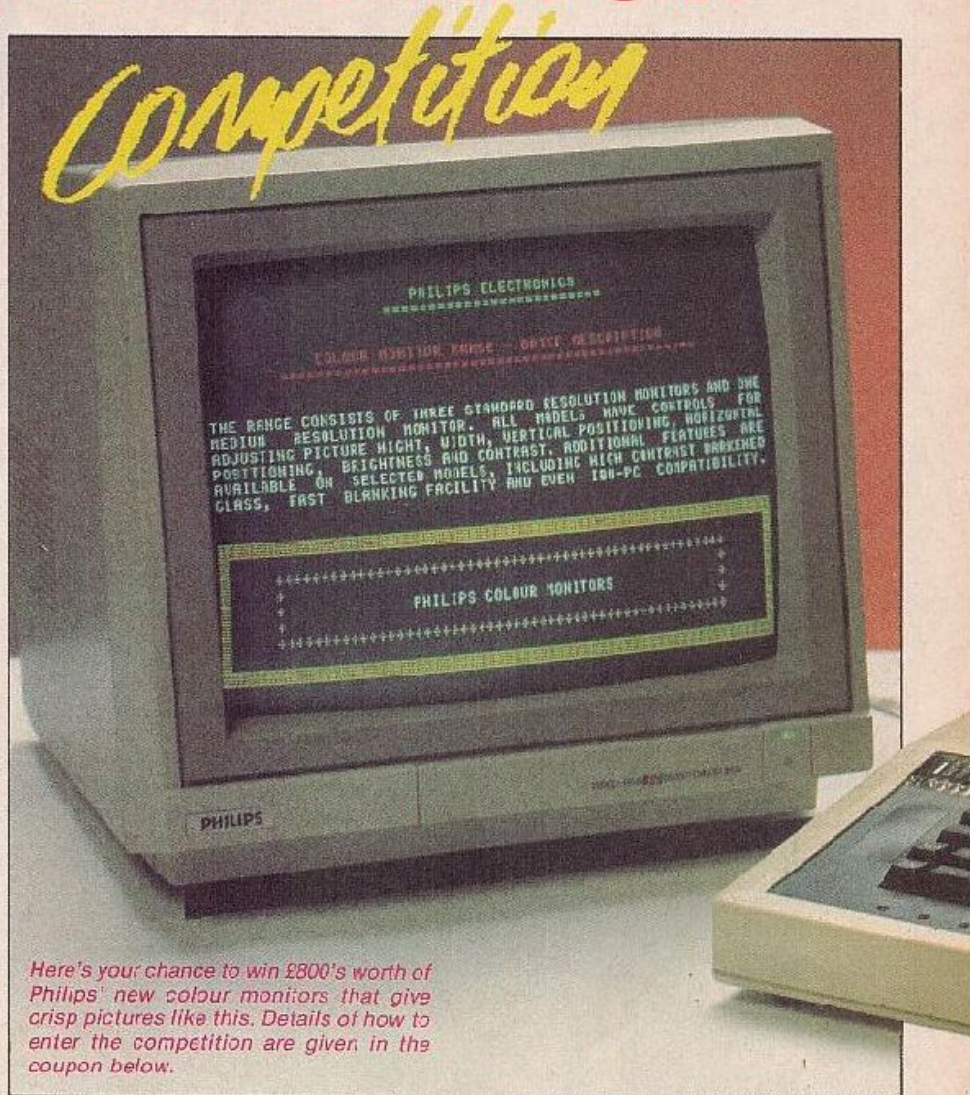
Interface Publications Ltd., Dept YC,  
9-11 Kensington High Street,  
London W8 5NP  
(Trade only: WHSD Leicester)

# Interface



# PHILIPS MONITOR

How bright is your computer? Not as bright as it could be with the new range of Philips colour monitors. We're giving away a £300 Philips CM-8533 as first prize, and the runners-up will receive a CM-8524 and CM-8501, together with £500. The new 8500 series is designed exclusively for use with all leading makes of home and personal computers. All four models have 14in. screens — three are standard resolution models whilst the top of the range is a medium resolution monitor for 80-character text and colour graphic use. A choice of composite video and RGB inputs and adjustable stands make life much easier.



Here's your chance to win £800's worth of Philips' new colour monitors that give crisp pictures like this. Details of how to enter the competition are given in the coupon below.

## COMPETITION RULES

- The winner of the competition will be the person who, in the view of the editor, puts the monitor features in the right order and comes up with the most convincing or amusing reason for wanting a Philips' monitor.
- The name of the winner will be printed in the December issue of *Your Computer*.
- All entries must arrive at the *Your Computer* offices by the last working day in September 1985.
- Each person may enter the competition only once.
- Entries to the competition cannot be acknowledged.
- No employees of Business Press International or their relatives may enter the competition.
- The decision of the editor is final.
- No correspondence on the result of the competition will be entered into.
- Business Press International assumes no responsibility or liability for any complaints arising from this competition.

## PHILIPS COMPETITION

Don't forget to enclose this coupon, or a photocopy of it, when you send in your entry to Philips Competition, *Your Computer*, Room L221, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS.

Study the list below and mark in order of priority the key features of the new Philips colour monitors.

- Dedicated for computer use ☐
- Outstanding text and graphic displays ☐
- Adjustable stands ☐
- Low-reflection treated glass ☐
- Choice of composite video and RGB inputs ☐
- Compatibility with leading computers ☐

I would like a dedicated Philips monitor because \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_



PIXEL BY PIXEL movement, sound, 10 different screens and interrupt-driven animation are some of the features that make this commercial quality game so compulsive.

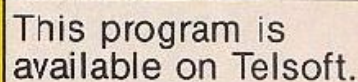
At times it may appear to be propelled by a death wish, but in fact it is simply being true to the laws of zero-G physics. The control keys are as follows:

Caps and Space together quits the game; pressing 1 will pause it, and any key restarts.

SAVE "M.Caverns" CODE 34240,6800  
If you can't face the effort of entering over  
6K of machine code the program is available  
on tape for £2.00 from Karl Jeffery, 27  
Testcombe Road, Alverstoke, Gospor., Hamp-  
shire PO12 2EL.

[illegible][illegible][illegible]



[illegible]

```

10 DEF FN h(h$)=16+CODE h$(1)
-40 (7*AND h$(1):9*1)+CODE h$(2)
-40 (7*AND h$(2):9*1)
20 INPUT "Sta: ";s
30 INPUT "Finish ";f
40 FOR n=5 TO STEP 8
50 LET tot=0: PRINT n: ""
60 INPUT h$: PRINT h$
70 LET x=0
80 FOR b=1 TO LEN h$ STEP 2
90 LET z=FN h(h$): LET tot=tot
+z
100 POKE n+x,z
110 LET h=h$(3 TO ): LET x=x+1
120 NEXT b
130 PRINT " = "; INPUT t: PRINT
T
140 IF tot<t THEN PRINT "input
error - try again": GO TO 50
150 NEXT n
160 REM enter STOP to stop

```

[illegible]

YOUR COMPUTER, SEPTEMBER 1985 65



(continued from previous page)



**QUICKSHOT II AUTO RAPID-FIRE JOYSTICK**

**SPECTRUM INTERFACE**

**SPECTRUM UPGRADE KIT**

**TURBO INTERFACE**

Trade and Export enquiries welcome



[illegible]

The burgers are made in four sections each of which must be walked across causing it to fall down a level and knock down anything which is below it until it reaches the tray at the bottom. There are six levels, each one gets progressively harder until, on the sixth sheet,

# KING BURGER

# Lives

Score

99568

```

100DATA0,17,51,119,119,118,252,252,204,238,255,255,2
55,247,243,243
200DATA254,255,255,119,119,51,2,6,247,238,238,204,20
4,204,6,0
300FX=&5000
40FORT=0T031:READD:T?FX=D:NEXT
50TEMP=FX+128:UX=TEMP+64:FORT=0T02STEP2:PX=UX:[OPTT
60LDA#&40:STA&D70:LDA#&5A:STA&D71:LDA#32:STA&D72:LD
A#21:STA&D73:LDA#11:STA&D74
70LDA#TEMP MOD256:STA&D76:LDA#TEMP DIV256:STA&D77
80LDA#0:STA&D75:LDY#0:TYA:YS STATEMP,Y:INY:CPY#64:
BNEYS
90LDA#64:STA&D7B:LDA#89:STA&D79:LDA#0:STA&D7A:LDA#2
1:STA&D7B:LDA#0:STA&D7C:LDA#0:STA&D7D
100LDA#(TEMP+32) MOD256:STA&D7E:LDA#(TEMP+32) DIV256
:STA&D7F:RTS
110.rout JSRrub
120LDA#A5:CMP#&FF:BEQN
130LDA#A3:CMP#76:BNEosam
140LDA#A2:CMP#D02:BMinoleft:JSRleft:JMPNORU:.noleft
JSRright:.NORU JMPN
150.nosam

```

```

160LDA&A4:CMF#1:BNE0:JSRleft:JMPN:.no JSRright:.N
170JSRSEE:LDA&A5:CMF#&FF:BNE0LAD:JSR_AADR:.N0LAD
180JSRDIS:CSR&A6:CPX#&FF:BEQySA:JSRBJR6:CPX#&FF:BNE
ySA:JSRrub:JSRU%:JMPDIS:.ySA
190.DIS CLC:LDA&A0:ADC#&30:STA&4D:LDA&A1:ADC#1:STA&4
E:LDY#0:.A LDAF%:Y:STA(&A0),Y:INY:CPY#16:BNEA:.B LDAF%
,Y:STA(&4D),Y:INY:CPY#32:ENE8:RTS
200.check LDA&A4:CMF#0:BEQau:LDA&A2:CMF#0:BEQrit:JMP
AU:.au LDA&A2:CMF#38:BEQhit:.AU LDX#0:LDY#0:.C LDA(&4D
),Y:BEQhit:RTS:.hit LDX#&FF:RTS
210.BUR6 LDX#2:SEC:LDA&A0:SBC#&40:STA&4D:LDA&A1:SBC#
1:STA&4E:LDY#0:.Bur LDA(&4D),Y:ANC#240:BNEhit:INY:CPY#
16:BNEBur:RTS
220.check LDX#0:LDY#8:.PaA LDA(&4D),Y:CNPF%.Y:BEQhit
:INY:CPY#16:BNEPaA:RTS
230.1=ft LDA#1:STA&A4:CLC:LDA&A0:ADC#&78:STA&4D:LDA&
A1:ADC#2:STA&4E:JSRcheck:CPX#&FF:BEQright:SEC:LDA&A0:S
BC#16:STA&4D:LDA&A1:SBC#0:STA&4E:JSRcheck:CPX#&FF:BEQ
END:SEC:LDA&A0:SBC#8:STA&A0:LDA&A1:SBC#0:STA&A1:DEC&A2
:JMPread
240.EEND LDA#1:STA&A4:RTS
250.right LDA#0:STA&A4:CLC:LDA&A0:ADC#&90:STA&4D:LDA
&A1:ADC#2:STA&4E:JSRcheck:CPX#&FF:BEQleft:CLC:LDA&A0:A
DC#16:STA&4D:LDA&A1:ADC#0:STA&4E:JSRcheck:CPX#&FF:DCQ1
eft:CLC:LDA&A0:ADC#8:STA&A0:LDA&A1:ADC#0:STA&A1:INC&A2
:JMPread

```

```

10VDU23,130,31,31,63,63,255,255,255,0,23,131,255,255,255,255,255,255,0
20VDU23,132,248,248,252,252,255,255,0,23,133,126,189,219,231,231,189,126
30VDU23,134,31,127,233,233,255,255,127,31,23,135,255,255,255,255,255,255,23,136,248,254,255,255,255,255,254,248
40VDU23,137,255,255,255,255,63,31,15,7,23,130,255,255,255,255,252,248,240,224
50VDU23,139,32,16,8,7,0,0,0,0,23,140,0,0,0,0,255,0,0,0,0,23,141,4,8,16,24,0,0,0,0
60ENVELOPE1,1,2,10,2,5,2,10,126,0,0,-126,126,126
70ENVELOPE2,1,10,-30,10,20,4,4,126,0,0,-126,126,126
80VDU23,128,255,0,255,0,255,0,255,0,23,129,24,0,0,0,126,0,255,0
90DATA119,51,51,48,48,48,16,3,238,204,204,64,224,19,2,128,12,7,7,135,195,51,119,102,119,14,14,22,56,204,102,238,119
100DATA119,51,51,48,48,48,16,3,238,204,204,64,224,19,2,128,12,22,22,22,7,3,17,17,17,14,14,14,134,12,136,136,284
110DATA119,51,51,32,112,48,16,3,238,204,204,192,192,192,128,12,7,7,134,193,51,102,119,238,14,14,30,60,204,238,102,238
120DATA119,51,51,32,112,48,16,3,238,204,204,192,192,192,128,12,7,7,22,3,17,17,51,134,134,134,14,12,136,136

```

```

36,135
130DATA119,51,51,48,48,176,144,131,238,204,204,192,1
92,192,128,128,135,7,7,3,34,102,0,14,30,30,30,20,60,6
8,102
140DATA119,51,51,48,48,48,16,3,238,204,204,192,192,2
08,144,20,7,135,135,135,131,34,34,102,30,14,14,12,6
8,102,0
150DATA#11,0,1,0,120,0,1,0
160DATA0,17,136,0,68,0,0,68,0,17,0,34,0,0,68,0
170DATA0,0,1,0,20,0,3,0
180DM 6% 6000:FORT=0T022:READD:T?6%:D:NEXT:J%=6%-3
00:M1=6%:M2=M1+64:M3=M2+64:S0=M3+64:PEP=S0+8:S02=PEP+1
6:TEMP=S02+8
190FORT=0T02STEP2:P%=J%:LOPTT
200LDA#6%:MOD256:STA#70:LDA#6%:DIV256:STA#71:LDA#&0
:STA#72:LDA#&73:STA#73:LDA#0:STA#60:STA#D02:STA#D03:ST
A#D04:STA#D05:STA#76:STA#D06:STA#D05:STA#D0B
210LDA#0:STA#A7:JSRL%:SEC:LDA#B0:SBC#5:STA#B0:JSRSCD
RE
220.start JSRDIS
230LDY#0:.wrT LDA#D50,Y:AND#240:CMF#96:BNEngs:JSRBUR
G:.hgs INY:CPY#8:BNEwrT
240LDA#D58:CMF#0:BECS:JSRMOBU:.tS
250WJSR1X
260LDX#0:JSRf1orr:CPX#&FF:BNEYr:RTS:.yr DEC#A3:LDX#0
:JSRf1orr:CPX#&FF:BNEYr:RTS:.ry INC#A3:INC#A3:LDX#0:JS
Rf1orr:CPX#&FF:BNEYr:RTS:.YR DEC#A3
270JSRdelay
280LDA#D58:CMF#0:BECS:JSRMOBU:.tTS

```





This program is available on Telsoft.

Brian Lewis finds a difference at Macdonalds.

Lives

Score

00578

a second egg is introduced. My first major problem was to find a workable algorithm for the movement of the egg. I ended up partly pinching an idea I had seen in a friend of mine's game "Monsters" which he wrote some time ago on the Atom. The basic idea is that the egg or eggs check whether or not you are on the same level as them — if so they move towards you or else they move about randomly until they find a ladder and then, depending on your position, move up or down. Thanks to Andrew Greene for the idea.

The next problem was the movement of the two burgers. I solved this by setting aside eight memory locations, each containing a number which corresponds to the piece of burger and the extent to which it has been walked on. These memory locations are then moved around after the piece of burger has stopped moving. You have an advantage over Freda — the ability to drop one level and leave the egg stranded on a platform. However, this advantage is slowly taken away from you as you go through the six sheets. Any BBC users who wish to play the game will have to increase the numbers held in the X and Y registers in the "delay" routine and thus slow down the game. Each of the four programs should be typed in, checked, saved and then run to ensure you do not get a bad program.

```
260.rub CLC:LDA#A0:ADC#30:STA#4D:LDA#A1:ADC#1:STA#4E:LDY#0:.D LDA#A5,Y:AND#15:STA#A0,Y:INY:CPY#16:BNE D:.E LDA#A6,Y:AND#15:STA#4D,Y:INY:CPY#32:BNEE:RTS
270.read CLC:LDA#A0:ADC#30:STA#4D:LDA#A1:ADC#1:STA#4E:LDY#0:.F LDA#A0,Y:STA#A6,Y:INY:CPY#16:BNEF:.G LDA#4D,Y:STA#A6,Y:INY:CPY#32:BNEG:RTS
280.LADDR JSRfloor:CPX#FF:BNESS:LDA#76:CMF#A3:.SS BEQend:LDA#FF:STA#A5:LDA#A3:CMF#75:EMIInoup:JSRdown:JMP NDw:.noup JSRup:.NDw:RTS
290.up SEC:LDA#A0:SBC#40:STA#4D:LDA#A1:SBC#1:STA#4E:JSRcheck:CPX#FF:BEQend:INC#A3:SEC:LDA#A0:SBC#40:STA#A0:LDA#A1:SBC#1:STA#A1:JMPread
300.down CLC:LDA#A0:ADC#C0:STA#4D:LDA#A1:ADC#3:STA#4E:JSRcheck:CPX#FF:BEQend:DEC#A3:CLC:LDA#A0:ADC#40:STA#A0:LDA#A1:ADC#1:STA#A1:JMPread
310.end LDA#0:STA#A5:RTS
320.SEE LDY#4:LDA#A6,Y:CMF#7:BEQFOUN:RTS:.FOUN LDA#FF:STA#A5:RTS
330.floor LDA#A3:.ID CMP#0:BEQon:SEC:SBC#7:CMF#22:BP L off:JMP:D off LDX#0:RTS:.on LDX#FF:RTS
340.SAME LDX#0:LDA#D58:CMF#0:BEQa1:RTS:.a1 LDX#FF:RTS
350.I% LDY#0:.AaA LDA#D70,Y:STA#A0,Y:INY:CPY#8:BNEAaA:JSRrout:LDY#0:.BbB LDA#A0,Y:STA#D70,Y:INY:CPY#8:BNEbbB
```

```
360LDA#BA:CMF#0:BEQRWR:
370LDY#0:.CcC LDA#D78,Y:STA#A0,Y:INY:CPY#8:BNECC:JS Rrcut:LDY#0:.DdD LDA#A0,Y:STA#D78,Y:INY:CPY#8:BNEDD:RWF:RTS
380:NEXT
390MODE4
400PRINTTAB(14,2):"Burger King!"
410PRINT:"You (GORDON BLUE the chef) must go round the screen knocking down pieces of the burgers to form two stacked burgers in the bottom trays."
411PRINT:
420PRINT:"However a rampant fried egg (FREDA) is trying to stop you in your task,if she touches you then you loose one of your lives an the burgers are reset."
421PRINT:
430PRINT:"There are six screens each of which gets progressively harder as you slowly loose your advantages over FREDA,your advantage being the ability to drop one level without killing yourself,drop any further and it's bye bye."
440PRINTTAB(5):"The controls for Gordon are :-"
441PRINT:
450PRINT:"Z - Left , X - Right , * - UP , / - DOWN"
460VDU2B,0,31,39,28,17,129,17,0,12
470CHAIN:"
```

```
290JSRSEE:CPX#FF:BNEgs:LDA#FF:STA#D04:INC#D05:DEC#76:JSRdrop:JMPHY:gs LDA#D05:CMF#8:BMIhe:RTS:.he LDA#0:STA#D04:STA#D05:.hy
300LDA#D59:CMF#FF:BEQY5:LDA#D58:CMF#0:BNELY5:JSRsee:.uY5
310LDA#D04:CMF#FF:BNEHY5:JMPno1e:.HY5
320LDA#D02:CMF#38:BEQno1e:LDA#B1:LDX#BD:LDY#FF:JSRFFF4:CPY#FF:BNEori:JSRrub:LDA#D03:CMF#0:BEQrig:LDA#M1 MOD256:STA#70:LDA#M1 DIV256:STA#71:LDA#0:STA#60:LDA#0:STA#D03:.rig
330JSRani:INC#D02:CLC:LDA#72:ADC#8:STA#72:LDA#73:ADC#0:STA#73:JSRread
340.nor: LDA#D02:CMF#0:BEQno1e:LDA#B1:LDX#9E:LDY#FF:JSRFFF4:CPY#FF:BNEori:JSRrub:LDA#D03:CMF#1:BEQie:LDA#M2 MOD256:STA#70:LDA#M2 DIV256:STA#71:LDA#0:STA#60:LDA#1:STA#D03:.lef
350JSRani:DEC#D02:SEC:LDA#72:SBC#8:STA#72:LDA#73:SBC#0:STA#73:JSRread
360.no1e LDA#B1:LDX#BD:LDY#FF:JSRFFF4:CPY#FF:BNEori:JSRrub:CPX#FF:BNEori:INC#76:JSRrub:LDA#D03:CMF#2:BEQup:LDA#M3 MOD256:STA#70:LDA#M3 DIV256:STA#71:LDA#0:STA#60:LDA#2:STA#D03:.up
370JSRani:SEC:LDA#72:SBC#40:STA#72:LDA#73:SBC#1:STA#73:JSRread
380.noup LDA#B1:LDX#97:LDY#FF:JSRFFF4:CPY#FF:BNEori:JSRcheck:CPX#FF:BNEndow:DEC#76:JSRrub:LDA#D03:CMF#2:BEQdown:LDA#M3 MOD256:STA#70:LDA#M3 DIV256:STA#71:LDA#0:STA#60:LDA#2:STA#D03:.down
390JSRani:CLC:LDA#72:ADC#40:STA#72:LDA#73:ADC#1:STA
```

```
&73:JSRread
400.norow
410LDA#D58:CMF#8:BNERz:RTS:.Rz JMPstart
420.rub LDY#0:.A LDATemp,Y:STA#72,Y:INY:CPY#16:BNEA:CLC:LDA#72:ADC#30:STA#4D:LDA#73:ADC#1:STA#4E:.A1 LDATemp,Y:STA#4D,Y:INY:CPY#32:BNEA1:RTS
430.ani LDX#S0 MOD256:LDY#S0 DIV256:LDA#7:JSRFFF1:LDA#60:CMF#1:BEQB:CLC:LDA#70:ADC#32:STA#70:LDA#71:ADC#0:STA#71:LDA#1:STA#60:RTS
440.B SEC:LDA#70:SBC#32:STA#70:LDA#71:SBC#0:STA#71:LDA#0:STA#60:RTS
450.delay LDX#B0:.D LDY#90:.E DEY:BNEE:DEX:BNEB:RTS
460.read LDY#0:.F LDA#72,Y:STATemp,Y:INY:CPY#16:BNEF:CLC:LDA#72:ADC#30:STA#4D:LDA#73:ADC#1:STA#4E:.G LDA#4D,Y:STATemp,Y:INY:CPY#32:BNEG:RTS
470.check LDX#0:CLC:LDA#72:ADC#80:STA#4D:LDA#73:ADC#2:STA#4E:LDY#0:LDA#4D,Y:CMF#1:BEQH:RTS:.H LDX#FF:RTS
480.CEH LDX#0:SEC:LDA#72:SBC#40:STA#4D:LDA#73:SBC#1:STA#4E:LDY#0:LDA#4D,Y:CMF#1:BEQH:RTS
490.SEE CLC:LDA#72:ADC#80:STA#4D:LDA#73:ADC#2:STA#4E:LDY#4:LDA#4D,Y:CMF#0:BEQH:RTS
500.drop JSRrub:CLC:LDA#72:ADC#40:STA#72:LDA#73:ADC#1:STA#73:JMPread
510.DIS LDY#0:.a LDA#70,Y:STA#72,Y:INY:CPY#16:BNEa:CLC:LDA#72:ADC#30:STA#4D:LDA#73:ADC#1:STA#4E:.b LDA#70,Y:STA#4D,Y:INY:CPY#32:BNEb
```

(continued on page 71)



# L.A. T.O. N.Y.



Seattle-Miami. San Francisco-Washington.  
Or a grand tour of the entire U.S.A. 3000 miles of the most incredible  
road race ever designed for home computers.

## THE GREAT AMERICAN CROSS-COUNTRY ROAD RACE™

"I vote for Road Race.  
It's a tough choice. But I'd  
have to say that Road Race  
is now the best racing  
game on the market."

MILWAUKEE JOURNAL



"Cannonball Run on the small screen.  
This is one fun game. Activision have  
done it up right with sharp graphics and  
excellent play value to produce the  
most entertaining racing game ever for  
a home computer."

CREGONIAN

£9.99

ACTIVISION  
HOME COMPUTER SOFTWARE™

Available now on C64 Cassette and Disk, and AHC Cassette and Disk. Activision UK Ltd, 15 Harley House, Marylebone Road, London, NW1. Tel: 01-938 1428.  
From selected branches of Boots, WH Smith, John Menzies, Wasky's, Spectrum, Rumbelows, Woolworth and good computer software stores everywhere.

Coming soon for your Amstrad. Also Great European Road Race for your Sinclair Spectrum.



(continued from page 69)

```
520RTS
530.scroll J9RSCORE:LDY#7:CLC:LDA#72:ADC#80:STA#4D:
LDA#73:ADC#2:STA#4E:LDA#4D,Y:PHA:LDY#6:.e LDA#4D,Y
:INX:STA#4D,Y:DEY:DEY:CPY#FF:BNE:LDY#0:TYA:STA#4D
,Y:LDY#4D:STA#6D:LDA#4F:STA#6E:CLC:LDA#4D:AUL#40:STA
#4D:LDA#4E:ADC#1:STA#4E
540LDY#0:P.A
550STA#4D,Y:RTS
560.see CLC:LDA#72:ADC#80:STA#4D:LDA#73:ADC#2:STA#4
E:LDY#0:LDA#4D,Y:AND#240:CMF#0:BEQqW:JSRscroll:JSRWH
ER:.qW RTS
570.WHER LDY#0:LDA#18:CMF#D02:BPLover:LDY#4:.over LD
A#21:.OV STA#4D:LDA#76:CMF#4D:BEQfoun:INX:SEC:LDA#4D:S
BC#7:CMF#249:BNEOV:RTS
580.foun LDA#D50,Y:STA#4D:AND#240:CLC:LSRA:LSRA:LSRA
:LSRA:TXA:INX:TXA:CLC:ASLA:ASLA:ASLA:STA#4E:LDA#4
D:AND#15:ORA#4E:STA#D50,Y:RTS
590.BURG CPY#3:BEQrew:CPY#7:BEQrew:TYA:TXA:INX:LDA#D
50,Y:AND#15:STA#4D,X:rew TYA:PHA:LDA#D50,Y:STA#4D:LD
X#2:LDA#18:CMF#D02:BPLove:LDX#15
600.OVE LDA#D50,Y:AND#15:STA#D50,Y:CPY#0:BEQ#1:CPY#4
:BEQ#1:CPY#1:BEQ#2:CPY#5:BEQ#2:BEQ#3:CPY#6:BEQ#3
:CPY#3:BEQ#4:CPY#7:BEQ#4:RTS
610.a1 LDY#3:JMPa5:a2 LDY#10:JMPa5:a3 LDY#17:JMPa5
:.a4 LDY#22:.a5
620S1X#90:STY#91:JSRf111:PLA:TYA:STY#92
630.print LDA#D50,Y:AND#15:CMF#0:BEQ#1:CMF#1:BEQ#2:C
MP#2:BEQ#3:CMF#3:BEQ#4
640.h1 LDA#130:STA#950:LDA#131:STA#961:LDA#132:STA#9
62:LDA#2:STA#4D:LDA#128:STA#4E:JMPb5:.b2 LDA#133:STA#9
60:STA#961:STA#962:LDA#2:STA#4D:LDA#128:STA#4E:JMPb5
650.b3 LDA#134:STA#960:LDA#135:STA#961:LDA#136:STA#9
62:LDA#3:STA#4D:LDA#128:STA#4E:JMPb5:.b4 LDA#137:STA#9
60:LDA#135:STA#961:LDA#138:STA#962:LDA#2:STA#4D:LDA#12
3:STA#4E:.b5 LDA#17:JSR&FEE:LDA#4D:JSR&FEE:LDA#17:JS
R&FEE:LDA#4E:JSR&FEE
660LDA#31:JSR&FEE:LDA#90:JSR&FEE:LDA#91:JSR&FEE:L
```

#### Listing 4.

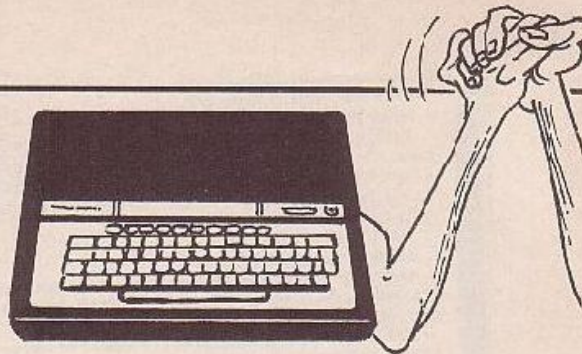
```
10VDU23,142,0,31,31,63,63,255,255,255
20VDU23,143,0,126,189,219,231,231,219,189
30VDU23,144,0,31,127,255,255,255,255,127
40VDU23,145,0,255,255,255,63,31,15
41VDU23,146,0,1,3,7,7,31,15,63,23,147,63,63,31,63,1
27,63,31,31
42VDU23,148,31,63,63,63,127,63,127,63,23,149,63,31,
31,15,7,3,3,0
50MODES:VDU23;8202;0;0;0;0;19,1,4;0;
60DIMA$(3):A$(0)=CHR$(130)+CHR$(131)+CHR$(132):A$(1)=CHR$(
133)+CHR$(133)+CHR$(133):A$(2)=CHR$(134)+CHR$(135)+CHR$(136):A$(3
)=CHR$(137)+CHR$(135)+CHR$(138)
70DATA2,2,3,2
80PROCDEMO
90COLOUR128:CLS:1:ivesZ=3:SCX=0:FORT=0TC4:~?&30=0:NE
XT
100RESTORE70:FORTX=0T03:READD:COLOURD:PRINTTAB(8,TX+
14):A$(TX):NEXT
110FORG=0T01000:NEXT:SOLOD0,1,4,4
111VDU5:GCOL0,0:MOVE640,576:VDU146,10,8,147,10,8,148
,10,8,149,10,8
120VDU4:COLOUR3:PRINTTAB(5,6):"SHEET NO.":SCX+1
130FORG=0T01000:NEXT:CLS
140FORTX=0T031:TX?(GX-224)=0:NEXT
150FORTX=0T07:AX=TX:IF AX=3 AX=(AX-4)
160TX?&D50-AX:TX?&A30=AX:NEXT
170FORTX=0T031:TX?(GX+224)=0:NEXT:FORTX=1T03:VDU19,T
X,0;0;NEXT
180COLOUR1:FORTX=3T024STEP7:PRINTTAB(0,TX):STRING$(2
0,CHR$(128)):NEXT
181IF SCX>4 THEN ?&BA=1 ELSE ?&BA=0
190IF SCX<4 PRINTTAB(8,3):" "
200IF SCX<2 THEN PRINTTAB(8,17):" "
210FORTX=1T09:PRINTTAB(1,TX):CHR$(129TAB(7,TX):CHR$(12
9TAB(18,TX):CHR$(129:NEXT
220FORTX=8T016:PRINTTAB(5,TX):CHR$(129:IF SCX<4 THEN
PRINTTAB(13,TX):CHR$(129
230NEXT
240FORTX=15T023:PRINTTAB(1,TX):CHR$(129TAB(7,TX):CHR$(
129TAB(18,TX):CHR$(129:NEXT
250IF SCX=0 AND SCX<4 THEN FORTX=8T016:PRINTTAB(7,TX
):CHR$(129:NEXT
260IF SCX>3 THEN FORTX=1T09:PRINTTAB(13,TX):CHR$(129
:NEXT
270RESTORE70:FORTX=3T024STEP7:READD:COLOURD:PRINTTAB
(12,TX):A$(TX-3/7):TAB(15,TX):A$(TX-3/7):NEXT
280COLOUR3:VDU31,2,31,139,140,141,31,15,31,139,140,1
41
290PRINTTAB(8,25):"Lives":COLOUR1:PRINTTAB(10,27):1i
vesZ:COLOUR2:PRINTTAB(8,29):"Score"
300RESTORE310:FORTX=1T03:READD:VDU19,TX,D:0:SOUND#1
1,1,TX#70,5:FORG=0T01000:NEXT
310DATA4,3,7
320CALLJ%
330FX15,0
340IF ?&D5B=0 THEN 390
350COLOUR128:SOUND0,1,255,255
```

```
DY#0:.resY LDA#960,Y:JSR&FEE:INX:CPY#3:DNEResY:INL#D5
8:RTS
670.3rUB LDA#17:JSR&FEE:LDA#128:JSR&FEE:LDA#31:JSR
&FEE:TXA:JSR&FEE:INX:TYA:JSR&FEE:LDA#32:JSR&FEE:JS
R&FEE:JMP&FTCC
680.MOBJ LDX#90:LDY#91:DEY:JSR&UB:LDY#92:INC#91:JSR
print:JSR30T:LDA#D58:CMF#4:BNEH5a:JSR&E3:.h5a LDA#D58
:CMF#7:BEQEND:RTS
690.END LDY#92:LDA#0:STA#D58:LDA#D50,Y:AND#15:STA#D5
0,Y:STA#4D:LDA#D59:CMF#FF:BNEH5:INC#92:LDY#92:LDA#D50
,Y:ORA#96:STA#D50,Y:LDA#0:STA#D59:JMP&out:.h5 LDY#0:.jh
LDA#D50,Y:AND#240:ORA#A50,Y:STA#D50,Y:INX:CPY#8:BNEjh
:RTS
700.see3 LDA#31:JSR&FEE:LDA#90:JSR&FEE:LDX#91:INX
TXA:JSR&FEE:LDA#135:JCR&FFF4:CPX#120:BEQqz:LDA#8FF:ST
A&D59:STA#D5A:.qz RTS
710.BOT LDA#25:CMF#91:BPLTY:STA#31:JSR&FEE:LDA#90:
JSR&FEE:LDY#91:INX:TYA:JSR&FEE:LDA#135:JCR&FFF4:CPX#
32:BEQTY:STA#D58:INC#D58:JSRSCORE:JSRSCORE:JSRSC
ORE:JSRSCORE:.tys RTS
720.f111 LDA#D5A:CMF#FF:BEQaz:LDA#17:JSR&FEE:LDA#1
28:JSR&FEE:LDA#17:JSR&FEE:LDA#1:JSR&FEE:LDA#31:JSR&
FEE:TXA:JSR&FEE:TYA:JSR&FEE:LDA#128:JSR&FEE:JSR&FF
EE:JSR&FEE:.az LDA#0:STA#D5A:INC#91:RTS
730.sou LDA#7:INX#502:MOD256:LDY#502:DIV256:JMP&FFF1
740.florr LDA#A2:CMF#D02:BNEA1:LDA#A3:CMF#76:BNEA1
:LDX#FF:RTS:.aA1 LDY#A2:INX:CPY#D02:BNE1S:LDA#A3:CMF#
76:BNE1S:LDX#FF:RTS:.is DEY:DEY:CPY#D02:BNE1S:LDA#A3:
CMF#76:BNE1S:LDX#FF:RTS:.s1 RTS
750.SCORE LDA#17:JSR&FEE:LDA#3:JSR&FEE:CLC:LDA#B0:
ADC#5:STA#B0:CMF#10:BNEH50:LDA#0:STA#B0:INC#B1:DA#B1
:CMF#10:BNEH50:LDA#0:STA#B1:INC#B2:LDA#B2:CMF#10:BNEH
50:LDA#0:STA#B2:INC#B3:LDA#B3:CMF#10:BNEH50:LDA#0:ST
A#B3:INC#B4
760.SHOW LDY#0:LDX#12:.vinc LDA#31:JSR&FEE:TXA:JSR&
FEE:LDA#31:JSR&FEE:LDA#B0,Y:CLC:ADC#48:JSR&FEE:INX:
DEY:CPY#5:BNEvinc:RTS
770: NEXT:CHAIN"
```

```
360FORTX=0T0:0:FORG=0T030:NEXT:VDU19,0,1;0;:SOUND#11
,2,30,20:FORG=0T030:NEXT:VDU19,0,0;0;:NEXT:*FX21,5
3701ivesZ=livesZ-1:IF livesZ=-1 THEN 420
380COLOUR128:CLS:GOTO150
390FORTX=0T0255STEP5:SOUND1,1,TX,1:NEXT
400SCX=SCX+1:VDU28,0,31,19,25:FORTX=1T08:PRINTTAB(0,
0):CHR$(11):SOUND#11,1,TX*20,15:NEXT:VDU26:*FX21,5
410CLS:GOTO100
420CLS:COLOUR2:PRINTTAB(5,16):SIRING$(10,CHR$(133)):A
$="GAME OVER":COLOUR1:FORTX=1T0LENA#
430PRINTTAB(TX+4,16):MID$(A$,TX,1)
440SOUND#11,2,TX+25,6:FORG=0T0203:NEXT
450*FX15,1
460COLOUR3:PRINTTAB(0,18):"PRESS SPACE TO START"
470A$=INKEY$(500):IF A$="" THEN PROCDEMO ELSE GOTO90
480GOTO90
490DEFPROCDEMO: ?&BA=0
500CLS
510COLOUR1:PRINTTAB(0,12):STRING$(20,CHR$(128)):
520COLOUR2:PRINTTAB(8,12):A$(TX):COLOUR3:PRINTTAB(0,
3):A$(TX):COLOUR2:PRINTTAB(8,14):A$(TX)
530COLOUR3:PRINTTAB(3,19):"KISS YOUR YJKE":COLOUR2:P
RINTTAB(6,21):"GOOD BYE":COLOUR1:PRINTTAB(7,23):"SUCKE
R"
540CALLU%: ?&D70=880: ?&D71=844: ?&D74=0: ?&D72=1: ?&D02=
39
550FORTX=0T05000:NEXT
560FORTX=0T017:CALLJ%
570SOUND#11,1,25,10
580FORG=0T050:NEXT
590FORTX=0T0700:NEXT:COLOUR2:FORTX=0T010
600PRINTTAB(0,TX):A$(0)
610FORTX=0T060:NEXT:SOUND#11,2,TX*20,10
620PRINTTAB(0,TX):" ":NEXT
630PRINTTAB(8,TX):A$(0):COLOUR3:PRINTTAB(7,10):"TA
B(4,9):"AHH!"
640FORTX=0T013000:NEXT
650CLS:RESTORE70:FORTX=0T03:READD:COLOURD:PRINTTAB(2
,TX):A$(TX):TAB(15,TX):A$(TX):NEXT
660COLOUR3:PRINTTAB(5,0):"PREPARE TO":COLOUR2:PRINTT
AB(6,1):"MEET THY":COLOUR1:PRINTTAB(8,2):"DROM"
670FORTX=0T027:PRINTTAB(0,0):CHR$(11):SOUND#11,1,TX#8,
1:FORG=0T050:NEXT
680PRINTTAB(9,31):SOUND0,-15,5:FORG=0T090:NEXT
690PRINTTAB(0,0):CHR$(11):SOUND0,-15,5:FORG=0T090:NE
XT
700FORG=0T0100:NEXT:A$="IN BRIAN LEWIS'S":B$="ALL NE
W!":C$="BURGER KING!"
710FORTX=1T0LENA# :PRINTTAB(1+TX,10):MID$(A$,TX,1):S
OUND#11,2,TX*20,1:FORG=0T090:NEXT
720COLOUR2:FORTX=1T0LENA# :PRINTTAB(5+TX,12):MID$(B$,
TX,1):SOUND#11,2,TX*20,1:FORG=0T060:NEXT
730COLOUR3:FORTX=1T0LENA# :PRINTTAB(3+TX,14):MID$(C$,
TX,1):SOUND#11,2,TX*20,1:FORG=0T060:NEXT
731*FX15,1
740PRINTTAB(0,23):"PRESS SPACE TO START":REPEAT:UNTI
L GET=32
750CLS:ENDPROC
```



# CORE



MOST PROGRAMMERS seem to play arcade games in their spare hours, but now, from America, the land of hacking, the Big Mac and War Games comes the new line in strategy games — Core Wars.

