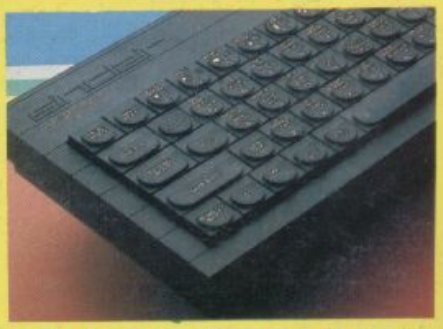
SAVE WITH SCROOGE: XMAS MEGABASIC OFFER!

YOUR SPECTRUM

No.10 Dec/Jan 85p

Byte High, No Limit

ON THE BENCH



SPECTRUM+

Computer... Or Cop-Out?

HACKING HINTS

CODE BUSTERS

Breaking And Entering!

GAMES GALORE

JOYSTICK JURY

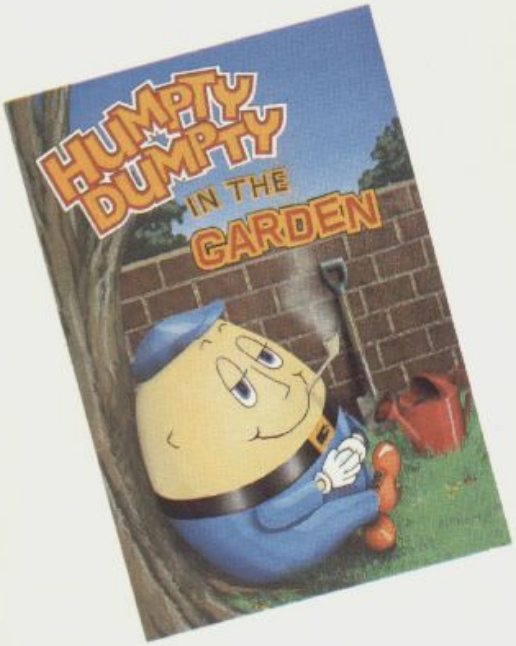
5 Pages Of Xmas Reviews

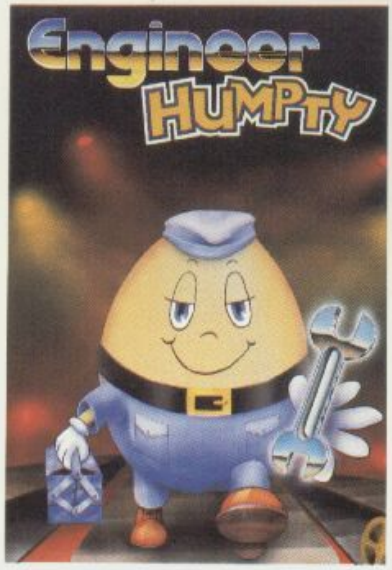
CINEMATIC SOFTWARE

DEUS EX MACHINA

Automata Goes To Hollywood!

HUMPTY DUMPTY





COMMODORE 64
SPECTRUM 48K

£6.95 EACH

SPECIAL CHRISTMAS OFFER
ORDER ALL 3 HUMPTY'S
FOR ONLY
£16.00
WITH THIS ORDER

Computing Ltd

To: Artic Computing Ltd, Main Street
Brandesburton, Driffield YO25 8RL

Please supply

*Cheque for total amount enclosed £

Name

Address

*Access/Barclaycard No.

*Please delete or complete as applicable

INSIDE YS

FEATURES

28 **Breaking And Entering** Everything you always wanted to know about hacking ... but were afraid to ask! *Terry Bulfib*

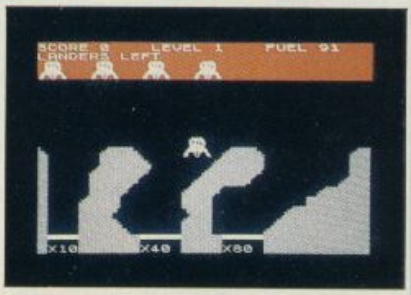
48 **Procedural Practice** More on *YS MegaBasic* — plus your chance to be first in the queue to order the package. See inside ... *Mike Leaman*

PROGRAMS

83 **Message Mover** Scroll text on the 23rd line of the screen display. *Martin Evans*

85 **Hints 'N' Tips** Routines to make your programs more professional. *Gavin Monk*

87 **Christmas Card** An Xmas message from us to you ... or you to them? *Tony Samuels*



91 **Lunar Buggy** A spaced-out, fast-moving lunar extravaganza. *Robert Stockton*

SOFTWARE

52 **Deus Ex Machina** The latest experience in cinematic software — transforming your Spectrum into a video recorder! *Ross Holman* and *Dave Nicholls*

57 **Joystick Jury** All the reviews you'll need if you're in the market for Xmas software. *Roger Willis, Ross Holman* and *Dave Nicholls*

HARDWARE

34 **Spectrum+** What's it got that the old one lacked? A new micro ... or just fancy packaging?? *Max Philips*

GAMES

TOP 20 16
Your tips for the top ... and guess who's back at number one!

SPECTRUM ADVENTURES 66
Our avid adventurers tackle *Hampstead, Peter Pan* and *Eureka*!

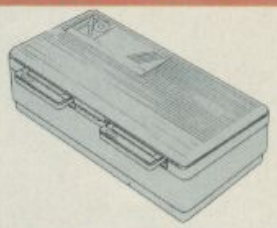
PERSPECTIVE

INTERFACE ROMS 26
The inside story of the Interface 1 ... as told by *Andrew Pennell.*

SPRITE DESIGNER 39
Crafty code from *Toni Baker* to make spritely shapes fly around the screen.

AWESOME SECRETS OF THE QL 75
Max Phillips reveals the mystery of the QL's Microdrives.

COMPETITION



WIN A WAFADRIVE 71

REGULARS

FRONTLINES 3
Our news is always good news! Catch up on all the gossip, along with *From The Hip, Concurrent Affairs, Hacking Away* and *Hard Core.*

FORUM 19
Programs, problems and personalities — they're all here!

SPECTROLYSIS 25
Number crunching à la *Ian Beardsmore*!

INPUT/OUTPUT 79
Book your *free* ad — and make a few friends into the bargain!

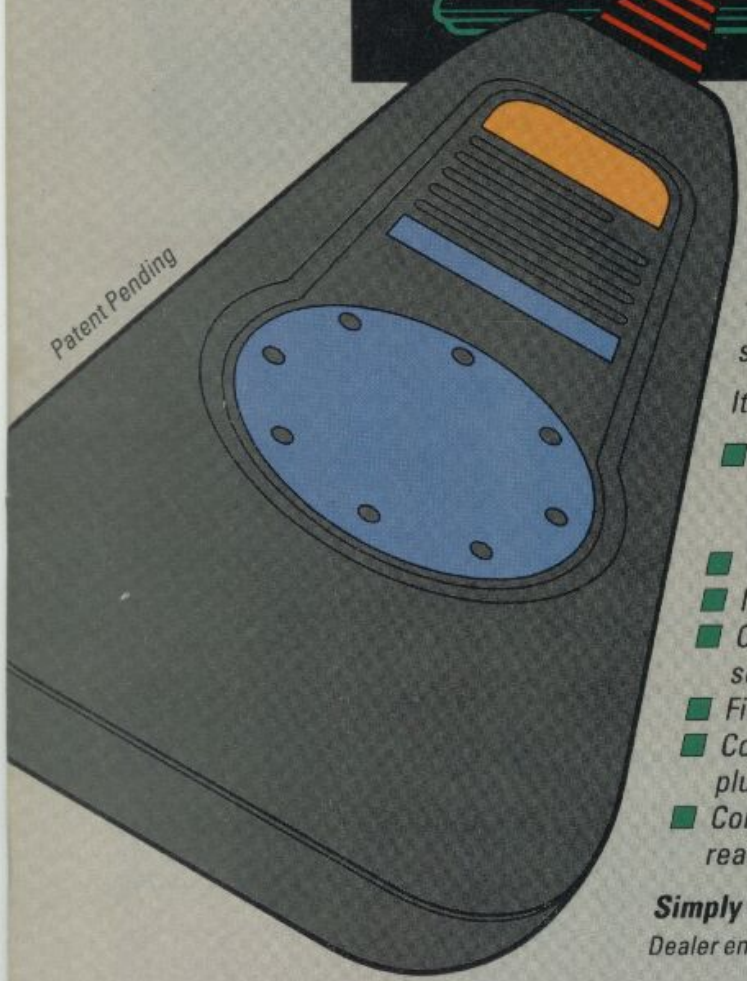
CIRCE 104
The secrets of the Spectrum+ — Sinclair Research MD Nigel Searle speaks out.

SUBSCRIPTIONS 80
T-SHIRTS 91
BACK ISSUES 102

ON THE LINE
01 631 1433

Editor Roger Munford
Deputy Editor Tina Boylan
Technical Editor Peter Shaw
Group Advertising Manager Jill Harris
Advertising Manager David Baskerville
Publisher Stephen England

THE AGE OF THE R.A.T



Patent Pending

CONVENTIONAL JOYSTICKS ARE DEAD!

*The Cheetah **R**emote **A**ction **T**ransmitter is the most sophisticated computer controller available.*

It has these features:

- *Infra Red transmission – so there are no leads trailing across the living room. Just sit back in your chair up to 30 feet from your machine.*
- *Touch control – no moving parts, extremely fast, long life.*
- *No extra software required.*
- *Can be used with all Cheetah RAT/Kempston compatible software.*
- *Fits comfortably in your hand for long play periods.*
- *Comes complete with receiver/interface unit which simply plugs into the rear of your Spectrum.*
- *Compatible with all Sinclair/Cheetah peripherals via the rear edge connector.*

Simply incredible at £29.95 including VAT and p & p.

Dealer enquiries welcome. Export orders at no extra cost.

Send cheque/p.o now to:
Cheetah Marketing Ltd.** (Dept. YS), **24 Ray Street, London EC1R 3DJ. phone 01·833 4909

Cheetah products are also available from branches of

John Menzies Boots WHSMITH Rumbelows

and all good computer shops.

Cheetah Marketing

FRONTLINES

News and views, Hacking Away, From The Hip, Hard Core, Concurrent Affairs and the 1984 YS Top Turkey awards. It's all here ...

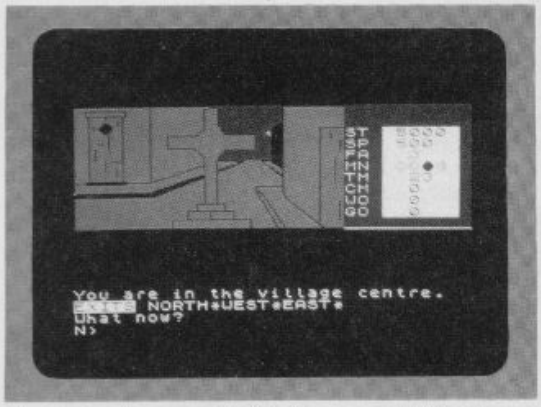
MASTERS OF THE THIRD WORLD

How long have you been waiting for *Wrath of Magra?* Well, kick those cobwebs away because, yes, it's finally arrived — courtesy of Mastertronic's new label, Mastervision. The only trouble is, it's bad news for all adventurers with shallow pockets ... for the price tag records an extravagant £12.50 — and not the £1.99 we know and love.

The Wrath of Magra manifests itself as a two-cassette package containing 120K of code as well as 158-page paperback crammed full of spooky spells.

Plans are currently in hand to make all three parts of the adventure available in one package, but there's no price tag as yet. But, further thrills, there's another part to the saga in the pipeline, the working title for which is *The Legacy of Light*, destined for a Spring launch.

If it's arcade stuff you're after, well, don't go complaining to Mastertonic (on 01-402 3316) — they'll only tell you about *See-Ka of Assiah* which is priced at £7.50 ... you see if they don't!



Mastertronics move into the big-time with *Wrath of Magra* — 120K of code for £12.50.

DOUBLE VISION AT THE HIPPO

Back in the Summer, *YS* held a competition in which readers were asked to prepare an animated software sequence which included the Hippodrome Logo.

The standard of programming was extremely high from all entrants, but two displays in particular stood out from the crowd — and, as Hippodrome owner Peter Stringfellow says, "They're as good as each other — and both are amazing!". So, in a sudden burst of generosity, Peter came up with the obvious solution — both entrants win the first prize.

The two luckly lads, **Graham Thorpe** of Kent and **Chi-Yeung Choy** of South Ruislip, are due a full years' membership to the Hippodrome, a weekend wallow at the Waldorf Hotel, a Champagne dinner at the Hippodrome (where they'll see the first showing of a video, made up from a combination of their entries) and, best of all, a free 12-month subscription to *Your Spectrum*. (*Give me the Champagne dinner anytime! Ed.*)

YS subscriptions are also due to all ten runners-up — **Neil Strudwick** of London; **Mr J Adams** of Wolverhampton; **Mr C Beckwith** of W Yorkshire; **Mr P Brown** of Norwich; **RJ Harvey** of Cheshire; **Daniel Harley** of Cheshire; **Matthew Carberey** of Lincoln; **John Strett** of Liverpool; **Mr Thorne** of Hartlepool and **Kevin Thompson** of Hammersmith. Congrats to each and everyone of you.

Two great winning Logos from our Hippodrome competition. That's Chi-Yeung Choy's at the top and Graham Thorpe's at the bottom.

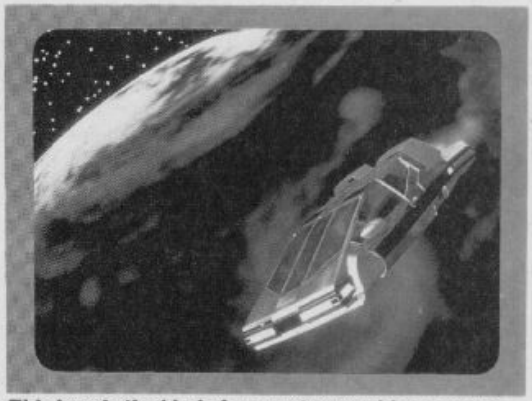
ONE OVER THE EIGHT

Four of Activision's new releases ... and *Ghostbusters* is on its way for Xmas!

Activision has launched eight cassettes for the Spectrum and plans in addition to bring out *Ghostbusters* just before Christmas.

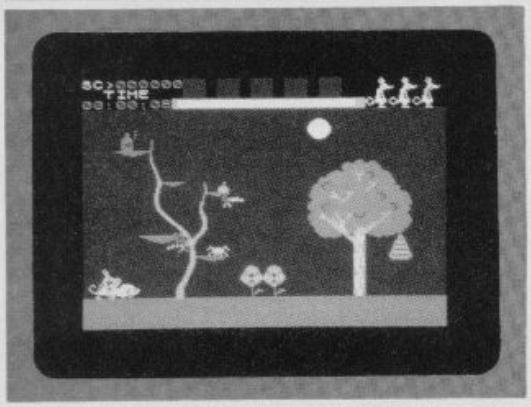
The line-up reveals *Beamrider, Enduro, H.E.R.O, Pitfall II, River Raid, Space Shuttle, ZENJI* and *The Designer's Pencil.* All will retail at £7.99, except *Pitfall II* (£8.99) and *The Designer's Pencil* (£9.99).

Those of you who attended the PCW Show earlier this year will perhaps understand the natural reservations we have about the forthcoming Christmas release. Activision had a stand opposite our's at the show and was playing the *Ghostbusters* single non-stop throughout the whole five days. We reckon we suffered, in total, over 2000 renditions!



This here's the kind of computer graphics you can look forward to if you're planning to catch the new film, *The Last Starfighter*. For some reason the film-makers chose to use the Cray X-MP instead of the Spectrum (*They must be crazy. Ed.*) and the movie claims graphic scenes that way outdo *Tron*.
(Reproduced by kind permission of Digital Productions, Digital Scene Simulation (sm), Los Angeles, CA. (c) 1984. All rights reserved.)

WANGLING A FURT



Jungle japes with Jasper — find out what happens once the Furt has been wangled!

Micromega has just released a new game called *Jasper* — a nifty little number that mixes Furts with flowers, potions, brollies and killer bunnies.

Confused? So you should be!

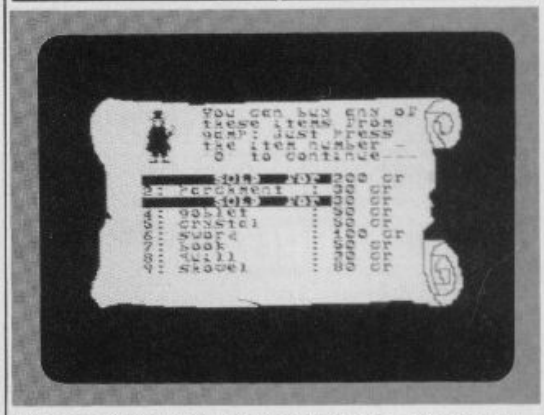
Apparently the lucky player lands the role of a jungle rat called Jasper, making his way through his native land just after the Furt has wangled.

Written by Derek Brewster (author of *Codename Mat* and just-released *Kentilla*), the game seems to have some loose connections with *Alice in Wonderland*. The mysterious Furt has just done its wangling and poor old you have to follow a killer bunny that's armed only with a total lack of resolve as you search for safety.

In fact, *Jasper* is another one of those platform-type games, giving the benefit of no fewer than 22 screens; it also employs the strategy elements of an adventure game.

You can obtain your Furts from Micromega for a mere £6.95.

WINNING AND LOSING



This year's Cambridge Award winner — *The Prince*.

The Cambridge Award winners have been announced, prizes presented and CCS has several new games into the bargain.

The competition was won this year by *The Prince*, 'penned' by John Sherry of Keele.

Anyway CCS is retailing *The Prince* at £7.95 and the four runner-up tapes — *1942 Mission, Insurgency, Blue Riband*, and *War Zone* — all at the conventional £5.95.

HACKING AWAY

HUNT EMERSON

Andrew Pennell peruses the POKEs. Write to him at Hacking Away, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

First up, thanks for the terrific response to my appeal for information — the result has been quite amazing. As usual, the letters divide into two groups — the 'haves', who wish to divulge information, and the 'have nots' who want it.

As promised last month, here's a bit of info about *Chuckie Egg* which (by the way) is probably the best game A 'n' F has ever produced. It's quite old now and doesn't work with the Kempston joystick. Other joysicks (for example, Interface 2) are OK as it uses definable keys; it can, however, be suitably modified. But before that, let's reveal the most important POKE ... for infinite lives. When I originally hacked *Chuckie Egg* (actually before it was released) I didn't even look for infinite lives—. which goes to show how long ago it must have been! Luckily I kept my notes and recently had another go at it, with the help of a letter from **Graham Hutton**.

The first thing to do is to load the bytes, which is not very straightforward because of the protection method it uses. I don't want to step on anyone's toes, so I'm not going to supply a special loader; I'll use instead a modified version of the loader in the game. To begin with, enter the multiple line (do a NEW first if you have Interface 1 attached):

```
MERGE "":POKE 24501,195:GO TO 1
```

Then play the tape. It'll load as normal, but will return to Basic when finished. At this stage, if any error occurs, the machine will fall over — so be careful what you type. For infinite lives enter:

```
POKE 42837,0: RANDOMIZE USR 42000
```

And the game should start. It's not the most efficient way of doing the job, but it does work. Instead of removing a DEC(HL) or DEC(IX+n), it changes a jump instruction, and this has the effect of printing the 'Game Over' message a couple of times during the game ... but don't let that put you off.

Now for the joystick mod. Having reset the Speccy, enter the listing given and save it on tape with LINE 1000 (don't save it to Microdrive or you'll get into all sorts of problems). Then load *Chuckie Egg* in the way described above and do the POKE on its own if you want it. Next, load the joystick mod and, hey presto — a joystick *Chuckie Egg*! As before, if any error occurs during the loading of the second listing, the machine will fall over and you'll have to start from scratch.

I also got a letter from someone who wishes to be known as '**ITR**', who said that he or she knew the infinite lives POKE for *Chuckie Egg* but wouldn't condescend to tell me what it was — we don't need your type round here! Actually, ITR did come up with some interesting stuff on the way the screens are stored. Apparently they're stored from 46000 to 51372, each taking 672 bytes. The letter went on to supply a neat little program that fills in all the holes at the bottom of the screens:

```
500 FOR f=46000 TO 51372 STEP 672
510 FOR g=0 TO 31
520 POKE f+g,5
530 NEXT g
540 NEXT f
560 RANDOMIZE USR 42000
```

Enter this in the same way as the joystick patch, by saving it to tape. In fact, I think these POKEs are better than infinite lives; the game still remains difficult, though easier than the standard version.

I've also received several requests about putting *Sabre Wulf* on Microdrive — apparently even Ultimate has said it's impossible. Shame on you Ultimate! Considering it costs a tenner, you should be more helpful than that. I never use cassettes except for loading originals before converting them, and switching *SW* is pretty simple — details on that next month.

Until then, keep hacking and sending your letters in (though please no more *JSW* POKEs — I've enough letters on that subject to wallpaper my bedroom!).

```
1000 DATA 39277,103,39321,71,40311,71,40893,71,39
341,79,40254,79,40850,79,40655,95,40713,40713,87
1010 RESTORE 1000
1020 FOR i=1 TO 9: READ a,b
1030 POKE a,219: POKE a+1,223: POKE a+2,0: POKE a
+3,0: POKE a+4,203: POKE a+5,b
1040 NEXT i
1100 RANDOMIZE USR 42000
```

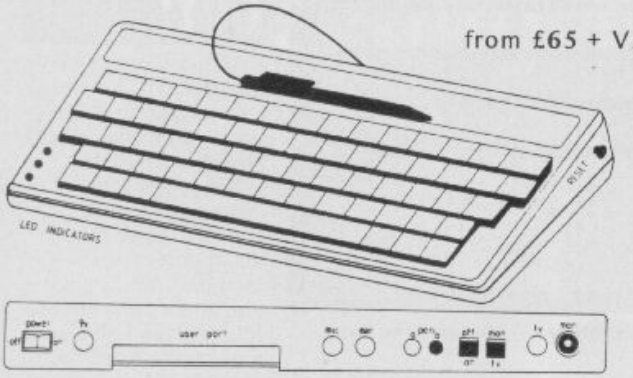
The Basic listing providing a joystick mod for *Chuckie Egg*.

GETTING SERIOUS?

THEN LOOK NO FURTHER EIDERSOFT HAS THE ANSWER TO YOUR QUESTIONS

WHICH IS THE BEST REAL KEYBOARD FOR THE SPECTRUM?

from £65 + VAT



THE EIDER SYSTEMS PROFESSIONAL SERIES

The ultimate keyboard for the serious Spectrum user

STANDARD

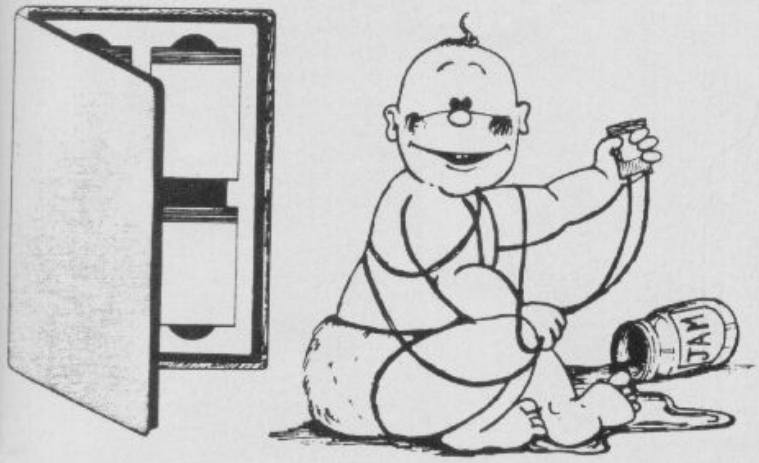
- ★ 67 keys with repeat shifts
- ★ On/off switch with LED indicator
- ★ Reset button
- ★ Fully built-in — no messy wires or holes
- ★ Fully compatible with interface/and all other addons

OPTIONAL EXTRAS

- ★ Built in composite video interface/TV switchable
- ★ Built in light pen interface with pen. LED indicator
- ★ Special interference filter no need to remove mic leads gives extra mic socket for backups + super reliable recordings. Save/load LED indicators

★ NOTE These are not addon keyboards but are fully fitted to your Spectrum at our specialized workshop in days

WHERE CAN I PUT MY MICRODRIVE CARTRIDGES TO KEEP THEM SAFE?



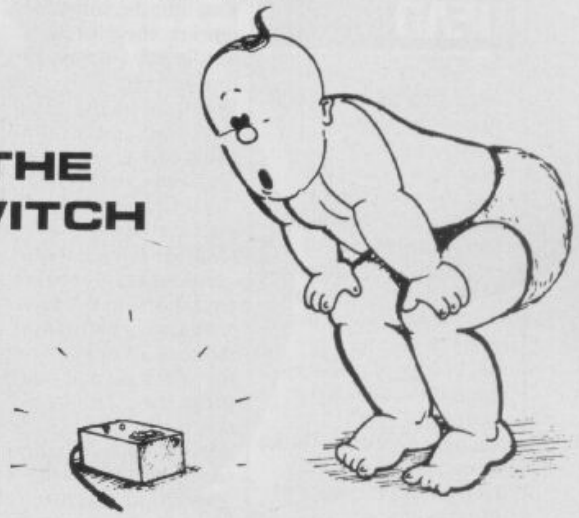
EIDERBOX

- ★ Holds 4 microdrive cartridges
- ★ Comes with full index book
- ★ Free standing
- ★ QL or Spectrum versions
- ★ Cover contains a useful list of the microdrive commands and applications

UNBELIEVABLE AT £1.49 INC.

HOW CAN I RE-SET MY SPECTRUM WITHOUT PULLING OUT THE LEAD?

THE SWITCH



- ★ Allows the Spectrum to be switched off or reset without removing the power supply lead
- ★ LED power indicator
- ★ Separate reset button
- ★ Compatible with *all* other addons including full size keyboards

AMAZING VALUE at £4.90 INC. VAT AND DELIVERY

CAN I CONNECT MY SPECTRUM TO A FULL SIZED PRINTER? WILL IT WORK WITH A MONITOR?

YES! EIDERSOFT ANNOUNCE A VERY SPECIAL DEAL FOR SPECTRUM AND QL OWNERS

Buy a discount printer from us and we will supply you with a centronics interface for only £20 (Spectrum) or £30 (QL) and give you a bumper starter pack of paper and labels as well!!!

KAGA/TAXAN

THE ULTIMATE K810

- ★ Near letter quality 80 col
- ★ 160 cps; friction and tractor feed
- ★ All standard fonts
- ★ Optional NLQ fonts in rom e.g. handwriting, bold etc.
- ★ Quiet with superb looks

Suits Spectrum/QL

INCREDIBLE AT £269 + VAT

EPSON

THE INDUSTRY STANDARD

- ★ RX80 F/T £265 + VAT
- ★ FX80 £355 + VAT

MONITORS

- ★ KAGA K12 RIX colour £199 + VAT Suits Spectrum
- ★ KAGA K12 N £99 + VAT Suits 85 col QL
- ★ PHILIPS V7001 £59 + VAT Suits both

STOP PRESS, KAGA QL Colour Monitors

HURRY! ONLY A FEW BLACK AND HIGH RES! £260

PLEASE ADD £5 P&P + VAT ON ALL LARGE ITEMS

Eidersoft

FREEPOST, PO BOX 54, ILFORD, ESSEX IG1 1BR

01-478 1291
10AM - 8PM

THE FIRST 200 ORDERS RECEIVE A FREE C15 CASSETTE OR A FULL COLOUR PROGRAMMING CHART WORTH £1.25! NAME OUR BABY AND WIN A FREE CHRISTMAS BUNDLE YOURSELF! DETAILS WITH EVERY ORDER. HAVE YOU SEE OUR GAMES LIST?

HURRY, HURRY, HURRY, EIDERSOFT SILLY SERIOUS SOFTWARE SALE! ... MICRO PROLOG (24-95) £22 IS COMPILER (9-95) FP COMPILER (19-95) £17.95 LOGO (39-95) £35 MELBOURNE DRAW (8-95) £8 ABERSOFT FORTH (14-95) £13.00 CYRUS IS CHESS (9-95) £8.95 CHESS TUTOR (9-95) £8.95 ZEUS ASSEMBLER (12-95) £11.50 TASWORD TWO (13-90) £12.50 TRANS EXPRESS (MICRODRIVE VERSIONS) £15 MACHINE CODE FOR BEGINNERS (7-95) £7 MACHINE CODE TEST TOOL (9-95) £8.95 BEYOND BASIC (9-95) £8.95 H.U.R.G. (14-95) £13.00 MANY MORE PHONE FOR BEST PRICES IN TOWN. HAVE YOU SEEN OUR GAMES LIST?

BRING OUT YOUR DEAD

Judging by the number of times we at *Your Spectrum* hear of Spectrums byting the dust, the new 'Micro Repair Club' sounds like a very good idea. For your yearly enrolment fee of £24.95 (obviously they've done some heavy research into the psychology of pricing), you get an extended warranty; if your machine ever does choke on its chips, it can be fixed within the week at no extra charge.

Said Micro Repair Club's general manager, Simon Jamison, "The club is offering a service that has been needed in the home computer market for a long time.

"Now users will know that if their computer breaks down after the initial manufacturer's warranty has run out, they can still protect their investment by joining the club."

The MRC is also offering a reduced price to schools, which understandably have more computers than your average user — but not necessarily a huge budget to spend on them.

Once you've paid your initial membership fee you can renew it indefinitely at a reduced £14.95 a year. On the other hand, you could start off with a cost-effective four-year plan at £57.95. Mind you, with a Spectrum, you get a year's guarantee anyway. So add another four years on that and it doesn't take a mathematical genius to work out that you have a Spectrum that will keep working — perhaps through the odd patch-up job — for five years! Five years ago there wasn't even such a thing as the ZX80, so who knows what'll be around in the next five?

More details on Speccy rescusitation on 01-946 7777.

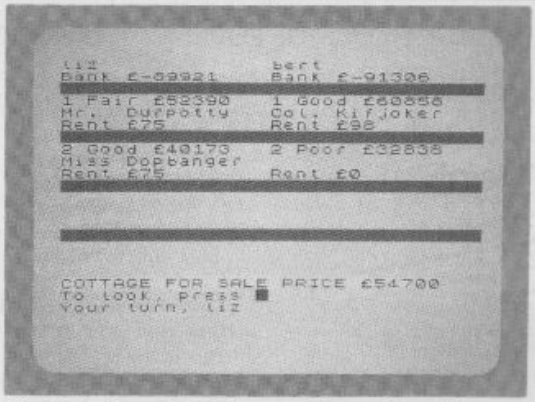
STERLING STUFF?

It's not exactly rare these days to see book publishers dipping their toes into the software market, therefore it's hardly any surprise to find Sterling Publications sprouting forth the dynamically titled division, Sterling Software.

The new company's got two packages due for October release, both aimed at the Spectrum user. First up is *Country Cottages*, a two-player strategy affair involving the purchase and sale of properties ... a sort of down-market *Monopoly*. In the usual struggle to outdo the opposition, Sterling claim that the game contains "an infinite number of different graphic views"!

The other title is called *Assignment East Berlin* — which sounds a bit like *James Bond meets his Funeral In Berlin*, except that in its infinite wisdom, Sterling has named the lead character 'Ice Man'. Hmm? Still, old traditions never die ... just as you know Bond can't cop it in his new film (because they've already started making another), you'll be pleased to know that Sterling has already got its man of ice earmarked to star in *Assignment Hong Kong* in the future.

Both titles will be on sale for £5.95, and if you want to find out where Ice Man's going after Hong Kong give 'em a bell on 01-258 0066.



Sterling's *Country Cottages* — *Monopoly* on the cheap?

OCEAN SPLASHES OUT!

Final negotiations have just been completed between the liquidator of poor old Imagine, and Ocean Software.

Not only has the company bought exclusive rights to a major portion of Imagine's assets, but it's also got its mitts on the Imagine name and logo. Says David Ward, Ocean director, "We now have sole rights to use the Imagine name".

Ocean has also re-employed eight of the ex-Imagine programming team to work on the development of program concepts, in particular a new animated strategy adventure to be released sometime in November.

FROM THE HIP

Troubleshootin' Pete Reporting

Pete's phone lines are open from 10 am-1 pm and 2-5 pm on Wednesdays and Fridays. Ring him on 01-631 1433.

One call out of this month's pack came from Mrs Frome of Staines in Middlesex. She said she'd seen our news item in the last issue about the BBC and Basicode, but that she didn't actually know what Basicode was. Would it work with her Spectrum?

Basicode is, as I see it, a way of making the various versions of Basic, and the individual loading systems of machines, compatible with each other. There are 10 machines that I know have Basicode at the moment, and that list *does* include the ZX Spectrum.

It actually works by having a minimal 42 statements which can be used in a program; any other commands — that is the ones which change from machine to machine — are kept in subroutines. Under Basicode, all programs start from line 1000 because lines 0-999 are reserved for Basicode's standard subroutines. For example, if in your Basicode program you want to clear the screen, you have to say GOSUB 100.

Basicode isn't perfect though. The makers have assumed, for instance, that your machine supports two-letter string names and have the 'standard' LEFT$, RIGHT$ and MID$ string slicing techniques — which the Spectrum doesn't. Fortunately, they've found a way around it.

Anyway, the BBC continues to do its Basicode broadcasts on Sunday mornings at an unearthly hour. If you want more details I believe you can get Basicode for the Spectrum from the BBC itself, by writing to Chip Shop, Broadcasting House, Portland Place, London W1.

■ Now, a small point for all callers who have found that their Speccy's have cremated themselves out of the guarantee period. Read the piece in *Frontlines* about the Micro Repair Club, because apparently you can get hardware fixed by them — even if you're not a member — for quite a lot less than it would normally cost. The company uses Thorn EMI to fix the dead machines, so check 'em out.

■ Lastly for this month, I'll tell you a bit about the stuff I've been doing for London's Capital Radio recently. Bubbly DJ, Kelly Temple (who runs the kid's program *XYZ*) has started a ComputerWorld spot. Maybe for my youthful looks — or could it be because he was desperate (*You got it. Ed.*) — he has taken me in to look after it.

Anyone in London who's after a good laugh can hear me every week stumbling over my words on Sundays at 3pm. If you're 16 or under, you can join in the competitions to win an Amstrad (*That's blasphemy! Ed.*) and we're starting a series to teach you Basic. If you're not in the Capital listening area, get in touch with your local radio station and start one up. It's worth a try!

Catch you on the 'phones ...

Troubleshootin' Pete

Integrated Forth, Assembler and Debug for ZX Spectrum

Another radical new concept in add-ons from CURRAH

Next month CURRAH launch μSOURCE, their most advanced product yet. μSOURCE lets you write and use Assembler or FORTH in BASIC lines, so you can run these advanced languages by themselves or even 'integrate' them into BASIC programs.

μSOURCE gives you the ability to write ultra-fast, highly compact programs which use the powers of all three languages, yet is so user-friendly that even a novice will be using it in minutes! Add advanced features like a full Debug, so you can easily correct your programs, and at £44.50 you can give your Spectrum on-board programming power only found on more expensive machines.

Send in now for an advance information pack to: CURRAH, Hollymount, Hartlepool TS26 0HA.

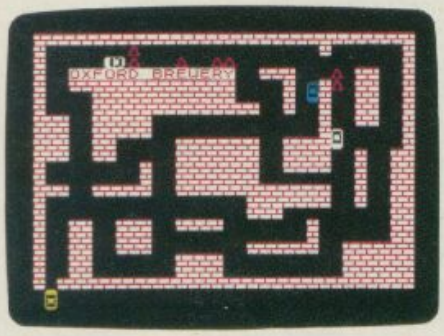
CURRAH

Seeing is

See the pack – see the screen – see the game. See the difference the moment you pick up one of the games from Firebird's new Silver Range.

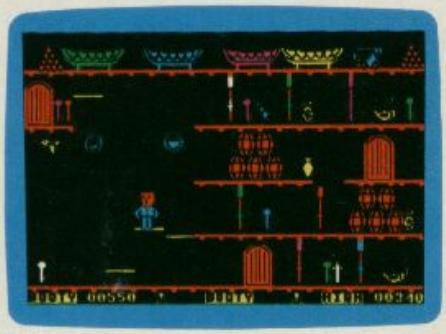
The difference is that our packs show the high quality you'll see on the screen when you play, so you know exactly what you're buying.

Here's a sneak look at three of the NEW games:



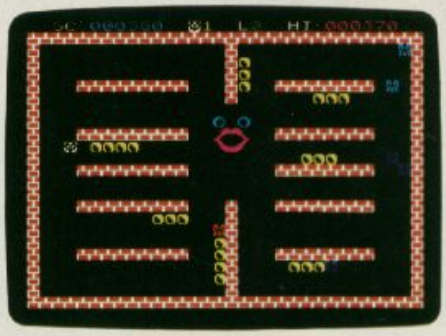
RUN BABY RUN

RUN BABY RUN is a demanding cop chase around five derelict locations. You, the getaway driver must dispose of six pursuing police cars and elude the seventh car's fire power to make good your escape. It's not as easy as it sounds...



BOOTY

Well shiver me timbers and splice the mainbrace and pass the grog, me hearties. Here be the greatest pirate adventure of them all, aboard that scourge of the Seven Seas – the dreaded Black Galleon. Feast yer eyes on the BOOTY-ful treasure stored in 20 holds. There be pirates, parrots and fun galore. If you don't like it, matey, we'll hang you by the highest yard-arm!!!



CRAZY CAVERNS

Ten Crazy Caverns, ten hungry mouths to feed. Line up the Crunchy Cubes and cannon them into the Craving Craw. Watch out for the Crazy Crashers coming to convert your little Cubey Crammer into a Crushed Crisp. It's a cracker!

Look out for these games in the FIREBIRD silver range at selected high street stores.

SPECTRUM: THE WILD BUNCH · BOOTY · MR. FREEZE · TERRA FORCE · VIKING RAIDERS · MENACE · EXODUS · RUN BABY RUN · CRAZY CAVERNS.
COMMODORE 64: BOOTY · MR. FREEZE · EXODUS · HEADACHE · ZULU.
VIC 20: SNAKE BITE · MICKEY THE BRICKY.
BBC MICRO B: BIRD STRIKE · GOLD DIGGER · ACID DROPS · DUCK!

believing

The same high standard applies to all twenty games in the range and all are available at the remarkably low price of

£2.50

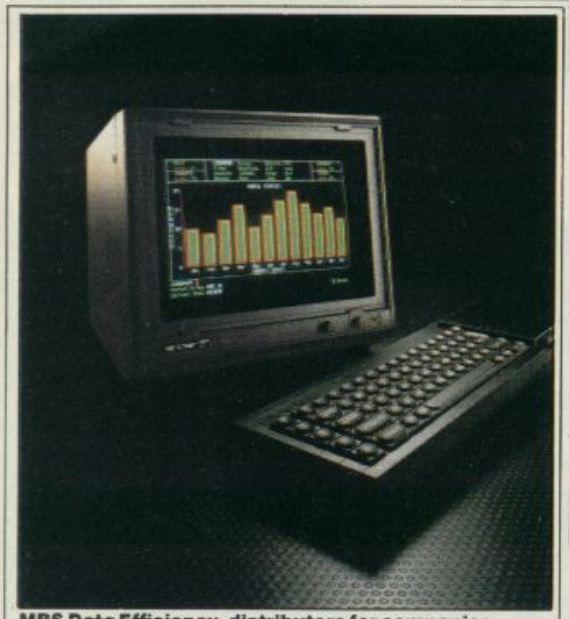
firebird

SOFTWARE

The new range from British Telecom. **You'd better believe it!!!**

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

Firebird and the Firebird logo are trademarks of British Telecommunications plc.



MBS Data Efficiency, distributors for companies like Brother, Epson and BASF, has just announced a contract with Sinclair Research for a beast called the Sinclair Vision QL Monitor. Developed jointly by Sinclair Research and MBS for exclusive use by the QL, it's a 12" RGB colour monitor and has the latest 'blackface' non-glare tube for better colour contrast. Needless to say (yawn) the casing is designed to complement the delightful lines and nifty colour of the QL. The price for this Sinclair Research authenticated piece of equipment is £299 (including VAT) and comes with a 12-month warranty.

Akai is introducing its first television set to be sold on the UK market. But it's a TV with a difference, because of the RGB and Video inputs that come out of its rear end. Apart from these functions — which will obviously interest the home computer user — it also has another 14 channels for ordinary telly programs and VCR enthusiasts. How much for this piece of electronic wizardy? Only £279 to you! OK John?

DJ FIGHTS BACK

A cheque for £2100 was presented to proud Radio Luxembourg disc jockey Stuart Henry, which will be used to fight the crippling disease Multiple Sclerosis. The cash had been raised by Bellflower Software and WH Smiths from sales of the Spectrum game *Stuart Henry's Pop Quiz*, which was launched earlier this Summer.

An MS sufferer himself, Stuart Henry said, "Everyone who's bought the program so far has made a contribution to vital research into finding a cure for MS". And if you haven't rushed out and bought one already or you just don't like music ... well, that's not good enough! Why not send a donation to the MS Society anyway — it's an impeccable cause! You can ring the society on 01-381 4022.

IF YOU CAN'T BEAT 'EM ...

Bug-Byte, CBS, Quicksilva and Virgin Games have joined forces to set up a sales service to sell all of their collective software, as from 1st October 1984.

The operation is jointly controlled by the four companies involved, and an extra person in the guise of Geoff Thompson has joined to become national sales manager.

The Software Sales Service, as it's called, plans to move the simple selling of software into a more dynamic dimension, using marketing aids, distribution networks and promotional material. We'll be able to pop in and see how they're getting on — because the new service is based just down the road from the *YS* towerblock — at 3-5 Rathbone Place, London W1.

Quicksilva's MD Rod Cousens.

CHILD'S PLAY

Described in the blurb as a 'totally new experience for the very young', *The Magic Sword* is an adventure program that comes complete with a 48-page booklet to help set the fairytale scene.

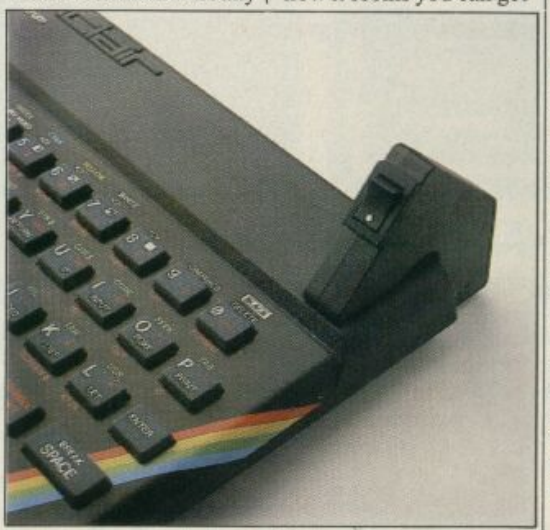
Priced at £8.95, the action sets the micro toddler in 'the magical world of a handsome prince, a beautiful princess and a castle ...' The idea of the game is to pick up lumps of magic until you've enough to finish the story.

Childish information can be obtained from Database Communications on 061-456 8383.

***The Magic Sword* — read all about it!**

SOUND SOFTWARE

As you well know, creating sound effects independently of the BEEP command usually means shelling out about £30 for an add-on synthesiser chip. But now it seems you can get some surprisingly good sound effects under software control for a fraction of that.



Hardware company, TEC, has just released an ON/OFF switch for the Spectrum priced at £4.95. Although that may seem a little pricey for something so simple, it's actually quite a good design and doesn't look at all out of place attached to the Speccy. If you want one, TEC is at 24 Victoria Road, Bromsgrove, Worcs.

For a mere £7.95 (including postage and packing) you can get your mitts on *Spectrum Sound Effects* — a program that gives you 50 different pre-programmed machine code effects which, by varying both the pitch and duration, provides 2000 sounds in all. They can all be played through the Spectrum's keyboard, plotted with a graph on the screen and saved independently of the main program — so you can use them in your own creations!

Sound Effects is available from MFM Data Services Ltd, 141a Camden Road, Tunbridge Wells, Kent TN1 2RA.

The Sinclair QL and you

Exploring the Sinclair QL — An Introduction to SuperBASIC

Andrew Nelson, £4.95

The QL has a rich, new programming vocabulary, and this great book gives you the chance to master the host of new words Sinclair has added. Sure, you can use the QL more or less just like a Spectrum, but if you do, you are missing the extraordinary power which lies behind the radical concepts of SuperBASIC. Command by command, statement by statement, Andrew Nelson takes you through the richness of QL SuperBASIC in *Exploring the Sinclair QL — An Introduction to SuperBASIC*. Just £4.95 and available from most book and computer shops. In case of difficulty, you can order it directly from Interface Publications, using the coupon below. (Trade only: Interface Publications are distributed exclusively in the UK and Eire by W H S Distributors. Export orders handled by Interface Publications.)

Interface Publications, Department QYS,
9-11 Kensington High Street, London W8 5NP.

Please send me the following books.
I enclose a total of £_____

☐ **Exploring the Sinclair QL — An Introduction to SuperBASIC** Andrew Nelson, ISBN 0 907563 84 8 —	£4.95
☐ **Mastering Machine Code on your ZX Spectrum** — Toni Baker	£9.95
☐ **Spectrum Machine Code Made Easy, Volume One for beginners** — James Walsh	£5.95
☐ **Spectrum Machine Code Made Easy, Volume Two for advanced programmers** — Paul Holmes	£5.95
☐ **The Spectrum Machine Code Reference Guide** — Richard Ross-Langley	£4.95
☐ **Creating Adventures on your ZX Spectrum** — Peter Shaw and James Mortleman	£4.95
☐ **Putting Your Spectrum to Work (including 15 major programs, including a word-processor and spread-sheet calculations)** — Chris Callender	£4.95
☐ **Creating Arcade Games on the ZX Spectrum** — Daniel Haywood	£3.95
☐ **Programming Your ZX Spectrum** — Hartnell/Jones	£6.95
☐ **60 Games and Applications for the ZX Spectrum** — David Harwood	£4.95
☐ **Beyond Simple BASIC — Delving Deeper into your ZX Spectrum** — Dilwyn Jones	£7.95
☐ **Instant Spectrum Programming (tape and book)** — Tim Hartnell	£4.95
☐ **20 Simple Electronic Projects for the Spectrum** — Stephen Adams	£6.45

Name.....

Address.....

.....

..... QYS

INTERFACE PUBLICATIONS

We're the experts!

CONCURRENT QL AFFAIRS

John Torofex and Nigel Cross investigate the QL news scene.

Well, Sinclair Research has finally announced that the QL mail order operation is being wound down, and QLs are making their presence felt in the high street stores.

However, there are all sorts of rumours around which suggest there's still the odd reliability problem with many of the machines. The manager of the local branch of Dixons told me that out of 1000 machines delivered to their warehouse, only 190 worked properly. Further rumbles from distributors Spectrum, seem to indicate similar troubles — with one hapless dealer spending a whole morning with six QLs and six sets of Psion software, trying to find a combination that enabled all the Psion wares to be loaded.

DIY RAM?

Has anyone out there seen the ad for the 256K RAM expansion module from Simplex Data Ltd? Is it my failing sight, or does close inspection of said photographed device reveal the alleged unit to be constructed from four separate components — three pieces of chopped-up QL PCB and a DIN 41612 connector — all held together with black sticky tape!

What beats me is how the company can sell the board at £198, when each QL that's chopped up will have cost over £300 at trade prices!

RESPONSE FRAME

In a recent communiqué with Dr David Potter of Psion, he claims that an analysis of how the company are dealing with QL enquiries over the period June 6th to October 10th gave the following results: 65 per cent were answered and posted on the same day as receipt; 15 per cent were dealt with within 48 hours of receipt; and eight per cent were sorted within 24 hours.

My more astute readers will note that the above leaves 12 per cent out in the cold. It seems these are the 'tricky' questions, involving printers and the like, that need much more research. Nice one,Psion!

EXTRA, EXTRA!

Fans of QLUB (*Wake up out there! Ed.*) who've been on the edge of their seats waiting for the second thrilling instalment of *QLUB News* will have not have to hold their breath much longer. However, according to my calculations, as the first QLs appeared in April, surely we should have seen at least four issues by now? Maybe the editor's too busy sifting through the wealth of programming contributions to put together the next issue.

SIR CLIVE WHO?

A rather interesting journal fell on to my desk this month, the *Quarterly Newsletter of the Society for the Study of Artificial Intelligence*... and it details the exploits of one, Sir Clive Hardware. He reminds me of someone.

A SERIAL SOAP OPERA

It appears that the QL has all sorts of problems in its serial ports. As the serial I/O ports require to be set at the same baud rates, it's been assumed by many that the machine has these two sockets 'ganged' together in some way through their internal wiring. Take the recent experience of a QL user.

Picture a QL (JM version) with Sinclair-provided serial I/O cables, an Epson RX80 printer performing perfectly at 9600 baud using its XON/XOFF protocol and an Apple II using a proprietary serial card at 1200 baud (with the RTS and DTS signals shorted together to fulfill the requirements of the Apple transmission). However, connect the printer to the QL's ser1 port (and switch it on) and the Apple to the ser2, and type the following on the QL:

```
BAUD 1200
COPY SER2 TO SCR
```

All you'd expect is the QL to display any transmission from the Apple. However, without transmitting any data from the Apple, characters appeared on the screen!

If you remove the Apple there's no difference, even though there's nothing attached to ser2 where the Apple was once attached and from where the QL is supposed to be getting its information. If you disconnect the printer at this point, no more characters appear on the screen. If you then reconnect the Apple to ser2, you'll get perfect results.

The moral of this sad story is that QL users won't be able to 'mix and match' disparate pieces of equipment through the serial ports, as spurious characters are most likely to interfere with their work! Also, it seems as though the QL serial ports are so wired that it is *impossible* to continue working in a 'reasonable fashion' (according to the QL's documentation!) without disconnecting other pieces of equipment. Which, when you think about it, is not a very satisfactory situation!

Nigel Cross

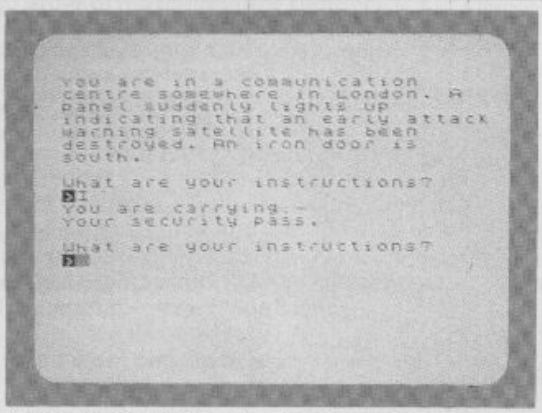
AND ON THE 8TH DAY...

Yet another Liverpudlian software house has just programmed itself into existence. Called 8th Day Software, the company's opening its range with six text adventures, ranging in difficulty from beginner's stuff to 'jolly difficult'.

All have a low price of £1.75, but 8th Day is quick to disclaim the 'you-get-what-you-pay-for' syndrome.

The six new titles, all launched under the 'Games Without Frontiers' banner, are all *Quill*ed adventures and your measly £1.75 even includes postage, packing and VAT. How they can do it at such a low price and still make a profit defeats us.

Unwrapping the first six packages, we have *Four Minutes to Midnight* (an advanced strategy adventure), *Cuddles* (a moderately difficult adventure for 'big' kids), *Quann Tulla* (a science fiction adventure), *Ice Station Zero* (a beginner's crime solving adventure), *In Search of Angels* (another crime adventure) and *Faerie* (an advanced fantasy adventure). All the games can be ordered direct from 8th Day Software, so give them a ring on 051-677 1581.



***In Search of Angels* — one of six packages all priced at £1.75!**

DOWN IN THE DUNGEON

PSS seems to be getting more than enthusiastic about its latest release, *Swords & Sorcery*. The company now claims that it's the best reproduction of the role playing idea on a computer yet; it's true there's been nothing *completely* true to the original concept of *Dungeon & Dragons* to date.

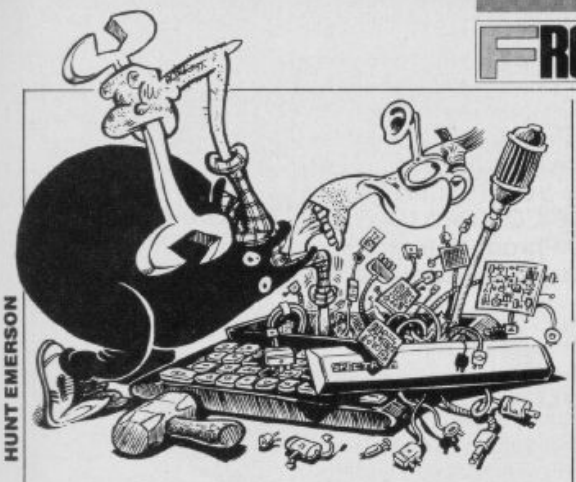
Written using an odd system called MIDAS (whatever that might be) the program is a 3D graphic animation, simulating the effect you get with Video Disk games.

The colour leaflet that PSS is currently putting about makes *Sword & Sorcery* sound like nothing on earth. Either it's got a very good public relations department, or it *is* like nothing on earth.

The fact that the game sticks very close to the gripping role playing

idea makes this program kind of special. If it's got the graphics it claims to have, then it's no wonder PSS is screaming about it.

More enlightment on 0203 667556.



HUNT EMERSON

HARD CORE

Our hardware hacker, Trevor Marchant, is here to help you rescusitate your Spectrum equipment. Write to him at Your Spectrum, 14 Rathbone Place, London W1P 1DE.

Welcome to the Spectrum graveyard. If you're having any hardware problems with the Spectrum, Interface 1, Interface 2, Microdrives or any other peripherals, I'm here to offer advice. Needless to say, I can only do so much ... so if your equipment has disappeared in a puff of blue smoke, your best bet is to contact Sinclair Research on 0223 353204 (Cambridge general enquiries) or 0276 685311 (Camberley customer services).

What I'll need from you is a *detailed* description of your problem — obviously the more information you can provide, the better equipped I'll be to answer your query; please *don't* send your broken Speccys to me — with the best will in the world I can't manage any on-the-spot repairs!

Also, I'm looking to compile a list of reputable repair companies. Anyone who's managed to fix your computer in record time is worthy of mention, so write to me with their names and addresses and I'll then be able to offer any readers advice on where to send their equipment once it's bitten the dust. While I'm on the subject, you may be interested to know that Sinclair Research is setting up a nationwide repair service with Verran (UK) — for more details of the new Computerfix service, dial 0276 66266.

So, remember, when your machine dies on you, you've got a friend. I may not be able to fix your equipment for you, but I might be able to tell you exactly what's wrong with it and who'll be the best to sort you out.

CHEAP STUNTS DEPT.

Praise *Kokotoni Wilf* and meet Lee Majors? Yuck!

Elite Systems offered a copy of *Fall Guy* to anyone who could crack *Kokotoni Wilf* and send the company details of the hidden message. Entrants to the competition receive copies of Elite's new game in November but the accompanying letter gave the winners yet another competition to enter. To quote: "We're offering the first five *Kokotoni Wilf* fans, who get a letter printed in a computer magazine *praising* the game, the opportunity to meet Lee Majors ... but remember, we must see your letter in print before we can declare you a winner".

Hah! 'Tis but a pretty cheap publicity stunt! By the way, we got hold of a copy of Elite's letter from a winner who got the hidden message because the game failed to load properly — the message was given up within 30 seconds.

The Key to Spectrum Machine Code Success.

Picturesque's MACHINE CODE SYSTEM is used and recommended by professional software writers, yet the excellent documentation and the friendly, easy-to-use programs have been highly recommended for beginners.

You will only buy one Machine Code System, so buy the best, the one the professionals use.

NEW IMPROVED PROGRAMS — MICRODRIVE COMPATIBLE

ASSEMBLER

Completely self-contained with its own line editor, giving an easy-to-read 40 column tabulated listing. Auto line numbering, line renumbering and auto tabulation make this one of the fastest and easiest Assemblers to use. 5-character label names. Decimal, Hex or ASCII constants. SAVE/LOAD/VERIFY both the listing and Machine Code to cassette/MICRODRIVE/NETWORK. Assemble from cassette or Microdrive into memory for very large programs. Customise to most Centronics printer interfaces, or RS232 (with Interface 1) for 80 column printout. FAST ASSEMBLY — 1k of code in 7 seconds. Assembler Directives:— ORG, END, DEFB, DEFW, DEFM, EQU, DEFL. (Microdrive and Centronics facilities only operate with 48K machines.)

£8.50
INCL. VAT & P&P.

MONITOR

The ideal tool to help the beginner get started, yet it contains all the commands for the experienced programmer to run and de-bug machine code programs. Inspect and alter memory contents in Hex or ASCII. Breakpoints and full Register display. NOW WITH SINGLE STEPPING through RAM or ROM. Disassemble any part of memory, RAM or ROM. Dec-Hex-Dec number converter. Printer output to ZX printer or via RS232 (with Interface 1) or customise to most Centronics printer interfaces. General memory management commands include Hex dump, Insert, Delete, Fill and Move. Can reside in memory with the Assembler (48K machines only) to give a complete Machine Code programming system.

£7.50
INCL. VAT & P&P.

Programs supplied on cassette with option to Save onto Microdrive (cartridge not supplied.)

Existing owners can obtain the new programs by returning the **cassette only** to Picturesque, along with a cheque/PO. for **£1.50 per program** (inc. VAT & P&P). New cassettes will be supplied by return of post.

Available from the "SPECTRUM" chain of stores, branches of John Menzies and all good computer shops, or by mail order by sending cheque/PO to:
PICTURESQUE, 6 Corkscrew Hill, West Wickham, Kent, BR4 9BB. Send SAE for details.

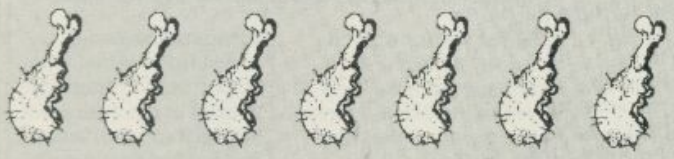
PICTURESQUE
PICTURESQUE
PICTURESQUE
PICTURESQUE

YOUR SPECTRUM TOP TURKEYS

Good, bad and indifferent . . . as usual us gamesters got an across-the-board sprinkling in 1984. *Old Nick* takes a three-pronged look at the seamier side of it all.

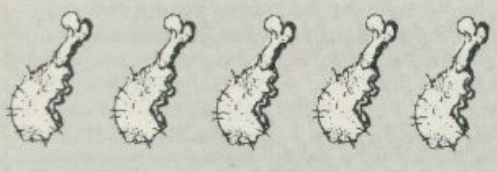
You said it, not us! Yes, it's the time of the year when all good men and true POKE around the depths of their souls — to dredge up their considered contribution to the poll that signals all that's worst in commercial games software.

Funny thing is some of them also get voted as the best! (*Well I never! Ed.*) Still here are the Turkeys in descending order of nastiness — culminating, of course, with this year's winner of the coveted *Your Spectrum* Strangled Turkey Awards for 1984.



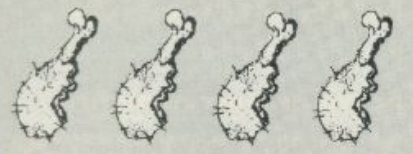
1 JET SET WILLY SOFTWARE PROJECTS

Hey ... how come this is top of the best sellers *and* bottom of the dogs? Is there sneaky work afoot? Perhaps it was just the publicity overkill . . ., And no, I haven't got any more POKEs for chrissake!



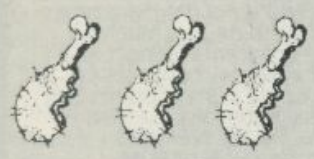
2 TRANSYLVANIAN TOWER RICHARD SHEPHERD SOFTWARE

Here it is again — skimmed off the top of last year's poll and pipped only by *JSW*. Looks like some people *never* forgive and forget.



3 MAD MARTHA II MIKRO-GEN

After *Mad Martha I*, who would be man enough to sample *MMII*? A few it seems — otherwise we'd never have known just how awful the follow-up was!



4 YOMP VIRGIN GAMES

One of the true low points of 1983 disinterest. Still this early Virgin release pulls in the negative votes — with the most impeccable reasons.

5 SCHIZOIDS IMAGINE SOFTWARE

If you weren't already before you started, then schizoid you're likely to be before you're finished — if you can stay awake that long. Let's hope it's one that Imagine's receiver *isn't* able to flog off in the forseeable future.

If there's one thing you can say about the games software released in 1984 — it's that the quality overall has been higher than in 1983. That's not to say, of course, that there haven't been the usual crop of misfires. Take A 'n' F Software's *Dashing Dougie*, for instance. The copious pages of advertising early in the year suggested a mega-bombshell was on the way — then, nothing. The ads stoped and A 'n' F quietly forgot about it. Perhaps the game was so awful it never reached the duplication stage. Certainly whispers went around that the software changed programmers towards the end of its aborted life; was the first programmer making a pig's ear of it? Or was it just that the second programmer was unfamiliar with the particular coding techniques of the first? It looks like we'll never know.

Biggest teeth-gnash of the year for me has been the latest 'megadventure' program, *Eureka*. On the whole it's pretty good, but — and that's a *big* but — the arcade games that you *have* to play to get into the adventure can be summed up in one unprintable word. Pass the POKEs, Gladys.

Those unkind enough to want to present companies with Turkey Awards for knocking out consistently bad programming may look no further than Virgin Games. On the other hand, VG has just gone and ruined everything by switching strategy and actually buying the rights to some decent stuff! K-TEL, however, is still riding high on its lowliness ... I haven't seen a good game from that direction so far. 'Two-for-one' sounds OK, providing somewhere down the line you're getting value for money. Sidney Snide says the programs we list in *YS* are far better than the wee packs K-TEL send us for review ... of course, I wouldn't dare say such a thing myself.

So, on we go to '85. It might be nice to predict that we've seen the last of the turkey droppings and that next year, all will be fascination and excitement on the software shelf. The trouble is, should such an awesome dream gain fulfillment, what am I going to write about next year?

THE ULTIMATE EXPERIENCE

Ultimate Play The Game should have released the first of its two MegaGames by the time your eyes light upon this page.

The package you can buy now — if you believe the PR person — is the follow-up to *Sabre Wulf*.

So, here we go — welcome to *UnderWurld*, the evergreen lair of the Wulf.

The other game — *KnightLore* — should be released by the end of this month, but Ultimate's not saying much about what the game involves.

Both games are going to be retailed at £9.95, but they really should be worth it — honest!

BT GOES SOFT

Who knows what the relationship is between telephones and computer software, but British Telecom seems to think there is one. It's launched a range of packages under the Firebird label, available for the Spectrum, CBM 64 and BBC Micro.

Priced at only £2.50, the cassette insert actually has a screen shot of what appears on your telly. By golly that's bravery for you! BT has 20 titles to kick off with, nine of which are for the Speccy.

Richard Hooper said when announcing the venture, "You can now judge a game by its cover. In a market where quality and prices tend to be variable and complaints of misrepresentation frequent, Firebird software is setting new standards".

If you want to get hold of a Firebird game and check for yourself what the quality is like, then dive into your local stockist. Otherwise give BT a buzz on 01-357 3796.

BEWARE. THE CYCLONE.

You've seen the havoc Tornado Low Level can create.
Now it's the turn of Cyclone. The latest action game from Vortex.
Stunning multi-view 3D graphics. Vast dynamic playing area. A new game designed to take the Spectrum world by storm.
Beware. The Cyclone...is imminent.

Vortex SOFTWARE

☐ CYCLONE	SPECTRUM 48K	£6.95	
☐ T.L.L.	SPECTRUM 48K	£5.95	
☐ ANDROID TWO	SPECTRUM 48K	£5.95	
☐ ANDROID ONE	SPECTRUM 16K·48K	£4.95	TOTAL VALUE £

NAME (BLOCK LETTERS PLEASE)

ADDRESS

ENCLOSE P/O CHEQUE PAYABLE TO VORTEX SOFTWARE (SALES) LTD.
SEND TO VORTEX SOFTWARE (SALES) LTD. 280 BROOKLANDS ROAD, MANCHESTER M23 9HD

· VORTEX ACTION GAMES · AVAILABLE AT ALL LEADING RETAILERS ·

YS TOP TWENTY CHART

THIS MONTH	LAST MONTH	MONTHS IN CHART		
1	2	7	**JET SET WILLY** SOFTWARE PROJECTS	BACK AT THE NUMBER ONE SPOT WITH A VENGEANCE! SO HOW COME IT'S TOP TURKEY AS WELL?
2	1	4	**SABRE WULF** ULTIMATE	AT LAST, IT'S BEEN KNOCKED OFF THE TOP . . . ULTIMATELY, IT HAD TO HAPPEN!
3	5	7	**MANIC MINER** SOFTWARE PROJECTS	AREN'T YOU FED UP WITH THIS ONE YET — IT'S POSITIVELY ANCIENT . .
4	6	7	**ATIC ATAC** ULTIMATE	GOING UP! A NEW LEASE OF 'UN-LIFE' FOR THE SPOOK SPOOF.
5	4	6	**TRASHMAN** NEW GENERATION	THIS ONE'S ON ITS WAY DOWN . . . AGAIN! WHAT DO YOU THINK OF TRASHY'S LATEST ADVENTURE?
6	8	2	**ANT ATTACK** QUICKSILVA	NOT THIS ONE AGAIN! HASN'T ANYONE OUT THERE SEEN *ZOMBIE ZOMBIE* YET?
7	19	7	**CHEQUERED FLAG** PSION	ACCELERATING UP THE CHARTS, HERE'S ONE TO DRIVE YOU TO DISTRACTION!
8	3	6	**LUNAR JETMAN** ULTIMATE	IT SEEMS THAT NO-ONE'S INTERESTED IN THE MOON ANYMORE. WHY'S THAT?
9	12	6	**WHEELIE** MICROSPHERE	NUDGING ITS WAY INTO THE TOP TEN. THIS GAME LOOKS SET TO STAY.
10	11	4	**LORDS OF MIDNIGHT** BEYOND SOFTWARE	OK, HANDS UP WHO'S SEEN ALL 32,000 SCREENS!
11	13	4	**MUGSY** MELBOURNE HOUSE	THE RUMOUR'S NOT TRUE THAT WE'VE BEEN BRIBED TO INCLUDE THIS GAME!
12	9	7	**CHUCKIE EGG** A & F SOFTWARE	YOU'LL HAVE EGG ON YOUR FACE IF YOU LET THIS GAME SLIP AWAY UNSEEN.
13	10	2	**THE HOBBIT** MELBOURNE HOUSE	GET THE HOBBIT HABIT — THE SOFTWARE OF THE FILM OF THE BOOK, ETC.
14	16	4	**WORLD CUP** ARTIC	ALL THE FUN OF THE FOOTBALL PITCH . . . WITHOUT THE MUD!
15	14	2	**MATCHPOINT** SINCLAIR	SINCLAIR COULD BE AT FAULT SERVING UP A TENNIS GAME AFTER WIMBLEDON.
16	NEW	1	**HUNCHBACK** OCEAN	WE HAD A HUNCH THIS ONE WOULD BE BACK. WE WAS RIGHT!
17	NEW	1	**FOOTBALL MANAGER** ADDICTIVE GAMES	SO, TWO FOOTBALL GAMES IN THE CHARTS AT ONCE. WHICH DO YOU THINK'S BEST?
18	17	2	**JET PAC** ULTIMATE	NOW YOU SEE IT . . . SOON YOU WON'T? *JET PAC* LOOKS SET TO BLAST OUT OF THE CHARTS.
19	NEW	1	**TLL** VORTEX	OBLITERATE THE TARGETS IN THIS FLIGHT SIMULATION AS YOU CONTROL A SWING-WING FIGHTER.
20	NEW	1	**FRED** QUICKSILVA	WHAT'S THIS ONE DOING SKULKING AROUND THE CHART'S NETHER REGIONS? HAVE YOU NO TASTE?

JOHN HALLET

NEW RS 232 & PARALLEL PRINTER INTERFACE for ZX SPECTRUM

Connect to professional printers with this improved and cheaper printer interface.

£34.95 cable £9.95 inc. VAT

ZXLprint III interface enables your ZX Spectrum computer (16 or 48k) to print on almost any dot matrix or daisywheel printer with RS 232 or Centronics input. Just plug in ZXLprint III and LPRINT and LLIST commands will work. COPY works without any additional software on Seikosha 100 & 250, hi-res Epsons, Star 510, 515, STX 80, Gemini & Delta, Walters WM80, Shinwa and CTI . . . Plus Seikosha GP 700 in full colour. COPY on Microline, CGP115 and MCP40 is optional.
And because NO additional software is needed all of your RAM is free to take Tasword 2 or Kemp Business Accounts, Viewfile etc.

- ●WORD PROCESSING
- ●HIGH RESOLUTION SCREEN DUMPS
- ●PRINTS SPECTRUM AND USER DEFINED GRAPHICS
- ●JUST PLUG IN FOR LPRINT LLIST and COPY
- ●COMPATIBLE WITH MICRODRIVES & PRESTEL ADAPTOR

EUROELECTRONICS

ORDER: To EUROELECTRONICS, 26 Clarence Square, Cheltenham, Glos. GL50 2JP. Tel: Tewkesbury (0684) 292448

From: Name:_____

Address:_____

This order is for: (Quantity)

ZXL PRINT III at £34.95 _____

Centronics Cable at £9.95 _____

RS 232 Cable at £9.95 _____

Tasword 2 at £13.90 _____

Please add £1.45 p&p

Cheques/PO payable to EUROELECTRONICS

Amount enclosed_____

Microdrives adaptor for ZX Lprint I and II £4.50 + 70p p&p

THE YS TOP 20

Here we are, it's almost Christmas and it would seem, from our chart at least, that everyone's still playing the 'oldies but goldies'. Remember, this chart is based *solely* on the votes you send in — and not on fictitious sales figures — so if you don't agree with what you see, fill in the form below (or a photocopy . . . we're not fussed) and tell us what *you* think should be topping the charts.

The carrot is still three software packages for the first voting slip to be pulled out of the Editor's hat, and this month's lucky winner is Matthew Williamson of Haverfordwest.

As you can see in *Frontlines* this month we've compiled a Christmas Turkey Chart of the top five software 'nasties'. But don't think we're going to let you off so easily! You'll notice our coupon still allows you to fill in your top three turkeys of the month — these will be used to get together our Turkey Chart for Christmas 1985. So don't forget to fill 'em in!

On a last note, when you're sending off your letters to Forum, or ordering *ZIP* or *YS MegaBasic*, why not put your voting slip in as well. It'll save you the price of a stamp! Post all entries to *YS Charts, Your Spectrum, 14 Rathbone Place, London W1P 1DE.*

YS TOP 20 READER POLL

My top five raves on the Speccy are:

1 _____

2 _____

3 _____

4 _____

5 _____

My three top turkeys for the Speccy are:

1 _____

2 _____

3 _____

Name _____

Address _____

_____

_____

_____

Postcode _____

I understand that when this chart was tested — eight out of ten owners said their Spectrums preferred it. *(What? Ed.)*

YS TOP TWENTY
YOUR SPECTRUM
14 RATHBONE PLACE
LONDON W1P 1DE

YOUR SPECTRUM

JOHN HALLET

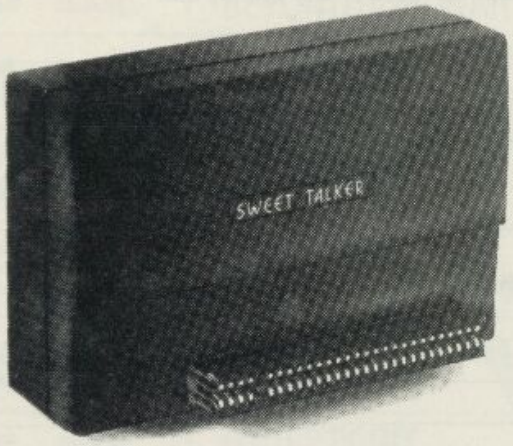
Why wait any longer?

Upgrade your 16K ZX SPECTRUM Now!

The CHEETAH 32K RAMPACK simply plugs into the user port at the rear of your computer and increases the memory instantly to 48K.

- ★ Fully compatible with all SINCLAIR accessories via rear edge connector
- ★ **NO NEED TO OPEN COMPUTER AND INVALIDATE GUARANTEE**
- ★ Why send your computer away and wait weeks for upgrade
- ★ Fully cased tested and guaranteed.

only £39·95
including VAT and P&P.



Now make your Spectrum and ZX-81 Talk

Compatible with Interface I & II

The Cheetah "SWEET TALKER" just plugs into the back of the computer using the existing power supply. Based on an allophone system you can easily program any word sentence or phrase. Fully cased, tested guaranteed and compatible with all SINCLAIR accessories via rear edge connector. Complete with demonstration cassette and full instructions.
No more lonely nights!

Simply incredible at **£29·75**

(Please quote when ordering whether Spectrum or ZX81 owner)

16K RAM Pack for ZX-81	£19.75
64K RAM Pack for ZX-81	£44.75

Prices include VAT, postage & packing. Delivery normally 14 days. Export orders at no extra cost.

Dealer enquiries welcome

Cheetah, products available from branches of

John Menzies Boots WHSMITH Rumbelows

and all good computer stores

Cheetah Marketing

Cheetah Marketing Ltd, 24 Ray Street, London EC1R 3DJ. Tel: 01 833 4909. Telex: 8954958.

FORUM

Is there something you're not telling us? From next issue on, there'll be a crisp tenner awarded to the Star Letter of the Month. Don't miss out . . . write to Forum, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

ISSUE FORTH

I was interested to read in the September issue of *YS* an article about the '64K Spectrum' by Simon Goodwin. Two weeks prior to reading the article I had to return my 48K Spectrum to Sinclair Research for repair (for the fifth time since 1982). I have just received my 'repaired' Spectrum back and it's actually a brand new machine.

Naturally, my first action was to take the back off the machine to find out whether or not it was one of the 64K Issue 3.5 models; it is in fact an *Issue 4a* model and the circuit board is completely different to my previous Issue 2 Spectrum. I don't know how different my Issue 4a Spectrum is from an Issue 3 Mk 5 (or any other Issue 3), as I've never had the opportunity to look inside an Issue 3. Perhaps you could publish a sketch of the inside of an Issue 3 machine to enlighten me?

Andy Sheppard, Burnley, Lancs

We haven't yet managed to get our hands on one of the new Mk 5s — so it's going to be difficult to provide you with a sneak look at the said device. However, if you want a rough idea of what goes on in an Issue 3, try looking at Sexing Your Spectrum, *an article we published in the third issue of YS (where else?). If you haven't got a copy, see if you can look in a friend's as I have a rather nasty feeling it's getting rather rare. Ed.*

SHORT SHRIFT

I am writing to you because, as a devoted follower of the Sinclair cult, I went out and bought myself a copy of your highly esteemed mag. Having read this from front to back, I sent off for some back issues (1, 3 and 4) but received only 1 and 4 with a note saying that all issues of number 3 were sold out — but I would, however, receive a copy of issue 9 for my anguish. So I sat down and read the issues I now had, but soon begin to pine for my non-existent issue 3. Also to my further grief (and being a moron of the highest order) I don't understand a word (or digit??) of machine code; I therefore welcomed *Paper Data* in issue 2. But wait, yet another aid to my gradual mental demise . . . no addresses were given as to the purchase of the aforementioned books. Also, being a great lazy wally, I have an (original) copy of *The Quill* but would also like some advice on the available arcade games designers. So would you please, please, please advise me on how to:

a) Reserve myself a copy of the much sought after *YS* issue 3.
b) Order a copy of *Spectrum Machine Language For The Absolute Beginner.*
c) Obtain a copy of a good arcade games designer.

Philip Hankinson, Warrington

a) Hah!, no chance!; b) walk into Smith's.; c) see (b). Troubleshootin' Pete.

DRAG AT YS?

Hello from one of the *Your Spectrum* fans. Fine magazine, excellent reading, guaranteed to produce the bags under the eyes and the twitchy finger syndrome so distinctive of the Spectrum addict. Well done! ('And so you ought to be' says my Dad when he's trying to get me to bed.)

While I'm on the subject of my Dad, he's part of the problem I'm writing to you about. He uses a BBC-based system. Ouch, I'm sorry, I didn't really say that word. I've told him loads of times but he's just plain arrogant. His system uses a Microvitec 1451 monitor which I'd like to use with the Spectrum. I'm one of your original fans and have a complete set of *YS* (wow?), so I dug out issue 2 and read Ian Beardsmore's article on doing the necessary surgery. Everything Spectrumwise is in order (Issue 3 and outside guarantee period, etc).

My problem is whether the composite video signal produced by Ian's Spectrum mods will drive the Microvitec monitor which has RGB input. If the answer is 'no, Ian's method won't work', is there any other way to connect the two items? Some sort of interface perhaps? Do you know of any manufacturer who may produce a kit or whatever, to carry out this conversion?

Finally, a much more important question — a question which has been at the heart of many a finger-resting coffee break since the amazing Issue 1 first hooked us. Who is she, the lady on the cover? She with the green necklace and blue eyes. What is she thinking as she pensively studies the lighting system? Is this Toni Baker, Sue Denham or perhaps Penny Page? After much debate, my friends and I think we know. Fingering a scalpel with such longing . . . dreaming of hacking the then soon-to-be-released *Jet Set Willy* . . . it must be, please tell us we're right — Andrew Pennell in drag?

Mark Quilliam, Gunnislake, Cornwall

Taking your minor question first, no Ian's method won't work with the Microvitec. But if you get hold of Adapt on 01-504 2840, they'll send you an excellent RGB interface for £29.95 which does make the Speccy produce pretty pictures. As for your second and, as you say, more important question, sorry to disappoint you but Andy didn't look good enough in drag to grace our front cover. However, that's him on the front of issue 8, so don't annoy him too much or it'll be BIG trouble! Just for you, here's a photo of Andy Pennell, hacker extraordinaire . . . 'orrible, isn't it? Ed.

A HEXING QUESTION

First of all, having bought your mag since issue 1, may I take this opportunity to congratulate you on a publication which is nothing short of excellent.

However, having said that, there is one problem that I keep stumbling over in some of your articles . . . the quotation of addresses in Hex, without a decimal equivalent given!?

Now taking a purely logical standpoint to the above problem, I have come up with the following five possible solutions to this crisis situation:

1) Threaten the writers with Barry Manilow (audio or visual) if they refuse to mend the error of their ways.
2) Make me buy a Hex-Dec converter (sorry, I'm too tight-fisted to do it myself).
3) Publish a Hex-Dec converter for Hex up to at least DEC 65535 (beg, beg).
4) Threaten the writers with Barry Manilow *and* Des O'Connor (audio *and* visual!) if they refuse to co-operate.
5) Shoot myself!

Anthony Mayers, Wrexham, Clwyd

Aaargh . . . anything but Bazza and Des! Well, we'll work on option 4, but if you can't wait that long try option 5. Ed.

DUMPS ON A SHOESTRING

Looking through my back issues of *YS*, I couldn't help feeling envious at the number of conversions of Andrew Pennell's *Dumps of Distinction* program. Wouldn't it be great to have screen dumps all over my bedroom wall? All I need is a printer costing around £300! Hah!

Gazing around my room, my eyes alighted on my obsolete ZX Printer. Is it possible, I asked myself. After a few hour's work (honest!), I'd converted the program to work on my little machine. Out came the scissors and Sellotape and I'd managed the impossible (*Dramatic stuff this! Ed.*). The trimmer listing fits nicely on to an A4 sheet — glue might be better than tape to afix it, but be careful or you'll end up with nasty blotches all over the place.

The result is about the same size as Mr Pennell's dumps — but not *quite* as pretty. But if you've only got a ZX Printer and your piggy-bank's not full to bursting, what else can you do? I leave the task of pushing the ZX Printer to further limits to all the thousands of you out there who own one — come on you lot, there's nothing to be ashamed of in owning a ZX Printer you know.

David Valentine, Mansfield

On the next page is David Valentine's re-working of *Dumps of Distinction* for the ZX Printer.

malan MAIL ORDER

FOR SPECTRUM USERS

JOIN ALBERT BATTERSBY IN HIS SEXUAL FANTASIES AND ADVENTURES IN HIS DESIRE TO ACHIEVE THE ULTIMATE SENSATION

"SOHO SEX QUEST"

Albert is a 27 year old sewing machine attendant from North Yorkshire. He wins a national contest. The prize "A Night With Zelda The First Lady of Soho". What a way to go, but before you get to Zelda's bedroom, you must first encounter the dark and luring parts of soho. If you go wrong the pimps, perverts and police will get you.
Good Luck Albert . . . you'll need it.

£7.50 48K SPECTRUM

"HERPES OR BUST"

It's not a good start I'm afraid Albert . . . you're back at the sewing machine factory and after the thrills of Soho and Zelda, life is all too boring. However, you read in a book of a strange trance you can get into where fantasies. Yes especially sexual fantasies can take you over. It's up to you Albert. First achieve the trance like state and work towards a world of ultimate unreal sexual fantasies.
Will your body stand it? Will your sewing machine ever mean the same?

£7.50 48K SPECTRUM

Cheques/PO made payable to:
MALAN ASSOCIATES
PO Box 390, Purleigh, Essex CM3 6QQ.

Orders processed same day 0621-828763 (24 hrs)
SOLD ONLY TO PEOPLE OVER 18 YEARS OLD

TT-S: SPECTRUM TOOLKIT £7.95
For the 16 or 48K Spectrum. 5 programmer's programs on one cassette. *"You certainly get your money's worth" (YS Aug 84)*

★ **GAMMA:** A relocatable, microdrive compatible BASIC extension giving improved editing plus 10 new keywords including intelligent RENUMBER and MOVE as well as DELETE, FIND, TRACE, FREE, AUTO and VARIABLES.
★ **SCREEN:** A High resolution drawing utility.
★ **UDG:** A powerful aid to creating user-defined graphics characters.
★ **TAPE:** Reads valuable information from tape file headers.
★ **RAM:** A thorough memory test program.

HI-T: SPECTRUM SCREEN ENHANCER £5.95
Gives the option of using 32 rows of 64 characters each on the screen of a 16 or 48K Spectrum, with text 'windows', superscripts and subscripts and INPUT AT any part of the screen. A fully relocatable microdrive compatible machine code program, integrated with the Spectrum's normal PRINT, INPUT and LIST commands. Invaluable for serious Spectrum users.

BOOKS for the serious programmer:
Exploring Spectrum Basic: ISBN 907892 03 5: £4.95
Explorers Guide to the ZX81: ISBN 907892 02 7: £4.95

ZXS SPEECH SYNTHESISER for the Spectrum or ZX81: £24.99
ZXM 3-CHANNEL SOUND BOX for the Spectrum or ZX81: £29.95

QL CONNECTORS
Joystick adaptor; for use with any standard joystick: £6.00
SER plug with 1 m cable: £3.00
CTRL plug with 1 m cable: £3.00

★ ★ ORDERS DESPATCHED WITHIN 48 HOURS OF RECEIPT ★ ★

Prices inclusive of VAT and U.K. P&P. Overseas customers add £1.50 per item for surface mail. Access/Visa accepted.

TIMEDATA Ltd., Dept
16 Hemmells, Laindon, Essex SS15 6ED
Tel: (0268) 418121

THE FABULOUS CASSETTE 50 FROM cascade

ONLY £9.95 (INC.P&P and VAT)

VALUE that's out of this world

50 GAMES ON ONE CASSETTE

NOW AVAILABLE FOR commodore 64 ELECTRON Atmos
DRAGON BBC A/B Spectrum apple ATARI ORIC-1 ZX81 VIC-20

SPECTRUM
'Incredibly frustrating!' That's the verdict on Cassette-50's FROGGER. Satisfied users say it's one of the most challenging you'll find - it's almost as good as the arcade version too. Plus 49 other tactical, logical and adventure games featuring multi-coloured and user-defined graphics, scrolling and full use of the spectrum sound capabilities. You'll keep coming back for more!

No.	Game	No.	Game	No.	Game
1	MAZE EATER	18	THIN ICE	34	GHOSTS
2	GALACTIC ATTACK	19	ORBITTER	35	SUBMARINES
3	SPACE MISSION	20	MOTORWAY	36	ROCKET LAUNCH
4	LUNAR LANDING	21	FORCE FIELD	37	PLANETS
5	PLASMA BOLT	22	NIM	38	BLACK HOLE
6	STARTREK	23	TUNNEL ESCAPE	39	DYNAMITE
7	RADAR LANDING	24	BARREL JUMP	40	DO YOUR SUMS
8	ATTACKER	25	CANNONBALL BATTLE	41	DERBY DASH
9	GALACTIC DOG FIGHT	26	OVERTAKE	42	SPACE SEARCH
10	PSION ATTACK	27	SITTING TARGET	43	UNIVERSE
11	INVASIVE ACTION	28	SMASH THE WINDOWS	44	RATS
12	KNIGHTS AND CROSSES	29	SPACE SHIP	45	TANKER
13	BOGGLES	30	JET FLIGHT	46	PARACHUTE
14	PONTOON	31	PHASER	47	JET MOBILE
15	SKI JUMP	32	INTRUDER	48	HIGH RISE
16	HANGMAN	33	INFERNO	49	THE FORCE
17	D.D. BONES			50	EXCHANGE

50 GAMES ALSO AVAILABLE FOR ZX81

WE PAY TOP PRICES FOR TOP QUALITY GAMES

EXPRESS DELIVERY- ORDER NOW

Name _____
Address _____
_____
_____ Post Code _____
Country _____

Dealers & Stockists enquiries welcome.

Please send me by return of post, Cassette 50 at £9.95 per tape. I enclose a cheque/postal order for

£ _____ made payable to Cascade Games Ltd.

Please debit my ☐ No. _____

COMMODORE 64 ☐	VIC 20 ☐	ORIC-1 ☐	BBC A/B ☐
SPECTRUM ☐	ELECTRON ☐	ZX 81 ☐	APPLE ☐
ATARI ☐	ATMOS ☐	DRAGON ☐	✓

Cascade Games Ltd.,
Suite 4, 1-3 Haywra Crescent, Harrogate,
North Yorkshire, HG1 5BG. England.
Telephone: (0423) 504526.

★ ★ ★ NEW ★ ★ ★ FROM ★ ★ ★

LET'S GET DOWN TO BUSINESS

TM

ALL PROGRAMS ARE NOW SINCLAIR MICRODRIVE™ COMPATIBLE AND, PLUS 80 VERSIONS WORK WITH 15 DIFFERENT CENTRONICS/RS232 INTERFACES AND PRINTERS

COMPATIBLE WITH sinclair ZX Microdrives

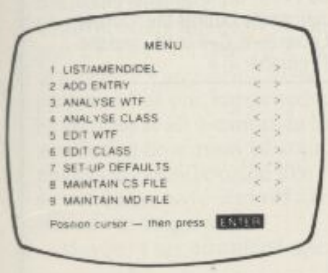
★ VAT MANAGER ★ £8.95

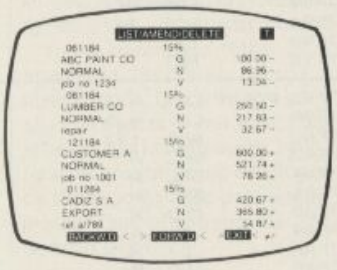
★ 'PLUS 80' VAT MANAGER ★ £19.95

★ 'PLUS 80' STOCK MANAGER ★ £19.95

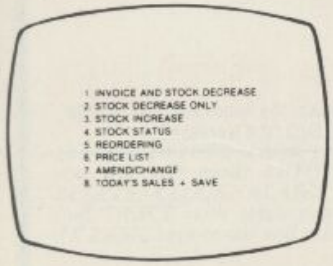
Write to us for a quotation for the software, the interface and printer — you will find our prices very competitive.

VAT MANAGER is available in standard form which works with ZX™ and Alphacom 32 column printers, and the Plus 80 version works in conjunction with most Centronics/RS32 printers which are menu selected from software. **VAT MANAGER** is a welcome aid to the businessman faced with the completion of VAT 100 returns. Provides calculation and checking facilities for any combination of Gross/Net values input. VAT can be analysed under defined classifications.





STOCK MANAGER — (Available in Plus 80 form only) — provides a controlled stock accounting environment for up to 600 different product lines. Full facilities exist for the production of Invoices, Price Lists, with the facility to show Stock Status and Value, Stock Adjustment and Re-order requirements.



Also available ***ADDRESS MANAGER*** and ***FINANCE MANAGER*** in standard 32 col. versions £9.95 and 80 column **PLUS 80** versions £19.95.

★ ★ ★ ★ UTILITIES £9.95 ★ ★ ★ ★

TM

sinclair ZX MICRODRIVE COMPATIBLE

★ MACHINE CODE TEST TOOL ★
★ EDITOR ASSEMBLER ★
★ MASTER TOOL KIT ★

(Existing users wanting latest versions will receive a £3.00 rebate on return of old cassette)

From **WHSMITH** and other outlets or send cheque or telephone details to 0753 889055.
Replacement tapes only available from OCP direct.

OXFORD COMPUTER PUBLISHING LTD., 4 High Street Chalfont St. Peter, Bucks. SL9 9QB.

SOFTWARE ★ ★ ★ ★ SIMPLY THE BEST

YS12

```
7EC2            ORG  32450

5800    PRBUF   EQU  23296
```

Saves the stack pointer (SP) in case the Break key is pressed.

```
7EC2 START LD    (BOT),SP
```

Defines DE to be the next block of code printed.

```
7EC6       LD    DE,48981
7EC9       CALL  SECT
7ECC       LD    DE,27221
7ECF       CALL  SECT
7ED2       LD    DE,5398
7ED5       CALL  SECT
7ED8       RET
```

Prints out one section of the screen.

```
7ED9 SECT  LD    C,0
7EDB SECT1 CALL  LINE
7EDE       INC   C
7EDF       LD    A,C
7EE0       CP    0
7EE2       JR    NZ,SECT1
7EE4       CALL  PRINT
7EE7       RET
```

Prints out one vertical line of a section.

```
7EE8 LINE  PUSH  BC
7EE9       PUSH  DE
7EEA       XOR   A
7EEB       LD    (BUFFX),A
7EEE       LD    B,D
7EEF NXY   PUSH  DE
7EF0       PUSH  BC
7EF1       CALL  POINT
7EF4       LD    B,A
7EF5       INC   B
7EF6       LD    A,1
7EF8 NXY1  RRCA
7EF9       DJNZ  NXY1
7EFB       AND   (HL)
7EFC       PUSH  AF
7EFD       LD    A,H
7EFE       RRCA
7EFF       RRCA
7F00       RRCA
7F01       AND   3
7F03       OR    88
7F05       LD    H,A
7F06       LD    B,(HL)
7F07       POP   AF
7F08       LD    A,B
7F09       JR    NZ,INK
7F0B PAPER RRCA
7F0C       RRCA
7F0D       RRCA
7F0E INK   AND   7
7F10       LD    HL,TABLE
7F13       ADD   A
7F14       ADD   A
7F15       LD    E,A
7F16       LD    D,0
7F18       ADD   HL,DE
7F19       LD    B,3
7F1B NXY2  LD    A,(HL)
7F1C       CALL  STORE
7F1F       INC   HL
7F20       DJNZ  NXY2
7F22       LD    A,(BUFFX)
7F25       ADD   3
7F27       LD    (BUFFX),A
7F2A       POP   BC
7F2B       POP   DE
7F2C       DEC   B
7F2D       DEC   E
7F2E       JR    NZ,NXY
7F30       CALL  PRINT
7F33       POP   DE
7F34       POP   BC
7F35       CALL  CKBRK
7F38       RET
```

Stores a three-by-three character in the area of the printer buffer determined by BUFFX.

```
7F39 STORE PUSH  BC
7F3A       PUSH  HL
7F3B       LD    C,A
7F3C       LD    A,4
7F3E       SUB   B
7F3F       LD    B,A
7F40       LD    HL,PRBUF-32
7F43       LD    DE,32
7F46 STOR1 ADD   HL,DE
7F47       DJNZ  STOR1
7F49       LD    A,(BUFFX)
7F4C       LD    B,3
7F4E STOR2 RL    C
7F50       CALL  C,PLOT
7F53       INC   A
7F54       DJNZ  STOR2
7F56       POP   HL
7F57       POP   BC
7F58       RET
```

Sets the area containing the three-by-three character in BUFFX.

```
7F59 PLOT  PUSH  AF
7F5A       PUSH  BC
7F5B       PUSH  HL
7F5C       LD    C,A
7F5D       AND   248
7F5F       SRL   A
7F61       SRL   A
7F63       SRL   A
7F65       LD    E,A
7F66       LD    D,0
7F68       ADD   HL,DE
7F69       LD    A,C
7F6A       AND   7
7F6C       LD    B,A
7F6D       INC   B
7F6E       LD    A,1
7F70 PLOT1 RRCA
7F71       DJNZ  PLOT1
7F73       OR    (HL)
7F74       LD    (HL),A
7F75       POP   HL
7F76       POP   BC
7F77       POP   AF
7F78       RET
```

Prints out the first three lines of the printer buffer, and then clears them.

```
7F79 PRINT DI
7F7A       PUSH  BC
7F7B       PUSH  HL
7F7C       LD    HL,PRBUF
7F7F       LD    B,3
7F81 PRIN1 PUSH  BC
7F82       CALL  3828
7F85       POP   BC
7F86       DJNZ  PRIN1
7F88       LD    A,4
7F8A       OUT   (251),A
7F8C       LD    HL,PRBUF
7F8F       LD    DE,PRBUF+1
7F92       LD    BC,96
7F95       LD    (HL),0
7F97       LDIR
7F99       POP   HL
7F9A       POP   BC
7F9B       EI
7F9C       RET
```

This is a full screen point, that is it includes the bottom two lines. Thus Y=0 is the top of the screen and Y=191 is the bottom. This routine also returns the address of pixel B=Y, C=X in HL, and the BIT number in A.

```
7F9D POINT LD    H,64
7F9F       LD    A,B
7FA0       AND   192
7FA2       SRL   A
7FA4       SRL   A
7FA6       SRL   A
7FA8       ADD   H
7FA9       LD    H,A
7FAA       LD    A,B
7FAB       AND   56
7FAD       SLA   A
7FAF       SLA   A
7FB1       LD    L,A
7FB2       LD    A,B
7FB3       AND   7
7FB5       ADD   H
7FB6       LD    H,A
7FB7       LD    A,C
7FB8       AND   248
7FBA       SRL   A
7FBC       SRL   A
7FBE       SRL   A
7FC0       ADD   L
7FC1       LD    L,A
7FC2       LD    A,C
7FC3       AND   7
7FC5       RET
```

Scans the Space key and returns to Basic if it's pressed.

```
7FC6 CKBRK PUSH  AF
7FC7       PUSH  BC
7FC8       LD    BC,32766
7FCB       IN    A,(C)
7FCD       RRCA
7FCE       JR    NC,BRK
7FD0       POP   BC
7FD1       POP   AF
7FD2       RET
```

Puts SP back to its old value, thus effectively clearing the stack.

```
7FD3 BRK   LD    SP,(BOT)
7FD7       RET

7FD8 BUFFX DEFB  0
7FD9 BOT   DEFW  0

7FDB TABLE DEFB  224,224,
                 244,0
7FDF       DEFB  192,96,
                 192,0
7FE3       DEFB  160,64,
                 160,0
7FE7       DEFB  32,64,
                 128,0
7FEB       DEFB  96,0,
                 96,0
7FEF       DEFB  64,0,
                 64,0
7FF3       DEFB  0,64,0,0

7FF7       DEFB  0,0,0,0
```

A disassembled listing of David Valentine's re-working of Andrew Pennell's *Dumps of Distinction* on to the ZX Printer. You see, pigs can be made to fly!

ZIPPING ON A PENSION

At last, somewhat belatedly, I've got Simon Goodwin's *Zip Compiler* to work — four months after typing in the Zip Library. So why, you may ask did it take me so long? Partly it was my dim eyesight and dimmer wits (well, I am in my early 70s) but some of the blame must go to Simon himself.

To explain: after sorting out my many mis-typings, I found it got jammed on line 90 of the example program in the July issue in a never-ending loop and it was only after trying every bug-tracing stunt I could think of that I eventually found the cause. Unlike nearly all the other variables, he introduced variable 'L' in capitals,no doubt aware that his daisywheel printer produced straight 'l's which could be confused with '1's.

Unfortunately in line 6755 he puts'LET t1=INT(u+l)/2': so of all the '1's appearing in his program, this one happened to be not one at all. I cannot help wondering how many of your readers got bomboozled like me, and may have sent off for a cassette in desperation.

Maybe at my advanced age I should not be concerning myself with computers. On the other hand, I want to keep my fast diminishing brain cells active as long as possible — but not by hacking into *Jet Set Willy*.

Looking forward to the next issue of *Your Spectrum*.

H E Hammond, Luton, Bedfordshire

How else could we get you all to buy the tape? But seriously, Mr Hammond, thank you very much for sorting out the bug. We've had the odd problem with ZIP, *but overall I hope that all who've mastered the program will agree that it's probably the best compiler on the market. Ed.*

AVAST YE SOFTWARE HOUSES

I am anxious to comment on a subject foremost in my mind at the moment — software piracy.

In the *older days* of the Spectrum, everybody copied their friends' tapes with two tape recorders — but now, this is being made impossible by a new technique being employed by the tape-to-tape protection system (any of you pirates noticed it yet?).

This new system is making home copying and commercial piracy a thing of the past (I always imagine commercial pirates having huge Hi-Fi systems recording tape-to-tape at double speed). Since a lot of pirates probably find the tape copiers available slow and boring, this should bring down piracy to a tolerable level.

OK, all well and good, the companies have found a great way to beat most pirates — but still companies are obsessed with putting more and more protection into the software. I've spent an incredible amount on software, over £30 on Microdrive transfer tapes alone and, having beaten the major software pirates, I see no reason why the software houses should make it difficult for us Microdrivers. They consistently add new protection methods as the old ones are discovered and beaten. Some of the protection methods seem to have been written specifically to stop the program being put onto Microdrive!

Having bought many of the latest software titles, it was my annoyance at not being able to transfer them to Microdrive that urged me to write this letter. Please, software houses, have a heart for us menials with Microdrives.

Richard Harrison, Forest Hill, London

When you start getting onto the subject of piracy, you're treading on very shaky ground. Although Your Spectrum *in no way condones the pirates, there is a very thin line between actual piracy and putting software you have bought onto a different media for ease of use. If a software house made a program simple enough for anyone with a basic knowledge of computing to put it on to Microdrive cartridge — then a true pirate would see it as a gift. If the software houses actually included a 'Microdrive SAVE' option in the program, this might go some way to solving the problem. Unfortunately, we don't live in a perfect world, and software houses have nothing to gain except minimal increased sales through making their software Microdrive compatible. Even Sinclair Research doesn't include a 'Microdrive SAVE' option in its programs, so unless there's a pretty drastic change in the attitude of software houses towards Microdrives, I don't think we'll be able to do anything except resort to the ever-improving transfer tapes . . . Troubleshootin' Pete.* YS

HISOFT

ULTRAKIT £9·45

The most powerful toolkit yet for ZX BASIC. All the features you will ever need; AUTO insert, full RENUMBER, block DELETE, CLOCK, ALARM, error trapping, break trapping. Full TRACE with single-step and much, much more. Makes ZX BASIC easy-to-use and powerful.

DEVPAC £14

An excellent assembler, an advanced line-editor, a comprehensive disassembler and a superb 'front panel' debugger all in one package. Used by many leading software houses to write their games. "Buy it!" Adam Denning 1984.

PASCAL £25

A powerful and almost full implementation of Pascal - not a Tiny Pascal. A valuable educational and development tool, programs typically run 40 times faster than a BASIC equivalent. Spectrum version includes Turtle Graphics package. " I haven't seen any other compiler that could match Hisoft's Pascal"

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

HISOFT

C

for the ZXSpectrum

Hisoft is pleased to announce a new compiler for this popular and effective systems programming language. Not a tiny-C but an extensive, easy-to-use implementation of the language. Allows direct execution of compiled statements. Supplied with function library. Available direct from Hisoft for £25, or write for further details.

All prices, UK delivered, relate to 48K ZX Spectrum versions. Our software is available for many other Z80 machines e.g. Amstrad CPC 464, MSX, Memotech, SHARP MZ700, New-Brain, CP/M etc. Please write for details.

SPECTRA IMPORTS
STOP PRESS

The cold weather must have affected our sanity. Our bank managers and accountants have turned their back on us, at selling these items at such ridicuously low prices. We have been warned that these prices will make us bankrupt. But we are willing to take the gamble and have this once in a lifetime sale in November and December. As all items listed below must be sold before January 1st 1985.

COMPARE THESE UNBEATABLE PRICES:

COMMODORE VIC 20	£59.95 CASH	COMMODORE 64	£99.95 CASH
SPECTRUM 48K	£59.95 CASH	BBC MODEL B	£315.00 CASH

BRAND NEW COLOUR MONITOR 14"	£115.00 CASH
RECONDITIONED COLOUR TV/MONITOR 17"	£49.95 CASH
BRAND NEW MONOCROME MONITORS	£35.95 CASH

COMPUTER AND VIDEO GAMES

SPECTRUM	(OUR PRICE)
747	5.95
AIRLINER	3.95
ATICATAC	3.50
ARCADIA	2.99
ANTICS	4.99
ALCHEMIST	2.99
AUTOMANIA	5.99
BLACK CRYSTAL	4.99
BIRDS & BEES	2.99
BEAKY & EGG SNATCHERS	3.99
CODE NAME MAT	3.99
FIGHTER PILOT	3.99
FOOTBALL MANAGER	2.99
FOREST	4.99
FULL THROTTLE	4.50
FACTORY BREAKOUT	3.99
HARRIER ATTACK	2.99
HEATHROW A.T.C.	3.99
HOBBIT	8.99
HUNCHBACK	3.99
HULK	6.99
JET PACK	2.99
JET SET WILLIE	2.99
JOHNNY REB	2.99

SPECTRUM	(OUR PRICE)
JACK & BEANSTALK	2.99
LORDS OF MIDNIGHT	6.99
MISSION 7	4.99
MANIAC MINER	2.99
MICRO OLYMPICS	2.99
MOON BUGGY	2.99
MATCH POINT	4.99
MUGSY	3.99
MR WIMPY	2.99
NIGHT FLIGHT	3.98
NIGHT GUNNER	2.99
PSYTRON	5.99
POOL	2.99
PYRAMID	2.50
PEDRO	2.99
STAR TRADER	3.99
SABRE WOLF	6.99
SCUBA DIVE	2.99
SPLAT	2.99
TITANIC	4.99
TIMEGATE	3.99
TRASHMAN	3.99
VALHALA	8.99
WAR OF THE WORLDS	6.99

COMMODORE	(OUR PRICE)
ARCADIA	2.99
AZTEC CHALLENGE	6.99
ARABIA NIGHTS	5.99
BEACH HEAD	6.99
BEAM RIDER	7.99
BLACK HAWK	7.99
CHINA MINER	3.99
EGBERT	3.99
FALCON PATROL	3.99
FOOTBALL MANAGER	4.99
FLIGHT PATH 737	4.99
HOBBIT	8.99
HUNCHBACK	2.99
HUSTLER	3.99
INTERNATIONAL SOCCER	5.99
KICK OFF	3.99
MANIAC MINER	2.99
PYRAMID	2.99
PITFALL	7.99
PILOT 64	5.99
SPACE PILOT	4.99
SOLO FLIGHT	8.99
SNOW BALL	6.99
TALES OF ARABIA	3.99

BBC	(OUR PRICE)
AVIATOR	10.25
BRAINSTORM	4.50
BLAGGER	4.50
BUG	4.50
COLDITZ ADVENTURE	4.99
CRAZY PAINER	4.25
CHESS	4.99
DANGER UXB	4.99
3 DEEP SPACE	4.99
FLAK	5.99
FORTRESS	5.99
FLIGHT SIMULATOR	4.99
FELIX	4.99
GARGOYLE	4.99
GENERATORS	4.25
HUNCHBACK	4.99
LOST IN SPACE	4.99
MUSIC PROCESSOR	9.50
OWZAT	4.99
PEDRO	2.99
PSYCO	4.99
TIME TREK	4.50
VOODOO CASTLE	4.50
WIZZARD	4.50

FINANCE FACILITIES

BBC MODEL B	DEPOSIT	£145	10 MONTHLY PAYMENTS @ £18.50p
COMMODORE 64	..	£50	.. .. @ £ 6.50p
COMMODORE VIC 20	..	£30	.. .. @ £ 4.00p
SPECTRUM 48K	..	£30	.. .. @ £ 4.00p
NEW COLOUR MONITOR	..	£60	.. .. @ £ 6.50p
RECON. COL. MONITOR	..	£49.95	NO FINANCE AVAILABLE
NEW MONO MONITOR	..	£35.95	NO FINANCE AVAILABLE

Orders to:

SPECTRA IMPORTS (UK)
ARCADE CENTRE
1st FLOOR OFFICES
SCOTLAND RD, NELSON
LANCS. TEL: 0282 698666

PLEASE SEND ME .....

AT £.....CASH OR £.....DEPOSITED

I ENCLOSE MY CHEQUE/PO/CASH FOR £.....

NAME .....

ADDRESS .....

.....

.....

PLEASE ALLOW 28 DAYS DELIVERY. POSTAGE & PACKAGE: CASSETTE 25p P/P OTHER ITEMS £5.00.
N.B. ALL FINANCE ARRANGED BY OUR OWN COMPANY

Even **Ian Beardsmore** *can be bitten by the games bug — and memory's no problem when you use his base 255 numbering system!*

YOUR NUMBER'S UP

I've been described as 'hard-bitten' and 'jaded' in my time (*And a whole lot else I shouldn't wonder. Ed.*) . . . and you want to know why? Simply because games of any kind — yes, even *Jet Set Willy* — leave me cold. So, you can imagine the psycho-physical trauma my self-image underwent when a matter of months ago I got hooked on a wargame by CCS called *Pacific War*. Never heard of it? Don't worry, no-one else has either!

Anyway, the upshot of all this is that I decided to write my *own* version of this great game.

DEALING WITH THE DATA

I'd already worked out how I was going to store the data — using a database as the crux of the program — but it was only when I was explaining to a friend that I would need to use three bytes of storage to store the necessary data that I began to see his eyes glaze over. He was perplexed . . . and so was I. It seems that what was obvious to me, namely using the character set as a base 255 numbering system, had not occurred to him — or to anyone else I mentioned it to. How do you think that mega-sized dungeons are produced then?

Most of the techniques I'll explain here are quite simple, but the contraction of storage space is phenomenal. First, think of how numbers are built up in decimal and Hex (using base 10 and base 16 respectively). In decimal, when you reach '9', you add another digit — in Hex, having '0' to 'F', you don't need another digit until you reach 'F'. Well, using the character set, you wouldn't need to add more digits until you reached '255', and even then each character only takes up one byte.

Maybe I ought to explain that a little. Each of the Spectrum's keywords, punctuation, etc, are stored as single-byte tokens. So commands like SAVE, LOAD, etc, take up the same storage space as punctuation, such as ',', '!', etc. Thus, if you could store direct commands as strings and then add them together, you could store numbers up to 16,777,215 in three bytes.

Take a look at the first two programs I've included so that you can recap your knowledge of string handling. The first program allows you to input anything from the Spectrum keyboard and output it as a string. The second program takes two strings and converts them into numerical data, adds them together and outputs them as a string.

```
 10 LET z$=CHR$ 65: LET y$=CHR$ 200
 20 PRINT z$,y$
 30 REM
 40 LET z$=CHR$ 65 AND 66
 50 PRINT z$
 60 REM
 70 LET z$=" THEN "
 80 PRINT z$,: PRINT LEN z$
 90 LET z$="* THEN *"
100 PRINT z$,: PRINT LEN z$
110 REM
120 LET z$=CHR$ 148: LET y$=CHR$ 69: LET x$=CHR$
137: LET w$=CHR$ 10
130 PRINT z$;"  ";y$,x$;"  ";w$
140 REM
150 LET z$=CHR$ 20
160 PRINT z$
```

This program allows you to input anything from the Spectrum keyboard and output it as a string.

```
 10 LET z$="!@£$567:£"
 20 LET y$=" THEN NOT  GO TO qweASD"
 30 LET a=CODE z$(5)
 40 LET b=CODE y$(2)
 50 PRINT a,CHR$ a,b,CHR$ b
 60 LET c=a+b
 65 PRINT "----- +           ---- +"
 70 PRINT c,CHR$ c
 80 LET x$=CHR$ c
 90 PRINT : PRINT x$,CODE x$;"  ";LEN x$
100
110 LET d=CODE z$(1 TO 4)
120 PRINT d,CODE z$(1)
```

This routine takes two character strings, converts them to numeric data, adds them together and outputs the result as a character string.

```
  4 DIM A$(4,100)
  5 DIM Z$(3)
 10 LET a=0
 12 LET b=0
 14 LET c=0
 20 INPUT a
 25 PRINT a
 30 IF a>255 THEN  LET b=INT (a/256)
 40 IF b>255 THEN  LET c=INT (b/256)
 50 LET Z$(1)=CHR$ c
 55 PRINT CHR$ c,c
 60 LET b=INT (b-(c*256))
 70 LET Z$(2)=CHR$ b
 75 PRINT CHR$ b,b
 80 LET a=INT (a-(b*256+c*65536))
 85 LET Z$(3)=CHR$ a
 90 PRINT CHR$ a,a
 95 PRINT
100 LET a$(2,60 TO 62)=Z$
110 PRINT a$(2,60 TO 62)
120 STOP
```

```
175000
?                       2
ATTR                    171
i                       152

?ATTR i
```

A decimal to base 255 convertor; simply input the number you want converted and it prints out the relevant Spectrum characters you need in your character string. An easy way to store any number up to 16,777,215 in just three bytes!

BACK TO BASE

OK, now take a look at the third program I've included. This is a decimal to base 255 converter — all you do is input the number you want converted and it prints out the Speccy commands, etc, you'll need to use in your string — and it'll all be stored in just three bytes. Clever, eh?

The program works by finding the larger numbers first. So, variable a and Z$(3) will hold the units of the number, b and Z$(2) will hold the '255's, and c and Z$(1) will hold the '65536's. The example program was written for my own specific purposes. I had four aircraft carriers, each with 100 bytes of data. As I wanted to allocate 175,000 gallons of fuel to the second carrier, the data is stored in three bytes in the field 60 TO 62 — thus, A$ represents the carriers and Z$ the temporary store for the data. In the example printout, you can see that the commands I need to put in a string are '?', ATTR and 'i'.

Number bases are a fairly complex idea, and I am *not* a mathematician, but the example here does work and can be amended to suit your own particular requirements.

BUT I DIGRESS . . .

Partly as a digression and also to get your grey matter on the boil, try changing line 95 to read 'STOP' in the decimal to base convertor, and enter the number 17000. No problem — apart from the fact that there's nothing on the screen. Ah, but being a clever *YS* reader you've probably guessed that CODE 16 is unprintable — try changing the program back the way it was and you'll get your error message.

What I've stumbled on to here is 'protection' — where the PAPER and INK colours are the same . . . so nothing much shows up on-screen. Put line 95 back to 'STOP' and enter the number 1052688. The CHR$ would appear to be just visible . . . the only problem is that we're seeing the CODE. Now try entering the numbers 1052689 and 1052690; the last number should really put the cat amongst the pigeons!

Next month, I'm going to be dealing with a number of small problems that some *YS* readers seem to be labouring with. But, in the meantime, if there's anything bugging you (literally!) then write to me, Ian Beardsmore, c/o *Your Spectrum*, 14 Rathbone Place, London W1P 1DE. YS

INTERFACE ROM

THE INSIDE STORY

Andrew Pennell *discusses the changes made to the Interface 1 ROM.*

Following my comments in a previous article, there have been numerous enquiries about the forthcoming Interface 1 ROM — the one Sinclair Research is apparently still denying even exists! Well here's how you 'spot the difference.'

It's an open secret that the existing Interface 1 has various bugs — a fact that was realised in Cambridge quite soon after the Microdrive launch. Thus, a new ROM was born, the code being finalised in early February this year. However, actual production was delayed by the QL difficulties and has only recently begun. Even now, at the time of writing, the release date has still to be announced. To check which ROM you have, enter the following line after a NEW or switch-on:

```
CLOSE #0:PRINT PEEK 23729
```

This will either give '0' for an old ROM, or '80' for the new one. The differences are fairly apparent from Basic. To begin with the main Microdrive commands have been speeded up considerably, so CAT and OPEN "M" now take seven seconds, instead of the previous 10. The improvement has been made by a clever piece of code which calculates the length of the tape — instead of just assuming it's always 255 sectors as the old ROM does. The other speed difference occurs during a FORMAT. On the old ROM it takes about 35 seconds; on the new it's around 10 seconds faster. The only drawback is that there's a slight loss in capacity with the new format routine.

SPACING OUT

The other difference available from Basic is in the RS232 software. 'T' type streams now support the TAB function properly, and the double-space bug has been corrected. Unfortunately, the former function requires two bytes for system variables, in fact using the previously 'unused' ones at 23728 and 23729. The first holds the cursor position, and the second the printer's width — hence the default value of 80 after initialisation.

Along with these improvements, many of the bugs in the ROM have now been corrected — the most notorious being the 'low RAMTOP' one that crashed the machine if the stack was too close to the channels area. The CLOSE# bug has also been fixed, in exactly the same way as I suggested in my book! Also fixed is a very rare bug in the network software that caused it to fall over; now it preserves the value of IX during a subroutine call.

However, some bugs still remain, in particular the 'big Basic' one; try loading a large Basic program from Microdrive which is too big to fit and the machine still falls over with both types of ROM. Also in the new ROM is the 100 bytes of code that prints out memory in Hex, used for debugging when the original ROM was first written. It's strange to see it still there as the new ROM is already pushed for space (there are only 31 unused bytes left, compared with over 1K in the old version). One addition though, is a copyright message, together with the author's initials — MJB.

BASIC IMPROVEMENTS

The improvements for the Basic programmer are very nice and all existing Basic Microdrive software should work on both ROMs, but for the machine code programmer there's a real incompatibility problem. When the numerous improvements were made to the code, it was clearly decided not to use patches that would retain compatibility; they just re-wrote it regardless. Some programs will work OK, just so long as they use the existing hook codes only. If they call other routines directly, the chances are they won't work. Practically everything has moved, apart from the syntax routines, up to 0800 Hex. Although an extra eight bytes have been added at 0234 Hex, they've been compensated for by truncating an unused error message shortly after it.

The hook codes themselves are similar — the working ones do just the same as before (albeit, some more quickly), while the non-working ones have been corrected. Code 2B now does what it should originally have done, namely 'Create an M area'; and code 2F (for the network) also now works. In addition, two extra codes have been added, one to read the next sector header, the other to open a 'B' channel. Neither seem particularly useful.

CHECK IT OUT

For the full rundown on the differences between ROMs, anxious readers will have to await the reprint of *Master your ZX Microdrive*, which should just about be available by the time you read this.

The new ROM is certainly a great improvement on the old but it's doubtful whether any upgrade service will be offered. The ROMs are not socketed in the Interface 1, making an upgrade not only difficult, but unlikely.

STOP PRESS

I have just obtained the third version of the Interface 1 ROM, and it's very similar to version 2. The reason for its release is improved compatibility with the QL over the network and this has been achieved by a slight timing modification to the 'buffer' routine. The mod uses no extra bytes. The only other difference is that an extra instruction has been added, moving all subroutines from 1C3C Hex on in memory by two bytes. I'm not 100 per cent sure what the extra instruction does, but I think it's meant to improve capacity during a FORMAT. YS

". . . and Robbie here is going to teach you all about computers . . ."