I first came across the idea of Core Wars in, unsurprisingly, an American magazine, *Scientific American*, a few months ago. The idea seemed excellent, so I dug out my Advanced User Guide, and put together this half Basic, half machine code version of Core Wars, to the best of my knowledge, the first version in this country.

The game scenario is original — the Americans have succeeded in penetrating a giant Russian mainframe, and each player is trying to cause his opponent's program to crash, by the simple means, familiar to all machine code junkies, of making it execute an illegal instruction.

In Core Wars, two programs try to deliberately corrupt each other. A number of techniques have been developed so far; there are the simple methods like overwriting sections of memory at random, or alternatively, "intelligent" methods involving searching out the opposing program. Most people who have written machine code will be familiar with the problem — an incautiously calculated jump, and the processor is trying to execute data rather than a program, with unpredictable and surprising results.

This means the game is played by two players. Each writes a program, of maximum length 100 lines, in a specially-developed language called Redcode, which looks rather like a stripped-down assembly language. These programs are then assembled; play takes place in a memory space of the 3000 locations in the "core" from which the game takes its name —

core is a now obsolete term once used to describe a computer's memory space — and each location can contain either a single Redcode instruction, or a piece of data.

If you try to execute data as an instruction, the program will not recognise it, and the opposing one will win! The core is organised slightly differently from a present-day memory, in that core location 2999 "wraps round" and is next to location 0. This means that attempting to access location 3000 results in accessing location 0, and so on. Then play starts for real — the computer executes one instruction from each player's program in turn, rather in the manner of a time-sharing system. Play continues until one program is forced to crash by executing an invalid instruction, and so the other player wins.

Obviously, one simple tactic is just to write a program that overwrites various areas of memory at random, hoping to score a 'hit' on a vital part of the other program, making it crash when it tries to execute that part. But an experienced player could find a way round such an attack — if he set up a block of memory with known contents, which was continuously checked, as soon as a byte was corrupted, he could arrange for his program to transfer itself somewhere in memory less vulnerable, and start a counter-attack.

## Easy to pick up

The sort of instructions used will be immediately familiar to anyone who has dabbled in machine code, but don't despair if you never ventured beyond Basic — the limited instruction set will be easy to pick up, and will leave you with some knowledge of the techniques used in genuine machine code. At this point it seems appropriate to describe briefly the

## Jon Cottrell makes war, not love, on his BBC.

instruction set and some details of how the instructions are assembled, and then run through how to use the program.

Each instruction has a code, as for any assembly language, also a mnemonic. The mnemonic is what you might consider the 'real' instruction — it is the mnemonic that you type in to the computer as a line of your Redcode program. The instructions are dealt with in numerical order of code.

Each instruction has either one or two "arguments" — the numbers that follow the mnemonic. The largest argument allowed is 3000 — anything larger will be reduced modulus 3000. Negative arguments are assembled in "complement form"; i.e. an argument of -1 becomes 2999, since subtracting 1 has the same effect as adding 2999 in a core of 3000 contiguous locations.

0 — DAT — Used for putting data in a location. Although this instruction has a code of 0, it is a special case, as it assembles as an unexecutable instruction followed by the byte of data. Strictly speaking, any location in the core containing an unexecutable statement followed by data could be regarded a data statement, but DAT is provided to actually store data in specified locations. It takes one argument.

1 — MOV — Moves data from one location to another. It takes two arguments, so the format is MOV a,b. It will move the contents of location a to location b, without affecting the contents of a.

1 — ADD — This instruction takes two arguments, which makes its format: ADD a,b. It adds the contents of location a to the contents of location b, leaving the result as the new contents of b, and leaving the contents of a unchanged.

3 — SUB — Takes two arguments, so its format is SUB a,b. The effect is to subtract the contents of location a from location b, leaving the contents of a unchanged.

4 — JMP — Has but one argument, which makes its format JMP a. It is an unconditional jump to location a — used for the same purpose as Goto in Basic, but is relative rather than absolute, as explained below.

5 — JNZ — This is a conditional jump instruction which takes two arguments, making its format JNZ a,b. If the contents of location b is 0, the program will jump to relative location a — otherwise it will carry on with the next instruction after the JNZ.

6 — JMG — As above, except that a jump occurs if the contents of location b is greater than zero.

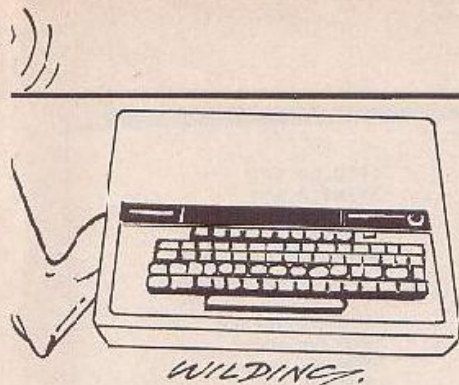
7 — DJZ — Takes two arguments, making

```

100N ERROR RESTORE:VDU 170LDA #72          410LDA PC:CLC
26:CLS:CLFAR:RIN      180RCL A:STA #72      420ADC argL,X
200IM code 1000.table 190LDA #73          430STA argL,X
17,arg 8,PC(1),IN$(8),B#( 200RCL A      440LDA PC+1
1) 210STA #73          450ADC argH,X
300IM code 1.gover 0,a 220CLC          460STA argH,X
rgL 1,argH 1,mask 1,data 230LDA #base MOD 256 470JSE sizeck
1,PC 1 240ADC #72      480PLA:TAY
40current=#74:~mask=15 250STA #72      490RTE
:mask?1=240 260LLA #73 500.getbyte LDA data
500IM rcw 0,col 0,flag 270ADC #base DIV 256 510STA #70
0 280STA #73          520LDA data+1
500IM base 11999,p$(1, 290RTS          530STA #71
100),E(1),ad(1) 300.get LDA (current),Y 540LDY #2
70FOR LL=0 TO 2 STEP 2 310BIA argL,X 550LDA (#70),Y
30P%=code 320TYA:PHA 560STA data
70I OPT LL 330LDY #3 570INY
100.convert LDA #70 340LDA (current),Y 580LDA (#70),Y
110CLC:ROL A 350AND mask,X 590STA data+1
120STA #72 360CPX #1 600RTS
130LDA #71 370BNE .end 610.start LDA PC
140ROL A 380CLC:ROR A:ROR A 620STA #70
150STA #73 390ROR A:ROR A 630LDA #0
160CLC:DEY 400.trans STA argH,X 640STA flag

```





# WARS

the format DJZ a,b. The effect is to decrement the contents of location b by one, then jump to location a if the contents of location b is now 0.

8 — CMP — this also has two arguments, so its format is CMP a,b. It compares the contents of location a and location b, and if they are not equal to each other, the computer will skip the next instruction, and continue execution with the one after.

## Assumes direct mode

As I have said, arguments lie in the range 0-2999 when assembled, but in addition, each can take one of three modes, called addressing modes. These modes are immediate, direct and indirect. Unless you specify otherwise, the computer assumes the argument is in direct mode. Prefixing the argument with # means it is immediate, and prefixing with @ means it is indirect. Taking as an example the complete instruction MOV 0,1 the full effect would be:

(1) The computer finds neither argument has a prefix, so assumes both are direct.

(2) It therefore adds the first argument onto the current address to find out where to get the data to be moved from, and then adds the second argument onto the current address to find out where to put it.

The instruction therefore moves the data 0 locations beyond the instruction — i.e. the instruction itself — to a position 1 location beyond the instruction i.e. in the next location. Incidentally, this is an example of a complete one-line program — when the instruction has been executed, the computer will look for the next instruction, and find the instruction "MOV 0,1" that has been put there by the previous one, and execute this, and this will continue, leaving a trail of MOV 0,1's throughout the core.

Machine code programmers will have noticed that the direct mode, as are all modes, is relative — there is no way for a program to know its absolute address in the core, and the start address for each program within the core is assigned randomly on assembly.

The other two modes I mentioned work as follows — first immediate mode. This causes the argument to be interpreted as a number, rather than an address in core. This means that MOV #3,2 will place the number 3 in the location 2 places further on from the present one, as opposed to MOV 3,2, which would copy the contents of the location three places on from the present one into the location two on from the present one.

Indirect mode is rather more complicated, and is best explained by an example.

ADD @2,4 means "read the contents on location 2. Add this number on to the current location. Now read the contents of this location,



This program is available on Telsoft.

and that is the value to be added to that four locations on from the current one."

So, if you're still with me, type in the program, save it and type Run. After the title page press space and you should see the second screen, headed 'Phase 1 — Ralcode entry', and below that, the heading 'Player 1' and an input prompt, '0>'. Here's where you use those instructions I just explained, and type in your program.

Remember, you have a maximum of 100 lines of program each, and each prompt is numbered to show you how you're doing for space.

When you finish your program, press Return in response to the prompt, and then the other player will be given the chance to input his program. After each player enters his program, he is asked to specify which instruction he wishes execution to commence with; in response to the question, enter the number of the instruction you wish to execute first.

When both players have finished, you will be asked to enter the number of turns of execution — i.e. how many instructions the computer is going to execute from each program before it announces a draw.

When both players have entered their code, it is assembled. If an error such as an illegal instruction or format is encountered, the appropriate player has to re-input his code. Assuming no errors are present in either program, however, the game starts in earnest.

This is where I made a major change to the game as I discovered it. Apart from the fact that the original game had no assembler, and the code had to be put together by hand, I have stuck to the original guidelines. But the game as it stood wasn't exactly visual — each player typed in a mass of numbers, sat back and waited. This was all very well in the early days, but now people expect something more in the way of a display.

## Semi-graphic display

So to that end, I added a semi-graphic display, which takes the form of an array of graphic blocks, 20 blocks wide by 10 high. Each block represents 15 locations in the core, numbered across the screen, so the top left hand block represents locations 0-14, the top right hand locations 295-299, the bottom left 2700-2714, and the bottom right 2985-2999. When the game starts, the area occupied by player one's code is shown in red, and that occupied by player two's in green.

This is the first time either player can know where their code is in memory. After that, whenever a player's program changes the contents of a location in the core, the block representing that location changes to the appropriate colour, so, if a program is overwriting areas of memory as an attack, it is possible to see how close the attack is to a vital point.

The game ends when one program or the other tries to execute an illegal instruction, or when the set number of turns has elapsed.

650STA qover	870BNE n11	1130LDA argH,X
660LDA PC+1	900LDA #1	1140STA #71
670STA #71	910.n11 STA mode+1	1150JSR convert
680JSR convert	920LDA (current).Y	1160LDA #72
690LDA #72	930AND #15	1170BIA cata
700STA current	940CMP #1	1180LDA #73
710LDA #73	950BCC end2	1190STA data+1
720STA current+1	960CMP #5	1200JSR getbyte
730LDY #0	970BCS end2	1210LDA data
740LDA #48	980LDX #0	1220CLC
750AND (current).Y	990LDY #1	1230ADC PC
760CMP #32	1000.rep LDA mode.X	1240STA argL,X
770BNE n1	1010CMP #1	1250LDA data+1
780LDA #2	1020BNE n1	1260ADC PC+1
790.n1 CMP #15	1030JSR get	1270STA argH,X
800BNE n1	1040JMP finish	1280JSR sizeck
810LDA #1	1050.end2 LDA #1	1290.finish CFX #1
820.n1 STA mode	1060STA qover	1300BED exec
830LDA #192	1070RTS	1310LDY #2
840AND (current).Y	1080.end CMP #2	1320INX
850CMP #128	1090BNE imm	1330JMP rep
860BNE n11	1100JSR get	1340.imm LDA (current).Y
870LDA #2	1110LDA argL.X	1350STA argL,X
880.n11 CMP #54	1120STA #70	1360TYA:PHA

(continued on next page)



(continued from previous page)

```
1370LDY #3
1380LDA (current),Y
1390AND mask,X
1400STA argH,X
1410PLA:TAY
1420JMP finish
1430.exec LDY #0
1440LDA (current),Y
1450AND #15
1460STA &74
1470CLC
1480ADC &74
1490TAX
1500LDA table,X
1510STA &74
1520INX
1530LDA table,X
1540STA &75
1550JMP (&74)
1560.sizeck LDA argH,X
1570CMP #11
1580BCC clr
1590BNE nce
1600LDA argL,X
1610CMP #105
1620BCC clr
1630.nce LDA argL,X
1640SEC
1650SEC #184
1660STA argL,X
1670LDA argH,X
1680SBC #11
1690STA argH,X
1700.clr RTS
1710.getarg LDA mode,X
1720CMP #0
1730BEQ transfer
1740LDA argL,X
1750STA &70
1760LDA argH,X
1770STA &71
1780JSR convert
1790LDA &72
1800STA data
1810LDA &73
1820STA data+1
1830JSR getbyte
1840.LDA data
1850STA argL,X
1860.LDA data+1
1870STA argH,X
1880.transfer RTS
1890.inc JNC PC
1900BNE return
1910INC PC+1
1920.return LDA PC
1930CMP #185
1940BNE rt
1950LDA PC+1
1960CMP #11
1970BNE rt
1980LDA #0
1990STA PC
2000STA PC+1
2010.rt RTS
2020.zp LDA argL,X
2030STA &70
2040LDA argH,X
2050STA &71
2060JSR convert
2070CPX #0
2080ENE high
2090LDA &72
2100STA &74
2110LDA &73
2120STA &75
2130RIS
2140.high LDA &72
2150STA &76
2160LDA &73
2170STA &77
2180RTS
2190.mov LDA mode
2200BEQ immd
2210LDX #0
2220JSR zp
2230INX
2240JSR zp
2250LDY #0
2260.agn2 LDA (&74),Y
2270STA (&75),Y
2280INY
2290CPY #4
2300BNE agn2
2310JSR inc
2320INC flag
2330RTS
2340.immd LDX #1
2350JSR zp
2360LDY #0
2370TYA
2380.agn3 SIA (&76),Y
2390INY
2400CPY #2
2410BNE agn3
2420LDA argL
2430STA (&76),Y
2440INY
2450LDA argH
2460STA (&76),Y
2470JSR inc
2480INC flag
2490RTS
2500.add LDX #0
2510JSR getarg
2520INX
2530JSR zp
2540JSR getarg
2550CLC
2560LDA argL
2570ADC argL+1
2580STA argL
2590LDA argH
2600ADC argH+1
2610STA argH
2620LDX #0
2630JSR sizeck
2640.thn LDA argL
2650LDY #2
2660STA (&76),Y
2670INY
2680LDA argH
2690STA (&76),Y
2700JSR inc
2710INC flag
2720RTS
2730.sub LDX #0
2740JSR getarg
2750LDX #1
2760JSR zp
2770JSR getarg
2780SEC
2790LDA argL+1
2800SBC argL
2810STA argL
2820LDA argH+1
2830SBC argH
2840STA argH:LDX #0
2850JSR sizeck1
2860JMP thn
2870.sizeck1 LDA argH,X
2880CMP #11
2890BCC clri
2900BNE nce1
2910LDA argL,X
2920CMP #185
2930BCC clri
2940.nce1 LDA argL,X
2950CLC
2960ADC #184
2970STA argL,X
2980LDA argH,X
2990ADC #11
3000STA argH,X
3010.clri RTS
3020.jmp LDA argL
3030STA PC
3040LDA argH
3050STA PC+1
3060RTS
3070.jmz LDX #1
3080JSR getarg
3090.jm LDA argL+1
3100BNE ret2
3110LDA argH-1
3120ENE ret2
3130JMP jmp
3140.ret2 JSR inc
3150RTS
3160.jmz LDX #1
3170JSR getarg
3180LDA argL,X
3190BNE jmp
3200LDA argH,X
3210BNE jmp
3220JMP ret2
3230.diz LDX #1
3240JSR zp
3250JSR getarg
3260LDA argL+1
3270SEC
3280SBC #1
3290STA argL+1
3300LDA argH+1
3310SBC #0
3320STA argH+1
3330JSR sizeck1:LDY #2
3340LDA argL+1
3350STA (&72),Y
3360INY
3370LDA argH+1
3380STA (&72),Y
3390LDA &72
3400SIA &76
3410LDA &73
3420STA &77
3430INC flag
3440JMP in
3450BNE skip
3460JSR getarg
3470INX
3480JSR getarg
3490LDA argL
3500CMP argL+1
3510BNE skip
3520LDA argH
3530CMP argH+1
3540BNE skip
3550JSR inc
3560RTS
3570.skip JSR inc
3580JSR inc
3590RTS
3600.display LDA #0
3610STA row
3620STA col
3630LDA #(HIMEM+140) MOD 256
3640STA &80
3650LDA #(HIMEM+160) DIV 256
3660STA &81
3670LIY #0
3680.agn LDA #150
3690STA (&80),Y
3700JSR inc1
3710LDA #255
3720STA (&80),Y
3730JSR inc1
3740LDA col
3750CMP #19
3760BEQ rrow
3770CLC
3780ADC #1
3790STA col
3800JMP agn
3810.nrow LDA #0
3820STA col
3830.LDA row
3840CMP #18
3850BCC end
3860CLC:ADC #2
3870STA row
3880LDA &80
3890CLC
3900ADC #40
3910STA &80
3920LDA &81
3930ADC #0
3940STA &81
3950JMP agn
3960.end RTS
3970.inc1 LDA &80
3980CLC
3990ADC #1
4000STA &80
4010LDA &81
4020ADC #0
4030STA &81
4040RTS
4050J: NEXT LL
4060PROCinit
```



# ATARI 600XL ENTERTAINMENT PACK

Great news for games addicts who appreciate high quality graphics and sensational arcade action gameplay. For Only £69, you can buy a 16K Atari 600XL Computer with two top arcade ROM cartridge titles and a joystick. These two ROM titles are the famous arcade hit Donkey Kong and another favourite Qix (We only have a limited number of packs with Qix. When these run out, Qix may be substituted for an arcade entertainment cartridge of the same value). The 600XL Entertainment Pack offers real value for money and enables you to save £63.96, nearly half of the normal RRP's of the pack items when purchased individually. Silica Shop have a wide range of ROM cartridges available including arcade favourites such as Asteroids, Centipede, Missile Command, Popeye, Q\*Bert, Star Raiders, Super Cobra for only £9.95 each! The 600XL is a programmable home computer with the Basic Programming Language built in and if you later add a 1010 Program Recorder (XLC 1010 - £34), a range of hundreds of cassette programs will become available to you. The Atari 600XL is recommended as a first class games machine.

**ATARI PACKS - POWER WITHOUT THE PRICE!**



ATARI 600XL ENTERTAINMENT PACK	
16K Atari 600XL	£99.99
Donkey Kong (R)	£14.99
Qix (R)	£9.99
Single CX40 Joystick	£7.99
Total (if purchased separately)	£132.96
Less Discount (approx 48.1%)	£63.96
<b>PACKAGE PRICE (XLC 1600)</b>	<b>£69.00</b>

## £69

# ATARI 800XL AND RECORDER PACK

The 64K 800XL is packaged here with the 1010 recorder, an economical storage and retrieval unit, a smash hit arcade game and programming aid, all for a package price of only £129 (ref: XLC 1010), a saving of £95.96 off the RRP's of the individual items which total £194.96. The game included in this pack is Pole Position. Now on cassette from Atari, Pole Position is an accurate reproduction of Atari's own highly successful arcade driving game which has all the thrills and spills of the grand-prix race track. On the reverse of this cassette is a demonstration program of Atari's amazing sound and graphics capabilities giving an example of the high quality performance of the Atari 800XL. Also included is an invitation to Programming 1 cassette which takes you step by step through the first stages of programming in Atari Basic using Atari's unique soundthrough facility which allows pre-recorded human speech to be played through your TV speaker. All you need is a joystick (ATJ 0400 - £7.90 for Pole Position), to be up and running with this package. The Atari 800XL in this pack comes with a Silica two year guarantee.

**ATARI PACKS - POWER WITHOUT THE PRICE!**



ATARI 800XL + PRG. RECORDER PACK	
64K Atari 800XL	£129.99
1010 Program Recorder	£34.99
Pole Position + Demo Prog (C)	£9.99
Invitation to Programming 1	£14.99
Total (if purchased separately)	£194.96
Less Discount (approx 33.8%)	£65.96
<b>PACKAGE PRICE (XLC 1010)</b>	<b>£129.00</b>

## £129

# ATARI 800XL AND DISK DRIVE PACK

This pack includes the 64K 800XL with a 1050 Disk Drive for mass storage and speedy information retrieval as well as a brand new adventure game and a powerful home help program, all for only £249 (ref: XLC 1050), a saving of £115.96 off the RRP's of the individual items which total £364.96. The first of these programs is The Payoff on disk, a new adventure game which is a fantasy simulation in which you play the leading role. An exciting introduction to adventure programs which are always popular (with a demonstration program of Atari's amazing sound and graphics on the reverse). Also included in this pack is Home Filing Manager to help you organise your files. It allows you to catalogue and file details of birthdays, books, your stamp collection or anything else which would normally require you to use filing cards. The instructions for Home Filing Manager are on the reverse of the disk and all the disks which come in this package are in protective paper wallets. You get an extended two year guarantee on the 800XL and 1050 free programs with the disk drive when you buy this package from Silica.

**ATARI PACKS - POWER WITHOUT THE PRICE!**



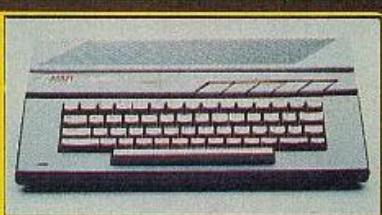
ATARI 800XL + DISK DRIVE PACK	
64K Atari 800XL	£129.99
1050 Disk Drive	£199.99
Home Filing Manager (D)	£24.99
The Payoff + Demo Prog (D)	£9.99
Total (if purchased separately)	£364.96
Less Discount (approx 31.9%)	£115.96
<b>PACKAGE PRICE (XLC 1050)</b>	<b>£249.00</b>

## £249

# NEW ATARI 130XE NOW IN STOCK

Atari's new 128K computer, the Atari 130XE offers an enormous 131,072 bytes of RAM for only £169. The 130XE comes with built in Basic and full operating instructions and is now in a newly designed case with a modern full stroke keyboard. The XE is fully compatible with both the 400/800 and the XL ranges of machines, this means that it can run approximately 90% of all Atari Computer software on the market. This provides a range of over 1,000 software titles as well as a large selection of accessory and peripheral items. Initial stock of the 130XE will be limited, so it's first come first served.

## £169



## SILICA SHOP

**WE ARE THE UK'S No1 ATARI SPECIALISTS**  
Since the introduction of Atari Video Games into the UK six years ago, Silica Shop has been selling Atari products and supporting Atari owners with a specialist mailing service which we believe is unbeatable. We stock over 1,000 Atari related product lines and have a mailing list including over 300,000 Atari 2600 VCS owners and over 50,000 Atari Home Computer Owners. Because we specialise in Atari, we aim to keep stocks of all the available Atari hardware, software, peripherals and accessories. We also stock a wide range of Atari dedicated books and through us, the owners on our list can subscribe to several American Atari dedicated magazines. We can provide a full service to all Atari owners and are now firmly established as the UK's NUMBER ONE Atari specialists. Here are just some of the things we can offer you:

**FREE POST & PACKING ON MAIL ORDERS**  
**FREE CLUBS & INFORMATION SERVICE**  
**HIGHLY COMPETITIVE PRICES**  
**AFTER SALES SUPPORT SERVICE**  
**REPAIR SERVICE ON ATARI PRODUCTS**

If you would like to register on our mailing list as an Atari computer owner, or just because you are interested in buying an Atari machine, let us know. We will be pleased to keep you up to date with all new developments on the Atari scene free of charge. So, post off the coupon with your order or enquiry and begin experiencing an Atariservice that is second to none.

**01-309 1111**

**SILICA SHOP LTD, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX Tel: 01-309 1111**  
**ORDER NOW-OR SEND FOR OUR FREE ATARI BROCHURES**

To: SILICA SHOP LTD, Dept YC 0985, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX. Telephone: 01-309 1111

YC0985

### LITERATURE REQUEST:

☐ Please send me your FREE brochures on Atari Home Computers.

☐ I already own a ..... Videogame ☐ I already own a ..... Computer

Mr/Mrs/Ms: ..... Initials: ..... Surname: .....

Address: .....

Postcode: .....

### ORDER REQUEST:

#### PLEASE SEND ME:

<input type="checkbox"/> 16K 600XL Entertainment Pack	£69
<input type="checkbox"/> 64K 800XL & 1010 Recorder Pack	£129
<input type="checkbox"/> 64K 800XL & 1050 Disk Drive Pack	£249
<input type="checkbox"/> 128K 130XE Home Computer	£169

All prices include VAT

Post & Packing  
is Free Of Charge

☐ I enclose Cheque/P.C. payable to Silica Shop Limited for the following amount: £ .....

☐ CREDIT CARD - Please debit my:

Access/Barcard/Visa/American Express/Diners Club

My Card No is: .....









# FALL

## Paul Hammond simulates the laws of gravity on the CBM-64.

ROCK FALL IS A game in which you have to guide a little man around 10 caves collecting the 16 diamonds in each. If you burrow under a rock it will fall on you and kill you unless you move out of the way quickly.

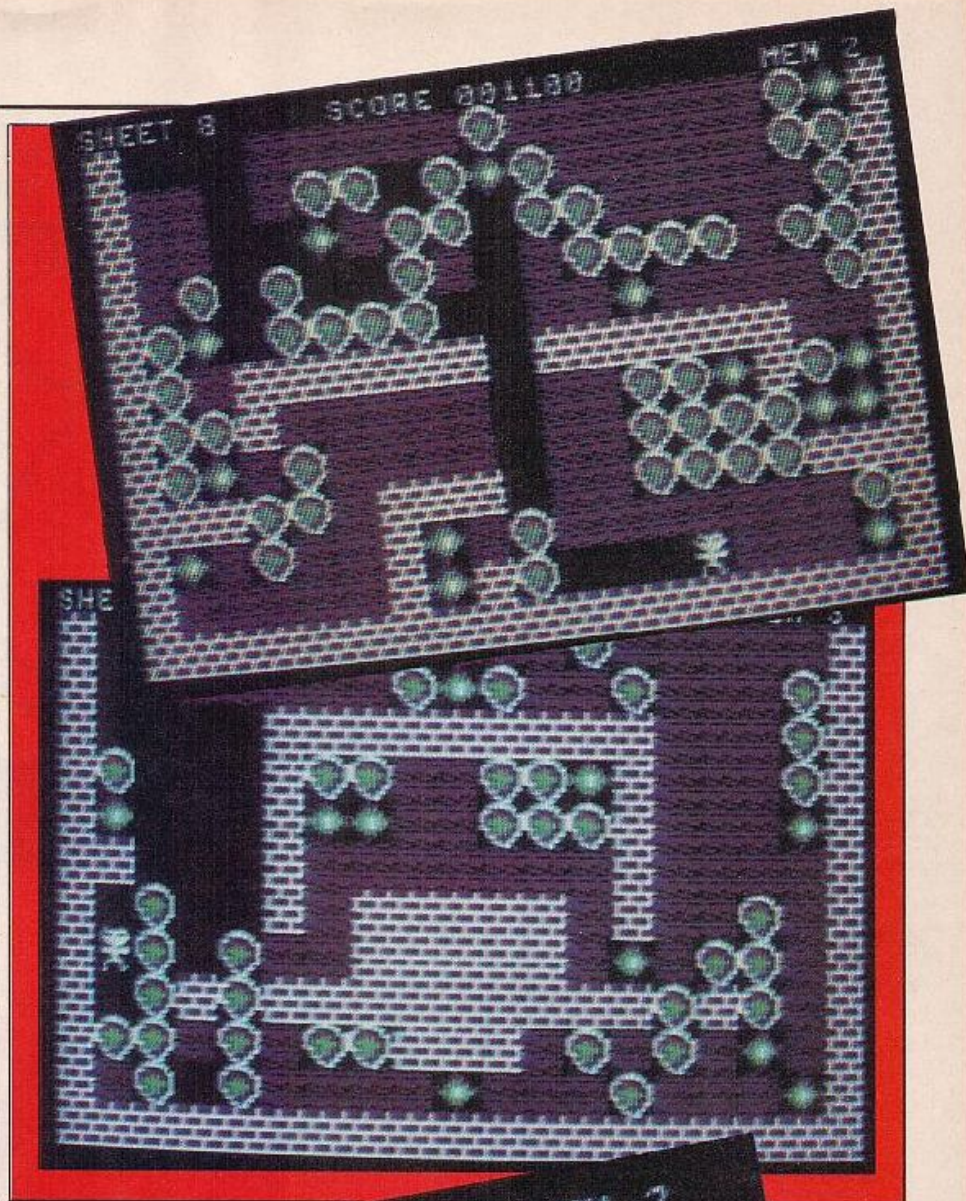
During the game you will probably find that you have dropped a rock and it has cut you off from one or more of the diamonds. If this happens press the F1 key to lose a life and the screen will be redrawn. On most of the screens the rocks are placed strategically so that under mining one could block you off or the diamonds off from each other, it could also unblock the way to a diamond.

The game is keyboard only and the following keys should be used:

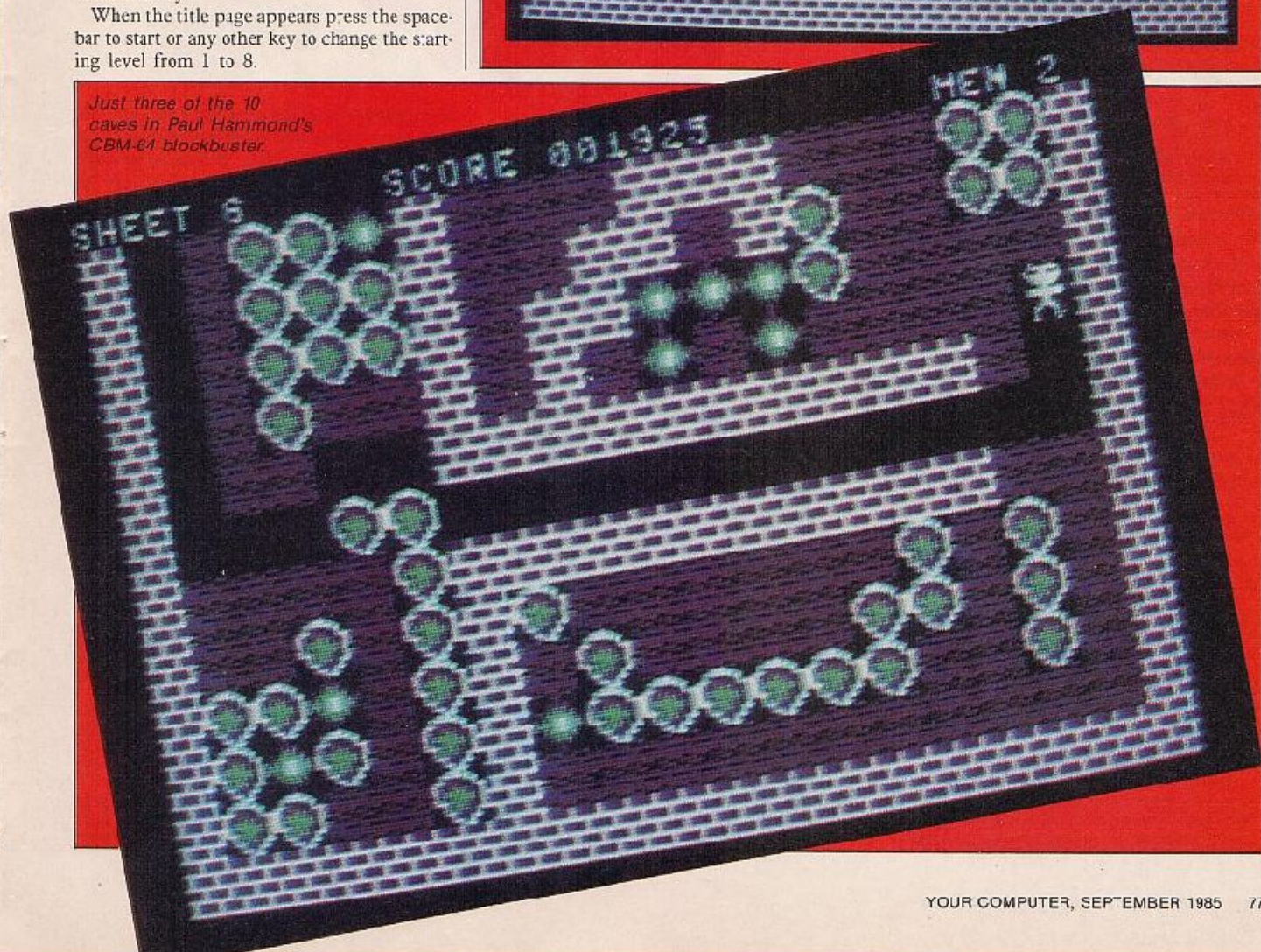
S = Up  
X = Down  
← = Left  
→ = Right  
F1 = Dig

To play the game type in the first program which sets up the machine code and graphics and save it. Next type in the Basic program and save it after the first. Now, when you press Shift and Run/Stop the game should load and run automatically.

When the title page appears press the spacebar to start or any other key to change the starting level from 1 to 8.



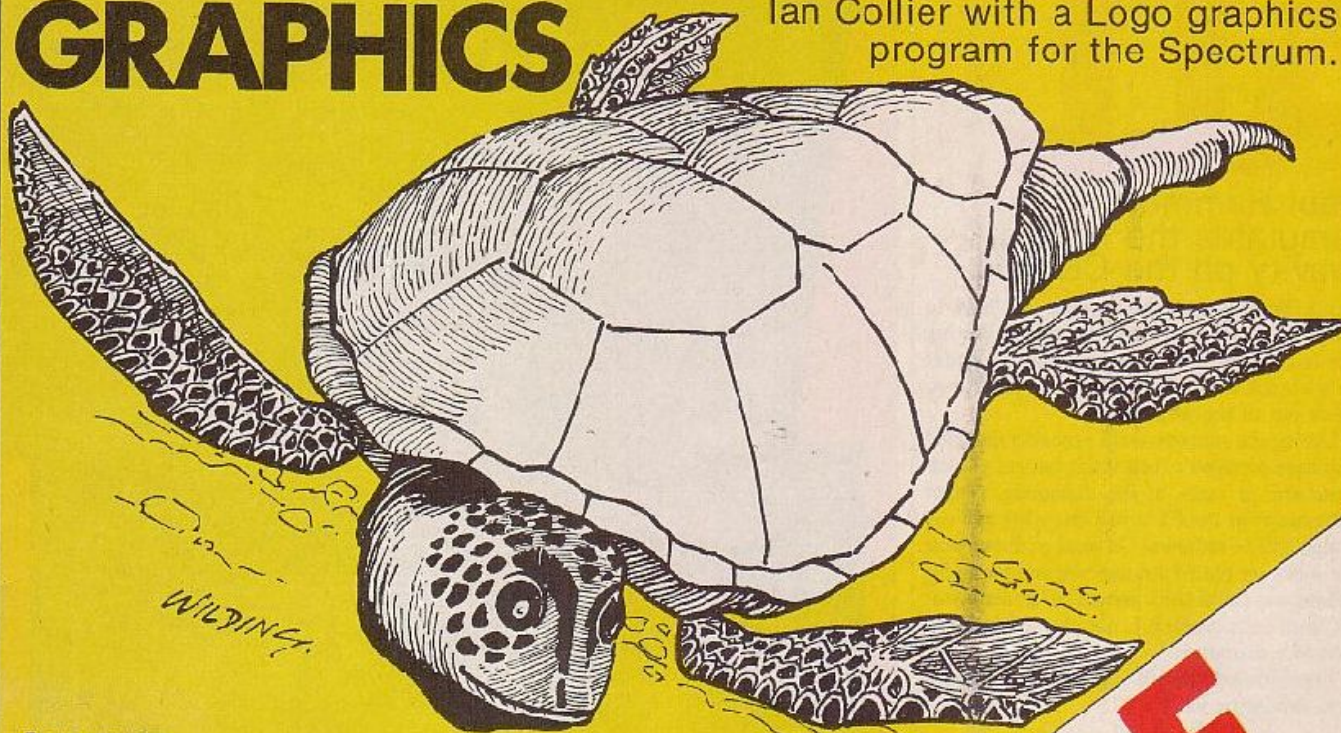
Just three of the 10  
caves in Paul Hammond's  
CBM-64 blockbuster.





# GRAPHICS

Ian Collier with a Logo graphics program for the Spectrum.



## Demo program.

```
10 BORDER 0: PAPER 0: INK 7: C
LS : RANDOMIZE USR 30000
20 "d:0:mov127.87:rep90:for45-
rep/2:rot30:end
30 "for44:rot90:for10:fill125.85
.4
40 PAUSE 50:"scr2.0": PAUSE 50
:"scr0.2
50 ".sta:rep5:fora:rot150:fora:
rot-78:end
60 PAUSE 50: CLS
70 "box255 175:mov100.70:pol6.1
40.60
80 LET a=20:"mov130.87:dir5:st
a:fill140.100.2
90 "bor2:inf4:cir60
100 INPUT ""
110 "mov8.8:dir0:ink6:rep4:rep30
-10*(rep=1 OR rep=3):for4:iun4:e
nd:rot90:end
```



On  
Telsoft.

# TURTLE

THIS IS an implementation of the turtle graphics part of Logo, adapted into about 15 commands.