MICROSPHERE

Skooldaze –
the game that has everything – excitement, drama, comedy, tragedy, catapults . . . join our hero on a madcap romp with your favourite characters – the wicked headmaster, the nutty professor, the ancient history master (the history's quite old, too!) and, not forgetting the swot and the school bully.
Speech bubbles, amazing animation, great graphics.

£5.95

Skyranger –
patrol the air between the skyscrapers and make the city a safer place to live. 3D like you've never seen before, showing what a Spectrum is really capable of with the right programmer.

£5.95

Wheelie –
in February the CRASH magazine reviewers thought this was one of the most addictive games ever. At a rough guess I'd say they were addicted to this game.

£5.95

All for the 48K Spectrum.
Available from all good computer shops.
or direct from: **MICROSPHERE COMPUTER SERVICES LTD,**
72 Rosebery Road, London N10 2LA

Everything you always wanted to know about the art of hacking . . . but were afraid to ask!
***The facts up-front from* Terry Bulfib.**

BREAKING AND ENTERING

Let me state, right from the very beginning, this magazine does *not* condone pirate copying. It's both illegal and immoral, and it discourages the development of quality software. However, there's no legal or moral objection to breaking the protection on a program in order to examine the programming methods, make alterations, or even just for the hell of it! Under the copyright laws (as you may read in the notice taped to the photocopier in any library) it's perfectly legal to make a copy of a work for the purposes of private study; the only stipulation is you must not use such a copy for other purposes, or pass it on to others. Private study is what we are proposing here.

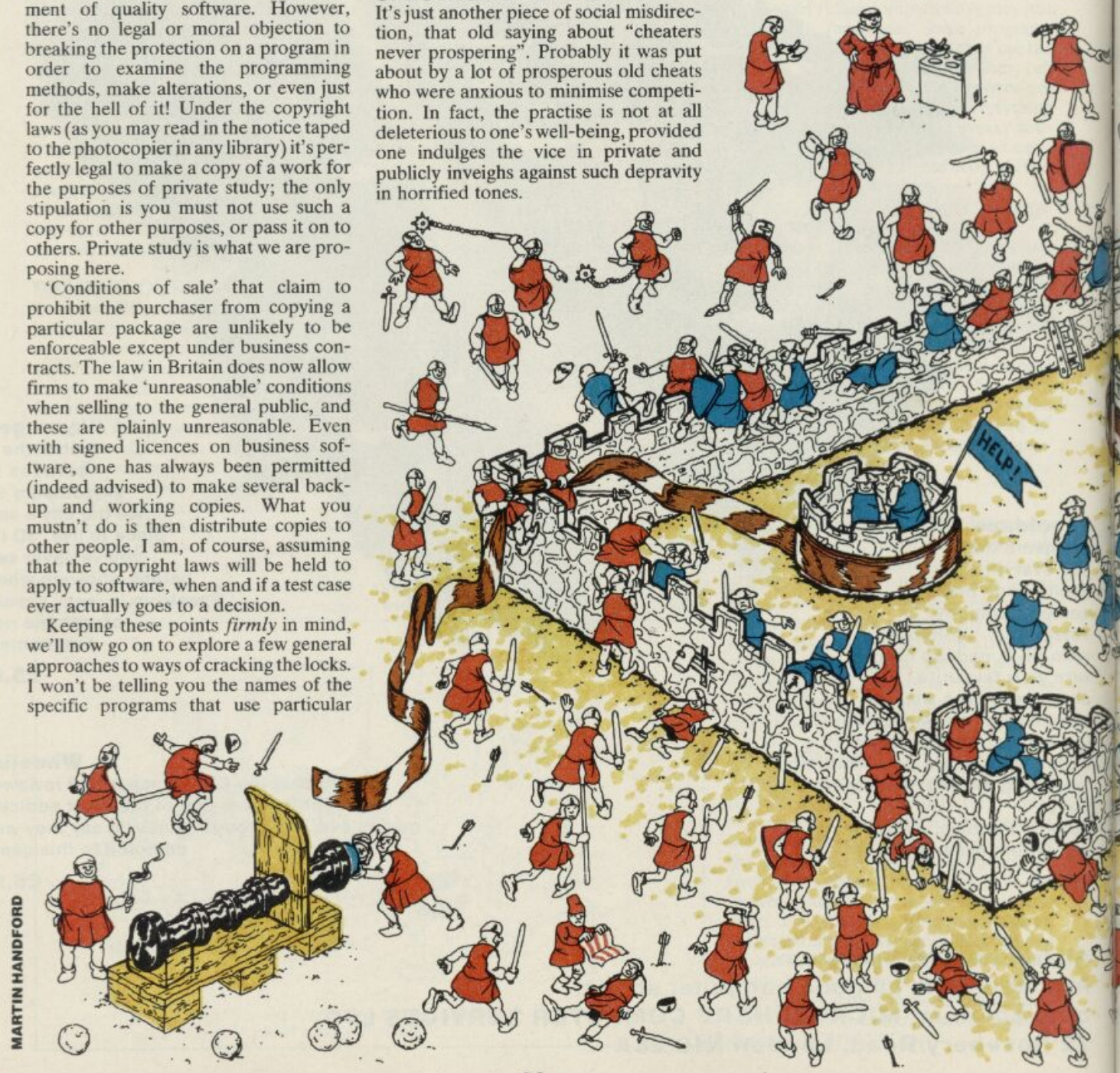
'Conditions of sale' that claim to prohibit the purchaser from copying a particular package are unlikely to be enforceable except under business contracts. The law in Britain does now allow firms to make 'unreasonable' conditions when selling to the general public, and these are plainly unreasonable. Even with signed licences on business software, one has always been permitted (indeed advised) to make several back-up and working copies. What you mustn't do is then distribute copies to other people. I am, of course, assuming that the copyright laws will be held to apply to software, when and if a test case ever actually goes to a decision.

Keeping these points *firmly* in mind, we'll now go on to explore a few general approaches to ways of cracking the locks. I won't be telling you the names of the specific programs that use particular methods of protection ... there's no point in making it *too* easy!

SPECTRUM BREAK DANCE?

It's just another piece of social misdirection, that old saying about "cheaters never prospering". Probably it was put about by a lot of prosperous old cheats who were anxious to minimise competition. In fact, the practise is not at all deleterious to one's well-being, provided one indulges the vice in private and publicly inveighs against such depravity in horrified tones.

The letters columns of various computer mags are occasionally scorched by very upset arcade players complaining that the POKEing of *JSW* or similar destroys all credibility in the top scores they have virtuously and arduously attained. What these purists do not wish to acknowledge is that cheating is a skill no less difficult to master than their own cherished ability to press a button at precisely the right moment. It must be admitted that the rewards for deviousness are somewhat greater than those for virtue, but that's merely the way the world works. Confucius he say "You have to turn the handle the way it goes, not the way it ought to go".



MARTIN HANDFORD

CHEATING BY NUMBERS

But how do you get started? Spectrum programs are often protected by ingenious methods designed to help stop piracy (rather than cheating) to the extent that one even begins to suspect that 'protection' is the favourite game of the programmer! These measures are of little use in preventing piracy, in any case.

At a recent press launch, Melbourne House (of *Penetrator, The Hobbit, Mugsy, et al*) admitted that its cassette protection routines apparently had no effect on the level of piracy and sales on games so protected — as compared to games published without protection.

The latest vogue is for fast loading routines which, while purporting to save loading time, usually appear designed to make tape-to-tape copying less reliable. Inevitably, they also make legitimate loading of the tape you paid for trickier, with the faster speed offset by the need to try several LOADs before one actually works! This can only be counter-productive from the publisher's point of view.

DEEPER AND DEEPER

The first point to make is that you'll not get far with most programs unless you learn at least a little machine code. Luckily, cracking protection is both an ideal way to learn and an excellent motivation. You may not get into every tape you try to chisel open, but when you strike gold, it'll make up for any amount of failure.

There are a number of books around which will help you to learn machine code, but when it comes to breaking Spectrum protection there are just two which I consider indispensable. These are *Understanding Your Spectrum* and *The Complete Spectrum ROM Disassembly* from Melbourne House. The first, by Dr Ian Logan, will get you started on machine code and at the same time give you a lot of information on how the Spectrum ROM routines can be used by your own programs. The second book, though not for the beginner, is invaluable once you know enough about machine code to be able to follow it.

GOING EQUIPPED

Besides knowledge (just a little to start with) you'll need a few handy tools — the software equivalent of prybar, celluloid ruler ... and nitro!

Nothing is so helpful as a nice compact little Hex handling utility, writtin in Basic so that you can add things as you need them and carve them out again when space gets tight. The one I use came from the book mentioned above. It's tiny and simple and worth more to me for this kind of work than the full feature disassembler on my disk-based computer. This is little more than the sort of Hex loader that gets published with machine code games so you can type them in, but the utility allows you to list code as well as enter it. Mine gives me both decimal and Hex simultaneously, and calculates the two-byte addresses in decimal as well. A quick scrabble through back issues of *YS* should reveal something suitable for conversion.

The next essential is a 'header reader' that'll tell you what length of screech is Basic or bytes, what the start LINE is (if any), where the CODE LOADs are going to go and how long they are. There was a nice header reader in issue four — shame on you if you missed it! Send for a back number (and a subscription too, to make sure it doesn't happen again).

Of course, some LOADs have no header — but that just puts the smile on the coconut.

IN THE BEGINNING

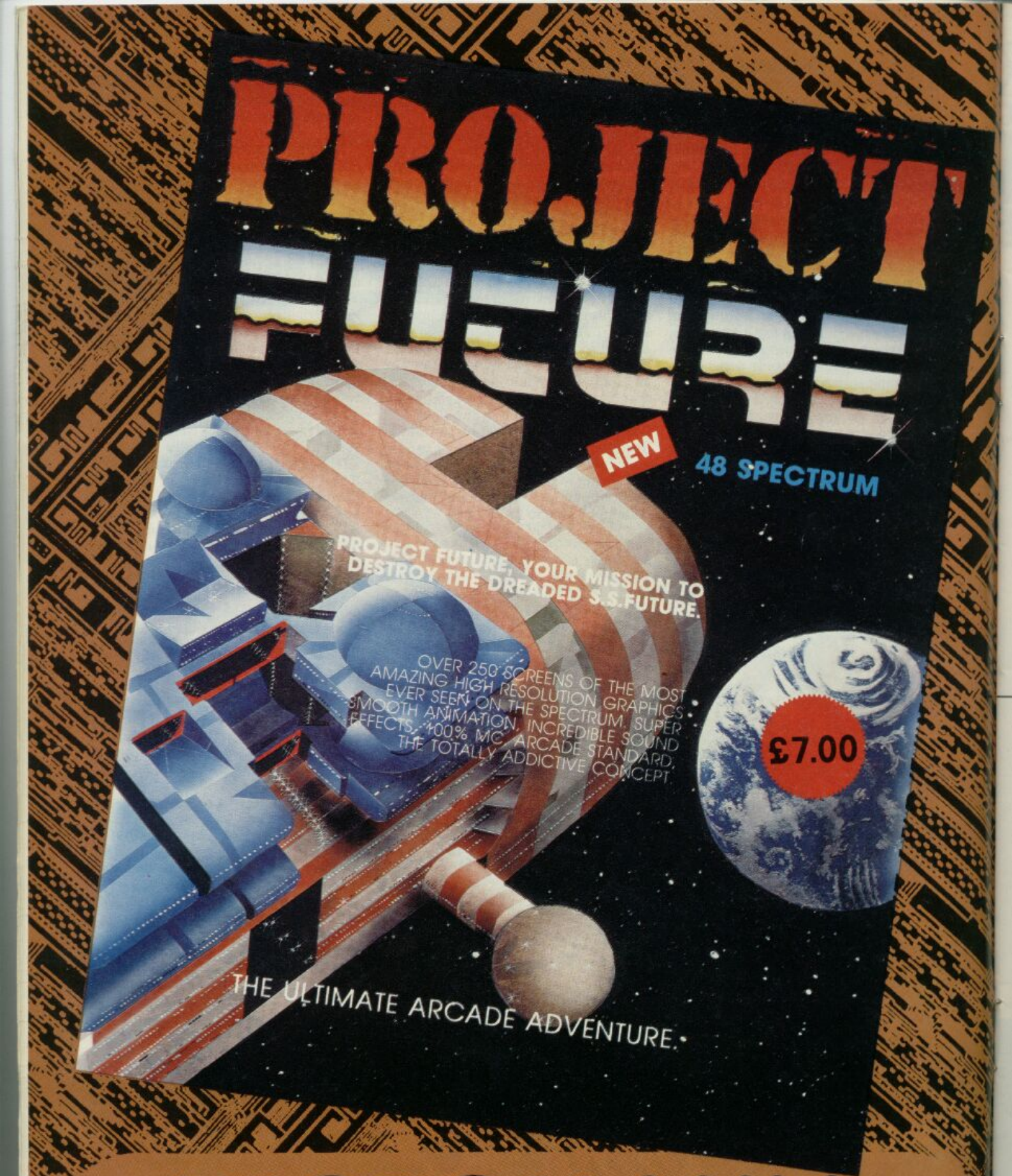
As with any new endeavour, start with something easy and work up. Protection was a lot easier to get through a year ago, so try your hand at an older program before tackling a fast loader.

Once a program is running it's too late to do any clever hacking tricks. Occasionally the writer will leave in a 'magic word' for his own convenience (like 'WRITETYPER' in *Jet Set Willy*) but even if this is the case, you'll only unearth it by breaking into the program. You won't find it by guessing, not in a million (no exaggeration!) years.

'Once it is running' includes the short loading program preceding most games. These usually disable or 'bomb' the Break key to stop you from interrupting a LOAD to get a look at part of the program.

The classic method of sussing out the lock on a program is to use MERGE instead of LOAD to get the Basic loader program aboard. Once in the Spectrum, without having been auto-run, the loader can be investigated for clues about the main program (which is usually a block of machine code). The loader will often tell you the USR address of the start of the M/C proogram, and in the case of headerless LOADs, there will be a bit of code somewhere (possibly POKEd into a REM statement) to load the machine registers with the address and length of the LOAD and call the appropriate ROM routine.

Naturally, the protection artist (PA for short) knows that this is the classic approach and takes measures against it.



MICROMANIA

Available now! From all good software outlets or direct from: Micromania, 14 Lower Hill Road, Epsom, Surrey. P + P free.Dealers phone: (03727) 20152.

There are three general methods of foiling an investigation by MERGE.

One of the most popular ways is to have a loader of just one line, that is something like '10 LOAD "" CODE'. This gives you no information beyond the fact that all the protection is in the CODE LOAD to follow. This is often used with a block of code which includes a Basic program and the system variables as well as the M/C game itself. That Basic program might start like this:

```
10 SAVE "TEEHEE" CODE 23552,40000
20 POKE 23659,0:REM bomb the break key,
      then continue with the rest of the
      program
```

The programmer SAVEs this program with GO TO 10, and when this block of code is loaded, the Spectrum thinks it has just finished doing line 10 (because that's what the system variables just loaded tell it) and it starts working on line 20. This method gives you a CODE LOAD which has an auto-run, and is less easy to crack than a Basic LOAD with auto-run. It also makes a game written in Basic load as if it were machine code. The code may start at 16384 to LOAD a title page in the same block.

Of course, the loader could be packed with false information. Because of the way the Spectrum Basic stores numbers, the visible part of the listing can be POKEd with spurious and misleading figures without affecting the invisible five-byte floating point notation which follows each visible number in the listing. The Spectrum only uses the invisible part itself, so protection artists can put whatever they think will be most misleading into the visible part. The careful hacker will not take the figures on trust, but PEEK out all the invisible notations, just to make sure.

Last, but not least, MERGE won't work! The copyright message rides again! The PA has POKEd a line number to be bigger than about 32,512. 'POKE (address of first byte of line number), 128' will do the trick for him. this confuses the MERGE routine in ROM, which doesn't know how to deal with illegal line numbers. You just need to POKE the same address with zero — once you've got in, that is. You can't use MERGE, so you get in by using LOAD, but with the header from another program — one that doesn't auto-run and is as long or preferably longer than the loader program. LOAD the 'tame' header, then switch tapes and play the protected program (just the part after the header) as if it were the rest of the 'tame' program. 'Et Viola!', as the starving cellist said.

Using a 'tame' header is useful in other situations too, such as with headerless LOADs. Once you've LOADed it, you won't be able to see the line with the impossible line number. This won't matter if the PA has put in a line at the end of the program, just to have the impossible line number and stop MERGE from working. If the PA's POKEd the number of a line that actually has some program in it, then it'll have to be un-POKEd before the line will run.

There is, of course, nothing to stop the keen and/or dedicated protection artist from using all three of the above, or even from disguising one approach as another. Dodges such as setting the INK to the same colour as the PAPER (which won't fool a printer) may be added for nuisance value. POKEing in impossible INVERSE numbers will make a listing unLLISTable as well as unLISTable. POKE them out again. It's better not to use EDIT, because editing a line with falsified numbers will cause the invisible notation to be changed to agree with the visible figures — which is not what you're after! Nothing the PA can arrange is proof against what you can do, but they'll try to wear you out before you unravel the last knot.

AFORE YOU GO ...

Next month, I'll be looking into 'headerless' loaders with a number of hints and tips on what to do with them. There'll also be some other interesting titbits for you to play around with ... so be there!

On a *very* important note, it must be stressed that in no way am I or this magazine condoning software piracy — it's illegal! If you're looking for a quick way to provide free copies of software for a few of your mates then you've just read the wrong article ... but if you want to find out more about that little black box of tricks, then I applaud you and look forward to your company next issue. YS

DON'T JUST PLAY GAMES!

EDUCATIONAL SOFTWARE

FOR ANY SPECTRUM 16K or 48K

Physics	O level/CSE Revision Aid
Biology	O Level/CSE Revision Aid
Maths	CSE Revision
Computer Studies	O Level/CSE Revision Aid
Science	Revision 12/14 Years
Maths	Revision 12/14 Years
Mathematics	Revision 8/11 Years
Arithmetic	Revision 7/10 Years
Reasoning	11+ Revision
Knowledge	Quiz 9/99 Years

Exceptional value at just £4.95 each post free

IMMEDIATE DELIVERY BY FIRST CLASS POST

Cheques/PO to:

Micro-De-Bug Consultancy
Dept YS, 60 Sir John's Road
Selly Park, Birmingham, B29 7ER
Tel: 021 472 7610

DEALER ENQUIRIES WELCOME

Better ways to machine code.

MODER-80 really helps you read, write and test machine code. Monitor features include breakpoint set, execute, hex-dec-hex conversion, hex arithmetic, hex/ASCII dump to screen or printer, hex modify, memory move, and single-step (with register display) through programs in ram or rom. The disassembler can output to tape (for use with Gener-80) as well as to screen or printer. And, unlike comparable products, Moder-80 even contains a simple non-symbolic assembler so beginners can use proper assembly language instead of hex when entering short programs into memory.

Spectrum 16k/48k £5.95

GENER-80 is the easy-to-use assembler with a full-screen 40-column editor which processes source text upon keyboard entry, giving immediate error detection, shorter source code and much faster assembly! Block delete and move also available. Full Microdrive compatibility on 48k Spectrum includes save, load (with auto-merge) and verify to tape, Microdrive or network. Can co-reside on 48k Spectrum with virtually any monitor (not just Moder-80) to form a machine-code development system.

Spectrum 16k/48k £7.95

Programs can be transferred to Microdrive (full instructions supplied), and can be used with ZX printer *and* most 80-column printer interfaces without modification. All prices post free.

SEVEN STARS

Seven Stars Publishing,
Dept S,
15 Gloucester Avenue,
London NW1 7AU.

Top 50 Spectrum

LOGIC 3

BRITAIN'S No.1 OF

New Member Price

POS	TITLE	R.R.P.	CLUB	SPECIAL	TICK
1	Lords of Midnight	9.95	8.95	**5.00**	
2	Sabre Wulf	9.95	8.45	**6.95**	
3	Full Throttle	6.95	5.45	**4.45**	
4	Go To Jail	6.00	5.00	**4.00**	
5	Daley's Decathlon	6.90	5.85	**5.25**	
6	Jump Challenge	6.95	5.90		
7	Avalon	7.95	6.75		
8	Pyjamarama	6.95	5.85	**3.45**	
9	Mugsy	6.95	5.95	**4.95**	
10	Combat Lynx	7.95	6.75	**5.95**	
11	Jet Set Willy	5.95	4.55	**3.45**	
12	Trashman	5.95	4.45		
13	Braax Bluff	6.95	5.85		
14	Tornado Low level	5.95	4.50		
15	Monty Mole	6.95	5.55	**4.50**	

New Member Price

POS	TITLE	R.R.P.	CLUB	SPECIAL	TICK
16	Chequered Flag	6.95	5.45	**2.95**	
17	Codename Mat	6.90	5.90	**4.90**	
18	Ad Astra	5.95	4.45		
19	Travel With Trashman	5.95	5.05		
20	Beach—Head	7.95	6.50	**5.95**	
21	Dartz	5.00	4.00		
22	Valhalla	14.95	12.95	**10.95**	
23	Manic Miner	5.95	4.55	**3.45**	
24	Atic Attack	5.50	4.95	**3.50**	
25	Kentilla	6.95	5.85		
26	Strangeloop	6.95	5.90		
27	Factory Breakout	5.95	4.75		
28	Rapscallion	7.95	6.75		
29	The Pyramid	5.50	4.15	**2.95**	
30	Frank N. Stein	5.95	5.05		

★ **12 months membership ONLY £3.00 (equivalent to 25p each month)**

Careful attention to product storage and a computer-assisted stock control system means a rapid turn around of customers orders.

Up to 50% Discount

Following the outstanding success of the Logic 3 Spectrum Club – we are delighted to be able to offer Spectrum users the oppotunity to purchase some of the best products available for the Spectrum – *at up to 50% discount.*

Thanks to its position as a major distributor of Spectrum software Logic 3 is able to bulk purchase software and offer considerable discounts to Club Members. Members can choose from an extensive range of Spectrum products including best-selling games and educational programs.

The Logic 3 Spectrum Club has something for everyone: regular reviews, massive savings on all the latest games and applications software, discounts on hardware.

New Members Intoductory Offer. Join the Logic 3 Spectrum Club and benefit from our new members introductory offer to purchase our "Software Specials" at up to 50% discount. **Membership is only £3.00 per Year**, (equivalent to only 25p per month). To join fill in your name and address on the order form (or on a separate sheet of paper) an send with your £3.00 to the address below.

Freepost, LOGIC 3, Mountbatten House, Victoria St. Windsor SL4 1HE (No stamp needed)

LOGIC 3 Spectrum Club

Top 50

LOGIC 3 SOFTWARE CLUB

POS		TITLE	R.R.P.	CLUB	SPECIAL	TICK
31		Pool (CDS)	5.95	4.45	**3.45**	
32		Deathchase	6.95	5.45	**4.45**	
33		Twin Kingdom Valley	9.50	7.95		
34		Stop The Express	5.95	5.05		
35		Sherlock	14.95	12.95	**10.00**	
36		World Cup Football	6.95	5.55		
37		Harrier Attack	5.95	4.45	**3.45**	
38		Giant's Revenge	6.95	5.56		
39		Air Traffic Control	9.95	8.45		
40		Alchemist	5.50	4.15	**3.45**	

New Member Price

POS		TITLE	R.R.P.	CLUB	SPECIAL	TICK
41		Wheelie	5.95	4.45		
42		Psytron	7.95	6.45		
43		Ant Attack	6.95	5.75		
44		The Hobbitt	14.95	12.95	**10.95**	
45		Hulk	9.95	8.45	**7.95**	
46		Deus Ex Machina	15.00	12.75		
47		Match Point	7.95	6.75		
48		Kokotoni Wilf	5.95	4.95		
49		Morris Meets The Bikers	6.00	4.00		
50		Blade Alley	5.95	4.75		

New Member Price

HOW TO ORDER:

Put a tick alongside the Product(s) you wish to order and put a ring around the price you are paying. If you are applying to join the Logic 3 Spectrum Club (and you post this order by 8th March, 1985) you may take up to five titles at the "New Member" special price, and as many titles as you wish at the "Club" price. If you apply after 8th March, 1985 you may take any number of titles at the club price, but none at the "New Member" price. If you do not wish to join the Logic 3 Spectrum Club you may purchase any number of titles at the retail price. If you don't want to cut up your magazine, you can copy out all the relevant information onto a piece of paper (or make a photocopy) and post to us at

Freepost, LOGIC 3, Mountbatten House, Victoria St Windsor SL4 1HE (No stamp needed)

TICK ☐ Please enrol me as a member of Logic 3 Spectrum Club.
☐ Please send me a free copy of the Club's current catalogue.

Name (BLOCK CAPS PLEASE) _____

Address _____

_____

_____ Postcode _____

PAYMENT:

Either: I enclose a cheque/Postal order no. _____ payable to Logic 3 Ltd

or: Please charge my Access/Barclaycard

VISA ACCESS

TOTAL	
Membership Fee	£3 00
"Learn BASIC"	
Postage *(see below)*	
Amount Enclosed	£ :

POSTAGE (per order)

UK post & packing	50p
Europe	£2.00
USA & Middle East	£3.00
Australia, Far East & Africa	£5.00

22,000 Learn BASIC the LOGIC 3 Way

Logic 3 publishes a series of teach-yourself programming courses which are – simply the best way to learn computer programming. Each course comes with a 192 page work-book backed up with exercises and experiments. Quiz programs allow you to check how you are getting along. The course has been designed on the basis of considerable experience in teaching people about computers – so you won't be confused by unnecessary jargon.
Club members can order the course for £11.95 (normal price £14.95) add this amount to your order and tick this box.

Logic 3's "Learn BASIC Programming" tutorials have been widely accepted as the most easy-to-use, educationally sound introduction to computer programming for beginners.

REVIEWS make Club Catalogue a winner!
The latest issue of the Spectrum Club Catalogue is crammed full of independent reviews of all the best Spectrum products. For a free copy of the catalogue simply send us your name and address on a sheet of paper marked "FREE SPECTRUM CLUB CATALOGUE" or fill in the order form above.

SPECTRUM+

As predicted in our last issue, Sinclair Research did indeed launch an upgrade to the ZX Spectrum — the ZX Spectrum+. Max Phillips grabbed it as it came through the door to give us his verdict.

Well, the great day came . . . and went. There was no major launch for the Spectrum+, just an anonymous knock on the editor's office and a cheery, "Look what you've got in the post this morning!" This isn't the type of fanfare we've come to expect from Sinclair Research . . . but then neither is the new machine.

The Spectrum+ (or the 'Plus' as I'm sure it'll be known on the streets) is the much-awaited upgrade to the ZX Spectrum. But don't throw your old Speccy out of the window just yet, the new one's just a quick cosmetic job. All you're getting is a new case and keyboard, six bundled programs, a shiny new user guide and a slick intro tape. Oh, I almost forgot . . .and a price rise to £179.95!

WITH LOOKS TO KILL

Looking like a sawn-off QL with a very crowded QL-style keyboard, the Spectrum+ is certainly better built than its predecessor and includes two fold-down feet in its base; these tip the machine to a suitable typing angle for users who can't afford an Interface 1. The new casing allows a free flow of air through the *real* 'QL-type' grills and should help with the overheating that dogged some Spectrums in the past.

The only *genuine* mod that I could find on the whole machine was a reset button tucked under the left edge of the case. Pressing it is the same as switching off and on, so its only use is to save wear and tear on the plugs — there's still no warm-restart facility.

Moving inside the case, there's nothing but an ordinary Spectrum; it looks like an Issue 3, but carries a very original '1983 issue 4B' label. The ROM is identical to the Spectrum (you can check this with the VERIFY command) so, unless there are further board mods that I couldn't unearth, absolutely *all* Spectrum software and hardware should work with the Plus. And, I'm afraid to report, this may turn out to be the machine's best feature.

(Chatting around the subject a little, if I may, it'll be interesting to see if a program can be made to tell which of the two machines it's running on. There's no simple message in ROM to make the job easy — but it would allow programs to adapt between the two different keyboards so that the user was never asked to press keys that didn't exist and so on.)

ON-BOARD ADD-ONS

The Spectrum+'s keyboard has extra keys to simplify the keyword and editing system; these are hard-wired to produce the same signals as the original keyboard — doing it this way meant that there was no need to alter the firmware. A positive side-effect of this is that, although many keytops are unmarked, all the original key sequences on its predecessor still work. A hardened Spectrum user will still probably find it easier to use Symbol Shift and the 'P' key for quotes than go looking for the separate quotes key . . . but for new users — well, that's another story.

There are now two Caps Shift and two Symbol Shift keys. What's more, you can go straight into Extended or Graphics mode at the press of a *single* key. Edit, Delete and Break also get their own keys, as do True Video and Inverse Video (although the latter two do seem rather unimportant). Purists, like the rest of us, would argue that Delete should really be above the Enter key and Break should be out of the way on the left . . . but that's the way the keyboard crumbles. What did you expect Sinclair Research to do anyway — follow established trends?!?

The most obvious benefits are separate cursor keys, quotes, semi-colon, full stop and comma keys, and a relatively full-sized Space bar; with a bit of practise, you can even type on it! Even so, I'm not convinced the new keyboard is that much of an improvement — if you remember the comments generated about the QL's keyboard, it's hard to imagine why Sinclair Research has plumped for the same design . . . apart from the fact that it looks very stylish alongside its big brother, the QL.

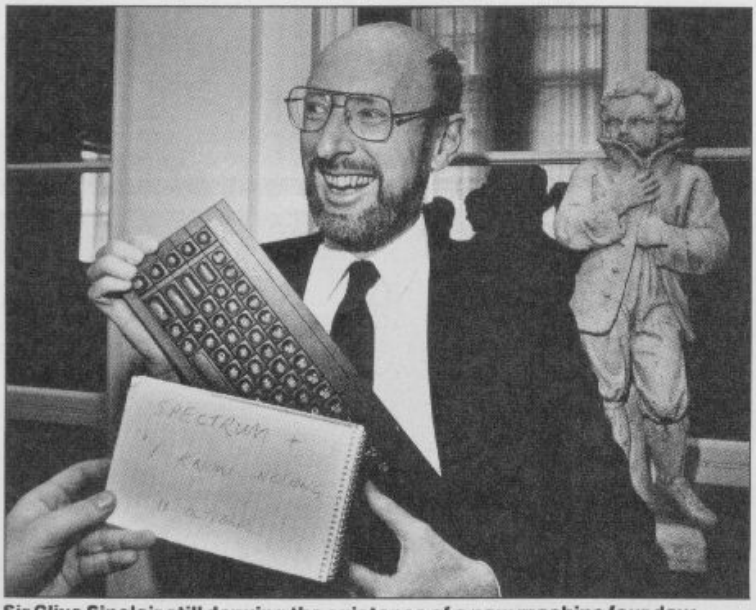
Despite the new keys, the layout remains awkward and the absence of colour coded legends is surprisingly a real pest — to be honest, I'd kind of got used to that colour scheme. I'd like to say that the keyboard of the Plus is more reliable than its predecessor, but even so the review sample had started to come to bits; for example, unless pressed *very* gently, the 'J' key would generate a 'j' (or 'LOAD') on the way down and a 'g' on the way up. Another thing that bothers me . . . just how long will the keytop legends stand up to constant wear and tear?

ADDITIONAL PLUSSES

The Spectrum+ *User Guide* is really twee. Published by Dorling Kindersley, it's a full colour, heavily designed book that looks more like a 'week-by-week, builds into a pile of magazines you never read' series than a manual. The message is loud and clear. From now on, computers must be as presentable and approachable as videos and washing machines.

Although the new book is a triumph of its genre and will no doubt be welcomed by newcomers to computing, it *has* to be less detailed than the original Spectrum manual . . . it's smaller for a start! For a computer manufacturer whose success is based on the expertise of its customers, this is a mistake. By all means have such a simple introductory book . . . but don't leave out the old manual as well.

NEVER 'EARD OF IT!



Sir Clive Sinclair still denying the existence of a new machine four days before the launch of the Spectrum+.

The new machine also heralded the end for the *Horizons* tape — the enclosed intro tape for the Plus contains some very flash software, although it's mostly fancy logos and screen clears. There's a long keyboard tutor on side one, which seemed a bit simplistic under all the wrapping (and had at least one obvious bug) and the other side contains two simple games and a nice character generator (which can be used to alter the graphics in one of the games).

But, of course, software's not really a problem because, apart from the thousands of commercial programs already on the market, the Plus has six tapes bundled in with it; the one-time best-sellers and members of the 'Spectrum Six Pack' are *Scrabble, Make-A-Chip, Chequered Flag, Chess, Tasword 2* and *Vu-3D*. And that little lot should be more than enough to keep a new owner quiet!

MARKET FORCES

The Spectrum+ is quite openly a bit of traditional marketing. Every once in a while a product's fluffed up and offered at a little bit more than 'last year's model' — hardly Sinclair Research-style, but who can blame them in this day and age? It's obvious that Sinclair Research must be suffering lost micro sales along with everyone else this year, that and the components costing more at the moment. There's also the fact that the going will be a lot tougher, starting this Christmas.

But the price of the Plus is still a bit shocking! Sinclair Research could have taken a bit more time and effort to produce a machine it's *worth* upgrading to. Of course, Sinclair Research can't do a *very* enhanced Spectrum (say, with CP/M ability) as the product would more than likely knock spots off the QL. So what we get instead is a rather limp marketing ploy and a return to old Spectrum prices. And while I'm on this tack, you'll notice that the idea of a 16K colour computer for under £100 has been quietly dismissed.

I suppose I'm disappointed. Something around the size of an Apple II with a Fuller-style (*Who? What! Ed,*) keyboard would be a good start; a spare RS232 port could be used for a proper detached keyboard if the user wanted. The system should be capable of total compatibility with existing software but would include lots of extras, such as 16K pages of RAM below Basic and Interface 1 ROMs; these pages could be used for development software and so on, and switched off when full compatibility is required.

RGB and composite video ports are obligatory, and several expansion slots would be really appreciated (maybe Sinclair Research should have taken a peep at the USP system from U-Micros). You could then offer floppy controllers, 80 column boards, extra RS232 and Centronics ports and so on and so on.

Such a machine would have a lot going for it. Few people would mind paying around £400 for a starter system — it becomes the number one Spectrum development tool and also a viable business system. With the Spectrum's current software and user base, it would seem to make a *lot* of sense.

OK, the Plus does look good and, when you consider the current industry support for the existing Spectrum, seems set to be with us for many years to come. That's not such a bad thing — the Spectrum has done a great deal to promote the art of programming and the Spectrum+ will no doubt follow the tradition. I suppose we should be grateful it didn't come with its own kludge . . . YS

The ZX Spectrum Expansion System. Only £99·95

Sinclair's complete alternative to floppy discs...

The ZX Spectrum Expansion System contains:

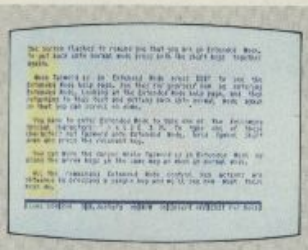
- One ZX Microdrive
- One ZX Interface 1
- One wallet containing four programs on Microdrive cartridge
- Microdrive demonstration cartridge
- One blank Microdrive cartridge
- Full documentation
- Connecting lead for Microdrive/ Interface 1
- ZX Net Lead

The new ZX Spectrum +
Fully compatible with all Spectrum software and peripherals, including this Expansion System

Tasword Two word processor

Turns your ZX Spectrum into a high-quality word processor!

Tasword Two has all the essential features of professional word processing packages – move and copy, insert, margin settings, 'help' pages, find and replace, and much more.
Written by Tasman Software Ltd.
Usual price (RRP): £13.90.



Games Designer

Now, all you need to create original games are original ideas – and Games Designer! It has eight, very different, pre-programmed games for you to play as they are – or modify out of all recognition!

There's never before been an easier, more enjoyable, way into games design.
Written by Quicksilva Ltd.
Usual price (RRP): £14.95.

Masterfile filing system

Address lists... personal files... stock inventories... stamp or album collections... club records... recipes ...if you can file it, you can Masterfile it!

Masterfile is a menu-driven filing and retrieval system of immense power. Display formats are user-defined, so the range of applications is enormous.
Written by Campbell Systems Ltd.
Usual price (RRP): £16.95.

Ant Attack

The all-time classic 3D strategy game. Ant Attack combines stunning Escher-like graphics with fast-moving action and a real tactical challenge.

Your task is to enter the walled city, seek out your captured partner, and escape. At all times you can choose from four angles of view. But beware: the city is patrolled by giant ants...
Written by Quicksilva Ltd. Usual price (RRP): £6.95.

All programs run on a 48K Spectrum or Spectrum +. Recommended retail prices are for each program on cassette.

...includes this great set of Microdrive programs!

The unique ZX Microdrive system sets the Spectrum apart from all other home computers.

It gives you all the advantages of floppy disc drives – at a fraction of the cost. And tests show the Microdrives are faster than some disc drives.

Now, the complete Microdrive system comes in one package – together with four of the best-ever Spectrum programs, on Microdrive cartridges.

This software alone would normally cost you over £50. Yet the Sinclair price for the complete ZX Spectrum Expansion Pack is just £99.95!

You'll find full details of its contents in the panel opposite.

ZX Microdrives – another Sinclair first!

The ZX Microdrive is a revolutionary fast access / mass storage device. And it's the only truly affordable alternative to disc drives ...

- Loads or saves up to 85K of program or data from Microdrive cartridges.
- Just 3.5 seconds to access a typical file.
- Only 9 seconds to load a typical 48K program.

The ZX Microdrive cartridge – a unique storage medium.

Smaller than a matchbox, the ZX Microdrive cartridge packs in a massive amount of data and programs.

Each Microdrive cartridge holds at least 85K bytes of data or programs (that's 30 pages of A4 text). And you can store up to 50 different data files per cartridge, identified by titles of your choice.

Every cartridge comes in its own protective case. Simply remove the cartridge, slot it into the Microdrive, and it's ready to use.

ZX Interface 1 – adds powerful new capabilities to your Spectrum.

ZX Interface 1 connects to the back of your Spectrum and controls up to 8 Microdrives. (Additional Microdrives are available for £49.95 each.)

It also gives you:

- An RS 232 interface – to link your Spectrum with full-size printers, other computers using RS 232 (the industry-standard interface) and provide data transmission over telephone lines, via modems.
- ZX Net – lets you set up a local area network of up to 64 Spectrums, for high-speed data communications between you and Spectrum-owning friends.

At your local Sinclair stockist – today!

The ZX Spectrum Expansion System adds an exciting new dimension to Spectrum and Spectrum + computing. At £99.95 it's superb value too.

To find out more, call in at your local Sinclair stockist now!

Sinclair Research Ltd,
Camberley (0276) 685311.

™ sinclair, ZX, ZX Spectrum, ZX Microdrive, ZX Net and ZX Interface are Trade Marks of Sinclair Research Ltd.

sinclair

KEMPSTON
MICRO ELECTRONICS LTD

CENTRONICS, RS232 INTERFACES

Printer interfaces for the ZX Spectrum allowing you to use a wide range of printers.

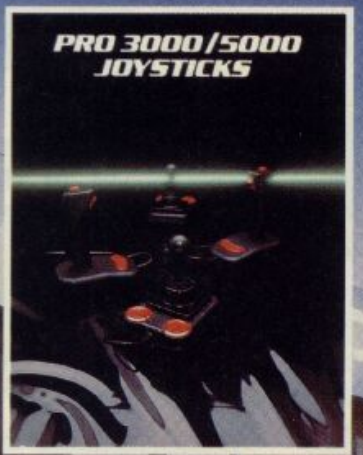
BBC PRO JOYSTICK

Complements the BBC computer in both design and performance. 8-way micro switches for precision control.

KEMPSTON JOYSTICK INTERFACE

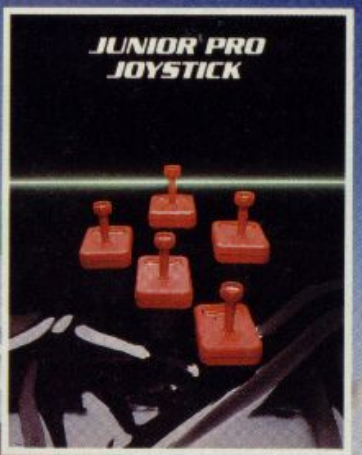
Allows all joysticks in the Kempston range and others that are Atari compatible to be used with the Spectrum.

PRO 3000/5000 JOYSTICKS



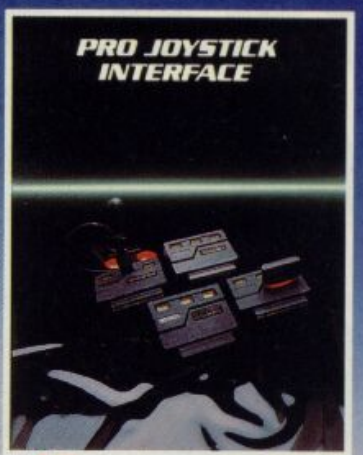
Kempston's proven winners with excellent arcade quality action. Suitable for Atari, Commodore 64 & Sinclair ZX Spectrum (when used in conjunction with a Kempston Joystick Interface).

JUNIOR PRO JOYSTICK



Offering maximum arcade quality features at an unbeatable price. Available in a special Combination pack with the Kempston Joystick Interface.

PRO JOYSTICK INTERFACE



The ultimate interface for the ZX Spectrum. Compatible with the Sinclair/Psion software, Kempston Joystick software and cursor key software, together with cartridge slot for ROM based software.

The Circuit Pro-fessionals

Most items available from
Littlewoods WHSMITH
Selfridges Boots John Menzies
spectrum Currys Ramleys

Available directly from
Kempston Micro Electronics Ltd
Fast mail order service
Please send me the following

☐	Centronics "E" Interface	£49.00	☐	RS232 Interface	£45.00
☐	Centronics "S" Interface	£35.00	☐	BBC Pro Joystick	£16.95
☐	Kempston Joystick Interface	£11.50	☐	Pro 3000 Joystick	£12.75
☐	Pro Joystick Interface	£19.95	☐	Pro 5000 Joystick	£13.50
☐	Junior Pro Special Combination	£14.99	☐	Junior Pro Joystick	£5.99

I enclose a cheque/P.O. for £ .....
Access/B'card ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
Name _____
Address _____
_____
_____ P/code _____
Signature _____

All prices include VAT P&P Overseas add £4 P&P

Kempston Micro Electronics Ltd Singer Way Woburn Road Industrial Estate Kempston Bedford MK42 7AF Tel (0234) 856633 Telex 826078 KEMPMI G

SPRITE DESIGNER

***User-defined sprites on the Spectrum? It's not that difficult! Get things moving on-screen with more machine code magic from* Toni Baker.**

This month's block of crafty code makes wierd shapes fly around all over the screen. In fact, you shouldn't find it too hard to add a few bits and pieces to the idea yourself. It's all basically very simple. You design up to five different sprites — of any figure, shape, design and so on — which in this case are 16 pixels wide by 16 pixels high; imagine four user-defined graphics characters glued together in a square and you have the idea. But — and this is where the story really begins — there's more to this program than meets the eye, for it incorporates a rather mind-blowing idea . . .

MOTION PICTURES

You see, once you've defined a sprite, you can then specify its co-ordinates on the screen and its *velocity* across the screen. In other words, they move! Curiouser and curiouser. Once a sprite is set in motion, you can continue executing more Basic or machine code. The sprites will keep moving on-screen, simultaneously with any other program.

One line of Basic can set a sprite in motion. The next Basic line will, of course, be executed in sequence — but it'll be executed whilst the sprite is moving. Thus, the setting in motion in the first place is all you have to worry about. How it all works is quite intricate, so I'll explain in a moment or two; if you find the blurb a bit too heavy-going, try quaffing a cuppa or two before attempting to follow it. In the meantime, I'll tell you how to integrate my machine code with your Basic.

DOWN TO DESIGN

The first statement of your Basic program must be a 'DIM sS (x,8)'; where x is the maximum number of things you want flying around on-screen at any one time. Then, you'll want to include the statements 'LET on=33013' and 'LET off=33020'. From here on in it's up to you. The statement 'RANDOMIZE

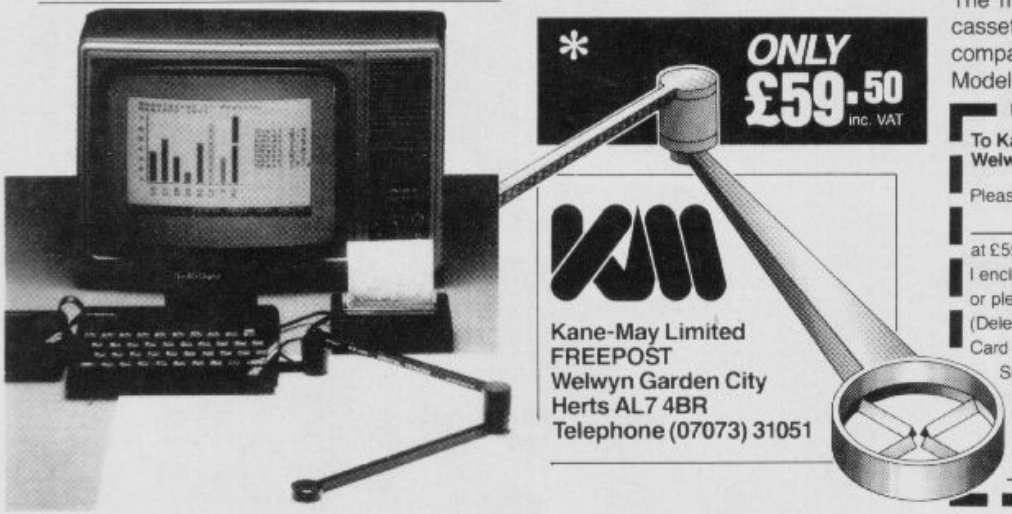
CODE	ASSEMBLER		COMMENTS
		ORG 80F5	
3E80	ON	LD A,80	
ED47		LD I,A	I:=80
ED5E		IM 2	Activate interrupt routine.
C9		RET	
ED46	OFF	IMO	Deactivate interrupt routine.
C9		RET	
0181	IADDR	DEFW 8101	Direct interrupt control to address 8101.
F5	SPRITES	PUSH AF	
C5		PUSH BC	
D5		PUSH DE	
E5		PUSH HL	
DDE5		PUSH IX	Stack all registers used by the routine.
DD2A4B5C		LD IX,(VARS)	Point IX to array sS.
DD7E00		LD A,(IX+00)	
FED3		CP D3	
200F		JR NZ,EXIT	Jump if first variable is not array sS.
DD4604		LD B,(IX+04)	B:= first dimension of array (number of sprites).
C5	SP_LOOP	PUSH BC	Stack this number.
010800		LD BC,0008	
DD09		ADD IX,BC	Point IX to start of next sprite data (next element of array).
CD7181		CALL NXT_SPRT	Treat next sprite.
C1		POP BC	B:= remaining number of sprites to treat.
10F4		DJNZ SP_LOOP	
DDE1	EXIT	POP IX	
E1		POP HL	
D1		POP DE	
C1		POP BC	
F1		POP AF	Restore all registers.
FF		RST 38	Carry out normal interrupt procedures.
C9		RET	
CB0C	LINE	RRC H	
CB0C		RRC H	
CB0C		RRC H	HL:= coded print position.
011F00		LD BC,001F	
09		ADD HL,BC	Move print position one square down and one square left.
CB04		RLC H	
CB04		RLC H	
CB04		RLC H	HL:= correct print positon.
C9		RET	
CD4081	WIPE	CALL H_WIPE	Erase top half of sprite.
CD2981		CALL LINE	Point HL to bottom half of sprite.
CD4481	H_WIPE	CALL Q_WIPE	Erase one square of sprite.
23		INC HL	Point HL to remaining square.
E5	Q_WIPE	PUSH HL	
0608		LD B,08	B:= Number of rows per square.
3600	WP_LOOP	LD (HL),00	Erase next row.
24		INC H	Point HL to next row.
10FB		DJNZ WP_LOOP	
E1		POP HL	
C9		RET	
AF	TEST	XOR A	A:=00.
CD5581		CALL H_TEST	Test upper half of sprite position.
CD2981		CALL LINE	Point HL to lower half.
CD5981	H_TEST	CALL Q_TEST	Test one square of sprite position.
23		INC HL	Point HL to remaining square.
E5	Q_TEST	PUSH HL	
0608		LD B,08	
B6	TS_LOOP	OR (HL)	If any pixel is set then A becomes non-zero.
24		INC H	HL points to next row.
10FC		DJNZ TS_LOOP	
E1		POP HL	
C9		RET	

Paint pictures on your television screen

WITH THE

The RD Digital TRACER

■ CREATE UNIQUE GRAPHIC DESIGNS QUICKLY AND ACCURATELY ■ TRANSFER MAPS, NEWSPAPERS OR TEXT BOOK ILLUSTRATIONS ■ USE COMPUTER GRAPHICS IN YOUR PROJECTS REPORTS, LECTURES AND PRESENTATIONS



* ONLY £59.50 inc. VAT

Kane-May Limited
FREEPOST
Welwyn Garden City
Herts AL7 4BR
Telephone (07073) 31051

Convert your Sinclair into your very own digital paintbox.
Without complicated programming you can paint anything quickly onto your TV screen. You can draw lines of varying thickness, blocks of colour or shading at a stroke and print text anywhere. Then you can enlarge or reduce your picture, turn it upside down or even make a mirror image. You can print it or store it on cassette or microdrive.
The Tracer comes complete with a software cassette, tracing grid and interface compatible with ZX Spectrum (BBC-B Models are also available).

To Kane-May Limited FREEPOST, Welwyn Garden City, Herts AL7 4BR

Please send me:

_____ RD Digital Tracer(s) RDZX/A4 at £59.50 inc VAT + £3.00 Postage & Packing
I enclose a cheque/postal order for £_____
or please debit my Access/Barclaycard.
(Delete as necessary)
Card Number_____
Signature_____
Mr/Mrs/Miss_____
(BLOCK CAPITALS PLEASE)
Address_____
_____ Postcode_____

★ NOW AVAILABLE FOR THE AMSTRAD CPC 464!!

WIN THE POOLS?

SPECTADRAW 3 – THE LATEST VERSION OF THE ORIGINAL AND BEST POOLS PREDICTION PROGRAM FOR THE 48K ZX SPECTRUM!!

AND NOW . . . AMSTRA-DRAW – THE FIRST POOLS PREDICTION PROGRAM FOR THE AMAZING NEW AMSTRAD CPC 464!!

- Supplied with Database containing data on over 10,000 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!
- Fully microdrive compatible! (Spectadraw only).
- Compatible with Currah Microspeech – the first pools program to read you its predictions! (Spectadraw only).

Spectadraw 3 for the 48K Spectrum.....£9.95 inclusive
Amstra-Draw for the Amstrad CPC 464.....£9.95 inclusive
(Cheques/P.O.s payable to B. S. McALLEY)

We dispatch every Monday with the database made up to include all matches up to the date of dispatch.

SPECTADRAW (Dept YS), 1 Cowleaze, Chinnor, Oxford OX9 4TD.
(Tel: 0844-52426)

NOW IN SELECTED OUTLETS OF W.H. SMITH

Green Fingers

GARDEN PLANT DIRECTORY

Here's your FIRST computerised plant database!

* **Only 80 seconds to find the ideal plants to fit your requirements.**
You can ask for plants that suit up to any 5 out of 17 characteristics **simultaneously** (height, hardiness, sun, water and soil needs, pruning, month of flowering, colour, etc.).

* **Comprehensive details of over 350 flowers, shrubs and trees.**

* **You can look up plants using Latin names, common names, or part of names** (e.g. 'lily' displays nine different types of lily, any one of which you can obtain fuller details within 60 seconds).

To order cassettes for 48k SINCLAIR SPECTRUM send cheque/postal order for £8.95 to:

PRACTICAL SOFTWARE,
DEPT. YS,
40 WORPLE ROAD,
LONDON, SW19.

WATFORD PLUGS THE GAP

SP-DOS
Spectrum Disc Operating System

- Single Drive capacities from 200K to 800K (formatted)
- Expandable to a massive 3.2Mb (formatted)
- Turn-key System capabilities
- Disc versions of Tasword Two, Masterfile and Omnicalc 2, together worth £50 included FREE OF CHARGE
- 100% compatible with the Watford Centronics/RS232 Printer Interface
- Comprehensive manual with step by step instructions

Watford Centronics/
RS232 Printer Interface

- The first and still the best Printer Interface
- Centronics and Bi-directional RS232 with full hand shaking
- Compatible with Interface 1, Interface 2, Microdrives and Watford's Spectrum Disc Operating System
- Compatible with most Professional programs
- Hi-Res screen dumps in two sizes on most dot matrix printers—a standard feature not an extra

£99.00
(Carr. £2)

£29.95
(Carr. £2)

Professional Computing Power

Get plugged into real computing with Watford's Spectrum Disc Operating System and Centronics/RS232 Printer Interface. Professional power for Spectrum users starts at under £400 with a 200K Disc Drive, Seikosha GP100A Printer, Spectrum Disc Operating System, Centronics/RS232 Printer Interface, printer cable and Tasword Two, Masterfile and Omnicalc 2 included absolutely FREE OF CHARGE. Now all Spectrum users can PLUG THE GAP.

Write for FREE leaflet on SP-DOS Spectrum Disc Operating System and Centronics/RS232 Printer Interface.

Mail Order and Retail Shop. Trade and Export inquiries welcome. Government and Educational Establishments Official orders accepted.
Prices subject to change without notice. All goods advertised subject to availability.
VAT: UK customers please add 15% VAT to total cost including any carriage charges.
Overseas customers—No VAT payable
Access Orders: Phone (0923) 50234 (24 Hrs)

SP-DOS Disc Drive Prices

SPS2	200K Single formatted	£129.00
SPS4	400K Single formatted	£149.00
SPS8	800K Single formatted	£175.00
SPD1M6	1.6Mbyte Twin formatted	£339.00

(Carr. on Drives £7—Securicor)

Printer Prices

Seikosha GP100A	£125.00
QUEN-DATA DPW1120 Daisywheel	£175.00
Epson RX80	£229.00
KAGA/TAXAN KP810	£235.00
Epson RX80 F/T	£245.00
Epson FX80	£316.00
Brother HR15 Daisywheel	£339.00
Epson FX100	£435.00
KAGA/TAXAN KP910	£435.00
Centronics or RS232 Printer cable (Please specify which is required)	£8.00

Carr. on Printers £7—Securicor

Watford Electronics

Shop Hours: 9am to 6pm
Monday to Saturday

Cardiff Road, Watford, Herts Telephone: (0923) 40588/37774 Telex 8956095 WAELEC

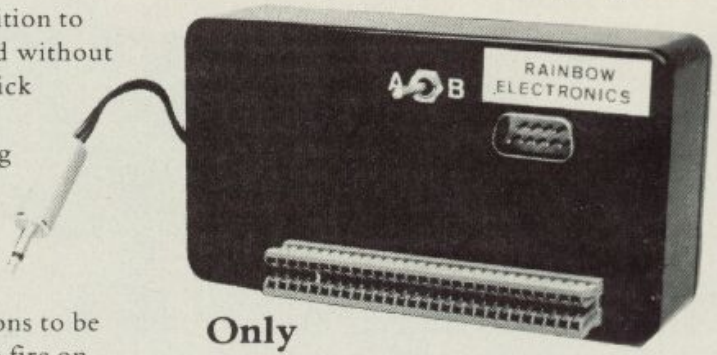
Rainbow's Spectrum Programmable Joystick Interface

This interface allows any Joystick position to represent any key or keys on the board without leads, hardware or software. All joystick positions are programmed simply by selecting the joystick position, pushing the desired key(s) on the Spectrum, releasing the joystick, and then the key(s).

It is flexible, allowing diagonal positions to be programmed with any keys, also auto fire on joystick positions if desired.

The internal Amplifier boosts the Spectrum's weak sound with a simple connection to the ear or mic socket.

With optional through port



Only
£24
Through port £2 extra
plus £1 p&p
One Year Guarantee

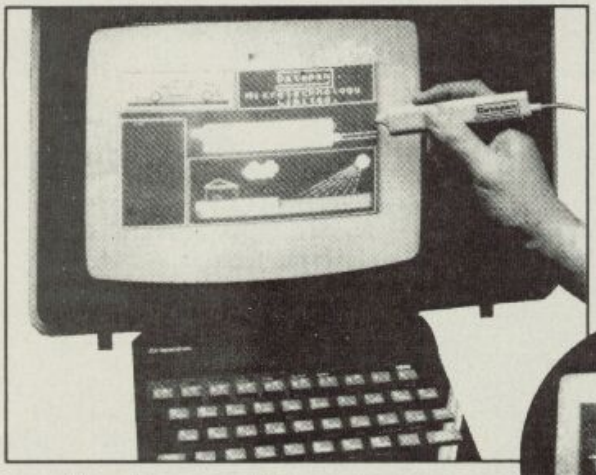
Send Cheque or P.O. to:
Rainbow Electronics Y.S.
Glebe House
Southleigh, Witney
Oxfordshire OX8 6XJ
Tel: Witney (0993) 5432

With Sound.

Datapen

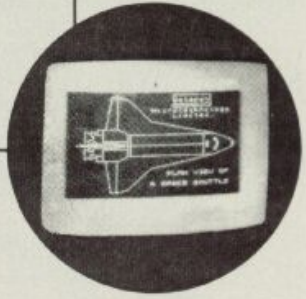
A QUALITY LIGHTPEN
for use with the SPECTRUM computer

The DATAPEN lightpen enables you to create high resolution pictures and technical layouts directly on your T.V. screen. The accompanying software allows you to draw any shape or *filled area* you wish, to *pixel accuracy*, in full colour and the results may be utilised within your own programs, e.g. for animation, or to illustrate your title pages. At just £29 inclusive, the Datapen lightpen package represents superb value – just look at the actual screen photographs and you will agree that this must be the best value for money on the market.