To set up the machine code the listing of data must be entered and run. The data will be read and Poked in by the Basic program.

After creating the graphics code it should be ready for use at 30000. It may, however, need to be moved, for example to a higher address in

a 48K Spectrum. Having saved the code with: Save "logo"CODE 30000,1000 the relocate program will move the code, first by loading it in at the new address, if this has not already been done, then changing the absolute addresses. A copy of the code at 30000 should

be retained for the demonstration program.

Program 1 allows you to use the turtle graphics without writing a program. It incorporates one loop using the control variable *x*, which can be set up. Commands are as follows:

- DIR *x* — Points turtle in a direction *x* degrees anticlockwise from horizontal right.
- CIR *x* — Draws a circle around the turtle, radius *x* pixels.
- BOX *xy* — Draws a box with two diagonally opposite corners at the turtle and (*xy*).

## Data loader.

```
10 DEF FN d(a#)=CODE a#-48-(32
AND a#>2)-(7 AND a#>9): DEF
FN h(a#)=FN d(a#11)+16+FN d(a#
(2))
20 RESTORE : CLEAR 29999: LET
a=30000
30 FOR x=100 TO 340 STEP 10
40 READ a#: LET t=VAL a#( TO 4
): LET a#:=a#(5 TO )
50 POKE a, FN h(a#): LET t=t-PE
EK a: LET a=a+1
60 LET a#:=a#(3 TO ): IF a#>""
THEN GO TO 50
70 IF t THEN PRINT "Error in 1
line 'x': STOP
80 PRINT "Line 'x': OK": NEXT
x
90 CLS : PRINT AT 10,10:"Finis
hed"
100 DATA "67072a3d5c36dc233675d
f225f5c21d77ae52a535c2b1e22cd8a1
d384be7fe2e2b19237ecdb618fe0d2fe
bfe2220032318e4fe3a20ec23fe2e20e
```

```
7225d5c0603d1e7"
110 DATA "6965cbaf121310f9e7eb7
3237223c5cb7ecdb618fe0d2b0e23fe2
220f37efe3a28b4fe0d20ea18aee13c0
021d675225d5ccdb2283817233600233
60023224a752334"
120 DATA "5418002336022a5f5c225
d5cc92a4b5ce500010800cd5516e3224
b5ce12336b22336652336f018ce52455
03a595d11cc75d53a3a5cfe0b2013cd1
576210313cd3025"
130 DATA "7056200421cf12e5c3761
be13a7a5cfd3e00ffcd302528043cc31
3132a5d5c225f5c225b5cc3bd12f360
0ff2a3d5ce5e5ed733d5ce1cd3275e12
22d5cfdcb007ec0"
140 DATA "670618c7df2b7efe22c28
alc225d5ccdb30252807cd4d0d4d3656f
80f110677e50c03e7cbef4f1ab922061
310f5c11870e1225d5c1313131310fd1
ae720e1e7fe2e20"
150 DATA "57551ecd302506a3a29070
622237ecdb618fe222807fe0d2803b82
0f0225d5c183dcd302520c0603dffe0
```

```
dca8a1ce710f7182b1d77ae50603cba
f4f1ab9200713e7"
160 DATA "742910f5c1180fe1225d5
c13131310fd1aa720e2cf18eb4e23460
3cd407a1812e71ad5cd57fe1235e235
6ebcd3025c42c16cd541fd27b1bdfef0
dc8fe3aca4976fe"
170 DATA "616622c28a1ce7c9a7c84
7c5cd821cfe2c2001e7c110f4c944495
2017c78434952019e78424f5802cb784
64f52010279424f5201942246494c036
677504f4c032379"
180 DATA "5401494e4b01f6794a554
d01fe79524f5401177a444f56022f7a5
04c4f02377a53435202517a524550016
f7a454e4400807a43414c013d7a3e10d
7cd452dd7cd0723"
190 DATA "704311010121fe00cd2d7
87cfe203051e50ffe033061cd6678798
34cd087828e7cbb5c0at93b814f7a8
047cd0878280a79834fcd087820f818c
a21f40079934fcd"
200 DATA "873708782016cd2d787cf
e1038f8c5d5af92573047cd7377d1c11
8df79834f18a4c5e5d5af92573047cd7
```



# Relocate program.

```
1 DEF FN h(a#)=FN d(a#(1))*16
+FN d(a#(2)): DEF FN d(a#)=CODE
a#-48-(32 AND a#)"Z")-(7 AND a#>
"q")
2 DEF FN a(a)=INT (a/256): DE
F FN b(a)=a-256*INT (a/256): DEF
FN c(a)=PEEK a+256*PEEK (a+1)
3 INPUT "New address? ":a: CL
EAR a-1
4 INPUT "Original address? ":
f: LET t=PEEK 23730+256*PEEK 237
31+1
10 RESTORE : DIM a(70)
20 LET a=1
30 FOR x=1 TO 3
40 READ a$: LET tot=VAL a$ ( TO
41: LET a=a$(5 TO )
50 LET t=FN h(a$): LET h=FN h(
a$(3 TO 4))
60 IF NOT 1 AND NOT h THEN GO
TO E0
70 LET tot=tot-h-1: LET a(a)=h
```

- FOR x — Moves the turtle forward, leaving a trail.
- BOR x — =BORDER x
- FL x,y,z — Fills in any enclosed area in ink z, starting at (x,y). If filling starts at the edge of the area, then it is possible that only half will be filled, so aim for the middle.
- POL x,y,z — Draws a polygon with x sides, moving first to (x,y) and going anticlockwise.
- INK x — Any further drawing will be in ink x; this only lasts to the end of the line of instructions.
- JUM x — Moves the turtle forward x pixels without changing the screen (Jump).
- ROT x — Rotates the turtle x degrees anticlockwise.
- MOV x,y — Moves the turtle to (x,y).
- PLO x,y — Moves the turtle to (x,y) and plots a pixel.
- SCR x,y — Changes the screen colours to paper x and ink y without erasing the patterns.
- REP x — Marks the start of a set of instructions to be repeated x times. Also sets up the Basic variable Rep which is equal to the counter of the innermost loop. Note Rep starts at x and goes down to 1.
- END — Marks the end of the repeated instructions.

The instructions can be in upper or lower case.

The prompt Instructions will appear and the instructions must be typed in. I have printed out:

```
377c1e1c17ce60f67cb85188ec5e5d57
88247af935f814f"
210 DATA "8383cd08787b20f821fe0
0cd7377d1e1c17ce6f067cbcd373777
93c281b3d281878a72814feaf2810e5c
5cdad2247047e0710fde601c1e1c9cd6
678af3cc9c5c578"
220 DATA "71828247cd087887f5adc
b4f280124e6fd6ff1b56f87f6fba56fd
1c1c5d5789247cd0878f5adcb4728047
cc610677de6fe6ff1b56fd1c1c9c5d5e
5cdad2247043e01"
230 DATA "67930f10fdb677cddb0be
1d1c1c9efa3043440e0005a053811b97
acde033ef3120811f020230010a00eb1
1be7aedb0c93a7d5ccdd282def01383a7
e5cdd282def0138"
240 DATA "74982a7d5ce53a8f5c5f5r
d2d23f1328f5ce1227d5cf0d3656f8c9e
fc102383a7d5ccdd282def03e1383a7e5
ccd282def0338cd0723c50600cd2a24c
1c50e00cd2a24c"
250 DATA "7596c5af9257af935f0e0
0cd2a24c10e00c3ba24ef3:3821be7ac
```

```
*256+1-30000+t: LET a=a+1: LET a
=a*(5 TO ): IF a<>" " THEN GO T
O 50
80 IF tot THEN PRINT "Error in
line ":90+10*x: STOP
90 NEXT x
100 DATA "5188347537753d759a75a
c75dd75e87525764b76a276ca76d276e
d760a77107716771c7728772e7734773
a77407746774c77"
110 DATA "5728527758775e7764777
7785778b779b77a377b077b577c477d
877f177fa77067828783378587887789
978067914792479"
120 DATA "568627795a79717981798
b799c79ae79bd79c379d279da79e079e
679e7990c7a247a2d7a4a7a737a8f7aa
97a527b00000000"
135 LET a=t-f
140 IF PEEK t=42 THEN GO TO 170
150 PRINT "Insert tape & press
a key": PAUSE 0
155 CLS
```

some examples). Then the prompt For a= will appear and you must set up the loop as in Basic by typing three numbers followed by Enter, e.g.

FOR a= 1 TO 50 STEP 1

If a loop is not required, three 1s can be entered.

If a mistake has been entered in the instructions, the program will stop with a report. Otherwise, the instructions will be carried out and you may then enter some more. Each time a set of instructions is entered, the screen is cleared and the turtle is moved to the centre of the screen and pointed horizontally right.

To use the commands in a program they must be initialised. If the code is still in its original position, this is done by:

RANDOMIZE USR 30000

The syntax checker will now accept the new commands, but to use the commands, they must be re-initialised if the program has been altered. This is so that the new position of the variables is recognised, and the new defined procedures are found. The commands need to be initialised after Clear and Run, as these reset the machine stack. If Interface I is connected, this adds complications.

The new commands are regarded by the program as syntax errors unless followed by a turtle graphics command, but they work within a program. Also, when one of the new error reports — e.g. Microdrive not present — is caused, this resets the machine stack and the graphics commands need to be re-initialised.

To enter the new commands, they must be

```
160 LOAD "logo"CODE t
170 FOR x=3 TO 70
180 LET c=FN c(a(x))+a: POKE a(
x),FN b(c): POKE a(x)+1,FN a(c)
190 NEXT x
200 LET a=a+PEEK (t+4)-256*PEEK
(t+7)
210 POKE t+4,FN b(a): POKE t+7,
FN a(a)
```

## Program 1.

```
10 RANDOMIZE USR 30000
20 PRINT AT 0.10:"code:";TAB 1
0:
30 INPUT "Instruction >": LINE
a$
40 LET z=0: FOR x=1 TO LEN a$:
LET a=a+1: IF a=4 THEN PRINT "
":
50 IF a$(x)="/" THEN PRINT TAB
12: LET a=0: GO TO 70
60 PRINT a$(x):
70 NEXT x
80 INPUT "FOR a=":x1: TO ":x
2: STEP ":x3
140 CLS :="mov128.88:d:r0
145 LET xx=FN x()
150 LET a=x1
160 "cal:xx
170 LET a=a+x3: IF a<=x2 THEN G
O TO 160
180 GO TO 20
9500 BORDER 0: PAPER 0: INK 7: C
LEAR 29999: LOAD "logo"CODE : RU
N
9510 DEF FN x()=FN v(USR 31500,a
$): DEF FN v(v)=v
```

placed inside quotes, but at the end of a line, the final quotes may be omitted. For use in a program, there is one more command — Cal.

It calls instructions at the address given. If these instructions are in a string, the address of the instructions needs to be found and the string needs to be prepared by inserting the hidden floating point forms after the numbers — these will not be hidden in a string and will appear as question marks and other characters. This is done by the routine at 31500 and is demonstrated in program one in lines 145,9510.

New commands are like definable procedures. For an example see the command sta in the demo program. To define a procedure, open quotes as usual and type a full stop followed by the three-letter name, then a colon. The commands following this will be executed every time the new command is encountered. The end of the defined command is at the first close quotes encountered in the definition, or at the end of the line.

```
dc033ed53655cef04013821c37acdc03
3ed53655cef0430c3b72421b97a11c07
a010f00edbb0efc4"
260 DATA "638302c502382a7d5ce57
cdd2824e17dcd282defc3342c0003e50
301e403010524e3e50337a3a30f040f3
811b97acdc033ef5e5e438cd0723c5ef3
120011f020238eb"
270 DATA "698411be7a010a00edbb0c
12a7d5c7d91c5e5dcf179cd282de1c17
c90dcf179cd282def31040131040f280
238eb11af7acddc033ef31a30105310f3
10f0233eb11b47a"
280 DATA "8030ccc033cdd52d47c5e
f3158e21af7acdc033cd0279ef31313
E010a00a7ebcd42eb21b47aedb0ef0f3
811b97acdc033cd8c78c110d221c87a1
1b97a010f00edbb0"
290 DATA "8672c92f3c2effc93e10d
7cdc52dd7c94d3556ff21915c7e5c5c
6b6c6d0279f132915f4d3656f8c9efa
3043440e0005a053138eb21b97acdc03
3ef0f38c38678cd"
300 DATA "74730723ed437d5cc9cd0
```

```
723c3e522cda22d2a5d5ce50bed435d5
ccd4976e1225d5cc93e10d7cdd52dd73
e11d7cdd52dd73a8f5c2100581101580
1b0f277ed50c9cd"
310 DATA "9265d52d2ada75772a5d5
ce3f511841dc5e9e1c178fel2804c5e
5c-f00f:3ded5bda75122809d1d515c5e
d535d5ce9d1c17afe1d2009f1f5d5ed5
bja7512e9d5e985"
320 DATA "50813b46736a81060a91c
1377bad2dbd07c1c5aed7e31d0f5498
77bad2dbd07c1c5aed7e31d0f549414
1410e50000000000000000000000000
00000000000000000000000000000000
330 DATA "355r000000000000000000
00000000000000000000000000000000
000000007cd282da2e1c235e2356e01
77e232225f5c2ufed02806cd32:6233
62de1e5237efe22"
340 DATA "72072806cd5216233622e
1e523cda7112a5d5cd225b5ca1e522d5
dcfcb30a6f0cb01becd49762a5b5c225
d5cfdcb01fe2a55c2b2bd1a7ed52eb4
44d722b730c900"
```



# BASIC

Geoff Hatto with a routine to help in the development of a program by storing and executing individual lines of Basic text

from within a standard editor. For the CBM-64.

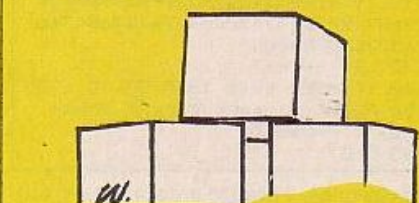
THIS PROGRAM allows individual Basic macros — lines of Basic text — to be stored and executed from within the standard editor. This means that you can define simple one line Basic routines to help in the development of a program. The macros are themselves completely separate from the main program under development.

They are stored in a different area of memory and can be defined, listed, edited and executed using a special set of simple commands. The program also supports an Old command and has two further commands for disc drive owners, a screen directory and command string utility.

The program has been designed to be easy to use and has full error-checking facilities in addition to the standard error routines. The extensions are in the form of single character commands, and all the standard Basic abbreviations are left intact — i.e. L shift, I for List etc.

Up to 10 macros can be defined at any time. Each one can access the main program with a Run or Goto/Gosub statement, but a macro cannot be called from within another macro. Macros only work in direct mode, and therefore cannot be accessed by the main program. Also, the Input and Get commands cannot be included in a macro because they are not direct mode statements.

To define a macro, the letter M is typed followed by the desired macro number — 0 to 9. This is then followed by the Basic text as though you were typing in a standard line in Basic. When return is finally entered, the line is stored in memory ready to be executed.



# PROGRAM

To run the macro, the letter M is again typed followed by the macro number, but this time with no following text. The macros can then be run — or redefined — as many times as required. To list a macro, the letter L is typed followed by the desired macro number.

After hitting return the macro is listed to the screen preceded by an M and the macro number. This allows you to directly screen edit the listed macro.

When using Macro 0, the macro number 0 itself need not be specified. Typing M is therefore equivalent to M0. When defining macro 0 like this, a space must be left between the M and the text, otherwise a syntax error will result.

If you execute a macro which causes an error,

a message will appear, displaying the error and the macro number. If the error occurred in the main program which was called from a macro, then the error will be reported together with the current macro number. Programs executed in the normal way produce standard error messages.

Because this program has been designed as a program development aid, it is relatively crash resistant. Hitting the Run/Stop and Restore keys together have no effect on the extensions and the program can still recover the macro definitions even after a complete power reset — cold start SYS64738 or shorting pins 1 and 3 on the user port — with care! Just type

SYS49152



This program is available on Telsoft.

```

10 REM *****
20 REM **
30 REM ** MACRO EDITOR EXTENSION **
40 REM ** (LOADER) G.HATTO '85 **
50 REM **
60 REM *****
70
80 READ ADDRESS
90
100 BEGIN = ADDRESS
110 MAXNUMBER = 199
120
130 DEF FN LINENUMBER(A) = PEEK(43)+PEEK(54)+256
140
150 PRINT "LOADING CODE INTO RAM - PLEASE WAIT."
160 PRINT
170 FOR COUNT=1 TO MAXNUMBER:GOSUB 400 (* READ A DATA
  LINE *) READ CHECKSUM
180 IF SUMO CHECKSUM THEN PRINT "CHECKSUM ERROR IN "FN
  LINENUMBER(COUNT) END
190 L = FN LINENUMBER(COUNT) PRINT L
200 IF ADDRESSOL+8 THEN PRINT "LINE NUMBER(L) NOT
  IN ORDER" END
210 NEXT COUNT
220
230
240 REM SAVE CODE TO DEVICE
250
260 REM DEVICE TARDIS DISK-2
270 DEVICE = 1
280
290
300 S'S 57912"EDITOR EXTENSION",DEVICE,1
310
320 POKE232,BEGIN+INT(BEGIN/256)+256
330 POKE253,INT(BEGIN/256)
340 POKE783,252
350 POKE781,ADDRESS+INT(ADDRESS/256)+256
360 POKE782,INT(ADDRESS/256)
370
380 S'S65496 S'S49152 END (* RUN EDITOR *)
390
400
410 SUM = 0
420 FOR I=1 TO 8:READ ENTRY1
430 GOSUB 400 (* CONVERT HEX BYTE *)
440 POKE ADDRESS,ENTRY1
450 ADDRESS = ADDRESS+1 SUM = SUM+ENTRY1
460 NEXT I
470 RETURN
480
490 IF LEN(ENTRY1) < 2 THEN 570
500 A1 = RIGHT$(ENTRY1,2):GOSUB 530 ENTRY = V
510 A1 = LEFT$(ENTRY,2):GOSUB 530 ENTRY = ENTRY+A1
520 RETURN
530

```

```

540 IF ASC(B) OR ASC(F) OR ASC(S) AND ASC(A) THEN 570
550 V = ASC(AS1+ASC(F)+ASC(S))
560 RETURN
570
580
590 PRINT "DATA ERROR IN "FN LINENUMBER(COUNT)
600
610
620 DATA 49152
630
640
650 DATA 00,50,A2,C1,8D,82,83,85,90B
660 DATA 83,83,A9,3B,A0,C1,20,04,735
670 DATA C1,20,21,C0,20,10,C0,A9,1851
680 DATA C0,20,90,FF,30,20,EC,C9,1139
690 DATA 60,A9,80,20,90,FF,A9,03,873
700 DATA 8D,87,C0,20,96,C0,90,15,1856
710 DATA EE,87,C0,AD,87,C0,C9,13,1378
720 DATA 90,7A,49,4A,A0,C0,20,04,1816
730 DATA C1,A9,80,3D,87,C0,20,B8,1105
740 DATA C0,60,8D,20,20,4E,4F,29,554
750 DATA 44,49,53,4B,20,44,45,55,554
760 DATA 49,43,45,20,46,4F,55,4E,553
770 DATA 44,20,4F,4E,20,53,45,52,523
780 DATA 49,41,4C,20,42,55,53,00,493
790 DATA 00,8D,20,20,44,49,53,43,376
800 DATA 20,53,55,50,50,4F,52,54,605
810 DATA 20,41,55,54,4F,2D,53,45,542
820 DATA 54,20,54,4F,20,44,45,56,534
830 DATA 49,43,45,20,23,60,A9,0F,468
840 DATA AE,87,C0,A0,8F,20,BA,FF,1197
850 DATA A9,83,A2,38,A0,C0,20,87,1091
860 DATA FF,20,C0,FF,88,A9,0F,20,958
870 DATA C3,FF,20,C0,FF,28,68,08,1085
880 DATA 55,49,2B,A9,71,68,C0,20,867
890 DATA 04,C1,4E,37,C0,A9,30,20,947
900 DATA CD,BD,49,0D,20,12,FF,68,1169
910 DATA AD,1B,C6,30,16,EE,18,C6,1091
920 DATA A9,89,3D,1C,C6,EE,18,C6,1088
930 DATA 20,7A,C3,20,A6,C3,CE,1C,976
940 DATA C6,10,75,68,90,EB,A9,1A,905
950 DATA A2,C1,3D,00,83,EE,01,03,645
960 DATA 68,A9,3B,A2,E3,ED,03,83,937
970 DATA 8E,01,33,68,85,35,84,36,614
980 DATA A0,00,B1,85,F0,EB,23,D2,883

```

```

49424 DATA FF,E6,35,30,F3,E6,36,D8,1481
49432 DATA EF,60,8A,30,8F,FD,1C,C5,935
49440 DATA 10,0A,A9,2F,80,C1,20,04,631
49448 DATA C1,20,41,C1,4C,EB,E3,00,938
49456 DATA 3F,45,52,32,4F,52,20,49,562
49464 DATA 4E,20,4D,41,43,52,4F,20,512
49472 DATA 00,40,0A,40,AD,1C,C0,23,722
49480 DATA 7F,A9,80,20,CD,B0,A9,1861
49488 DATA 20,20,D2,FF,68,FA,68,60,1003
49496 DATA A9,80,8D,1C,C6,20,68,A5,829
49504 DATA 86,7A,34,7B,20,73,03,AA,828
49512 DATA F0,EE,38,A2,00,20,79,00,881
49520 DATA DD,99,C1,90,8E,C9,43,F0,1294
49528 DATA 10,00,31,31,7A,F0,8D,C9,933
49536 DATA 3B,90,39,E8,60,66,D3,E5,1111
49544 DATA 28,4C,90,A4,20,8D,9F,C1,1805
49552 DATA 48,8D,45,C1,48,20,73,00,838
49560 DATA 60,4F,4D,4C,40,24,51,C4,785
49568 DATA C2,C3,C4,C5,14,FA,B0,1424
49576 DATA 6B,C3,E9,93,8D,20,23,42,825
49584 DATA 41,53,49,43,20,4D,41,43,529
49592 DATA 52,4F,20,45,44,49,54,4F,566
49600 DATA 52,20,45,58,54,45,41,58,585
49608 DATA 49,4F,4E,20,20,47,43,27,47A
49616 DATA 38,35,8D,20,20,2D,20,23,321
49624 DATA 2D,2D,2D,2D,2D,2D,2D,23,368
49632 DATA 2D,2D,2D,2D,2D,2D,2D,23,368
49640 DATA 2D,2D,2D,2D,2D,2D,2D,23,368
49648 DATA 2D,2D,2D,2D,2D,2D,2D,23,368
49656 DATA 8D,8D,20,20,45,44,49,54,384
49664 DATA 4F,52,20,43,4F,4D,4D,41,558
49672 DATA 4E,44,53,20,4E,4F,57,20,537
49680 DATA 41,56,41,49,4C,41,42,40,572
49688 DATA 45,3A,2D,8D,00,20,23,20,294
49696 DATA 20,20,4F,20,2E,2E,2E,2E,359
49704 DATA 2E,2E,2E,2E,2E,2E,2E,2F,387
49712 DATA 4C,44,3D,20,20,20,23,20,317
49720 DATA 4D,2A,58,2E,54,45,53,54,560
49728 DATA 2E,2E,2E,2E,20,44,45,46,423
49736 DATA 49,4E,45,20,42,41,53,49,539

```



# MACRO EDITOR

to recover extensions.

The macro definitions are located in the \$C000 block — as is the program — which has no effect on Basic. The macros are actually executed in this block and the only way to corrupt them is to poke into this area.

Typing the letter O followed by return runs an Old command. This recovers Basic text from the current start of Basic. The text can then be treated in the normal way. This is useful after a complete power reset or after typing New. This command, and typing New, have no effect on the macro definitions.

For disc owners, DOS support is provided. When the program is initialised, it scans the serial bus for a disc drive and assigns a matching device number to the program. If no drive is found, a device #8 is assumed — in case you've left the disc drive off! Command strings are sent preceded by the symbol @. Typing just the symbol @ followed by Return displays the current disc error channel. The demonstration disc provided with the drive contains something similar to this.

A screen directory is provided using an \$ command which lists the directory contents to the screen instead of the memory, it also shows the number of displayed files listed to the screen.

The command can be issued in the form of a string, i.e.

\$L\*=SEQ

would display all files beginning with L that are sequential. See disc drive operating manual for more details on command strings.

The program does not affect the speed of Basic program operation, as it is only active in direct mode. Should you require to load yet another one of the many programs that seem to end up in \$C000 then the Q command is provided which turns off the extensions. If you do this by mistake the macros will still be in memory — just re-enter the program.

To get a copy of this program on tape or disc — change line 270 as appropriate — type in the program listed and save it. Now place a blank cassette in the cassette deck or disc in the disc drive and type Run. If all is well, then the program will have saved an executable copy of the program on tape — or disc. If not, then the

reported errors in the Data statements must be corrected and the listing re-saved ready for another attempt.

The program may be reloaded and run when required by typing:

LOAD "EDITOR EXTENSION",1 for tape,  
LOAD "EDITOR EXTENSION",8,1 for disc,  
Execute with

SYS49152

followed by Return. Type New if no Basic program exists, or use the Old command — the letter O and Return — to recover any resident program.

To finish with, here are a few examples of macro definitions to show you how they can be used.

M LIST 2300 — 2450

lists the current set of lines of interest when developing a section of program, in this case from 2300 to 2450.

M1 CLR:PRINT FRE(0) — (FRE(0)<0)\*65536;"  
BYTES =FREE"

prints the correct number of free bytes available for a program.

M2 F\$="PROGRAMNAME"+STR\$(PEEK(252)):

SAVE F\$,1:POKE252,(peek(252)+1)AND255

saves the current Basic program called "Programname" to tape with an updated version number. Location 252 contains the current version number.

M3 GOSUB 10:PRINT"VARIABLE 'A' SET TO  
"A

If the End statement in the main program is replaced with a Return statement then the whole program can be treated as a subroutine by a macro, in this case displaying the final value of a variable A when the main program starting at line 10 has ended.

M4 OPEN4:4:CMD4:LIST

M5 PRINT #4:CLOSE4

These two definitions when executed can be used to print a program to a Commodore printer, the second one is used after the printer has stopped, to close the printer channel.

```
49744 DATA 43,20,4D,41,43,52,4F,0D,482
49752 DATA 20,20,20,20,20,4D,20,58,357
49760 DATA 2E,2E,2E,2E,2E,2E,2E,2E,363
49768 DATA 2E,20,45,50,45,43,55,54,543
49776 DATA 45,20,4D,41,43,52,4F,0D,484
49784 DATA 20,20,20,20,20,4D,20,58,355
49792 DATA 2E,2E,2E,2E,2E,2E,2E,2E,363
49800 DATA 2E,20,4C,49,53,54,20,4D,503
49808 DATA 41,43,52,4F,0D,20,20,20,402
49816 DATA 20,20,40,23,53,5,53,49,402
49824 DATA 4E,47,2E,2E,2E,2E,2E,2E,443
49832 DATA 49,53,48,20,43,4F,4D,4D,563
49840 DATA 41,4E,44,53,0D,20,2E,20,403
49848 DATA 20,20,24,20,53,5,52,49,454
49856 DATA 4E,47,2E,2E,2E,2E,2E,2E,443
49864 DATA 49,52,45,43,54,4F,52,59,625
49872 DATA 0D,20,20,20,20,20,51,20,200
49880 DATA 2E,2E,2E,2E,2E,2E,2E,2E,368
49888 DATA 2E,2E,20,51,55,49,54,0D,460
49896 DATA 0D,00,20,73,00,00,07,20,381
49904 DATA F3,BC,20,AA,B1,60,A2,0B,1079
49912 DATA 4C,3A,F4,0B,A2,00,0E,1C,638
49920 DATA C6,20,F0,32,B0,10,C5,30,969
49928 DATA 30,51,29,0F,0F,1C,C6,20,680
49936 DATA 73,00,F0,1E,93,45,A0,64,762
49944 DATA A6,7A,20,73,A5,20,7F,C3,955
49952 DATA B9,00,E2,91,35,F0,05,C0,830
49960 DATA C0,FC,00,F4,23,A6,C5,4C,1381
49968 DATA 74,A4,FD,1C,C6,20,A5,00,892
49976 DATA 09,00,ED,1C,C6,A9,0E,05,934
49984 DATA 9D,A0,FF,05,3A,20,7F,C3,1121
49992 DATA 30,A5,C5,E9,01,85,7F,A5,928
50000 DATA 36,E9,00,85,73,20,E1,A7,967
50008 DATA 4C,74,F4,A9,67,A0,C5,20,1015
50016 DATA 04,C1,F2,0E,4C,1A,C1,0D,681
50024 DATA 3F,4D,41,43,52,4F,20,44,533
50032 DATA 45,46,49,4E,49,54,45,4F,599
50040 DATA 4C,00,C0,00,05,35,0C,36,620
50048 DATA AD,C6,29,7F,A0,FE,10,991
50056 DATA 18,A5,35,69,53,85,35,A5,779
50064 DATA 36,69,00,85,35,80,DE,F0,939
```

```
50072 DATA 18,A9,1D,65,35,85,35,A9,731
50080 DATA C6,65,36,85,36,60,A9,00,805
50088 DATA A2,04,51,05,C0,CA,DE,FA,1224
50096 DATA 60,00,F2,03,0E,1C,C6,20,674
50104 DATA F0,10,E0,53,C9,30,9E,4C,981
50112 DATA 29,0F,ED,1C,C6,20,73,00,570
50120 DATA 30,45,A9,F3,A0,C3,2E,04,1005
50128 DATA C1,20,41,C1,A9,00,AE,C4,1016
50136 DATA 20,04,C1,20,41,C1,A5,01,689
50144 DATA 85,0F,00,00,84,49,04,14,665
50152 DATA 84,15,20,7A,C3,A5,35,A6,886
50160 DATA 36,85,5F,85,68,4C,03,A7,758
50168 DATA 0D,4D,41,43,52,4F,2E,4C,491
50176 DATA 49,53,54,43,4E,47,2E,00,494
50184 DATA 0D,0D,4D,00,A9,00,2C,A9,496
50192 DATA 0E,AA,4C,1A,C1,A6,2C,A5,854
50200 DATA 2D,05,2D,0C,2C,D0,02,C6,809
50208 DATA 2E,C6,2D,A9,02,A0,02,91,767
50216 DATA 2D,20,4E,C4,A0,00,2E,54,627
50224 DATA C4,B1,2D,D0,F7,C0,B1,2D,1295
50232 DATA D0,EF,C0,B1,2D,D0,EF,20,1343
50240 DATA 51,C4,2D,54,C4,20,35,A5,837
50248 DATA 20,59,A6,4C,74,A4,2E,51,755
50256 DATA C4,20,54,C4,E5,2D,DE,02,993
50264 DATA E6,2E,A5,2E,C5,38,DE,04,952
50272 DATA A5,2D,C5,37,B3,0C,66,A2,897
50280 DATA 10,4C,37,A4,F3,22,4E,AD,839
50288 DATA 37,C0,20,B1,FF,A9,6F,20,1151
50296 DATA 93,FF,A9,60,85,7C,6E,20,1050
50304 DATA A0,FF,20,73,03,C9,0E,D0,979
50312 DATA F6,20,AE,FF,A9,C9,07,7C,1334
50320 DATA 20,9E,C4,D0,03,4C,74,A4,953
50328 DATA 20,C0,FF,4C,74,A4,A5,00,1016
50336 DATA 85,90,AD,B7,C3,20,B4,FF,1292
50344 DATA 20,87,FF,D0,15,A9,6F,20,1012
50352 DATA 96,FF,20,A5,FF,24,90,70,1149
50360 DATA 85,20,I2,FF,D3,F4,20,AE,1157
50368 DATA FF,A9,00,80,A5,7H,CA,8E,1144
50376 DATA 3B,A6,7B,86,BC,C9,00,FE,1239
50384 DATA 07,20,73,00,C9,00,D0,F5,812
50392 DATA 33,A9,FE,85,9E,A5,7A,55,1236
```

```
50400 DATA EB,85,B7,A9,01,AE,B7,C0,1234
50408 DATA F0,00,20,BA,FF,A5,B7,A6,1147
50416 DATA EB,A4,BC,20,BD,FF,C0,1239
50424 DATA FF,B0,57,A2,0D,20,C6,FF,1178
50432 DATA E0,50,20,CF,FF,20,CF,FF,1244
50440 DATA 20,CC,FF,A9,D1,A0,C5,20,1226
50448 DATA 04,C1,A5,D6,C9,18,D0,05,1014
50456 DATA AD,02,F0,07,20,5D,C5,805
50464 DATA F5,90,D0,00,20,E1,FF,D0,1245
50472 DATA E9,E6,9E,18,A9,0D,20,C3,1054
50480 DATA FF,20,CC,FF,A9,C6,A0,C5,1478
50488 DATA 20,04,C1,A6,9E,00,C8,90,1121
50496 DATA 02,00,A9,00,20,C0,BD,759
50504 DATA A9,D5,A0,C5,20,04,C1,C4,1044
50512 DATA 74,A4,48,A9,0D,20,C3,FF,1016
50520 DATA 68,38,4C,F9,E0,A2,0D,20,916
50528 DATA C6,FF,20,A3,C5,20,A3,C5,1237
50536 DATA E6,9E,A9,20,20,D2,FF,20,1118
50544 DATA 12,FF,20,D2,FF,20,D2,FF,1459
50552 DATA 20,A3,C5,05,69,2E,A3,C5,1016
50560 DATA 85,62,20,D1,BD,A5,20,20,894
50568 DATA 12,FF,20,A3,C5,A2,B1,86,1154
50576 DATA 34,C9,00,F3,06,20,D2,FF,1156
50584 DATA 4C,8A,C5,23,C0,FF,A9,0D,1084
50592 DATA 4C,12,FF,23,CF,FF,A6,90,1345
50600 DATA 30,01,60,63,68,18,4C,2C,657
50608 DATA C5,0D,20,23,35,35,43,20,343
50616 DATA 53,48,49,45,54,20,4E,45,558
50624 DATA 59,20,2D,00,00,00,0D,20,237
50632 DATA 20,20,20,54,4F,54,41,4C,484
50640 DATA 20,4F,46,23,00,20,46,49,388
50648 DATA 4C,45,28,53,29,20,44,49,482
50656 DATA 53,50,4C,41,59,45,44,2E,576
50664 DATA 0D,00,A9,83,A2,A4,0D,02,702
50672 DATA 03,8E,03,03,18,20,EC,C0,635
50680 DATA A9,02,00,C5,20,04,C1,4C,034
50688 DATA 74,A4,ED,45,44,49,54,4F,666
50696 DATA 52,20,45,53,54,45,4E,53,505
50704 DATA 49,4F,4E,53,20,4F,46,46,564
50712 DATA 2E,0D,00,03,00,00,0E,00,59
```







The image displays two screenshots of the Game Boy game "Time Bomb".

**Top Screenshot (Title Screen):**

- Title:** "TIME BOMB" is written in yellow capital letters across the top.
- Grid:** A 10x10 grid of squares. Most are red, but some are blue and contain a yellow skull and crossbones.
- Score:** "SCORE: 280" is displayed in the bottom left.
- High Score:** "HIGH SCORE: 290" is displayed in the bottom right.
- Sheet:** "SHEET: 1" is displayed in the bottom right.

**Bottom Screenshot (Gameplay):**

- Grid:** A 10x10 grid of squares, similar to the title screen but with a different arrangement of red, blue, and skull-and-crossbones squares.
- Score:** "SCORE: 260" is displayed in the bottom left.
- High Score:** "HIGH SCORE: 290" is displayed in the bottom right.
- Sheet:** "SHEET: 1" is displayed in the bottom right.

[illegible][illegible]

```

9150 $MBOL 211,192,192,5,63,192,192,63,3
9160 $MBOL 212,0,15,24,6,6,112,112,116
9170 $MBOL 213,0,232,6,2,2,2,2,2
9180 $MBOL 214,116,116,2,112,2,2,2
9190 $MBOL 215,7,2,130,6,202,243,440,0
9200 $MBOL 216,56,124,36,124,125,254,40,108
9210 $MBOL 217,0,0,0,40,203,10,3,0
9220 $MBOL 218,0,0,0,9,153,6,0,0
9230 $MBOL 219,0,0,16,60,0,0,0,0,0
9240 $RESTORE 9200,F0R=1,0 TO 164;READ n:P0K=92000+*,*
NEXT
9250 DATA 221,126,2,50,161,144,221,126,3,50
9260 DATA 162,144,221,126,0,254,1,202,26,144
9270 DATA 254,1,202,26,144,221,126,0,197,17
9280 DATA 163,144,42,161,144,122,237,176
9290 DATA 237,41,161,144,42,161,144,1,23,0
9300 DATA 9,1,70,0,237,176,237,9,1,61,143
9310 DATA 3,70,0,237,235,35,163,144,1,2
9320 DATA 0,237,176,42,161,144,1,0,0,9
9330 DATA 34,161,144,153,16,190,201,6,11,19
9340 DATA 17,103,144,42,161,144,1,70,0,9
9350 DATA 1,2,0,257,176,42,161,144,1,170
9360 DATA 0,9,1,257,176,42,161,144
9370 DATA 17,72,0,257,176,161,144,1,17
9380 DATA 0,9,3,257,184,237,9,161,144,33
9390 DATA 163,144,1,2,0,237,176,42,161,144
9400 DATA 1,0,0,9,34,161,144,195,16,185
9410 DATA 201
9420 MODE 1
9430 N=0
9440 WINDOW #1,140,2,21
9450 WINDOW#2,15,26,12,14
9460 INK 9,0;INK 1,24;INK 2,6;INK 3,11
9470 BORDER 0
9480 PAPER=4;PCH=1
9490 PAPER#1,SIFEN #1,0
9500 PAPER#2,OPEN#2,1
9510 CLS;LOCATE
9520 LOCATE 1,1;PRINT" I M E B O M "
9530 LOCATE 5,54;PRINT"SCORE:";USING"#####";@;PRINT
HIGH SCORE:";USING"#####";@;LOCATE 33,25;PRINT"S
EET: 0";
9540 GOTO 101
9550 GOTO 201;101=1+CHR$(212)+CHR$(213);NEXT
9560 FOR W=1 TO 70;101=1+CHR$(214)+CHR$(215);NEXT
9570 ENT=1-1,10,4,1,1-20,1
9580 ENV 1,15,1-1,0
9590 ENT=2-1,10,5,1,1,20,1
9600 ENV 2,15,1-1,7
9610 RETURN

```



# COMMODORE 64, BBC AND SPECTRUM

```

5 REM  HEX LOADER FOR CBM 64  FIG.1
6 REM
10 FOR I=680 TO 727:READA:POKEI,A:T=T+A
20 NEXT I:IF T=676 THEN GOTO 100
30 PRINT"ERROR IN DATA":T=676:END
40 DATA 169,1,133,186,169,1,133,84
50 DATA 133,185,169,8,133,183,169,208
60 DATA 133,187,169,2,133,188,169,56
70 DATA 133,251,169,199,133,252,69,251
80 DATA 162,231,169,206,32,216,255,96
90 DATA 60,79,87,78,76,79,60,68
100 SA=51000:LA=52855
110 INPUT"START ADDRESS";A
120 IF (ACSA) OR (ADLA) THEN GOTO 140
130 IF A/8=(INT(A/8)) THEN GOTO 150
140 PRINT"PRINT ADDRESS ERROR":GOTO 110
150 T=(A-32768)AND255:PRINTA:INPUTD#
160 IF D#="END" THEN GOTO 400
170 IF LEN(D#)=20 THEN GOTO 130
180 PRINT"WRONG LENGTH" GOTO 150
190 FOR B=0 TO 7:B#=(D#*256+1)/2:
200 GOSUB 300:IF E=1 THEN GOTO 280

```

```

210 POKE A+E,D:T=T+D:NEXT
220 B#=(MID$(D#,18,3)):GOSUB 300
230 IF E=1 THEN GOTO 280
240 IF T=D THEN GOTO 260
250 PRINT"CHECKSUM ERROR":GOTO 150
260 A=A+B:IF A/8 THEN GOTO 150
270 GOTO 800
280 PRINT T#B*(8+2*B/D)*C#"?":
290 B=0:NEXT GOTO 150
300 E=0:D=0:FOR N=1 TO LEN(C#)
310 C#=(MID$(C#,N,1)):GOSUB 400
320 IF E=1 THEN D=N:N=4:NEXT RETURN
330 D=D*16+D:NEXT RETURN
400 X#ASC(C#)-48:IF X/10 THEN E=1:RETURN
410 IF X/10 THEN RETURN
420 X=X-7:IF X/10 THEN E=1:RETURN
430 IF X/10 THEN E=1
440 RETURN
500 H#="0123456789ABCDEF"
510 FOR A=5F TO LA STEP 8
520 PRINT A:"?":T=(A-32768)AND255
530 FOR B=0 TO 7:X#PEEK(A+B):GOSUB 600
540 T=T+X:NEXT PRINT":":
550 Y#INT(T/256):PRINT MID$(H#,Y+1,1)
570 X=255 AND T:GOSUB 600:PRINT
580 NEXT GOTO 500
600 PRINT MID$(H#,INT(X/16)+1,1):
610 PRINT MID$(H#,1+(X/16)+1):RETURN

```

THE PROGRAMS given here will enable Spectrum, BBC, and CBM-64 owners to download via *Your Computer's* Telsoft service. Each month for each machine we transmit at least one — and usually two — of the main programs appearing in the current issue. Also available is the full user to user communications program, Dialsoft.

So far OE LTD's Telemod 2 and the VTX 5000 modems have been tested with the BBC and Spectrum but the service also works with

```

800 SYS 630:C#=(CHR$(3#))
810 PRINT PRINT" TO RELOAD CODE "
815 PRINT PRINT" LOAN" C#(DOWNLOAN)
820 PRINT C#(1,1) (RETURN)
825 PRINT PRINT" THEN TYPE NEW"
830 PRINT" (RETURN)"
835 PRINT PRINT" TO RUN THE PROGRAM"
840 PRINT" SYS 51000 (RETURN)"
900 PRINT PRINT"PRINT"1 ENTER DATA"
910 PRINT PRINT"2 PRINT DATA"
920 PRINT PRINT"3 SAVE DATA"
930 INPUT Z:ON Z GOTO 100,500,800

```

```

51000 ? A90680D1D8D0D0D#E2
51008 ? A906D060A90E20#E4
51016 ? D2FFA900D15D0A9#4D3
51024 ? F5D0A002BA8E92CE#510
51032 ? 20CA920C70B2WF8#4D5
51040 ? C9AD00CE931F23#532
51048 ? C935F014C9356D006#43F
51056 ? 208C74C50C7A914#419
51064 ? 202FF202F03D0D8#52E
51072 ? 403FC8A9202D2FF#61
51080 ? 203C94C4C82063#411
51088 ? CC202CD9A95F857#41
51096 ? A90C65#E228D1A0#547
51104 ? 302395CC202FCBC9#494
51112 ? 44F00B954D0ED20#4E1
51120 ? D2FFA901D007F944#4EF
51128 ? 202FFA9008B8A20#4B9
51136 ? 25DCA90320ABC7A9#4A3
51144 ? B085D7A9C085FEA0#E0
51152 ? 002095CC2025C20#383
51160 ? 95CC9848A002C20#383
51168 ? C2018C96A82025#4C4
51176 ? CD2095CC3843A9#4E4
51184 ? 8D30C22D0C9AD7#5E3
51192 ? CE85FAD8A8CE85F#6EA
51200 ? 68A82060C8A501E5#38A
51208 ? B085B598A293A0CE#539
51216 ? 20B0FFA9A9C9C0A#567
51224 ? CE8B001C820DCE#479
51232 ? A9F8008FF20F1C#597
51240 ? 602095CC00D100E#3FE
51248 ? FFA90D202FF60A9#4E7
51256 ? 002029C8A90D20#306
51264 ? FF602063C0A00A9#43F
51272 ? FF9993CEC810F20#5FB
51280 ? D2C850FE20D2C8B0#5ED
51288 ? FB8D72CEA0000C7C#4D0
51296 ? C8C7DCE202CCD#4D4
51304 ? 202CE29F0C980D0E#450C
51312 ? 72DCEB01A9573CE#599
51320 ? C820ECC00090WF#4EB
51328 ? 0000AD760CE298D0#492
51336 ? 3FA52B85F318A5D#30B
51344 ? 6D75CE5FAC4C0C#5E7
51352 ? AD78CE85#AD79CE#607
51360 ? 65FC20D2C8B0A920#55E
51368 ? D9CC20D2FF3820D#9607
51376 ? C202ECC0010D0CA#528
51384 ? A202D2FFAD75CE#56A
51392 ? 202CED2D2C8B087#4D7
51400 ? C17DCECF8B087#4D7
51408 ? D2FF2029C8A5820#503
51416 ? 20D2C8B087#4D7
51424 ? C0E8AD75CEA993#687
51432 ? DCEB0E2020C8A993#687
51440 ? 202D2FF4C7E34C57#51F
51448 ? 202D2FF4C7E34C57#51F

```

```

51456 ? C8A000C07CEB07D#447
51464 ? CE20D2C8B0A931F#58F
51472 ? 202ECC08C07C7D0#4D3
51480 ? F020D2C8B0A931F#58F
51488 ? CEF008A9520D2FF#4D8
51496 ? 4C57C820D2C8B0CE#4C3
51504 ? CD7DCEFF034C23C9#47E
51512 ? 20AC032030C8AD75#409
51520 ? C8B8A9009993CEAD#506
51528 ? 84CEC90202520E0#436
51536 ? C8A90C820F3C8A955#558
51544 ? 3015C0A9520F3C3#432
51552 ? 20C7C80C73CE888#5D4
51560 ? B993CE02398D07#5F5
51568 ? C5CE7F95E2016#3D5
51576 ? 20F1C8A4C63C9A77#4EF
51584 ? CE20D2C8B0A920#57D
51592 ? D2C820D2C8A4C79#545
51600 ? 4C5C0A9285F5A5#43C
51608 ? 2C85FC80E01F89#52A
51616 ? 2200C8B1FB852370#4CE
51624 ? 08A52295F8032385#447
51632 ? FC4C91C9:8A5FB69#57D
51640 ? 02852D852F8531F#53B
51648 ? FC900852E85308#412
51656 ? 32602053C:A90280#3E1
51664 ? 34CA90B80320E0#4A3
51672 ? 8E81CE8C82CE200#533
51680 ? A9098D0DCE202FCE#414
51688 ? C014F016C09D015#4E2
51696 ? C924D01920D2F#0D#544
51704 ? C3CE584CE5C9E000#648
51712 ? D0E3E00AF0F07D02#554
51720 ? FFLA4CE5C9C9C9#554
51728 ? D4C9A901548AD03#444
51736 ? C9C924F034634CE#460
51744 ? C95AC74130B7C947#48A
51752 ? B03B20D2FF38E930#4D5
51760 ? C90A900E2907E005#36A
51768 ? F0FB91C3CE84CE5#61A
51776 ? C9E000F0A92001D3#52A
51784 ? 07ADC3CE924F095#4FF
51792 ? A92020D2FFA9FF9#54F
51800 ? C3CEA2008CEFC8E#544
51808 ? D0CE8E11CE8ED2CE#599
51816 ? FDCC3CE924D005A9#512
51824 ? 0FAD1DCE83D3C0E#570
51832 ? C9FF01D20C8B005B2
51840 ? 3418D0C3CEEDCE#524
51848 ? 8DCEFC8506D0DCE#566
51856 ? 81D0CE020634C75#534
51864 ? C9A0CEFC8C8C99#642
51872 ? C9C0C8AD00CE993#642
51880 ? CE8188C83CEAC8E#561
51888 ? CEAE81CE6A2025C0#561
51896 ? CE200D41CE0921F3#530
51904 ? 8720D2FFE84C8A9#570
51912 ? 4CCE9AD0CE8DCE#65F

```

```

51920 ? CEAD0FCE8D1CEAD#6C1
51928 ? D0CE8D02C18AD1#635
51936 ? CE6D0FCE8D0FCEAD#58F
51944 ? D2CE6D0CE8D0CE#68E
51952 ? B035CECECE8D0E660#525
51960 ? 2053C0A90F086602#414
51968 ? A95185DF9C185FE#575
51976 ? A002029DCC2025C0#343
51984 ? 209DCC20A9DCC020#33F
51992 ? CC2022D20A9C020#306
52000 ? 95CC2022C02095C#411
52008 ? 202FCB20D2FF608E#421
52016 ? 81CF8C2CE2069C#483
52024 ? 20CC0C20C8C0C300#48F
52032 ? D0D020F0CC931F#4F0
52040 ? 062001C4C35C70#314
52048 ? 80CCE81CEFC82CE#597
52056 ? 60A5CE2C9A4C5BC7#4CE
52064 ? 2022C0A92205F0A9#465
52072 ? CE5FEA00A2095C#4D0
52080 ? 2025C0A00A92099#393
52088 ? 93CE800F8193CE#619
52096 ? 202FCB0C914D0100#417
52104 ? 00A9F5202FF8A9#58F
52112 ? 209933CE4C08C0C9#50A
52120 ? D0F00B20D2FF993#4D0
52128 ? CEC8C01D0D0A9F02#579
52136 ? 20D2FF60A52020D2#484
52144 ? FFA94F20D2FFA94#580
52152 ? 20D2FF60A9138000#452
52160 ? DE8A:28D00FE6A9#4C0
52168 ? 536D0A9D8A9520100#40E
52176 ? DE60A996186D87CE#547
52184 ? 8C82CEC82CE2034#4D4
52192 ? C20ECC0CE07CE10#677
52200 ? 02386020F0DCCB0E#509
52208 ? 60A9FA8C82CEA820#597
52216 ? 04C86D0FA8C82C#610
52224 ? 602004C884H2A0C#3EE
52232 ? 00F0A82063C06020#454
52240 ? 25CDA90220A80C020#364
52248 ? 95CCAD0CE2012FF#573
52256 ? F920D2D2FFA90320#3A5
52264 ? ABCC20D3C9504D7D#48A
52272 ? CE8D'DCEA208AD7D#4AA
52280 ? CE2A0019D7DCE49#411
52288 ? 088D'DCEAD7DCE49#460
52296 ? 168D7DCE27DCE2E#3D5
52304 ? 7DCEC4D0E169A000#516
52312 ? A9009900D4C8C018#40E
52320 ? D0F660A99320D2FF#583
52328 ? 60A8A9A2290F01F#37E
52336 ? A5144A9A5A22910F0#441
52344 ? 05A9A44C88C0A920#42B
52352 ? 20D2FFA90085D4A9#51C
52360 ? 9D20D2FF6885D4A9#51C
52368 ? 6020D2FFC81FDC#520
52376 ? 21D0F6C8602025C0#483

```



# TELSoft



A reminder of how to use the Telsoft service.

a number of other maces. For the CBM-64 it will initially only be available with the OEL Comms pack together with the Telemond 2 or similar modem; later we hope to adapt the service to work with Commodore's modem.

To enter the download program first type in the hexloader for your machine — figure 1 — and then enter the machine code — figure 2. Once the program has been saved you can run it by entering CALL &6000 on the BBC, SYS 51000 on the CBM 64, RANDOMIZE USR

60000 on the Spectrum.

To find out what is available and how to receive software dial up Colchester (0206) 8068. This audio recorded information line will also advise you which telephone numbers to ring for the 300 and 1200 bit/s services.

When a program you want to download is on line, make sure your modem is set up and dial the number appropriate to its speed. As soon as you hear the modem tones switch the modem to line and replace the receiver. Select

Option 1 from the menu — Receive. After a block of data is received you will see "OK" printed if there are no errors, otherwise the program will wait for the blocks to come round again. When the "Program loaded OK" message appears return to the Telsoft menu and select Option 5. You can now save and run the program.

Note that CBM-64 owners will need to use Option 6 if machine code is to be saved.

Figure 1. BBC.

```
10 REM BBC HEX CODE LOADER
15 HIMEM=>7FF
20 CLEIPRINT
30 INPUT "START ADDRESS (Hex)":A$
40 A=VAL("&"+A$)
50 IF A>=0 THEN 200
60 IF A<=200 OR A>=6FE7 THEN 20
```

Figure 2. BBC.

```
6000 :A9CBAFEA20120F4,4C6
6001 :FF20616C2A80C9,3B9
6002 :31F00C93AF0C9,4CE
6003 :35F00A1AC0A0C47,200
6004 :6A98C20C3FA0E,4B2
6005 :A00A2F20F4FA5,4F0
6006 :83A20C20FAFA0,363
6007 :A020C20FAFA0A,4C9
6008 :1FA20C20FAFA0,4B2
6009 :C020C3FF20F6A9,439
600A :15A20120FAFA0,363
600B :A9F0B9956F0DFA,5E7
600C :4915A20120FAFA,354
600D :0C60F0F0200C6,346
600E :798A7AB780782,389
600F :356145782F0C789,439
6010 :00E2200C6C80B9,458
6011 :7100C20C305C0B9,422
6012 :08F0A000A52930,422
6013 :000A051C951B85,354
6014 :10A57305720C6A,289
6015 :00E20C3FFC820D,524
6016 :8A2C10F00A57320,433
6017 :1A20C20C6C0B0A,3CC
6018 :17A0F0B9956F0DFA,5E7
6019 :120F0F0C67A200C,34F
6020 :16C00C305C0B9A,4B2
6021 :5820C3FF20F6A9,439
6022 :167A0A720A9856F,43E
6023 :00E20C3FF20F6A9,439
6024 :1E3FF4C836A4C76A,469
6025 :A000A7AB780782,389
```

Figure 1. Spectrum.

```
5 REM SPECTRUM 48K
10 REM Hex Code Loader
15 CLEIPRINT
20 POKE 23450,B:CLS:PRINT
30 INPUT "Start Address":A$
40 IF A>=1135 THEN 80 TO 200
50 IF A<=8000 THEN 80 TO 20
60 PRINT
```

Figure 2. Spectrum.

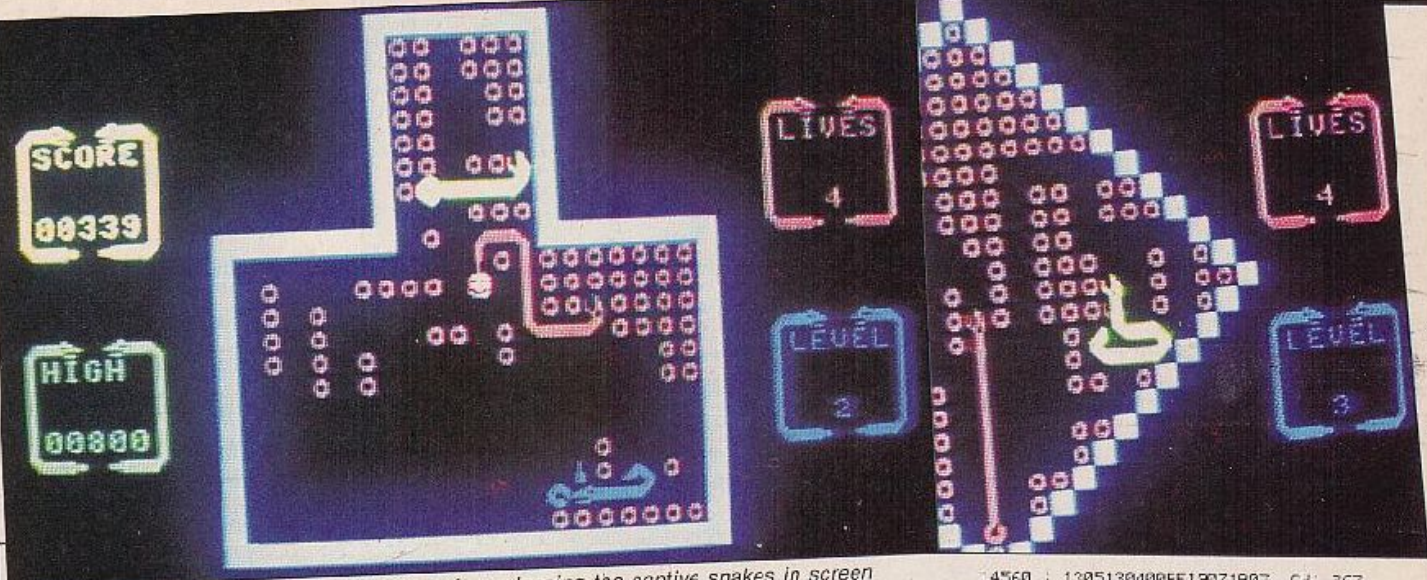
```
60000 :ED15ED0C37ECCD15,4C7
60001 :F0C03A6CCD66ECCD,631
60002 :150ED0C37ECCD15,4C7
60003 :1B0ED0C37ECCD15,4C7
60004 :150ED0C37ECCD15,4C7
60005 :150ED0C37ECCD15,4C7
60006 :150ED0C37ECCD15,4C7
60007 :150ED0C37ECCD15,4C7
60008 :150ED0C37ECCD15,4C7
60009 :150ED0C37ECCD15,4C7
60010 :150ED0C37ECCD15,4C7
60011 :150ED0C37ECCD15,4C7
60012 :150ED0C37ECCD15,4C7
60013 :150ED0C37ECCD15,4C7
60014 :150ED0C37ECCD15,4C7
60015 :150ED0C37ECCD15,4C7
60016 :150ED0C37ECCD15,4C7
60017 :150ED0C37ECCD15,4C7
60018 :150ED0C37ECCD15,4C7
60019 :150ED0C37ECCD15,4C7
60020 :150ED0C37ECCD15,4C7
```

```
70 PRINT "A":1
80 INPUT "B":B,C$
90 IF LEN(B$)<16 THEN 30
100 T=0
110 FOR N=0 TO 7
120 Y$=MID$(B$,2*N+1,1):GOSUB 300
130 IF E=1 THEN 260
140 Y$=MID$(B$,2*N+2,1):GOSUB 300
150 IF E=1 THEN 260
160 B=EVAL("&"+MID$(B$,2*N+1,2))
170 Y$=A+B:Y$=T+Y$
180 NEXT N
190 FOR M=1 TO LEN(C$)
200 X$=MID$(C$,M,1):GOSUB 300
210 IF E=1 THEN A=A+1:GOTO 240
220 NEXT M
230 IF T=EVAL("&"+C$) THEN 50
240 PRINT "CHECKSUM ERROR!"
250 A=A+1:GOTO 30
260 PRINT "TYPING ERROR!"
270 A=A+1:GOTO 30
280 A=A+1:GOTO 30
290 A=A+1:GOTO 30
300 E=0:IF ASC(X$)<48 THEN E=1:RETURN
310 IF ASC(X$)<58 THEN E=1:RETURN
320 IF ASC(X$)<65 THEN E=1:RETURN
330 IF ASC(X$)>71 THEN E=1
340 RETURN
```

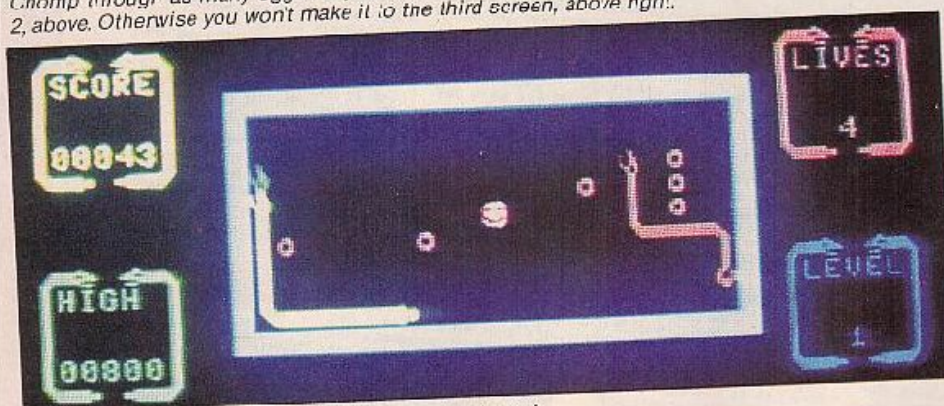
```
80 INPUT "B":B,C$
90 IF LEN(B$)<20 THEN 80 TO 200
100 LET T=256*INT(A/256)
110 FOR N=0 TO 7
120 LET Y$=MID$(B$,2*N+1,2)
130 LET Y$=T+Y$
140 LET Y$=T+Y$
150 LET Y$=T+Y$
160 LET Y$=T+Y$
170 LET Y$=T+Y$
180 LET Y$=T+Y$
190 LET Y$=T+Y$
200 LET Y$=T+Y$
210 LET Y$=T+Y$
220 NEXT N
230 IF T=0 THEN PRINT "B":GOTO 50
240 PRINT "CHECKSUM ERROR!"
250 LET A=A+1:GOTO 30
260 PRINT "TYPING ERROR!"
270 LET A=A+1:GOTO 30
280 PRINT "downloading CODE 60000,1136"
290 POKE 23450,B:STOP
300 LET A=A+1:GOTO 30
310 IF X$ OR X$>15 THEN LET E=1
320 RETURN
```

```
6000 :09C00D0056B0A0C,2C1
6001 :0C6A57C67D0A7E,3DC
6002 :16B0A7D0A96A0A,446
6003 :0020F1F9B2901F,3C0
6004 :08A995A20920F4FF,408
6005 :9819900130A67DA4,348
6006 :7C6A4A4F720A45,213
6007 :4144A9A4720A45,213
6008 :4E550D312020E52,193
6009 :70207053A5547042,1FC
600A :4543A4956A50B3,1F2
600B :20207053A5547042,1FC
600C :6175A420E2617A63,186
600D :90D3520E2617A63,186
600E :542054A52617A63,186
600F :4943A545A52617A63,186
6010 :20E2617A63186,186
6011 :2828553452617A63,186
6012 :52A2C20A7265A4F,1F5
6013 :52A5A5552A265A,254
6014 :4F78A45A552A265A,254
6015 :0053A55A552A265A,254
6016 :4553A55A552A265A,254
6017 :75A420E2617A63,186
6018 :4120207352617A63,186
6019 :16175A420E2617A63,186
6020 :13020A26175A420E,209
6021 :4320A26175A420E,209
6022 :16175A420E2617A63,186
6023 :1320A26175A420E,209
6024 :16175A420E2617A63,186
6025 :1320A26175A420E,209
6026 :16175A420E2617A63,186
6027 :1320A26175A420E,209
6028 :16175A420E2617A63,186
6029 :1320A26175A420E,209
6030 :16175A420E2617A63,186
6031 :1320A26175A420E,209
6032 :16175A420E2617A63,186
6033 :1320A26175A420E,209
6034 :16175A420E2617A63,186
6035 :1320A26175A420E,209
6036 :16175A420E2617A63,186
6037 :1320A26175A420E,209
6038 :16175A420E2617A63,186
6039 :1320A26175A420E,209
6040 :16175A420E2617A63,186
```





Chomp through as many eggs as you can before releasing the captive snakes in screen 2, above. Otherwise you won't make it to the third screen, above right.



The opening screen above — one down, nine to go!

#### Listing 1. The hex loader.

```
10 PRINT "LO"          SNAKES 64 H
EX LOADER"
20 INPUT "START ADDRESS";SA
25 PRINT
30 FORAD=SA TO 20092 STEP 10
40 CH=A:PRINTAD:INPUT "H";H$
43 IF H$="S" THEN L70
45 IF LEN(H$) < 2 THEN A40
50 FOR I=0 TO 9
60 X=ASC(MID$(H$,I*2+1,1))
70 Y=ASC(MID$(H$,I*2+2,1))
80 X=X-48:IF X>9 THEN X=X-7
90 Y=Y-48:IF Y>9 THEN Y=Y-7
100 PCKEAD=I,X*16+Y:CH=CH-X*16+Y
110 NEXT I
120 PRINT TAB(29);"DCH":INPUT C
130 IF C=CH THEN L60
140 PRINT "CHECKSUM ERROR! TRY A
    GRIN."
150 GOTO 40
160 NEXT AD
170 INPUT "Q FILE NAME";F$
180 FOR I=1 TO LEN(F$):POKE 39999+I,
    ASC(MID$(F$,I,1)):NEXT
190 POKE 700,1:POKE 781,1:POKE 782,
    1
200 SYS 65466
210 POKE 780,LEN(F$):POKE 701,64
220 POKE 782,156:SYS 65466
230 POKE 252,136:POKE 253,54:POKE 7
    30,252
240 POKE 781,0:POKE 782,82:SYS 6543
    6
```

#### Listing 2. The code.

```
13960 EDED0200209BA5000000 CH: 328
13970 08422BA5008100008100 CH: 652
13980 000000000F0003000300 CH: 117
13990 33000300033003000000 CH: 204
14000 0000FFFFFFFFFF3FFF001D CH: 1367
14010 FFFFFFF300FFFF000000 CH: 1333
14020 00000100020304050607 CH: 28
14030 1A0B1B0E1BEC1B0D1A0D CH: 193
```

```
14040 1F0C1A0B1B0E1B0C1B0D CH: 192
14050 1A0D1A0C0A0FA0A0A0A0 CH: 381
14060 0E0C0E0D0D0D0D0C0D0E CH: 128
14070 0E0B0E0C0E0D0D0D0C0E CH: 129
14080 00FF0C120D120D130D14 CH: 381
14090 0C140C130C120D120D13 CH: 156
14100 0D140C140C1300FF1304 CH: 374
14110 14041405140613061305 CH: 124
14120 13041404140514061305 CH: 123
14130 13050404140514061305 CH: 414
14140 1B141414141414141414 CH: 227
14150 1B131414141414141414 CH: 439
14160 0B0B0C0E0C0C0C0C0C0D CH: 118
14170 0B0C0B0C0C0C0C0C0C0D CH: 117
14180 0B0C0B0C0C0C0C0C0C0D CH: 349
14190 14051406130613051304 CH: 123
14200 14041405140613061305 CH: 124
14210 00FF1B0E1C0B1C0C1C0D CH: 413
14220 1B0D1B0C1B0B1C0B1C0C CH: 196
14230 1C0D1B0D1B0C00FF1312 CH: 412
14240 14121413141414141414 CH: 194
14250 13121412141314141414 CH: 193
14260 131300FF0E050F350F05 CH: 353
14270 0F070E070E050E350F05 CH: 102
14280 0F050F070E070E350F05 CH: 339
14290 19051A051A051A071907 CH: 158
14300 190619051A051A061907 CH: 157
14310 1907190600FF0E110F11 CH: 381
14320 0F120F130E130E120E11 CH: 163
14330 0F110F120F130E130E12 CH: 164
14340 00FF19111A111A121913 CH: 429
14350 1913191219111A111A12 CH: 216
14360 1A131913191200FF0E05 CH: 403
14370 0C050C060C070B070B05 CH: 89
14380 0B050C050C060C070B07 CH: 88
14390 0B0600FF100B110B110C CH: 356
14400 110D100D100C100E110B CH: 142
14410 110C110D100D100C00FF CH: 371
14420 170B180B180C180D170D CH: 178
14430 170C170B180B180C180D CH: 177
14440 170D170C00FF0E110C11 CH: 383
14450 0C120C130E130E120B11 CH: 148
14460 0A110C120C130A130A17 CH: 149
14470 00FF0D0C0C0E0B100912 CH: 361
14480 0A120914091409140B16 CH: 145
14490 0B150B160B160B160914 CH: 149
14500 0C1409140B120B120B10 CH: 141
14510 0C0E0D0C0D070E070E08 CH: 114
14520 0E090D050D060D070E07 CH: 107
14530 0E0B0E090D090D0800FF CH: 343
14540 13031403140414051305 CH: 118
14550 13041303140314041405 CH: 117
```

```
14560 1305130400FF19071A07 CH: 367
14570 1A081A0519E919081907 CH: 168
14580 1A071A021A0319031908 CH: 169
14590 00FF190F1A0F1A101A11 CH: 421
14600 15111910190F1A0F1A10 CH: 206
14610 1F111911191000FF1313 CH: 419
14620 14131414141513151314 CH: 199
14630 13131413141414151315 CH: 198
14640 131400FF0D0F0E0F0E10 CH: 381
14650 0E110D110D100D0F0E0F CH: 147
14660 0E100E110D110D1000FF CH: 375
14670 0B030C030C040C050305 CH: 78
14680 0B040B030C030C040C05 CH: 77
14690 0B050B04030F11031403 CH: 331
14700 14041405130513041303 CH: 118
14710 14031404140513051304 CH: 119
14720 00FF1B031C031C041C05 CH: 381
14730 1A051B041B031C031C04 CH: 156
14740 1C051B051B0400FF030E CH: 373
14750 0B0B0C0C0C0D0B0D030C CH: 119
14760 0B0B0C0B0C0C0C0D030D CH: 118
14770 0B0C03FF1B0B1C0B1C0C CH: 395
14780 1C0D1B0D1B0C1B0B1C0B CH: 197
14790 1C0C1C0D1B0D1B0C00FF CH: 415
14800 0B130C130C140C150B15 CH: 158
14810 0B140B130C130C140C15 CH: 157
14820 0B150B14030F13131413 CH: 395
14830 14141415131513141313 CH: 198
14840 14131414141513151314 CH: 199
14850 00FF1B131C131C141C15 CH: 445
14860 1B151B141B131C131C14 CH: 236
14870 1C151B151B1400FF0842 CH: 594
14880 5311130D090909090909 CH: 1222
14890 9D090909A14E44453253 CH: 1072
14900 20204755535441465353 CH: 680
14910 4F4E0011111D1D1C45 CH: 398
14920 41542354484520454747 CH: 649
14930 53204259205341535349 CH: 686
14940 4E47234F564552205448 CH: 685
14950 45422C0D1D131D485554 CH: 325
14960 2041554F494420544945 CH: 660
14970 2044454144455205344E CH: 660
14980 414B45332E205748454E CH: 676
14990 0D1D1D1D1D4848484848 CH: 508
15000 415245204E4F20454747 CH: 648
15010 53204C454542C205344F CH: 653
15020 552043414E031D1D1D45 CH: 496
15030 41542054484520534E41 CH: 664
15040 4B45332E20424F4E5553 CH: 686
15050 204C4946452045564552 CH: 658
15060 59301D1D1D3120303020 CH: 414
15070 504F494E4532E1111111 CH: 574
15080 9D090909090946312020 CH: 1120
15090 53544152542047414045 CH: 712
15100 0D111D1D1D1D1D1D1D CH: 262
15110 1D1D4633202047414045 CH: 525
15120 2033584545443A0D111D CH: 518
15130 1D1D1D1D1D1D1D1D1D46 CH: 331
15140 3520204D55534943204F CH: 613
15150 4E2F4F46460D111B1D11 CH: 549
15160 1D1D1D1D1D1D1D1D5055 CH: 397
15170 54204A4F59535449424E CH: 740
15180 20494E20504F52542032 CH: 622
15190 9E534C4F5720203E4D45 CH: 851
15200 4449554D9E4641535420 CH: 795
15210 2040472D9D1113140919 CH: 368
15220 1149484545454545D919 CH: 969
15230 9D115420205-9D5D9190 CH: 1034
15240 11542020549D9D5D9111 CH: 894
15250 5454545446444E1D5E44 CH: 729
15260 471194511945119451 CH: 800
15270 119D45119D9D9D5D9190 CH: 1202
15280 9D4944421D4844469F9D CH: 911
15290 9D9D9D9D9D914591D45 CH: 1370
15300 919D45913D459E53434F CH: 1129
15310 5E459D9D9D9D9D111111 CH: 987
15320 1E484947489D9D9D9D11 CH: 263
15330 11111C4C495645539D9D CH: 763
15340 9D9D9D11111111F4C455 CH: 784
```



SNAKES is a machine-code program for the CBM-64 and joystick. When you run it, you'll first be shown the title page and hear some music. After you have chosen your game speed, the game starts. On each screen there will be an area filled with eggs, and also a varying number of snakes. Only one of these, the red one, can eat eggs. This means that the other snakes are trapped until you or the red one let them out.

The object of the game is to eat all the eggs without being killed. When there are no eggs left, you can eat the snakes by crossing their tails, but you must still avoid their heads. And when the snakes are gone, the next screen is waiting for you. There are nine different screens available.

If you want to play the game, first type in the hex loader in listing 1. Run it, and input the start address. You can now enter the code, 10 bytes — no spaces — and a checksum each time. If there are any checksum errors, the program will

# SNAKES

tell you. You can save the code to tape at any time by typing S. When you have entered the code and saved it, you can hopefully run the program with

SYS 16384

If you think it's too much work to type the code in, I can supply you with a copy of the program on a cassette. Please send £3, name and address to Anders Gustafsson, Krokelyckan 62, 421 70 V. Frolunda, Sweden.

Nine screens of snakes coiled up inside your CBM-64. Serpents and eggs are on this unusual menu from Anders Gustafsson — eat them before they lunch you.