PLUS: 3 SOFTWARE PROGRAMS

- Routines and ideas for your own programs. (Menus, games, music, etc.)
- User-defined graphics creation program.
- Superb full colour drawing program as illustrated in these actual screen photographs.



- Incorporates features not provided with other pens.
- Push button operation on pen – no need to use keyboard.
- Works under any lighting conditions.
- Plots to pixel accuracy.
- 20 pre-defined commands allow plotting of geometric shapes, including triangle, lines, circles, etc., text, or user-defined characters.
- Uses all paper and ink colours.
- A screen grid may be turned on and off, at will, to assist drawing.
- Flexible erase capability.
- All drawings can be saved to tape for further use.
- Plugs in direct – no batteries, additional components, or adjustments needed.
- Handbook, plus printout of routines for use in your own programs.

Send cheque or P.O. for £29.00 to: Dept. SU1 DATAPEN MICROTECHNOLOGY LIMITED, Kingsclere Road, OVERTON, Hants. RG25 3JB 0256 770488
or ask at your local computer shop. Send S.A.E. for details. Lightpens and software are also available for BBC B, Dragon, CBM-64 and VIC-20.

SPRITE DESIGNER

USR on' will bring the moving sprite facility into action, whereas the statement 'RANDOMIZE USR off' will bring things back to normal.

The sprites themselves are defined using the ordinary user-defined graphics. You can have up to five different designs on-screen at once, which are:

Sprite 1=UDGs A,B,C,D
Sprite 2=UDGs E,F,G,H
Sprite 3=UDGs I,J,K,L
Sprite 4=UDGs M,N,O,P
Sprite 5=UDGs Q,R,S,T

You can define them yourself in the usual ways.

The array, s$, is the one that contains all the information, however, and each element must be precisely defined. Now . . . it's 'pay attention' time. Take a look at the box giving the explanation of the sprite parameters. (Note that in the explanations given, I've used the letter 'N' to represent one of the strings in s$; the number is completely arbitrary.)

The element s$(N,8) is actually very important. If it contains any character whose code is less than or equal to 64 (decimal), then the sprite is said to be *inactive* — that is, it'll not appear on the screen. You can make as many alterations as you like to the other elements of s$. Once all the alterations have been made, you can then alter s$(N,8) and the sprite will be *active* and will start moving across the screen.

If such a moving sprite collides with anything on-screen, or if it hits the edges of the screen, then it'll instantly stop

THE SPRITE PARAMETERS

STRING ELEMENT	EXPLANATION
s$(N,1)	CHR$ (the sprite number — between one and five).
s$(N,2)	This must always be initialised to CHR$(1).
s$(N,3)	CHR$ (the number of frames between successive movements).
s$(N,4)	CHR$ (the figure's Y co-ordinate).
s$(N,5)	CHR$ (the figure's X co-ordinate).
s$(N,6)	CHR$ (the figure's vertical displacement each time it moves).
s$(N,7)	CHR$ (the figure's horizontal displacement each time it moves).
s$(N,8)	This must be set last of all, and must be any character whose code is greater than 64.

In the table above, it must be noted that 'N' is used to represent one of the strings in s$ — the number is abitrary.

78	FIND_ADDR	LD A,B	This subroutine computes in
E618		AND 18	HL the print position of the
F640		OR 40	square (on the screen) which
67		LD H,A	has PRINT-AT co-ordinates
78		LD A,B	given by registers B,C.
OF		RRCA	
OF		RRCA	
OF		RRCA	
E6E0		AND E0	
B1		OR C	
6F		LD L,A	
C9		RET	
DD7E07	NXT_SPRT	LD A,(IX+07)	A:= activation flag.
FE40		CP 40	
D8		RET C	Return if sprite inactive.
DD3501		DEC (IX+01)	Count frames between movements.
C0		RET NZ	Return if the sprite does not require moving.
DD7E02		LD A,(IX+02)	A:= frame interval between movements.
DD7701		LD (IX+01),A	Re-initialise frame count.
DD4603		LD B,(IX+03)	B:= y co-ordinate.
DD4E04		LD C,(IX+04)	C:= x co-ordinate.
CD6281		CALL FIND_ADDR	HL:= print position of sprite.
CD3A81		CALL WIPE	Erase sprite.
DD7E03		LD A,(IX+03)	A:= y co-ordinate.
DD8605		ADD A,(IX+05)	A:= intended y co-ordinate.
FE17		CP 17	
301F		JR NC,NS_EXIT	Jump if intended y co-ordinate out of range.
47		LD B,A	B:= intended y co-ordinate.
DD7E04		LD A,(IX+04)	A:= x co-ordinate.
DD8606		ADD A,(IX+06)	A:= intended x co-ordinate.
FE1F		CP 1F	
3014		JR NC,NS_EXIT	Jump if intended x co-ordinate out of range.
4F		LD C,A	C:= intended x co-ordinate.
C5		PUSH BC	
CD6281		CALL FIND_ADDR	HL:= intended print position.
CD4E81		CALL TEST	Test for collision.
C1		POP BC	BC:= intended co-ordinates.
A7		AND A	
2008		JR NZ,NS_EXIT	Jump if sprite has hit something.
DD7003		LD(IX+03),B	Store new y co-ordinate.
DD7104		LD (IX+04),C	Store new x co-ordinate
180A		JR NS_DRAW	
DD360700	NS_EXIT	LD (IX+07),00	Deactivate sprite.
DD4603		LD B,(IX+03)	B:= old y co-ordinate.
DD4E04		LD C,(IX+04)	C:= old x co-ordinate.
DD6E00	NS_DRAW	LD L,(IX+00)	L:= sprite type number.
2D		DEC L	L now in range zero to four.
2600		LD H,00	HL now in range zero to four.
29		ADD HL,HL	
29		ADD HL,HL	
29		ADD HL,HL	
29		ADD HL,HL	
29		ADD HL,HL	Multiply by 32d.
ED5B7B5C		LD DE,(UDG)	Point DE to graphic A.
19		ADD HL,DE	Point HL to required sprite graphics.
E5		PUSH HL	
CD6281		CALL FIND_ADDR	HL:= print position of sprite.
D1		POP DE	DE:= address of pixel information.
CDDB81	DRAW	CALL H_DRAW	Draw upper half of sprite.
CD8129		CALL LINE	Point HL to lower half.
CDDF81	H_DRAW	CALL Q_DRAW	Draw next square of sprite.
23		INC HL	Point HL to next square.
E5	Q_DRAW	PUSH HL	
0608		LD B,08	
1A	DR_LOOP	LD A,(DE)	
77		LD (HL),A	Print next row.
13		INC DE	
24		INC H	Point HL to next row.
10FA		DJNZ DR_LOOP	
E1		POP HL	
C9		RET	

moving and deactivate. Element sS(N,8) will automatically reset to CHR$(0). You can test for this occurrance in a Basic program.

A TIMELY INTERRUPTION

OK, it's tea-break time! Arm yourself with a cuppa and I'll explain how it all works.

The machine code is an *interrupt* routine. This means that the program runs itself automatically 50 times a second. Each time it runs it checks out the array sS and shuffles sprites around the screen accordingly. The Basic instruction 'RANDOMIZE USR on' simply activates this interrupt procedure, whereas 'RANDOMIZE USR off' deactivates it. Interrupt procedures are quite clever; however, it's very easy to muck things up and just a tiny little bug will spell total disaster and blast the poor Speccy into oblivion. This is true simply because the program runs itself once for every new TV frame, whether you want it to or not.

Take a peek at the Basic program that's lying around in this article. It manages to do in just a few statements what would otherwise have been quite a complicated program; it produces a figure which bounces around the screen. The first seven lines just initialise the array, sS, and line 80 starts things moving. Line 90 is the one to think about — it looks like an infinite loop, but in fact it's not; it's just waiting until the figure hits an edge. If you break out of the program at any time you'll notice that the figure will keep moving *even* while you type a command, until it hits a wall (when it will stop). At this point, you should type 'RANDOMIZE USR off' before you do anything else.

`10 DIM s$(1,8)`	Dimensions the array, s$.
`20 LET on=33013` `30 LET off=33020`	Initialise the variables.

`40 FOR j=1 TO 8`
`50 READ a`
`60 LET s$(1,j)=CHR$ a`
`70 NEXT j`
	Read the data in line 160.

`80 RANDOMIZE USR on`	Switches the sprite facility on.
`90 IF s$(1,8)="A" THEN GO TO 90`	Waits until a sprite hits the edge of the screen.
`100 LET y=CODE s$(1,4)`	'y' is the Y co-ordinate of the sprite.
`110 LET x=CODE s$(1,5)`	'x' is the X co-ordinate of the sprite.
`120 IF y=0 OR y=22 THEN LET s$ (1,6)=CHR$ (256-CODE s$(1,6)): B EEP .03,24`	Reverses the Y movement of the sprite if necessary.
`130 IF x=0 OR x=22 THEN LET s$ (1,7)=CHR$ (256-CODE s$(1,7)): B EEP .03,12`	Reverses the X movement of the sprite if necessary.
`140 LET s$(1,8)="A"`	Reactivates the sprite.
`150 GO TO 90`	A loop to send the action back to line 90.
`160 DATA 1,1,2,10,5,255,1,65`	Contains the data for sS.

The Basic program to get things moving on-screen — type it in and see . . .

Well, that's it for this issue. I'm just going off to stick my head in a bucket of inspiration — hopefully in time for me to produce yet more gems next month. See you then. YS

!NEW VERSION!

TAPE TO MICRODRIVE

MICRODRIVE TO TAPE

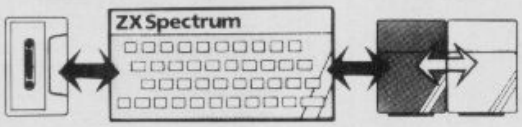
Would you like to transfer your Spectrum programs from

① MICRODRIVE TO MICRODRIVE ③ TAPE TO TAPE

② TAPE TO MICRODRIVE ④ MICRODRIVE TO TAPE

Then do it with

TRANS-EXPRESS



TRANS-EXPRESS is the most comprehensive package of four m/c utilities for transferring Spectrum programs. They are user-friendly, simple to use, reliable & very efficient. They will enable you to transfer any kind of programs up to the full 48.0k length. TAPE TO MICRODRIVE will also automatically, if necessary, modify, re-structure & relocate both BASIC and m/c to RUN from microdrives.

TRANS-EXPRESS is an essential microdrive companion and an invaluable software back-up utility.

You can buy each of the four programs separately for **£ 5.50** or TAPE TO MICRODRIVE & MICRODRIVE TO MICRODRIVE for **£ 7.50** or an entire package of all four programs on one tape for **£ 9.95** or on a microdrive cartridge for **£ 14.95** only.

M'DRIVE TO M'DRIVE

Please send me a copy of **TRANS-EXPRESS** ① ② ③ ④ Please tick where applicable Y.S.

I enclose cheque/PO for ..... [European orders please add £1, overseas £2]

Name/Address .....

.....

.....

ROMANTIC ROBOT 113 Melrose Ave, London NW2

Another great idea from

Computerworld

RESET SWITCH BOX

£4.49 incl p&p

SPECTRUM AND SPECTRUM +

Eliminates hassle. Saves wear. ON/OFF with LED. Superior box & styled switch. Compatible with *ALL* interfaces & keyboards.

WORLD'S FIRST COMPUTER JOKE BOOK **£4.95** inc. p&p Also available on microdrive £8.95

WIN A COMPUTER FOR £5! GRAND COMPETITION Ask for details

WHY NOT CHARGE TO DINERS CLUB INTERNATIONAL

APPLICATION FORMS AVAILABLE HERE

Ask in your local computer shop or direct from:

Computerworld

Kent House Road, Beckenham, Kent BR3 1JN

Telephone: 01-778 0479

5 WINNING CLASSICS FROM MICROMEGA

BRAXX BLUFF

Our ultimate 3D program — the multi-screen mission to save the dying crawler crew trapped at Braxx Bluff. Undock and land, walk in search of the crawler, drive it through the marsh, the ruins and the desert — one track wrong and you are dead! — skim the rocky seas at top speed . . . the natives are after your energy, but caution costs time and the crew are dying. There never was a cockpit-view mission like the one to Braxx Bluff!

FULL THROTTLE

Full Throttle places you on the saddle of a 500cc Grand Prix motorcycle. You can choose to race on any of ten of the world's top racing circuits. As a newcomer, you are started at the back of the grid in a field of 40 bikes. You have the best bike in the race, but that alone will not help you!

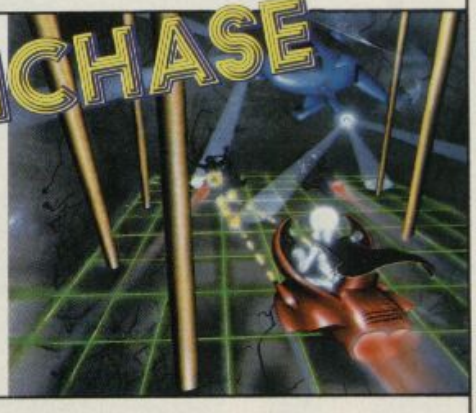
Codename mat

MAT is mankind's last hope! The desperate plan to place in the mind of a teenager the combined tactical skills of all the planetary leaders in the solar system. Now your mind is MAT's mind. Take control of the USS Centurion Battle Cruiser and Tactical Command Centre to control the planetary defence fleets against the Myon attacks in MISSION: ALIEN TERMINATION.

DEATHCHASE

3D as you have never seen before on your Spectrum! £6.95 will put you right on the saddle of the Big Bike! Ride deep into the forest through day and night, chasing the enemy riders.

Weeve through the trees at breakneck speed and watch out for helicopters and tanks — the greatest prizes of all!



Kentilla

Where netherbeast Grako is building his power. There's much to discover and dangers abound. Free-moving agents may help you or hinder, but might be befriended if ways can be found. The alchemist lore-work was false and a failure, but renders good service in different vein, vanquished aggressors might be your protector. In perilous places of dark, death and pain. Of devious problems and magical task, this song is a warning, a riddle, a clue. To Caraland's saviour it offers a little, So mark well its lines for the saviour is you . . .

AT £6.95 EACH FOR THE SPECTRUM

Selected titles available through larger branches of

Boots
John Menzies
Spectrum
WOOLWORTH

JUST RELEASED

JASPER

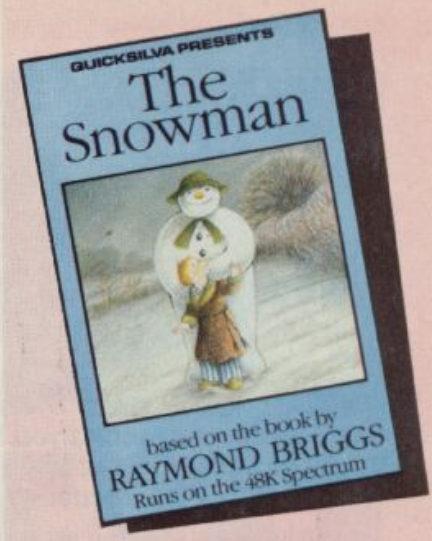
For the 48K Spectru the most amazing arcade adventure y with 22 screens of stunning cartoon animated graphics seeing is believing see the advertisement in th issue now.

A prophecy is about to be fulfilled. The Dead will rise again to eat the flesh of the living...
Zombie Zombie
From the authors of ANT ATTACK, Sandy White and Angela.
DJR
Softsolid 3D* from SPACEMAN
*Patent pending
48K Spectrum £6.95
All titles available from
QUICKSILVA
Quicksilva Mail Order, P.O. Box 6, Wimborne, Dorset BA21 7PY.
Telephone (0202) 891744.
WARNING: These programs are sold according to QUICKSILVA Ltd's terms of trade and conditions of sale, copies of which are available on request.
WHSMITH
Boots
WOOLWORTH
John Menzies
and leading multiple retailers and specialist computer stores

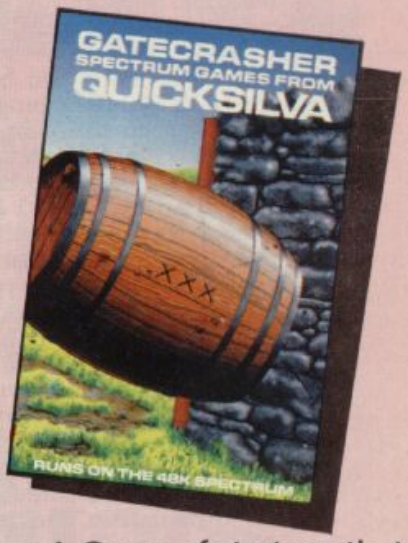
BATTLEZONE

The Official Atari approved version of the popular ATARI arcade game.

48K Spectrum
£6.95



An enchanting Christmas game based on RAYMOND BRIGGS' best selling book and film.



A Game of strategy that will test your mind to its limits.

A fantastic fight to the death within your own bloodstream!

Blood & Guts

Strontium the DCC Killing

A battle to the end with the deadliest killers in the Galaxy!

available from

QUICKSILVA

Quicksilva Mail Order, P.O. Box 6, Wimborne, Dorset BA21 7PY.
Tel. (0202) 891744

48K Spectrum £6.95 each

YS MEGABASIC TUTORIAL

PROCEDURAL PRACTICE

Mike Leaman *shows you how to structure your programs in* YS MegaBasic. *And, at last, there's an opportunity to be first in the queue for the program itself!*

From looking around at other Basics for home computers — sort of sounding out the opposition, if you like — one aspect I was particularly keen to incorporate in *YS MegaBasic* was a means of helping users to structure their own programs. The 'experts' are constantly suggesting that you should structure your Basic for efficiency, but ZX Basic is hardly conducive to that!

However, I'm more than happy to report that a *YS MegaBasic* program *can* be written in structured sections — called 'procedures'. The main advantage is, of course, that each separate procedure can be tested on its own *before* it's added to the main program. Another useful aspect of working in procedures is that you can name each one; although you may understand each separate subroutine call in one of your own programs, it's not always true that it'll be a piece of cake for someone else who's attempting to debug it later. Using my system of structuring your programs each procedure has a name allocated to it — which should ideally describe its true purpose within the main program. Then, when a particular section is to be executed, all you have to do to bring the procedure into play is to use the name of the section in a program line — as opposed to using a GO SUB statement which doesn't give you any clues as to what's going on!

UP THE ORGANISATION

In *YS Megabasic*, the start of a procedure is defined by a '@' symbol along with its specific title — then, if required, this is followed by an underline character and a list of parameters. Note that all the procedure names are converted to upper case letters, and that any existing Basic commands can't be used to specify the procedures, so don't call a procedure 'PRINT' . . . use a bit of imagination!

A number of other Basics which include the use of procedures also allow the use of 'local' variables. With that system, variables used within a procedure don't affect the value of the variable of the same name outside that procedure. I'm sorry to say this is not available with *YS MegaBasic*, so take care when choosing the names of each procedure's variables.

A procedure's end is defined by the command ENDPROC; when a program encounters the ENDPROC command, processing is continued from the statement after the procedure call. Note too that the procedure name can be tagged on to the end of the ENDPROC statement to aid the program's legibility, so 'ENDPROC_DISPLAY' would define the end of the procedure 'DISPLAY'.

I've already mentioned in passing that parameters can be passed to procedures. This system of 'parameter passing' allows values to be assigned to variables at the beginning of a procedure for use in the rest of the procedure.

STACKING THE ODDS

Yet another feature of *YS MegaBasic* is the inclusion of the REPEAT ... UNTIL structure. The REPEAT command marks the beginning of a loop and UNTIL signifies its end. The UNTIL command is always followed by an expression — if this expression is false then a jump is made to the statement after the last REPEAT command and, if it's true, then program execution continues from the statement after the UNTIL command.

```
9000 @DISPLAY_A$
9010 DIM Z$(64)
9020 LET Z=(64-LEN A$)/2
9030 LET Z$(Z TO )=A$
9040 PRINT '''CHR$ 1;Z$
9050 ENDPROC_DISPLAY
```

This example program can be used to print a string on-screen in the centre of a line using the procedure 'DISPLAY_A$. For example, 'DISPLAY_"YS MegaBasic"' is equivalent to the ZX Basic 'Let A$="YS MegaBasic": GO SUB 9010'. Which one would *you* prefer to use?

```
10 REPEAT
20 OUT 254,RND*7
30 UNTIL_INKEY$="z"
```

This *YS MegaBasic* listing causes the border to flash until the 'Z' key is pressed.

```
10 OUT 254,RND*7
20 IF INKEY$<>"z" THEN  GO T
O 10
```

Now look at the bog-standard ZX Basic equivalent — frightening isn't it!

```
10 MTASK_9000
20 FONT_0
30 PRINT "Task 1 ";
40 GO TO 30
9000 CURRENT_0
9010 FONT_1
9020 PRINT "Task 2 ";
9030 GO TO 9020
```

This program causes 'Task 1' to be printed in window 2 using the standard Spectrum character set, and 'Task 2' to be printed in window 0 using the alternate character set.

Both procedures and the REPEAT ... UNTIL commands use a stack to store line and statement numbers. So that when a procedure is called, the line and statement number of the command after the call is placed on the stack — then, when an ENDPROC command is executed, the value is removed from the stack. When a REPEAT command is executed, the value is removed from the stack. When a REPEAT command is processed, the line and statement number are placed on the stack (something similar to a procedure call). When UNTIL is executed, if the expression is true, then a value is removed from the stack and program execution continues as normal. But if the expression is false, the top value from the stack is copied and a jump is made to the correct statement.

REPEAT ... UNTIL loops and procedures can be nested together. There is more than enough room on the stack for 10 values, but if you try to place more than 10 values on the stack you'll get a 'PROC stack overflow' error message. Likewise removing a value from the stack when it's already empty produces a 'PROC stack underflow' error message.

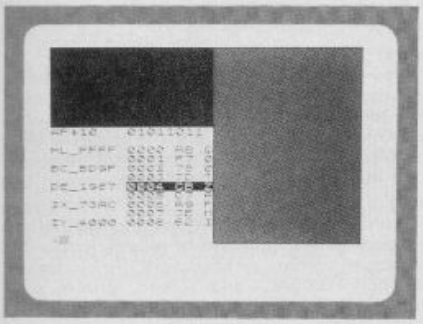
There are three commands to alter the stack without causing a program jump: POP, PUSH AND PCLEAR. POP is used to remove a value from the stack, PUSH specifies the statement and line numbers to be placed on the stack, and PCLEAR clears the stack; the command PCLEAR should always be used at the beginning of any programs involving the use of procedures or REPEAT ... UNTIL loops in order to prime the stack.

GO WITH THE FLOW

There are two commands that can affect program flow — these are MTASK and BRANCH. MTASK provides the Spectrum with a simple form of multi-tasking; it splits a program into two parts, executing a line from the first part and then a line from the second. This 'multi-tasking' continues until either one part of the program finishes or it's turned off. MTASK is always followed by a number which defines the start line of the second part of the program (the first part of the program is assumed to continue after the MTASK command). If you want to turn it all off, execute MTASK 0. Both sections of the program must use the same variables, but each can access different windows and character sets.

The second command, BRANCH, causes a jump to be made to a subroutine after a line has been finished. Bear in mind though that MTASK has priority over BRANCH, so if you want to multi-task, dont't try to branch as well. The number after the BRANCH command specifies the line number at which the subroutine starts; the subroutine is terminated by an ENDPROC statement. You'll find branching especially useful when debugging a program; take, for example, when a programmer wishes to monitor the value of a particular variable during the execution of a program, this is when a BRANCH subroutine can be used to display its value. YS

YS MEGABASIC OFFER!



YS MegaBasic will be available from 1st January 1985 for just £7.95 — and that's at least £2 less that it'll cost you if you wait for it to hit the high street shelves. All you've got to do to get this massive price reduction is to fill out the form below, attach the *YS MegaBasic* tokens (or photocopies of same) from issues 8 and 9, and send us a cheque/Postal Order (made out to Sportscene Specialist Press Ltd) for £7.95.

Complete with a comprehensive manual that'll explain through programming examples how to make the most of the new language, *YS MegaBasic* is compatible with both Spectrum and Spectrum+ computers.

If you haven't got the three tokens you'll need to take advantage of this amazing offer, don't panic — there'll be others printed in future issues of *Your Spectrum*. All orders will be sent out as we receive them ... so place your order *now* and be first in the queue!

YS MEGABASIC PRIORITY ORDER FORM

I can't wait to get my hands on a copy of *YS MegaBasic*! I enclose a cheque/Postal Order for £7.95 made out to Sportscene Specialist Press Ltd and the two *YS MegaBasic* tokens from issues 8 and 9 of *Your Spectrum*.

Name .....

Address .....

.....

Postcode ..... Phone ..... Age .....

Name .....

Address .....

.....

Postcode ..... Phone ..... Age .....

Fill out the coupon above (or a photocopy) and send it off to *YS MegaBasic Offer, Your Spectrum, 14 Rathbone Place, London W1P 1DE. Allow 28 days for delivery (from 1st January 1985).*

YOU CANNOT BE SERIOUS ...

64-COLUMN TEXT?
THREE-CHARACTER SIZES?
QL-STYLE WINDOWS?
TWO-CHARACTER FONTS?
SPRITES GALORE?
SINGLE LETTER ENTRY?
NAMED PROCEDURES?

... ON A SPECTRUM!!??

Leonardo

SIMPLY THE MOST ADVANCED SPECTRUM GRAPHICS PACKAGE.

For programmers, artists, draughtsmen, or just plain doodlers.

Special Draw Functions	Leonardo	C.A.D.	Melbourne Draw	Paintbox
Line (solid or dotted)	●	●		
Circle	●	●		●
Arc	●			●
Ellipse	●			
3D Cubes	●	●		
Fill	●	●	●	●
Scaling of Objects	●		●	
Pixel scrolling of window or entire screen	●		●	
Merge pictures	●			
U.D.G. creation	●	●	●	●
Pattern Generator	●			
Separate screen and colour editing.	●	●		

The table demonstrates the capabilities of LEONARDO against the best selling similar packages. LEONARDO'S facilities do not stop there however. In fact over 50 commands are available making this the most advanced and useful graphics package yet produced for the SPECTRUM 48K.

- Compatible with all leading joysticks.
- Clear commands make LEONARDO easy to use.
- Complete with a comprehensive 30 page instruction manual.

£9.95

CREATIVE SPARKS

Creative Sparks, 296 Farnborough Road, Farnborough, Hampshire, GU14 7NF.

Available from All good computer software stockists.
Send me (tick as required)
☐ **LEONARDO** TNDC301 — **£9.95**
☐ My local stockist's address
☐ Your full list of games
Game/s at **£9.95** each — £ : p
+ single P&P sum — : 30p
Total to send — £ : p

Method of payment: By cheque or PO (no cash) made payable to **TECS** or
Enter card no.
☐ By Access
☐ Barclaycard
Sign below:

Credit card sales: UK buyers only. Response within 21 days.
Creative Sparks, Department MO, 296 Farnborough Road, Farnborough, Hampshire, GU14 7NF. Telephone: (0252) 518364.

Name
Address

YS1284

WD Software

QL Utilities (£10 on Microdrive)

This package offers single-key loading, running or deletion of files, multiple formatting of cartridges to another with optional over-writing of namesakes. In addition, a directory of 60+ files can be viewed without screen overflow. NB a VERIFY program is unnecessary — QDOS does this automatically. Now includes directory print-out and "qprint" to print any or all files on a cartridge with optional dated titles. Owners of the earlier package can update by sending OUR cartridge and 25p.

Current Spectrum Software

Tradewind (£5 cassette)
Buy a ship, provisions and cargoes to trade between the harbours of the Coral Islands. Make a fortune if the weather and pirates let you live long enough to master seamanship and economics. A strategy/adventure game with graphics for 48K.

Jersey Quest (£5 cassette)
Following an accident, you are stranded in the labyrinth of time and must find you own way back to the present with the aid of persons and objects from Jersey Folklore. Meet the Black Horse of St Ouen, the Dragon and Knight of La Hougue Bie, the Black Cat of Carrefour a Cendre, the Witches of Rocqueburg and many others. A text-only adventure for 48K in machine code (Quill).

Morse Tutor (£4 cassette)
This one has it all! 4-19 words/minute, variable spacing, variable number of groups of random letters, numbers or mixed, random sentences, own message, single characters (including punctuation), variable pitch FEEDBACK via screen, printer or SPEECH (phonetic alphabet via Currah u-Speech on 48K version only), and repeat facility. Takes you to and beyond RYA and Amateur Radio receiving standards. 16K and 48K versions on one cassette, 48K only on Microdrive cartridge.

Spectrum Programs on Microdrive

All the above are available on Microdrive cartridges at a price of £4.50 for one cartridge + the price of each program as shown above, e.g. a cartridge with Tradewind and Morse Tutor would be £13.50. As a BONUS, Gavin Monk's Indexed Loader is included FREE with each cartridge.

Available from:

WD SOFTWARE
Hilltop, St Mary, Jersey, c.i. Tel: (0534) 81392

COMPUTERS AT WORK IN THE VEGETABLE GARDEN????

Here, at last, is a really practical use for the home computer. To ensure optimum utilisation of your plot and avoid that glut of vegetables during some months and nothing at all for others, here is the . . .

VEGA-TABLE

This versatile and easy to use program for the 48K SINCLAIR SPECTRUM computer is designed to help you decide what to have in your vegetable garden and when, where and how much to plant. You have only to divide the plot into manageable sections and then you move around it selecting and positioning crops as you wish. They "grow" before your eyes! You can see immediately if you are planting too close together or wasting space and you are guided into a straightforward 3 year rotation scheme.

You finish your planning with a clear picture (literally) of exactly where everything will be on your plot and a chart giving the date each crop is to be sown, when it should be ready for planting out and the likely harvesting season. You even get an estimate of the yield you might expect.

Stored within the program are details of over 40 varieties of commonly grown vegetables e.g. planting distances, sowing and harvesting dates etc. All carefully researched and verified.

Well worth £6.75 inc. VAT, p&p

Order now from:
VEGA SPACE SYSTEMS LTD.
Dept YS, Waxhouse Gate,
15 High Street,
St Albans, Herts AL3 4EH

VEGA

NEW

TEAM UP WITH FLOYD

FLOYD 40

ON RELEASE NOW
THE FIRST SPECTRUM COMPATIBLE PRINTER WITH BUILD IN INTELLIGENCE.

Features:
- Clear easy to read print
- 3 print modes (see below)
- No split words
- Indented printing
- Double height double width • Interface I & II compatible • Inverse printing • 32 or 40 columns — software selectable • Firmware program — no loading from tape.

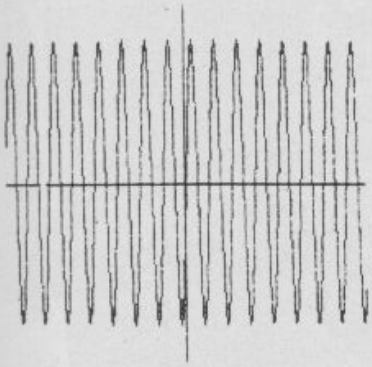
The printer comes in a slim matt plastic case, which will compliment your Spectrum. It connects with the Spectrum via a 56-way ribbon cable and all connections are brought through to the back of the printer.

The printer has two switches — one for paper feed and one for on/off line.

3 PRINT MODES

GRAPHICS MODE

Full graphics capability is available in the Graphics Mode:



SINEWAVE

ADJUST MODE

This is a high quality thermal printer for the Sinclair Spectrum. It has three modes of operation:
- the Graphics Mode,
- the Adjust Mode,
- and the List Mode.

and three special features:
- double height,
- double width,
- and inverted printing.

In the Adjust Mode, the printing is such that no split printing of words at the end of lines occurs, and printing is done with up to 40 characters per line.

It is possible to mix the
double width and double
height features even within normal text!
Inverted printing
is also possible!

LIST MODE

The List Mode allows BASIC programs to be more easily read by indenting the program statements from the corresponding line numbers:

```
360>REM This is a program to plot any
    required trigonometric function.
    The period and magnitude of the
    waveform can be specified by the
    user.
360 CLS
370 PLOT 0,87: DRAW 255,0
380 PLOT 127,0: DRAW 0,175
390 INPUT s,e$
395 LET t=0
400 FOR f=0 TO 255
410 LET x=(f-128)*s/128: LET y=VAL e$
420 IF ABS y>87 THEN LET t=0: GO TO
    440
425 IF NOT t THEN PLOT f,y+88: LET
    t=1: GO TO 440
430 DRAW 1,y-old y
440 LET old y=INT (y+.5)
450 NEXT f
460 RETURN
```

SPECIAL INTRODUCTORY OFFER £49.95 (+4.95 p&p)

To: S.I. FLOYD, 153 MERRION RD, DUBLIN, IRELAND

	QTY	PRICE	TOTAL
FLOYD 40	.....	£84.95	.....

I enclose cheque/P.O. for £..... (inc £4.95 p&p) made out to **S.I. FLOYD**

PLEASE PRINT

NAME _____

ADDRESS _____

_____

Dealer enquiries welcome. Please allow 28 days for delivery.

AUTOMATA PRESENTS

DEUS EX MACHINA

Deus Ex Machina *may be an innovation — bringing a touch of Hollywood to your screens — but what of the game itself? Is it a game anyway?!* Ross Holman *auditions Automata's rising star, providing out-takes from its screen test.*

Deus Ex Machina is not just a game, it's a visual and aural experience. The idea is not unlike that of the 'concept' LP, where you're supposed to follow a theme from beginning to end. The theme in this case is the growth, birth, ageing and death of a mutant generated by an all-powerful computer. The initial process of creation is in fact brought about via a lump of mouse dropping; you as the player have to nurture and guide this freak organic accident through its life cycle.

For *only* (?) £15 you'll lay your hands on a very large plastic box containing two cassettes and a large poster. Cassette one provides the computer games, while the other has the accompanying soundtrack. On the reverse of the poster is a brief description of how to load the game and the control options. The game is Kempston and Interface 2 compatible but so easy to control that just using the keyboard alone is not difficult. The poster also offers a complete transcript of the songs and narrative, along with an explanation of each game and pictures of all the celebrities who appear on the tape.

Automata describe the game as 'an animated televised fantasy' and as the union of computer game, film, book and LP is perhaps stretching it a bit. Still, the company is obviously proud of its latest release, and justly so. It's produced maybe 70K of machine code games, all synchronised to a music and narrative cassette, featuring the likes of Frankie Howard, Jon Pertwee, Mel Croucher, Donna Bailey and Ian Dury. All in all it's a slickly produced and presented piece of software which has clearly had a lot of time and effort spent on it. The question is, does it makes for an appealing game?

EASY MORALS

Automata certainly seems keen to get across the idea of genetics and dangers inherent in experimenting in this field; any other ideas or messages that may appear to lie within the game are strictly up to the individual to find. As for games content, well, the games are not too difficult to play and getting to the end is easy. On the other hand, I'm sure that this is deliberate. The idea of synchronising game and soundtrack is new and works well, but the appeal soon wears off; eventually, I found myself playing the game without any audio assistance at all!

If *Deus Ex Machina* appeals to you then maybe it's worth the £15 price tag to own what's potentially an interesting chunk of computer history. But don't expect it to knock your socks off.

IAN McKINNELL

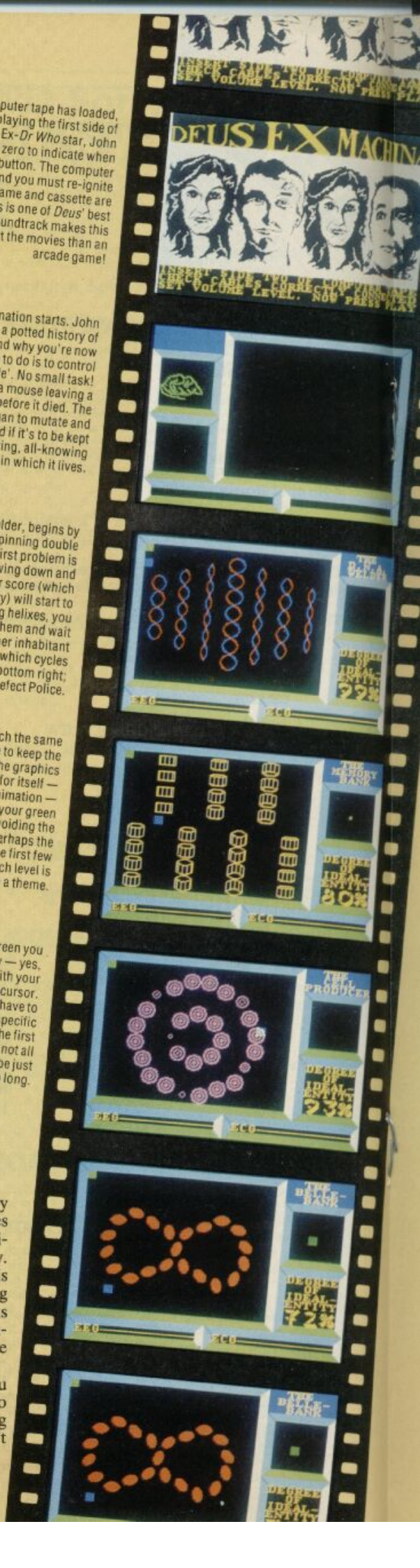
Once side one of the computer tape has loaded, you're told when to start playing the first side of the soundtrack cassette. Ex-*Dr Who* star, John Pertwee counts down to zero to indicate when you should hit the 'pause' button. The computer now counts down to zero and you must re-ignite the audio tape. Eureka! Game and cassette are now synchronised. This is one of *Deus*' best features; the audio soundtrack makes this program more like a night at the movies than an arcade game!

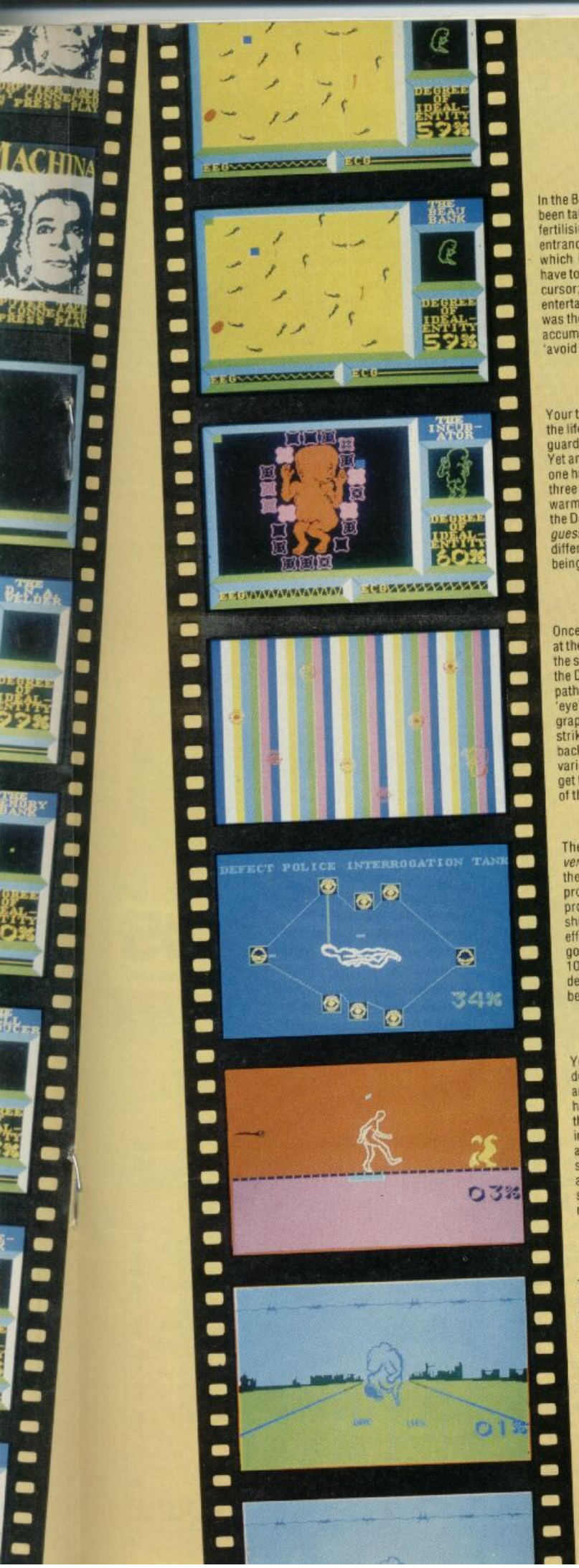
This is where the animation starts. John Pertwee takes you through a potted history of how the 'accident' occured and why you're now playing the game. All you have to do is to control a mutant through its weird 'life'. No small task! Apparently, it all began with a mouse leaving a small organic present just before it died. The lump of mouse dropping began to mutate and your protection is required if it's to be kept secret from the all-thinking, all-knowing machine in which it lives.

Game one, The DNA Welder, begins by confronting you with some spinning double helixes (representing DNA). The first problem is to prevent them from slowing down and stopping; if this happens, your score (which starts at 99 per cent normality) will start to decrease. To speed up the spinning helixes, you have to guide a green cursor on to them and wait until it regains speed. The only other inhabitant of the screen is the blue cursor, which cycles down line by line, from top left to bottom right; this is the scanner of the Defect Police.

On this level — which is pretty much the same as the one before — you have to keep the rocking memory banks moving. The graphics are up to the standard *Deus* has set for itself — large characters, with very smooth animation — and once again, you have to use your green cursor to warm the banks up while avoiding the blue Defect Police probe. This is perhaps the biggest criticism of *Deus* — for the first few games, you *do* get the impression each level is going to be a simple variation on a theme.

More blue cursor stuff here. On this screen you have to keep the cells pulsating by — yes, you've guessed it — touching them with your green cursor while avoiding the blue DP cursor. As the soundtrack and computer game have to go hand-in-hand, all the games play to a specific time limit. I found that, especially on the first few levels where the variation in play is not all that spectacular, the games tended to be just that little bit too long.





In the Beau Bank (game five) a single egg has been taken by the machine and now needs fertilising. At this point, Ian Dury makes his entrance singing 'I'm a fertilising agent' — which is good news indeed for all the eggs. You have to guide the sperm by bouncing it off your cursor; this turned out to be the most entertaining of all the screens — for a start, it was the only one on which I could actually accumulate points! This game is one of the 'avoid the Defect Police cursor' series.

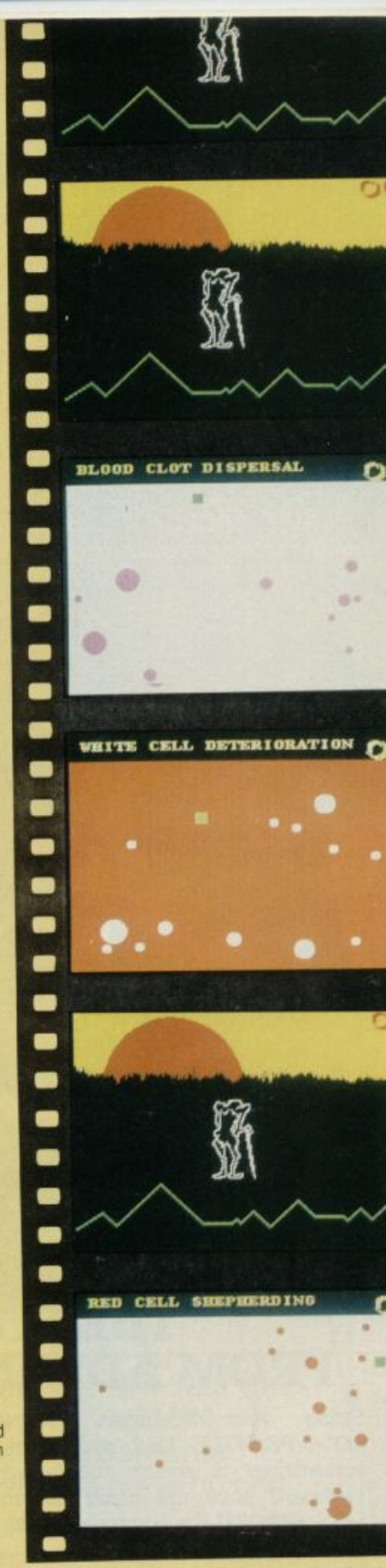
Your task inside the Incubator involves keeping the lifeform's cocoon intact; you do this by guarding and preserving its constituent parts. Yet another 'Defect Police cursor' game, this one has a slightly different twist from the first three games. This time you keep the cocoon warm and in its sea of pulsating cells, and avoid the Defect Police yet again (*Who'd have guessed! Ed.*). At least the lifeform looks a bit different (even if it does look more like a human being).

Once the infant's born, it's thrown into the world at the deep end . . . literally. You have to guide the spinning foetus through the probing eyes of the Defect Police and along a psychedelic pathway to safety. Each time your babe hits an 'eye', your normality score decreases; the graphics in this part of the game are quite striking, mainly due to the colours used for the background. Although I experimented with various techniques, there was no way I could get through this level without hitting at least one of the Defect Police's eyes!

The last two games on side one show the young, *very* human, lifeform spinning in the centre of the screen. Surrounding him (or her!) are probing eyes that emit psychic rays. For protection, you have to manoeuvre a small shield around the babe — thus nullifying the effects of the probes. I found that no matter how good your reactions were you couldn't achieve 100 per cent success and, as ever, the score decreases. (No sooner are you born than you begin to die!)

Your score is carried over into side two — so don't reset your computer; this is a slightly annoying feature as I'm sure many users would have preferred to have a 'save-game' option at this stage. The first two games on side two involve the now adult man running, jumping and avoiding the pitfalls of life. The action on-screen shows the figure under attack both from above and either side. It's time to whip out three shields, to block the path of the advancing nasties.

The next game is perhaps the most impressive, showing the middle-age creature lumbering towards the player — that is, out of the screen. At its feet are a number of words representing good and evil; the idea is to jump over the 'good' words like 'joy' and 'peace', while stamping on words like 'evil' and 'war'. It's not all that easy to judge when to jump and the creature seems to jump on its own at times(?). Each mistake causes some of your empire (which you see in the background) to collapse.



Once you've guided the scanner along the old creature's pulse you're thrown in the second part of the final section in which you have to stop the creature's blood clotting. You do this hitting the clotting cells with your cursor. On this game's over, you die. The game ends jus like a movie with the credits scrolling up the screen in the usual Hollywood fashion. As th soundtrack quietly fades into the background the computer resets with the Sinclair Researc copyright message and it's all over.

SPECTRUM'S ADVANCED KEYBOARD

HI-QUALITY

■ The **LO>>PROFILE** professional keyboard is the ultimate upgrade for your Spectrum. By replacing its existing keyboard with a high quality **LO>>PROFILE**, you give this world-beating computer the keyboard it deserves.

■ The **LO>>PROFILE** is a full size QWERTY keyboard with full-travel positive-action keys for super-fast entry of programs and data. Presented in an ultra-modern and robust enclosure, the **LO>>PROFILE** is elegantly styled and is inclined forwards for convenient operation.

■ Featuring a full size space bar with dedicated numeric and curser keypad the **LO>>PROFILE** increases the number of keys from 40 to 53. A combination of clearly labelled, sculptured and height-adjusted keys aids the advance to fault-free touch-typing.

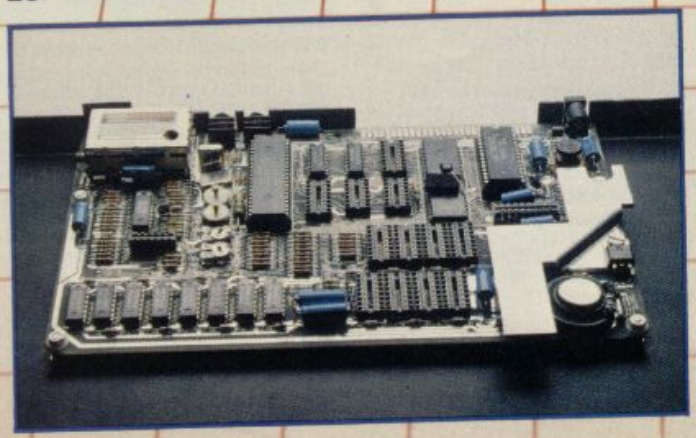
■ Advanced Memory Systems have established an excellent reputation for product reliability and prompt delivery. This product has been tested to an impressive 20,000,000 depressions per key and AMS offer a full one year guarantee.

LO>>PROFILE

£49·95
plus £2.50 p&p (VAT inclusive)

THE LO>>PROFILE PROFESSIONAL FROM ADVANCED MEMORY SYSTEMS LIMITED.

Fitting your Spectrum computer board into the **LO>>PROFILE** keyboard is easy. All you need is a screwdriver to secure the board onto the base of the keyboard enclosure using the mountings provided. The **LO>>PROFILE** is compatable with all Spectrum add-ons.



If not available from one of our 200+ dealers then fill in the coupon and we will send you a **LO>>PROFILE** with our full no-quibble money-back guarantee. Or phone 0925 602690/ 62907 for instant Access or Visa orders.

Please send No.....**Lo>>Profile Keyboard** at £49.95 plus £2.50 p&p (VAT inclusive)
I enclose a cheque/PO for £..... or debit my credit card.
Card No
☐ Barclaycard
☐ Access card
Signature _____ Date _____
Name _____
Address _____
_____ Postcode _____

To: Advanced Memory Systems Ltd.,
Woodside Technology Centre,
Green Lane, Appleton, Warrington WA4 5NG

HACKER'S GUIDE

Seasoned hacker, Dave Nicholls shuffles through Deus' code — and comes up trumps!

There have been many instances of companies claiming their games use programming techniques that are 'new' or which have 'never been used before' — but going by the ones I've seen, I can only assume that those concerned have never heard of Knuth's *Fundamental Algorithms* or any other classic programming books!

SOLID AS A ROCK!

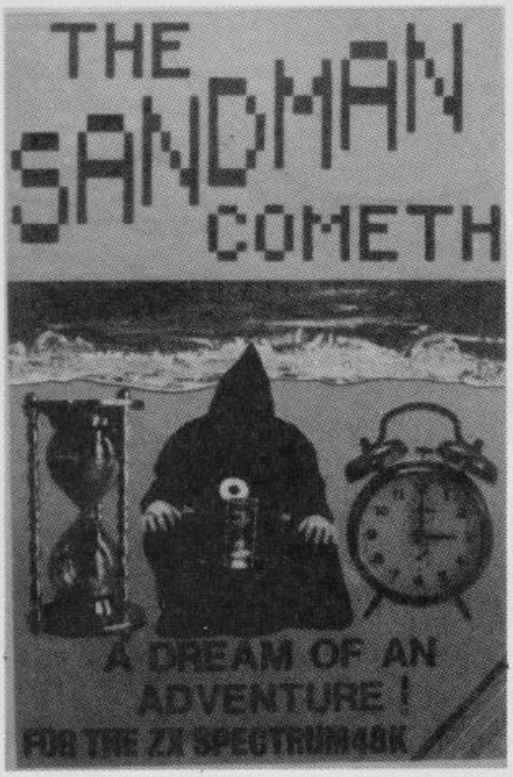
I've always maintained that, although innovation is a wonderful thing, there's no substitute for good, solid 'standard' programming when it comes to getting things done. This is where *Deus Ex Machina* really stands out. The concept of the music cassette is obviously new, but Andrew Stagg's coding for the games is virtually an object lesson in good programming. Any of you who've read my words of wisdom before (*Shame on you if you've missed them! Ed.*) will know that there are several coding faults in games programming that really get up my nose — the two major ones being self-modifying code (of which there's none in *Deus*), and large 'gaps' in between subroutines. On the latter score, *Deus* is amazing — it's so densely packed that when I needed to insert a small routine of my own, it took me about half an hour to find room for it!

One thing *Deus* does seem to have pretty much sussed is its use of interrupts. For those of you not in the know, this is the method of stopping the CPU periodically, making it jump to another program in a different location in memory. This is a relatively easy way to make a computer run more than one program at once (multi-tasking to you, John!). Spectrum interrupts occur 50 times a second and are normally used to scan the keyboard and update the FRAMES system variable ... but they can be re-directed to do other things, such as to provide a continuous tune throughout the game. This is obviously redundant in *Deus* (as it comes with its own soundtrack), so Andrew Stagg has used them to make the games stay in sync with the words/music tape. To this end, each game has a set of timing values used by the interrupt handler to inform the main code when things are due to occur; this is done by modifying a particular memory location which is checked repeatedly by the main program and used to work out which routine to run next. This is also used the other way round, so that the handler can run routines needed for a particular game; these routines are all of a fixed length so that they can be allowed for in the timing constants for the game. So, remember, next time you play *Deus* you're actually running two independent, but interacting, programs.

WHAT'S THE SCORE?

My final comments on *Deus Ex Machina* concern the scoring system. While hacking a game, I tend to play it quite a lot to get a 'feel' for what's going on. My efforts were rewarded with a consistent score of zero per cent. OK, so this isn't unusual for me, but I knew that Ross 'Magic Fingers' Holman was having the same problem ... so I decided to investigate. After much rooting around in the code, I soon found the answer.

For each game, you're given a percentage mark (however, this isn't the mark you see on-screen!) which is then used to reduce your current score — for example, if you score 60 per cent on a game then you'll lose 40 per cent of your overall score. Geddit? So that you don't lose points too quickly, each game has a limit below which your score cannot fall (for instance, all the games on side two of the cassette have a 50 per cent limit). However, as your maximum score is 99 per cent and an integer divide routine is used, you'll lose at least one per cent on each game (except for the Beau Bank where you get one per cent added for each fertilised egg). I can only think that Automata are trying to tell us that nobody's perfect!



THE PROGRAM THAT S-T-R-E-T-C-H-E-S YOUR IMAGINATION

This is no ordinary adventure. It can change your whole way of looking at the world!

Starring the Sandman, the Cheddar Cat and a cast of thousands, (well, OK, about a dozen really). The Sandman Cometh comes in two 48k parts on one cassette.

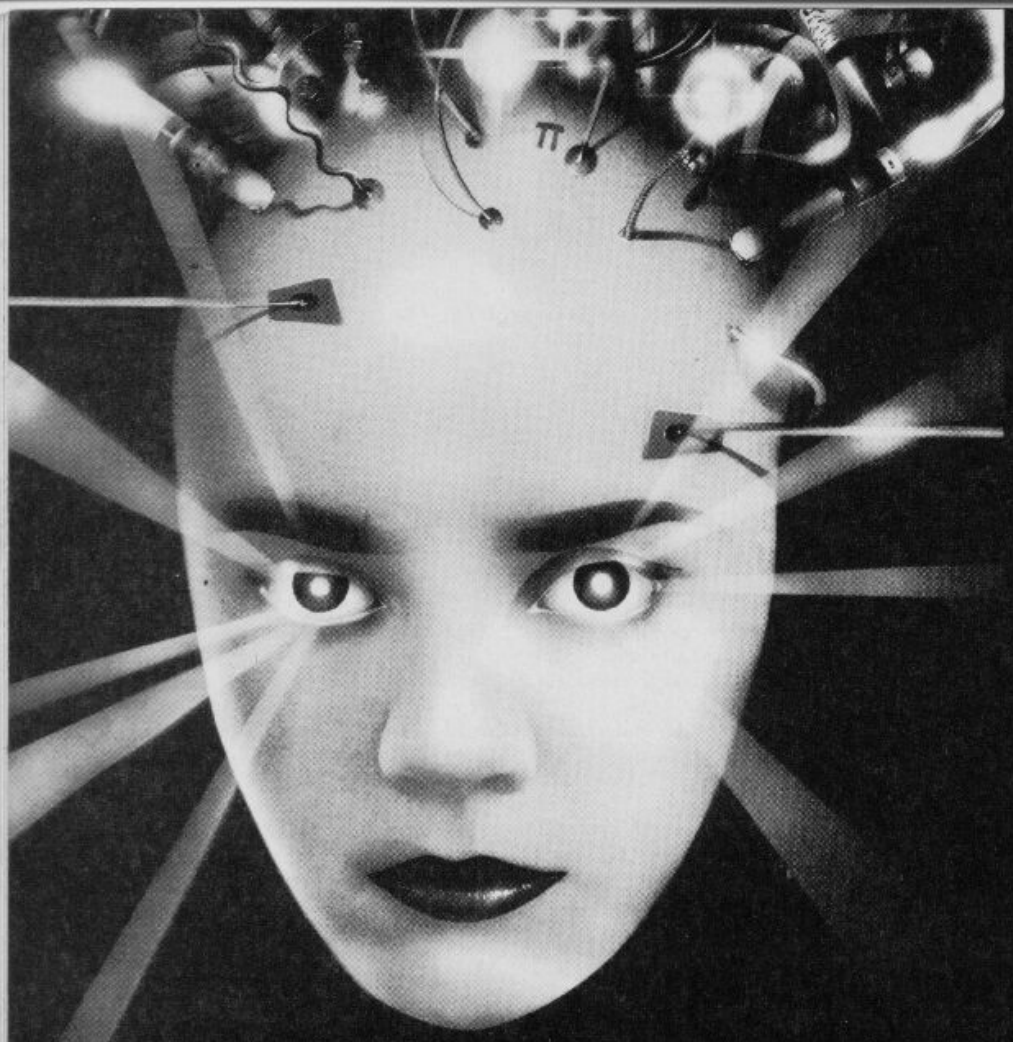
And the first player to answer the hidden question correctly wins a weekend for two in Paris!

"Highly entertaining with attractive original graphics that display very quickly" — *Computer & Video Games*

£10.95

The Sandman Cometh is available from most good retailers or direct from:

Star Dreams, 17 Barn Close, Seaford, E. Sussex, BN25 3EW. (P&P free)



AUTOMATA U.K. PRESENTS
YOURSELF
IAN DURY
JON PERTWEE
MEL CROUCHER
DONNA BAILEY
and FRANKIE HOWERD in

DEVS EX MACHINA

WRITTEN AND DIRECTED BY MEL CROUCHER

AUTOMATA thanks everyone who has taken DEUS EX MACHINA to their hearts . . . reviewers, wholesalers, retailers, the media, and most important of all, our public . . . THANK YOU !