15350	454C9D9D0D111119D00	CH: 824	16150	A5A41A9A41A9A41A69	CH: 1178	16940	E245A20188D0FDCAD3FA	CH: 1715	
15360	43414A0000000004341	CH: 346	16160	A41A6AA41A6AA41A5AA	CH: 1036	16950	ADD98C9A0D0E320ED43	CH: 1495	
15370	4A000000000004341A00	CH: 288	16170	A5AA41A46A41A46A41A	CH: 826	16960	EED580E0E080AD0E3C9	CH: 1891	
15380	000000004341A000000	CH: 222	16180	46A41A41A41A41A41540	CH: 829	16970	0FD012A9018DDE0A02F	CH: 1117	
15390	00004341A0000000000	CH: 24	16190	540000550001FAA006AA	CH: 588	16980	4238E920100CA931802F	CH: 763	
15400	43414A0000000004341	CH: 346	16200	9006AA901A96F41F36AA	CH: 1144	16990	0E8D1A81AC1A8120834C	CH: 858	
15410	4A00000000004341A00	CH: 288	16210	A41A41A41A41A41A41A	CH: 791	17000	424CB041A9122002FA9	CH: 1236	
15420	000000004341A000000	CH: 222	16220	A41A41A41A41A41A41A	CH: 955	17010	AD1A8118691A8D1A81C9	CH: 980	
15430	00004341A0000000000	CH: 214	16230	A41A41A41A41A41A41A	CH: 1159	17020	DEDEED6A004C0D0F088	CH: 1712	
15440	00000FFFF0F0001813	CH: 588	16240	A41A41A41A41A41A41A	CH: 791	17030	DEFA60847F900835FEA0	CH: 1649	
15450	18183C3C3C3C3C3C3C3C	CH: 780	16250	A41A41A41A41A41A41A	CH: 595	17040	8E84F8C884FFA030B1F7	CH: 1679	
15460	FFFF00003C3C3C3C3C3C	CH: 780	16260	A41A41A41A41A41A41A	CH: 845	17050	91FEC8C01AD0F7358FAD	CH: 1721	
15470	18180000FFFF0000000	CH: 1068	16270	901A5A0105N401F6A40	CH: 780	17060	1E81858EC9800342380	CH: 1129	
15480	3C3C3C3C3C3C3C3C3C3C	CH: 480	16280	A99001A99001A9A001A	CH: 685	17070	4608E1781AC16313320	CH: 899	
15490	83070F1F3E3C3C3C3C0E0	CH: 594	16290	A4001A99001A99001A6A	CH: 686	17080	CF48B1FE290F8D9602AD	CH: 1211	
15500	F0F87C3C3C3C3C3C3C3C	CH: 1760	16300	401A6A401A5A991A5A9A	CH: 788	17090	1FD4CF8A8008C00E322	CH: 1506	
15510	00003C3C1F0F37030000	CH: 178	16310	1A46A41A46A415415400	CH: 690	17100	C5B8A02B4C0843D1381	CH: 1083	
15520	3C7E8F07E7F7F7E333C7A	CH: 1430	16320	1555541A9A41A9A41A	CH: 936	17110	858EAD1381858F190338	CH: 1103	
15530	F7E7E7F7E3C3C3C3F7FE7	CH: 1822	16330	AAA41A55541A42001A40	CH: 709	17120	0F8E858E99008E58F85	CH: 1376	
15540	E3FD7E3C3C7E7E7E7E7E7	CH: 1308	16340	001035001A9901A9900	CH: 301	17130	EF4C0047D1881358FAD	CH: 1069	
15550	5E3C00E0F83E7FC037000	CH: 1259	16350	1A55001A40001A4001A	CH: 317	17140	1981858E4C0843AD1881	CH: 906	
15560	608E7B39391918030007	CH: 519	16360	40001A40001A4001A55	CH: 355	17150	858FAD1931858E4C0D42	CH: 1241	
15570	1F7CFF033E001013989C	CH: 820	16370	541A9A41A9A41A9A41A	CH: 1164	17160	AD178118558F8A8D1681	CH: 1087	
15580	9CDE763E7FFF99FF9FF9	CH: 1783	16380	155554000A988F0C1936	CH: 1103	17170	18658A88323CA48B1FE	CH: 1228	
15590	C37E7E7E7E7E7E7E7E7E7	CH: 1755	16390	25FAD9D485FFA00034FE	CH: 1701	17180	290F85F8D08502F00839	CH: 1233	
15600	FFFFFFFFFFF7FF0003C	CH: 2100	16400	11FC91FEC8C013D0F7A9	CH: 1869	17190	00F02C29A0F32A0CC142	CH: 1114	
15610	7E66667E3C003D11210	CH: 767	16410	018502858A903553CA9	CH: 1019	17200	AD178118558F8A8D1681	CH: 1087	
15620	000000F310001151000	CH: 390	16420	3D85D78A9F780143389	CH: 1060	17210	18658A88120CA48B1FE	CH: 1196	
15630	04108721104736031F15	CH: 341	16430	518D1503A50123F83501	CH: 838	17220	C995D0F204E434C5743	CH: 980	
15640	108721104736031F1510	CH: 353	16440	F00834FC838085F019D0	CH: 1524	17230	CEDA88D003CEDB8060A9	CH: 1581	
15650	7707308721103803100C	CH: 543	16450	65FAA20CB1FE91F0C8D0	CH: 1700	17240	FE85FE929085F7F00C2D	CH: 1665	
15660	0710470508872108A225	CH: 482	16460	F9E6FDE6FFC0D0F24501	CH: 2035	17250	F838891FEC8C8C001A	CH: 1743	
15670	10470608872108332A10	CH: 491	16470	0904850158A00094CA9	CH: 948	17260	D0F3A08E8D188118611A	CH: 1205	
15680	47060887210842251061	CH: 573	16480	3485FD8505FE9A93C85	CH: 1436	17270	81D1681A8A58F8D01931	CH: 1192	
15690	08103E2A10473603A51F	CH: 425	16490	FF81FE91F03830000F7	CH: 2106	17280	185D15818D1781A1820	CH: 802	
15700	10A22510E90730872110	CH: 703	16500	A9A185FC9A3685FD000A	CH: 1484	17290	F0FAD1881C900F00EC9	CH: 1477	
15710	61081047061047060801	CH: 508	16510	84F8A9D085F81FCC9F7	CH: 2036	17300	01F005A95804CAF43A9AE	CH: 1066	
15720	1210000008EF13031F15	CH: 360	16520	F0C291FEC8C02D0A3A0	CH: 1689	17310	40CF43AD1981C91F005	CH: 1092	
15730	10300410872110470608	CH: 353	16530	F88CF3073C0D07C08CF9	CH: 1635	17320	A9514CAF43A94F20D2FF	CH: 1313	
15740	1F15108721104706080F	CH: 368	16540	07C88CF87C88CF87C8F	CH: 1402	17330	AC1481AE15811820F0FF	CH: 1196	
15750	15107707308721108905	CH: 560	16550	8CF0C7A9418D2F42B993	CH: 1203	17340	AD1281CD1681D003402A	CH: 999	
15760	100C0710470538311C10	CH: 228	16560	30D3FA2085A010300F0	CH: 1139	17350	44AD1381CD1791000340	CH: 1093	
15770	F804081E1068851110E4	CH: 726	16570	FFA20A001EA933208748	CH: 1121	17360	3144AE1481AC1581EC12	CH: 1016	
15780	0408311C08872110ED05	CH: 523	16580	A238A01EA99320874820	CH: 955	17370	B1F022B010CC17B18005	CH: 1132	
15790	103E2A1040408A22508	CH: 525	16590	6B41A21080A020FD0A02	CH: 1031	17380	A9464C6344A9464C6344	CH: 967	
15800	8721109080586311C10A5	CH: 607	16600	E8A8A520F0408A200006	CH: 1269	17390	ERC0178130097A74C683	CH: 1186	
15810	1F102303108721108505	CH: 422	16610	20FD40A298A00420FD40	CH: 1176	17400	44A9484C6344A9484C634	CH: 1136	
15820	10A22510F4038D11210	CH: 729	16620	R270A00220FD40A248A0	CH: 1179	17410	B010EC1681B006A94640	CH: 1076	
15830	000008EF13081F151030	CH: 390	16630	0020FD404C2C4186FD84	CH: 1053	17420	6344A9A9474C6344EE16	CH: 1142	
15840	04108721104706081F15	CH: 341	16640	FEA9D085FFA00031FEA9	CH: 1780	17430	818006A949463444A9A9	CH: 1195	
15850	108721104706081F1510	CH: 353	16650	E88A91FEC900D005A220	CH: 1377	17440	484C6344AD1381CD1781	CH: 993	
15860	7707308721108905100C	CH: 543	16660	8E100C5FDD003AE10D0	CH: 1430	17450	F012A9454C6344AD1281	CH: 1055	
15870	0710470508872108A225	CH: 482	16670	000F0010A200C000F0	CH: 1416	17460	CD1681F085A9444C6344	CH: 1081	
15880	10470608872108332A10	CH: 491	16680	40B741EA99008DFE7F20	CH: 1105	17470	AE1481AC1581EC1681F0	CH: 1272	
15890	47060887210842251061	CH: 573	16690	A043AD00DCC06F055A5	CH: 1437	17480	0D8006A94C6344A9A9	CH: 1086	
15900	08103E2A10470608A51F	CH: 425	16700	C5C904F04F035F0064C	CH: 1249	17490	4A4C6344CC1781B006A9	CH: 1024	
15910	10A22510E90730872110	CH: 703	16710	2C41E8E8A8DDE7FC900	CH: 1566	17500	404C6344CC00A4D0020F	CH: 1220	
15920	61081047061047060807	CH: 434	16720	10DFFA99FF8DF57FAD2F	CH: 1831	17510	A93285FE98185F8A000	CH: 1404	
15930	2110000008A225083E2A	CH: 368	16730	4238E920100CA931802F	CH: 827	17520	B1FEC0081D009C8B1FE	CH: 1613	
15940	10610808872108A22510	CH: 528	16740	42206A414C314A213A0	CH: 80	17530	88CD0181F038C8C0A18	CH: 1383	
15950	8F0A103E2A1077070887	CH: 558	16750	1A1820F0FAD2F42C941	CH: 1129	17540	14E0000818E01311820	CH: 1103	
15960	2108A225106180887211	CH: 537	16760	10020156C021D002A05D	CH: 1153	17550	F0FFFE0081A00181EC04	CH: 1335	
15970	083E2A1000708872108	CH: 331	16770	C9010002A054A207F933	CH: 1059	17560	0100CB005A9404C854	CH: 1120	
15980	R225105103103E2A1007	CH: 623	16780	20B71500A20081500A9E	CH: 1059	17570	A9424FB544C08381B005	CH: 1077	
15990	0A9A772108A225106108	CH: 518	16790	10808ED1808ED2008ED3	CH: 1648	17580	A9414CB544A943CEA28	CH: 1295	
16000	088721083E2A10470608	CH: 389	16800	080ED480E8ED5908ED0	CH: 1689	17590	D2FA90285FE98185FF	CH: 1708	
16010	8721084225106108103E	CH: 574	16810	08A2048ED680A9320D2	CH: 1306	17600	A000B1FECDF0000093C	CH: 1595	
16020	2A13473603A51F10A225	CH: 554	16820	FFA91220D3FFA9300D02	CH: 1504	17610	B1FEC8C0F30F01A0C0C	CH: 1821	
16030	10E70730872110610810	CH: 533	16830	FFA00084F0A98205FF01	CH: 1631	17620	C018D0E8AEFF00ACFE80	CH: 1769	
16040	47051030031030042005	CH: 312	16840	FFC8C0D0D0F9AED580C	CH: 2037	17630	1820F8FFA99020DFE89	CH: 1530	
16050	48414C4C234F45294641	CH: 637	16850	10062065494C1342AD0	CH: 1061	17640	5620D2FFA90085FEA931	CH: 1437	
16060	4D451C9003550001A950	CH: 518	16860	6620949494C1C42CA006	CH: 850	17650	83FFA0001FE91F7C8C0	CH: 1763	
16070	06A9A41A9A41A95901A	CH: 1045	16870	2051A94C1C42C8D03620	CH: 805	17660	1A20F760AED080ACD780	CH: 1610	
16080	40431A4001A990006A94	CH: 558	16880	FA4A4C1C42C8D03620D	CH: 1163	17670	8ED080C0C803820CA85	CH: 1341	
16090	0005A93001A9A4006A99	CH: 660	16890	4A4C1C42C8D03620A441	CH: 774	17680	B1FE290FC90A8203860	CH: 1092	
16100	0013903005A40001A401	CH: 566	16900	4C1C42C8D03620A441C	CH: 935	17690	AD00DC49FF290FC9010	CH: 1187	
16110	01A40656A41A9A41A9A1	CH: 977	16910	1042C8D03620094E4C1C	CH: 733	17700	065CDD804C4F45C902D0	CH: 1192	
16120	9005A9A4003500001501	CH: 490	16920	4220074F200A503EAD02	CH: 670				
16130	541A41A41A41A41A41A	CH: 929	16930	4E2CE8D920045590340	CH: 1092				
16140	1A91A1A91A1A1A9A41A	CH: 1851							

(continued on next page)







# WIN AN ATARI 130XE

*Competition*

## RESULTS

or Carnival Massacre?

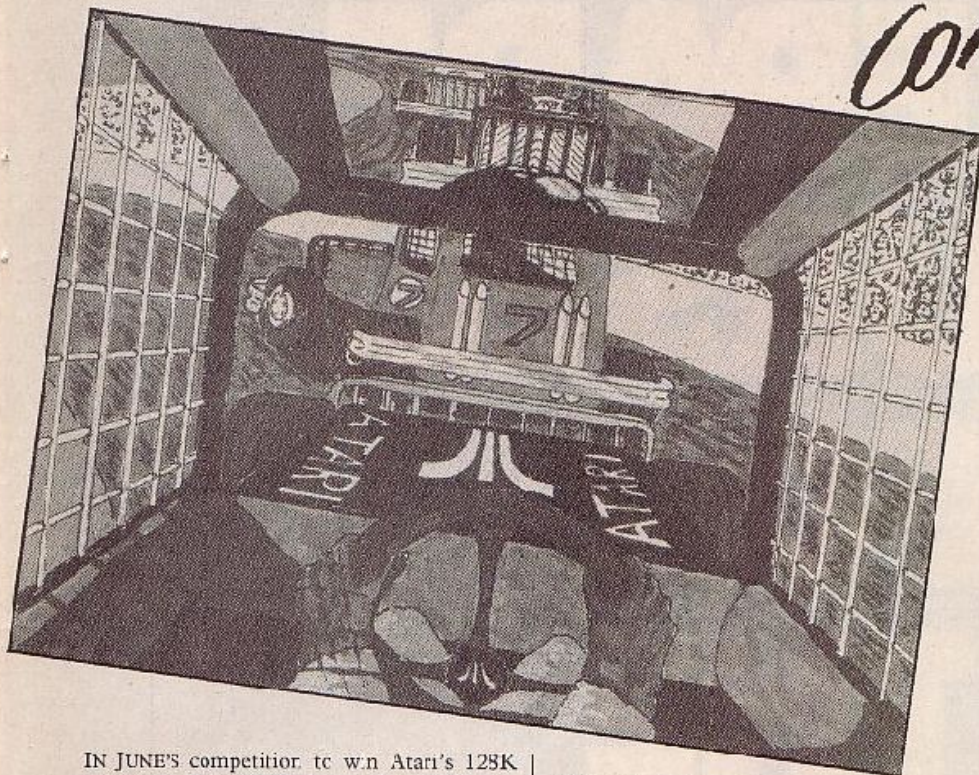
When it came to describing your ideal game for 128K, most of the entries were uninspired. In fact the bank-switched 64K is less of an advantage than you might think. It is unlikely that many software houses will write games which fully exploit the Atari's 128K. If they do use the extra memory it will be to store text and screen data rather than the game code itself.

This was the direction that most of the entries took: they wanted to see adventures with more locations and more graphics, and platform games with yet more screens. M. Topping suggested a follow-up to Elite with an adventure game element, in which you leave your ship and explore space stations. N. Sraith thought that 128K would be sufficient to stage a text and graphics version of Lord of the Rings.

Rather different was S. Patel's idea for a game called Father. In this, a boy has lost his father and has to find him by asking the computer questions about three possible candidates. The program needs 128K since it chooses the three men from a database of 100 characters, on each of whom there is an extensive dossier. J. Stone's Battle of Chevrolets was equally novel — a stock car racing game where instead of dodging other cars you have to collide with them.

All those mentioned above receive a runners-up prize, along with M. Simon, K. Etheridge, R. Drukker, C. Pearson, A. Bennet, A. Ahmad. We awarded the first prize to J. Davison, 44 West St, Great Garsden, Sandy, Beds. SG19 3AU. His ideal game, Zone, is not especially original but it is conceived on an epic scale. You have to retrieve a stolen reactor from the Zone.

The reactor has been broken up and its parts are scattered over a vast network of underground passages and caverns, with unpeopled, different levels and hundreds of creatures.



IN JUNE'S competition to win Atari's 128K computer, the 130XE, you were asked first to write a plot for a game which could take advantage of the Atari's extra memory, then to name the five worst programs you ever paid money for. As a prize for the runners-up we offered copies of Firebird's Don't Buy This tape, a compilation of the five worst programs ever sent in for evaluation.

When we set the competition we thought we would be able to draw up a definitive list of the great software disasters of our time. As it turned out, there was almost no consensus on what is good and what is bad. No two entries agreed on more than one title. Some people even nominated such chart-toppers as Ghostbusters, Harrier Attack, and Jeff Minter's Gridrunner — in our book, one of the all-time greats. The moral seems to be that, as far as games are concerned, one man's treat is another man's poison, or as the Romans put it: De gustibus non disputandum est.

If there was one game that qualified for the title of worst-ever it was Legend's The Great Space Race — probably because it was so overhyped and, at £14, over-priced. Among the other games that received at least three nominations apiece were: Alcatraz Harry, Blue Thunder, Flight Path 737, Mad Martha, Airwolf, Micro Olympics, Johnny Reb, Gulpman, Winged Avengers, Pedro, Zip Zap, JCB Digger, Schizoids, Ah Diddums.

You may be surprised to learn that the last three came from Imagine, a company responsible for some of the best games of 1983/84. But they date from the time when Imagine's production line was churning out programs at a rate of almost one a week.

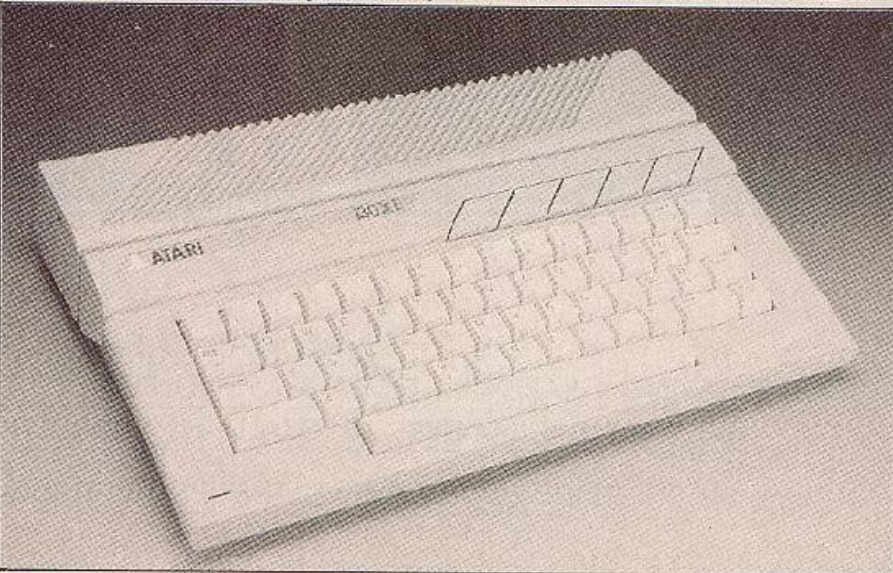
No doubt some of these titles do not deserve their place on the list. People are often unduly severe on a game if it has been hyped up and

*J Stone's Battle of the Chevrolets.*

then falls short of expectations. It is probably also unfair to compare games written in 1982 with today's software. Winged Avengers and Gulpman, for example, were produced when the Spectrum was in its infancy.

Admittedly, Winged Avengers — a monochrome shoot-em-up from a long-forgotten company called Workforce — was truly bad; but, for its time, Gulpman was one of the best Pacman games around. It is surprising nobody nominated Specman, Jega's version of Pacman on the Spectrum.

There were also scores of games that received only one nomination. Most of them have long since passed out of circulation. Who remembers Cosmic Piracy, Fred's Fan Factory, Astro Blast,





# **PREPARE YOURSELF FOR THE HIGHWAY ENCOUNTER.**



APPROACHING FAST...

BRAIN-BLOWING GRAPHICS...MEGA-BLASTING POWER...FAST-ACTION PLAYABILITY...  
'HIGHWAY ENCOUNTER'...A TOTALLY NEW DIRECTION FROM VORTEX.

ONCE YOU'RE ON IT...THERE'S NO TURNING BACK.

HIGHWAY ENCOUNTER FOR SPECTRUM 48K · £7.95 ·

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



# I could do that...

Never mind the text books — bolt-on programming is here to stay according to John Ransley, and here's your chance to prove that the unstructured approach can be effective, if not always particularly elegant, and earn yourself this month's First Bytes £15 program prize.

We want you to devise a short program that combines a loop and several uses of Gotos and/or Gosubs; the targets of which can be simple one-line statements rather than elaborate modules. Your purpose should be simply to effectively demonstrate some of the principles touched upon in John Ransley's article rather than produce a spectacular screen show.

In July we set readers the task of creating an animated display by Poking to screen memory. The £15 prize goes to Martin Wright, 2 Rye Lane, Halifax, HX2 0QD. Apart from demonstrating the complexities of the Spectrum's display file, the program also shows that Poking to the screen is usually slower than printing.

```
10 DATA 99, 99, 99, 99, 99, 99, 99, 99, 99, 99
20 FOR I=0 TO 99
30 FOR J=0 TO 99
40 FOR K=0 TO 99
50 FOR L=0 TO 99
60 FOR M=0 TO 99
70 FOR N=0 TO 99
80 FOR O=0 TO 99
90 FOR P=0 TO 99
100 FOR Q=0 TO 99
110 NEXT Q
120 NEXT P
130 NEXT O
140 NEXT N
150 NEXT M
160 NEXT L
170 NEXT K
180 NEXT J
190 NEXT I
200 GOTO 10
```

# BEGINNERS

## first bytes

Starting out in home computing? First Bytes is for you. Just write to

Your Computer with any hardware or software problems, no matter how small or simple.

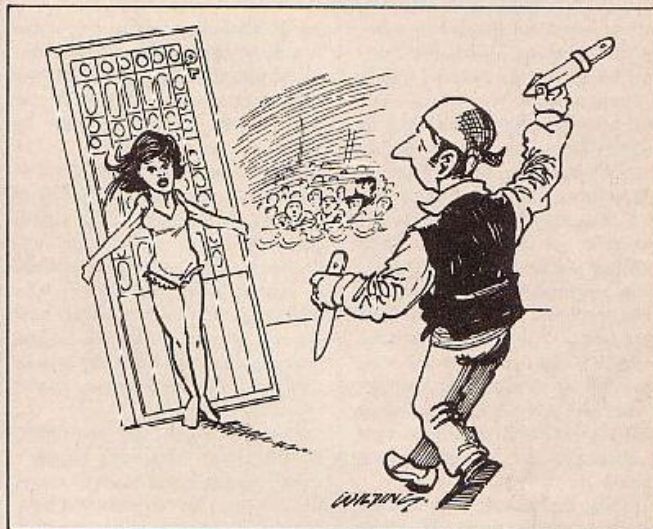
## A bluffers' guide to micros

OF COURSE, there is always a danger that you will fall prey to the belief which prevails amongst outsiders to the computer fraternity that there is actually some reason for having a home micro. The half-hearted justification for originally buying a micro range from "it's important to keep abreast of new technology" to "it's important for the kids — computers are so important in education now!"

These original excuses might be followed by a desire to make the micro of some use in the real world — hence the plethora of books which purport to show you how you can calculate the amount of wallpaper needed for the living room, shopping lists, telephone directories, television directories(!), freezer stock lists, calendars, bank statements, measurement conversion programs, car maintenance file, gas and electricity bills, VAT.

No-one in their right mind believes that switching a computer on, plugging it into the telly, loading a cassette or a disc and then accessing a file is any quicker than doing the calculation on the back of a bubblegum packet in the traditional way.

It just looks more efficient, and the hopelessly crazed user probably derives some tactile satisfaction from the use of the micro. Some people may regard this as unduly cynical — and as software for household book-keeping becomes more sensible and user-friendly perhaps people really will start filing bills on



their home computer instead of in the wastepaper basket. But it is still camouflage, designed to disguise the fact that the home micro dwells in a realm of sublime abstraction.

The other good piece of camouflage is word processing. Rather like food processing, this is something that enables you to combine formerly discrete and interesting items into a bland tasteless mush. Everyone knows that word-processing makes it really easy to change paragraphs around in what you have written. You can just play with the text on the screen. You just scroll through the text, mark the paragraph you want to shift, scroll back, mark where you want it shifted to and give the order to shift it. Then you check through the text and find that because you forgot to mark the end of the paragraph you wanted copied nothing happens.

So you go back and mark the paragraph properly. The text is moved successfully. But don't forget to scroll back through the text and delete the marks relating to moving the paragraph about or the computer will get very confused. So far so good. Now all you have to do is print it out — that is, set the parameters on the printer, make sure you cleared the buffer if you've just been printing something out, maybe tell it to number the pages, and untangle the printout when it jams in the printer.

We are told that this is easier than buying a cheap typewriter and some Tippex, but realise that word processing serves two purposes. One, it disguises the abstract nature of the computer, and, two, it makes the writing process more interesting by substituting a whole new order of mistakes to make under the guise of dealing with human error. *Paul Bord*

## Speaking the right language is half the battle

IT IS ONLY fairly recently that computer manufacturers started to supply micros with a resident Basic. Many business micros only provide Basic on disc; while Apple's Macintosh comes without any high-level language, Basic or otherwise.

For home computer owners there is clearly an advantage to having Basic in Rom — it is instantly available as soon as the machine is turned on. But it also has its drawbacks. Unless you can switch the Basic Rom out — as on the BBC and the Amstrad — it takes up

memory space even when it is not in use.

This means that other language interpreters or compilers must load into the area normally reserved for programs. More generally, resident Basic makes owners less likely to consider trying other languages.

There is much to be said for using an alternative language to Basic. For one thing, if it is a compiled language it will run much faster. Almost all home computers use Basic interpreters which take

a program line at a time, translate it, and then execute it. Compilers, by contrast, translate high-level language programs into machine code before they are run. The resulting "object code" may not be as efficient as hand-crafted machine code but it is still substantially quicker than an interpreted program.

Apart from speed, there are other reasons why you should consider an alternative language. It is a matter of horses for courses: for particular applications some languages are more suit-

able and easier to write in than Basic. Forth, for example, would be a good language to choose if you wanted to write a program to control a robot arm. It was originally designed for control applications.

Logo supporters will tell you the language is capable of much more than just turtle graphics, and is well suited for list processing or writing database programs. They will even argue that a full version of Logo is more powerful *(continued on next page)*



(continued from previous page)

than Basic.

Pascal demands a rigid program layout in which variables and procedures must be defined at the outset. It encourages disciplined programming with the emphasis on advanced planning and a structured approach. For this reason it is regarded as a sound language with which to teach programming.

If you are looking for a job as a programmer a knowledge of C will stand you in better stead than fluency in Basic. It is currently the most fashionable language around. Most new operating systems are now partly written in

C, as are many successful application programs. At the same time as being highly structured, C allows you to get at the guts of a machine in a similar way to assembly language.

These languages are available on most home micros; although, in some cases, they are stripped-down versions such as Small C or Tiny Pascal. Other languages include Basic compilers, Lisp, BCPL, Comal, Prolog, and Cobol.

Each has its strengths and weaknesses; over the next few months we will be telling you what they are, as First Bytes takes a closer look at some of the more important languages.

Chris Lam.

# BEGINNERS

## first bytes

## Happiness is a thoroughly haywire program!

BEFORE SAVING enough pennies to buy my first computer — and like many other would-be micro owners, I suspect — I enjoyed a sort of voyeuristic love affair with the sylphs of silica city by reading *Your Computer* every month, eventually buying a couple of those early teach-yourself-Basic titles which looked as if they'd come from under the counter in an Old Compton Street bookshop and dealt with their subject just as predictably.

Not much was to be found in them about how to write a Pacman program or devise a neat database utility — instead, chapters on using your computer to work out acreages of carpeting or rivers of paint, or interesting exercises in calculating the fifteenth decimal point of Pi.

If those Puritan-severe tutorials did venture beyond the realm of numbing numeracy, it was only to remind the reader that strict and programming was the Right Path Through Life. In other words, any and every program you wrote was bound to be interpreted as an algorithm in the form of program steps presented in strict chronological order of execution, branching or non-execution. Further, that even sparing

use of subroutines was not only a sign of a swivelling surrender to convenience on the part of the programmer but was guaranteed to ensure that, worse, he would never be taken seriously by anyone who knew better.

Such counsel was enough either to send you rushing out to buy one of those plastic templates full of skewiff geometric shapes or force you into becoming a closet algorithmic anarchist — joyously peppering your programs with Gotos and Gosubs no matter what the consequences. In fact, such apparently irresponsible behaviour is but a sign that, programming-wise, you've grown up.

I'd like to find the guy who dreamt up the phrase 'structured programming' because he has much to answer for. Not least, for the souls who have fallen at the wayside endeavouring to follow his cretinous creed, because trying to structure a computer program is like attempting to water-ski on blanchmange — it's possible to do it but decidedly less invigorating than the alternative.

While professional programmers find that it's not a bad idea to scribble down their first thoughts on paper and to con-

ceive of their implementation as a series of modules, from there on in it's usually a case of keyboard creator — with the finished program actually building or screen before their eyes and with not a plastic template in sight.

One of the arguments made in favour of the structured approach is that it makes it easy for anyone — including the author, even months later — to fathom out how the program works. So whatever happened to Rems? I bung a Run in practically every other line of any program I'm developing, and Save a 'library' copy of it with them intact.

I may knock them out to gain a little more speed and memory in the working copy — but even that's not necessary if one intends to produce a compiled version, because utilities such as the excellent Jetpack from Dataview Wordcraft automatically ignore all Rems anyway.

Another so-called advantage of the SP approach is that it makes for tidier programs. Are you tidy? Is Bob Geldof? Is the molecular structure of the Taj Mahal? Next question.

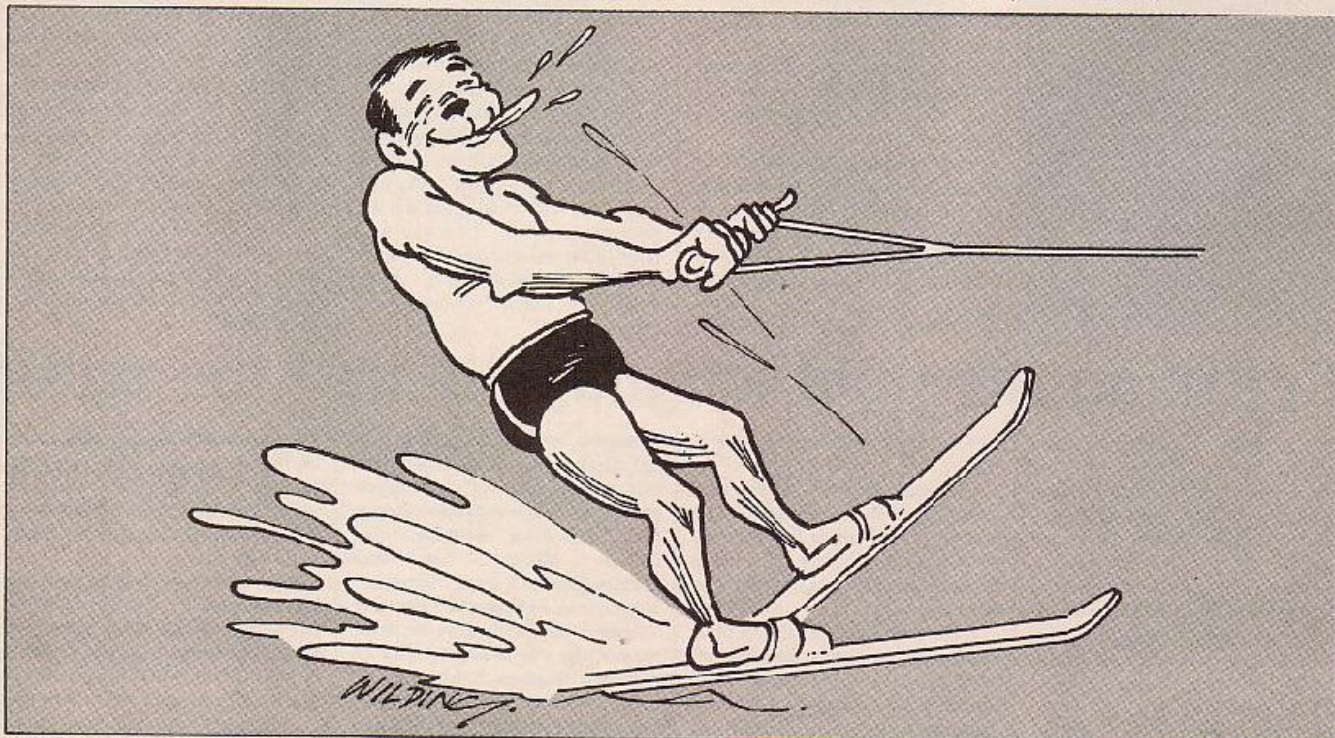
The algorithmics also lose hands down when it comes to usually the most important of all considerations — pro-

gram execution speed. Particularly in games writing, you need to keep to the absolute minimum the number of lines contained within the primary loop; that used to test for keyboard or joystick inputs. Avoid preceding that loop with a chunk of program to set up, for example, the game's playfield design, user-defined characters and/or sprites and go instead for a single Gosub to a module beginning at a much higher line number.

This is because any Return or Goto usually forces a laborious count beginning at the very first line used all the way up to that which the Return logic or Goto dictates is the next to be executed.

Thus you should aim at starting the 'active' part of your program at the lowest line number possible and at keeping the loop itself short and sweet. Delaying the first and prolonging the second, as the structuralists would have you do, will result in a program that runs as fast as a concrete rabbit. Psst! Anyone wanna buy a programmer's template with a possible secondary application in cutting out marzipan shapes for *petit fours*?

John Ransley.









# SOFTWARE

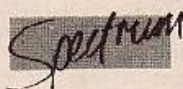
Programs for Software File should be fairly compact and sent on a cassette.

Please include clear instructions and say what computer it's for. We pay between £6 and £36 for programs published. They must be double-checked and submitted

*File*

## Klondike

Brian Fitton,  
Bradford,  
West Yorkshire.



THIS is the story of Klondike Bill — you take his part. Bill has arrived in the small town of Fittsville in the Middle West in response to stories of a Gold Strike. He finds himself a plot of land that he can prospect on.

You move him about with the cursor keys 5, 6, 7, 8 and when you decide which square to mine press S. The program will respond by telling you whether there is gold there or not; if there is you have a choice, mining it or not. The screen then changes to show the level indicators which show your current status and at the bottom of the screen a pointer which traverses left and right by means of the cursor keys 5 and 8 and points to a type of icon instead

of the more usual menu.

You must ensure that the Energy level is kept high, the Fatigue level low, the Food level high, and the hunger level low.

You may convert gold to cash any time, and you may also buy food providing you have enough cash to do so.

The variables for the initial levels are held in line 35 and can be altered as you wish, they are a=Fatigue, b=Food, c=Cash, d=Energy, e=Gold, f=Hunger.

The graphic characters are as follows:

LINE 75 "AC" "BD" "EG" "FH". LINE 365 Each one is shifted graphic three times. LINE 450 is "N". LINE 475 is "K" "I" "J" "L" "M" "O". Line 480 is shifted Graphic 8. LINE 690 are unshifted Graphic 3 eight times, shifted Graphic 5, unshifted Graphic 5 and shifted Graphic 3 eight times. LINE 710 is the same +1 LINE 900 is "AC" "BD" "EG" "FO". LINE 910 is "AC" "BD" "EG" "PH".

```

10 REM © Brian Fitton 13/4/85
11 PRINT "Klondike Bill"
12 PRINT "Bradford, West Yorkshire"
13 PRINT "POKE 23658,0"
14 PRINT "POKE 23659,0"
15 PRINT "POKE 23660,0"
16 PRINT "POKE 23661,0"
17 PRINT "POKE 23662,0"
18 PRINT "POKE 23663,0"
19 PRINT "POKE 23664,0"
20 PRINT "POKE 23665,0"
21 PRINT "POKE 23666,0"
22 PRINT "POKE 23667,0"
23 PRINT "POKE 23668,0"
24 PRINT "POKE 23669,0"
25 PRINT "POKE 23670,0"
26 PRINT "POKE 23671,0"
27 PRINT "POKE 23672,0"
28 PRINT "POKE 23673,0"
29 PRINT "POKE 23674,0"
30 PRINT "POKE 23675,0"
31 PRINT "POKE 23676,0"
32 PRINT "POKE 23677,0"
33 PRINT "POKE 23678,0"
34 PRINT "POKE 23679,0"
35 PRINT "POKE 23680,0"
36 PRINT "POKE 23681,0"
37 PRINT "POKE 23682,0"
38 PRINT "POKE 23683,0"
39 PRINT "POKE 23684,0"
40 PRINT "POKE 23685,0"
41 PRINT "POKE 23686,0"
42 PRINT "POKE 23687,0"
43 PRINT "POKE 23688,0"
44 PRINT "POKE 23689,0"
45 PRINT "POKE 23690,0"
46 PRINT "POKE 23691,0"
47 PRINT "POKE 23692,0"
48 PRINT "POKE 23693,0"
49 PRINT "POKE 23694,0"
50 PRINT "POKE 23695,0"
51 PRINT "POKE 23696,0"
52 PRINT "POKE 23697,0"
53 PRINT "POKE 23698,0"
54 PRINT "POKE 23699,0"
55 PRINT "POKE 23700,0"
56 PRINT "POKE 23701,0"
57 PRINT "POKE 23702,0"
58 PRINT "POKE 23703,0"
59 PRINT "POKE 23704,0"
60 PRINT "POKE 23705,0"
61 PRINT "POKE 23706,0"
62 PRINT "POKE 23707,0"
63 PRINT "POKE 23708,0"
64 PRINT "POKE 23709,0"
65 PRINT "POKE 23710,0"
66 PRINT "POKE 23711,0"
67 PRINT "POKE 23712,0"
68 PRINT "POKE 23713,0"
69 PRINT "POKE 23714,0"
70 PRINT "POKE 23715,0"
71 PRINT "POKE 23716,0"
72 PRINT "POKE 23717,0"
73 PRINT "POKE 23718,0"
74 PRINT "POKE 23719,0"
75 PRINT "POKE 23720,0"
76 PRINT "POKE 23721,0"
77 PRINT "POKE 23722,0"
78 PRINT "POKE 23723,0"
79 PRINT "POKE 23724,0"
80 PRINT "POKE 23725,0"
81 PRINT "POKE 23726,0"
82 PRINT "POKE 23727,0"
83 PRINT "POKE 23728,0"
84 PRINT "POKE 23729,0"
85 PRINT "POKE 23730,0"
86 PRINT "POKE 23731,0"
87 PRINT "POKE 23732,0"
88 PRINT "POKE 23733,0"
89 PRINT "POKE 23734,0"
90 PRINT "POKE 23735,0"
91 PRINT "POKE 23736,0"
92 PRINT "POKE 23737,0"
93 PRINT "POKE 23738,0"
94 PRINT "POKE 23739,0"
95 PRINT "POKE 23740,0"
96 PRINT "POKE 23741,0"
97 PRINT "POKE 23742,0"
98 PRINT "POKE 23743,0"
99 PRINT "POKE 23744,0"
100 PRINT "POKE 23745,0"
101 PRINT "POKE 23746,0"
102 PRINT "POKE 23747,0"
103 PRINT "POKE 23748,0"
104 PRINT "POKE 23749,0"
105 PRINT "POKE 23750,0"
106 PRINT "POKE 23751,0"
107 PRINT "POKE 23752,0"
108 PRINT "POKE 23753,0"
109 PRINT "POKE 23754,0"
110 PRINT "POKE 23755,0"
111 PRINT "POKE 23756,0"
112 PRINT "POKE 23757,0"
113 PRINT "POKE 23758,0"
114 PRINT "POKE 23759,0"
115 PRINT "POKE 23760,0"
116 PRINT "POKE 23761,0"
117 PRINT "POKE 23762,0"
118 PRINT "POKE 23763,0"
119 PRINT "POKE 23764,0"
120 PRINT "POKE 23765,0"
121 PRINT "POKE 23766,0"
122 PRINT "POKE 23767,0"
123 PRINT "POKE 23768,0"
124 PRINT "POKE 23769,0"
125 PRINT "POKE 23770,0"
126 PRINT "POKE 23771,0"
127 PRINT "POKE 23772,0"
128 PRINT "POKE 23773,0"
129 PRINT "POKE 23774,0"
130 PRINT "POKE 23775,0"
131 PRINT "POKE 23776,0"
132 PRINT "POKE 23777,0"
133 PRINT "POKE 23778,0"
134 PRINT "POKE 23779,0"
135 PRINT "POKE 23780,0"
136 PRINT "POKE 23781,0"
137 PRINT "POKE 23782,0"
138 PRINT "POKE 23783,0"
139 PRINT "POKE 23784,0"
140 PRINT "POKE 23785,0"
141 PRINT "POKE 23786,0"
142 PRINT "POKE 23787,0"
143 PRINT "POKE 23788,0"
144 PRINT "POKE 23789,0"
145 PRINT "POKE 23790,0"
146 PRINT "POKE 23791,0"
147 PRINT "POKE 23792,0"
148 PRINT "POKE 23793,0"
149 PRINT "POKE 23794,0"
150 PRINT "POKE 23795,0"
151 PRINT "POKE 23796,0"
152 PRINT "POKE 23797,0"
153 PRINT "POKE 23798,0"
154 PRINT "POKE 23799,0"
155 PRINT "POKE 23800,0"
156 PRINT "POKE 23801,0"
157 PRINT "POKE 23802,0"
158 PRINT "POKE 23803,0"
159 PRINT "POKE 23804,0"
160 PRINT "POKE 23805,0"
161 PRINT "POKE 23806,0"
162 PRINT "POKE 23807,0"
163 PRINT "POKE 23808,0"
164 PRINT "POKE 23809,0"
165 PRINT "POKE 23810,0"
166 PRINT "POKE 23811,0"
167 PRINT "POKE 23812,0"
168 PRINT "POKE 23813,0"
169 PRINT "POKE 23814,0"
170 PRINT "POKE 23815,0"
171 PRINT "POKE 23816,0"
172 PRINT "POKE 23817,0"
173 PRINT "POKE 23818,0"
174 PRINT "POKE 23819,0"
175 PRINT "POKE 23820,0"
176 PRINT "POKE 23821,0"
177 PRINT "POKE 23822,0"
178 PRINT "POKE 23823,0"
179 PRINT "POKE 23824,0"
180 PRINT "POKE 23825,0"
181 PRINT "POKE 23826,0"
182 PRINT "POKE 23827,0"
183 PRINT "POKE 23828,0"
184 PRINT "POKE 23829,0"
185 PRINT "POKE 23830,0"
186 PRINT "POKE 23831,0"
187 PRINT "POKE 23832,0"
188 PRINT "POKE 23833,0"
189 PRINT "POKE 23834,0"
190 PRINT "POKE 23835,0"
191 PRINT "POKE 23836,0"
192 PRINT "POKE 23837,0"
193 PRINT "POKE 23838,0"
194 PRINT "POKE 23839,0"
195 PRINT "POKE 23840,0"
196 PRINT "POKE 23841,0"
197 PRINT "POKE 23842,0"
198 PRINT "POKE 23843,0"
199 PRINT "POKE 23844,0"
200 PRINT "POKE 23845,0"
201 PRINT "POKE 23846,0"
202 PRINT "POKE 23847,0"
203 PRINT "POKE 23848,0"
204 PRINT "POKE 23849,0"
205 PRINT "POKE 23850,0"
206 PRINT "POKE 23851,0"
207 PRINT "POKE 23852,0"
208 PRINT "POKE 23853,0"
209 PRINT "POKE 23854,0"
210 PRINT "POKE 23855,0"
211 PRINT "POKE 23856,0"
212 PRINT "POKE 23857,0"
213 PRINT "POKE 23858,0"
214 PRINT "POKE 23859,0"
215 PRINT "POKE 23860,0"
216 PRINT "POKE 23861,0"
217 PRINT "POKE 23862,0"
218 PRINT "POKE 23863,0"
219 PRINT "POKE 23864,0"
220 PRINT "POKE 23865,0"
221 PRINT "POKE 23866,0"
222 PRINT "POKE 23867,0"
223 PRINT "POKE 23868,0"
224 PRINT "POKE 23869,0"
225 PRINT "POKE 23870,0"
226 PRINT "POKE 23871,0"
227 PRINT "POKE 23872,0"
228 PRINT "POKE 23873,0"
229 PRINT "POKE 23874,0"
230 PRINT "POKE 23875,0"
231 PRINT "POKE 23876,0"
232 PRINT "POKE 23877,0"
233 PRINT "POKE 23878,0"
234 PRINT "POKE 23879,0"
235 PRINT "POKE 23880,0"
236 PRINT "POKE 23881,0"
237 PRINT "POKE 23882,0"
238 PRINT "POKE 23883,0"
239 PRINT "POKE 23884,0"
240 PRINT "POKE 23885,0"
241 PRINT "POKE 23886,0"
242 PRINT "POKE 23887,0"
243 PRINT "POKE 23888,0"
244 PRINT "POKE 23889,0"
245 PRINT "POKE 23890,0"
246 PRINT "POKE 23891,0"
247 PRINT "POKE 23892,0"
248 PRINT "POKE 23893,0"
249 PRINT "POKE 23894,0"
250 PRINT "POKE 23895,0"
251 PRINT "POKE 23896,0"
252 PRINT "POKE 23897,0"
253 PRINT "POKE 23898,0"
254 PRINT "POKE 23899,0"
255 PRINT "POKE 23900,0"
256 PRINT "POKE 23901,0"
257 PRINT "POKE 23902,0"
258 PRINT "POKE 23903,0"
259 PRINT "POKE 23904,0"
260 PRINT "POKE 23905,0"
261 PRINT "POKE 23906,0"
262 PRINT "POKE 23907,0"
263 PRINT "POKE 23908,0"
264 PRINT "POKE 23909,0"
265 PRINT "POKE 23910,0"
266 PRINT "POKE 23911,0"
267 PRINT "POKE 23912,0"
268 PRINT "POKE 23913,0"
269 PRINT "POKE 23914,0"
270 PRINT "POKE 23915,0"
271 PRINT "POKE 23916,0"
272 PRINT "POKE 23917,0"
273 PRINT "POKE 23918,0"
274 PRINT "POKE 23919,0"
275 PRINT "POKE 23920,0"
276 PRINT "POKE 23921,0"
277 PRINT "POKE 23922,0"
278 PRINT "POKE 23923,0"
279 PRINT "POKE 23924,0"
280 PRINT "POKE 23925,0"
281 PRINT "POKE 23926,0"
282 PRINT "POKE 23927,0"
283 PRINT "POKE 23928,0"
284 PRINT "POKE 23929,0"
285 PRINT "POKE 23930,0"
286 PRINT "POKE 23931,0"
287 PRINT "POKE 23932,0"
288 PRINT "POKE 23933,0"
289 PRINT "POKE 23934,0"
290 PRINT "POKE 23935,0"
291 PRINT "POKE 23936,0"
292 PRINT "POKE 23937,0"
293 PRINT "POKE 23938,0"
294 PRINT "POKE 23939,0"
295 PRINT "POKE 23940,0"
296 PRINT "POKE 23941,0"
297 PRINT "POKE 23942,0"
298 PRINT "POKE 23943,0"
299 PRINT "POKE 23944,0"
300 PRINT "POKE 23945,0"
301 PRINT "POKE 23946,0"
302 PRINT "POKE 23947,0"
303 PRINT "POKE 23948,0"
304 PRINT "POKE 23949,0"
305 PRINT "POKE 23950,0"
306 PRINT "POKE 23951,0"
307 PRINT "POKE 23952,0"
308 PRINT "POKE 23953,0"
309 PRINT "POKE 23954,0"
310 PRINT "POKE 23955,0"
311 PRINT "POKE 23956,0"
312 PRINT "POKE 23957,0"
313 PRINT "POKE 23958,0"
314 PRINT "POKE 23959,0"
315 PRINT "POKE 23960,0"
316 PRINT "POKE 23961,0"
317 PRINT "POKE 23962,0"
318 PRINT "POKE 23963,0"
319 PRINT "POKE 23964,0"
320 PRINT "POKE 23965,0"
321 PRINT "POKE 23966,0"
322 PRINT "POKE 23967,0"
323 PRINT "POKE 23968,0"
324 PRINT "POKE 23969,0"
325 PRINT "POKE 23970,0"
326 PRINT "POKE 23971,0"
327 PRINT "POKE 23972,0"
328 PRINT "POKE 23973,0"
329 PRINT "POKE 23974,0"
330 PRINT "POKE 23975,0"
331 PRINT "POKE 23976,0"
332 PRINT "POKE 23977,0"
333 PRINT "POKE 23978,0"
334 PRINT "POKE 23979,0"
335 PRINT "POKE 23980,0"
336 PRINT "POKE 23981,0"
337 PRINT "POKE 23982,0"
338 PRINT "POKE 23983,0"
339 PRINT "POKE 23984,0"
340 PRINT "POKE 23985,0"
341 PRINT "POKE 23986,0"
342 PRINT "POKE 23987,0"
343 PRINT "POKE 23988,0"
344 PRINT "POKE 23989,0"
345 PRINT "POKE 23990,0"
346 PRINT "POKE 23991,0"
347 PRINT "POKE 23992,0"
348 PRINT "POKE 23993,0"
349 PRINT "POKE 23994,0"
350 PRINT "POKE 23995,0"
351 PRINT "POKE 23996,0"
352 PRINT "POKE 23997,0"
353 PRINT "POKE 23998,0"
354 PRINT "POKE 23999,0"
355 PRINT "POKE 24000,0"
356 PRINT "POKE 24001,0"
357 PRINT "POKE 24002,0"
358 PRINT "POKE 24003,0"
359 PRINT "POKE 24004,0"
360 PRINT "POKE 24005,0"
361 PRINT "POKE 24006,0"
362 PRINT "POKE 24007,0"
363 PRINT "POKE 24008,0"
364 PRINT "POKE 24009,0"
365 PRINT "POKE 24010,0"
366 PRINT "POKE 24011,0"
367 PRINT "POKE 24012,0"
368 PRINT "POKE 24013,0"
369 PRINT "POKE 24014,0"
370 PRINT "POKE 24015,0"
371 PRINT "POKE 24016,0"
372 PRINT "POKE 24017,0"
373 PRINT "POKE 24018,0"
374 PRINT "POKE 24019,0"
375 PRINT "POKE 24020,0"
376 PRINT "POKE 24021,0"
377 PRINT "POKE 24022,0"
378 PRINT "POKE 24023,0"
379 PRINT "POKE 24024,0"
380 PRINT "POKE 24025,0"
381 PRINT "POKE 24026,0"
382 PRINT "POKE 24027,0"
383 PRINT "POKE 24028,0"
384 PRINT "POKE 24029,0"
385 PRINT "POKE 24030,0"
386 PRINT "POKE 24031,0"
387 PRINT "POKE 24032,0"
388 PRINT "POKE 24033,0"
389 PRINT "POKE 24034,0"
390 PRINT "POKE 24035,0"
391 PRINT "POKE 24036,0"
392 PRINT "POKE 24037,0"
393 PRINT "POKE 24038,0"
394 PRINT "POKE 24039,0"
395 PRINT "POKE 24040,0"
396 PRINT "POKE 24041,0"
397 PRINT "POKE 24042,0"
398 PRINT "POKE 24043,0"
399 PRINT "POKE 24044,0"
400 PRINT "POKE 24045,0"
401 PRINT "POKE 24046,0"
402 PRINT "POKE 24047,0"
403 PRINT "POKE 24048,0"
404 PRINT "POKE 24049,0"
405 PRINT "POKE 24050,0"
406 PRINT "POKE 24051,0"
407 PRINT "POKE 24052,0"
408 PRINT "POKE 24053,0"
409 PRINT "POKE 24054,0"
410 PRINT "POKE 24055,0"
411 PRINT "POKE 24056,0"
412 PRINT "POKE 24057,0"
413 PRINT "POKE 24058,0"
414 PRINT "POKE 24059,0"
415 PRINT "POKE 24060,0"
416 PRINT "POKE 24061,0"
417 PRINT "POKE 24062,0"
418 PRINT "POKE 24063,0"
419 PRINT "POKE 24064,0"
420 PRINT "POKE 24065,0"
421 PRINT "POKE 24066,0"
422 PRINT "POKE 24067,0"
423 PRINT "POKE 24068,0"
424 PRINT "POKE 24069,0"
425 PRINT "POKE 24070,0"
426 PRINT "POKE 24071,0"
427 PRINT "POKE 24072,0"
428 PRINT "POKE 24073,0"
429 PRINT "POKE 24074,0"
430 PRINT "POKE 24075,0"
431 PRINT "POKE 24076,0"
432 PRINT "POKE 24077,0"
433 PRINT "POKE 24078,0"
434 PRINT "POKE 24079,0"
435 PRINT "POKE 24080,0"
436 PRINT "POKE 24081,0"
437 PRINT "POKE 24082,0"
438 PRINT "POKE 24083,0"
439 PRINT "POKE 24084,0"
440 PRINT "POKE 24085,0"
441 PRINT "POKE 24086,0"
442 PRINT "POKE 24087,0"
443 PRINT "POKE 24088,0"
444 PRINT "POKE 24089,0"
445 PRINT "POKE 24090,0"
446 PRINT "POKE 24091,0"
447 PRINT "POKE 24092,0"
448 PRINT "POKE 24093,0"
449 PRINT "POKE 24094,0"
450 PRINT "POKE 24095,0"
451 PRINT "POKE 24096,0"
452 PRINT "POKE 24097,0"
453 PRINT "POKE 24098,0"
454 PRINT "POKE 24099,0"
455 PRINT "POKE 24100,0"
456 PRINT "POKE 24101,0"
457 PRINT "POKE 24102,0"
458 PRINT "POKE 24103,0"
459 PRINT "POKE 24104,0"
460 PRINT "POKE 24105,0"
461 PRINT "POKE 24106,0"
462 PRINT "POKE 24107,0"
463 PRINT "POKE 24108,0"
464 PRINT "POKE 24109,0"
465 PRINT "POKE 24110,0"
466 PRINT "POKE 24111,0"
467 PRINT "POKE 24112,0"
468 PRINT "POKE 24113,0"
469 PRINT "POKE 24114,0"
470 PRINT "POKE 24115,0"
471 PRINT "POKE 24116,0"
472 PRINT "POKE 24117,0"
473 PRINT "POKE 24118,0"
474 PRINT "POKE 24119,0"
475 PRINT "POKE 24120,0"
476 PRINT "POKE 24121,0"
477 PRINT "POKE 24122,0"
478 PRINT "POKE 24123,0"
479 PRINT "POKE 24124,0"
480 PRINT "POKE 24125,0"
481 PRINT "POKE 24126,0"
482 PRINT "POKE 24127,0"
483 PRINT "POKE 24128,0"
484 PRINT "POKE 24129,0"
485 PRINT "POKE 24130,0"
486 PRINT "POKE 24131,0"
487 PRINT "POKE 24132,0"
488 PRINT "POKE 24133,0"
489 PRINT "POKE 24134,0"
490 PRINT "POKE 24135,0"
491 PRINT "POKE 24136,0"
492 PRINT "POKE 24137,0"
493 PRINT "POKE 24138,0"
494 PRINT "POKE 24139,0"
495 PRINT "POKE 24140,0"
496 PRINT "POKE 24141,0"
497 PRINT "POKE 24142,0"
498 PRINT "POKE 24143,0"
499 PRINT "POKE 24144,0"
500 PRINT "POKE 24145,0"
501 PRINT "POKE 24146,0"
502 PRINT "POKE 24147,0"
503 PRINT "POKE 24148,0"
504 PRINT "POKE 24149,0"
505 PRINT "POKE 24150,0"
506 PRINT "POKE 24151,0"
507 PRINT "POKE 24152,0"
508 PRINT "POKE 24153,0"
509 PRINT "POKE 24154,0"
510 PRINT "POKE 24155,0"
511 PRINT "POKE 24156,0"
512 PRINT "POKE 24157,0"
513 PRINT "POKE 24158,0"
514 PRINT "POKE 24159,0"
515 PRINT "POKE 24160,0"
516 PRINT "POKE 24161,0"
517 PRINT "POKE 24162,0"
518 PRINT "POKE 24163,0"
519 PRINT "POKE 24164,0"
520 PRINT "POKE 24165,0"
521 PRINT "POKE 24166,0"
522 PRINT "POKE 24167,0"
523 PRINT "POKE 24168,0"
524 PRINT "POKE 24169,0"
525 PRINT "POKE 24170,0"
526 PRINT "POKE 24171,0"
527 PRINT "POKE 24172,0"
528 PRINT "POKE 24173,0"
529 PRINT "POKE 24174,0"
530 PRINT "POKE 24175,0"
531 PRINT "POKE 24176,0"
532 PRINT "POKE 24177,0"
533 PRINT "POKE 24178,0"
534 PRINT "POKE 24179,0"
535 PRINT "POKE 24180,0"
536 PRINT "POKE 24181,0"
537 PRINT "POKE 24182,0"
538 PRINT "POKE 24183,0"
539 PRINT "POKE 24184,0"
540 PRINT "POKE 24185,0"
541 PRINT "POKE 24186,0"
542 PRINT "POKE 24187,0"
543 PRINT "POKE 24188,0"
544 PRINT "POKE 24189,0"
545 PRINT "POKE 24190,0"
546 PRINT "POKE 24191,0"
547 PRINT "POKE 24192,0"
548 PRINT "POKE 24193,0"
549 PRINT "POKE 24194,0"
550 PRINT "POKE 24195,0"
551 PRINT "POKE 24196,0"
552 PRINT "POKE 24197,0"
553 PRINT "POKE 24198,0"
554 PRINT "POKE 24199,0"
555 PRINT "POKE 24200,0"
556 PRINT "POKE 24201,0"
557 PRINT "POKE 24202,0"
558 PRINT "POKE 24203,0"
559 PRINT "POKE 24204,0"
560 PRINT "POKE 24205,0"
561 PRINT "POKE 24206,0"
562 PRINT "POKE 24207,0"
563 PRINT "POKE 24208,0"
564 PRINT "POKE 24209,0"
565 PRINT "POKE 24210,0"
566 PRINT "POKE 24211,0"
567 PRINT "POKE 24212,0"
568 PRINT "POKE 24213,0"
569 PRINT "POKE 24214,0"
570 PRINT "POKE 24215,0"
571 PRINT "POKE 24216,0"
572 PRINT "POKE 24217,0"
573 PRINT "POKE 24218,0"
574 PRINT "POKE 24219,0"
575 PRINT "POKE 24220,0"
576 PRINT "POKE 24221,0"
577 PRINT "POKE 24222,0"
578 PRINT "POKE 24223,0"
579 PRINT "POKE 24224,0"
580 PRINT "POKE 24225,0"
581 PRINT "POKE 24226,0"
582 PRINT "POKE 24227,0"
583 PRINT "POKE 24228,0"
584 PRINT "POKE 24229,0"
585 PRINT "POKE 24230,0"
586 PRINT "POKE 24231,0"
587 PRINT "POKE 24232,0"
588 PRINT "POKE 24233,0"
589 PRINT "POKE 24234,0"
590 PRINT "POKE 24235,0"
591 PRINT "POKE 24236,0"
592 PRINT "POKE 24237,0"
593 PRINT "POKE 24238,0"
594 PRINT "POKE 24239,0"
595 PRINT "POKE 24240,0"
596 PRINT "POKE 24241,0"
597 PRINT "POKE 24242,0"
598 PRINT "POKE 24243,0"
599 PRINT "POKE 24244,0"
600 PRINT "POKE 24245,0"
601 PRINT "POKE 24246,0"
602 PRINT "POKE 24247,0"
603 PRINT "POKE 24248,0"
604 PRINT "POKE 24249,0"
605 PRINT "POKE 24250,0"
606 PRINT "POKE 24251,0"
607 PRINT "POKE 24252,0"
608 PRINT "POKE 24253,0"
609 PRINT "POKE 24254,0"
610 PRINT "POKE 24255,0"
611 PRINT "POKE 24256,0"
612 PRINT "POKE 24257,0"
613 PRINT "POKE 24258,0"
614 PRINT "POKE 24259,0"
615 PRINT "POKE 24260,0"
616 PRINT "POKE 24261,0"
617 PRINT "POKE 24262,0"
618 PRINT "POKE 24263,0"
619 PRINT "POKE 24264,0"
620 PRINT "POKE 24265,0"
621 PRINT "POKE 24266,0"
622 PRINT "POKE 24267,0"
623 PRINT "POKE 24268,0"
624 PRINT "POKE 24269,0"
625 PRINT "POKE 24270,0"
626 PRINT "POKE 24271,0"
627 PRINT "POKE 24272,0"
628 PRINT "POKE 24273,0"
629 PRINT "POKE 24274,0"
630 PRINT "POKE 24275,0"
631 PRINT "POKE 24276,0"
632 PRINT "POKE 24277,0"
633 PRINT "POKE 24278,0"
634 PRINT "POKE 24279,0"
635 PRINT "POKE 24280,0"
636 PRINT "POKE 24281,0"
637 PRINT "POKE 24282,0"
638 PRINT "POKE 24283,0"
639 PRINT "POKE 24284,0"
640 PRINT "POKE 24285,0"
641 PRINT "POKE 24286,0"
642 PRINT "POKE 24287,0"
643 PRINT "POKE 24288,0"
644 PRINT "POKE 24289,0"
645 PRINT "POKE 24290,0"
646 PRINT "POKE 24291,0"
647 PRINT "POKE 24292,0"
648 PRINT "POKE 24293,0"
649 PRINT "POKE 24294,0"
650 PRINT "POKE 24295,0"
651 PRINT "POKE 24296,0"
652 PRINT "POKE 24297,0"
653 PRINT "POKE 24298,0"
654 PRINT "POKE 24299,0"
655 PRINT "POKE 24300,0"
656 PRINT "POKE 24301,0"
657 PRINT "POKE 24302,0"
658 PRINT "POKE 24303,0"
659 PRINT "POKE 24304,0"
660 PRINT "POKE 24305,0"
661 PRINT "POKE 24306,0"
662 PRINT "POKE 24307,0"
663 PRINT "POKE 24308,0"
664 PRINT "POKE 24309,0"
665 PRINT "POKE 24310,0"
666 PRINT "POKE 24311,0"
667 PRINT "POKE 24312,0"
668 PRINT "POKE 24313,0"
669 PRINT "POKE 24314,0"
670 PRINT "POKE 24315,0"
671 PRINT "POKE 24316,0"
672 PRINT "POKE 24317,0"
673 PRINT "POKE 24318,0"
674 PRINT "POKE 24319,0"
675 PRINT "POKE 24320,0"
676 PRINT "POKE 24321,0"
677 PRINT "POKE 24322,0"
678 PRINT "POKE 24323,0"
679 PRINT "POKE 24324,0"
680 PRINT "POKE 24325,0"
681 PRINT
```



```

745 PRINT : PRINT LET Q$=ENE
RGY : GO SUB 790 PRINT 1 : PAU
SE 10 : LET R$=PATGUE : 20 SUB
790 PRINT A : PAUSE 10 LET Q$=
PAUSE 10 : LET Q$=CASH : 30
SUB 790 PRINT C : PAUSE 10 LET
Q$=FOOD : GO SUB 790 PRINT
T B : PAUSE 10 : LET Q$=HUNGER :
GO SUB 790 PRINT
795 PLOT Q,30 DRAW 68.0 : PRINT
PRINT : PRINT TOTAL : 40+
+-----+
755 LET H$=a+b+c+d+e+f
780 PLOT Q,13 DRAW 255.0 : PLOT
Q,38 DRAW 255.0 PAUSE 100
765 PRINT : PRINT PRINT : PRI
NT : PRINT PRINT : LE Q$=0
YOU WISH TO TRY AGAIN Y/N : GO
SUB 790
770 PRINT : PRINT PRINT : PRI
NT : PRINT HIGH SCORE = " : H$ : PA
USE 0
785 IF INKEY$="Y" THEN RESTORE
RUN
780 IF INKEY$="N" THEN BRIGHT 0
BORDER 7 : PAPER 7 : INK Q : CLS
STOP
785 LET C=C+INT 4+3 LET A=0 : F
OR Z=0 TO 200 : GO TO 130
790 LET B=NOT PI : LET U=NOT Z
FOR I=1 TO 10 : PRINT C+I
BEEP .02, CODE C$+I-50 NEXT I
RETURN
795 C$="" FOR Z=0 TO 10 : PRINT
PAPER 5 :
NEXT Z : LET Q$="YOU
MAY BUY FOOD : UNITS OF 10 : GO
SUB 790 : PAUSE 20 : PRINT :
: LET Q$="HOW MANY UNITS WOULD
YOU LIKE ?" : GO SUB 790 : INPT
UN : IF C=0 OR C=6 THEN GO TO 37
5
300 LET B=B+UN*10 : LET C=C+UN*2
0 : GO TO 790
305 BORDER ON C$ : PAPER AND 5
INK AND 6 : BRIGHT AND 1 : FLASH A
ND 1 : CLS : PRINT AT 10,4 : ARE Y
OU SURE YES OR NO : BEEP .02, IR
ND 25+1
310 IF INKEY$="N" THEN FLASH Q
5 : BRIGHT 0 : RESTORE : GO TO 15
315 IF INKEY$="Y" THEN BORDER 7
: PAPER 7 : INK Q : FLASH Q : BRIGH
T 0 : CLS : STOP
320 GO TO 305
- 900 PRINT INK 2,AT 3,bb;"AC" : A
- 900 PRINT BB INK 8,AT 3+2,bb
"EG" : INK 1,AT 3+3,bb : F+2,bb
EP .03,.50 : RETURN
- 910 PRINT INK 2,AT 3,bb;"AC" : A
- 910 PRINT BB INK 8,AT 3+2,bb
"EG" : INK 1,AT 3+3,bb : PH+2,bb
EP .05,.50 : RETURN

```

Spectrum

To get line 60, go into E mode and press key 5, the background to the line will then be cyan. Go into E mode and press key 7 when the line is finished.

```

740 " " GO SUB 100
380 IF ! = 0 THEN GO TO 560
390 GO SUB 110
400 IF x = 0 THEN GO TO 470
410 LET t = -x + 1
420 IF SCREEN( aa, x ) = "" AND x =
1 THEN GO SUB 620 LET bs(x TO
) = "" LET sc = sc + 10 LET nm = 1 G
O TO 460
430 IF SCREEN( ad, x ) = "" AND x =
1 THEN GO SUB 630 LET bs(x TO
) = "" LET sc = sc + 20 LET nm = 1 G
O TO 460
440 IF SCREEN( ac, x ) = "" AND x =
1 THEN GO SUB 640 LET bs(x TO
) = "" LET sc = sc + 50 LET nm = 1 G
O TO 460
450 IF SCREEN( ab, x ) = "" AND x =
1 THEN GO SUB 650 LET bs(x TO
) = "" LET sc = sc + 100 LET nm = 1
GO TO 460
460 LET x = 0 IF nm = 1 THEN LET t
= t - 10 LET nm = 0
470 PRINT PAPER 0 AT 20, e#
480 PRINT PAPER 0 AT ab, a, s AT
ac, a, s AT ad, a, s AT ae, a, s
490 LET a = 1 THEN LET q = 0 IF vb >
+1 LET a = 3d + e - x + 1 LET a = 3d
500 IF a = 10 THEN LET a = 1 IF vb
< -10 - h THEN LET ab = a + 1 LET ac =
a + 1 LET ad = a + 1 LET ae = a + 1
LE 100
510 IF a = 1 OR a = 5 THEN LET vb = v
b + 1
520 IF q = 0 THEN LET s = a + 1
530 IF q = 1 THEN LET s = a - 1
540 IF t = 400 THEN LET t = 0 GO T
O 560
550 GO TO 100
560 PRINT INVERSE ; INI 2; CRI
GHT 1; FLASH 1 AT 10, 0