(Barry Norman, Radio 4)
"Perfection, the aim of all of us!"

(Popular Computing Weekly)
"a completely new computer experience, rare and truly great!"

(Dave Freeman, Radio 1)
"You've got to play it to believe it! This will get to Number One!"

(Computer & Video Games)
"The most original concept since the Spectrum was a gleam in Clive Sinclair's eye. The computer equivalent of Pink Floyd's The Wall . . ."

(Thorn EMI)
"The first computer program to inspire a cult following. To be without it is to lose social standing!"

(Crash Magazine)
"There are few things in life that can be called global certainties . . . this is one of them! Hypnotic, emotive, noble, humorous, absolutely excellent . . ."

(Home Computing Weekly)
"To call this a game is an insult. It's a stunning and profound audio-visual experience.

Instructions	*100%*
Playability	*100%*
Graphics	*100%*
Value for money	*100%"*

DEUS EX MACHINA – Amstrad and Commodore 64 versions available soon!

CRUSOE ..... 48K Spec £6 ☐	DEUS EX MACHINA ..... 48K Spec £15 ☐	PIMANIA ..... 48K Spec £10 ☐
PI-EYED ..... 48K Spec £6 ☐	GO TO JAIL ..... 48K Spec £6 ☐	OLYMPIMANIA ..... 48K Spec £6 ☐
PIROMANIA .... 48K Spec £6 ☐	MORRIS MEETS THE BIKERS .. Amstrad £6 ☐	PI-BALLED ..... 48K Spec £6 ☐
PI-IN'ERE..... 48K Spec £6 ☐	MORRIS MEETS THE BIKERS .. Any Spec £6 ☐	DARTZ ..... 48K Spec £5 ☐
YAKZEE .. Dragon/48K Spec £5 ☐	PIMANIAC T-SHIRTS (state size) ..... Price £5 ☐	NEW WHEELS JOHN? 48K Spec £5 ☐
'BACKCHAT' Speech Synth. CBM64 with Software & Programming Book ..... £25 ☐	Piman's Stereo L.P. Cassette .... £3 ☐
PIMANIACS CLUB for 20% off all products, etc. Annual Subscription UK £5 ☐ Overseas £7 ☐	Piman's Greatest Hits Vol. 2 .... £3 ☐

I enclose the right money, or debit my ACCESS/VISA Card. My Card number is ..... Expiry Date.....

Card holder's signature ..... Card holder's name ..... Tel. Number.....

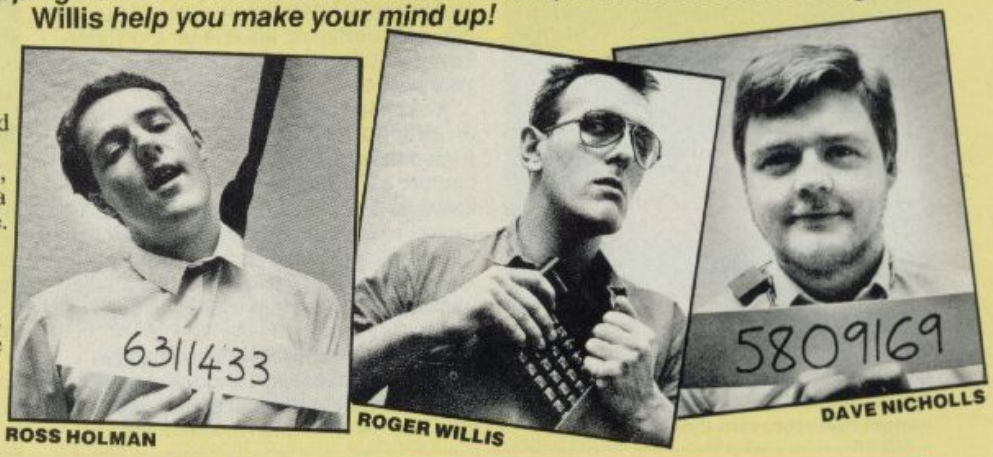
Card holder's address .....

..... *Post Code* .....

NO EXTRAS! *All our prices include VAT and Postage & Package. 24 hr.–CREDIT CARD HOT LINE (0705) 735242.*
Send your order and payment to: AUTOMATA U.K. LTD. 27 HIGHLAND ROAD, PORTSMOUTH, HANTS. PO4 9DA, ENGLAND.

JOYSTICK JURY

What's on your software shopping list for Christmas? Let* Ross Holman, Dave Nicholls *and* Roger Willis *help you make your mind up!

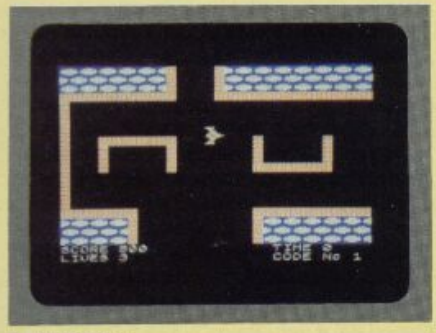


ROSS HOLMAN ROGER WILLIS DAVE NICHOLLS

This month, our motley crew of Joystick Jurors include Dave Nicholls, a self-confessed adventure fanatic and seasoned hacker; Ross Holman, ace games player and winner of the *Jet Set Willy* prize; and, last but by no means least, Roger Willis, a relative newcomer to the Spectrum scene.

Dave and Ross you'll already know from our monthly major games reviews. Roger Willis, on the other hand, is probably more at home in the saddle of a massive motorbike ... but that was before he discovered the thrills and spills of the Spectrum.

Check out what they thought of the latest in games software ...



THE PRIZE

Arcade Software/£5.50

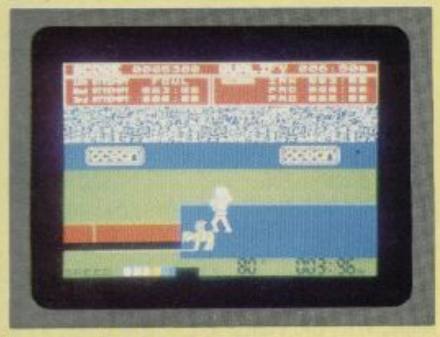
Dave *The Prize* is a variation on the maze theme. You have to control your spacecraft through the maze, collecting 'code pods' as you go. The pods are numbered and must be gathered in the correct order; reaching number five promotes you to the next level.

Those hitting the fourth level are asked to find the 'special code', photograph it, and send the evidence to Arcade Software. This entitles you to enter the competition that goes with the game. The competition has a prize (cunning title isn't it!) of £5000, but the catch is that the money will be divided between all the people who send in correct answers before January 1985.

On the game front *The Prize* is quite good, the maze is very large and your ship moves nice and smoothly. This is, however, really a game that will appeal more to cartographers than to shoot 'em up freaks. *2/5* **MISS**

Ross A very colourful maze game with a large prize for the winner. The nasties aren't that clever, so only the overall size poses a problem. It loses its appeal very rapidly. *2/5* **MISS**

Roger Being quite unable to imagine what five thousand folding green drink vouchers will look like stacked next to my keyboard and as I've never had that much wonga in my short and miserable life, I find it hard to imagine this game holding anybody's interest . . . *1/5* **MISS**



DALEY'S DECATHLON

Ocean/£6.90

Dave *Daley's Decathlon* is, of course, one of the several attempts to transfer the arcade game *Track and Field* onto the Spectrum. In fact, it's just about the best attempt so far. The object of the game (in case there's anyone out there who doesn't know!!) is to compete in each of the ten decathlon events scoring points for speed, height jumped and so on.

In the running events movement is accomplished, as usual, by either hitting two keys alternately or wiggling a joystick back and forth; a further key is used to throw or jump in the other events. Graphically, *Decathlon* is very good, the only problem being the rather stiff running motions of your man. Ocean's logo scrolls past at the top and a crowd applauds when you do well. Although there are a few small bugs (for example, I have it from a reliable source that it's possible to clear over 400 metres in the long jump!) the game simulates all of the events very well; including an energy limit on the 1500m.

For anyone on the look-out for a *Track and Field*-type game, this is the best buy at the moment. *4/5* **HIT**

Ross Certainly the best track and field game for the Spectrum, although it doesn't contain some of the nicer touches in other versions. *3½/5* **HIT**

Roger Put a few quid in a deserving *shamateur's* pocket. After all, our boy Daley must've flogged the right to use his name. Good luck to 'im, too, because *Decathlon* earns its keep in screen time and gave me a lot of much-needed exercise. *3/5* **HIT**

DELTA WING

Creative Sparks/£6.95

Roger This was the one that kept me up at nights — not that I broke any 'high scores'. *Delta Wing* is definitely a game for patient technocrats. It's based on only two screens, but these are complicated and composite. Simulator tendencies are confirmed by the continuous presence of cockpit instrumentation across the bottom. Altitude, air-speed, fuel gauge, radar and artifical horizon add in to a total of 14 informative variables to complement the pilot's hand moving the on-screen joystick according to player instruction.

All it takes is a tweak of the old handlebar moustache and there you are, blasting 'em out of the sky or bombing their bases. The second screen flashes up on request and is made up of a map showing your bases (which can be landed at for fuel and ammunition), their bases (which can be bombed), and the current position of enemy planes (which got me reciting 'Tally Ho' and 'Wizard Prang' epithets ...).

A significant attention span and a great deal of preseverance are vital though, because in this game nothing comes easily. Just taking off, involving correct ground speed related to flap position and timed pull-back on the joystick, is a thoroughly skilful operation. Being honest, I could barely get off the runway but I *felt* like an RAF pilot! *4/5* **HIT**

Ross Slightly simpler controls here than with other flight games. It's good and fast, but too similar to existing products to sell that well. *3/5* **MISS**

Dave This game drops in somewhere between the flight simulators and *Zzoom*. It's quite playable and easier to fly than most others of its type. If you want to fly, but don't want to be able to tell your flaps from your ailerons then this is the one for you. *3/5* **HIT**

JOYSTICK JURY

KOKOTONI WILF
Elite/£5.95

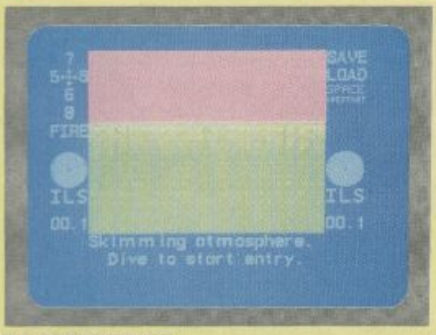
Ross Elite has taken the little white man out of the realm of the superhuman jumper and more into that of winged avenger; he's now a decidely unheavenly-looking angel! Wilf can be made to move left, right or flap up the screen; the 'flap' key repeats so you don't have to wear out your keyboard.

Kokotoni Wilf is a game of 60 screens divided into six time zones. To progress from one to the next, you have to collect a number of flashing pieces of an amulet — and then find a time gate. Incidently, Elite forgets to mention that you can start in any of the first three time zones by pressing keys '1-3' and then you'll find that all the objects on the previous levels will be credited to you.

Each screen consists of large fixtures like trees or dinosaurs (some of which may animate a little) and smaller, moving graphics. Tunnels and recesses have tended to replace the familiar platforms. The graphics aren't really up to *Jet Set Willy* standards and the difficulty I had controlling Wilf's spritely extravagances spoilt any appeal that the game had. *2/5* **MISS**

Dave This is a reasonable game with above average graphics, but it gets annoying after a while because the controls are not precise enough. Elite advertise this as the successor to *Jet Set Willy*. It's good, but not that good! *3/5* **HIT**

Roger Maybe 'Flapping Fred' would have been a better name, or perhaps 'Blundering Budgie', because our hero Wilf's mishaps can't all be blamed on Spectrum keyboard insensitivity. Shame 'cos there's enough screens to last a long time. *3/5* **HIT**



BRAXX BRUFF
Micromega/£6.95

Roger Mission Control, Houston, heaved a collective sigh of relief the day my careers master decided I was much too stupid to become a space pilot because — as this game finally proves — I would have been *very* bad at it. Nevertheless, tantrums at my inability to land the naffin' rescue pod on the planet Prolon were unavoidable. I couldn't get past the first *three* superb screens in *Braxx Bluff* ... who knows how many more I missed!

Moving 3D graphics are 'the biz' right from the beginning of this rescue mission. The screens I actually got at involve descending from the mother ship's orbit down to skimming the planet's atmosphere, before diving towards a landing — the point where you'll need fine stablising control to score sufficient points to achieve a safe descent.

Getting onto the planet and beginning the search for the three crewmen, trapped in a stranded hydro-crawler by alien lifeforms, means acquiring eight points during 'Lander Phase'. I only managed to clock a maximum of four and a bit ... All the same, expert space jockeys can move on to Walker Phase, Land-Crawler Phases, Sea-Crawler Phases and a finale where the Commander's 'enigmatic' boat race appears on-screen to say 'Ta very much' ... Pass the joystick, Gladys! *5/5* **HIT**

Ross Definitely a disappointment after the last few Micromega games. The 3D effect is not very awe-inspiring and the supposed finale is dull. If it didn't have a 'save to tape' facility, I wouldn't have played it for very long. *2/5* **MISS**

Dave The 3D graphics are unconvincing and the game is quite easy to beat. Even so, the last stage goes so long that I was just crashing into rocks on purpose for excitement! *1/5* **MISS**

BEATCHA
Romik Software/£6.99

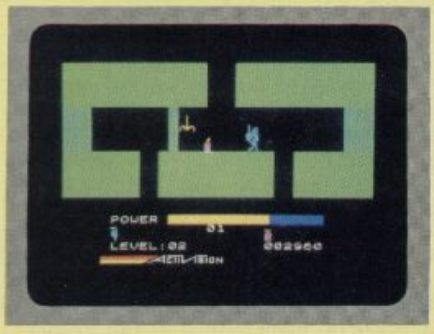
Dave At first glance, *Beatcha* looks a bit like *Gulpman*, which was one of the first *Pacman*-type games to come out on the Spectrum. It takes, however, a few more glances to realise just how similar they actually are!!

The object of the game is to move around various 'classrooms' and collect keys. When all the keys are collected you have to reach the main door and escape. Your man is a single cursor 'Smiley' face which moves at a ridiculous rate and is chased by unhappy little faces (the teachers) which in some cases move so fast that you lose several of your 26 lives before you can get out of the way. In fact the game's only redeeming feature is that there are quite a few classrooms to be killed in.

In short this game is about as much fun as a three-hour 'partly predictable' broadcast on behalf of any party you care to mention. It might make a useful dustbin filler. *0/5* **MISS**

Ross This is a standard maze-type game which proves difficult merely due to the speed and persistence of the chasers. I don't think it has much going for it. *0/5.* **MISS**

Roger Why did I used to fall asleep at school? Why does this game remind me of what fanciful commentators refer to as 'the best days of my life'? *Beatcha,* in relation to teacha(s), is as boring as the real thing. *1/5* **MISS**



H.E.R.O.
Activision/£7.99

Dave *H.E.R.O.* is a game in which, as the name implies, you get to play the hero — Roderick Hero to be precise. Roderick's job is to rescue trapped miners caught when Mount Leone erupted.

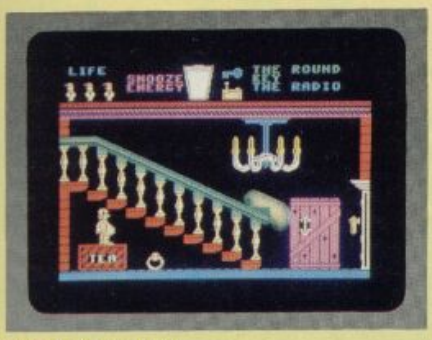
To help him he has a miniature helicopter thing strapped to his back which allows him to fly up and down the vertical shafts, a microlaser helmet for shooting nasties, and several sticks of dynamite which are capable of 'removing' any thin walls that happen to get in the way (if necessary the laser can also be used to break through walls, but this uses up a lot of power). As well as having to shoot his way past spiders, bats and other mine-dwelling creatures, Roderick also has to contend with lamps that can be put out by careless shooting or flying and, in the later stages, 'molten lava' walls that kill on contact.

Graphically the game is simple. The walls are large blocks, and the control of the backpack leaves a lot to be desired. But it *has* got that 'one more time' addictive quality that keeps you playing and, because after level 17 the mines are randomly generated, there's no way it'll be mastered. *4/5* **HIT**

Ross The delay on our hero's contraption makes control tricky — though not to a detrimental extent. But the plain blocky graphics for the cave walls are very dull. *2/5* **MISS**

Roger Wot is Roderick Hero doing with this 'rescuing miners' stuff? Doesn't he know the political consequences? Being an 'all-round Good Guy' does have its advantages and sleep inducement seems to be one of them, despite increasing difficulty. *1/5* **MISS**

JOYSTICK JURY



PYJAMARAMA

Mikro-Gen/£6.95

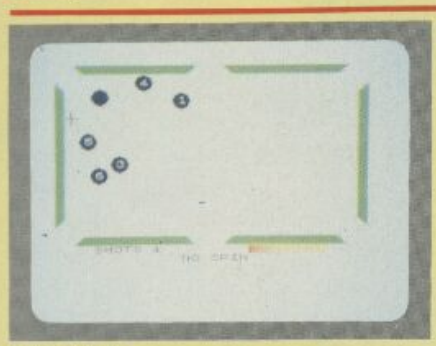
Ross *Pyjamarama* is the second of Mikro-Gen's games to feature the infamous 'Wally'. This time, our Wal' is having a nightmare (*He'd dreamt he'd just bought a CBM 64? Ed.*) and the only way he's going to be able to wake himself up is to find the key to his alarm clock and wind it into action. The setting for the game is Wally's home, each screen representing one room and each filled with beautifully drawn and coloured furniture. In a way that's similar to *Atic Atac*, you guide our sleeping hero through the rooms — this time seen from the side; just like *Jet Set Willy*, you can move left, right or jump. Only a few screens have things for Wally to jump on — chairs, tables or staircase.

Each room of Wally's house has a number of doors. Some can be opened just by jumping at the handle but to get through others you need to be carrying certain 'objects'.

You also have a limited amount of energy per life which decreases each time a moving graphic hits you ... so watch out for the hands which burst from the floor and grab you! Touches like this make *Pyjamarama* a humourous and enjoyable game. *4½/5.* **HIT**

Dave Mikro-Gen says you'll never dream a program could be this good, and for once the advert is right. It's worth buying for the games room. *5/5* **HIT**

Roger It's hard to play but easy to watch. Wally's nightmare won't put you to sleep — just the opposite. It's both pretty and pretty funny, err, if you know what I mean . . . *4/5* **HIT**



HUSTLER

Bubble Bus/£6.99

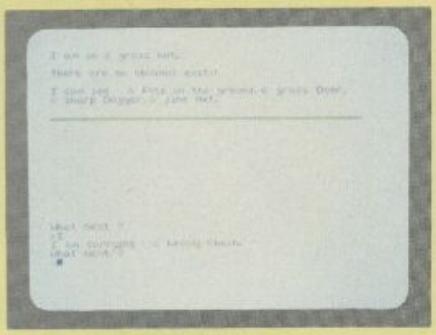
Ross Is there really a market for another pool game? Answer ... probably only if it's sufficiently different from the others to maintain interest. Bubble Bus must have recognized this because *Hustler* provides six different games to choose from.

Having selected your particular poison, you see on-screen the table, balls and a status line at the bottom. The screen is white with green bars representing the cushions, and the balls are black — thus avoiding attribute corruption problems; they also have their numbers on them. To make a shot you move a cross to some point along the desired line between cue ball and object ball, and hit the 'fire' key. The speed of the shot is controlled by a strength indicator. Unfortunately, the speed of the balls never gets much beyond sluggish ... they just bounce for longer. An added refinement is the kind and strength of spin.

If you haven't got a pool game then this isn't bad. *2/5* **MISS**

Dave The balls move accurately, but rather too slowly for my liking. The choice of games keeps it interesting for a while but it isn't good enough to knock CDS's *Pool* from the top of the Spectrum pool game league. *2/5* **MISS**

Roger It's impossible for me to be objective about this pool package because I find the original game as objectionable as any programmed simulation. Trying desperately to be fair, I can only say that it must be possible to create better visual representation and action than this offering. *0/5* **MISS**



EYE OF BAIN

Artic/£6.95

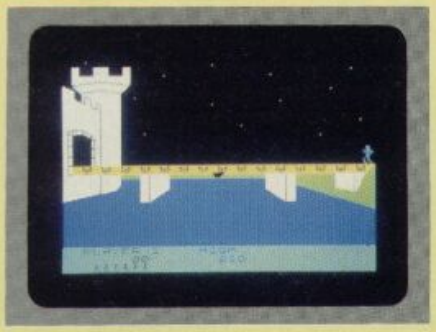
Ross The task set in Artic's *Eye of Bain* is to locate and hang on to a priceless emerald. You don't, however, start off in the easiest of circumstances. At first you seem to be in a hut, and typing 'Look' will instigate the drawing of a full screen picture of your surroundings. It's not until you start to try and move around that you're told a chain is clamped to your leg — which in turn is attached to a pole. To free yourself you have to type in two absolutely correct words. This problem of syntax and vocabulary is one that I find very annoying with adventures in general and *Eye of Bain* is no exception. For example, words that are used to describe objects at a location are not recognised if you try to use them yourself.

All the locations I visited had an associated picture and most had some useful objects, or tasks that needed to be performed. The top few lines of the screen are devoted to describing the location ... its exits and objects. This is quite useful but my more hardened adventuring friends suggested that it detracted from the atmosphere of the game.

A reasonable adventure, but I got stuck because I hadn't quite got the language right. *2/5* **MISS**

Dave It took me about ten minutes to get started and I'm nowhere near finished yet. The game is interesting enough for me to keep on trying. *3/5* **HIT**

Roger Tarl the mighty warrior turned out to be a bit of a wimp thanks to my erratic, misspelt or incomplete commandments. Adventurers should have patience with the lame lexicon, though, because I haven't declared the sacred emerald on my tax return yet . . . *3/5* **HIT**



DRAGONFIRE

Cheetahsoft/£7.95

Roger Prefaced with barking hokum about militant rebels and their house-trained dragons depriving young Prince William of his treasure, this program is enough to put even you off royalty for life.

Our regal hero begins his attempt at regaining his birthright on the first screen depicting the castle gates and drawbridge. All the young lad has to do is nip across quick, dodging the odd gob of lethal dragon fire, to gain entry to the treasure.

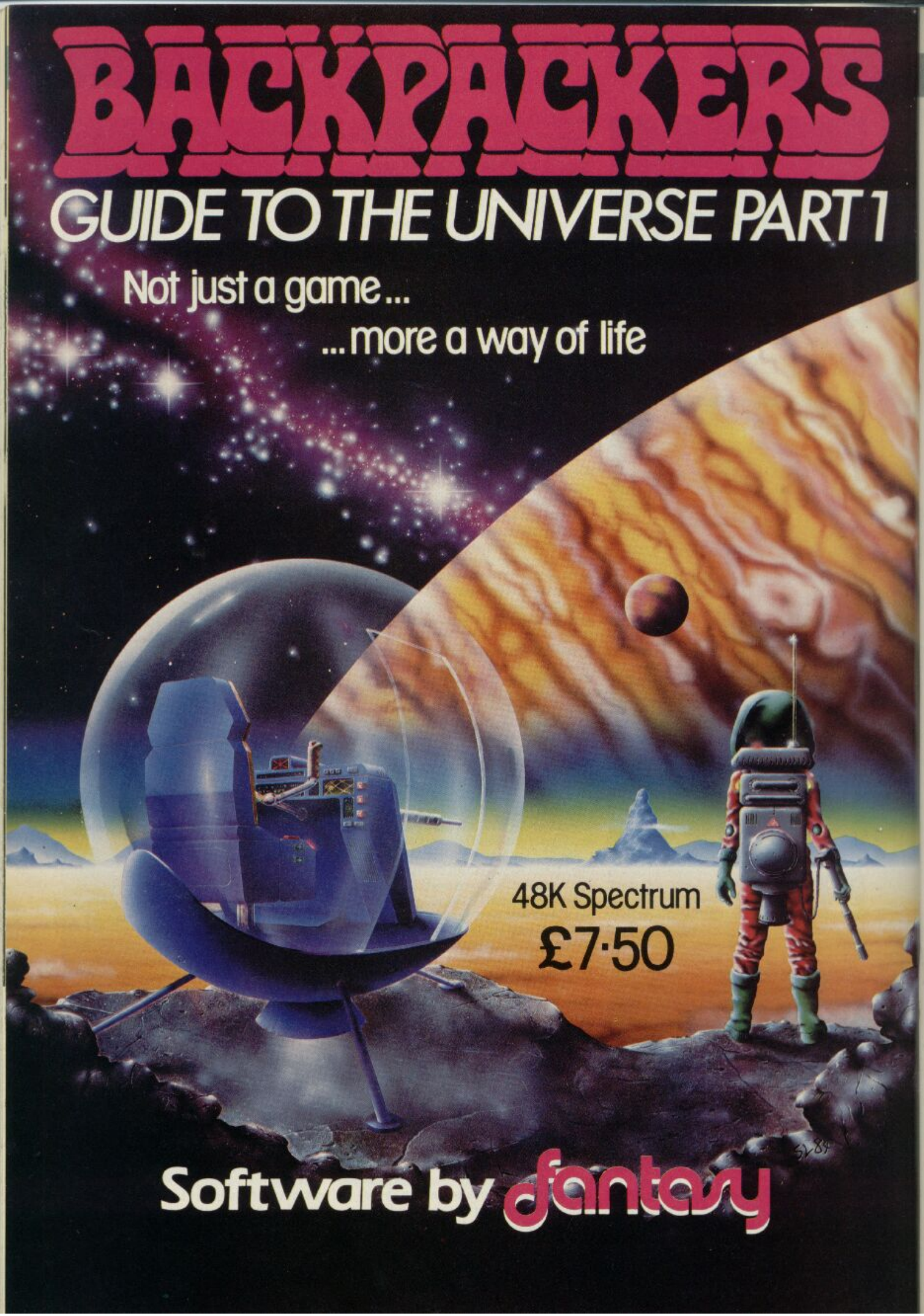
So far, so good, and on to the second screen, which has even cruder graphics. The noble prince can be shuffled round safely out of dragon-range and the relevant goodies scooped up into His Highness's Post Office account — or wherever yer Royals keep their negotiables. Prince and player should then be trembling at the dire warning about how hard life gets after the second level ...

Although there's a voluntary choice of four difficulty levels, the game automatically gets more serious with success — but the grandiose let-down is that there *isn't* anything past the second level. That's your lot, mate! It's back to the first screen ... it just gets harder.

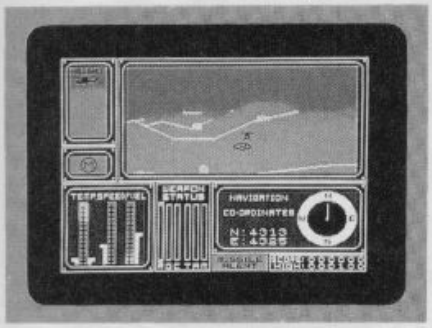
What we're actually looking at is a stunning lack of program content and detail. Boredom grows faster than skill rating and, quite frankly, *Dragonfire* has got about as much future as the feudal system. *1/5* **MISS**

Ross How they ever managed to write this code in such a way that you need 48K to run it, I'll never know. This is one that wouldn't have been well received two years ago! *0/5* **MISS**

Dave A real contender for the Turkey of the Year Award is this one, the graphics are awful (the jumps are particularly hilarious) and the game has no real challenge to it. *0/5* **MISS**


BACKPACKERS
GUIDE TO THE UNIVERSE PART 1
Not just a game...
...more a way of life
48K Spectrum
£7·50
Software by fantasy

JOYSTICK JURY



COMBAT LYNX

Durell Software/£8.95

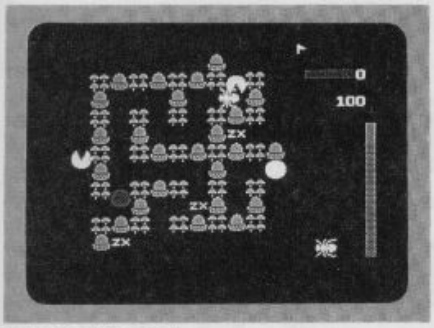
Dave *Combat Lynx* is a battle simulation program that has you flying your Lynx helicopter around a three-dimensional battlefield (which is randomly created for each game); you have to perform the dual function of destroying enemy forces and supplying your bases.

Controlling your helicopter can be a bit of a nightmare, because there are four command modes and some keys are used in more than one mode to perform different functions. Even allowing for this, there are nearly 30 control keys (most are re-definable) although any keyboard reading joystick can be used for five of them.

The screen shows your flight instruments and a rather peculiar view of your helicopter. It's strange because, although you can fly in any direction, the view of the landscape is always North, South, East or West, with the helicopter graphic turning through up to 45 degrees. When you turn far enough, the screen blacks out and re-draws with the landscape turned through 90 degrees. These factors neatly conspire to turn what is basically a very good game into a mess. *2/5* **MISS**

Ross The representation of the hills and valleys is well performed and fast. *2/5* **MISS**

Roger Sorry Colonel, but it ain't *simulator* material for hackers with Falklands Factor aspirations and it ain't *simple* enough for all us conscientious objectors still hiding in arcades. *2/5* **MISS**



HYPERACTION

Silversoft/£5.95

Ross Silversoft's more recent output has tended to be colourful, well writen and fun to play — and Hyperaction is no exception. At first glance it seems a sort of cross between *Pacman* and *Pengo*, but it's actually different again. To begin with, each screen cleared means another almost totally different game, strategy-wise.

In screen one you're a spider in a maze consisting of blocks of greenery separated by patches of mushrooms. Also tucked up inside the maze are four 'ZX' symbols and the object is to collect all of them and return pronto to the centre of the maze. The only problem is that Pacmen also live in said maze and if they touch you — whoops, there goes another life. You can push around the blocks of greenery to alter the maze and block in the Pacmen — but watch out!

The next game has you trying to destroy all the blue maze pathways by walking over them. The following screens are variations that get increasingly more difficult. I couldn't get past screen five, where marauding 6502 chips soon polished me off.

Good graphics and a fun game. Careful thought is needed if you're going to be good at it. *4/5* **HIT**

Dave A nice *Pengo* variation with good graphics. Possible a bit too fast but very addictive. *3/5* **HIT**

Roger I'd like to say it only had one screen, but that'd just be an excuse for my bad play! Pure arcadia in the best sense of the word. *3/5* **HIT**

KENTILLA

Micromega/£6.95

Dave *Kentilla* is a text and graphics adventure by Derek Brewster, and a follow-up to his very successful *Velnor's Lair*. The story follows on from the previous adventure with 'baddie' Grako taking over from Velnor; he's hungry for the Moonstone of Algrath — the source of Velnor's power. Mr Brewster writes an adventure column for a certain Spectrum games review magazine, where he gives each adventure a rating under five different headings. It seems fair, therefore, to rate his own adventure in the same way.

Atmosphere: The graphics are good but, as Derek has himself said, most graphics are no substitute for good text; his are no exception.

Vocabulary: Kentilla has a very good input editor which behaves rather like the Basic line editor.

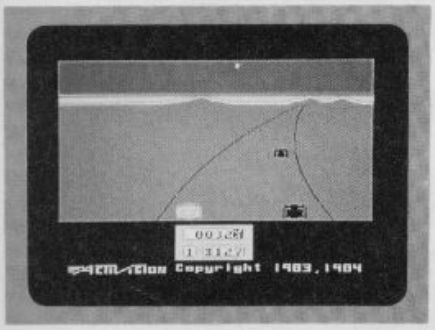
Logic: After some three hours of play I was still stuck within a 10-location section, while trying everything I could think of to progress. I must have missed something but either it's too obvious to notice (if so, then apologise to Mr Brewster) or it's completely illogical.

Debugging: Very good.

Overall: I'd have expected something better from someone who tells people what's wrong with *their* adventures. *2/5* **MISS**

Ross A reasonable enough adventure with good edit and recall facilities. I didn't like the way it lists out objects, exits and so on, and the puzzles were a bit too puzzling for me. *2/5* **MISS**

Roger Is our hero's surname meant to be Livingstone or do we need to move further North and interpret this as a mystical allegory on a quiet day at the National Union of Miners? Did Grako cross picket lines when he returned to the abyss? Am I mad? *4/5* **HIT**



ENDURO

Activision/£7.99

Roger Although we're talking racing cars here rather than motorbikes, the scenario and practical action of *Enduro* is very similar to Micromega's *Full Throttle*. The player uses a pair of keys to steer, and has both throttle and brakes on the keyboard. Joystick control is easier and obviously more instinctive, with a simple pull-back on the stick to hang out the anchors.

The challenge is to keep on going in any weather or visibility condition, overtaking the requisite number of other cars each 'day'. During the first cycle, 200 cars must be passed and in subsequent 'days', the opposition increases to 300. Apart from 'day' and 'night' driving conditions — only tail lights are visible during the latter — ice and fog also appear, demanding slower, more careful and precise car control.

The essential similarities to *Full Throttle* are tracking control and graphics, in as much as the visuals are dominated by a wiggling ribbon representing the road, tapering off to the horizon. I suppose it's got the same ability to excite, amuse and addict 'go-faster' merchants, but it ain't sufficiently different to justify acquisition if that other program's been LOADed in the recent past ...

To be honest, I got quickly tired of it, but there again, I've been tired all my life ... *3/5* **HIT**

Ross Very similar to the VCS version. An outdated game more like a dodging blobs session. *1/5* **MISS**

Dave The graphics are quite good. The cars coming towards you are not exactly perfect but they're reasonable and they move fast. It seems quite easy to master and will probably get tedious once you get the hang of it. *3/5* **HIT**

NEW LOW PRICE

LIGHT RIFLE© FOR SPECTRUM 48k

Disassembles into 3 separate parts, for pistol shooting. Made of tough durable plastic.

Realistic sound effects, can be used with your own TV.

AS SEEN ON T.V.!

Comes with over 12' of cable.

FROM STACK

INCLUDING 3 GAMES

An exciting new games concept. Included with your SLR are 3 exciting action games, Shoot Invaders, Cowboys and Mad Bombers, all in full colour. For those games that require agility and fast reactions break down the rifle to form a pistol.

ALL THIS FOR ONLY

£19.95

Please send me (Qty) Light Rifle(s) at £19.95 each + £1.90 p & p. I enclose a Cheque/Postal Order for £

Name .....

Address .....

.....

.....

Tick box for free brochure, price list and address of your nearest stockist ☐

All prices include VAT E&O.E.

STACK 100

COMPUTER SERVICES LIMITED
MARKETING DIVISION
290-298 Derby Road, Bootle,
Merseyside L20 8LN.
Trade Enquiries: 051-933 5511 ask for 'Trade Sales'
Telex: 627026 (Stack G).

JOYSTICK JURY

TROUBLE BREWIN'

Silversoft/£5.95

Roger Never mind *Trouble Brewin'*, I had trouble playing this game! Typically, most of the aggro came from a complete lack of instructions or explanations with the test sample, which meant that I had to suss out the required action on each of five screens. Fortunately, a 'practice' facility accesses any of the screens and erratic key-stroking soon indentified the point of it all.

Imagery is mostly concerned with alcoholic beverages, a subject extremely dear to my heart. Barrels, vats and glasses of bubbly proliferate. In the first screen, a deadly corkscrew is just one of the things to be avoided and in the fifth, the champagne realistically knocks you out — well, it always makes me comatose!

Altogether, despite my 'orrible suspicion of things arcade, I must say that the game did seem a bit — dare I say — easy. The mobile nasties and fixed obstacles are far too predictable and crude.

Maybe it'll be a big success with 'Real Ale' freaks, but I think I'll stick to lager. *2/5* **MISS**

Ross Silversoft has come up with more pretty graphics. It also seems to have the knack of making the nasties just intelligent enough to cause problems, but not so you can't escape. *3/5* **HIT**

Dave Just the job if you're looking for another 'jumping around and collecting' game. It has nicer graphics than most but calls for arcade skill rather than planning. *3/5* **HIT**

ZENJI

Activision/£7.99

Dave *Zenji* is the latest in a long line of computerised puzzles and it comes complete with the obligatory mish-mash of philosophical bits and pieces that are traditionally used to jazz up this type of program.

In order to achieve 'Zenji' you must rotate the maze 'elements' (straight lines, corner pieces and 'T' shapes) so that they all join up with a particular element known as the 'source'. Rotation is achieved by moving your face-shaped player to the centre of the element you wish to turn and pressing a special key (or the joystick button) along with a rotation key. In normal use the rotation keys move you left and right, with two more keys for up and down. There's a time limit for the completion of each maze (which get bigger as the game progresses) and 'Flames of Desire' appear which follow you around and quite rightly provoke fatal consequences if touched.

Zenji will appeal mostly to puzzle enthusiasts but on the higher levels it becomes quite a test of arcade skill. As the cassette sleeve says, you have to 'let go' and leave your fingers to do the work on their own. *3/5* **MISS**

Ross Quite an intriguing little mind-twister with reasonable graphics and easy-to understand instructions. However, that's not saying it's easy to play. If you like 'thinking' games, then this could be worth a look. *2/5* **MISS**

Roger The 'Flames Of Desire' are not a threat I learnt to fancy much but that's not because I suffer 'illusions' . . . Lust for success and puzzling enlightenment failed to overcome my lack of skill, Oh Grey One . . . *4/5* **HIT**

BEACH-HEAD

US Gold-Ocean/£7.95

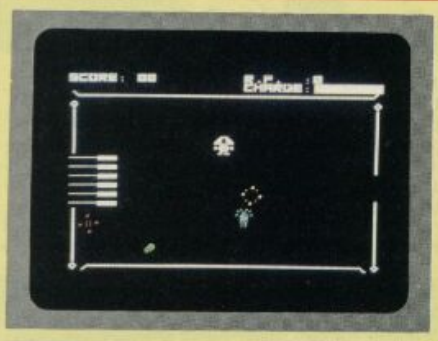
Ross One of the Commodore 64 gamester's most popular releases, *Beach-Head* has now been implemented on the 48K Spectrum — courtesy of the combined might of US Gold and Ocean. Personally, I never found it that brilliant on the 64, but certainly it's easily as good on the Speccy.

Beach-Head is a multi-screened (six in all) arcade/war game where the aim is to penetrate the defensive power protecting a piece of coastline, and capture the enemy fortress. The first screen is a plan view of the coast you're going to attack; you move a cross (representing your fleet) through a secret passage and into combat with the opposing forces. The other five screens are rather more lively. They involve steering your ships through a barrage of torpedoes, shooting down attacking planes, sinking the enemy ships, guiding your tanks through the shore defences and finally blowing up the enemy's Big Gun.

This is definitely the best piece of code ever written by Ocean. It has good instructions, comprehensive player and control options and a good range of skill levels. *3/5* **HIT**

Dave Ocean has done well in converting this from the Commodore 64 version. The game is very playable and the graphics are good, especially the plane attack phase. Even so, it hasn't got very much lasting appeal. *3/5* **HIT**

Roger Not enough authentic strategy to please commited wargames recruits and not enough zap-splat-kapoww! to satisfy the electronic bloodlust of trigger-happy arcade troopers. Nevertheless it's got sufficient entertainment and complexity value. *2/5* **HIT**



PSYTRAXX

The Edge/£7.95

Roger A sample tape with hardly any instructions didn't increase the likelihood of my establishing instant rapport with this game. I'm still not completely sure what you're supposed to achieve and/or whether there are hidden programming secrets that incompetence and general lack of Willis-interest failed to unlock.

If my eyes haven't decieved me — which is always possible — the on-screen action occurs on a circuit board and involves the usual four-key control of movement plus the ability to zap any oppostion with what one can only assume are graphic attempts to represent electro-magnetic energy.

I would call it a one-screen stand even though it's claimed to have over 1000! It's not that other screens didn't exist, they're just not that different. The graphics are abysmal — unclear and unoriginal. The screens seemed to suggest the programmer had defined a few characters at the most, and then used them around the edge.

If your vocabulary in Basic is even smaller than your basic vocabulary, then it might just hold your interest for longer than it did mine, but I doubt it. I'm afraid I have to report that this is one of the most boring and overrated games I've had the misfortune to play since an old schoolfriend brought out his conkers! *1/5* **MISS**

Ross A competent piece of software but rather dull in play and certainly not original. If you like mapping games, look no further. *3/5* **MISS**

Dave Very like *Atic Atac* in approach but with less interesting graphics. The Edge is claiming a new programming technique called *Synergy* allowing it to get over 1000 screens in 48K; *Similar* would probably be a better name 'cos that's what the rooms are. *2/5* **MISS**

Flexibility for Spectrum users!

56-way I.D.C. connector and ribbon cable assembly, designed and manufactured by Varelco Ltd., to fit the Sinclair Spectrum and Spectrum+ computers Available in single, double-ended and threeway format. Also available, paddle board to convert female connector to male plug format.

Please send me the following:		Insert Quantity here
6" grey cable with connector each end	£7.99 each	
9" grey cable with connector each end	£8.49 each	
9" grey cable with three connectors fitted	£11.95 each	
12" colour coded cable with one connector	£5.99 each	
Connector only	£4.45 each	
Paddle board for conversion to male plug format	£2.49 each	

Block capitals please — Prices include VAT and Post & Packing

Name_____

Address_____

_____ Town_____

County_____ Post Code_____

I enclose cheque/PO value £_____
or debit my Access Account

If paying by Access, enter number here

ACCESS □□□□ □□□□ □□□□ □□□□

Signed_____

Available from **Hawnt Electronics Limited**
Firswood Road Garretts Green Birmingham B33 0TQ

Allow 28 days for Delivery. Reg. in England No. 306808

HIRE SPECTRUM SOFTWARE

OVER 280 different tapes for hire including **ARCADE, ADVENTURE, BUSINESS, EDUCATIONAL**, etc. –even an m/c Compiler. **FREE** 26 page catalogue. **FREE** newsletter, with hints, tips and our top tape chart.
OVER 3000 tapes in stock, with up to 60 copies of each title for fast service. All tapes sent by 1st class post.
LOWEST PRICES – hire up to 3 tapes at a time, from 63p each for two weeks hire. (Plus p&p and VAT). European members welcome.
Tapes for sale at DISCOUNT prices. Telephone 01-661 9240 (9am - 5pm) or write for further details, or complete the coupon and **JOIN TODAY** – you've nothing to lose!

SAVE £3.00!!

For a limited period, we are offering **HALF-PRICE** membership to readers of this magazine. Join now, **LIFE** membership is only £3.00 (normally £6.00).

SWOP SHOP

A new service from N.S.L. **SWOP** your unwanted tapes with tapes from other members for a small handling charge of only 60p (plus p&p and VAT)

NATIONAL SOFTWARE LIBRARY

200 Mulgrave Road, Cheam, Surrey SM2 6JT.

I enclose cheque/postal order for £3.00 for LIFE membership. Please rush my membership kit to me. If, within 28 days, I'm not delighted with your service you'll refund my membership fee..

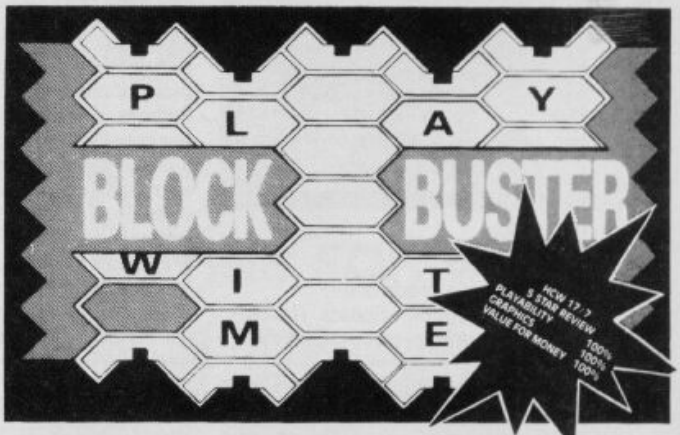
Name_____

Address_____

_____

_____ YS12

ADAPTED FOR 16/48 SPECTRUM FROM THE POPULAR T.V. SERIES!!!



BLOCK—BUSTER is an exciting quiz game for ONE or TWO players and will appeal to a wide range of ages and skills with nine levels of play against the clock. The game tests speed of recall involving anticipation of the question as it 'unfolds' across the screen and speed of response dependant on the level of play.
BLOCK BUSTER is supplied with the FIRST ADDITIONAL QUESTION TAPE FREE to maintain the challenge of the game. Now available at good computer shops or direct with cheque/P.O. for £5.95 inclusive. ACCESS and VISA orders taken on our 24 Hour Hotline.

COMPUSOUND

DEPT SU10, 32-33 LANGLEY CLOSE, REDDITCH, WORCS B98 0ET
TELEPHONE (0527) 21429 (21439 24 Hr. HOTLINE)

TRANSFORM LTD. Business Software

Are you taking your Spectrum seriously?

£69.95
plus
£2.00 p&p

The Transform Keyboard transforms your Spectrum into a fully operational professional machine.

- Will incorporate micro-drive interface and power supply
- 60 keys including fullsize space bar
- Large ENTER key
- Full stop, comma, semi-colon, colon, single delete and edit keys
- On/off switch with LED
- Easy installation – no soldering required
- Black anodised case
- Now with 3 colour printed key tops
- EMODE key

"Its price of £69.95 reflects the kind of use to which it will be put but it is certainly the top keyboard at the moment."

SINCLAIR USER JUNE 1984

Business Software

Business Bank Account £10.75
This program will enable you to enter debits under 17 different subheadings. Statements include totals of all subheadings.

Sales Day Book £10.75
For all your invoices, this program will enable you to prepare statements of outstanding invoices. Program will also calculate VAT.

Purchase Day Book £10.75
Keeps a complete record of all your purchases under 17 different subheadings. This program also calculates VAT.

Business Pack £25.00
Including all the above programs.

Stock Control £10.75
Handles 900 lines, including details of supplier. Program has full search facilities enabling you to search and update all lines from one supplier.

Invoicing £15.00
This program will print out invoices, calculates discounts and VAT. The program will calculate totals from unit prices. Up to 50 accounts with 250 outstanding invoices.

Word Processing by Tasman **£13.90**
Tasword Two is a powerful word processing program that will perform all the functions available on large processors. The program will give you 64 characters per line on screen.

Masterfile by Campbell Systems **£15.00**
This is one of the best database programs available for the ZX Spectrum. This program has many uses in a small business.

Dlan by Campbell Systems **£7.95**
Use your Spectrum to sell your products. Dlan will display messages in up to 11 different typefaces. Will scroll text in any direction.

64 Column Generator by Tasman **£5.50**
You can use this program within your other programs to display 64 columns on screen.

Payroll by Byte One **£19.95**
This payroll program will handle up to 40 employees and will calculate NIC, PAYE, superannuation and many other deductions. This is a very user friendly program and extremely good value.

NEW

Sales/Purchase Ledger Invoicing £25.00
This program is for use on micro-drive only. The program will print an invoice using a built-in price list and post the invoice to your customer's account. Will also print price lists, statements, labels etc.

Tasmerge £10.95
Allows you to transfer data from Masterfile into Tasword enabling you to use Tasword for mail merge. The program allows you to specify line and column of each field. For use on micro-drive only.

Superfile £14.95
This is a new database program that stores pages of text 64 columns x 22 rows. The program includes word processing and full search facilities.

Omnicalc 2 £14.95
This is the long-awaited micro-drive version of omnicalc complete with histograms and many other features.

Projector 1 £13.90
Business graphics program that will help you present your cashflow, sales expenditure in many different ways including pie line, and histogram charts.

Tasprint £9.90
Use this program with Tasword Two to produce 5 different fonts on a dot matrix printer.

MF-Print £6.95
Enables you to set a print format for your full-size printer within masterfile. Supplied complete with masterfile for **£19.95.**

Trans Express £9.95
Micro-drive utility program which will enable you to backup all your micro-drive cartridges.

Now in stock

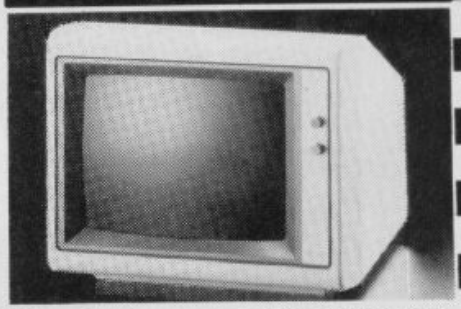
Blank micro-drive cartridges	£4.95
Continuous paper	£12.99
Printer ribbons from	£3.50

QL

Centronics Interface	£39.95
QL Dust Cover	£5.00

Transform can supply a wide range of printers, monitors, and leads for the QL. For further details send S.A.E.

Monitors



It is possible to connect your Spectrum to both Black/Green and composite Video monitors using high resolution monitors are particularly useful with programs like Tasword that use 64 columns. We supply complete instructions on how to connect monitors to both Issue Two and Issue Three Spectrums. These monitors can also be connected to your QL.

Phillips black and green	£75.00
Kaga/Taxan black and green	£99.95
Sanyo Med res for QL	£273.60

Printers

All the software we supply runs on full-size printers (unless you are using interface 1) you will require an interface to connect your Spectrum to a printer, the interface we supply uses the graphics characters to set printer codes as in Tasword and prints a double size screen dump.

Centronics/RS232 Interface	£45.00

Dot matrix printers

Brother HR5	£132.00
Brother M1009	£163.00
Star Gemini 10x	£199.00
Epson RX80 FT	£229.00
Epson FX80	£324.00

Daisywheel printers

Smith-Corona TP I	£189.00
Silver Reed EXP500	£284.00
Brother HR15	£349.44

Please add **£5.00** delivery plus VAT to the price of printers and monitors. All software prices include VAT, post and packing.

Access

TRANSFORM LTD. (Dept. YS) 01-658-6350
41, Keats House, Porchester Mead, Beckenham, Kent.

BARCLAYCARD VISA

Avid adventure fanatics* Peter Shaw *and* Dave Nicholls *get to grips with* Eureka, Hampstead *and* Peter Pan. *And if you're lost, stuck or just plain suicidal in adventure-land, phone for the YS Adventure Helpline . . .

EUREKA

£25K IN 48K

This month, I bring you details of Domark's first game — *Eureka*. Yes, this is the one that has the £25,000 prize tagged on to its rear-end (check out the ads this month). The game wasn't supposed to be available until the 31st October — magazine editors being no exception. On the other hand, we here at *YS* always get those exclusive stories!

The game splits into five separate parts, each made up of an arcade game and an adventure. The former gets a pretty low rating in my book and probably wouldn't interest you adventure fanatics anyway. So no more about it, save the excruciating fact that you *have* to complete the arcade game before you can play each adventure. Yah boo sucks!

The aim of the fivesome is to present a potted history of our meagre planet — starting in Prehistoric times, working on through the Roman Empire, Medieval Britain, Germany during the second World War, and on into the future. Most of the locations you visit contain graphics and, although they use a slightly lower resolution than the ZX Spectrum allows for, they're very cleverly used. At only £14.95 this set's well worth an investment. Here are a few clues to help with the 'War' level.

The action begins in a cornfield (no, not *that* sort of action!) and from here you'll need to go south-east to find the RAF officer's uniform. When you get caught by the Germans in the village (which is inevitable) you get hauled off to Colditz and stuck in the cooler. Once out, finding your way around the camp isn't too difficult and there are only a few locations where the guards get nasty and throw you back in again.

To make a German officer's uniform you'll need the sewing kit, and that you'll find under the stage. To get an ID card you'll have to go through the secret passage in the chapel — there you'll find the blank card, plus rubber stamp and camera. To make the ID look genuine, you'll need to take a picture of yourself, develop the film, stamp the card — and then bring the pieces together with the MAKE command.

The rope, made from the traditional blankets, can be used to scale the drop below the window at the end of the dormitory, underneath which you'll find a pickaxe and crowbar.

Once out of Colditz, you'll find yourself in the village, but so far further progress has been very slow. However, I'm sure there'll be plenty of hints on all five games in the future ... watch this space! YS

YS ADVENTURE HELPLINE
England and Wales: Gary Smart (0264 59489) and Peter Marment (0264 66660). Scotland: Neil Mackintosh (041-332 2216).

VENTURING OUT

HAMPSTEAD
MELBOURNE HOUSE/£9.95

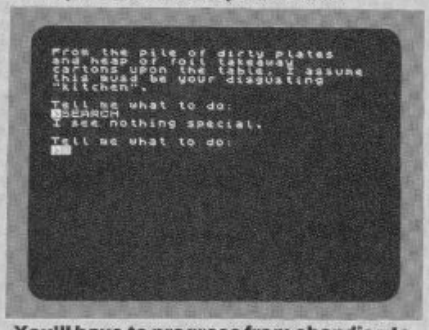
If you've extricated yourself from the magical grasp of Dieslowly the Wizard and beaten Bashenchopen the Troll black and blue and you're still driving around in a clapped-out Mark 1 Cortina and drinking pints of best down at the local, then *Hampstead* is the game for you.

You start off in your disgusting flat in north-west London watching '1-2-3' on TV (presumably you couldn't get any lower than that!). Having decided that life surely has more to offer, you begin to progress up the social scale — until you have satisfied all the requirements necessary to attain 'Hampstead'. The idea is that you'll be able to pass into said borough and be accepted by the other inmates. Requirements, of course, include such material possessions as a big car and house ... and you also need a good job, a nice wife (sexist devils!), and naturally you have to be seen in the right places wearing the right clothes.

The adventure comes in the now almost mandatory large plastic box that includes a 16-page booklet containing much of the background information that's necessary for social climbing.

Most of the puzzles are thoroughly logical (there's no using a toilet roll to open the large stone portcullis here!), and the few that aren't will be explained somewhere; exploring is very worthwhile. In fact, the problems are nicely graduated and the further you get, the harder it becomes to progress; the puzzles are also quite linear and each section has to be solved before social aspiration can begin anew for the next. (For instance, you'll get nowhere without your dole money!).

All in all, *Hampstead* is an excellent adventure and a refreshing change from the usual dungeons-type affair ... it makes a worthy addition to any collection.



You'll have to progress from shandies to champers in Melbourne House's social climbing *Hampstead*.

PETER PAN
HODDER AND STOUGHTON/£9.95

Peter Pan is the first adventure — in fact the first game of any kind — from book publishers Hodder and Stoughton. The package includes a large plastic video box containing the cassette, a copy of the original book and a four-page introductory leaflet which explains the aims of the game and some of the more useful commands. Out of the retail price, a contribution is made to the Great Ormond Street Children's Hospital as part of the 'Barrie Bequest' — a worthy cause indeed.

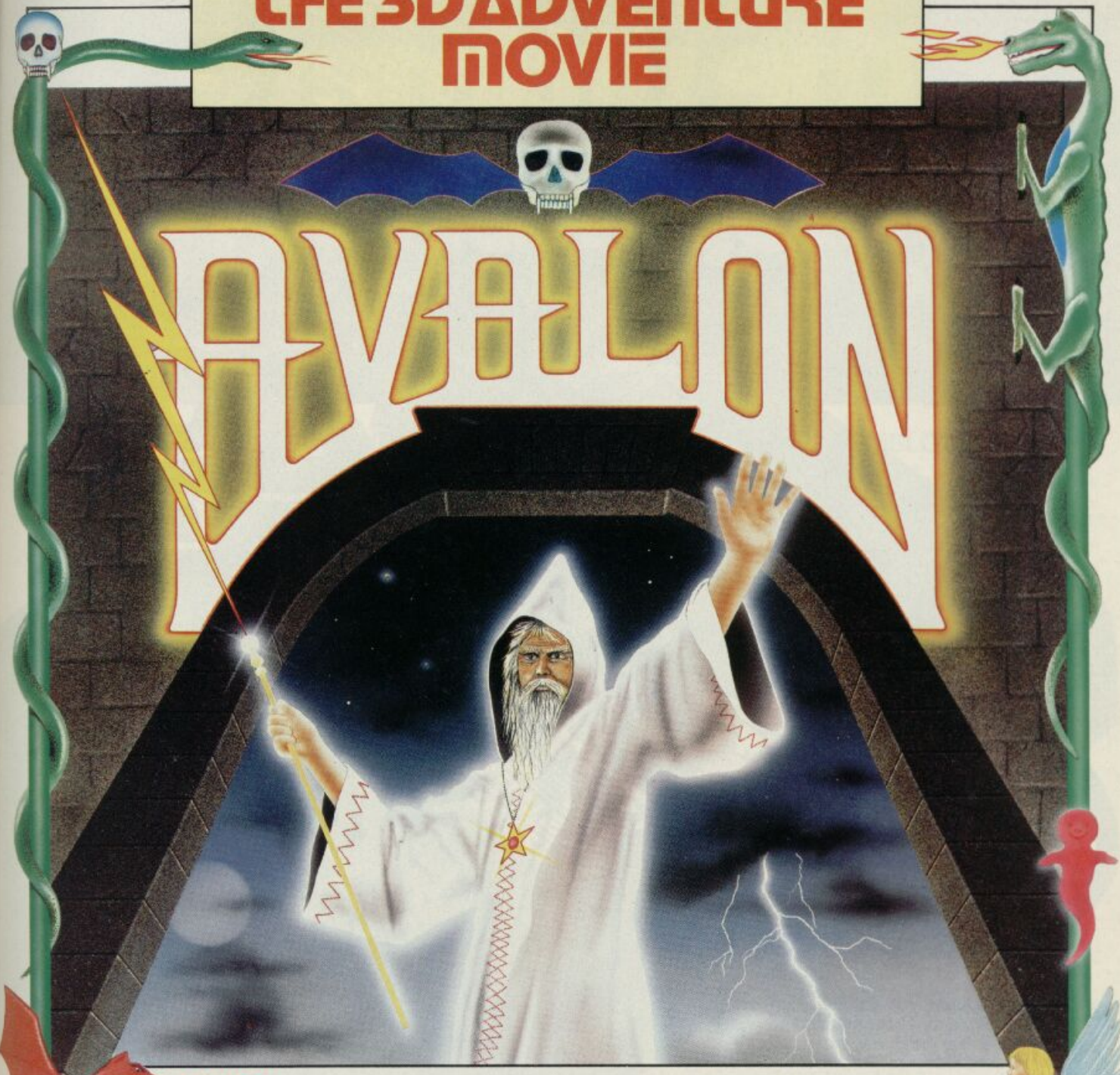
Peter Pan's format owes a lot to *The Hobbit*, with full screen graphics and independent characters. There are, however, several differences — many purely technical but one in particular that centres around the actual solving of the adventure. Whereas in *The Hobbit* the average punter can do quite well without reading the book, in *Peter Pan* knowledge of the text is essential. So if like me you never quite got around to reading it (the sad indicator of a miss-spent youth) you'll find Tinkerbell dying with alarming regularity and a few other strange things happening besides!

On the technical side, one has to say that it drops below the '*Hobbit* standard' on almost every count. The commands, like most other adventures, are single verb/noun pairs (with the exception of the SAY command which allows you to speak), and the input routine is slow — as is the response to commands. But *PP* does manage to serve up some very good graphics.

Actually, despite all the forgoing, I think *Peter Pan* really is a reasonable adventure ... it's just that it suffers from an overdose of bad programming. I wouldn't recommend it to everyone, but if you've read the book — or if you're one of those avid adventurers — you'll probably find it quite enjoyable. YS

A *Hobbit*-like sortie into Never Never Land — but make sure you read the book first!

THE 3D ADVENTURE MOVIE



AVALON

For the first time ever there is an all action, 3D adventure game with stunning moving graphics – the unique Avalon.

Only Hewson Consultants could bring you Avalon with its awe inspiring animation. Avalon is the breakthrough that brings adventure to life. In this challenging game you must use your astral projection Morac the Mage to search into the heart of the Isle of Glass and forever banish the Lord of Chaos before he can subject Earth to the Dark Ages for a thousand years. You must explore a three dimensional world with more than 220 separate rooms and over 30 tunnels. On your way you will be challenged by over a hundred animated foes, goblins, wraiths, guardians and evil wizards. Your only protection is the magic of your spells. Avalon, by Steve Turner, is the adventure game of the year, and is available NOW! from your local software stockist. Remember, a world of graphic adventure awaits for only **£7.95**

Other titles for ZX Spectrum

3D LUNATTACK – Steve Turner
Fly your Hover Fighter over the 3D Lunar landscape battling the SEIDDAB.
Joystick compatible, 48K only **£7.95**

3D SEIDDAB ATTACK – Steve Turner
Using your radar, missiles and sixth sense clear the city area of SEIDDAB.
Joystick compatible, 16K or 48K **£5.95**

3D SPACE WARS – Steve Turner
Hunt the Seiddab through four levels of 3D hyperspace and destroy them.
Joystick compatible, 16K or 48K **£5.95**

NIGHTFLITE II – Mike Male
Flight simulation with full instrument display and perspective runway view.
Joystick compatible, 16K or 48K **£7.95**

HEATHROW AIR TRAFFIC CONTROL – Mike Male
Written by a professional air traffic controller.
16K or 48K **£7.95**

QUEST ADVENTURE – Kim Topley
Find a map hidden in an inhospitable world inhabited by gruesome creatures.
48K only **£5.95**

FANTASIA DIAMOND – Kim Topley
Retrieve the magnificent Fantasia Diamond and rescue Boris the master spy.
48K only. **£7.95**

KNIGHT DRIVER – Clive Brooker
Steer your car round a tortuous circuit of roads, braking and accelerating as you go.
Joystick compatible, 48K only. **£5.95**

Books

20 Best Programs for the ZX Spectrum **£5.95**
40 Best Machine Code Routines for the ZX Spectrum **£5.95**

As part of our continuing development of innovative software we are always happy to evaluate software sent to us with a view to publication.

GSH

HEWSON CONSULTANTS

56B Milton Trading Estate, Milton, Abingdon, Oxon OX14 4RX

Selected items available from Centresoft Dealers and all leading computer software retailers.

WHSMITH Rumbelows John Menzies TIGER TRADER Spectrum LASKYS Boots HMV

The ultimate development from

agf

NEW PROTOCOL 4

THE LATEST PROGRAMMABLE JOYSTICK INTERFACE ONLY £29.95

Designed exclusively for the ZX Spectrum, Protocol 4 brings you game control customising in a way that no other interface does. It can accept all commercially standard joysticks, including the Quickshot II with 'rapid fire' or Trackball controllers, and is compatible with ALL Spectrum software. **OPERATES LIKE FIXED OPTION INTERFACES OR CAN BE FULLY HARDWARE PROGRAMMED**

The flexibility of Protocol 4 control is achieved by a specially designed 'CustomCard' system. CustomCards are easily programmed to suit all types of games.

Simply clip in a programmed card for immediate customised control. With preset cards supplied Protocol 4 can emulate the following control standards: AGF/Protek, Kempston and ZX Interface 2 — both players. You can change or reprogram blank cards (1 supplied) to get the responses you want — even on games without joystick options.

Utilising Hardware Programmed technology you have the benefit of automatic eight direction control, no power-down programming loss, guaranteed conflict-free operation with other peripherals, including microdrives, and no extra software to load or awkward joystick movements and key presses to make each time you load another game. The keyboard remains fully operative at all times.

It is also perfectly possible to connect up to five Protocol 4's on one Spectrum, each programmed separately, for multiple player control — only possible with the hardware programmed design.

Incorporated into the design is a computer Reset button for clearing the computer memory between games without pulling the power plug out.

Fully guaranteed for 18 months, Protocol 4 comes supplied with five CustomCards, ten Quick Reference Programming Cards and complete instructions.

PROGRAMMABLE INTERFACE

As the first fully hardware programmed joystick interface, this product has become well established over the past year and will accept ALL standard joysticks or trackballs, including Quickshot II with 'rapid fire', for use with ALL Spectrum or ZX81 software — not just those with a joystick option.

* No Software programming required.
* Programming is *not* lost when power is disconnected between games.
* Eight way movement — with or without the fire button pressed — only requires setting of the four normal directions.
* Compatibility is guaranteed with ALL key reading techniques — machine code or BASIC.
* Several interfaces can be separately programmed and fitted to one computer for multiple player games.

Keyboard operation is totally unaffected by this interface, as with all AGF add-ons, and will never conflict with *any* other device fitted at the same time.

Twelve months guarantee, key programming information and a pack of Quick Reference Cards, to speed up setting of the clips, are supplied with full instructions.

INTERFACE II

The AGF Interface II represents the best low cost introduction to joystick control.

The 'AGF' control standard is now offered by over 100 games or utility programs for use with any joystick or trackball.

Any game which is controlled by the cursor movement keys (5,6,7,8) or has a Protek option is also compatible with Interface II.

A rear connector allows other peripherals to be connected at the same time.

This product is available for either the Spectrum or ZX81, is supplied with full instructions, a 12 month guarantee, and a 12½% discount voucher against further AGF mail-order purchases.

ROMSLOT

The new AGF RomSlot is designed for anyone who already owns a programmable joystick interface, or prefers to use the keyboard to control games, and would like to add the facility of ROM cartridge software to their system.

RomSlot will accept the Sinclair range of instant loading games and will also be compatible with the new releases from Parker Software — exciting new games only to be available in ROM format.

This system allows instant play. Your computer memory size is not important and you will be able to play games that could ordinarily require more RAM.

RomSlot incorporates an extra feature called 'Restart'. This allows you to instantly *restart* the ROM game.

RomSlot is guaranteed for 12 months and has a full width expansion connector to accept joystick interfaces, speech units and printers etc.

QUICKSHOT

The Quickshot joystick is an excellent value game controller incorporating suction cups for sure-footed precision with a comfortably contoured handle offering a convenient top firing button as well as one on the base.

QUICKSHOT II

Quickshot II has improved styling with a trigger type firing button as well as the top firing action, with a broader base for greater suction stability.

It also has a unique 'Auto-Fire' facility which at the flick of a switch provides a constant rapid firing action simulating a fast trigger finger.

	PRICE	TICK BOX OPPOSITE REQUIRED ITEM
AGF Protocol 4	£29.95+£1.00 p&p	☐
AGF Programmable Interface	£24.95+£1.00 p&p	☐
AGF RomSlot	£ 9.95+£0.50 p&p	☐
AGF Interface II	£ 9.95+£0.50 p&p	☐
Quickshot II Joystick	£10.50+£0.50 p&p	☐
Quickshot Joystick	£ 7.95+£0.50 p&p	☐
Extra 'CustomCards' (5 per pack)	£ 3.95 inc. p&p	☐
Extra Quick Reference Programming Cards (10 per pack)	£ 0.65 inc. p&p	☐
Specify Computer	ZX81	☐
	Spectrum	☐

I enclose cheque/Postal Order for .....

Please debit my Access/Visa/Diners Club Card

Account No .....

Signature .....

My Name .....

Address .....

.....

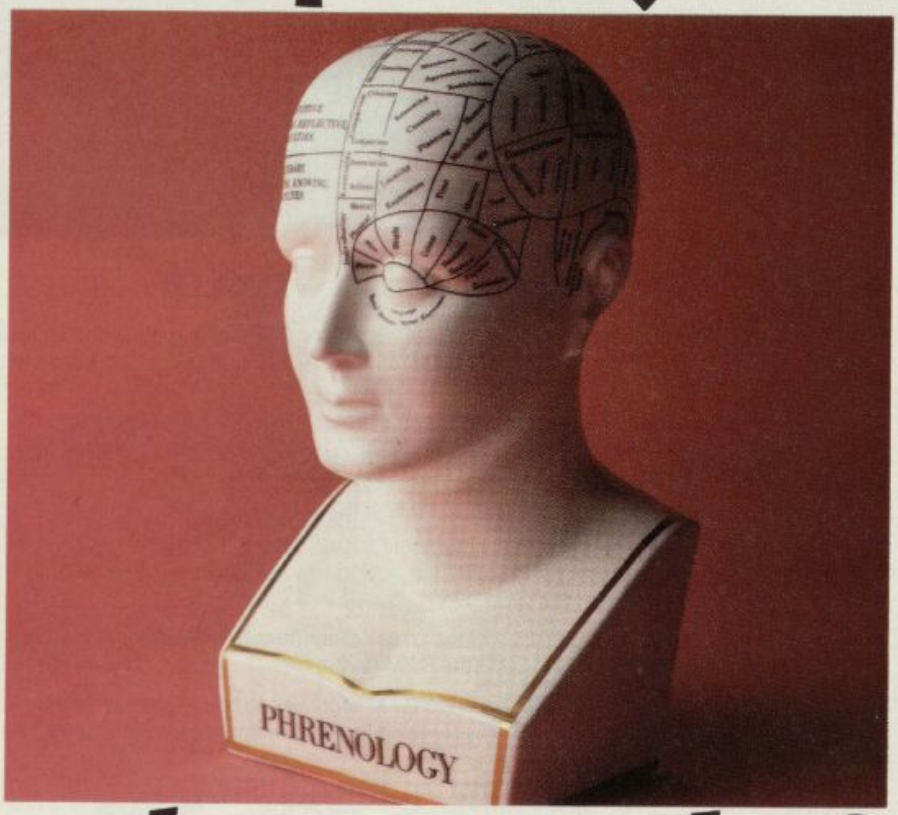
Send to: AGF Hardware, Dept YS, Freepost, Bognor Regis, West Sussex, PO22 9BY.

Trade Enquiries ring (0243) 823337

There's nowhere else to go

agf

Do you want to expand your mind



or lose weight?

Home computing isn't all fun and games. The Mirrorsoft Home Discovery series of software programs can help broaden your knowledge and experience or even assist you to lose weight.

KNOW YOUR OWN PSI-Q

How strong are your Psi powers? This intriguing and comprehensive package, by Prof Hans Eysenck and Carl Sargent is based on their book published by Michael Joseph. It checks for and helps develop latent Psi ability in individuals or groups of individuals – notably clairvoyance, recognition of hidden objects or symbols, and precognition, foretelling future events.

On cassette for the CBM64, Spectrum 48K, BBC B, Electron. **£9.95**

KNOW YOUR OWN PERSONALITY

A fascinating way to get through to the 'real' you. Devised by Prof Hans Eysenck and Dr. Glenn Wilson from their Pelican book of the same name. You'll get a clearer insight into yourself, and others too.

On cassette for the Spectrum 48K, BBC B, Electron. **£9.95.**

STAR SEEKER

Published in association with the London Planetarium. This pair of programs, written by Dr. Paul Phillips FRAS, brings the magic of the heavens into your home.

Star Seeker accurately plots the most prominent stars from any position on Earth; at any time in this or the next century. You can obtain information on individual stars, and draw constellations. Solar System plots Planets and Halley's Comet, with us next year!

On cassette for the BBC B (Spectrum 48K and CBM64 versions coming soon). **£9.95**

MASTERMIND

Adapted from the well known BBC TV quiz game, this program lets you take the chair for general knowledge and special subject questions. It comes with two sets of each. Up to four players. Further low-cost packs of questions coming soon.

On cassette for the Spectrum 48K, BBC B, Electron. **£9.95**

THE JOFFE PLAN

A 'no-diet' personal weight control program. Prof. Joffe's Plan awards credits or penalties based on progress to a target weight agreed between the user and the computer. Food is the best reward for an over-eater. So credits earned allow you to indulge a favourite dish. Penalties mean less food, more exercise.

On cassette for the CBM64, Spectrum 48K, BBC B, Electron. **£9.95**

Also available: Mastermind QUIZMASTER – Set your own questions to run on the Mastermind program. On cassette for the Spectrum 48K, BBC B, Electron. **£5.95**

MIRRORSOFT

SOFTWARE FOR ALL THE FAMILY

Available from Boots, W. H. Smith, Spectrum and all good software stockists. Write for free catalogue to: Mirrorsoft, Holborn Circus, London, EC1P 1DQ.

WIN A WAFADRIVE!

Can you afford to miss the chance to win a Wafadrive? There's 25 of 'em up for grabs in our easy-to-enter competition.

The Rotronics Wafadrive provides a full expansion system for the ZX Spectrum and ZX Spectrum+. As well as an alternative stringy/floppy storage system, it's also got full RS232 and Centronics interfaces. Access to these facilities is available via Basic with a similar, *but* simpler, set of commands to that used to access the ZX Microdives.

HOW TO ENTER

It's easy! All you've got to do is to put the list of 10 Wafadrive attributes in the order you think is the most important. For example, if you reckon that item B — 'Attractive, self-contained unit' — is its most alluring feature, then make this number one on your list.

Once you've put all 10 features in what you consider to be the correct order, try and make up a caption for the accompanying photograph. This'll be used as a tie-breaker in case more than 25 of you manage to come up with the goods. Make the captions as funny as you like — after all, it's not often we get to chuck a whole load of Wafadrives at the editor!

WAFADRIVE RULES OK!

1. The decision of the judges is final. No correspondence will be entered into.
2. Entries which are illegible, incomplete or do not fully satisfy the rules will be ceremoniously burned!
3. All materials will be retained and may be published without further permission.
4. All entries *must* be received by 31st January 1985.

THE MEATY BITS

Here's the list of Wafadrive attributes to sort out. Once done, fill in the box on the coupon and send it off to Wafadrive Competition, *Your Spectrum*, 14 Rathbone Place, London W1P 1DE.

A. Centronics and RS232 ports as standard
B. Attractive, self-contained unit
C. 'User-friendly' syntax and interface
D. Free wordprocessor program
E. Twin drives for maximum flexibility
F. Inexpensive cartridges
G. Fast access to files and programs
H. Software available in wafer form
I. Highly reliable data storage
J. Superb documentation

TONY SLEEP

Here's the order I'd put the Wafadrive's features in . . .

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

Here's my caption for the photo . . .

_____

_____

Name _____

Address _____

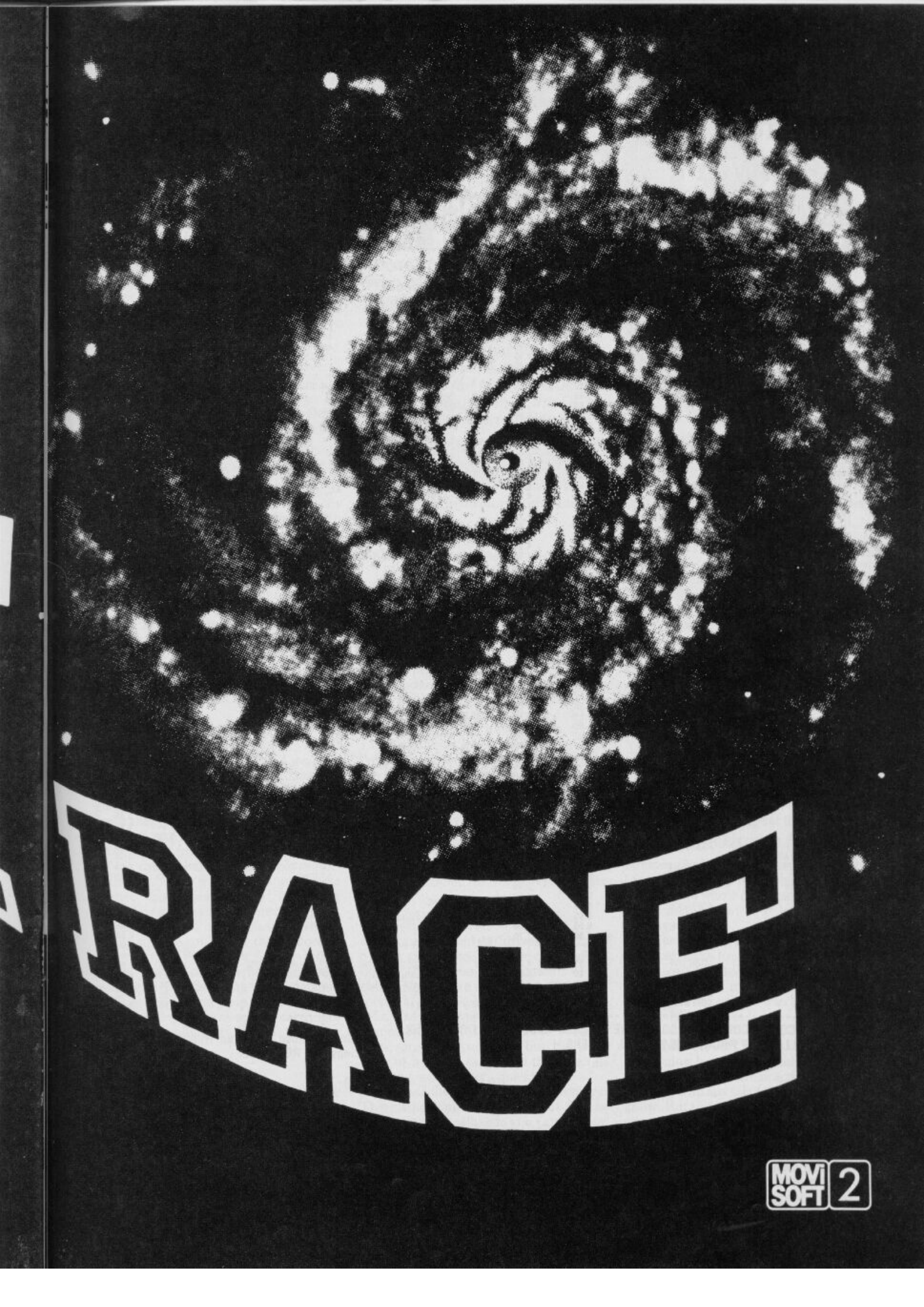
_____

_____ Postcode _____

Phone Number _____ Age _____

Fill in the above coupon (or a photocopy if you don't want your issue to look like an extra in *The Texas Chain-Saw Massacre*) and send it off to **Wafadrive Competition, Your Spectrum, 14 Rathbone Place, London W1P 1DE.** All entries in by 31st January 1985 please!

THE GREAT SPACE


RACE
MOVI SOFT 2

Discount Computer Software

Registered No. 1795113
Telephone: (0276) 20611
16 Coates Close, Brighton Hill,
Basingstoke RG22 4EE

AMAZING SOFTWARE BARGAINS BY MAIL, 100's OF TITLES AVAILABLE!
TELEPHONE ORDERS WELCOME. WRITE OR RING NOW FOR FULL DETAILS

Game	Supplier	RRP Inc. VAT	Our Price Inc. VAT
SPECTRUM			
FOOTBALL MANAGER	ADDICTIVE	6.95	5.75
CHUCKIE EGG	A & F	6.90	6.00
JUNGLE FEVER		6.90	5.90
PIMANIA	AUTOMATA	10.00	8.75
PI-BALLED		6.00	5.00
KONG	ANIROG	5.95	4.95
MOON BUGGY		5.95	4.95
SLAP DAB		5.95	4.95
GALACTIC ABDUCTOR		5.95	4.95
GALAXIANS	ARTIC	4.95	4.15
CHESS II		9.95	8.50
BEAR BOVVER		6.95	5.95
MONKEY BIZNESS		6.95	5.95
BIRDS & BEES		6.95	5.95
PSYTRON	BEYOND	7.95	6.75
POOL	CDS	5.95	4.95
TEST MATCH	C.R.L.	5.95	4.95
STAR GAZER SECRETS		5.95	4.95
DERBY DAY		5.95	4.95
HANDICAP GOLF		5.95	4.95
OMEGA RUN		5.95	4.95
THE GREAT DETECTIVE		5.95	4.95
THE INCREDIBLE ADVENTURE		5.95	4.95
THE WARLOCKS TREASURE		5.95	4.95
OLYMPICS		5.95	4.95
GRAND NATIONAL		5.95	4.95
GLUG GLUG		5.95	4.95
WAR OF THE WORLDS	CRL	7.95	6.95
STOP THE EXPRESS	HUDSON	7.95	6.95
FULL THROTTLE	MICROMEGA	6.95	5.95
INFERNO	RICHARD SHEPHERD	6.50	5.55
FIGHTER PILOT	DIGITAL	7.95	6.95
NIGHT GUNNER		6.95	5.95
SEA HARRIER ATTACK	DURREL	5.95	4.95
JUNGLE TROUBLE		5.95	4.95
SCUBA DIVE		5.95	4.95
NIGHTFLIGHT II	HEWSON	7.95	6.75
3D SPACE WARS		5.95	4.95
HEATHROW		7.95	6.75
3D LUNATTACK		7.95	6.75
THE ALCHEMIST	IMAGINE	5.50	4.60
PEDRO		5.50	4.60
SPLAT	INCENTIVE	5.50	4.60
VALHALLA	LEGEND	14.95	11.95
PARAS	LOTHLORIAN	5.95	4.95
MUGSY	MELBOURNE HSE	6.95	5.75
TUTANKHAMUN	MICROMANIA	5.95	4.95
PENGY		5.95	4.95
CODENAME MAT	MICROMEGA	6.95	5.75
HAUNTED HEDGES		6.95	5.75
LASERWARP	MICRO-GEN	6.95	5.75
TRASHMAN	NEW GENERATION	5.95	4.95
MR WIMPY	OCEAN	5.90	4.90
HUNCHBACK		6.90	5.70
ESKIMO EDDIE		5.90	4.90
SCRABBLE	PSION	15.99	13.00
FLIGHT SIMULATION		7.95	6.75
3D ANT ATTACK	QUICKSILVA	6.95	5.95
BUGABOO THE FLEA		6.95	5.95
THE SNOWMAN		6.95	5.95
BLUE THUNDER	R. WILCOX	5.50	4.60
MANIC MINER	SOFTWARE PROJECTS	5.95	4.95
JETSET WILLY		5.95	4.95
ATIC ATTACK	ULTIMATE	5.50	4.60
SNOOKER	VISIONS	8.95	7.70
ZX81			
FOOTBALL MANAGER	ADDICTIVE	5.95	4.95
PIMANIA	AUTOMATA	5.00	4.00
PILOT	HEWSON	5.95	4.95
QS SCRAMBEL	QUICKSILVA	3.95	3.40
49ER	SOFTWARE FARM	5.95	4.95

Game	Supplier	RRP Inc. VAT	Our Price Inc. VAT
COMMODORE			
PETCH	ANIROG	6.95	5.95
HOUSE OF USHER	ANIROG	6.95	5.95
PYRAMID	FANTASY	6.50	5.35
THE SKULL	GAMES MACHINE	6.95	5.95
GHOULS	MICROPOWER	6.95	5.95
SWOOP	MICROPOWER	6.95	5.95
GILLIGANS GOLD	OCEAN	6.90	5.85
ANDROID 2	OCEAN	6.90	5.85
BLUE THUNDER	R. WILCOX	6.95	5.95
KONG 64	ANIROG	7.95	6.75
SKRAMBLE 64		7.95	6.75
3D TIME TREK		5.95	4.95
FLIGHT PATH 737		7.95	6.75
SPACE PILOT		7.95	6.75
CYBOTRON		7.95	6.75
ZODIAC		7.95	6.75
ICE HUNTER		6.95	5.95
TWIN KINGDOM VALLEY	BUG BYTE	9.50	8.25
OMEGA RUN		7.95	6.75
DERBY DAY		7.95	6.75
HARRIER ATTACK	DURREL	6.95	5.95
SCUBA DIVE		6.95	5.97
BURGER TIME	INTERCEPTOR	7.00	5.95
GET OFF MY GARDEN		7.00	5.95
CHINA MINER		7.00	5.85
ARABIAN NIGHTS		7.00	5.95
REV OF MUTANT CAMELS	LLAMASOFT	7.50	6.25
HELLOGATE		5.00	4.00
HUNCHBACK	OCEAN	6.90	5.85
THE BOSS	PEAKSOFT	8.95	7.50
SUPER PIPELINE	TASKSET	6.90	5.85
BOZO'S NIGHT OUT		6.90	5.85
SNOOKER	VISIONS	8.95	7.50
BEACH HEAD	ACESS	9.95	8.50
MANIC MINER	SOFTWARE PROJECTS	7.95	6.75
VIC 20			
BONGO	ANIROG	7.95	6.75
SKRAMBLE		7.95	6.75
KRAZY KONG		7.95	6.75
BATTLEFIELD		5.95	4.95
SLAP DAB		5.95	4.95
DARK DUNGEONS		5.95	4.95
DRACULA		5.95	4.95
FLIGHT PATH 737		7.95	6.75
FLIGHT ZERO ONE FIVE	AVS	5.95	4.95
FALCON FIGHTER	INTERCEPTOR	6.00	5.95
ARCADIA	IMAGINE	5.50	4.50
HELLGATE	LLAMASOFT	6.00	5.95
GOLD RUSH	MR MICRO	6.90	5.85
BENGO		6.90	5.85
HUMPHREY		6.90	5.85
AMIGO		6.90	5.85
PUNCHY		6.90	5.85
SKYHAWK	QUICKSILVA	7.95	6.50
SPACE JOUST	SOFTWARE PROJECTS	5.95	4.95
JET PAC	ULTIMATE	5.50	4.65
SNOOKER	VISIONS	8.95	7.50
ORIC			
SEA HARRIER ATTACK	DURELL	6.95	5.95
SCUBA	DURELL	6.95	5.95
XENON	IJK	8.50	6.50
ZORGONS REVENGE	IJK	7.50	5.50
PROBE 3	IJK	7.50	5.50
THE HOBBIT & BOOK	MELBOURNE HOUSE	14.95	12.95
DINKY KONG	SEVERN SOFT	6.95	4.95
DRACULA'S REVENGE	SOFTEK	6.95	5.95
ULTIMATE ZONE	TANSOFT	8.50	6.50
RAT SPLAT	TANSOFT	7.95	5.95

TO: DISCOUNT COMPUTER SOFTWARE. PLEASE ACCEPT MY ORDER FOR THE FOLLOWING PROGRAMS/SPECIAL OFFERS

1. .....
2. .....
3. .....
4. .....
5. .....

Make cheques payable to Discount Computer Software
Cheque No ..... For £ ..... enclosed
Please debit my
Access No ..... Signed .....

16 Coates Close, Brighton Hill, Basingstoke RG22 4EE

SEND

Name .....

Address .....

SEND SAE FOR UP TO DATE LIST OF OUR AMAZING BARGAINS

AWESOME SECRETS OF THE QL

Those of you with your own QL who have started to explore its many mysteries and delights will probably be tired of the constant barrage of bitching and criticism. What you want to see are the micro miracles other computers fail to offer.* Quentin Lowe *reveals one of the QL's lesser-known qualities.

Ingredients required: your QL and a copy of *QL Archive*. You'll be glad to hear that the following experiments won't affect anything that's on the cartridge. OK, put your QL into SuperBasic and when MDV1_ has stopped spinning, place your *Archive* tape in the drive. Now, load up the short Basic program used to load *Archive*. Type:

```
LOAD MDV1_BOOT
```

Notice how long it takes to load. Use LIST and you should see the program. Now, get rid of the program by typing:

```
NEW
```

Type LIST to prove the program has gone... there's no trickery here! Now, let's load it again:

```
LOAD MDV1_BOOT
```

Well, didn't that load quickly! The QL can't have looked at the cartridge for more than a quarter of a second. Don't believe it? Type LIST and you'll see that the program is back.

THEORY AND FACT

Let's be scientific about this and presume that the Microdrive tape was in exactly the right place to get the program. If it was, it should be just past that program now. Assuming the tape can't go backwards (a fair assumption I think) and even if it could, the QL wouldn't know it needed to go backwards (definitely a fair assumption), then it follows that if we try to load the program again, the QL must have to go all the way round the tape to get it. So, type:

```
NEW
```

Followed by:

```
LOAD MDV1_BOOT
```

And it did it again, didn't it? So what's going on? Despite the fact that we have NEWed the program, the QL knows it has a copy of it in RAM. All it does is check that we haven't changed cartridges (with that quick quarter-second peep at the tape) and, if we haven't, it restores the program not from tape but from RAM.

You can probably see a couple of potential problems with this. Suppose we change cartridges for an identically named cartridge with a different program also called BOOT on it. This takes a bit of setting up but you'll find that it doesn't fool the QL. When you format a cartridge, the machine writes a random number to the tape along with the name. The quarter-second peep at the tape will tell the QL you've swapped cartridges and it'll actually load BOOT from the tape.

CHANGE THE TUNE

More obviously, suppose we change the copy of BOOT that's in memory and then NEW it. When we try to load the program again, if the QL uses the version that was just NEWed, we'll get the changed copy of the program back and not the original that we've asked it to load.

So, LOAD MDV1_BOOT if you haven't got it in memory at the moment. Then add lines:

```
5 REMark Here's a new line
6 REMark Here's another
7 REMark These shouldn't be here when
8 REMark we load the program
```

Now (roll of drums), NEW the program. And, type:

```
LOAD MDV1_BOOT
```

The QL peeps at the tape for a quarter of a second and then loads the program from RAM. Has it fouled-up and restored the changed version of the program? Actually, it hasn't. If you type LIST, you'll see that it's loaded a perfect copy of the original program without having to get it off the tape again.

This is nothing short of clever! Unless I'm mistaken (and Sinclair Research is welcome to say so) the QL is using a 'cache' memory for the Microdrives. When you read some sectors off tape, they're stored in this temporary cache and then copied to wherever they are needed.

SECRET CACHE

Next time you read the 'drives the QL has a quick peep to see if you've changed the tape. If you haven't, the contents of the cache memory are still current. If the sectors you want are in there, the QL turns off the Microdrives and copies the information from RAM instead. NEW really does scrap the program, but there's a copy of it in the cache and thus the QL can load it again very quickly.

Okay, so the QL's got a cache memory. There's nothing dramatic about that as with a little bit of hassle you can get one fitted to many business micros. You can even find the odd one with a cache as standard. However, I did promise something out of the ordinary. Normally cache memories are quite small and in a 128K QL (sorry, 96K... 32K is screen RAM), you wouldn't expect the cache to be very big.

SIZING IT UP

To test the size let's see if we can overflow it by reading a lot of information off the Microdrives. In this case, the cache should overflow and only be able to retain copies of the last few sectors read. Then if we ask for the information again, the QL will have to re-read the tape. So, suppose we copy the contents of the Archive demonstration database to the screen. Type:

```
COPY MDV1_GAZET_DBF TO SCR_
```

You'll see the database file in all its naked glory appear character by character on the screen. Keep an eye on MDV1_. Notice that the QL is reading a few sectors every few seconds. It takes a while. When it's finished, repeat the command:

```
COPY MDV1_GAZET_DBF TO SCR_
```

Amazing isn't it? The QL checks that you haven't switched tapes and then gaily trots out the whole database file from the cache memory without looking at the tape again!

So just how big is the cache? This little example seems to suggest that, unlike any ordinary computer, QDOS (the program producing these miracles) uses the free memory it has available to form a cache for the Microdrives.

JOKING APART

There must be a lot more things going on to make such a system practical... if you come up with any further comments let us know. But the practical results of this big cache are obvious... it's going to be a lot quicker reading stuff off Microdrives than anybody previously suspected. Next time anyone tells you the QL has a noddy architecture or that QDOS is a joke, sit 'em in front of your machine and hand them this article! YS

HATS OFF TO MEL

☐ Please send me your free catalogue.
Please send me:

SPECTRUM BOOKS & SOFTWARE

SOFTWARE

- ☐ Sir Lancelot 16K & 48K £5.95
- ☐ Spectrum Hampstead 48K £9.95
- ☐ Spectrum Sherlock 48K £14.95
- ☐ Spectrum Sports Hero 48K £6.95
- ☐ Spectrum Mugsy 48K £6.95
- ☐ Spectrum Penetrator 48K £6.95
- ☐ Spectrum The Hobbit 48K £14.95
- ☐ H.U.R.G. 48K £14.95
- ☐ Spectrum Classic Adventure 48K £6.95
- ☐ Melbourne Draw 48K £8.95
- ☐ Abersoft FORTH 48K £14.95

BOOKS

- ☐ Super Charge your Spectrum £5.95
- ☐ Micronet Book £6.95
- ☐ Spectrum Software Projects £6.95
- ☐ Over The Spectrum £4.95
- ☐ Spectrum Machine Language for the Absolute Beginner £5.95
- ☐ Advanced Spectrum Machine Language £6.95
- ☐ The Complete Spectrum ROM Disassembly £9.95
- ☐ Understanding Your Spectrum £6.95
- ☐ Spectrum Microdrive Book £5.95

I enclose my cheque/money order for £

Please debit my Access Card No. Expiry Date

Signature

Name

Address

Postcode YS12

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

Correspondence to:
Church Yard
Tring
Hertfordshire HP23 5LU

All Melbourne House cassette software is unconditionally guaranteed against malfunction.

Trade enquiries welcome.

£

£ +p/p .80

Total
£

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

Access orders can be telephoned through on our 24-hour ansafone (0235) 83 5001.

GSH

ELBOURNE HOUSE!

Super Charge Your Spectrum. Extend your Spectrum with ready-made Machine Language routines. Now without any additional effort, you can overcome the limitations of BASIC and give your Spectrum real power. Not only will your programs look better, run faster, and be more spectacular — but you will also be able to develop them in a fraction of the time you would expect it to take.

Spectrum Micronet Book provides a wealth of detail about using a Sinclair Spectrum to access MICRONET and PRESTEL. The PRISM VTX5000 interface allows a Spectrum user to convert his microcomputer into a PRESTEL terminal and thereby gain access to the quarter of a million pages that are currently available. Includes: a description of the VTX5000 interface, an introduction to PRESTEL and the facilities offered to the MICRONET subscribers.

Spectrum Software Projects will enable you to create useful programs and learn more about programming. It gives you program ideas, discusses the overall set-up and an outline of the various procedures. You write the programs, and Software Projects tells you how to test them or offers hints and clues on how to do it. Create six useful programs, ranging from information management to business programs and games.

Sir Lancelot. At last, a game all Spectrum owners can enjoy — 24 exciting screens that will prove challenging, infuriating and, even worse, madly addictive!

Sir Lancelot must storm the castle, undaunted by such dangers as birds, bouncing balls, dogs, stars (and even cooking pots with legs??!!).

Your task is to collect the various precious objects scattered throughout the castle — a task that sounds easier than it is.

Great animation and high resolution make Sir Lancelot a game to beat.

Hampstead is an adventure game for would-be social climbers. Speed of reaction isn't so important. What matters is your ability to solve complex problems, which get harder the further you proceed in the game.

It is a quest but not for gold. The aim is to reach the pinnacle of social status, and acquiring wealth is only part of the problem. You must also gain the admiration and respect of your fellow men, and there's more to that than a fat bank balance.

At the start of the game you are a nobody whose aim is to become a somebody. So lie, cheat, steal and defraud. You **know** it makes sense!

Hampstead — a new type of adventure game!

All or Nothing

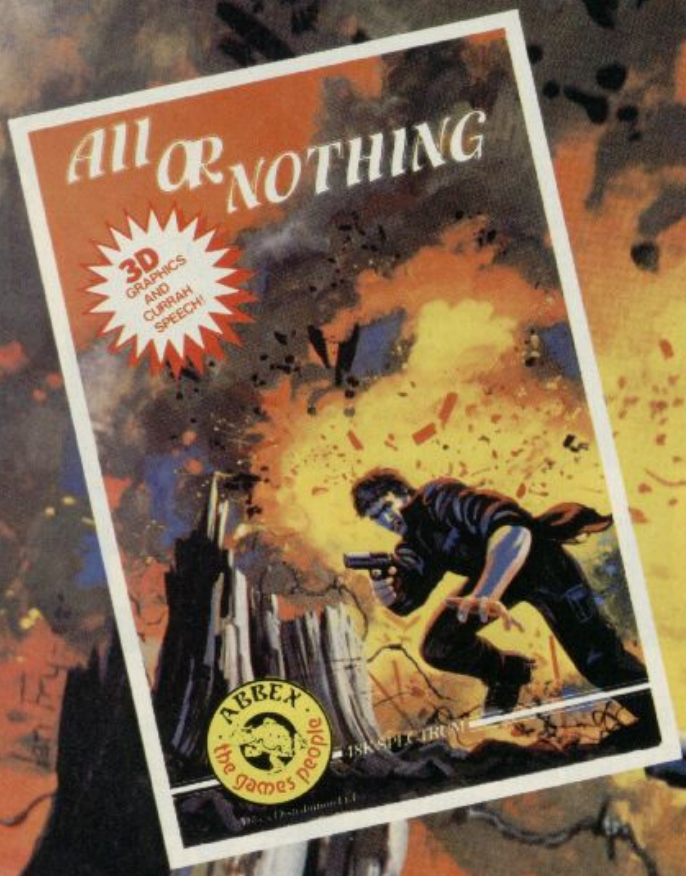
3D GRAPHICS

... He knew that parachuting in the enemy compound was no problem. The run for his life was getting from one place to another searching for the scattered secret files ...

The task required every skill he could master!

ALL OR NOTHING – WITH CURRAH SPEECH!
Three D action – a superb combination of arcade, adventure and strategy – Superfast – Packed with action SPECTRUM 48K – £6.95.

(Send for our full list of games).



Do you write your own programmes? If you do, we would be delighted to evaluate, and perhaps make your game part of our range!

HOW TO ORDER
To purchase 'ALL OR NOTHING' simply write on a piece of paper your name, address, and game name, enclosing your cheque/P.O. for £6.95 made payable to: ABBEX ELECTRONICS.

OVERSEAS ORDERS
Please add £1.00 per game ordered.

Please allow 14 to 28 days for delivery.

ABBEX
the games people

ABBEX DISTRIBUTION LIMITED
17 MARBLE HOUSE, ELGIN AVENUE, MAIDA VALE, LONDON W9.
TEL: (01) 289 2377.

THE FREE YS CLASSIFIED AD SERVICE

INPUT OUTPUT

Swop your software, flog your hardware and make a few friends into the bargain. Achieve immortality and get your name in print for nothing. Simply fill in the form below and send it off to us today. Go for it!

SOFTWARE

■ Swop *Manic Miner, Chuckie Egg, Programmer's Dream, Specbug 2* and *Trashman* for *White Lightning* by Oasis. NJ Osborn, 74 Coombe Lane, Westbury-on-Trym, Bristol, BS9 2AY, Avon.

■ Interested in swopping either *Trashman, Atic Atac* or *Ad Astra* for *Gobble*? Contact M Lewis, The Old Forge, Stansdatch, Staunt on Arrow HR6 9L6.

■ Have *Antics, TLL* and *Jet Set Willy*. Will swop all three for *Pole Position* or any two for *Tir Na Nog*. Phone 0254 65347 for more info.

■ Swop *Lunar Jetman, Atic Atac, Jetpac, Hobbit, Penetrator, Jungle Trouble, Galaxians, Ah Diddums, Cosmos*. Wanted *White Lightning, HURG, TLL, Full Throttle, Codename Mat*. Phone Leamington Spa 882764.

■ Spectrum software to swop. Send your list for mine. SAE please. Mr D Mason, 4 St. Leonards Gardens, Hove, Sussex BNJ 4QB.

■ *Ant Attack, Lunar Jetman, Halls of Things, Penetrator, Hobbit, Timegate, Valhalla, Knot in 3D*. Will swop for Alphacom 32 or similar. Write to Mr Light, 106a Bohemia Road, Hastings E. Sussux TN37 6RN.

■ I want *Mugsy, Bugaboo, Fighter Pilot, Wheelie, Bear Bovver, Olympics, The Quill, Mr Wimpy, Fred, Wong's Loopy Laundry, Psytron, TLL* — I've got utilities to swop. Paul 0326 317998. Evenings.

■ Have *Automania, Cavelon, JATB, Trashman, Snowman, Alchemist* and lots more. Want *White Lightning, Paintbox, HURG, Quill* instructions and a disasembler, also I would like *Daley's Decathlon* and *Ad Astra*. M Hutton, 22 Rannoch Ave, Woodhill, Bishops Briggs, Glasgow G64 1BU.

■ Swop my *Hobbit* for your *Chess-the-Turk* or *CP SuperChess 3.0*. Phone Preston 25689.

■ Wanted — *Fighter Pilot*, swop for *Atic Atac* or *Lunar Jetman*. S Hamilton, 49 Chapel Way, Epson, Surrey KT18 STD.

■ *Killer Knight, Pedro, Alchemist, Microbot, Atic Atac, Lunar Crabs* and *Android Two*. Swop three for the *Quill* and instructions or the lot for a speech synth. Ewan Baker, 44 Watson Place, Dumfermline, Fife. Tel. 0303 723387.

■ Spectrum software to swop. Send your list for mine. SAE please. J Howell, 69 Pople Street, Wymondham, Norfolk NR18 OLW.

■ Wanted — *The Quill* by Gilsoft. I have various games including *Kong, 3D Tanx, Terror-Dactyl, Pool* and *Snooker*. Phone Andy on Yapton 552753 weekends only. Any other swops please phone.

■ Swop *White Lightning* for issues 1 to 78 of PCN in good condition. Tel. 0952 618839.

■ Exchange *JSW, Manic Miner, Lunar Jetman, Atic Atac, Hobbit, Valhalla, Deathchase, Android 2, Scuba Dive, Test Match*. All offers considered. R Evans, 16 Leigh Terrace, Graig Quakers' Yard, Treharris, Mid Glamorgan, South Wales.

■ Have *Subre Wulf*, will swop for *Lords of Midnight*. Also have *Fighter Pilot* will swop for *Psytron*. James, 8 Elton Grove, Wollaton Park, Nottingham NG8 1FT.

■ *Space Raiders, Ugh!, Frenzy, Advanced Maths, General Statistics, Vector Maths, Push Off!, Bridgemaster, POGO, Kempsoft 1&2, Mined Out* plus lots more originals to swop. Also swop Kempston Joystick for Currah MicroSlot. Phone 0734 697095.

■ Swop *Chequered Flag, Match Point, Valhalla, Flight Simulation* and more if need be for Sinclair's *LOGO Language*. All original tapes with documentation (with details of Microdrive conversion). Phone Holyhead (0407) 3273 — Keith.

■ 48K Spectrum software to swop. My list of 450 programs for yours. Send SAE to Clive Snelling, 40 Kelso Close, The Ridings, Pound Hill, Crawley, Sussex RH10 4XH.

■ Will swop *Atic Atac, Android 2, Alchemist, Psytron, War of the Worlds, Redweed, Tank Trax, Warlock of Fire Top Mountain, TLL* and *Night Gunner*. Send list of swops to me. Phone 0733 208615.

■ Will swop *Lords of Midnight* and nearly 20 others for your Spectrum games 16/48K. Write with info to: GD Shaw, 25 Redwood Avenue, Royston, S Yorkshire S71 4JP.

■ Swop. *Micro Olympics, Black Crystal, Crypt, Cricket Captain, Manic Miner, Dallas, Snooker* (Visions). Wanted: *TLL, Olympimania, Paras* or any good s/w. Write: Jeff, 26 Harry Price House, Oldbury B69 1EQ.

■ Swop *Tasword Two* plus *VU-3D* for *Quill*. Originals only. Ring Chris on 0532 506098.

■ Swop *HURG* plus *Jet Set Willy* plus *Arcadia* plus *Pssst* for Dk'Tronics Lightpen. Phone Kidderminster 751042 and ask for Robert.

■ Amazing address database. My database can handle 200 addresses, LOAD and SAVE addresses. Send cheque for £3 to Steven Marshall, 69 Collingwood Street, Barnhill, Dundee, Scotland for this fantastic program.

■ Swop tapes! Wanted: *Tasword 2, Quill* for: *Games Designer* or both *Hunter Killer* and *Blockade Runner*. Write to Jon Rype, Box 18Y, N-3420 Lierskogen, Norway.

■ I have *Stonkers* and *Starfire*, will swop for *The Quill, Snowball, Collosal Adventure, Conquest* by Cheetahsoft or *Johnny Reb* (originals). Contact S Brown, 11 Carr Grove, Milnrow, Rochdale, Lancs OL16 3DX.

■ I would like to swop £45 worth of software plus a cursor key joystick for the ZX Printer and paper. Phone Daz on Coventry (0203) 454024.

■ Spectrum software to swop. Send SAE or phone with offers to D J Ianetta, 52 Finavon Place, Fintry, Dundee DD4 9DY. Phone 0382 43183 after 6pm any day except Sundays.

■ Swop *Trashman, Jet Set Willy, Penetrator, Manic Miner, Sabre Wulf, Quill, Tranz-Am, Atic Atac*, machine code books. Wanted: Speech unit, Interface 2 or any Spectrum hardware or software utilities. Phone 0946 820026.

■ Spectrum software to swop including *Jet Set Willy, Manic Miner, Chequered Flag, Bugaboo* and lots more. Write to Brian Mullowney, 5 Frenchfurze Grove, Kildare, Ireland or phone 045 21878.

■ Wanted: *White Lightning, Timedata TTS Toolkit*. Offer *Psytron, Night Gunner, Codename Mat*. Also various Spectrum books. Phone 0992 20663.

■ Will swop *Vu-3D* for either *Antics, Rapscallion, Jumbly* or Picturesque's *Editas Assembler*. Phone A Batt on Epsom 24729 after 5pm.

■ Swop *Hobbit, Football Manager, Penetrator, Horace and the Spiders, Meteroids, Nightflite*. Interested in *Fighter Pilot, Nightgunner, Full Throttle, Worse Things Happen At Sea, Kosmic Kanga, Lords of Midnight*. Phone 02302 4362 (John).

■ Swop *Atic Atac, Tribble Trouble* and *Horace Goes Skiing* for *Wheelie, Ant Attack* and *Matchpoint*. Phone 0674 73285 after 5pm (Michael).

■ Physics problems? Then send for my *Gas Laws* program. Cheque/Postal Order for £3.50. Brian Shirreffs, 30 West Glebe, Stonehaven, Kincardine AB3 2HZ.

■ Large selection of Spectrum books. Swop Abersoft's *Forth, Softek Floating Point Compiler, Cyrus Chess, Hobbit, Valhalla* for *Prolog, Logo* or offers. A Pearson, 52 Stocks Green, Castle Acre, King's Lynn, Norfolk PE32 2AE.

■ Swop *Maziacs, Flight Simulation, Train Game, Kong* (originals) for *Dungeon Builder, Matchpoint* and *Decathlon*. Phone Jonathon on 97 811785.

■ Swop *Lunar Jetman, Pssst* and *3D Ant Attack* for *Supercode 2* by CP Software. Phone Simon in 01-678 7420

BOOK YOUR FREE AD HERE

I'd like you to insert the following advertisement in the next available edition of INPUT/OUTPUT.

Please enter it under the following category:

☐ HARDWARE ☐ SOFTWARE ☐ WANTED

☐ MESSAGES ☐ CLUBS & EVENTS ☐ PEN PALS

Address this coupon to: INPUT/OUTPUT, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

Name .....

Address.....

.....

.....

.....Postcode.....

If you don't want to mutilate your issue, send a photocopy instead!

SUBSCRIBE TODAY... AND SEE WHAT YOU'RE MISSING

Don't get caught without the latest copy of Your Spectrum. Avoid the queues and be the first to have the magazine that's informative, accurate and fun! Just send off the coupon below and mail it to Speccy Subs, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

SUBSCRIPTIONS: PRIORITY ORDER FORM

YOUR SPECTRUM

I would like to subscribe to Your Spectrum. Please start my subscription from the ..... issue.

Please tick appropriate boxes:

☐ One year £12 UK and Eire

☐ One year £15 Europe

☐ One year £25 Rest of the world

I enclose my cheque/postal order payable to Sportscene Specialist Press Ltd for £ .....

☐ Please charge my Access/Visa/American Express/ Mastercharge card number .....
(Delete where not applicable)

Signature .....
(Credit card orders cannot be accepted without a signature)

Name .....

Address .....

Postcode ..... Phone no.....

Send the completed form with payment or credit card number to: *Your Spectrum Subs, 14 Rathbone Place, London W1P 1DE.* If you don't want to cut up your magazine, use a photocopy of this coupon.

INPUT OUTPUT

anytime after 5pm.

■ Will swop original of *HURG* for *White Lightning*. Also *Sabre Wulf* for *Melbourne Draw*. Stuart Knight, 7 Furlong Road, Westcott, Dorking, Surrey RH4 3PP.

■ Swop *Pssst, Stonkers, Inca Curse* for *Valhalla*. T Durston, 25 Burydale, Stevenage, Herts SG2 8AU. Phone 0438 723821.

■ I am offering *Espionage Island, Scuba Dive, Super-League, Bugaboo* and *Space Raiders*. I would like *World Cup, The Boss, Moon Alert, Champions* and *Kosmic Kanga*. Phone Glarryford 85479.

■ Swop *Timegate, Zip-Zap, Knot in 3D, Halls of Things, Phoenix, Trashman* for any addictive games or utility programs or Currah MicroSpeech. Phone 0792 891578 (Carl) after 6pm.

■ Swop tapes. *Horace and the Spiders, Urban Upstart, Jetman, Timegate, Galaxy Attack* and *Vu-Calc*. Interested in *Scrabble*, or *TLL*. Originals. Phone Dave on 021-449 3673 after 5pm.

HARDWARE

■ Stonechip programmable joystick interface. Enables any games to be used with joystick (not included). Simple and fast to program. Still under guarantee, half original price at £9.95. 091-285 4865 after 4pm.

■ Swop 48K Spectrum, Interface 1, Microdrive, cassette recorder, Kempston Joystick interface, Currah MicroSpeech and software — all excellent condition — for Commodore 64 and cassette or sell £200. Phone Sheffield (0742) 372418.

■ Typewriter/printer. Brother EP22. Has socket for input from your RS232 interface. Very portable typewriter with built-in 1K memory and LCD display. Cost £180. Offers? Leeds (0532) 703143.

■ 48K Spectrum, Lo-Profile keyboard, 14 arcade cassettes worth £220, sell for £150 or exchange for Commodore 64 or Vic 20 with extras. A Laws, 3 Church Farm Cottages, Stockton, Nr Beccles NR34 0HJ.

■ Willing to swop Dk'Tronics Lightpen, demonstration tape, booklet included and *Gobble a'Ghost* and *Rescue* for Currah MicroSpeech unit. Phone 0555 719111 Monday to Friday after 5pm. Ask for Stuart.

■ 48K Spectrum with ZX printer, sound amplifier and dust cover plus tape recorder, 35 original games and loads of magazines. Only £165 ono — telephone Slough 41066 after 4pm.

■ 48K Spectrum, Interface 1, Microdrive, nine cartridges, Alphacom printer, Kempston Joystick interface, sound amplifier, tape recorder, books, plenty of software. £275 ono. Must sell. Phone Mr Kwong, 0823 75615 after 6pm.

■ 48K Spectrum, Interface 1, Microdrive, Saga Keyboard, Printer interface, £250 of software (all original) and books. For details and your offers ring 0377 42803 after 7pm.

■ ZX 48K Spectrum still under guarantee. Want £110. Phone 01-673 7847 and ask for Anil. Everything included, manual and leads.

■ Spectrum 48K includes tape deck and interface. Also over £300 of original software. Spectrum only two months old, sell for £200. Ring John on 021-784 0138.

■ I have three serious computer books on computers and Basic programming. Ideal for 'O' level study worth £12, will sell for £5 or swop for games. Phone Wolverhampton 753866 (Steve).

■ 32K ZX81 with Filesixty keyboard and software. Little used. £40 including carrying case. Telephone 0302 63967.

■ Epson FX80 dot matrix hi-res printer for sale. Compatible with any computer when appropriate printer interface is used. Price £300. Also Cumana disk drive still under guarantee £150. Phone 01-674 7795.

■ ZX Microdrive and Interface 1 for sale. Also Currah MicroSpeech £90. Phone Gravesend 50791.

■ 48K Spectrum with masses of software, joystick, amplifier and console. Sell for £100 or swop for expanded ZX81 plus accessories and £60 cash. Stefan, Flat 2, 1 Station Road, Lytham, Lancs FY8 5DH.

■ Swop Stonechip programmable joystick interface for Currah MicroSpeech or sell for £15. Phone Thanet (0843) 32893 ask for John.

■ Dk'Tronics keyboard in perfect condition for Spectrum. Will sell for £35 ono. Telephone Berkhampstead, Herts 4411.

■ ZX Spectrum power supply — unused £4. Top quality professional keyboard just plug into rear of Spectrum case. Will take Spectrum and power supply. Mint condition £25. Liphook 723 635.

■ Swop Currah MicroSpeech — one month old — for printer for Spectrum or joystick and interface for Spectrum. Phone 0753 651529.

■ 48K Spectrum, cassette recorder, Kempston interface and Quickshot 2 joystick, Dk'Tronics keyboard (works!), £115 of software, originals and mags. Worth £360 sell for £230. Phone Harlow (0279) 20045 and ask for Dave.

■ Swop ZX Printer and four rolls of paper, for Currah MicroSpeech or £25. Swop Dk'Tronics disassembler and *Birds and Bees* for *Psytron* and booklet. Phone Ryan on 0604 403905.

■ Swop Kempston type joystick interface and Quickshot 2, plus over £100 worth of top software and books for Alphacom 32 or ZX Printer (with paper). Phone Warrington (0925) 816403 after 4pm.

■ I will give a Dk'Tronics lightpen and a Kempston joystick interface to anyone who can teach me machine code. Write to Paul, 9 Bourne Estate, Brimscombe, Stroud, Glos GL5 2RH.

■ For Sale. Four rolls of ZX Printer paper £7 or swop for a beginners. machine code programming book. Contact SP Elmer, 19 Brooksfield, Bildeston, Ipswich, Suffolk 1P7 7EJ.

■ Interface 1 and 2, Microdrives and RS232 cable and five Microdrive cartridges plus storage box. Almost new with manual and leads. Excellent condition, worth about £200, sell for £130 ono. Phone 01-504 0565.

■ Swop Quickshot 2 and *Arcadia, Robon, Armageddon, Alchemist, Cyberrats* and *Zzoom* for Currah MicroSpeech, all unused. 01-440 3450 after 5pm. (Or joystick for £9 and software for Level 9 adventures.)

■ Dragon 32 plus software, excellent condition, for Spectrum in good condition or Interface 1 plus Microdrive — must work! Phone 0253 739726.

■ Stack Light Rifle as new in box with programs worth £30. Will swop for Dk'Tronics Lightpen or *Quill* and *Mugsy*. Telephone Wallsend 633716.

■ 48K Spectrum, Dk'Tronics keyboard, Interface 1, Microdrive, Currah MicroSpeech, Quickshot joystick, Dk'Tronics joystick interface, lots of software, books and utilities. Total value £400. Any offers? May split. Dennis Waugh, 7 Nursery Lane, Kingsthorpe, Northampton NN2 7QG.

■ Microdrive and Interface 1 for sale — only four months old. Phone 0277

cp software — Commodore 64 and Spectrum Programs

NEW CHRISTMAS PROGRAMS

NEW 48K Spectrum
SUPERCHESS 3.5

GUARANTEED TO CONSISTENTLY BEAT ANY SPECTRUM OR COMMODORE 64 CHESS PROGRAM WHATSOEVER!

UNIQUE NEW WAY TO SET OVER 900 LEVELS ACCORDING TO TIME.

SAVE PROGRAM OR GAME TO MICRODRIVE

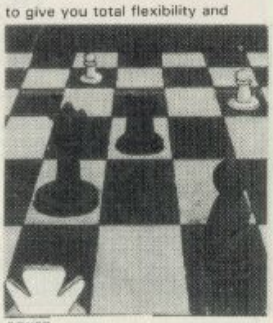
STRONG
Here is the ultimate development of the Superchess series, using advanced artificial intelligence techniques that make it an estimated 100 times faster and 1500 times more intelligent . . .

FAST
3.5 is incredibly fast at every level of play, moving in seconds at the lower levels and always within tournament times of 3 minutes or less, even at the highest level.

PENETRATING
This program has amazing power; it looks ahead at least 7 moves deep, often more, trying literally thousands of lines of play.