```

YOUR COMPUTER, SEPTEMBER 1985 95



## 96 • YOUR COMPUTER, SEPTEMBER 1985



```

7510 PRINT "YOU WISH TO FIGHT?"
7515 INPUT "Y/N"; A$
7520 IF A$ = "Y" THEN GOTO 7525
7525 PRINT "WHICH OPPONENT DO YOU WISH TO FIGHT?"
7530 INPUT "1/2/3/4"; B$
7535 IF B$ = "1" THEN GOTO 7540
7540 REM *** FIGHT WITH OPPONENT 1 ***
7545 REM *** FIGHT WITH OPPONENT 2 ***
7550 REM *** FIGHT WITH OPPONENT 3 ***
7555 REM *** FIGHT WITH OPPONENT 4 ***
7560 REM *** FIGHT WITH OPPONENT 5 ***
7565 REM *** FIGHT WITH OPPONENT 6 ***
7570 REM *** FIGHT WITH OPPONENT 7 ***
7575 REM *** FIGHT WITH OPPONENT 8 ***
7580 REM *** FIGHT WITH OPPONENT 9 ***
7585 REM *** FIGHT WITH OPPONENT 10 ***
7590 REM *** FIGHT WITH OPPONENT 11 ***
7595 REM *** FIGHT WITH OPPONENT 12 ***
7600 REM *** FIGHT WITH OPPONENT 13 ***
7605 REM *** FIGHT WITH OPPONENT 14 ***
7610 REM *** FIGHT WITH OPPONENT 15 ***
7615 REM *** FIGHT WITH OPPONENT 16 ***
7620 REM *** FIGHT WITH OPPONENT 17 ***
7625 REM *** FIGHT WITH OPPONENT 18 ***
7630 REM *** FIGHT WITH OPPONENT 19 ***
7635 REM *** FIGHT WITH OPPONENT 20 ***
7640 REM *** FIGHT WITH OPPONENT 21 ***
7645 REM *** FIGHT WITH OPPONENT 22 ***
7650 REM *** FIGHT WITH OPPONENT 23 ***
7655 REM *** FIGHT WITH OPPONENT 24 ***
7660 REM *** FIGHT WITH OPPONENT 25 ***
7665 REM *** FIGHT WITH OPPONENT 26 ***
7670 REM *** FIGHT WITH OPPONENT 27 ***
7675 REM *** FIGHT WITH OPPONENT 28 ***
7680 REM *** FIGHT WITH OPPONENT 29 ***
7685 REM *** FIGHT WITH OPPONENT 30 ***
7690 REM *** FIGHT WITH OPPONENT 31 ***
7695 REM *** FIGHT WITH OPPONENT 32 ***
7700 REM *** FIGHT WITH OPPONENT 33 ***
7705 REM *** FIGHT WITH OPPONENT 34 ***
7710 REM *** FIGHT WITH OPPONENT 35 ***
7715 REM *** FIGHT WITH OPPONENT 36 ***
7720 REM *** FIGHT WITH OPPONENT 37 ***
7725 REM *** FIGHT WITH OPPONENT 38 ***
7730 REM *** FIGHT WITH OPPONENT 39 ***
7735 REM *** FIGHT WITH OPPONENT 40 ***
7740 REM *** FIGHT WITH OPPONENT 41 ***
7745 REM *** FIGHT WITH OPPONENT 42 ***
7750 REM *** FIGHT WITH OPPONENT 43 ***
7755 REM *** FIGHT WITH OPPONENT 44 ***
7760 REM *** FIGHT WITH OPPONENT 45 ***
7765 REM *** FIGHT WITH OPPONENT 46 ***
7770 REM *** FIGHT WITH OPPONENT 47 ***
7775 REM *** FIGHT WITH OPPONENT 48 ***
7780 REM *** FIGHT WITH OPPONENT 49 ***
7785 REM *** FIGHT WITH OPPONENT 50 ***
7790 REM *** FIGHT WITH OPPONENT 51 ***
7795 REM *** FIGHT WITH OPPONENT 52 ***
7800 REM *** FIGHT WITH OPPONENT 53 ***
7805 REM *** FIGHT WITH OPPONENT 54 ***
7810 REM *** FIGHT WITH OPPONENT 55 ***
7815 REM *** FIGHT WITH OPPONENT 56 ***
7820 REM *** FIGHT WITH OPPONENT 57 ***
7825 REM *** FIGHT WITH OPPONENT 58 ***
7830 REM *** FIGHT WITH OPPONENT 59 ***
7835 REM *** FIGHT WITH OPPONENT 60 ***
7840 REM *** FIGHT WITH OPPONENT 61 ***
7845 REM *** FIGHT WITH OPPONENT 62 ***
7850 REM *** FIGHT WITH OPPONENT 63 ***
7855 REM *** FIGHT WITH OPPONENT 64 ***
7860 REM *** FIGHT WITH OPPONENT 65 ***
7865 REM *** FIGHT WITH OPPONENT 66 ***
7870 REM *** FIGHT WITH OPPONENT 67 ***
7875 REM *** FIGHT WITH OPPONENT 68 ***
7880 REM *** FIGHT WITH OPPONENT 69 ***
7885 REM *** FIGHT WITH OPPONENT 70 ***
7890 REM *** FIGHT WITH OPPONENT 71 ***
7895 REM *** FIGHT WITH OPPONENT 72 ***
7900 REM *** FIGHT WITH OPPONENT 73 ***
7905 REM *** FIGHT WITH OPPONENT 74 ***
7910 REM *** FIGHT WITH OPPONENT 75 ***
7915 REM *** FIGHT WITH OPPONENT 76 ***
7920 REM *** FIGHT WITH OPPONENT 77 ***
7925 REM *** FIGHT WITH OPPONENT 78 ***
7930 REM *** FIGHT WITH OPPONENT 79 ***
7935 REM *** FIGHT WITH OPPONENT 80 ***
7940 REM *** FIGHT WITH OPPONENT 81 ***
7945 REM *** FIGHT WITH OPPONENT 82 ***
7950 REM *** FIGHT WITH OPPONENT 83 ***
7955 REM *** FIGHT WITH OPPONENT 84 ***
7960 REM *** FIGHT WITH OPPONENT 85 ***
7965 REM *** FIGHT WITH OPPONENT 86 ***
7970 REM *** FIGHT WITH OPPONENT 87 ***
7975 REM *** FIGHT WITH OPPONENT 88 ***
7980 REM *** FIGHT WITH OPPONENT 89 ***
7985 REM *** FIGHT WITH OPPONENT 90 ***
7990 REM *** FIGHT WITH OPPONENT 91 ***
7995 REM *** FIGHT WITH OPPONENT 92 ***
8000 REM *** FIGHT WITH OPPONENT 93 ***
8005 REM *** FIGHT WITH OPPONENT 94 ***
8010 REM *** FIGHT WITH OPPONENT 95 ***
8015 REM *** FIGHT WITH OPPONENT 96 ***
8020 REM *** FIGHT WITH OPPONENT 97 ***
8025 REM *** FIGHT WITH OPPONENT 98 ***
8030 REM *** FIGHT WITH OPPONENT 99 ***
8035 REM *** FIGHT WITH OPPONENT 100 ***
8040 REM *** FIGHT WITH OPPONENT 101 ***
8045 REM *** FIGHT WITH OPPONENT 102 ***
8050 REM *** FIGHT WITH OPPONENT 103 ***
8055 REM *** FIGHT WITH OPPONENT 104 ***
8060 REM *** FIGHT WITH OPPONENT 105 ***
8065 REM *** FIGHT WITH OPPONENT 106 ***
8070 REM *** FIGHT WITH OPPONENT 107 ***
8075 REM *** FIGHT WITH OPPONENT 108 ***
8080 REM *** FIGHT WITH OPPONENT 109 ***
8085 REM *** FIGHT WITH OPPONENT 110 ***
8090 REM *** FIGHT WITH OPPONENT 111 ***
8095 REM *** FIGHT WITH OPPONENT 112 ***
8100 REM *** FIGHT WITH OPPONENT 113 ***
8105 REM *** FIGHT WITH OPPONENT 114 ***
8110 REM *** FIGHT WITH OPPONENT 115 ***
8115 REM *** FIGHT WITH OPPONENT 116 ***
8120 REM *** FIGHT WITH OPPONENT 117 ***
8125 REM *** FIGHT WITH OPPONENT 118 ***
8130 REM *** FIGHT WITH OPPONENT 119 ***
8135 REM *** FIGHT WITH OPPONENT 120 ***
8140 REM *** FIGHT WITH OPPONENT 121 ***
8145 REM *** FIGHT WITH OPPONENT 122 ***
8150 REM *** FIGHT WITH OPPONENT 123 ***
8155 REM *** FIGHT WITH OPPONENT 124 ***
8160 REM *** FIGHT WITH OPPONENT 125 ***
8165 REM *** FIGHT WITH OPPONENT 126 ***
8170 REM *** FIGHT WITH OPPONENT 127 ***
8175 REM *** FIGHT WITH OPPONENT 128 ***
8180 REM *** FIGHT WITH OPPONENT 129 ***
8185 REM *** FIGHT WITH OPPONENT 130 ***
8190 REM *** FIGHT WITH OPPONENT 131 ***
8195 REM *** FIGHT WITH OPPONENT 132 ***
8200 REM *** FIGHT WITH OPPONENT 133 ***
8205 REM *** FIGHT WITH OPPONENT 134 ***
8210 REM *** FIGHT WITH OPPONENT 135 ***
8215 REM *** FIGHT WITH OPPONENT 136 ***
8220 REM *** FIGHT WITH OPPONENT 137 ***
8225 REM *** FIGHT WITH OPPONENT 138 ***
8230 REM *** FIGHT WITH OPPONENT 139 ***
8235 REM *** FIGHT WITH OPPONENT 140 ***
8240 REM *** FIGHT WITH OPPONENT 141 ***
8245 REM *** FIGHT WITH OPPONENT 142 ***
8250 REM *** FIGHT WITH OPPONENT 143 ***
8255 REM *** FIGHT WITH OPPONENT 144 ***
8260 REM *** FIGHT WITH OPPONENT 145 ***
8265 REM *** FIGHT WITH OPPONENT 146 ***
8270 REM *** FIGHT WITH OPPONENT 147 ***
8275 REM *** FIGHT WITH OPPONENT 148 ***
8280 REM *** FIGHT WITH OPPONENT 149 ***
8285 REM *** FIGHT WITH OPPONENT 150 ***
8290 REM *** FIGHT WITH OPPONENT 151 ***
8295 REM *** FIGHT WITH OPPONENT 152 ***
8300 REM *** FIGHT WITH OPPONENT 153 ***
8305 REM *** FIGHT WITH OPPONENT 154 ***
8310 REM *** FIGHT WITH OPPONENT 155 ***
8315 REM *** FIGHT WITH OPPONENT 156 ***
8320 REM *** FIGHT WITH OPPONENT 157 ***
8325 REM *** FIGHT WITH OPPONENT 158 ***
8330 REM *** FIGHT WITH OPPONENT 159 ***
8335 REM *** FIGHT WITH OPPONENT 160 ***
8340 REM *** FIGHT WITH OPPONENT 161 ***
8345 REM *** FIGHT WITH OPPONENT 162 ***
8350 REM *** FIGHT WITH OPPONENT 163 ***
8355 REM *** FIGHT WITH OPPONENT 164 ***
8360 REM *** FIGHT WITH OPPONENT 165 ***
8365 REM *** FIGHT WITH OPPONENT 166 ***
8370 REM *** FIGHT WITH OPPONENT 167 ***
8375 REM *** FIGHT WITH OPPONENT 168 ***
8380 REM *** FIGHT WITH OPPONENT 169 ***
8385 REM *** FIGHT WITH OPPONENT 170 ***
8390 REM *** FIGHT WITH OPPONENT 171 ***
8395 REM *** FIGHT WITH OPPONENT 172 ***
8400 REM *** FIGHT WITH OPPONENT 173 ***
8405 REM *** FIGHT WITH OPPONENT 174 ***
8410 REM *** FIGHT WITH OPPONENT 175 ***
8415 REM *** FIGHT WITH OPPONENT 176 ***
8420 REM *** FIGHT WITH OPPONENT 177 ***
8425 REM *** FIGHT WITH OPPONENT 178 ***
8430 REM *** FIGHT WITH OPPONENT 179 ***
8435 REM *** FIGHT WITH OPPONENT 180 ***
8440 REM *** FIGHT WITH OPPONENT 181 ***
8445 REM *** FIGHT WITH OPPONENT 182 ***
8450 REM *** FIGHT WITH OPPONENT 183 ***
8455 REM *** FIGHT WITH OPPONENT 184 ***
8460 REM *** FIGHT WITH OPPONENT 185 ***
8465 REM *** FIGHT WITH OPPONENT 186 ***
8470 REM *** FIGHT WITH OPPONENT 187 ***
8475 REM *** FIGHT WITH OPPONENT 188 ***
8480 REM *** FIGHT WITH OPPONENT 189 ***
8485 REM *** FIGHT WITH OPPONENT 190 ***
8490 REM *** FIGHT WITH OPPONENT 191 ***
8495 REM *** FIGHT WITH OPPONENT 192 ***
8500 REM *** FIGHT WITH OPPONENT 193 ***
8505 REM *** FIGHT WITH OPPONENT 194 ***
8510 REM *** FIGHT WITH OPPONENT 195 ***
8515 REM *** FIGHT WITH OPPONENT 196 ***
8520 REM *** FIGHT WITH OPPONENT 197 ***
8525 REM *** FIGHT WITH OPPONENT 198 ***
8530 REM *** FIGHT WITH OPPONENT 199 ***
8535 REM *** FIGHT WITH OPPONENT 200 ***
8540 REM *** FIGHT WITH OPPONENT 201 ***
8545 REM *** FIGHT WITH OPPONENT 202 ***
8550 REM *** FIGHT WITH OPPONENT 203 ***
8555 REM *** FIGHT WITH OPPONENT 204 ***
8560 REM *** FIGHT WITH OPPONENT 205 ***
8565 REM *** FIGHT WITH OPPONENT 206 ***
8570 REM *** FIGHT WITH OPPONENT 207 ***
8575 REM *** FIGHT WITH OPPONENT 208 ***
8580 REM *** FIGHT WITH OPPONENT 209 ***
8585 REM *** FIGHT WITH OPPONENT 210 ***
8590 REM *** FIGHT WITH OPPONENT 211 ***
8595 REM *** FIGHT WITH OPPONENT 212 ***
8600 REM *** FIGHT WITH OPPONENT 213 ***
8605 REM *** FIGHT WITH OPPONENT 214 ***
8610 REM *** FIGHT WITH OPPONENT 215 ***
8615 REM *** FIGHT WITH OPPONENT 216 ***
8620 REM *** FIGHT WITH OPPONENT 217 ***
8625 REM *** FIGHT WITH OPPONENT 218 ***
8630 REM *** FIGHT WITH OPPONENT 219 ***
8635 REM *** FIGHT WITH OPPONENT 220 ***
8640 REM *** FIGHT WITH OPPONENT 221 ***
8645 REM *** FIGHT WITH OPPONENT 222 ***
8650 REM *** FIGHT WITH OPPONENT 223 ***
8655 REM *** FIGHT WITH OPPONENT 224 ***
8660 REM *** FIGHT WITH OPPONENT 225 ***
8665 REM *** FIGHT WITH OPPONENT 226 ***
8670 REM *** FIGHT WITH OPPONENT 227 ***
8675 REM *** FIGHT WITH OPPONENT 228 ***
8680 REM *** FIGHT WITH OPPONENT 229 ***
8685 REM *** FIGHT WITH OPPONENT 230 ***
8690 REM *** FIGHT WITH OPPONENT 231 ***
8695 REM *** FIGHT WITH OPPONENT 232 ***
8700 REM *** FIGHT WITH OPPONENT 233 ***
8705 REM *** FIGHT WITH OPPONENT 234 ***
8710 REM *** FIGHT WITH OPPONENT 235 ***
8715 REM *** FIGHT WITH OPPONENT 236 ***
8720 REM *** FIGHT WITH OPPONENT 237 ***
8725 REM *** FIGHT WITH OPPONENT 238 ***
8730 REM *** FIGHT WITH OPPONENT 239 ***
8735 REM *** FIGHT WITH OPPONENT 240 ***
8740 REM *** FIGHT WITH OPPONENT 241 ***
8745 REM *** FIGHT WITH OPPONENT 242 ***
8750 REM *** FIGHT WITH OPPONENT 243 ***
8755 REM *** FIGHT WITH OPPONENT 244 ***
8760 REM *** FIGHT WITH OPPONENT 245 ***
8765 REM *** FIGHT WITH OPPONENT 246 ***
8770 REM *** FIGHT WITH OPPONENT 247 ***
8775 REM *** FIGHT WITH OPPONENT 248 ***
8780 REM *** FIGHT WITH OPPONENT 249 ***
8785 REM *** FIGHT WITH OPPONENT 250 ***
8790 REM *** FIGHT WITH OPPONENT 251 ***
8795 REM *** FIGHT WITH OPPONENT 252 ***
8800 REM *** FIGHT WITH OPPONENT 253 ***
8805 REM *** FIGHT WITH OPPONENT 254 ***
8810 REM *** FIGHT WITH OPPONENT 255 ***
8815 REM *** FIGHT WITH OPPONENT 256 ***
8820 REM *** FIGHT WITH OPPONENT 257 ***
8825 REM *** FIGHT WITH OPPONENT 258 ***
8830 REM *** FIGHT WITH OPPONENT 259 ***
8835 REM *** FIGHT WITH OPPONENT 260 ***
8840 REM *** FIGHT WITH OPPONENT 261 ***
8845 REM *** FIGHT WITH OPPONENT 262 ***
8850 REM *** FIGHT WITH OPPONENT 263 ***
8855 REM *** FIGHT WITH OPPONENT 264 ***
8860 REM *** FIGHT WITH OPPONENT 265 ***
8865 REM *** FIGHT WITH OPPONENT 266 ***
8870 REM *** FIGHT WITH OPPONENT 267 ***
8875 REM *** FIGHT WITH OPPONENT 268 ***
8880 REM *** FIGHT WITH OPPONENT 269 ***
8885 REM *** FIGHT WITH OPPONENT 270 ***
8890 REM *** FIGHT WITH OPPONENT 271 ***
8895 REM *** FIGHT WITH OPPONENT 272 ***
8900 REM *** FIGHT WITH OPPONENT 273 ***
8905 REM *** FIGHT WITH OPPONENT 274 ***
8910 REM *** FIGHT WITH OPPONENT 275 ***
8915 REM *** FIGHT WITH OPPONENT 276 ***
8920 REM *** FIGHT WITH OPPONENT 277 ***
8925 REM *** FIGHT WITH OPPONENT 278 ***
8930 REM *** FIGHT WITH OPPONENT 279 ***
8935 REM *** FIGHT WITH OPPONENT 280 ***
8940 REM *** FIGHT WITH OPPONENT 281 ***
8945 REM *** FIGHT WITH OPPONENT 282 ***
8950 REM *** FIGHT WITH OPPONENT 283 ***
8955 REM *** FIGHT WITH OPPONENT 284 ***
8960 REM *** FIGHT WITH OPPONENT 285 ***
8965 REM *** FIGHT WITH OPPONENT 286 ***
8970 REM *** FIGHT WITH OPPONENT 287 ***
8975 REM *** FIGHT WITH OPPONENT 288 ***
8980 REM *** FIGHT WITH OPPONENT 289 ***
8985 REM *** FIGHT WITH OPPONENT 290 ***
8990 REM *** FIGHT WITH OPPONENT 291 ***
8995 REM *** FIGHT WITH OPPONENT 292 ***
9000 REM *** FIGHT WITH OPPONENT 293 ***
9005 REM *** FIGHT WITH OPPONENT 294 ***
9010 REM *** FIGHT WITH OPPONENT 295 ***
9015 REM *** FIGHT WITH OPPONENT 296 ***
9020 REM *** FIGHT WITH OPPONENT 297 ***
9025 REM *** FIGHT WITH OPPONENT 298 ***
9030 REM *** FIGHT WITH OPPONENT 299 ***
9035 REM *** FIGHT WITH OPPONENT 300 ***
9040 REM *** FIGHT WITH OPPONENT 301 ***
9045 REM *** FIGHT WITH OPPONENT 302 ***
9050 REM *** FIGHT WITH OPPONENT 303 ***
9055 REM *** FIGHT WITH OPPONENT 304 ***
9060 REM *** FIGHT WITH OPPONENT 305 ***
9065 REM *** FIGHT WITH OPPONENT 306 ***
9070 REM *** FIGHT WITH OPPONENT 307 ***
9075 REM *** FIGHT WITH OPPONENT 308 ***
9080 REM *** FIGHT WITH OPPONENT 309 ***
9085 REM *** FIGHT WITH OPPONENT 310 ***
9090 REM *** FIGHT WITH OPPONENT 311 ***
9095 REM *** FIGHT WITH OPPONENT 312 ***
9100 REM *** FIGHT WITH OPPONENT 313 ***
9105 REM *** FIGHT WITH OPPONENT 314 ***
9110 REM *** FIGHT WITH OPPONENT 315 ***
9115 REM *** FIGHT WITH OPPONENT 316 ***
9120 REM *** FIGHT WITH OPPONENT 317 ***
9125 REM *** FIGHT WITH OPPONENT 318 ***
9130 REM *** FIGHT WITH OPPONENT 319 ***
9135 REM *** FIGHT WITH OPPONENT 320 ***
9140 REM *** FIGHT WITH OPPONENT 321 ***
9145 REM *** FIGHT WITH OPPONENT 322 ***
9150 REM *** FIGHT WITH OPPONENT 323 ***
9155 REM *** FIGHT WITH OPPONENT 324 ***
9160 REM *** FIGHT WITH OPPONENT 325 ***
9165 REM *** FIGHT WITH OPPONENT 326 ***
9170 REM *** FIGHT WITH OPPONENT 327 ***
9175 REM *** FIGHT WITH OPPONENT 328 ***
9180 REM *** FIGHT WITH OPPONENT 329 ***
9185 REM *** FIGHT WITH OPPONENT 330 ***
9190 REM *** FIGHT WITH OPPONENT 331 ***
9195 REM *** FIGHT WITH OPPONENT 332 ***
9200 REM *** FIGHT WITH OPPONENT 333 ***
9205 REM *** FIGHT WITH OPPONENT 334 ***
9210 REM *** FIGHT WITH OPPONENT 335 ***
9215 REM *** FIGHT WITH OPPONENT 336 ***
9220 REM *** FIGHT WITH OPPONENT 337 ***
9225 REM *** FIGHT WITH OPPONENT 338 ***
9230 REM *** FIGHT WITH OPPONENT 339 ***
9235 REM *** FIGHT WITH OPPONENT 340 ***
9240 REM *** FIGHT WITH OPPONENT 341 ***
9245 REM *** FIGHT WITH OPPONENT 342 ***
9250 REM *** FIGHT WITH OPPONENT 343 ***
9255 REM *** FIGHT WITH OPPONENT 344 ***
9260 REM *** FIGHT WITH OPPONENT 345 ***
9265 REM *** FIGHT WITH OPPONENT 346 ***
9270 REM *** FIGHT WITH OPPONENT 347 ***
9275 REM *** FIGHT WITH OPPONENT 348 ***
9280 REM *** FIGHT WITH OPPONENT 349 ***
9285 REM *** FIGHT WITH OPPONENT 350 ***
9290 REM *** FIGHT WITH OPPONENT 351 ***
9295 REM *** FIGHT WITH OPPONENT 352 ***
9300 REM *** FIGHT WITH OPPONENT 353 ***
9305 REM *** FIGHT WITH OPPONENT 354 ***
9310 REM *** FIGHT WITH OPPONENT 355 ***
9315 REM *** FIGHT WITH OPPONENT 356 ***
9320 REM *** FIGHT WITH OPPONENT 357 ***
9325 REM *** FIGHT WITH OPPONENT 358 ***
9330 REM *** FIGHT WITH OPPONENT 359 ***
9335 REM *** FIGHT WITH OPPONENT 360 ***
9340 REM *** FIGHT WITH OPPONENT 361 ***
9345 REM *** FIGHT WITH OPPONENT 362 ***
9350 REM *** FIGHT WITH OPPONENT 363 ***
9355 REM *** FIGHT WITH OPPONENT 364 ***
9360 REM *** FIGHT WITH OPPONENT 365 ***
9365 REM *** FIGHT WITH OPPONENT 366 ***
9370 REM *** FIGHT WITH OPPONENT 367 ***
9375 REM *** FIGHT WITH OPPONENT 368 ***
9380 REM *** FIGHT WITH OPPONENT 369 ***
9385 REM *** FIGHT WITH OPPONENT 370 ***
9390 REM *** FIGHT WITH OPPONENT 371 ***
9395 REM *** FIGHT WITH OPPONENT 372 ***
9400 REM *** FIGHT WITH OPPONENT 373 ***
9405 REM *** FIGHT WITH OPPONENT 374 ***
9410 REM *** FIGHT WITH OPPONENT 375 ***
9415 REM *** FIGHT WITH OPPONENT 376 ***
9420 REM *** FIGHT WITH OPPONENT 377 ***
9425 REM *** FIGHT WITH OPPONENT 378 ***
9430 REM *** FIGHT WITH OPPONENT 379 ***
9435 REM *** FIGHT WITH OPPONENT 380 ***
9440 REM *** FIGHT WITH OPPONENT 381 ***
9445 REM *** FIGHT WITH OPPONENT 382 ***
9450 REM *** FIGHT WITH OPPONENT 383 ***
9455 REM *** FIGHT WITH OPPONENT 384 ***
9460 REM *** FIGHT WITH OPPONENT 385 ***
9465 REM *** FIGHT WITH OPPONENT 386 ***
9470 REM *** FIGHT WITH OPPONENT 387 ***
9475 REM *** FIGHT WITH OPPONENT 388 ***
9480 REM *** FIGHT WITH OPPONENT 389 ***
9485 REM *** FIGHT WITH OPPONENT 390 ***
9490 REM *** FIGHT WITH OPPONENT 391 ***
9495 REM *** FIGHT WITH OPPONENT 392 ***
9500 REM *** FIGHT WITH OPPONENT 393 ***
9505 REM *** FIGHT WITH OPPONENT 394 ***
9510 REM *** FIGHT WITH OPPONENT 395 ***
9515 REM *** FIGHT WITH OPPONENT 396 ***
9520 REM *** FIGHT WITH OPPONENT 397 ***
9525 REM *** FIGHT WITH OPPONENT 398 ***
9530 REM *** FIGHT WITH OPPONENT 399 ***
9535 REM *** FIGHT WITH OPPONENT 400 ***
9540 REM *** FIGHT WITH OPPONENT 401 ***
9545 REM *** FIGHT WITH OPPONENT 402 ***
9550 REM *** FIGHT WITH OPPONENT 403 ***
9555 REM *** FIGHT WITH OPPONENT 404 ***
9560 REM *** FIGHT WITH OPPONENT 405 ***
9565 REM *** FIGHT WITH OPPONENT 406 ***
9570 REM *** FIGHT WITH OPPONENT 407 ***
9575 REM *** FIGHT WITH OPPONENT 408 ***
9580 REM *** FIGHT WITH OPPONENT 409 ***
9585 REM *** FIGHT WITH OPPONENT 410 ***
9590 REM *** FIGHT WITH OPPONENT 411 ***
9595 REM *** FIGHT WITH OPPONENT 412 ***
9600 REM *** FIGHT WITH OPPONENT 413 ***
9605 REM *** FIGHT WITH OPPONENT 414 ***
9610 REM *** FIGHT WITH OPPONENT 415 ***
9615 REM *** FIGHT WITH OPPONENT 416 ***
9620 REM *** FIGHT WITH OPPONENT 417 ***
9625 REM *** FIGHT WITH OPPONENT 418 ***
9630 REM *** FIGHT WITH OPPONENT 419 ***
9635 REM *** FIGHT WITH OPPONENT 420 ***
9640 REM *** FIGHT WITH OPPONENT 421 ***
9645 REM *** FIGHT WITH OPPONENT 422 ***
9650 REM *** FIGHT WITH OPPONENT 423 ***
9655 REM *** FIGHT WITH OPPONENT 424 ***
9660 REM *** FIGHT WITH OPPONENT 425 ***
9665 REM *** FIGHT WITH OPPONENT 426 ***
9670 REM *** FIGHT WITH OPPONENT 427 ***
9675 REM *** FIGHT WITH OPPONENT 428 ***
9680 REM *** FIGHT WITH OPPONENT 429 ***
9685 REM *** FIGHT WITH OPPONENT 430 ***
9690 REM *** FIGHT WITH OPPONENT 431 ***
9695 REM *** FIGHT WITH OPPONENT 432 ***
9700 REM *** FIGHT WITH OPPONENT 433 ***
9705 REM *** FIGHT WITH OPPONENT 434 ***
9710 REM *** FIGHT WITH OPPONENT 435 ***
9715 REM *** FIGHT WITH OPPONENT 436 ***
9720 REM *** FIGHT WITH OPPONENT 437 ***
9725 REM *** FIGHT WITH OPPONENT 438 ***
9730 REM *** FIGHT WITH OPPONENT 439 ***
9735 REM *** FIGHT WITH OPPONENT 440 ***
9740 REM *** FIGHT WITH OPPONENT 441 ***
9745 REM *** FIGHT WITH OPPONENT 442 ***
9750 REM *** FIGHT WITH OPPONENT 443 ***
9755 REM *** FIGHT WITH OPPONENT 444 ***
9760 REM *** FIGHT WITH OPPONENT 445 ***
9765 REM *** FIGHT WITH OPPONENT 446 ***
9770 REM *** FIGHT WITH OPPONENT 447 ***
9775 REM *** FIGHT WITH OPPONENT 448 ***
9780 REM *** FIGHT WITH OPPONENT 449 ***
9785 REM *** FIGHT WITH OPPONENT 450 ***
9790 REM *** FIGHT WITH OPPONENT 451 ***
9795 REM *** FIGHT WITH OPPONENT 452 ***
9800 REM *** FIGHT WITH OPPONENT 453 ***
9805 REM *** FIGHT WITH OPPONENT 454 ***
9810 REM *** FIGHT WITH OPPONENT 455 ***
9815 REM *** FIGHT WITH OPPONENT 456 ***
9820 REM *** FIGHT WITH OPPONENT 457 ***
9825 REM *** FIGHT WITH OPPONENT 458 ***
9830 REM *** FIGHT WITH OPPONENT 459 ***
9835 REM *** FIGHT WITH OPPONENT 460 ***
9840 REM *** FIGHT WITH OPPONENT 461 ***
9845 REM *** FIGHT WITH OPPONENT 462 ***
9850 REM *** FIGHT WITH OPPONENT 463 ***
9855 REM *** FIGHT WITH OPPONENT 464 ***
9860 REM *** FIGHT WITH OPPONENT 465 ***
9865 REM *** FIGHT WITH OPPONENT 466 ***
9870 REM *** FIGHT WITH OPPONENT 467 ***
9875 REM *** FIGHT WITH OPPONENT 468 ***
9880 REM *** FIGHT WITH OPPONENT 469 ***
9885 REM *** FIGHT WITH OPPONENT 470 ***
9890 REM *** FIGHT WITH OPPONENT 471 ***
9895 REM *** FIGHT WITH OPPONENT 472 ***
9900 REM *** FIGHT WITH OPPONENT 473 ***
9905 REM *** FIGHT WITH OPPONENT 474 ***
9910 REM *** FIGHT WITH OPPONENT 475 ***
9915 REM *** FIGHT WITH OPPONENT 476 ***
9920 REM *** FIGHT WITH OPPONENT 477 ***
9925 REM *** FIGHT WITH OPPONENT 478 ***
9930 REM *** FIGHT WITH OPPONENT 479 ***
9935 REM *** FIGHT WITH OPPONENT 480 ***
9940 REM *** FIGHT WITH OPPONENT 481 ***
9945 REM *** FIGHT WITH OPPONENT 482 ***
9950 REM *** FIGHT WITH OPPONENT 483 ***
9955 REM *** FIGHT WITH OPPONENT 484 ***
9960 REM *** FIGHT WITH OPPONENT 485 ***
9965 REM *** FIGHT WITH OPPONENT 486 ***
9970 REM *** FIGHT WITH OPPONENT 487 ***
9975 REM *** FIGHT WITH OPPONENT 488 ***
9980 REM *** FIGHT WITH OPPONENT 489 ***
9985 REM *** FIGHT WITH OPPONENT 490 ***
9990 REM *** FIGHT WITH OPPONENT 491 ***
9995 REM *** FIGHT WITH OPPONENT 492 ***

```

## Possessed

Guy Rowland,  
Hextable,  
Kent.

ZX-81

POSSESSED is a game for the 16K ZX-81 written entirely in machine code. The game itself occupies under 1K, but uses the full display file which unfortunately means the Rampack has to be firmly placed on the back of the machine for the game to run. The idea of the game is loosely based on Robotron: you are a megabeing — or a 0 — running around shooting the robots — or Xs — and the highly technical idea behind it is to zap as many robots as possible before the last of your five lives deserts you. The game includes on-screen scoring and a border indicating how many lives you have left.

The code is held in three Rem statements which should be the first three lines of the program. To begin, put the computer in fast mode, then type:

1 REM..... 439 FULL STOPS OR ANY OTHER CHARACTERS.....

and then slow. When entered, Peek 16953 should give 118 if you have done this correctly. It gives another number, add or delete characters as necessary. Next enter the short hex loader program in figure 1. This is the same as any normal hex loader, with two important additions:

■ totals are entered at the start of each line of hex, and

■ the END address is entered, so the computer stops automatically

If an error is made in entering any line of hex, instead of displaying the total, it will print E, and you must enter the total and hex again. So now enter the hex numbers and total in figure 2.

When you have finished this, alter the loader program so line 10 reads:

LET A=16959

and line 20 reads

LET D=17301

Next, type in a Rem statement at line 2, 343 characters long — which should return a value of 118 when 17302 is Peaked — and enter the hex in figure 3.

The final Rem statement is only 72 characters long, and should be line 3 of your program. Peek 17380 should give 118, and lines 10 and 20 of the loader should have the values 17308 and 17379. Enter the hex in figure 4, save the whole lot a couple of times just to make sure no mistakes have crept in, and type:

RAND USR 17303

## Border will flash

After pressing Newline, a border will flash, several Xs and an 0 will appear, the screen will go dark for a second and the game will commence. If you are not touching any of the keys, you will start firing and moving up, and before long one of the robots will get you. To move your megabeing around, use the following control:

any key from Q to T for up

any key from Z to V for down

any key from A to G for left, and

any key from H to L for right

I find it easiest to use Q, Z, G and H, although you may prefer others. Since you fire automatically in the direction you are moving, there is no fire button, and diagonal movement is possible by pressing two keys at once.

When a whole screen of robots is cleared, a screen with more robots should appear. On average, each screen should have two or three

more robots than the last, although occasionally you may find a higher sector has less than the one before.

If the game does not run correctly or crashes at some stage, reload the program from tape and enter the program in figure 4 substituting values for A and D depending on which Rem statement you are checking. When a screen is full of hex, press Cont to carry on where you left off. To alter the value of a byte, Poke the address with the correct value in decimal as a direct command. A hex/decimal conversion table is given in the Sinclair manual on page 181.

The game is available direct from the author for those who find the hex listing too hard. Please send £1.50 and a sae to Guy Rowland, Stony-acres, College Road, Hextable, Kent, BR8 7LT.

Figure 1.

```

5 REM HEXLOADER
10 PRINT "START ADDRESS"
20 INPUT S
30 PRINT "FINISH ADDRESS"
40 INPUT F
50 FOR N=S TO F STEP 8
60 LET T=0
70 PRINT N;" ";
80 INPUT A$
90 PRINT A$;"=";
100 INPUT TOT
110 PRINT TOT
115 IF PEEK 16422=2 THEN SCROLL

120 LET Z=0
130 FOR K=1 TO LEN A$ STEP 2
140 LET C=CODE A$(K)-28)*16+CODE A$(K+1)-28
150 LET T=T+C
160 POKE N+Z,C
170 LET Z=Z+1
180 NEXT K
190 IF TOT=T THEN GOTO 220
200 PRINT "ERROR - PLEASE INPUT AGAIN"
205 IF PEEK 16442=2 THEN SCROLL

210 GOTO 60
220 NEXT N

```



## 98 YOUR COMPUTER, SEPTEMBER 1985



```

810 IF dir=0 THEN dir=4
820 IF dir=1 THEN b=b-1
830 IF dir=2 THEN b=b+1
840 IF dir=3 THEN a=a-1
850 IF dir=4 THEN a=a+1
860 p=FN point(a,b):IF p=0 OR p=2 GOTO 880
870 IF p=1 OR p=3 THEN RETURN
880 LOCATE a,b:PRINT CHR$(239+dir):LOCATE PEEK(ea),PEEK(
K(eb)):PRINT
890 LOCATE PEEK(fa),PEEK(fb):PRINT CHR$(243+PEEK(fc))
900 LOCATE PEEK(ea+3),PEEK(eb+3):PRINT CHR$(247+PEEK(e
c+3))
910 fa=fa+3:fb=fb+3:fc=fc+3:IF p=2 GOTO 920 ELSE ea=ea
+3:eb=eb+3:ec=ec+3
920 POKE fa,a:POKE fb,b:POKE fc,c:dir
930 IF p=2 THEN GOSUB 1050
940 GOTO 750
950 RETURN
960 ***** end game *****
970 SOUND 4,0,0,0,2,0,15
980 FOR Z=0 TO 26:INK 0,Z:BORDER Z:FOR Y=1 TO 50:NEXT
Y,Z

990 INK 0,23:BORDER 23
1000 DIR=0,50,0,LENGTH=5
1010 Z$=""
1020 LOCATE 5,12:PEN 2:PRINT"PRESS SPACE BAR FOR ANOTH
ER GAME"
1030 z$=INKEY$:IF z$<>" " GOTO 1020
1040 RETURN
1050 ***** score *****
1060 SOUND 4,60,0,0,1,1
1070 c=INT(RND*38)+2
1080 d=INT(RND*21)+2
1090 IF FN point(c,d)>0 GOTO 1070
1100 LOCATE c,d:PEN 1:PRINT CHR$(253)
1110 c=INT(RND*38)+2
1120 d=INT(RND*21)+2
1130 IF FN point(c,d)>0 GOTO 1110
1140 LOCATE c,d:PEN 2:PRINT CHR$(252)
1150 sc=sc+length*10:length=length+1
1160 IF sc>hi THEN hi=sc
1170 sc$=STR$(sc):LOCATE 9,25:PEN 2:PRINT sc$
1180 hi$=STR$(hi):LOCATE 34,25:PRINT hi$
1190 PEN 1:SCND 132,0:RETURN

```

## Disc utility

Matthew Desmond,  
Cholmsford,  
Essex.

*CBM-64*

THIS is a program for a Commodore 64 plus 1541 Disc drive. The program enables the user to enter disc commands without the need for the open statement. The facilities are:

Directory, Format, Scratch, Re-name, Initialise, Validate and Copy. Disc Utility is menu drive, fully "nug trapped" and disk status is shown after every operation.

*Line Description.*

10-1140 Main Set Up  
1150-1210 Wait for a Key Press  
1220-1290 Read Error From Disk  
1300-1510 Main Menu  
1520-1560 End Program Routine

1570-1700 Directory Routine  
1710-1850 Format Routine  
1860-1980 Scratch Routine  
1990-2160 Re-name Routine  
2170-2290 Initialise Routine  
2300-2420 Validate Routine  
2430-2840 Copy Routine  
2850-3010 Machine Code Disassembly

The machine code reads a character from the disc for the directory.

```

1000 REM *****
*****
1010 REM          DISK UTILITY
1020 REM  BY MATTHEW DESMOND (C)
1030 REM *****
*****
1040 DIM N$(10):NF=0
1050 FORA=100:READ N$(A):NEXT
A
1060 DATADIRECTORY,FORMAT,SCRATCH
H
1070 DATAKL-NAME,INITIALISE,VALI
DATE
1080 DATACOPY,END
1090 FORA=5000TO50000
1100 READ:POKEA,B:NEXTA
1110 DATA 162,3,32,198,255,32,20
7
1120 DATA 255,32,210,255,208,248
,169
1130 DATA 13,32,210,255,76,204,2
55
1140 GOTO 1303
1150 REM *****
*****
1160 PFM*** WAIT FOR A KEY PRE
SS ***
1170 REM *****
*****
1180 PRINTTAB(13)""* PRESS A KE
Y *""
1190 POKE198,3
1200 GETA$:IF A$="" THEN 1200
1210 RETURN
1220 REM *****
*****
1230 REM *** READ ERROR FROM DI
SK ***
1240 REM *****
*****
1250 OPEN15,8,15
1260 INPUT#15,A,B$,C,D
1270 CLOSE15
1280 PRINT""* DISK STATUS :":A,
B$,C,D
1290 RETURN
1300 REM *****
*****
1310 REM ***** MENU *****
*****
1320 REM *****

```

```

*****
1330 POKE53280,5:POKE53281,1
1340 PRINT"";
1350 PRINTTAB(14)""*
1360 PRINTTAB(14)""DISK UTILITY""
1370 PRINT""
1380 PRINTTAB(16)""*****"
1390 PRINTTAB(16)""* MENU *"
1400 PRINTTAB(16)""*****"
1410 PRINT
1420 FORA=1000
1430 PRINT""*A,""C"":":A,B$,C
A)
1440 NEXTA
1450 PRINT""*WHICH FUNCTION DO
YOU REQUIRE?":
1460 GOSUB1130:A=VAL(A$)
1470 IF A<1000 THEN GOTO 1460
1480 PRINT""*A$:""
1490 GNA GOTO1570,1710,1860,199
0,2170
1500 GNA GOTO2300,2430,2520
1510 GOTO1460
1520 REM *****
*****
1530 REM ***** END *****
*****
1540 REM *****
*****
1550 PRINT""*GOOOOOVC:""
1560 END
1570 REM *****
*****
1580 REM ***** DIRECTORY ***
*****
1590 REM *****
*****
1600 PRINT"";PR=0
1610 PRINT""
1620 PRINT""*DIRECTORY:""
1630 PRINT""*PLEASE LOAD DISK":GO
SUB150
1640 OPEN3,8,0,""50""*GETH3,A$,A$
1650 GETH2,A$,A$,B$,B$
1660 IF A$="" THEN CLOSE3:GOTO1700
1670 B$=B$+CHR$(0):B$=B$+CHR
$(0)
1680 PRINT256*ASC(B$)+ASC(B$),
1690 SYS50000:GOTO1650
1700 GOSUB1150:GOTO1300
1710 REM *****
*****

```

```

1720 REM ***** FORMAT *****
*****
1730 REM *****
*****
1740 PRINT"";IDS=""*DNS=""
1750 PRINT""
1760 PRINT""*FORMAT:""
1770 PRINT""*PLEASE LOAD DISK":GO
SUB1150
1780 INPUT""*DISK NAME":DNS
1790 IF DNS="" THEN DNS=""*DNS=""*T
HEM1710
1800 INPUT""*DISK ID":IDS
1810 IF IDS<"" THEN DNS=DNS+" "+IDS
$
1820 OPEN1,8,15,""NO""*DNS:CLOSE1
1830 GOSUB1220
1840 GOSUB1150
1850 GOTO 1300
1860 REM *****
*****
1870 REM ***** SCRATCH ***
*****
1880 REM *****
*****
1890 PRINT"";
1900 PRINT""
1910 PRINT""*SCRATCH:""
1920 PRINT""*PLEASE LOAD DISK":GO
SUB1150
1930 PRINT""*NAME OF PROGRAM TO BE
SCRATCHED"
1940 INPUTPN$:IF PN$="" THEN 1960
1950 OPEN2,8,15,""S0""*PN$:CLOSE2
1960 GOSUB1220
1970 GOSUB1150
1980 GOTO1300
1990 REM *****
*****
2000 REM ***** RE-NAME *****
*****
2010 REM *****
*****
2020 PRINT"";
2030 PRINT""
2040 PRINT""*RE-NAME:""
2050 PRINT""*PLEASE LOAD DISK":GO
SUB1150
2060 PRINT""*NEW NAME":

```

(continued on next page)



(continued from previous page)

```

2070 INPUTMMS
2080 IFMMS=""ORNM=""$"ORNM=""$*T
HEN1990
2090 PRINT"OLD NAME";
2100 INPUTOLS
2110 IFOLS=""OROL=""$"OROL=""$*T
HEN1990
2120 OPEN4,8,15,"R0:"+"NM$+"="+DL
$
2130 CLOSE4
2140 GOSUB1220
2150 GOSUB1150
2160 GOTO1300
2170 REM*****
*****
2180 REM***** INITIALISE **
*****
2190 REM*****
*****
2200 PRINT"L";
2210 PRINT"2";
2220 PRINT"INITIALISE:";
2230 PRINT"PLEASE LOAD DISK":GO
SUB1150
2240 PRINT"NEW
"
2250 PRINT"INITIALISING DISK DR
IVE"
2260 OPEN5,8,15,"INITIALISE":CLO
SE5
2270 GOSUB1220
2280 GOSUB1150
2290 GOTO1300
2300 REM*****
*****
2310 REM***** VALIDATE. ***
*****
2320 REM*****
*****
2330 PRINT"L";
2340 PRINT"2";
2350 PRINT"VALIDATE:";

```

```

2360 PRINT"PLEASE LOAD DISK":GO
SUB1150
2370 PRINT"NEW
"
2380 PRINT"VALIDATING DISK"
2390 OPEN6,8,15,"VALIDATE":CLOSE
6
2400 GOSUB1220
2410 GOSUB1150
2420 GOTO1300
2430 REM*****
*****
2440 REM***** COPY. ****
*****
2450 REM*****
*****
2460 PRINT"L";
2470 PRINT"2";
2480 PRINT"COPY:";
2490 PRINT"PLEASE LOAD DISK":GO
SUB1150
2500 PRINT"COPY OR MERGE ? ";
2510 GOSUB1190
2520 IFAS=""M"THENPRINT"M":GOTO26
20
2530 IFAS<>"C"THEN2510
2540 PRINT"C":PRINT"ORIGINAL NAM
E:";
2550 INPUTOJS
2560 IFOJS=""OROJS=""$"OROJS=""$*T
HEN2430
2570 PRINT"NEW NAME:";
2580 INPUTNMS
2590 IFNMS=""ORNM=""$"ORNM=""$*T
HEN2430
2600 FF$="COPY0:"+"NM$+"="+OJS
2610 GOTO2810
2620 PRINT"HOW MANY FILES (2-4)?
";
2630 GOSUB1190 A=VAL(A$)
2640 IFAC20&A>4THENGOTO2930
2650 PRINTA$"FILES"
2660 NM$(1)=""NM$(2)=""
2670 NM$(3)=""NM$(4)=""
2680 FORB=1TOA

```

```

2690 PRINT"FILENAME H";MID$(STR
$(B),2);
2700 PRINT"
";
2710 PRINT"*****";
2720 INPUTMMS(B):TS=MMS(B)
2730 IFT$=""ORTS=""$"ORTS=""$*T
HEN
2690
2740 IFB<>1THENMMS(B)=""B:"+"MMS(
B)
2750 NEXTB:PRINT"
"
2760 PRINT"NEW FILENAME:";
2770 INPUTMMS
2780 IFMMS=""ORNM=""$"ORNM=""$*T
HEN2760
2790 FF$="COPY0:"+"MMS+"="+B:"+"MMS(
1)+"MMS(2)
2800 FF$=FF$+MMS(3)+MMS(4)
2810 OPEN7,8,15:PRINTH7,FF$:CLCS
E7
2820 GOSUB1220
2830 GOSUB1150
2840 GOTO1300
2850 REM*****
*****
2860 REM*****
*****
2870 REM*** MACHINE CODE LISTIN
G. ****
2880 REM*****
*****
2890 REM*****
*****
2900 :
2910 :
2920 ,C000 12 03 LDX #503
2930 ,C002 20 C6 FF JSR $FFC6
2940 ,C005 20 CF FF JSR $FFCF
2950 ,C008 20 D2 FF JSR $FFD2
2960 ,C00B 00 F8 BNE $C005
2970 ,C00D 10 00 LDA #50D
2980 ,C00F 20 D2 FF JSR $FFD2
2990 ,C012 4C CC FF JMP $FFC0
3000 :
3010 :

```

## Data moving routine

Wai Kei Ho,  
Aston,  
Oxfordshire.

*Amstrad*

THIS PROGRAM is written for people who have got disc drives and want to store binary file directly from the disc into the locations occupied by the disc operating system. All addresses entered are decimal values, otherwise '&' must be added in front of those hexadecimal addresses.

The data moving routine must not be in the locations of the moved file or the destination. If the file moved does not overlap the destination file, the file will be moved from the beginning, otherwise from the end.

If moved file is stored on tape, firstly load the

file into where it does not overlap the DOS; the sum of the start address and the length must be less than 42619. The store it onto disc. To run this routine, the file must first be loaded into the computer with the data moved from the start address which is calculated by yourself.