FRIENDLY
And it comes with every possible feature, updated to give you total flexibility and ease of use:

FEATURES:
- Transferable to microdrive for rapid loading
- On-screen clocks for player and computer give tournament realism
- Change sides and levels during play if required
- Stop the game to change positions at any time
- Set up particular games you want to play at any stage)
- Will recommend your next move when asked
- Set it to solve problems up to mate in four
- Interrupt mode can force it to play the best move so far
- Extensive library of standard opening moves
- Determine your own colours for the display if required
- You can play blindfold chess
- Easy to use with every conceivable option, help menus and special beginner's level (0)
- Fascinating self-play mode for you to study the game
- Total information on-screen of the computers' thought processes — including best line of play found so far, number of positions evaluated, depth of search, and its own internal scoring. A great tutor!



BOXED
£9.95 WITH MANUAL

NEW 48K SPECTRUM
ASTRONOMER

A PLANETARIUM ON YOUR TV SCREEN

Astronomer has everything in one powerful program . . . See the night sky of more than 1000 stars from any time or place on earth. Watch it plot the planets or draw in the constellations for you. See close-ups from the Star Atlas of 362 charts. Watch animated detail of our Solar System in motion and see how it changes with the months. Calculate everything needed for serious astronomy to a high standard of accuracy and produce your own tables to save having to buy them. Anything can be transferred to a ZX Printer.

FEATURES
- Comprehensive Manual with reference sections
- On-screen demonstration for the beginner
- Suitable for serious astronomical study
- Night Sky views from anywhere on earth
- Works for past, present and future times
- Displays over 1000 stars
- Draws the constellations on your command
- Plots the solar system on the night sky
- Huge Star Atlas for detailed study
- Shows the motion of the solar system
- Illustrates and predicts oppositions and conjunctions
- Calculates position for the Sun, Moon, Planets, Comets and Asteroids
- Then plots them o the Night Sky or Star Chart
- Displays the phases of the moon
- The distance from earth of any object
- Sidereal time and rising and setting times
- Ephemeris section: generate and print your wont ables
- Fully compatible with ZX Printer

Stunningly realistic views of millions of skyscapes in your own comprehensive planetarium . . .

NEW BRAND NEW SPECTRUM VERSION
BRIDGE PLAYER 2

THE DEFINITIVE AND CHALLENGING SOLO BRIDGE WITH EVERY SPECIAL FEATURE

BRIDGE PLAYER 2 is the ultimate refinement in home computer versions of this sophisticated card classic. Pit your wits against this powerful program and it will definitely give you an enjoyable and engrossing game. Even highly skilled player will get a real insight into the game. At last, here is a program with everything the solo Bridge Player ever needed. The computer generates random hands, allows proper bidding in the ACOL system including the Stayman and Blackwood conventions, and then IT TAKES YOU ON, playing both your opponents' hands. There is full cumulative scoring on-screen and you can study your game by setting-up hands or contracts, reviewing the play and even peeping at your opponents' cards during play. Every feature that can be packed into the Spectrum has been included in this program to give you a really satisfying and enjoyable game of computer Bridge.

FEATURES
- Versatile bidding routines give you a worthy opponent
- The computer CAN PLAY AS DECLARER as well as defender
- Study your game: post-mortem facility allows rebidding and replaying of any hand
- You can review the bidding or play to previous tricks while playing a hand
- Or input a hand or contract of your choice to test yourself
- Make hard copy on a printer for your records
- Peep at the oppositions' cards if you desire
- AT ANY TIME go to the next hand or review the options
- COMPREHENSIVE ON-SCREEN INFORMATION DISPLAYS: contract, tricks won so far, cards played in current and last trick, score
- Option to BIAS THE DEAL to give you and your "partner" more high card points if you prefer to play as declarer
- Simplified key entering for a quick rhythm of play

A REALLY STRONG OPPONENT FOR A REALLY GOOD GAME OF BRIDGE
PRICE £9.95

ALSO: Amstrad Bridge Player £9.95
BRIDGE TUTOR Beginners £5.95
BRIDGE TUTOR Advanced £5.95

BOXED
£9.95 EXTENSIVE MANUAL

SUPERCODE II
—for 16K and 48K Spectrum

120 ROUTINES—MICRODRIVE COMPATIBLE 100%

This is the Ultimate Spectrum Toolkit, with 120 State of the Art Machine Code Routines for use in, or with, your own BASIC programs! Supercode II needs no prior knowledge of Machine Code to operate. If you have a ZX Microdrive, you can transfer Supercode II to Microdrive as easy as 1-2-3...if you do not, all the other features of Supercode II still work.

★ Unique Access Program lets you Index, List, Test, Tailor, Relocate and Save (to Tape or Microdrive, with original or new name) + Verify routines, all under software control. ★ Options include Example/Repeat/Jump/Again/Cont/Demo/Diagnosis/Tfr. ★ See each routine work—all details onscreen. ★ Supplied boxed with Comprehensive User Manual. ★ Guaranteed fastest and shortest routines for every application!

Routines include: TRACE (with Variable Program Speed) · ON ERROR GOTO · ON BREAK GOTO · FULL RENUMBER (Does everything!) · VARIABLE LIST · STRING SEARCH · STRING REPLACE · PAINT FILL · 5 SUPERB PROGRAMMABLE SOUND EFFECTS · RECORD + REPLAY SOUND/MUSIC · CONFUSE + UNCONFUSE LISTING · REMKILL · PROGRAM CONTRACT/EXPAND · PROGRAM ANALYSE · NUMBER—VAL $COMPRESS · CHARACTER SWOP/SCRAMBLE/INVERT/REVERSE/ROTATE · WHOLE NEW CHARACTER SET (Sci-Fi) · FLASH + BRIGHT ON/OFF/SWOP · MEMORY FREE · PROGRAM LENGTH · BLOCK LINE + MEMORY ERASE/FILL/COPY · APPEND CURSOR · SCREEN SAVE/LOAD/SWOP/MERGE/FILL/SEARCH · HEX—DEC + DEC—HEX CONVERTERS · REMFILL · DATAFILL · GRID · INK + PAPER CHANGE · ATTRIBUTE SWOP/FILL/INVERT/RESET · TAPE HEAD READER · PROGRAM PROTECT · PROGRAM BREAK-IN · HEADERLESS FILE CREATE · AUTORUN CODE · PROGRAM AS CODE · TAPE COPIER DEFEAT · MICRODRIVE DIAGNOSIS · FAST LOAD MICRODRIVE · SURE SAVE MICRODRIVE · ADAPT TO MICRODRIVE · SURE CLOSE/# · STRINGS + PROGRAM CASE CHANGE/SWOP · HEX LOADER · ANALYSE MEMORY · LINE ADDRESS · STARDRAW · FREE SCROLLER · 24 LINE PRINTING · LOWER SCREEN CLS · NEW UDG · PROGRAMMABLE BORDER EFFECTS · REMOVE COLOUR · RIPPLE + SHUTTER SCROLL SIL + R) · SCROLL PIXELS/CHARACTERS/ATTRIBUTES, SINGLY OR JOINTLY, UP/DOWN/LEFT/RIGHT, WITH OR WITHOUT WRAP-AROUND, IN A USER DEFINED WINDOW OF ANY SIZE POSITIONED ANYWHERE ON THE SCREEN ...**and much, much more besides. It's incredible.**

Supercode II has many many imitators—but no equals!

SUPERCODE II — £9.95

Plus for 48K Spectrum unless otherwise stated:			
FLOATING POINT FORTH with EDITOR	£9.95	SUPERCHESS II (Lynx)	£8.95
INTEGER FORTH	£9.95	SUPERCHESS II (Jupiter Ace)	£8.95
SUPERCHESS II	£4.95	PINBALL WIZARD (48K Spectrum)	£5.95
SUPERCHESS I (16K ZX81)	£4.95	PINBALL WIZARD (Commodore 64)	£6.95
16K SUPERCHESS (16K Spectrum)	£6.95	DRAUGHTS	£5.95
REVERSI	£6.95	BACKGAMMON	£5.95
SPECIAL OFFER:		SNAIL LOGO (Turtle Graphics)	£9.95
LOGO and FLOATING POINT FORTH	£20.95	GOLFING WORLD	£5.95
SUPERCODE and EXTENDED BASIC	£17.95	SPECTRUM EXTENDED BASIC	£9.95
DRAUGHTS and BACKGAMMON	£9.95	SUPERCHESS 3.0	£9.95
YAHTZEE	£4.95	BRIDGE PLAYER	£9.95

WANTED: **Interesting programs for Spectrum, Amstrad, Commodore 64 and QL.**

French translations available from:
SEMAPHORE
CH, 1283 LA PLAINE, Geneve, Switzerland

Available at most good computer stores.

Send SAE for Catalogue.

DELIVERY:
UK—prices include VAT and postage & packing.
EUROPE—add 80p per program
ALL OTHER PLACES—for air mail add £2 for the first program and 50p for each subsequent program. Surface delivery add 80p per program.

cp software
DEALER ENQUIRIES
0532-694504

Send Cheque, Postal Order or Access No. to:
CP SOFTWARE, Dept YS 8
2 Hawthorne Road,
Leeds, LS7 4PH.

Buy it with Access

INPUT OUTPUT

226587 and ask for Robert. All prices considered.

■ I want to sell my ZX Printer for only £30 including two rolls of paper. Please contact Clemens Oelker, Woderichweg 5, 2000 Hamburg 63, West Germany.

■ Exchange Currah MicroSpeech and Dk'Tronics Lightpen for your ZX Printer or Alphacom printer. N Atkinson, 22 Sowerby Crescent, Stokesley, Middlesborough, Cleveland TS9 5EQ.

■ ZX81 16K RAM pack, ZX Printer, swop ZX81 software for Spectrum software or any offers for printer and RAM. Also wanted any Spectrum hardware. A Meek, 24 Wheatfields, Enfield, Middlesex.

■ For sale 48K Spectrum, Interface 1, Microdrive, two cartridges, ZX Printer, RS232 lead, programmable joystick interface, joystick, tape recorder, software worth £90, books. 4 Edge End Dobcross, Oldham OL3 5QJ. Ring Saddleworth 6329. Price £376 ono.

■ Pack of five rolls of printer paper for the ZX Printer. Cost £11.95, great value at £7. Phone 031-336 5082 after 5.30pm.

■ 48K Spectrum, 200 games, utilities, etc, DK Lightpen, various books, three-channel Micro Power sound board. Offers? Phone Paul on 0326 317998 evenings.

WANTED

■ Any joystick wanted (Kempston if possible). Must work. Will swop or pay for. Phone Daniel Davies, evenings only 01-286 8918.

■ Secondhand 48K Spectrum. Must work. Phone Guildford 503876 or write to 9 The Crossways, Onslow Village, Guildford, Surrey GU25 5QQ.

■ Wanted. Alphacom 32 printer. Swop Tape R/C and £30; plus £20 software. Preferably Manchester area or Lancashire people with names like 'Sir Clive' given preference. Phone 061-205 5263 anytime.

■ Wanted *YS* 2 and 3. I offer *Tranzam, Spectre, Styx* and *3D Combat Zone* (original tapes and labels, not copies). Send address and/or phone number to J P Chartier, 11 Rue Ronsard, 28630 Barjouville, France.

■ ZX80 4K ROM in very good condition. Boxed, manuals, etc. Will pay £10 approx. P Rose, 22 Grange Gardens, Wellesbourne, Warwick CU35 9RL. Also interested in any other defunct computer in good condition.

■ Interface 1 and Microdrive. Swop for 10 games and Currah MicroSpeech. Contact Norman Tierney, 5 Campian House, Mayville Estate, Matthias Road, London N16. I need it urgently.

■ Wanted 48K Spectrum, keyboard, Alphacom or other printer, recorder. All or any combination considered. Contact Rik Bennett, 8 Elm Close, Tarporley, Cheshire. Or phone 08293 3369 (will collect).

■ Interface 1 plus Microdrive. Will swop £90 of software. *Psytron. Trashman, Hunter Killer, ELT.* M Mayhem, 23 Whitby Grove, Swindon, Wilts. Telephone Swindon 612594.

■ Issues 2 and 3 *Your Spectrum*, will pay £1 each plus postage and packing. Andy Sheppard, 32 Gorse Street, Stretford, Manchester M32 0HZ.

■ Issues 1 and 2 of *Your Spectrum* (must be in good condition). Will be willing to pay up to £1.50 each. Stuart Knight, 7 Furlong Road, Westcott Dorking, Surrey RH4 3PP.

■ Name price of copies 2 and/or 3 of *Your Spectrum*, without bits cut out please! Send your bids to Mark Keneally, Skehacrine, Abbeyside, Dungarven, County Waterford, Eire.

■ *YS* issues 2 and 3. Exchange or purchase (issues 6/7). Contact Martin Reid, 2 Empress Way, Euxton, Chorley, Lancs PR7 6QB.

■ Vol 1/2 (Feb/Mar) and vol 1/3 (Apr/May) of *Your Spectrum*. Phone Northampton 717502 and ask for Duncan.

MESSAGES

■ Speccy register for 48K Speccy owners with young children. Send for further details including your child's name and age (1-7 years). 38 Homedale House, 3 Brunswick Road, Sutton, Surrey SM1 4DG.

■ Can you help me? I am looking for a computer club for the Spectrum in Burnley or Rossendale. Phone Rossendale 227840 between 4pm and 6pm midweek and ask for Paul.

■ Can anybody help me with Hewson Consultant's *Quest Adventure*? Please write to Jonathon Bell, 2 Buller Park, Porton, Nr Salisbury, Wilts.

■ Request info from users of *The Quill* on methods of random monsters and use of flags. Also opinions on *Sprint*. Is it worth the money? M A Riddell, 87 Ivanhoe Drive, Glenrothes, Fife KY6 2NF.

■ Prestel users mailbox me for a chat, especially local users interested in using their user to user software. Free program to anyone who does. Keith Burton. Mailbox number 226292118.

PEN PALS

■ Accomplished hacker would like to contact any hacker, experienced or beginner, by letter or tape for exchange of ideas and conversation. Write to Kevin Metcalfe, 27 Fletton Avenue, Peterborough PE2 8AX.

■ I've just started *Sherlock* and *Fantasia Diamond* and would like a penpal to play either/both with. Tony Slater, Flat 3, 87 Dunsmore Road, London N16 5PT.

■ Pen pal wanted. Phone Kemish on 01-861 0340 after 4pm.

■ I'm Ricky and I am 14. Other than computers, I like videos. I would like a pen pal of the same age. Phone 041-773 2707.

■ I want a pen pal about 13 years old and interested in adventures, swopping programs and tips and messing up WH Smith's computers! Phone Dave on 021-449 3673 after 5pm.

■ I have loads of software to swop. Also have a VTX and user to user software. Keen hacker or games freak preferred. Philip Crawley, 3 Hilton Close, Stirchley Park, Telford, Shropshire TF3 1RG.

■ My name is Keir. I like all indoor sports and Michael Jackson. My age is 12. I would like a pen pal of same age. Phone 061-860 7938.

■ I would like a 10-year old girl pen pal to share Speccy games and tips. Please write to Helen Fircroft, Gladsmuir Road, Barnet, Herts or phone 01-449 5815.

CLUBS & EVENTS

■ Microelectronics Applications Fair is in its third year of running and exhibitors are again expected to be covering the whole software/hardware spectrum. As usual it will be held at Barden High School, Burnley, Lancs on Saturday, November 10th, from 10am-4pm.

■ Software exchange club. National organisation with huge program base seeks new members (Spectrum and Dragon). SAE please for membership forms, etc. UK Sec (YS), 15 Tunwell Greave, Sheffield S5 9GB. YS

COMPUTAPE'S "SPECIAL OFFER"

WE OFFER A MINIMUM OF £1 OFF THE RSP ON ALL OUR GAMES eg:—

		rsp	Our Price
Adventure of St. Bernard	Carnell	£5.95	£4.20
Aztec (48K)	Big Byte	£9.95	£5.95
Beach Head (48K)	U.S. Gold	£7.95	£6.90
Bear Bovver (48K)	Artic	£6.95	£5.95
Bear George	Clarabelle	£6.95	£5.95
Blade Alley (48K)	P.S.S.	£5.95	£4.75
Blue Thunder	R. Wilcox	£5.95	£4.90
Chequered Flag (48K)	Psion	£6.95	£5.95
Chuckie Egg	A&F Software	£6.00	£5.75
Daley Thompsons Decathlon (48K)	Ocean	£6.90	£5.50
Danger Mouse in Double Trouble	Creative Sparks	£8.95	£6.95
Digger Dan	Ocean	£5.90	£3.50
Factory Breakout (48K)	Peggy Software	£5.90	£4.50
Fighter Pilot	Digital Integ.	£7.95	£9.95
Football Manager (48K)	Addictive	£6.95	£5.95
Full Throttle (48K)	Micromega	£8.95	£5.95
Games Designer	Quicksilva	£14.95	£12.50
Gremlin Manager (48K)	Thor	£6.95	£5.95
Ring Ding (48K)	C.R.L.	£6.95	£4.95
"Hulk" The (48K)	Adventuresoft	£9.95	£6.95
Jack and Beanstalk (48K)	Thor	£6.95	£4.95
Jet Set Willy (48K)	Software Proj.	£5.95	£4.95
Kong	Ocean	£5.90	£4.90
Kosmic Kanga (48K)	Micromania	£5.95	£4.80
Lords of Midnight	Beyond Software	£9.95	£8.50
Lunar Jet Man	Ultimate	£5.50	£4.50
Manic Miner	Software Proj.	£5.95	£4.90
Match Point (48K)	Psion	£7.95	£5.95
Micromouse Goes Debugging	Lothlorien	£5.95	£4.95
Monty Mole (48K)	Gremlin	£5.95	£5.50
Moon Buggy	Anirog	£5.95	£4.90
Night Gunner	Digital Integ.	£6.95	£5.95
Olympimania	Automata	£8.90	£4.95
Psytron	Beyond Software	£7.95	6.95
Sabre Wulf (48K)	Ultimate	£9.95	£8.80
Scuba Dive	SandMarket	£5.95	£4.75
Space Intruders	Quicksilva	£6.95	£5.95
Stop the Express (48K)	Sinclair	£5.95	£4.95
T.L.L. (48K)	Fortec	£5.95	£4.90
Trashman	New Generation	£5.95	£4.90
Valhalla	Legend	£14.95	£12.50
Wheelie	Microsphere	£5.95	£4.95
White Lightning (48K)	Quicksilva	£14.95	£12.95
World Cup Football (48K)	Artic	£9.95	£5.95

All prices include VAT and Postage — Please make Cheques/P.O's payable to:—

COMPUTAPE
27, Coombe Road, Southminster, Essex CM0 7AH
Tel: Maldon 772589

Send SAE for details of other games available. We also have lists for the Comm. 64, Dragon 32, Vic 20, BBC, Atari, Oric and Tandy Computers.

ZX-81 & SPECTRUM REPAIRS ADD ON SPECIALISTS MOST COMPUTER COMPONENTS SPECTRUM REPAIRS £15.

Why do Spectrum users from London, Devon, Essex and other places send their micros to us for repairs?

Average price £15.00

- **Only company in UK** offering while you wait service.
- Or 24 hour turn around. Every micro insured from return journey.
- Phone or send for free estimate Enclosing £1.60 UK, I.O.M. EIRE C.I.
- **No hidden handling charges**
- Special rates for schools

MANCOMP LTD (Dept YS)
Printworks Lane, Levenshulme
Manchester M19 3JP
Tel: 061-224 1888.

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.

☐(C5) £4.35
☐(C10) £4.40
☐(C12) £4.45
☐(C15) £4.50
☐(C30) £4.70
☐(C60) £5.30
☐(C90) £7.00

BASF FLOPPY DISCS
Prices of boxes of 10
☐5¼ Single side/Double density £19.95
☐5¼ Double side/Double density £21.85
☐5¼ Double side/Quad density £28.75

MICRO FLEXI DISCS
Price per unit
☐3½" Single side £4.00 each
☐3½" Double side £4.75 each
Indicate quantity of each product required in boxes. Free deliverly UK only.
Cheque/PO Enclosed for £_____

NAME . . . . . .

. . . . . .

Professional Magnets Ltd

Cassette House, 329 Hunslet Road, Leeds LS10 3YY
FREEPOST Tel. (0532) 706066 YS

PROGRAM POWER

A bumper Xmas collection of four fantastic programs for you to tap into your Spectrum, courtesy of* Martin Evans, Gavin Monk, Tony Samuels *and* Robert Stockton. *If you've written a program that's good enough for publication, send it to Gavin Monk, Program Power,* Your Spectrum, *14 Rathbone Place, London W1P 1DE.

MESSAGE MOVER

BY MARTIN EVANS

Have you ever wanted to put a message or instructions for a game as scrolling text on the 23rd line of the screen display — just like they do in the professional commercial packages? Well, here's your chance. This machine code program can be used to display a string of text which is constantly scrolled so that the words go off one side of the screen as others enter from the opposite side.

I've produced an assembly listing of the routine (listed from the *GENS3* HiSoft assembler), but there's also a Basic program which will do the trick if you've not got an assembler at hand. The Basic listing of the routine should be typed in directly as it stands; you'll notice that a number is included at the end of each line of data as a checksum and, if a mistake is made in your typing, the line number containing the mistake will be displayed on-screen.

Once you've typed the program in without error, it would be wise to save it using SAVE "SCROLL" CODE 60000,95. It might also be a good idea to save the Basic as well, so that you can make the suggested changes that follow without corrupting your copy.

The Basic can now be erased using the command NEW — the machine code will, of course, still be present as it's positioned above RAMTOP. To test the routine, type in the second Basic program given and RUN it — you should now get the contents of zS scrolling, pixel by pixel, across the 23rd line of the screen display. To return to Basic, simply press any key.

To incorporate this routine in one of your own programs, you should use the second program given as a subroutine, define your particular message as zS and then GO SUB to the subroutine. The machine code is completely re-locatable, but it must *not* be loaded to the same address as the data for the message — otherwise you'll crash the computer.

As the routine stands the string will be scrolled round and round until a key is pressed. However, to alter the routine so that the message is only scrolled once, the value '40' in line 70 of the first program must be changed to '200'; alternatively, you could load the machine code, type POKE 60065,200 and re-SAVE the code as shown above.

16K Spectrum owners will be pleased to hear that they're not left out — for once! Simply add these two lines to the second Basic program:

15 RANDOMIZE (NEW ADDRESS)
16 POKE 60001, PEEK 23670: POKE 60002, PEEK 23671

You'll also have to alter the value '59399' in lines 30 and 50 to a new value 'new address — 1'.

As a last note, when POKEing zS into memory, it's important that the last address is POKEd with zero to tell the routine where the end of the message is; look at line 50 of the second Basic program.

```
EA60             0020         ORG   60000
EA60 2107E8      0030 LOOP4   LD    HL,59399
EA63 22005B      0040         LD    (23296),HL
EA66 1828        0050 BEGIN   JR    PRINT
EA68 3E08        0060 RETUR   LD    A,8
EA6A F5          0070 START   PUSH  AF
EA6B 0608        0080         LD    B,8
EA6D C5          0090 LOOP5   PUSH  BC
EA6E 06FF        0100         LD    B,255
EA70 10FE        0110 LOOP3   DJNZ  LOOP3
EA72 C1          0120         POP   BC
EA73 10F8        0130         DJNZ  LOOP5
EA75 21FF58      0140         LD    HL,22783
EA78 E5          0150         PUSH  HL
EA79 0E08        0160         LD    C,8
EA7B 0620        0170 LINE    LD    B,32
EA7D E1          0180         POP   HL
EA7E 25          0190         DEC   H
EA7F E5          0200         PUSH  HL
EA80 B7          0210         OR    A
EA81 CB16        0220 BYTE    RL    (HL)
EA83 2B          0230         DEC   HL
EA84 10FB        0240         DJNZ  BYTE
EA86 0D          0250         DEC   C
EA87 20F2        0260         JR    NZ,LINE
EA89 E1          0270         POP   HL
EA8A F1          0280         POP   AF
EA8B 3D          0290         DEC   A
EA8C 20DC        0300         JR    NZ,START
EA8E 18D6        0310         JR    BEGIN
EA90 FF          0320 PRINT   RST   56
EA91 3A055C      0330         LD    A,(23557)
EA94 FE00        0340         CP    0
EA96 C0          0350         RET   NZ
EA97 2A005B      0360         LD    HL,(23296)
EA9A 23          0370         INC   HL
EA9B 22005B      0380         LD    (23296),HL
EA9E 7E          0390         LD    A,(HL)
EA9F FE00        0400         CP    0
EAA1 28BD        0410         JR    Z,LOOP4
EAA3 21003C      0420         LD    HL,15360
EAA6 010800      0430         LD    BC,8
EAA9 09          0440 LOOP1   ADD   HL,BC
EAAA 3D          0450         DEC   A
EAAB 20FC        0460         JR    NZ,LOOP1
EAAD 11FF50      0470         LD    DE,20735
EAB0 EDA0        0480 LOOP2   LDI
EAB2 1B          0490         DEC   DE
EAB3 14          0500         INC   D
EAB4 79          0510         LD    A,C
EAB5 FE00        0520         CP    0
EAB7 20F7        0530         JR    NZ,LOOP2
EAB9 18AD        0540         JR    RETUR
                 0550         END
```

This is an assembly listing of the scrolling routine given by the *GENS3* HiSoft assembler. If you've not got an assembler to hand, use the Basic loader given.

```
  1 REM Scrolling Bottom Line Message
  5 REM PROGRAM 1
 10 DATA 33,7,232,34,0,91,24,40,62,8,531
 20 DATA 245,6,6,197,6,255,16,254,193,16,119
4
 30 DATA 248,33,255,88,229,14,8,6,32,225,113
8
 40 DATA 37,229,183,203,22,43,16,251,13,32,1
029
 50 DATA 242,225,241,61,32,220,24,214,255,58
,1572
 60 DATA 5,92,254,0,192,42,0,91,35,34,745
 70 DATA 0,91,126,254,0,40,189,33,0,60,793
 80 DATA 1,8,0,9,61,32,252,17,255,80,715
```

STOP for the QL

DOUBLES THE CAPACITY OF MICRODRIVES!

STOP is a STorage OPtimiser that will compress your microdrive files to as little as half their original size. Ideal for storing large amounts of text, BASIC programs, word processor documents etc., compatible with QL supplied software. STOP also works on data files.

Supplied on microdrive with full instructions. Send SAE for details. Available soon for the Spectrum.

STOP and save with this unique utility.

Only **£17.95** inclusive

DIGITEX

DIGITEX COMPUTERS LTD
4 Amwell House
The Woodlands
Isleworth, Middx TW7 6NX
Tel. 01-568 4148

NOW 3RD GREAT YEAR!

HIRE SPECTRUM PROGRAM TAPES

LIFE MEMBERSHIP £5·00
TAPE HIRE FROM 50p INCLUDING VAT

OVER 4,000 DELIGHTED MEMBERS!

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

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

SPECIAL OFFER! YOUR FIRST TWO TAPES FREE

IF YOU JOIN FROM THIS ISSUE or send 9"x6" sae for free details. Directors ALEC FRY, ARPS FRSA and ERNA FRY, BA

■ The first true software library to be set up in the world—and still the largest ■ Unrivalled tape stock, as you'd expect from our head start ■ Run on a 16-bit micro with **10 million bytes** of program and data on Winchester! aided by six less able but more friendly mere humans. ■ Often imitated (sometimes almost to the letter—flattery indeed!) but never equalled ■ Friendly, helpful service—at the end of a phone if needed ■ **Free** membership of our Discount Club: pounds off peripherals and top-of-the-chart tapes ■ Any loading problems (rare!) automatically credited ■ Shop now open (next to Post Office) for rental and discount sales of tapes and peripherals ■ Branches throughout the world ■ No complicated schemes, no commitment to quantity ■ New tapes arriving all the time ■ Printed, illustrated magazine "Computerchat" packs in more than any mere typed newsletter ■ Keenest-ever rates ■ ACCESS holders can join by telephone on 0730 892732 ■ **NO RIVAL can offer all this....**

To: **SOFTWARE LIBRARY**, Farnham Road, West Liss, Hants GU33 6JU.

NAME.....Machine.....

ADDRESS.....

.....

THE ORIGINAL SOFTWARE LIBRARY!

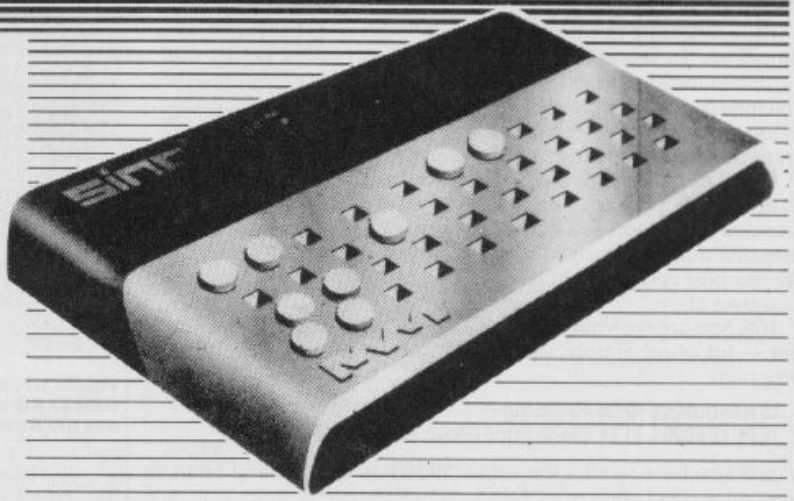
Special offer from this issue: LIFE MEMBERSHIP £5
(normally £9.50). Overseas (Europe only) £8, or join local branch in W. Germany, France, Holland, Belgium, Scandinavia, South Africa, Ireland—send Int. Reply Coupon and we'll forward your enquiry.

– Are you being zapped by 'finger drift'?

– Fed up with being eaten by monsters?

– Put new life into your game and hit the right key every time with the new

GAMES BOARD



Enjoy these great features:

- ☆ *Instantly attached/detached*
- ☆ *Games board masks unwanted keys*
- ☆ *Improves scores up to 50%*
- ☆ *Compatible with all games and software*
- ☆ *Can be used with joysticks for even faster control*
- ☆ *Can be used with all hardware add-ons*
- ☆ *Ideal for young children*
- ☆ *Keys can be inserted in any position*
- ☆ *10 keys supplied. Full set of keys available with the add-on kit*

Patents pending

All this and more for just £9.95

From your local computer shop or direct from:

MARVIC MARKETING LTD
FREEPOST (No stamp required)
Stretford, Manchester M32 8EL

Telephone:
061-864 2010

VISA

```
  90 DATA 237,160,27,20,121,254,0,32,247,24,1
73,1295
```

Lines **10-90** Contain the data for the machine code routine. The last number on each line of data is the value of the checksum — so you'll know whether a mistake has been made as soon as you RUN the program

```
  95 CLEAR 59399
 100 LET b=0
 110 FOR n=60000 TO 60091
 120 READ z
 130 IF z>255 THEN  LET d=b: LET b=0: IF z<>d
THEN  PRINT "ERROR IN LINE ";(INT ((N-60000)
'0))*10
 140 IF n=60091 THEN  STOP
 150 IF z>255 THEN  GO TO 120
 160 POKE n,z
 170 LET b=b+z
 180 NEXT n
```

Lines **95-180** Lower RAMTOP, clear the checksum (b), and READ and POKE the data making sure the checksum is correct for each line.

This program allows you to enter the machine code scrolling routine in Basic. Once you've made sure it's error-free, SAVE it to tape using the instructions given in the text.

```
   5 REM PROGRAM 2
  10 LET z$="PRESS ANY KEY TO STOP THIS DEMON
STRATION.  TO FIND THE CODE OF THE KEY PRESSE
D PEEK 23560. "
```

Lines **5-10** Place the message (given in quotes) in the array, z$.

```
  20 FOR N=1 TO LEN Z$
  30 POKE 59399+N,CODE Z$(N)
  40 NEXT N
```

Lines **20-40** POKE the message in z$ into locations 59399 onwards in memory.

```
  50 POKE N+59399,0
  60 RANDOMIZE USR 60000
```

Lines **50-60** POKE the value '0' at the end of the message in z$ and call the routine.

```
  70 PRINT "YOU PRESSED THE KEY WITH CODE    "
;PEEK 23560;" TO EXIT THE MACHINE CODE"
```

Line **70** Prints the code of the key pressed.

This program allows you to test the routine, providing a message in z$ which will be scrolled on the 23rd line of the screen display once the program is RUN. This program can also be used as a subroutine in your own programming efforts. 16K owners should read the text for instructions on how to manipulate this program for their machines.

TIPS FOR THE TOP

BY GAVIN MONK

Contributions to *Program Power* have been arriving at a steady rate over the Summer months and the quality has improved considerably since my few suggestions in issue 3.

What I'm doing this month is looking through all of the listings we've published in *YS* so far, picking out the good bits, adding a few little extras of my own — and presenting you with a series of nine routines. The REM statements may, of course, be omitted, but personally I'd suggest that you leave them in.

The routines use lines 1-30 and lines 8000-9999 — which should still leave you plenty of room for your own program. They offer the following facilities: flashy border, happy tune, UDG generator, display lives, end of game/high score, string input editor, case converter, user-defined keys and valid answer checker. You'll find a good explanation of each routine as it's listed in the following pages. The best thing to do is to type the whole program in and then, using the annotations for each routine, play around with each section until you understand how each one works.

```
   1 REM ************************
   2 REM *   Hints & Routines   *
   3 REM *   For Your Programs  *
   4 REM *   By Gavin B Monk    *
   5 REM ************************
   6 GO TO 30: REM jump past flashy bit
```

Lines **1-6** Cause a jump past the 'flashy border' routine so that the command RUN will still your program in motion.

```
   7 REM ************************
   8 REM Flashy Spectrum Border Routine
   9 REM ************************
  10 BORDER 2: BORDER 6: BORDER 4: BORDER 5:
BORDER 7: PAUSE 1: IF INKEY$="" THEN  GO TO 1
0
  20 RETURN
```

Lines **7-20** This routine is placed at the start of the program to ensure it runs fast and produces a steady display. Called by GO SUB 10, this routine will cause a spectrum of stripes to be displayed across the top half of the border, while waiting for a key press. When you leave the routine, the border colour will revert to white. The PAUSE 1 statement matches the program speed with the TV scan.

```
  30 REM ************************
  31 REM Your Program Here
```

Lines **30-31** You've got lines 30-7996 to write your own program — all you have to do is call the relevant routine you need to spice up the proceedings.

```
7997 REM ************************
7998 REM Tune for extra life, new level, new
high score etc.
7999 REM ************************
8000 RESTORE 8050: REM point to tune data
8010 FOR i=1 TO 8: REM number of notes
8020 READ t,n: REM read time and note
8030 BEEP t,n: REM play note
8040 NEXT i: REM repeat
8050 DATA 0.1,11,0.1,11,0.8,16,0.05,11,0.05,1
6,0.05,11,0.05,16,1,20: REM tune data
8060 RETURN
```

Lines **7997-8060** Use the 'happy tune' routine when you want to give a reward for good play . . . perhaps to signal a new high score, extra life or a switch to a new level. The routine produces an eight-note tune from the data in line 8050. You can call it by GO SUB 8000; note that it uses the variables 'i', 't' and 'n'.

```
8097 REM ************************
8098 REM UDG generator
8099 REM ************************
8100 RESTORE 8150: REM point to data
8110 FOR i=USR "a" TO USR "u"+7: REM loop for
 all UDG s if less than 21 are required chang
e 'u  see text
8120 READ z: REM read data
8130 POKE i,z: REM poke data
8140 NEXT i
8150 RETURN
```

Lines **8097-8150** This routine provides a simple user-defined graphics generator. First plan your UDG graphics, either on graph paper or with a suitable software package, and then make a note of the values as detailed in the Spectrum manual. Now change the 'u' in line 8110 so that only the number of graphics required will be set up — for instance, 'd' will allow graphics a-d to be defined. Place the data for each character in lines 8160-8180 and, to set up the UDGs, call the routine with GO SUB 8100.

```
8159 REM data for UDG's here - 8 numbers for
every UDG used
8160 DATA 0,255,0,255,0,255,0,255: REM exampl
e data for 'a'
8161 REM data for 'b' here
8162 REM data for 'c' here
8163 REM data for 'd' here
8164 REM data for 'e' here
8165 REM data for 'f' here
8166 REM data for 'g' here
8167 REM data for 'h' here
```

```
8168 REM data for 'i' here
8169 REM data for 'j' here
8170 REM data for 'k' here
8171 REM data for 'l' here
8172 REM data for 'm' here
8173 REM data for 'n' here
8174 REM data for 'o' here
8175 REM data for 'p' here
8176 REM data for 'q' here
8177 REM data for 'r' here
8178 REM data for 's' here
8179 REM data for 't' here
8180 REM data for 'u' here
```

Lines 8159-8180 These lines have been set aside for you to allocate the data you'll need to define each of the UDGs in your program.

```
8197 REM ************************
8198 REM print remaining lives
8199 REM ************************
8200 PRINT AT y,x;"AAAAAA"( TO li): REM A=UDG
 representing players character, li=lives rem
aining, in this case max lives=6
8210 RETURN
```

Lines 8197-8210 String handling on the Spectrum is very different to that found on all non-Sinclair inpedimentia, but did you know that items inside quotes in PRINT statements can also be sliced? 'What use is this?', I hear you wonder. Well, if you define a UDG character to represent your playing character, then you can quite easily have a string of characters displaying the number of lives anywhere on the screen. Set 'x' and 'y' to represent the co-ordinates of the screen position required and let 'li' equal the number of lives. Now, call the routine with GO SUB 8200 and you'll find that the remaining number of lives will be printed up on-screen in the form of a row of player characters — Pacmen, for example.

```
8297 REM ************************
8298 REM end game/high score routine
8299 REM ************************
8300 REM game over--requires the following va
riables sc=score, HS=high score & returns the
 high score name in h$
8310 PRINT  FLASH 1; INK 6; PAPER 2;AT 10,12;
"GAME OVER"
8320 FOR i=1 TO 400: NEXT i: REM wait loop
8330 IF sc<=hs  THEN  RETURN : REM return if
not new high score
8340 PRINT AT 10,9; BRIGHT 1;"NEW HIGH SCORE"
8350 FOR j=1 TO 3: GO SUB 8000: NEXT j: REM p
lay tune or just a wait loop as line 8320 if
required
8360 LET hs=sc: REM update high score
8370 CLS : PRINT '''" Well Done That Was Fant
astic": REM or whatever
8380 PRINT AT 19,0;"Please enter your name."
8390 GO SUB 8500: REM editor
8400 IF LEN a$>5 THEN  GO TO 8380: REM check
name length
8410 LET h$=a$: REM update high score name
8420 RETURN : REM or rerun game
```

Lines 8297-8420 This very handy routine is all that's needed to convey the sad message: "I'm sorry but your game is over". It also requires the input string editor (see the next routine), the 'happy tune' routine, and variables 'sc' (score) and 'hs' (high score) to be set. The routine is called by GO SUB 8300, and on return from the routine the high score name will be stored in h$. The maximum name length is set to five characters in line 8400, but this can be adjusted to suit.

```
8497 REM ************************
8498 REM string input editor
8499 REM ************************
8500 PRINT AT 21,0;"
       ": REM clear input line
8510 LET a$="": REM zero input string
8520 PRINT AT 21,0;: REM set print position
8530 PRINT  FLASH 1;" ";CHR$ 8;: REM print cu
rsor & place print position on it
8540 PAUSE 1: PAUSE 0: REM wait for key press
8550 LET k$=INKEY$: REM k$=key pressed
8560 LET co=CODE k$: REM co=code of key press
ed
8570 IF co=13 THEN  GO TO 8630: REM check for
 enter
8580 IF co=12 THEN  GO TO 8650: REM check for
 delete
8590 IF co<32 OR co>127 THEN  GO TO 8540: REM
 if not a valid character then get another
8600 IF LEN a$<>32 THEN  PRINT k$;: LET a$=a$
+k$: REM if input not full print character &
add it to input string
```


More exciting games for your ZX

Athlete
So you didn't make the Olympics? Never mind, here's a selection of track and field events where you can show the selectors how you compare against some tough opposition. Sprints (100m & 400m). Hammer Throw. Hurdles (110m & 400m).

Super Bridge
For beginners and experts alike. Designed to give above average players a good run for their money and to give beginners an excellent introduction without the worry of an impatient partner.

Make Music
A music synthesiser program designed to compose 3-part harmonies when used with the Zon Filter and Timedata sound boards or any other using the AY-3-8912 chip where the 'OUT' command is known. Brilliant – ZX Computing.

£5·50 ATHLETE 48K ZX SPECTRUM 1/1

£7·95 SUPER BRIDGE

£5·95 MAKE

Buffer Adventure
Featuring the real life characters who work at Buffer Micro. Dare you unravel the mysteries behind the shop? Are the people who serve you quite as weird as they seem? An amazing, pun-laden adventure.

Mysterious Fairground
All the fun of the fair, plus unimaginable terrors in the House of Horror and the Ghost Train before you can find the five items of treasure hidden somewhere in the Fairground.

Pools Predictions
Score draws, no score draws, home and away wins in this menu-driven program to help you fill in that winning coupon. English/Scottish leagues and Australian leagues for all year round success.

£5·95 BUFFER

£5·95 FAIRGROUND

£9·95 COMPUTER FORM POOLS PREDICTION

Racing Predictions
Covers the flat racing season at the touch of the keyboard – all the major courses catered for in the user friendly prediction program. Pick the first three home with confidence – not a pin!

Card Games
CRIBBAGE is the most fascinating of this series, produced in response to Cribbage addicts' requests. Also on the same cassette are PAIRS, BINGO and PATIENCE.

Loony Bin
Mad adventure requiring cool logical thinking to escape from the asylum and travel the world following the clues. Uses all but 8 bytes of the Spectrum's 48k memory.

£9·95 COMPUTER FORM RACING PREDICTION

£5·95

£5·95 LOONY BIN

FREE Blank Tape with every purchase

All prices include VAT. Add 75p p&p or call in person at Buffer. Trade enquiries welcome. Visa. Access. American Express. Diners Club.

Please send me the following games:
☐ Athlete ☐ S. Bridge ☐ Music ☐ Adventure
☐ Myst. Fair. ☐ Pools Pred. ☐ Racing Pred.
☐ Card Games ☐ Loony Bin

Name _____
Address _____
_____
_____
_____
I enclose cheque/PO for
£ _____ YS

BUFFER MICRO SHOP
310 Streatham High Road, London SW16 6HG. Tel: 01-769 2887
Open Tues-Sat 10.30-5.30 (Closed Mon)

```
8610 IF LEN a$=32 THEN  GO TO 8540: REM if in
put full get next character without printing
cursor
8620 GO TO 8530: REM get next character
8629 REM enter pressed
8630 PRINT AT 21,0;"
      ": REM clear input line
8640 RETURN
8649 REM delete pressed
8650 IF a$="" THEN  GO TO 8540: REM if nothin
g to delete get next character
8660 LET a$=a$( TO LEN a$-1): REM delete char
acter from input string
8670 IF LEN a$<>31 THEN  PRINT " ";CHR$ 8;: R
EM if input not full delete cursor
8680 PRINT CHR$ 8;" ";CHR$ 8;: REM remove las
t character
8690 GO TO 8530: REM get next character
```

Lines 8497-8690 If you've ever wanted to get rid of those keywords and punctuation marks accepted by the INPUT statement, then this one's for you. This input string editor allows screen line 21 to be used for alphabetical inputs of up to 32 characters. The input is checked that it doesn't contain keywords and all the other yuck that the normal INPUT accepts. The routine is quite long and you must note that it uses a$ (stores input), k$ (stores the key pressed) and 'co' (code of the key pressed). It all works by checking the code of the key pressed to see if it's in the required range; if it's the Enter or Delete key, then the appropriate jump is made to a routine which adds the key to the entry, stops the input or deletes the key from the input. This routine should be especially useful for adventure programmers.

```
8697 REM ************************
8698 REM case conversions
8699 REM ************************
8700 REM converts a$ to upper case
8710 FOR i=1 TO LEN a$: REM loop for string l
ength
8720 LET co=CODE a$(i): REM co=ascii code of
a$(i)
8730 IF co>=97 AND co<=122 THEN  LET a$(i)=CH
R$ (co-32): REM if element lower case change
to upper case
8740 NEXT i: REM next element
8750 RETURN
8800 REM converts a$ to lower case
8810 FOR i=1 TO LEN a$: REM loop for string l
ength
8820 LET co=CODE a$(i): REM co=ascii code of
a$(i)
8830 IF co>=65 AND co<=90 THEN  LET a$(i)=CHR
$ (co+32): REM if element upper case change t
o lower case
8840 NEXT i: REM next element
8850 RETURN
```

Lines 8697-8850 Here's another routine for the adventure freaks out there who are worried about the Caps lock being switched on or off during an entry. Everybody, of course, knows that POKE 23658,8/0 turns it on or off respectively. The trouble is, doing this doesn't stop someone turning it off/on during a listing. The answer is to change the limits in line 8590 of the input routine above, or use this two-case converter routine. To convert a$ to upper case use GO SUB 8700 — to lower case, GO SUB 8800. Note that the variables used are 'i' and 'co'.

```
8897 REM ************************
8898 REM adding user defined keys to your gam
e
8899 REM ************************
8900 RESTORE 9130: READ nk: REM read number o
f keys
8910 LET m$="": REM reset movement string
8920 CLS : PRINT "  USER DEFINED KEYS-SELECT
NOW"''
8930 FOR i=1 TO nk: REM loop for number of ke
ys
8940 LET m$=m$+CHR$ 0
8950 READ d$: REM read direction
8960 PRINT ''d$;: REM print direction
8970 FOR j=1 TO 16-LEN d$: REM loop for remai
nder of 1/2 screen line
8980 PRINT "-";
8990 NEXT j
9000 PRINT  FLASH 1;"?";CHR$ 8;: REM print ?
and move print position onto it
9010 PAUSE 1: PAUSE 0: REM wait for key press
9020 LET k$=INKEY$: REM get key press
9030 LET sel=0
9040 FOR j=1 TO LEN m$: REM scan for key alre
ady selected
9050 IF m$(j)=k$ THEN  LET sel=1: REM if sele
cted set flag
9060 NEXT j
9070 IF sel THEN  GO TO 9010
9080 LET m$(i)=k$
9090 PRINT k$: REM print key
9100 NEXT i
9110 PRINT £1;" Press any key to play the gam
e."
9120 FOR i=1 TO 10: NEXT i: GO TO 10: REM wai
t the flashy border
9130 DATA 5,"Left","Right","Up","Down","Fire"
```

Lines 8897-9130 Many commercial games now have a user-defined key option — the final solution to complaints about the control key layout. But here, another hidden benefit is that the Interface 2 and AGF joystick protocols can be used. This routine returns the keys selected in m$ (the movement string!) in the order given in the data statement at line 9130. The first digit in this statement is the number of keys required and the strings following this detail the purpose of each; checks are made to ensure the same key is not used twice. The following variables are used by the routine: nk (number of keys required); d$ (direction of required key); and k$ (key pressed). The 'flashy border' routine is also used so that a key press is waited for, once all the required keys have been entered. To add this feature to your game just GO SUB 8900. To check for movement in a game, all you now need is something rather like this:

IF INKEY$=m$(3) THEN . . . . .: REM
detects 'up' movement if using the given data

```
9497 REM ************************
9498 REM checking for a valid answer, e.g. on
ly
9499 REM ************************
9500 INPUT "Answer: "; LINE a$
9510 IF LEN a$>5 THEN  PRINT £1;"Answer is to
o long": GO SUB 9600: GO TO 9500: REM pause a
nd get answer again
9520 LET sel=0: FOR i=1 TO LEN a$: REM scan i
nput string
9530  IF (a$(i)<"a" OR a$(i)>"z") AND (a$(i)<
"A" OR a$(i)>"Z") THEN  LET sel=1: REM check
that each character is a letter and if not se
t flag
9540 NEXT i
9545 IF sel=1 THEN  PRINT £1;"Invalid Charact
er": GO SUB 9600: GO TO 9500
9550 STOP
9600 PAUSE 50: RETURN
```

Lines 9497-9600 This routine checks for a valid answer, but to be quite honest this is not so much a routine . . . more a collection of hints. Line 9500 asks for an answer to be input and this answer is then taken in a$; lines 9510 and 9550 check it for length (up to five characters) and invalid characters. If one of these is found, a message is flashed up briefly on the input line — and then the input prompt reappears once more. By changing the limits in line 9530, checks can be made against numeric or character inputs so that the VAL or VALS functions can be used.

XMAS CARD

BY TONY SAMUELS

This program generates a Christmassy scene on-screen, prints up our compliments of the season to all our readers in double-height characters and BEEPs a few of your favourite carols. To modify the message at the bottom of the screen, use the 'message-coder' routine given.

'Tis nearly Christmas . . . and I bet a lot of you out there haven't even given a thought to giving Grannie a Christmas card. Well, here's an idea from the author of Softek's *Ugh!* — why not send a computer-generated Christmas card with your own personalised message?

First, type in the main program as it stands and you'll get a personalised Christmas card from everyone here at *YS* — with accompanying Christmas carols. But once you've tired of our card to you, why not use the additional routine to place your own message in line 570 and wish all your friends a computerised 'Happy Christmas' on the day. All you have to do is RUN the 'message-coder' routine and input your required message, and then put the output data in place of the data we've put in line 570. Couldn't be simpler...

```
  10 INPUT "TYPE IN MESSAGE ..............."
: LINE m$
  15 DIM m(LEN m$)
  20 FOR f=1 TO LEN m$
  30 LET c=CODE m$(f): LET m(f)=255-c+PEEK f
  40 NEXT f
  90 CLS : PRINT " DATA ";
  91 LPRINT " DATA ";
 100 FOR f=1 TO LEN m$
 110 PRINT m(f);",";
 120 LPRINT m(f);",";
 130 NEXT f
 140 PRINT "999": LPRINT "999"
```

This routine allows you to insert your own Christmas message into the program. When you RUN the listing, you will be asked to insert your message — don't make it too long, otherwise you'll be *very* busy typing in all the data!

```
  10 CLEAR 32499: BORDER 0: PAPER 0: INK 0: C
LS : INK 7
```

Line 10 Clears space in memory for the machine code routine (at lines 550-560) and sets up the screen with the necessary colours.

```
  20 DATA 0,8,8,62,8,8,8,8: RESTORE : FOR f=0
 TO 7: READ z: POKE USR "t"+f,z: NEXT f
  30 DATA 0,0,0,0,1,0,0,0,0,2,64,0,0,0,16,0:
FOR f=0 TO 15: READ a: POKE USR "a"+f,a: NEXT
 f
```

Lines 20-30 Line 20 READs and then POKEs in the user-defined graphics data contained in line 30.

```
  40 LET a=50
  50 FOR f=0 TO 255
  60 PLOT f,0: DRAW 0,a
  70 LET a=a+INT (RND*3)-1
  80 IF a<32 THEN  LET a=32
  90 IF a>60 THEN  LET a=60
 100 NEXT f
```

Lines 40-100 This routine draws a snowscape at random along the bottom part of the screen.

```
 110 FOR f=17 TO 14 STEP -1: PRINT AT f,23; P
APER 1;" ": NEXT f
```

Line 110 Draws the trunk of a Christmas tree.

```
 120 LET a=10: FOR f=180 TO 200: PLOT f,30: D
RAW 0,a: LET a=a+INT (RND*3)-1: NEXT f
```

Line 120 This line makes sure that there's some snow around the bottom of the tree trunk.

```
 130 INK 4: LET a=30: FOR f=64 TO 160: PLOT 1
88,f
 140 DRAW -a,0: DRAW a*2,0
 150 LET a=a-.3
 170 NEXT f
```

Lines 130-170 Draw the main part of the Christmas tree in position on the tree trunk.

```
 180 DATA 4,23,6,23,7,22,7,24,8,23,9,22,10,24
,11,21,11,25,12,23,13,22,13,25
 190 FOR f=0 TO 11: READ x,y: PRINT AT x,y; I
NK RND*6+1; PAPER 4;"b": NEXT f
```

Lines 180-190 Elaborate the tree with a few 'fairy lights'. Well, it's nearly Christmas after all!

```
 200 INK 6
 210 LET a=0: FOR f=175 TO 165 STEP -1: PLOT
30,f: DRAW -a,0: DRAW a*2,0: LET a=a+.25: NEX
T f: FOR f=164 TO 146 STEP -1: PLOT 30,f: DRA
W -a,0: DRAW 2*a,0: LET a=a-.16: NEXT f
 220 LET a=2.5: FOR f=1 TO 10: PLOT 30-f,165:
 DRAW 0,a: DRAW 0,-a*2: PLOT 30+f,165: DRAW 0
,a: DRAW 0,-a*2: LET a=a-.25: NEXT f
 230 PLOT 26,170: DRAW -5,5: PLOT 34,170: DRA
W 5,5: PLOT 25,160: DRAW -7,-13: PLOT 36,160:
 DRAW 7,-13
 240 PRINT AT 1,23;"t"
```

Lines 200-240 Position a star up in the left-hand corner of the screen.

```
 300 FOR f=0 TO 30
 310 LET x=INT (RND*32): LET y=INT (RND*12)
 320 IF ATTR (y,x)<>0 THEN  GO TO 310
 330 PRINT AT y,x; INK 7;"a"
 340 NEXT f
```

Lines 300-340 A few random stars are thrown in to make the whole effect more realistic.

```
 350 PRINT AT 19,0; INK 2; PAPER 7;"
                   "
```

Line 350 This line clears an area of the bottom of the screen for a Christmassy-type message.

```
 360 RESTORE 550: FOR f=32500 TO 32571: READ
p: POKE f,p: NEXT f
```

Line 360 READs and POKEs the machine code data into the area created for it in memory by line 10.

```
 400 RESTORE 570: LET m$="": FOR f=1 TO 1000:
 READ m: IF m=999 THEN  GO TO 410
 405 LET m$=m$+CHR$ (255-(m-PEEK (f))): NEXT
f
 410 RESTORE 500: LET m$=m$+"       "
```

Lines 400-410 READ and POKE the message created by line 570.

```
 420 LET c=1
 430 LET c$=m$(c): PRINT AT 0,0; INK 0; PAPER
 0;c$: LET c=c+1
 440 IF c$="" THEN  GO TO 420
 450 READ b1,b2: IF b1=999 THEN  RESTORE 500:
 GO TO 450
 460 LET l=USR 32500: BEEP b1/4,b2
 470 GO TO 430
```

Lines 420-470 This routine READs the data from lines 500-540 and plays the Christmas carols that accompany the message as it scrolls from right to left across the bottom of the screen.

```
 500 DATA 1,7,1,7,1,7,1,9,1,7,1,7,2,2,1,4,1,2
,1,4,1,6,2,7,2,7,1,7,1,7,1,9,1,7,1,7,2,2,
1,4,1,2,1,4,1,6,2,7,2,7,1,14,1,12,1,11,1,9,1,
11,1,9,2,7,1,4,1,2,1,4,1,6,2,7,2,7,1,2,1,2,1,
4,1,6,1,7,1,7,2,9,1,14,1,12,1,11,1,9,2,7,2,12
,4,7
 510 DATA 1,11,.5,9,1,7,.5,4,.5,6,.5,7,.5,6,1
.5,4,1,11,.5,9,1,7,.5,4,.5,6,.5,7,.5,6,1.5,4,
1,7,.5,7,1,9,.5,9,1,11,.5,11,.5,14,.5,12,.5,1
1,.5,9,.5,11,.5,9,1,7,.5,6,3,4,1,6,.5,9,1,7,.
5,7,1,7,.5,2,1,7,.5,4,1.5,7,1,7,.5,7,1,7,.5,2
,1,7,.5,4,1.5,7,1,7,.5,7,1,9,.5,11,1,12,.5,11
,1,9,.5,11,1,7,.5,7,1,7,.5,2,1,7,.5,4,3,7
 520 DATA 1,7,1,12,.5,12,.5,14,.5,12,.5,11,1,
9,1,5,1,9,1,14,.5,14,.5,16,.5,14,.5,12,1,11,1
,7,1,11,1,16,.5,16,.5,17,.5,16,.5,14,1,12,1,9
,.5,7,.5,7,1,9,1,14,1,11,2,12
 530 DATA 1,7,1,12,1,12,1,12,2,11,1,11,1,12,1
,11,1,9,2,7,1,14,1,16,.5,12,.5,14,.5,16,.5,17
,1,19,1,7,.5,7,.5,7,1,9,1,14,1,11,2,12
 540 DATA 999,999
```

Lines 500-540 Contain the data for the Christmas carols. If you've an ear for music and find Tony's interpretations of all your favourite carols a little out of tune, this is the data you want to be looking to change.

SEE US AT ZX MICROFAIR
YOUR CHANCE TO WIN AN MO184 KEYBOARD
CONTACT US FOR DETAILS

The MO184 for SPECTRUM users

Designed by Programmers and Repair Specialists for Simplicity, Speed, Safety & Space.

KEYS:
★ Low-profile Keys, only 4 mm travel.
★ Large keycaps.
★ Readable at 3 feet.
★ Bright colours for easy identification.
★ Strategically placed for easy
- extended mode
- delete
- → ← ↑ ↓

★ Extra keys for left-handed users.
★ Full-size space bar.
★ Numeric pad with decimal point.
★ Double width enter keys.
★ Quiet action on gold contact switches.

HOUSING:
★ Glossy wipe - easy material.
★ Fully insulated no mains flying around.
★ Generous height and depth to House Interface 1 & power supply, WITHOUT REMOVING FROM CASING.
★ Large slots at rear for Spectrum and Interface 1.
★ Palm rest, to save tired wrists.
★ Pen holder.

Games programmers, watch out for our New Model!

ASSEMBLY:
★ No soldering required.
★ Full instructions supplied.

FURTHER EXPANSION
★ 3 slot (female) connector cable @ £12.50
★ 2 slot (female) connector cable @ £9.00
★ 8" Microdrive cable @ £5.50

DEALERS, CONTACT US FOR AN OFFER YOU CAN'T RESIST!