If you do not bother to calculate the routine starting point and file moved starting points, then delete the following lines:

190, 200, 250, 260, 290, 340, 350 and 550

And add the following lines:

250 RS=42615-LM-22:MS=42615-LM:

MT=MT+LM

260 HL=&2B:DE=&1B:bytea=&77:

hbytea=&A6

But attention must be paid that the file moved start address now indicates where to start loading data into the main memory, not where to commence moving the data. It is because you

do not know the start address without calculation, so that this address must be shown. Here is an example:

File	Start address	Length	Entry point
a	4900	24576	0
c	31448	12288	32/68

Hence the informations entered may be as follows:

Routine starting point	29800
Data moved starting point	30000
Length	12288
Destination	31448
Executed point	32768
Title move	

After that, use a simple program to link these three programs stored on the same disc.

```

10 MEMORY 4899
20 LOAD "a":Load "Move"
30 LOAD "b":30000
40 Call 29800

```

```

100 REM *****
110 REM ** data moving routine **
120 REM ** for **
130 REM ** AMSTRAD CPC 464 **
140 REM *****
150 MODE 1:INK 3,16,25:SPEED INK 30,50
170 PEN 3:PRINT TAB(9)"* DATA MOVING ROUTINE *"
180 LOCATE 1,6:PEN 2:PRINT"Enter the following items :
":PRINT:PRINT:PRINT
190 PEN 1:INPUT"Routine starting point : ".rs:PRINT
200 INPUT"File moved starting point : ".ms:PRINT
210 INPUT"Length of data moved : ".lm:PRINT
220 INPUT"Address of destination : ".mt:PRINT
230 INPUT"Executed address : ".ea
240 IF rs>65536 OR ms>65536 OR lm>65536 THEN PRINT CHR
$(7):GOTO 100

```

```

250 IF ms>lm>mt THEN MF$="END" ELSE MF$="BEGINNING"
260 IF MF$="END" THEN ms=ms+lm:mt=mt+lm
270 IS$=HEX$(MC):MT$=HEX$(MT):LM$=HEX$(LM):EA$=HEX$(EA
)
280 REM ** convert addresses to hi and low bytes data
**
290 lbytea=VAL("&"+RIGHT$(MS$,2)):hbytea=VAL("&"+LEFT$(
MS$,2))
300 lbyteb=VAL("&"+RIGHT$(MT$,2)):hbyteb=VAL("&"+LEFT$(
MT$,2))
310 lbytec=VAL("&"+RIGHT$(LM$,2)):hbytec=VAL("&"+LEFT$(
LM$,2))
320 IF EA$="" THEN er=&C9:ro=19:GOTO 350 ELSE er=&CD
:ro=21:GOTO 330
330 lbyted=VAL("&"+RIGHT$(EA$,2)):hbyted=VAL("&"+LEFT$(
EA$,2))
340 REM ** increment / decrement those registers **

```



```

490 NEXT i
500 LOCATE 1,7:PRINT"routine starting point ":"rs;" =&
":PEN 3:PRINT HEX$(rs):PRINT
510 PEN 1:PRINT"Data moved start address ":"ms;" =&":PEN 3:PRINT
520 PEN 1:PRINT"Length of data ":"LM;" =&":PEN 3:PRINT
530 PEN 1:PRINT"Store data into ":"MT;" =&":PEN 3:PRINT
540 IF EA<>0 THEN PEN 1:PRINT"Executed address ":"EA;" =&":PEN 3:PRINT EA$:PRINT
550 PEN 1:PRINT"Start moving from ":"PEN 3:PRINT MF$
560 LOCATE 14,22:FEN 2:PRINT"CORRECT ? (Y/N)"
570 fa$=INKEY$:fa$=UPPER$(fa$):IF fa$="Y" THEN GOTO
580 IF fa$="N" THEN RUN
590 GOTO 570
600 LOCATE 14,22:PRINT"
610 INPUT"Title "title$
620 SAVE title$.b.rs.ro
630 NEW

```

The routines can then be called in the usual way, i.e.: RAND USR address of routine

```

35,78,35,70,35,197,205,229,25,4
3,54,58,193,225,94,35,86,235,9,2
35,114,43,115,43,43,24,186,126,2
30,192,200,42,83,92
13 DATA 126,230,192,194,176,27
229,205,360+start,200,254,225,9
05,164,25,235,24,237,205,110,25
126,230,192,192,205,360+start,20
3,190,201,35,35,35,195,171,40,12
6,230,192
14 DATA 192,50,71,92,86,35,94,
237,83,69,92,35,229,221,225,94,3
5,86,34,93,92,25,35,34,86,92,237
98,217,201,205,221,25,197,196,2
32,25,217,193,9,217
15 DATA 201,126,205,182,24,254
34,34,93,92,192,35,71,237,177,2
4,240,42,83,92,205,366+start,194
176,27,231,253,52,13,254,206,32
9,35,205,411+start,254,41,32
16 DATA 248,35,205,411+start,2
54,56,40,202,254,200,40,228,254,
234,40,3,254,13,192,217,221,94,0
221,86,1,235,237,82,221,117,0,2
21,116,1,42,86,92,24,194
20 INPUT "start address?";star
t
30 IF start+491>PEEK 23732+256
*PEEK 23733 THEN GO TO 20
40 RANDOMIZE start: CLEAR star
t-1: LET start=PEEK 23670+256*PE
EK 23671
50 FOR a=0 TO 491: READ b: IF
b>255 THEN RANDOMIZE b: POKE sta
rt+a,PEEK 23670: LET a=a+1: POKE
start+a,PEEK 23671: GO TO 70
60 POKE start-a,b
70 NEXT a
80 PRINT "Delete digits :- "sta
rt,"Shorten var names :- "sta
rt+46,"Join lines :- "start+103

```



# YOUR COMPUTER CLASSIFIED

# 01- 661 3036

Contact: Lorraine Black

## ADVERTISEMENT RATES

Copy Date August 23rd

Lineage: 60p per word

(Min 20 words)

Box No: £7.00 extra

Lineage advertisements are prepayable and the order form published in this section should be completed and returned with remittance. Credit Card facilities are available.

RATES QUOTED BELOW ARE SUBJECT TO THE ADDITION OF 15% VAT.

Display — rates per scc (Min. 2scc)

One insertion	: £0.00
Three insertions	: £9.70
Six insertions	: £9.50
Twelve insertions	: £9.00
Display advertisers should preferably reserve space by phone.	

Closing date for Classified advertisements is the 29th July for the September issue.

Post to  
Your Computer, Classified  
Department, Room H211,  
Quadrant House, The Quadrant,  
Sutton, Surrey SM2 5AS.

## Britain's Biggest Selling Home Computer Magazine

### SPECTRUM MACHINE CODE SYSTEM

ASSEMBLER, DIS-ASSEMBLER, TESTER/DEBUGGER, ON-LINE LEARNING AID  
with teach yourself machine code booklet

Options include using microdrive, printer, hex or decimal numbers.  
"A different approach giving a highly usable package... the most impressive part is the test/debug features... invaluable guide to the secrets of the Z80 (Spectrum CPU)" — PC Today July 85  
"It seems to have absolutely everything you could possibly want for machine code... much care is taken in the manual in making the code as Basic-like as possible." — PC Weekly 21 Mar 85

Cassette £7.95, Microdrive Cartridge £9.75, Overseas + £1  
Orders with PO/cheque to ROYBOT, Dept YC1, 45 Hullbridge Road,  
Rayleigh, Essex SS6 9NL. Write or tel: 0268 771653 for leaflets.

### BLANK CASSETTES

WITH LIBRARY CASES

	C10	C15	C20	C30
10	3.65	3.85	4.00	4.00
50	14.00	14.15	14.30	14.30
100	25.00	26.00	27.00	27.00

Fully inclusive (COD 85p extra)  
Superior Tapes. Don't Settle for Less!

### 5 1/4" DS/DD DISKS

10 for £12.00 fully inc.  
10 for £3.50 inc. Plastic Case

RING US NOW! (0793) 695034  
JK HOME COMPUTERS (Dept YC)  
82 CHURCHWARD AVE,  
GWINDON, WILTS SN2 1NH

## ORIC

### ADVANCED USER GUIDE

For the Oric-1/Atmos, this book gives a complete description of the operation of these computers, plus a complete ROM disassembly and circuit diagram.

287 pp. ISBN 0 947925 01 0  
Available from bookshops or by mail at £10.45 (inc. p&p) from:

ADDER PUBLISHING LTD.,  
PO BOX 148,  
CAMBRIDGE CB1 2EQ.

# - MAXAM - FOR THE AMSTRAD

THE COMPLETE CODE DEVELOPMENT  
SYSTEM FOR THE AMSTRAD CPC 464.

★ ASSEMBLER ★ MONITOR ★ TEXT EDITOR ★

"The Arnor system is the best editor/assembler to be released for the AMSTRAD so far" - PCN 100  
"For flexibility and ease of use, ARNOR is easily the best I have seen" Pop. C. Wkly Vol 4 No 8  
"assemblers... look no further, ARNOR's is the best I have seen... by far the easiest to use and most friendly I have come across"

- Computing with the Amstrad. April 1985.

Now available in ALL THREE formats

**Tape (only) £13.50**

Disc £26.90.

**16K ROM + multifunction adaptor £59.90**  
(All prices include VAT, p & p)

Cheques/POs to ARNOR Ltd Dept YC  
PO Box 619, London SE25 6JL

-Overseas - no extra - Trade enq's welcome -

**Make MAXimum use of your AMstrad**

Hotline  
01.653.1483

Technical  
01.852.2174

WHY NOT  
let your microcomputer earn you money? Your hobby can provide the key to a fabulous income, full or part time. Expert manual explains how you can use your microcomputer to set up your own business from home with little capital. Send today for your copy of "Make Money with your Microcomputer" £10 incl. p&p (U.K. only) or for free details to:

Enterprise Books (YC)  
12 Felstead Road,  
Waltham Cross, Herts.  
EN3 7HB.  
Money back if not satisfied.

### Spectrum Repairs

£16.55 inclusive of labour, parts, p&p etc.  
ZX81 for £11. Fast reliable service. (Av. repair 24 hrs) by qualified engineers. Send computer only to:  
HS COMPUTER SERVICES  
2 The Orchard, Werton, Preston, Lancs.  
PR 1BE. Tel: 0772 632685

### FREE MEMBERSHIP SOFTWARE HIRE

- VIC-20 • COMMODORE 64 •
- SPECTRUM •

SAE FOR YOUR HIRE KIT

VSH (YC), PO BOX 65,  
NOTTINGHAM NG1.

PLEASE STATE MICRO

COMPUTER REPAIR CENTRE  
Have you got problems with your computer?

THEN CALL JS  
BBC, Spectrum, CBM, Dragon  
Mail order or call in

ENFIELD  
COMMUNICATIONS LTD  
135 High St, Fonders End,  
Enfield, Middx.  
01-805 7772



## AMSTRAD

### AMSTRAD

### TAPE UTILITIE V2.0

Load your software 4 times faster

- Handles more than any other.
- 10 loading speeds up to 4000 baud.
- The only one to handle headerless programs.
- Removes protection.
- Integral header reader.
- Easy to use, full instructions.

Only £6.99 on tape or £10.99 on disc

Overseas please add £1.50

Amstrad CPC 464 only

SIREN SOFTWARE, Dept. YC  
76 Bridge Street, Manchester M3 2RJ

## AMSTRAD



## IMPORT/EXPORT - TRADE ONLY

we stock all well-known brands all the time

**HOME-COMPUTERS** : Commodore, Atari, Spectrum, etc.

**PERIPHERALS** : printers, monitors, disk drives, etc.

**ACCESSORIES** : diskettes, joysticks, interfaces, ink-ribbons, etc.

and we are always looking for import/export connections.

IF YOU WANT TO SELL OR BUY, PLEASE CONTACT US

**ECTRON**  
Handelmaatschappij bv.

Kruiswaa 3 - 1161 AL Zwanenburg  
Holland - telephone (31) 2907 7102  
telex 10246 ectron nl

## VIDEO KEYBOARD TRAINING!

YOU can achieve professional standards of SPEED & ACCURACY in WEEKS using your own TV screen. UNIQUE NEW PITMAN video course trains easily, quickly, and enjoyably using senses of SOUND, SIGHT & TOUCH. Unobtainable elsewhere. For FREE details send 17p stamp to:

**METROPOLITAN/PITMAN**  
INFORMATION CENTRE, Dept C1,  
20 CARDIFF RD, LUTON LU1 1PP.

## NOTICE TO ADVERTISERS

In view of legislation which may shortly be introduced, 'Your Computer' will not publish advertising for copiers or other equipment which may encourage copyright theft.

## WDSoftware

### FOR THE QL

**WD Utilities (3rd ed)** (base £5.50)  
PRINT 80 file Directory or view: on one screen, one-key LOAD, COPY or PRINT ED files with one key (allows for r/makes). Multiple FORMATING to prevent corruption by stretching of tape. TOOLkit to give dated, numbered modules in program development. PRUNE old files to release space for key DELE. Ex a file. Full instructions in QULL file. Use up to 8 EXTRA MICRODRIVES (add on your Spectrum ones!).

**WD Utilities for CST Q-Discs** (base £8)  
100 file capacity, for CS/CompuMate disc systems AND up to 4 extra microdrives. User-friendly timesavers.

**RefTel (3rd ed)** (base £3)  
500 useful QL references in an ARCHIVE file (too long for one cartridge with Utilities and Morse).

### FOR SPECTRUM/Q./BBC

**WD Morse Tutor** (base £4)  
From absolute beginner to beyond RYA and Amateur Radio receiving. Adjust pitch. Set speed to your test level (4.18 wpm). Learn from single characters, via groups with wide spaces to random sentences, decrease spacing to normal. Write down what you hear, then CHECK on Screen or Printer for speech for Spectrum with Currah Microspeech. Also own message, random figures, letters or mixed.

### FOR SPECTRUM 48K

**Tradewind** (base £4)  
Sailing/trading strategy game with graphic surprises.

**Jersey Quest** (base £4)  
Text adventure with Bergerac and the Dragon. (not disc)

**PRICES (incl Europe postage - elsewhere add £1)**  
Spectrum/BBC Cassettes - base price only  
QL or Spectrum Microdrives - £2/cartridge plus base price  
5.25" floppies £2 plus base (SPDOS) format for Spectrum)

Two or more programs on one medium - pay medium + base. E.g. WD Utilities and RefTel for £10.00, but IMPROVIDE to mix QL/BBC/Spectrum programs on one medium. Send YOUR cartridge and base price, but FORMAT it FIRST in your DRIVE 1 for compatibility.

**WDSoftware (YC),**  
Hiltop, St Mary, Jersey.  
Tel. (0534) 81392

UNIQUE data on over 1500 winning horses for use on your own horse race program. S.A.E. free details: 12 Wilton Road, Marners, Worcs. WR14 3RL 756

## DUST COVERS SETS FOR AMSTRAD CPC 464/664 £6.95

\*Matching proofed nylon, treated with anti-static inhibitor. Green/Blue piping on monitor cover; AMSTRAD CPC on keyboard cover.  
\*Please state model, colour or mono.

### Cover for Tatung-Einstein £7.50

Proofed pale grey nylon piped in black with name on keyboard.

### Cover for other computers

Matching proofed nylon with toning piping and name on keyboard: EBC, DRAGON, E4.55, COMMODORE, COLSTAR, SANYO, SONY, TOSHIBA £3.95. In black but unpiped: SPECTRUM plus £2.50, QL £2.95.

### Matching covers for Printers

Actual DM7-1, Canon PW 1000A, Commodore MPS 801, Epson FX-80, RX-80, Mantermann MT-80 Panther DX 105 Shinwa CP-80, CPA-80, Seikosha 500, Tuxen KP810 £3.95, Brother HRS £2.50 and Juki 6100 at £4.50.

\*48 Hour Turn-Round 1st Class Postage.  
ALSO AVAILABLE: Monitor, disc drives etc. and good range of Business Computer coverage IBM-PC, Acricot, Macintosh, Olivetti M-24.

### BBD COMPUTER DUST COVERS

39 MANSE AVENUE  
WRIGHT NGTON WN6 9R  
Telephone 0257-422968

TRADE ENQUIRIES WELCOME

## IMPROVE YOUR PROSPECTS

with skills that employers want - learn the easy way with modern home study courses from Ideal Schools.

### MODERN ELECTRONICS

Train for success in the fastest ever growing industrial sector.

### COMPUTER PROGRAMMING

The demand for Programmers is increasing constantly - don't miss out! For free booklet write today to

**IDEAL SCHOOLS**  
(Ref. YC12)  
60 St. Enoch Sq  
Glasgow G1 1UK  
Tel: (41-248) 5200

## AMSTRAD 464

### BINARY BANANA

#### MAGIC PEN

Fill or sketch and save to file. Leaders allow position anywhere on screen, even half on. Leaders included £4.95

#### SYMBOL 464

Re-design your character set the easy way save to tape and/or Binary readout £3.95

#### BIG LETTERS

Can produce very large letters, pictures etc., with symbol 464 or standard a.s.c.i.i. character set. Loader program included £3.95.

#### LITTLE LETTERS

Text to a file 9 colours in a sixteen by sixteen pixel letter or small picture, then enlarge X2-X4 loader program supplied £3.60

#### THE ARTIST

Over 20 functions plus airbrush and Binary screen dump to tape. Includes text for titles etc. loader loads on screen while cassette runs £4.95.

#### DETAILS

Add a disk facility to your cassette system with this unique program. Now you can use C-60's or 90's. How did you ever manage without it! £2.95.  
Trade & export enquiries welcome.

Binary Banana c/o Pi Tec Ltd.  
Park Crescent, Peterborough PE1 4BG.

## FLOPPY DISKS

BULK PURCHASE FOR MAXIMUM DISCOUNTS

AN UNCONDITIONAL GUARANTEE

If you are dissatisfied with the disks they will be replaced or full credit given whichever you prefer.

The disks are certified 100% error free and carry a 10 million pass warranty without disk related errors or significant wear.

**PRICES 5 1/4" disks (inclusive of VAT post and packaging).** Orders under 10 units add another 20% of the prices shown

**TYPES**  
SSDD 48 TPI  
SSDD 48 TPI  
DSDD 48 TPI  
SSDD 96 TPI  
DSDD 96 TPI

**RRP**  
£2.77  
£2.97  
£2.25  
£2.79  
£2.95

**DISCOUNT  
PRICES/DISK**  
£1.08  
£1.15  
£1.22  
£1.45  
£1.54

Terms: Payment with order.

**T.J. SERVICES CO.,**  
Roach House, 3 Belmont Gardens, Chesham Herts. EN8 0PA.  
Tel: 0992 20365

## WIN THE POOLS?

AMSTRA-DRAW 2 - THE LATEST DISC BASED VERSION OF THE ORIGINAL AND BEST POOLS PREDICTION PROGRAM FOR THE AMSTRAD CPC464 (WITH DISC DRIVE) AND CPC664 COMPUTERS!!

"THE COMPUTER CAME UP WITH ONE FIRST DIVIDEND PLUS MINOR DIVIDENDS MAKING A TOTAL OF £6000!"  
- J. R. Beckett, Sheffield.



- Supplied with Database containing data on over 12,000 matches since 1980!
- You update the Database each week - but no tedious typing, as team and division names already in program!
- Errors easily corrected - the program even checks your entries!
- Comprehensive instruction manual and menu driven program easy to use, even for a newcomer to computing!
- Will forecast the least likely draws for those who prefer to bet on 'fixed odds'!
- Built in perm generator - complete your coupon direct from the screen!
- Compatible with the DK'tronics speech synthesiser - the only pools prediction program to read you its predictions!
- Each copy is individually updated with all results up to the date of dispatch - no typing in enormous lists of previous matches before using the program!
- Full after sales service, including Database updates and end of season upgrades

Due to the size and complexity of Amstra-Draw 2 it is available on disc only - £12.95 inc. usive.

(Cheques/P.O.s payable to B. S. McALLEY)

AMSTRA-DRAW (Dept C), 1 Cowleaze, Chinnor, Oxford OX9 4TD  
(Tel: 0844-52426)

754



## FREE MEMBERSHIP of F.U.G. (Feline User Group)



**FOLLOW ME PLEASE**

**WE HAVE LIFT OFF**

As a F.U.G. member you will be entitled to purchase supplies at **PREFERENTIAL TRADE PRICES** as and when required in any quantity.

T.J. Services will supply to F.U.G. members a total range of products:

- Floppy Discs - Printer Ribbons
- Continuous Paper - I/D Labels
- Computer Care Products, etc. etc.

Plus an **UNCONDITIONAL MONEY BACK GUARANTEE** in the unlikely event that you are dissatisfied with —

### T.J. SERVICES PRODUCTS

They will be replaced or full credit given whichever you prefer

**STILL INTERESTED?**

Please enrol me as a F.U.G. member for one year **FREE OF CHARGE** (normal annual subscription £12.75) and send an up-to-date **PREFERENTIAL TRADE PRICE LIST** plus my Membership Number

T. J. Services Co., 3 Beltona Gardens, Cheshunt, Herts. EN8 0PA. Tel: 0992 20365

Name..... YC5

Address.....

Tel. No. ....

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

### POOLS PREDICTION

Outputs best draws, homes and aways. Features analytical draw finder. Prints team form companion graphs. Analyses and graphs results every week. Takes full account of midweek games and 'Cup' matches between main league teams. Promotional/legation options. (Can be used from season to season.)

Easy to use, even for beginners. Gives paper printout of predictions if required. Full back up service.

48 wins (309 dividends) received by author so far. "This is the best and most scientific of any program I have seen" - Mr R.A.P. (Secretary, Ovington Computer Club).

"Once again, thank you for one of the best investments I have made" - Mr D.L.B. (Foltham).

"I would like to congratulate you on your excellent service - it is a rare thing these days" - Mr L.G.P. (Shrewsbury).

"I found your program very professional and user friendly - I am very satisfied with it" - Mr B.D. (Spalling).

### Racing Prediction

An easy to use predictor, by the same author, for the Flat racing season.

No knowledge of racing required.

Input information from any daily newspaper.

Holds data on draw advantage and ground conditions for 37 British courses.

Self-teaching program is never out-of-date.

Wins of up to 351 possible.

Ask for: British Pools @ £11.95

Australian Pools @ £11.95

Flatting Racing @ £11.95

Allow 7 days for delivery. Cheques, PO's payable to Rombeat or quote access card number.

Overseas customers please add £1 for P&P.

**ROMBEAT,**  
DEPT. YC,  
2 WELLAND CROFT,  
BICESTER,  
OXON OX6 8GD.

Available for 48 Spectrum. British Pools also available for Commodore 64.

### BLANK CASSETTES

Guaranteed top quality computer/ audio cassettes at great budget prices.

**Packed in boxes of 10 with labels, inlay cards and library case.**

Prices include VAT, post and packing.

□ IC51 £3.35 □ IC301 £4.70

□ IC101 £3.40 □ IC601 £5.30

□ IC121 £3.45 □ IC301E £7.00

□ IC151 £3.75

### BASF FLOPPY DISCS

Prices of boxes of 10

□ 5 1/4 Single side/Double density £19.95

□ 5 1/4 Double side/Double density £21.85

□ 5 1/4 Double side/Quad density £28.75

### MICRO FLEXI DISCS

Price per unit

□ 5 1/4 Single side £4.00 each

□ 5 1/4 Double side £4.75 each

Indicate quantity of each product required in boxes. Free delivery U.K. only.

Cheque/PO. Enclosed for £.....

NAME.....

ADDRESS.....

**PROFESSIONAL  
MAGNETICS LTD**

Cassette House, 329 Hunslet Road, Leeds LS10 5YJ  
FREEPOST Tel: (0532) 706065

AMSTRAC CP404 computer, green screen, £185. Quendata daisy wheel printer, £185. Absolutely mint, little used. Many games free. (B48 1445).

REPAIRS all computers, monitors, televisions, VCRs, video cameras. Free Estimates. Tel: Nick Beer, Holsworthy 253780.

# SUPER POWER

**ROM SOFTWARE FOR  
THE AMSTRAD CPC 464  
FULFILLS THE PROMISE OF  
YOUR AMSTRAD**

**SUPERPOWER ROM-CARD**  
- 7 Sockets for 8K or 16K eproms (external  
cased unit with bus extension) £39.95.  
**SUPERPOWER ROM-BASED  
SOFTWARE**

Disk User's Utilities • Mailing List/Club  
Membership • Programmer's Toolbox •  
Assembler/Disassembler/MC Code  
Monitor • All £39.95 each.

Word Processor, Database,  
Spreadsheet, Graphics/Statistics -  
With Data Interchange. Prices to be  
announced. Available Aug./Sept.

Order today Phone 0532 434006 or  
by mail order from MicroPower Ltd.,  
Sheepscar House, Sheepscar Street,  
South Leeds LS7 1AD. P&P 95p  
Access/Visa.

### ASTROLOGY for beginners only £11.50

A Starter Pack comprising a simple program  
to calculate a horoscope, an introductory  
booklet & 2 self-teaching programs (how to  
interpret the horoscope).

**No previous knowledge  
required**

Spectrum, BBC/Electron, Oric, Dragon,  
Tandy/Genie, Commodore 64/PET, Atari  
Sharp, Amstrad/Schneider, Colour Genie.

Many more programs for  
experienced astrologers also  
other micros, CPM and MSDOS.  
Deze programmas zijn tevens in  
Nederlands taal te verkrijgen.  
vertrijgt voor Spectrum &  
Commodore 64, Vraag Documentatie!  
Cash with order (add 50p outside UK) or  
large sae for free catalogue to:

### ASTROCAL (Dept YC)

**67 Peascroft Road,  
Hemel Hempstead,  
Herts. HP3 8ER.  
Tel: 0442 51809**

**"THE PIC"  
"DESTINED TO  
BECOME A SPECTRUM  
CLASSIC"!!**

### PROFESSIONAL REPAIRS

The complete Sinclair service centre

ZX-81 .....	£13.95
ZX16K RAM.....	£13.95
ZX Interface 2 .....	£13.95
ZX Interface 1 .....	£17.95
ZX Microdrive .....	£17.95
ZX Spectrum .....	£17.95
ZX Printer .....	£17.95
Sinclair QL .....	P.O.A.
16K to 48K Upgrade .....	£26.95

Also BBC, C64, ORIC, DRAGON, ATARI & AMSTRAD  
Ring 0234-213645

\* Ayr 3-4 day turnaround \* 6 month warranty  
\* All inclusive price \* Free estimates

**ZEDEM COMPUTERS LTD.**  
2 Kimbolton Road, Bedford, MK40 2NR.  
(Trace and overseas enquiries welcome)







# Hot★ lines

**Acorn Computers**

Telephone: Cambridge 0223 21C111

**Atari**

Telephone: Slough 0753 24561

**Amstrad**

Telephone: Brentwood 0277 223888

**Commodore CBM**

Telephone: Northampton 0536 205252

**Enterprise**

Telephone: 01-739 4282

**Sinclair**

Telephone: Camberley 0276 685311

**Tandy Corporation**

Telephone: Birmingham 021 5566101  
ext 33

**Toshiba**

Telephone: Camberley 0276 62222

# DATEBASE

## Info North

The Information Technology and Office Automation Exhibition takes place at Belle Vue, Manchester from September 17 to September 19. Open to the general public, more details available from BED Exhibitions, 44 Wallington Square, Wallington, Surrey. Telephone 01-647 1001.

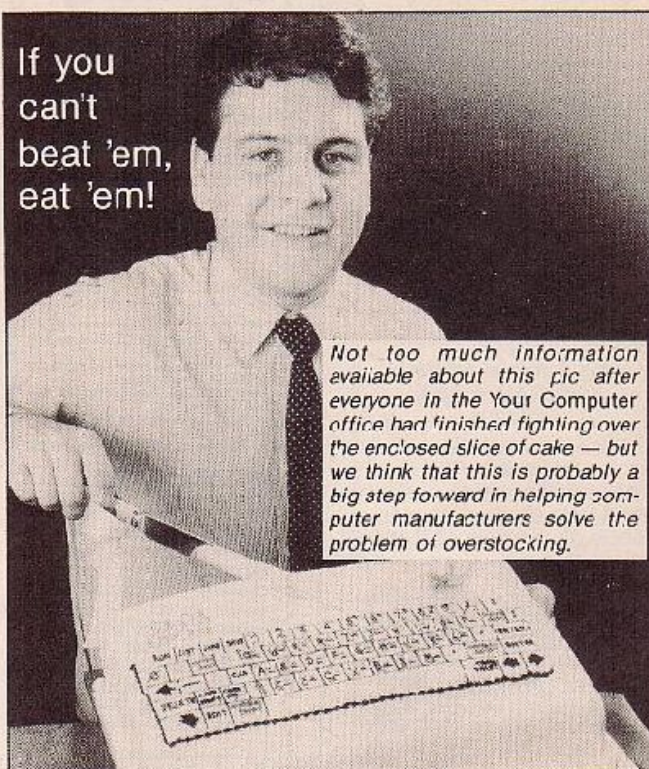
## Personal Computer World Show

At Olympia, London from 4-8 September, a show for home and business users, trade and public. For more details, telephone 01-486 1951.

## BBC Micro User Show

UMIST, The University of Manchester Institute of Science and Technology hosts the BBC Micro User Show from September 27-29. £2 to go in if an adult, £1.50 for non-adults. Telephone Database Publications, Stockport for more details 062 429 8080.

If you  
can't  
beat 'em,  
eat 'em!



Not too much information available about this pic after everyone in the Your Computer office had finished fighting over the enclosed slice of cake — but we think that this is probably a big step forward in helping computer manufacturers solve the problem of overstocking.

# EXPORT

ALL MAKES  
OF  
MICROCOMPUTERS  
PRINTERS  
PERIPHERALS  
AND  
SOFTWARE  
SUPPLIED AT  
DISCOUNT PRICES

# MICROGOLD

UNICOM HOUSE  
182 ROYAL COLLEGE STREET  
LONDON NW1 9NN

Telex: 295931 UNICOMG

Tel: 01-4821711

## INDEX TO ADVERTISERS

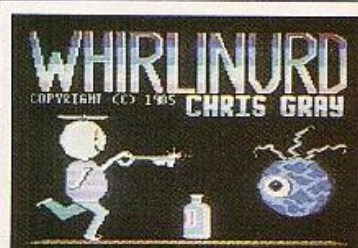
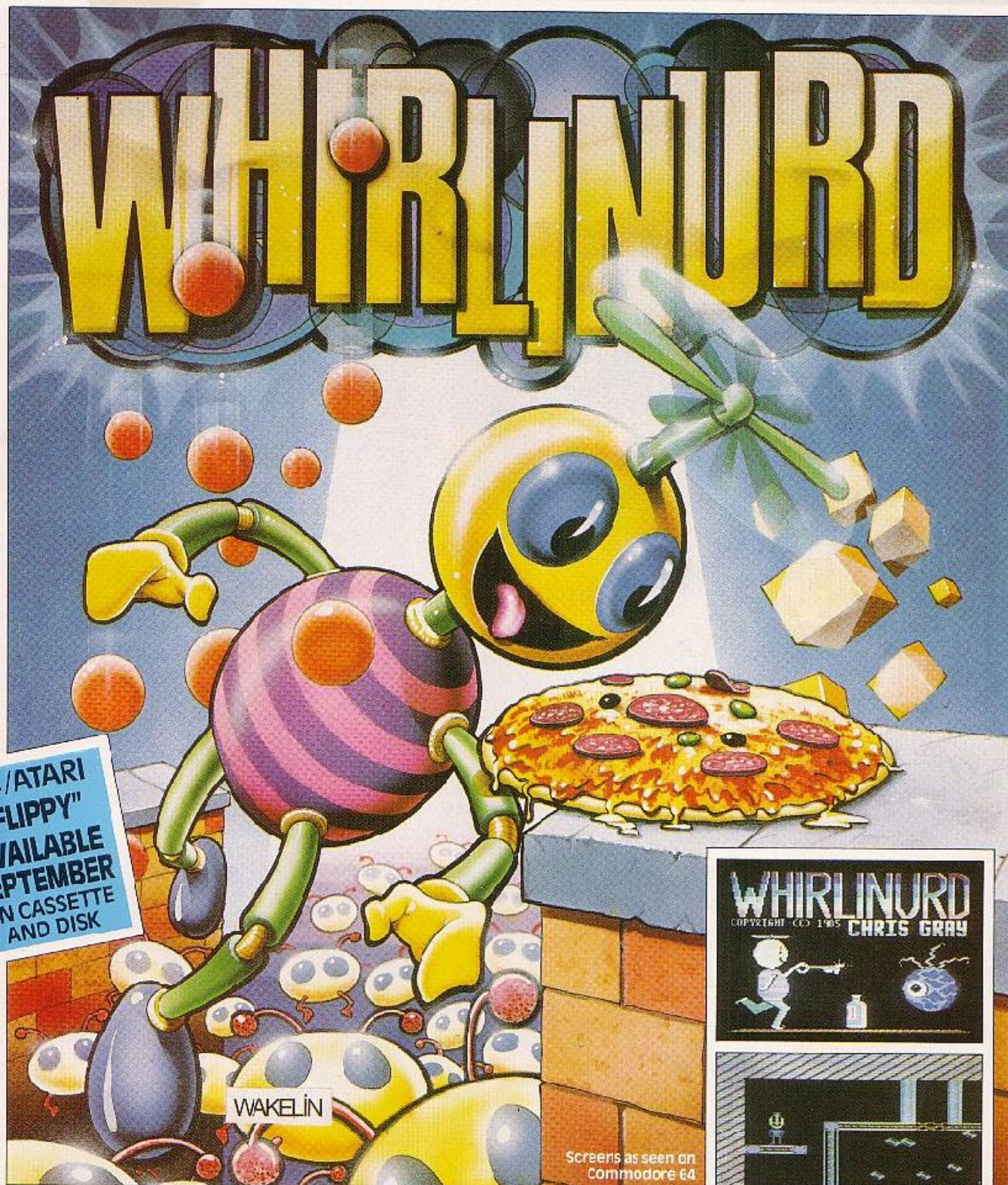
<b>A</b>		<b>N</b>	
Activision	6, 28, 58, 70	NE London Polytechnic	50
Acult Literacy	20		
AGF Hardware	7	<b>O</b>	
Allway Marketing	14	Ocean Software Ltd	IFC BC
Amstrad	54, 55	Opus Supplies Ltd	4
Amor Ltd	62		
<b>B</b>		<b>P</b>	
Beebug	22	Picturesque	36
Betasoft	35	Pioneer	24
<b>C</b>		<b>R</b>	
Caldew Business Computer Systems	14	Ram Electronics (Flaet) Ltd	67
<b>D</b>		Romantic Robot	36
Duraplug	10	RSD Connections Ltd	20
<b>E</b>		<b>S</b>	
Elito Systeme Ltd	5	Selec Software	14
The English Computer Shop	10	Silica Shop	75
<b>F</b>		SJB Discs Ltd	35
Flix Direct Discount Club	13	SMT	35
<b>H</b>		Mr. Software	16
HiSoft	33	Swanley Electronics	62
<b>I</b>		Swesoft	38
Industrial Process	35	System 3	18, 20, 22, 26
Interface Publications Ltd	22, 58, 62	<b>T</b>	
<b>L</b>		Thorn EMI Computer Software	32, 33
LCL	50	Thoughts and Crosses	11
Linear Graphics Ltd	50	<b>U</b>	
<b>M</b>		U.S. Gold Ltd	8, 9, IBC
The Micro Workshop	35	<b>V</b>	
Microgold	105	Vortex Software Ltd	90
MM Microwave	13	<b>Y</b>	
		Your Computer Subscriptions	30



SO YOU'VE BLASTED THE ALIENS AND SAVED THE WORLD!!  
BUT CAN YOU COPE WITH BLOPPERS, GLOBS AND SPUDNIKS  
AND FACE THE TERRIFYING NIPPLE OF DEATH?!!

# WHIRLINURD

64/ATARI  
"FLIPPY"  
AVAILABLE  
SEPTEMBER  
ON CASSETTE  
AND DISK



Screens as seen on  
Commodore 64



Enter the dangerous world of the Nurds where you meet hungry companions Naples Yerty, Hoosky Nurd, Hamish Pupkin and Melvin Lugby. Join them in their insatiable quest for sustenance, negotiating 50 rooms full of deadly obstacles. And beware! Slinky snakes, Jump Bugs, Bug Eyes and Bouncing Baby Ellillard Balls are just some of the foes that lurk ready to bop the unwary! Negotiate these; avoid deadly force walls, dodge the Blinking Bonkers and escape your encounters with the Nipple of Death and the Ultimate Feasts migh; just be your delight!

**£9.95** **£12.95**  
CASSETTE DISK

Selected U.S. Gold software is available from good computer stores and selected branches of:

**BOOTS JOHN MENZIES WH SMITH WILDINGS WOOLWORTH**

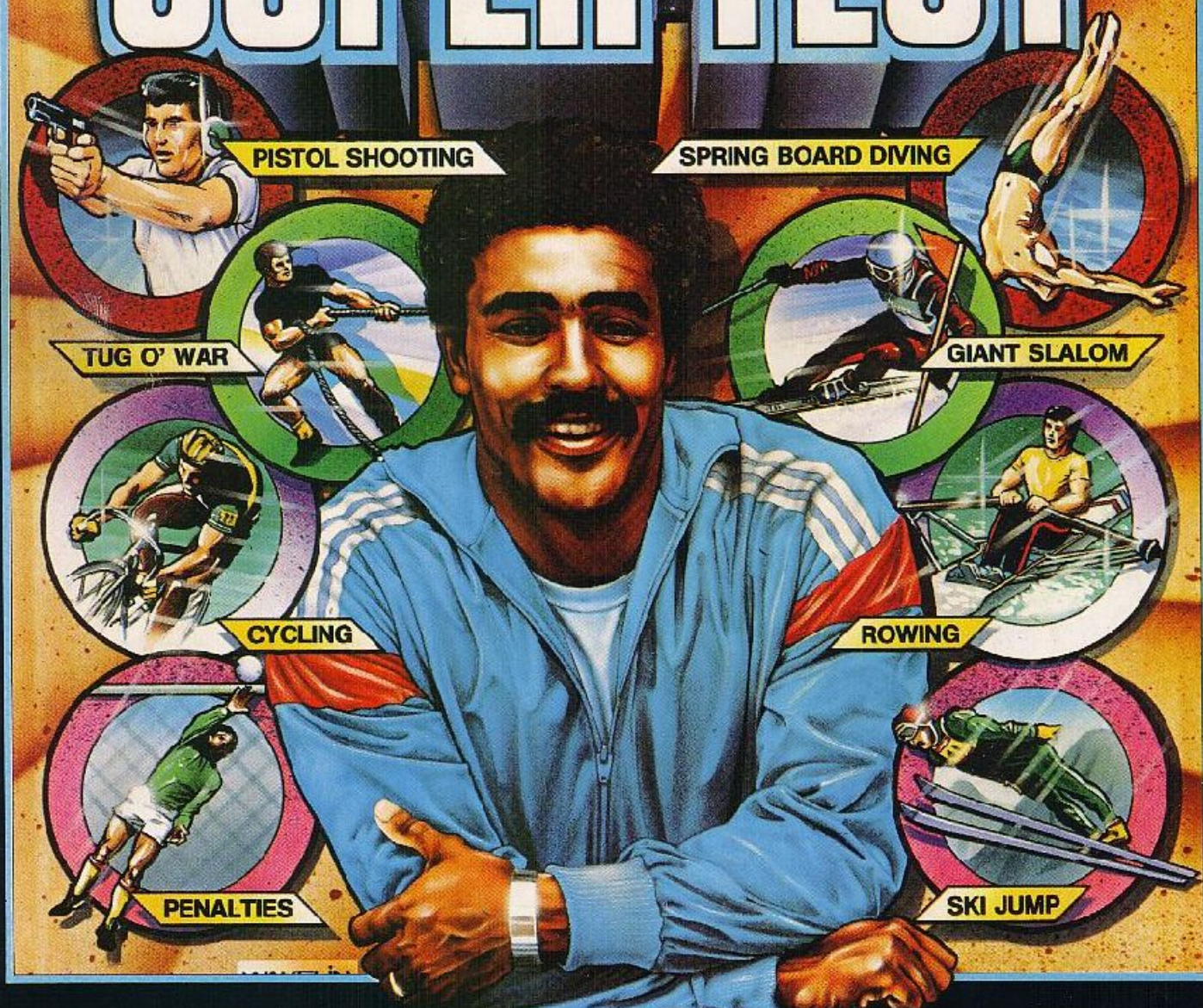
In case of difficulty contact U.S. Gold Ltd., Unit 10, Parkway Industrial Centre, Hockage Street, Birmingham B7 4LY. Telephone 021-359 8381.





Now after the glory of gold enter

# Daley Thompson's SUPER-TEST



SPECTRUM 48k

COMMODORE 64

AMSTRAD

6-95

7-95

8-95

Ocean Software is available from selected branches of

WOOLWORTH, WHSMITH, 

John Menzies, LASKYS, Rumbelows, COMET

Spectrum Shops and all good software dealers

**ocean**

Ocean Software

Ocean House 6 Central Street

Manchester M2 5NS

Telephone 061 832 6633 · Telex 669977 Oceans G