Please send_____MO184 Professional Keyboard @ £54.95 each*
_____3 slot connector cable @ £12.50 each
_____2 slot connector cable @ £8.50 each
_____8" microdrive cable @ £5.50 each

I enclose cheque/P.O. value £_____*(add £2 p&p)

NAME .....

ADDRESS .....

.....

TEL:.....POSTCODE.....

Please send to:-

£5 OFF!! THE MO184 KEYBOARD IF YOUR ORDER IS RECEIVED ON THIS COUPON BY THE 10/JAN/85

MANCOMP LTD.
FREEPOST, MANCHESTER M19 3BR. TEL: 061-224 1888

TURBO CHARGE YOUR SPECTRUM

Outperforms any Spectrum interface

The unique Turbo interface from Ram gives you all these features – and more – in one unit:

- A variety of interfaces including: Rom cartridge, two 9-way D plugs for standard joysticks, PLUS full expansion at rear.
- Compatible with Kempston, Protek and Interface 2 protocols.
- Works with latest Quickshot II rapid-fire joysticks and trackballs.
- Choice of Rom cartridge, tape cassette or Microdrive software.
- Works with virtually all joystick-compatible software.
- Instant program loading with cartridge software.
- Built-in power safety device – unique to Ram Turbo.
- Full one year guarantee.
- Immediate availability – orders will be despatched within 24 hours upon receipt of postal orders or credit card details (cheques – seven days).

So don't wait around. It's available from Boots, Menzies, Greens, Spectrum Group home computer centres and all good computer shops everywhere.

Or simply complete the coupon below and send it to us today.

Ram Electronics (Fleet) Ltd, Dept. , 106 Fleet Road, Fleet, Hampshire GU13 8PA.

Or call our credit card hot line on 02514 25252.

24 Hour despatch for credit cards and postal orders

Please send me

_____ Spectrum Turbo Interface(s) at £22.95 + £1.00 p+p (overseas orders £3.00 p+p).

_____ Quickshot II Joystick(s) at £9.95 (only when purchased with Turbo – normally £12.95 + £1 p+p)

I enclose cheque/postal order or charge my Access/Visa for: £_____

Expiry Date ____/____/____

Name_____

Address_____

_____ Postcode_____

Telephone_____

To: Dept. YS , Ram Electronic (Fleet) Ltd, 106 Fleet Road, Fleet, Hampshire GU13 8PA

RAM TURBO

Trade and export enquiries welcome.

```
 550 DATA 6,8,33,97,80,229,209,27,197,1,31,0,
237,176,1,225,0,9,193,16,240,6,8,33,129,80,22
9,209,27,197,1,31,0,237,176,1,225,0,9,193,16,
240
 560 DATA 33,0,64,17,127,80,6,4,126,18,20,18,
20,36,16,248,235,1,224,7,237,66,235,123,254,1
59,40,234,201,0
```

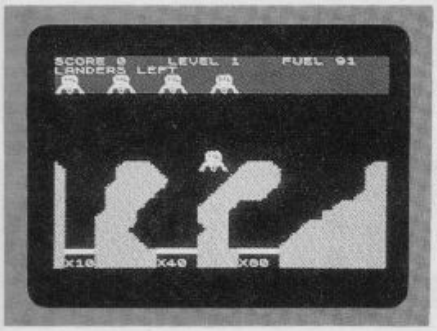
Lines 550-560 The machine code routine to run the program.

```
 570 DATA 358,175,398,398,329,426,184,188,251
,232,257,248,233,168,213,418,415,165,407,466,
478,426,405,187,251,303,349,380,279,139,362,4
16,339,183,182,380,409,402,466,418,263,190,40
9,392,409,466,478,372,196,238,233,363,418,316
,167,400,452,223,270,239,182,257,330,315,314,
328,179,226,392,203,218,420,365,363,336,154,4
32,351,364,464,417,345,363,251,476,289,143,39
1,279,200,233,333,343,244,478,464,464,464,464
,478,999
```

Line 570 This line contains the coded message from all of us here at *YS* to you lot out there. To alter the message, type your own Christmas greeting into the 'message coder' routine and then type its output into this line and type RUN.

LUNAR BUGGY

BY ROBERT STOCKTON



Here we see the first screen from *Lunar Buggy*, in which you have to land the space craft into one of the three bays. This done, you've to guide your buggy across the lunar surface, avoiding the various pitfalls en route and sniping the nasties.

This is a fast-moving graphic game for the 48K Spectrum — and it's packed full of all sorts of surprises!

You start off attempting to land your space craft in one of three landing bays that have been created on the lunar surface. One of the bays is fairly easy to land in, the other two are much more difficult . . . but, of course, you get more points for making a successful landing! The controls you use are simple: just keys '9' and '0' to move left and right respectively and '1' to thrust the craft skywards. You're a fuel guage in the top right-hand corner of the screen, and the amount of fuel you've left once you have landed is used to calculate your score — so use it sparingly.

Once you've made a successful landing, your craft is transported beneath the landing bay and you get into a moon buggy and drive off across the moon's surface in search of another moon lander. Along the way you'll find all sorts of hazards that you'll have to jump over using the '1' key. Once you've reached your destination, you start all over again . . . only this time it's much harder. The only thoughtful device you now have once you've gone past level two is a laser gun mounted on your moon buggy — you'll need that to deal with the troublesome aliens.

Lunar Buggy is like the old *Moon Lander* games but incorporating the more modern *Moon Patrol* theme. Making use of 42 (count 'em!) user-defined graphics, the program is a treat to look at.

```
1 INK 7:PAPER 0:BORDER 0:GO TO 8700
```

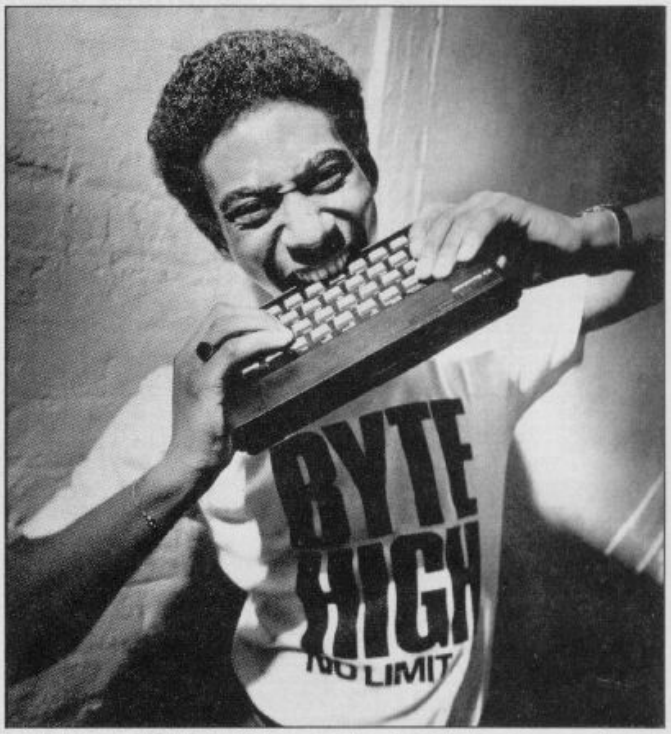
Line 1 Sets up the initial screen attributes and jumps to set up the user-defined graphics and the 'instructions' routine.

```
10 LET S=0: LET BUGGY=4
20 LET LEV=1: LET LAND=0
50 INVERSE 0: PAPER 0: INK 7: BORDER 0: CLS

60 GO TO 7000
```


THE SOFT-WEAR

NO SPECTRUM OWNER SHOULD BE WITHOUT



THE YOUR SPECTRUM T-SHIRT

Specially designed to slip over users of both the 16K and 48K machines, the *YS* T-shirt is the peripheral that costs a mere £4.99. Just fill in the form below, telling us how many you want, what colour you'd like (white, grey or black) and the size/s you require — then mail it off with a cheque or Postal Order for the correct amount (made out to Your Spectrum, please) and we'll do the rest. Send your orders to: *Your Spectrum T-shirt Offer, 14 Rathbone Place, London W1P 1DE.*

I want to look cool in a *YS* soft-wear peripheral! Please send me:

		black	grey	white	
.....	T-shirts	☐	☐	☐	small
.....	T-shirts	☐	☐	☐	medium
.....	T-shirts	☐	☐	☐	large
.....	T-shirts	☐	☐	☐	Xtra large

Name .....

Address .....

.....

..... Postcode .....

THOUGHTS & CROSSES

37 Market Street, Heckmondwike, West Yorks.
Telephone 0924-402337
Telephone orders 0924-409753

Title	Company	RRP	Ours
Evolution	Abbex	6.95	5.35
Sub-Hunting	Abbex	6.90	5.20
Golf	Abrasco	6.95	5.25
Enduro	Activision	9.95	8.95
Zenji	Activision	9.95	8.95
H.E.R.O.	Activision	9.95	8.95
River Raid	Activision	9.95	8.95
Ghost Busters	Activision	9.95	8.95
Football Manager	Addictive Games	6.95	6.25
Incredible Hulk	Adventure	9.95	8.95
Sorcerer of Claymorgue Castle	Adventure	9.95	8.95
Missile Defence	Aceing	6.95	5.35
Kong	Aceing	6.95	5.35
The Prize	Arcade	6.95	5.35
Red Riding Hood	Arrow	6.95	5.35
Enormous Tumip	Arrow	6.95	6.25
The Magic Shoe	Arrow	9.95	8.95
Mr Mens Day	Arrow	9.95	8.95
Nine Current Buns	Arrow	9.95	8.95
Pied Pide Ducks	Arrow	9.95	8.95
Goldilocks	Arrow	9.95	8.95
Chess II	Artic	6.95	6.25
Invaders	Artic	4.95	4.50
Golden Apple	Artic	6.95	6.25
Chess Tutor	Artic	6.95	6.25
Punch	Artic	14.95	13.00
Bear Bovver	Artic	6.95	6.25
Mr Wongs Loopy Launderette	Artic	6.95	6.25
Snooker	Artic	5.95	5.35
World Cup Soccer	Artic	6.95	6.25
Death Chess 5000	Artic	6.95	6.25
Eye of Ra	Artic	6.95	6.25
Hall of Rome	ASP	6.90	6.20
Chuckie Egg	A&F	6.90	6.20
BC Bill	Beaujolly	5.50	4.95
Beta Basin	Betasoft	11.00	9.90
Pharoah	Beyond	7.95	7.15
Lords of Midnight	Beyond	9.95	8.95
Birds and Bees	Bug-Byte	6.95	6.25
The Castle	Bug-Byte	6.95	6.25
Arcadia	Bug-Byte	6.95	6.25
Star Trader	Bug-Byte	7.95	7.15
Twin Kingdom Valley	Bug-Byte	7.95	7.15
Kung Fu	Bug-Byte	6.95	6.25
Tycoon	Bug-Byte	5.95	5.35
Masterfile & MF Print	Campbell Systems	19.95	18.00
French is Fun	CDS	9.95	8.95
Steve Davis Snooker	CDS	7.95	7.15
Soccer	Channel 8	7.95	7.15
Bear George	Cheetatech	6.95	6.25
Block Busters	Compusense	5.95	5.35
Superchess 3.0	CP Software	9.95	8.00
Pinball Wizard	CP Software	6.95	6.00
Bridge Player	CP Software	9.95	8.00
Bridge Tutor Beginner	CP Software	5.95	5.35
Bridge Tutor Advanced	CP Software	5.95	5.35
Commuter	CP Software	8.95	8.95
Logo & Floating Point Forth	CP Software	20.95	18.95
Floating Point Forth	CP Software	14.95	13.50
Supercode II	CP Software	9.95	8.95
Extended Basic	CP Software	9.95	8.95
Stagecoach	Creative Sparks	6.95	6.25
Blockhead	Creative Sparks	6.95	6.25
Deke Wing	Creative Sparks	6.95	6.25
Danger Mouse Double Trouble	Creative Sparks	6.95	6.25
Danger Mouse Black Forest	Creative Sparks	6.95	6.25
Olympics	DEL	5.95	5.35
Derby Day	DEL	5.95	5.35
Omega Run	DEL	5.95	5.35
Stargazer Secrets	DEL	5.95	5.35
Nim	DEL	5.95	5.35
Great Detective	DEL	5.95	5.35
War of the Worlds	DEL	7.95	7.15
Test Match	DEL	5.95	5.35
Hells of Things	Crystal	7.50	6.75
Kamikaze Revenge	Crystal	7.50	6.75
Invasion of the Body Snatchers	Crystal	6.50	5.85
Dungeon Master	Crystal	7.50	6.75
Cyber Zone	Crystal	5.50	4.95
Micro Olympics	Database	5.95	5.35
Dark Star	Design	7.50	6.75
Orbit Database	Dialogue	14.95	13.00
Fighter Pilot	Digital Integration	7.95	7.15
Night Gunner	Digital Integration	6.95	6.25
Tomahawk	Digital Integration	9.50	8.95
Metamorphs	DK Tronics	6.95	4.50
Monitor	DK Tronics	6.95	4.50
Maziacs	DK Tronics	6.95	6.25
Speed Duel	DK Tronics	6.95	6.25
Personal Finance	DK Tronics	6.95	6.25
Black Tower	Dollarsoft	9.49	5.85
Dracles Cave	Dorin	7.95	7.15
Queen of the Holy Grail	Dream	5.95	5.35
Dungeon Builder	Dream	5.95	5.35
Scuba Dive	Durell	6.95	6.25
Jungle Trouble	Durell	5.95	5.35
Harrier Attack	Durell	5.95	5.35
Kokotoni Wilf	Elite	5.95	5.35
The Pyramid	Fantasy	5.50	4.95
Doomsday Castle	Fantasy	6.50	5.85
Realm & Rgg Snatch	Fantasy	6.50	4.95
Bounty	Firebird	2.99	2.99
Skull	Games M/C	8.95	6.75
Ad Astra	Gargoyle	5.95	5.35
Tir Na Nog	Gargoyle	9.95	8.95
The Quill	Gilsoft	14.95	13.00
City of Sholkish	Goldstar	9.95	8.95
Mandy Mole	Greenlit Graphics	5.95	5.35
Wood Spell	Griffin	9.95	8.95
3D Seddo Attack	Hewson Consultants	7.95	7.15
Heathrow	Hewson Consultants	7.95	7.15
Nightflight I	Hewson Consultants	7.95	7.15
3D Lunar Attack	Hewson Consultants	7.95	7.15
Night Driver	Hewson Consultants	5.95	5.35
Fantasia Diamond	Hewson Consultants	7.95	7.15
3D Space Wars	Hewson Consultants	5.95	5.35
Avalon	Hewson Consultants	7.95	7.15
Hisoft Pascal	Hisoft	25.00	22.00
Ultrasat	Hisoft	9.43	8.50
Devpac 3	Hisoft	14.00	12.50
Stonkers	Imagine	5.50	4.95
Arcadia	Imagine	5.50	4.50
Molar Maul	Imagine	5.50	3.95
Ah Diddums	Imagine	5.50	4.95
Zaxxon	Imagine	5.50	4.95
Pedro	Imagine	5.50	4.50
Jumping Jack	Imagine	5.50	4.95
Alchemist	Imagine	5.50	4.95
Cosmic Cruiser	Imagine	5.50	4.95
Splat!	Incentive	5.50	4.95
Moviemore of Kel	Incentive	5.50	4.95
1984	Incentive	5.50	4.95
Millionaire	Incentive	5.50	4.95
Temple of Vran	Incentive	5.50	4.95
Final Mission	Incentive	5.95	5.35
Tau	Interceptor	5.50	4.95
Forest at World End	Interceptor	5.50	4.95
Defendo	Interceptor	5.95	5.35
Multi File	ISP	9.95	8.95
Screen Machine	ISP	9.95	8.95
Scope	ISP	17.95	16.20
Sales Ledger	Kamp	14.95	13.00
Purchase Ledger	Kamp	14.95	13.00
Stock Control	Kamp	14.95	13.00
Spanish Tutor A	Kosmos	9.95	8.95
Spanish Tutor B	Kosmos	9.95	8.95
Valhalla	Legend	14.95	13.00
Snowball	Level 9	9.90	8.90
Dungeon Adventure	Level 9	9.90	8.90
Colossal Adventure	Level 9	9.90	8.90
Adventure Quest	Level 9	9.90	8.90
Lords of Time	Level 9	9.90	8.90
Return to Eden	Level 9	9.90	8.90
Thunderbirds	Liversoft	9.95	8.95
Countdown	Longman	7.90	7.10
Confrontation	Lothlorien	7.95	7.15
Special Operations	Lothlorien	5.95	5.35
Johnny Reb	Lothlorien	5.50	4.95
Fleet	Lothlorien	6.95	6.25
Micro Mouse	Lothlorien	5.95	4.95
Tyrant of Athens	Lothlorien	5.50	4.95
Dreadnaughts	Lothlorien	5.95	5.35
Privateer	Lothlorien	4.50	4.05
Redoubt	Lothlorien	6.95	6.25
Odysseus of Hope	Martech	5.95	5.35
Olympiton	Martech	5.95	5.35
Eddie Kidds Jump Challenge	Martech	6.95	6.25
Combat Lynx	Martech	6.95	6.05
Megadonk	Martech	5.95	4.95
Classic Adventure	Melbourne House	9.95	6.25
4D Tanmi Tanti	Melbourne House	6.95	6.25
Mugsy	Melbourne House	6.95	6.25
Abersoft Forth	Melbourne House	14.95	13.00
Melbourne Draw	Melbourne House	9.95	8.00
Hung	Melbourne House	14.95	13.00
Hobbit	Melbourne House	14.95	13.00
Hampstead	Melbourne House	9.95	6.95
Sherlock	Melbourne House	14.95	13.50
Tutankhamen	Micromania	9.95	8.25
Pengo	Micromania	9.95	8.40
Cookie Kange	Micromania	9.95	5.35
3D Death Chase	Micromania	6.95	6.25
Codename Mat	Micromania	6.95	6.25
Haunted Hedges	Microdeal	8.95	6.25
Lunar Cradle	Microdeal	8.95	6.25
Full Throttle	Microdeal	9.95	6.25
Kamilla	Microdeal	8.95	6.25
Brave Skull	Microdeal	8.95	6.25
Jasper	Microdeal	8.95	6.25
Wheels	Microsphere	9.95	5.35
Dinamatic 2	Microsphere	14.95	12.00
Train Game	Microsphere	5.95	5.35
Air Traffic Control	Mikro-Gen	8.95	6.95
Pyjamarama	Mikro-Gen	8.95	6.95
Auto-Mania	Mikro-Gen	8.95	6.25
Mind Games	Mind Games	9.99	8.99
American Football	Mirrorsoft	8.95	8.00
Fred Stays with the Mi Men	Mirrorsoft	6.95	6.25
Quick Thinking	Mirrorsoft	6.95	6.95
Erik the Viking	Mikedo	8.95	6.25
3D Tunnel	New Generation	5.95	5.35
Trashman	New Generation	5.95	5.35
Travel with Trashman	New Generation	6.99	5.35
Machine Code Tutor	New Generation	14.95	13.00
Dana Tho' the Drinking Glass	NHS	5.50	4.95
White Lightning	Oasis	14.95	13.00
Spec Man Man	Oasis	14.95	13.00
Mind Games	Oasis	14.95	13.00
Mr Wimpy	Ocean	5.90	5.90
Satuno Riddle	Ocean	6.90	6.20
Royal Birkdale	Ocean	6.90	6.20
Digger Dan	Ocean	5.90	5.30
Pogo	Ocean	6.90	6.20
Hunchback	Ocean	6.90	6.20
Moon Alert	Ocean	5.90	5.30
Kong	Ocean	5.90	5.30
Cavelon	Ocean	5.90	5.30
Chinese Juggler	Ocean	5.90	5.30
Daley Thompson's Decathlon	Ocean	6.90	6.20
Ollegans Gold	Ocean	5.90	5.30
Pilgrim	Philpp	9.95	8.95
The Forest	Picturesque	7.50	6.75
Spectrum Monitor	Picturesque	7.50	6.75
Editor & Assembler	Picturesque	9.95	8.95
Factory Breakout	Pleasoft	5.50	4.95
Pandora	Print 'n' Plotter	8.25	7.40
Screen Machine	Print 'n' Plotter	8.25	7.40
Mission 1	Project Volcano	7.95	7.15
Hunter Killer	Protek	7.95	7.15
Aviator	Protek	5.95	5.35
Blade Alley	PSS	5.95	5.35
Frank n Stein	PSS	5.95	5.35
Moudor II	PSS	5.95	5.35
Electro Storm	PSS	5.95	5.35
Les Flics	PSS	5.95	5.35
The Black Hole	Quest	5.50	4.95
The Incredible Hulk	Quicksilva	9.95	8.95
Bugaboo	Quicksilva	6.95	6.25
Aquaplane	Quicksilva	6.95	6.25
3D Ant Attack	Quicksilva	6.95	6.25
The Snowman	Quicksilva	9.95	5.95
Fred	Quicksilva	6.95	6.25
Games Designer	Quicksilva	14.95	13.00
Zombie Zombie	Quicksilva	6.95	6.25
Defender	Quicksilva	6.95	6.25
Snagrabbers	Quicksilva	6.95	6.25
'97 Tank Duel	Realtime	5.99	5.35
Cash Controller	Richard Shepherd	8.95	5.35
Superspy	Richard Shepherd	8.50	5.85
Ship of the Line	Richard Shepherd	8.50	5.85
Androids Island	Richard Shepherd	8.50	5.85
Urban Upstart	Richard Shepherd	8.50	5.85
Transylvanian Tower	Richard Shepherd	8.50	5.85
Richard Shepherd	Richard Shepherd	8.50	5.85
Blue Thunder	R Wilson	5.99	5.35
Apocalypse	Red Shift	5.99	5.35
Shark Attack	Romik	5.99	5.45
Titanic	R & R	7.95	7.15
Orbiter	Silversoft	5.95	4.50
Ground Attack	Silversoft	5.95	4.50
Meteor	Silversoft	5.95	4.50
Cyber Rats	Silversoft	5.95	4.50
Armageddon	Silversoft	5.95	4.50
Robot Riot	Silversoft	5.95	4.50
Brain Damage	Silversoft	5.95	4.50
Semi Speedo	Silversoft	5.95	4.50
Freez' Bees	Silversoft	5.95	4.50
Entermorph	Silversoft	5.95	4.50
Mission Impossible	Silversoft	5.95	4.50
Unusual Things Happen at Sea	Silversoft	5.95	4.50
Collectors Pack	Sinclair	6.95	6.25
Horace & Spiders	Sinclair	6.95	6.25
Vu File	Sinclair	8.95	8.00
Vu Calc	Sinclair	8.95	8.00
Vu 3D	Sinclair	9.95	8.95
Backgammon	Sinclair	5.95	5.35
Flight Simulation	Sinclair	7.95	7.15
Small Business Accounts	Sinclair	12.95	11.60
Autobahn	Sinclair	14.95	14.00
Chequered Flag	Psion	8.95	6.25
Horace goes skiing	Sinclair	5.95	5.35
Early Punctuation	Sinclair	7.95	7.15
Speech Maths	Sinclair	7.95	7.15
The Apostrophe	Sinclair	7.95	7.15
Capital Letters	Sinclair	7.95	7.15
Alphabet Games	Sinclair	7.95	7.15
Castle Spellbound	Sinclair	7.95	7.15
Micro Printig	Sinclair	24.95	22.00
Hungry Horace	Sinclair	5.95	5.35
Match Point	Sinclair	9.95	8.95
Ring the Changes	Sinclair	8.95	8.25
Zeus Assembler	Sinclair	12.95	11.60
Musicmaster	Sinclair	9.95	8.95
Driller Tanks	Sinclair	5.95	5.35
Club Record Control	Sinclair	9.95	8.95
Cyrus is Chess	Sinclair	9.95	8.95
Learn to Read 1	LAdvantAfiler	9.95	8.95
Learn to Read 2	LAdvantAfiler	9.95	8.95
Learn to Read 3	LAdvantAfiler	9.95	8.95
Learn to Read 4	LAdvantAfiler	9.95	8.95
Learn to Read 5	LAdvantAfiler	9.95	8.95
Lunge	LAdvantAfiler	9.95	8.95
Glider	LAdvantAfiler	9.95	8.95
Spy Hunter	LAdvantAfiler	9.95	8.95
Spirit Editor	Softskills	3.50	3.15
Softalk	Softalk	5.95	5.35
Softpen	Softalk	5.95	5.35
Jasper's Creepers	Softalk	5.95	5.35
Revelation	Softalk	5.95	5.35
Jet Set Willy	Software Projects	5.95	5.35
Manic Miner	Software Projects	5.95	5.35
Automania	Software Projects	7.95	7.15
Olympics (H Database)	Storm	14.95	13.00
Tasmania	Taeman	5.95	5.35
Tasword Two	Taeman	13.80	12.50
Tasmerge	Taeman	14.95	13.00
Jack & The Beanstalk	Thor	5.95	5.35
Giant's Revenge	Thor	5.95	5.35
Mega Fruit	Thor	5.95	5.35
Jasper	Ultimate	5.50	4.95
Lunar Jasmin	Ultimate	5.50	4.95
Atic Atac	Ultimate	5.50	4.95
Traxx Arc	Ultimate	5.50	4.95
Entombed	Ultimate	5.95	4.95
Underwurlde	Ultimate	9.95	8.95
Knight Lore	Ultimate	9.95	8.95
Beach Head	US Gold	7.95	7.15
Strangelove	Virgin Games	6.95	6.25
Snooker	Visions	8.95	6.60
Android Two	Vortex	5.95	5.35
TLL	Vortex	5.95	5.35
Hewson	Wyvern	5.50	4.95

Please order stating make of computer, name, address & requirements

THETFORD MICROS

Service Department

21 GUILDHALL STREET, THETFORD, NORFOLK. Tel: (0842) 61645.

Why wait weeks to get your Spectrum back on your desk and working. We at Thetford Micros guarantee to repair your Spectrum in less than 24 hours, so from the time of you posting your micro to us it should (depending on the postman) be back with you within one week.

We pride ourselves in offering the quickest repair service available over a very wide area.

Repair charges are kept at a standard rate — any repair at £16.00 + VAT + £2.00 postage and package. So when problems occur just send your cheque, postal order, or your Barclaycard/Access number along with your faulty micro and we will do the rest.

We also undertake repairs of many other computers including Commodore, BBC, Electron, etc, prices on request.

We have in our shop a large selection of home computers, Sanyo MXS, Goldstar MSX, Spectrum the the Spectrum +, BBC, Electron, Commodore 64, Commodore C16, Memotec 500 + 512, all hardware and software plus much more in the accessory field.

So if you have any problems with your micro or need advice on any computer equipment, don't hesitate to telephone or call in and visit **Thetford Micros** and we will be happy to assist and advise you.

Lines 10-60 Set up the initial variables and attributes for the moon lander part of the game, then jump to the routine containing the screen details.

```
 100 REM SET UP LANDSCAPE
 105 POKE 23675,88: POKE 23676,255
 110 LET L$="iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
jiiiiiiiiiiiiiiiiiii
```

multiple of four, that is 'level/4-INT(level/4) then a larger bonus is awarded. The routine then moves to line 1500 for the next move.

```
1755 REM FIRE A SHOT
1760 FOR A=Y+4 TO 30: PRINT AT X+1,A;" o"
1780 BEEP .001,60: IF O$(C+A)<>" " AND LEV>2
AND X=17 THEN  LET S=S+10: LET O$(C+A TO C+A+
1)="  ": BEEP .1,-30: PRINT AT X+1,A;"    ": R
ETURN
1790 NEXT A
1800 PRINT AT X+1,31;" "
1810 RETURN
```

Lines 1755-1810 The routine to fire a shot from the buggy. This will only be of use after level two.

```
5000 REM LOSE A LIFE
5010 INVERSE 1: FOR a=24 TO 0 STEP -2: INK A/
4: BEEP .0005,a*2: PLOT y*8+a,(176-x*8)+8: DR
AW 0,-16: PLOT y*8,160-(x*8)+a: DRAW 24,0: NE
XT a: INVERSE 0: PRINT AT x,y;"    ";AT x+1,y;
"    ": INK 7
5020 LET C=1
5030 LET BUGGY=BUGGY-1
5040 IF BUGGY=0 THEN  GO TO 6000
5050 PRINT  PAPER 2;AT 2,BUGGY*5;"      ";AT 3
,BUGGY*5;"      "
5055 IF LAND=1 THEN  RETURN
5060 GO TO 1500
```

Lines 5000-5060 This routine comes into play once you have lost a life. Line 5010 blows the moon lander/buggy to smithereens, line 5040 checks you've still some lives in hand, line 5050 rubs out the lander from your score, and lines 5055 and 5060 return you to the part of the game in which you lost your life.

```
6000 REM GAME OVER
6010 PRINT AT 10,12; PAPER 2;"GAME OVER": BEE
P 1,-30
6020 BEEP 1,-50
6030 PRINT AT 11,8;"PRESS A KEY TO PLAY";AT 1
3,6;"PRESS I FOR INSTRUCTIONS"
6040 IF INKEY$="" THEN  GO TO 6040
6045 IF INKEY$="i" THEN  GO TO 9000
6050 IF INKEY$<>"" THEN  GO TO 6050
6060 RUN 3
```

Lines 6000-6060 The 'end of the game' routine. You'll be asked if you want to play again, and whether you want to see the instructions for play.

```
7000 REM LANDER
7005 POKE 23675,176: POKE 23676,254
7010 REM SET UP VARS
7020 LET X=4: LET Y=14
7030 LET V=.1: LET H=0
7040 LET FUEL=99
```

Lines 7000-7040 Set up the moon lander screen details. Line 7005 selects the first bank of UDG data.

```
7300 REM SET UP SCREEN
7310 PAPER 0: INK 7: BORDER 0
7320 CLS
7330 PRINT AT 0,0; PAPER 2;"SCORE ";S;"     LE
VEL ";LEV,AT 0,22;"FUEL ";FUEL,
7335 DIM A$(672)
7340 LET A$(311 TO )="          d      eaad
     eaad          eaa      aaaad       eaaaa
    aaa     eaaaab      eaaaab         aaa     aa
aab      eaaaab          eaaa     aaab      eaab
       eaaaaa    eaaa        aaa          aaaaaaa
   aaab       caa        eaaaaaaaa    aaad
eaa       eaaaaaaaaa    aaaad      aaa      eaaaa
aaaaaa■■■aaaaaa■■■■aaaa■■■■aaaaaaaaaaaX10aaaa
aaX40 aaaaX80 aaaaaaaaaa"
7350 PRINT AT 1,0;A$
```

Lines 7300-7350 Draw the screen. Lines 7335 and 7340 dimension aS to the size of the screen minus the top line (21 x 32 - 672). The screen is then filled with characters from element 311 onwards and, finally, aS is printed.

```
7355 PRINT  PAPER 2;AT 1,0;"LANDERS LEFT",,
7360 FOR A=1 TO BUGGY
7370 PRINT  PAPER 2;AT 2,A*5-5;"fgh  ",AT 3,A
*5-5;"ijk  ",
7380 NEXT A
```

Lines 7355-7380 Print the number of moon landers left as the actual characters used are two by three in size.

```
7500 REM PRINT AND MOVE LANDER
7510 LET CX=X: LET CY=Y
7520 LET V=V-((INKEY$="1" AND X>2)/10)
7525 IF V<.2 THEN  LET V=V+LEV*2/100
7530 LET H=H+((INKEY$="0")/10)-((INKEY$="9")/
10)
7550 IF Y>0 AND Y<29 THEN  LET Y=Y+H
7552 IF Y<=0 THEN  LET Y=1: LET H=0
7553 IF Y>=29 THEN  LET Y=28: LET H=0
7555 LET X=X+V
7556 IF X<4 THEN  LET X=4: LET V=.1
```

Lines 7500-7556 Variables CX and CY are used to contain the last position of the moon lander. The keyboard is then read and note is taken of the increase/decrease of the XY position and the change in velocity (V).

```
7570 PRINT AT CX,CY;"   ";AT CX+1,CY;"   ";AT
 X,Y;"fgh";AT X+1,Y;"ijk"
7575 LET FUEL=FUEL-.25: PRINT  PAPER 2;AT 0,2
7;INT FUEL;"  "
```

Lines 7570-7575 Erase the old moon lander and print it in its new position.

```
7580 LET B$=A$((INT (X))*32+INT (Y+1) TO (INT
 (X))*32+INT (Y+3))+A$(INT (X+1)*32+INT (Y+1)
 TO INT (X+1)*32+INT (Y+3))
7590 IF B$="      " THEN  GO TO 7500
7600 IF B$<>"   ■■■" THEN  LET LAND=1: GO SUB
 5000: LET LAND=0: GO TO 7000
```

Lines 7580-7600 Check if there's been a crash, or whether you've managed to land the moon lander successfully. If you've crashed then GO SUB 5000, if not the routine GO SUBs to line 7000.

```
7610 IF Y=1 THEN  LET B=10
7620 IF Y>8 AND Y<14 THEN  LET B=20
7630 IF Y>17 THEN  LET B=30
7800 REM BONUS
7810 LET X$="BONUS = "+STR$ INT FUEL+" X "+ST
R$ B
7820 FOR A=1 TO LEN X$
7830 PRINT AT 5,5+A;X$(A)
7840 BEEP .01,30
7850 NEXT A
7860 LET S=S+INT (B*FUEL)
7870 PRINT AT 0,6; PAPER 2;S
```

Lines 7610-7870 Calculate and print the bonus details — of course, this does rather depend on the landing position and how much fuel you've got left in the tank.

```
7875 BEEP .1,40: FOR A=1 TO 100: NEXT A
7877 PRINT AT 21,0;"a ■ aaaaaa ■■ aaaa ■■ aaa
aaaaaaa"
7878 PRINT AT 20,0;"a■■■aaaaaa■■■■aaaa■■■■aaa
aaaaaaa"
7895 REM LANDED
8000 FOR A=1 TO 11
8010 RANDOMIZE USR 3582
8020 PRINT AT 21,0;"a ■ aaaaaa ■■ aaaa ■■ aaa
aaaaaaa"
8022 NEXT A
8025 RANDOMIZE USR 3582
8026 PRINT AT 21,0;"a ■ caaaab ■■ caab ■■ caa
aaaaaaa"
8030 FOR A=1 TO 6
8040 PRINT AT 21,0;"a ■          ■■          ■■
     "; INK 1;"■■"
8045 RANDOMIZE USR 3582
8050 NEXT A
8060 PRINT AT 21,0;"aa■aaaaaaaaa■■aaaaaa■■aaaa
aaaaaaa"
```

Lines 7875-8060 The moon lander has landed, so the underneath of the landing bay is printed up on-screen. This is done using a call to 3582 of the ROM which scrolls the screen and attributes up one whole screen line.

```
8070 POKE 23675,88: POKE 23676,255: PRINT AT
19,22;"abc";AT 20,22;"def": POKE 23675,176: P
OKE 23676,254
```

Line 8070 Prints the buggy from the second bank of UDG data.

```
8090 FOR A=0 TO 18
8100 IF B=10 THEN  PRINT AT A,1;"   ";AT A+1,
1;"fgh";AT A+2,1;"ijk";AT A+3,1;"■■■"
8110 IF B=20 THEN  PRINT AT A,10;"   ";AT A+
1,10;"fgh ";AT A+2,10;"ijk ";AT A+3,10;"■■■"
8120 IF B=30 THEN  PRINT AT A,18;"   ";AT A+
1,18;"fgh ";AT A+2,18;"ijk ";AT A+3,18;"■■■"
8130 BEEP .1,A
8140 NEXT A
```

SAGA 1 EMPEROR

THE KEYBOARD FOR ZX SPECTRUM COMPUTERS

* **EASY FITTING**
* **PLEASURE TO USE**
* **LONG LASTING**

The Saga 1 Emperor, equipped with 67 keys, is a carefully designed replacement keyboard incorporating many special functions for the popular Spectrum Computer. For business or pleasure, the Emperor will make your computing time more productive and enjoyable. The SAGA 1 Emperor will enable you to use the Spectrum as a powerful programming tool easier and faster.

The style is easy:- for your benefit, the SAGA 1 Emperor has been designed to ensure that available Spectrum Peripherals will fit in the usual manner.

The assembly of the keyboard is simple — and fast. No soldering required, so that within just 5 minutes you can replace your current ZX Spectrum with the new SAGA 1 Emperor.

AND ALL THIS FOR JUST £54.95 (inc. VAT)

SAGA P.C.!
Your very own Personal Carrier, partitioned to neatly accommodate your Spectrum, Saga 1 Emperor and peripherals; Tape Recorder, Power Supply, Cables, manuals and cassettes. Of solid and attractive construction the P.C. is ideal for storing and transporting your computer accessories. The case uses a strong double stitched and bound Black Calf Vinyl with a tough thick ABS inner compartment, leather buckles and a strong handle. Only **£26.95** (inc. VAT).

DUSTCOVER
Another top quality product, this expertly produced long-lasting bound and sewn dustcover has been specifically designed for the SAGA 1 Emperor, which will keep everything looking neat and dust free. Only **£4.95** (inc. VAT).

SOUNDBOOST
Hear that keyboard click . . . with a SAGA SOUNDBOOST
The SAGA SOUNDBOOST is a tiny electronic circuit which considerably enhances the sound volume and quality of the Spectrum sound output. Adjustable from a whisper to a roar, the SOUNDBOOST provides added realism and excitement for games players and security for programmers (Hear that Keyboard Click!). No cutting, no soldering — just connect.
Only **£9.50** (inc VAT).

FLEXICABLE
Developed to relieve your Spectrum from the pressure of life, to fit your Spectrum and your add-ons taking the load with ease. By popular demand we now have two versions of the 9 inch FLEXICABLE available to suit your needs.
Male-Female FLEXICABLE — £12.45
Female-Female FLEXICABLE — £9.50
Convertor PCB — £2.95

THE COLLECTION

The latest addition to our product range is The Collection, providing you with three money saving action packed specials containing quality products — an ideal gift.

COLLECTION 1 — SAVE £10.00!!

r.r.p	£53.85
Our special price	£43.85
includes: Saga Personal Carrier	£26.95
Soundboost	£9.50
Dustcover	£4.95
Flexicable (M-F)	£12.45

COLLECTION 2 — SAVE £20.00!!

r.r.p	£108.80
Our special price	£88.80
Collection 1	£53.85
Saga 1 Emperor	£54.95

COLLECTION 3 — SAVE £30.00!!

r.r.p	£238.75
Our special price	£208.75
Collection 2	£108.80
48K Sinclair ZX Spectrum	£129.95

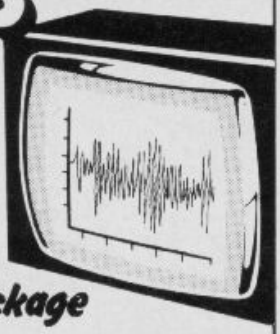
DISTRIBUTOR & TRADE ENQUIRIES CALL NOW ON WOKING (04862) 22922

Please write to: SAGA Systems Limited.
Dept. Woodham Road, Woking, Surrey
Telephone Woking (04862) 69527/22922
or Telex 859298
All prices include VAT
P&P free for Sound Boost and Flexicable.
P&P £1.25 for SAGA 1 Emperor U.K.
£4.00 for SAGA 1 Emperor Europe
£15.00 for SAGA 1 Emperor U.A.E.

Please send me
Name _____
Address _____
_____
The following SAGA PRODUCTS _____
_____
Total amount enclosed £ _____ YS
Please make CHEQUES/P.O. Payable to SAGA Systems Ltd.

SSL

SPECTRUM OWNERS



Turn your SPECTRUM into a synthesiser for just £7.95 with the 'SPECTRUM SOUND EFFECTS' software package

"Spectrum Sound Effects" is a user friendly, synthesised sound effect package for the 48K Spectrum. Over 2000 professional MACHINE CODE effects are readily available, and you can go on producing your own new effects 'to your hearts content'.

All sounds can (a) be played through the Spectrum's keyboard, (b) be easily saved to enhance your own programs with sounds never before heard from the Spectrum and (c) be plotted 'on screen'.

Effects vary from alien craft, lazer zap., U.F.O. to telephone, horse galloping, old jallopy and penny whistle, to name just a few.

Compatible with sound boosters etc. Full instruction manual included.

Totally microdrive compatible (instructions for transferring to microdrive included).

Available by mail order. Price of £7.95 includes UK carriage and VAT. (Overseas add 55p p&p per tape). Send cheque or postal order to:

M F M DATA SERVICES

M.F.M. DATA SERVICES LIMITED
(Dept. SA1) 141a CAMDEN ROAD, TUNBRIDGE WELLS,
KENT TN1 2RA. Tel: Tunbridge Wells (0892) 48832
Credit Card Hotline (0892) 48832

All tapes guaranteed against malfunction. 24 hour despatch.

POOLSWINNER

THE ULTIMATE POOLS PREDICTION PROGRAM

Boxed, with detailed instruction booklet

- **MASSIVE DATABASE** Poolswinner is a sophisticated Pools prediction 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 English and Scottish team names are in the program. Simply type in the reference numbers from the screen. Or use FIXGEN to produce fixture list automatically (see below).
- **DISC/MICRODRIVE COMPATIBLE** All versions (except Apple and IBM) are supplied on tape, with simple instructions for conversion to disc/microdrive operation.

(This seasons results are supplied with the package so that predictions can start immediately.)

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

PRICE £15.00 (all inclusive)

NEW

FIXGEN 84/5

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

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

COURSEWINNER V3

THE PUNTERS COMPUTER PROGRAM

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

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

PRICE £12.50 (all inclusive)

AVAILABLE (RETURN OF POST) FROM . . .

VISA phone 24 hrs

selec SOFTWARE

Access phone 24 hrs

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

Microdrive Microdrive Microdrive Microdrive Microdrive

NEW

ZX Spectrum and QL Microdrive Storage Box £5.95

- ★HOLDS 20 CARTRIDGES
- ★FULLY INTERLOCKING
- ★CENTRE SECTION FOR INDEX CARDS
- ★DESIGNED TO MATCH SPECTRUM AND QL

Transform Ltd has now produced a smart new **Storage Box** for the ZX Spectrum and QL

The Transform Microdrive **Storage Box** is attractively designed to match both the Spectrum and QL

It will hold 20 Microdrive cartridges (enough to store **1.6 megabytes** of data!)

The Microdrive Storage Box is fully interlocking and will allow you to expand your system with all the new programmes on microdrive as well as enhance the 'smart' efficient look of your office/study.

Simply write or telephone:

TRANSFORM LTD.

DEPT YS, 'SWATLANDS', LUCKS LANE
PADDOCK WOOD, KENT TN12 6QL 089 283 4783

For fast delivery quote your Credit Card/Access Barclaycard number

REGARDEZ

LANGUAGE LEARNING AIDS FOR FRENCH, GERMAN & SPANISH

FOR BBC(32K) · ELECTRON SPECTRUM (48K)

As used in numerous schools and colleges these programs provide a highly successful aid to modern language learning. Each cassette contains a sophisticated control program and a comprehensive series of vocabulary lessons which can be used in a variety of self-paced learning and test modes. Words, phrases etc are displayed with all necessary accents and special characters, different colours are used for masculine, feminine and neuter words to assist gender learning.

The programs are suitable for beginners, O-level and beyond as simple commands enable new lessons in vocabulary or grammar to be created by the user, edited as required, then permanently saved for later use. Invaluable for homework and exam revision!

Two cassettes are available for each language, together these contain a vocabulary of thousands of words; Level A provides 16 lessons in general subjects, Level B provides a further 16 lessons including adjectives, adverbs and fully conjugated verb lists.

Available from your computer store or by mail order Price £9.95
Also Available "ANSWER BACK General Knowledge Quiz" Price £10.95

kosmos
S·O·F·T·W·A·R·E

KOSMOS Software 1 Pilgrims Close Harlington DUNSTABLE Beds LU5 6LX
Telephone (05255) 3942

Please supply the following programs

The French Mistress	Level A @ £9.95 ☐	The French Mistress	Level B @ £9.95 ☐
The German Master	Level A @ £9.95 ☐	The German Master	Level B @ £9.95 ☐
The Spanish Tutor	Level A @ £9.95 ☐	The Spanish Tutor	Level B @ £9.95 ☐
ANSWER BACK Quiz	(Senior) @ £10.95 ☐		

I have a BBC/Electron/Spectrum computer (delete as necessary)

Mr/Mrs/Miss.....

Address.....

.....

..... Post code .....

I enclose a cheque/postal order for £ _____ payable to KOSMOS Software

KOSMOS SOFTWARE
1 Pilgrims Close, Harlington, DUNSTABLE, Beds. LU5 6LX

TAPE COPIER 6
(new)
MICRODRIVE 1
(plus disc/waferdrive transfer

Make your essential BACK-UP copies with our second generation copier TC6. It copes with the vast majority of programs, with new UNIQUE advanced features. 48k Spectrum only. Makes your old copier redundant?

- Deals with fast loaders + converts them to normal speed for drive transfer.
- LOADS in program parts CONTINUOUSLY — even when there is no sound gap, short tone leaders, false headers, etc, making the process simple and effective. User friendly.
- Copes with v.long programs (say 65000+ bytes).
- Extra features. e.g integral header reader, pause, delete, abort, repeat copies, FULL manual.
- M/Drive — this extra option GENUINELY copies BASIC, M/CODE + arrays onto MICRODRIVE, alters program names, etc.
- Updates for old customers £3, (£3.50 with m/drive) old tape and SAE
  TC6 £5.00 (WITH M/DRIVE OPTION £6.00)

MICRODRIVE ONE (MD1)

48k Spectrum owners with m/drive can NOW transfer the MAJORITY of their programs (inc headerless, long programs, + those with LOW addresses — say 16384).
TC6 transfers the bytes, but MD1 has 5 programs to help you do the conversions to get them running + 2 "CAT" housekeeping programs. The manual has examples/exercises and we believe this widely acclaimed program (together with TC6) gives you an unrivalled opportunity for you to fully utilise your m/drive. Try it and see for yourself.
MD1 (MD1X for disc or Waferdrive owners) costs a mere £6.50.
ALL PRODUCTS CARRY OUT MONEY BACK GUARANTEE.
OVERSEAS customers: add £1 Europe, £2 others for each product.
Please send SAE for enquiries.

LERM, DEPT YS,
10 BRUNSWICK GDNS, CORBY, NORTHANTS.

on·off
re·set
switch
for
spectrum

- No more crashing from worn power supply socket
- Does not affect expansion port and use of interfaces
- Just pushes into position does not affect spectrum or power supply lead.
- No need to remove once in position.
- Ergonomically designed — no more fumbling with power supply leads.
- Positive rocker action prevents accidental operation.
- Ideal for re-setting rom cartridge games — saves time when changing microdrive cartridges.

£4.95

I enclose a cheque/postal order for £_____payable to TEC Publications 24 Victoria Road, Bromsgrove, Worcs.

Name_____

Address_____

_____

Dealer Enquiries Welcome. Telephone (0527) 74567

FOX YOUR SPECTRUM

WITH THE

ULTIMATE IN JOYSTICK INTERFACES

"IS VERY CLEVER AND PROVIDES THE EASIEST INTERFACE ON THE MARKET TO USE"

SINCLAIR USER FEBRUARY 1984

- ★ Complete compatability with all programs.
- ★ In-built memory to store up to 16 different keysets at one time.
- ★ Battery back-up so no loss of memory after power off (battery recharged during use so no replacements are required).
- ★ Full casing.
- ★ Full through port for further expansion.
- ★ Proven compatability with the Microdrive.
- ★ Built in pseudo ROM facility with room for personal tool kit.
- ★ Compatible with all Atari type joysticks.
- ★ Compatible with Quickshot II Rapid Fire.
- ★ One switch only for simplicity of use.

ONLY **£28.95**

NO NEED TO REPROGRAM FOR EACH GAME JUST FLICK THE RESET SWITCH AND SELECT A NEW GAME KEYSET FROM THE MENU. IT'S SO SIMPLE, NO TAPES TO LOAD, NO LEADS, IT'S ALL IN ITS MEMORY!!

SPECIAL OFFER

OR BUY THE INTERFACE ABOVE WITH THE

QUICKSHOT I JOYSTICK ONLY £32.95 OR QUICKSHOT II £36.95

SPECTRUM UPGRADES

(ISSUE 2 AND 3)

16K to 48K

THE KIT REVEIWED AS *"THE EASIEST TO FIT"*

SINCLAIR ANNUAL

Full instruction supplied with this simply inserted kit, a high quality kit at a LOW! LOW! price.
(Please state issue 2 or 3 when ordering).

ONLY **£23.00** INCL.

NEW! NEW! NEW! SPECTRUM KEYBOARD

THE CHEETAH 68FX1, AN ALL NEW VERY HIGH QUALITY PRODUCT WITH

★ Full size querty keyboard ★
★ Numeric pad ★
★ Compatible with Microdrive ★
★ Accepts Interface 1 and Interface 2 (without modification) ★
★ Simple to fit ★
★ Sixty eight keys ★

A SUPERB NEW KEYBOARD ONLY £67.95 INCLUSIVE

SEND NOW TO:

FOX ELECTRONICS LTD
FOX HOUSE
35 MARTHAM ROAD
HEMSBY
GREAT YARMOUTH
NORFOLK NR29 4NQ
TEL: 0493 732420

PLEASE SEND ME
INTERFACE ☐
QUICKSHOT I + INTERFACE ☐
QUICKSHOT II + INTERFACE ☐
UPGRADE ☐
KEYBOARD ☐

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

Barclaycard/Access Number

Lines 8090-8140 Cause the moon lander to move down 18 lines of screen, one at a time, until it reaches the bottom.

```
8170 POKE 23675,88: POKE 23676,255
8190 FOR A=20 TO 15 STEP -1
8200 PRINT AT A,31;" "
8210 BEEP .1,1
8220 NEXT A
8230 FOR A=21 TO 28
8240 PRINT AT 19,A;" abc";AT 20,A;" def"
8245 BEEP .01,20
8250 NEXT A
8260 CLS
8270 GO TO 100
```

Lines 8170-8270 This routine moves the buggy across the screen into the moon buggy position at line 100.

```
8500 REM BLAST OFF
8510 POKE 23675,176: POKE 23676,254
8520 PRINT AT 17,27;"fgh";AT 18,27;"ijk"
8560 PRINT AT 10,10; INK 2;"BONUS = 5000": BE
EP 1,30
8565 LET S=S+5000
8566 FOR A=1 TO 50: NEXT A
8570 FOR A=16 TO 3 STEP -1
8580 PRINT  INK 8; PAPER 8;AT A,27;"fgh";AT A
+1,27;"ijk";AT A+2,27;"   "
8585 BEEP .01,2
8590 NEXT A
8595 CLS
8600 GO TO 7000
```

Lines 8500-8600 The routine to blast the moon lander off into space.

```
8700 REM SET UP UDG'S
8710 RESTORE 8800: CLEAR 65199
8715 PRINT AT 10,10;"PLEASE WAIT"
8720 FOR A=65200 TO 65535
8730 READ X: POKE A,X: BEEP .001,RND*20
8740 NEXT A
8750 GO TO 9000
```

Lines 8700 8750 Set up the UDGs. Note that this is different to the normal method as 42 characters have been defined — twice as many as you would normally expect. These are addressed as two banks of 21 UDGs by changing the system variable UDG(23675). Line 8750 just causes a jump past the data and isn't usually required.

```
8800 DATA 85,170,85,170,85,170,85,170,85,170,
84,168,84,168,64,128,85,170,85,10,5,10,5,0,64
,128,64,168,84,168,85,170,1,2,5,42,21,170,85,
170,0,1,3,3,3,3,3,1,171,255,117,37,85,116,255
,255,0,128,192,192,192,64,192,128,3,7,15,30,2
4,56,40,80,85,255,255,165,90,36,36,24,192,224
,240,112,24,28,20,10,0,0,64,224,248,134,177,2
33,0,0,0,0
8810 DATA 0,32,159,96,213,127,255,224,79,31,5
7,127,179,255,255,124,41,187,131,199,24,252,2
54,15,230,240,60,254,0,0,3,6,15,30,21,58,0,0,
192,224,112,184,220,172,53,123,119,234,221,17
1,223,255,94,174,126,174,247,107,255,255,207,
0,0,0,0,0,0,0,194,199,143,154,181,234,213,127
,64,224,248,134,177,233,179,255,0,0,0,32,159,
96,24,252,255,224,207,223,217,25,31,15
8820 DATA 255,108,57,171,187,131,131,1,254,15
,231,247,54,52,240,224,128,192,192,224,240,25
2,254,255,1,3,3,7,15,63,127,255,157,255,255,2
55,255,255,255,255,129,195,227,231,231,247,25
5,255,0,0,194,199,143,154,181,234,0,0,64,224,
248,134,177,233,0,0,0,0,0,32,159,96,213,127,2
55,224,79,31,57,127,179,255,255,124,41,187,13
1,199,24,252,254,15,230,240,60,254,0,0,3,6
8830 DATA 15,30,21,58,0,0,192,224,112,184,220
,172,53,123,119,234,221,171,223,255,94,174,12
6,174,247,107,255,255,207,0,0,0,0,0,0,0,0
```

Lines 8800-8830 Comprise the data for the two sets of UDGs. It may seem a lot of data to pump in . . . but the results are well worth it!

```
9000 REM INSTRUCTIONS
9010 PAPER 0: INK 0: BORDER 1: CLS
9020 PRINT TAB 10;"LUNER BUGGY"
9030 PRINT  OVER 1;AT 0,10;"          "
9040 PRINT '"PROGRAM BY ROBERT STOCKTON"
9050 PRINT '"BUGGY UGG'S BY ANDRE TABRIZIFAR"
9060 PRINT '"The object is to first land you
rmoon lander and get to your moonbuggy.Then y
ou have to get to  the next moon lander in y
our  luner buggy."
9070 PRINT '"To do this use keys-"
9080 PRINT "9-Left   0-Right"
9090 PRINT "1-Thrust or jump"
9100 PRINT "2-Fire(only the buggy has a gun)T
he buggy jumps higher the  further forwar
d you are."
9110 PRINT "Good Luck Press a key to play"
```

Lines 9000-9110 Print the instructions using black INK and black PAPER. (If that seems a bit silly, check out the next routine — it really does make sense!)

```
9120 FOR a=175 TO 0 STEP -1
9130 PLOT 0,a: DRAW  OVER 1; PAPER 7;255,0
9140 NEXT a
```

Lines 9120-9140 This routine draws white lines 'OVER' the whole screen — thus, the instructions are made to materialise as if by magic.

```
9150 IF INKEY$="" THEN  GO TO 9150
9160 IF INKEY$<>"" THEN  GO TO 9160
9170 GO TO 2
```

Lines 9150-9170 Wait for a key to be pressed.

PROGRAMMING ON SPEC

Programs submitted for publication in *Your Spectrum* have a tendency to suffer a number of common faults — simple little quirks which can be rectified easily.

Our major gripe is that the display is often messy and untidy. A screen can be made so much more legible if it is well-formatted — if spaces are left between lines of text and words are not split from line to line. And while we're on about screens, if you display something like the current score or whatever, do remember that labelling it makes all the difference — the whole effect becomes more user-friendly (to use a rather hackneyed phrase). Other suggestions for improvements are:

1. Use the 'PRINT #1;' statement to allow you to print on the bottom two lines of the screen.
2. Use INKEY$ for simple inputs which only require a single key response.
3. Check that answers to any questions within a program are valid.
4. If long calculations are carried out within the program's operation don't let the user sit there idly twiddling thumbs, print a message such as 'please wait — I'm thinking'. Or even better, give the user something to read, such as the instructions for playing the game, while the calculation is being undertaken.
5. Write major sections of your program as subroutines, and label them with REM statements explaining what they all do. It is always useful to place a REM statement after a GO SUB call, for instance.
6. If your program is written in machine code, or contains a machine code routine, then provide a checksum for the data so that the unwary typist will realise their mistake before it's too late. An Assembly listing accompanying the code would also be useful.
7. Write your listings in as structured a form as you can manage, as this will help other programmers to improve and/or modify them.

Above all, think of all the annoying aspects of listings you've experienced in your programming career — and make sure they don't happen in your programs. That said, the standard of contributions to *Your Spectrum* have been extremely high. So, if you want to see your name *YS*, then we want to see your programs — remember, we pay better than most, but they've got to be good! YS

Please send any programming contributions to:
Gavin Monk, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

CLASSIFIED INFORMATION

CALL DAVID BASKERVILLE FOR RATES AND DETAILS ON ADVERTISING

SUPERIOR SPECTRUM TAPE COPIER

The NEW 007 SPY is the ONLY copier capable of copying even a full 48K Headerless program.

- Copies multipart programs all in one Loading, automatically.
- Copies programs from 1 to 65279 bytes long. (Can yours)?
- Copies Headerless files upto a full 48K. **(No other copier can).**
- Copies ALL types, Basic, Code, Screen, Arrays, Headerless.
- Guaranteed easiest to use.

007 SPY IS JUST £3.95
Europe + 50p Other areas + £1.50
(Please order as 007N)

ZX-GUARANTEED (Dept SPU)
29 Chadderton Drive, Unsworth,
Bury, Lancs. BL9 8NL
Tel: 061-766 5712

THE MICRO WORKSHOP
12 STATION APPROACH
EPSOM, SURREY

We stock software and hardware for a range of home computers, including BBC, Spectrum, CBM 64, Memotech, Amstrad, etc.
COMPUTER SPECIALISTS
Visit us or ring for friendly service. See and try before you buy. Export orders welcome
● **REPAIRS UNDERTAKEN** ●

SPECTRUM KOPYKAT

Simply the best. Copying **any** of your 16/48K Spectrum programs is as easing as LOADing & SAVEing.
Only £4.95
It can even copy itself

NEW
MICRODRIVE KOPYKAT

Transfer your cassette based software onto the ZX Microdrive. **RELOCATES** programs. Stops and reveals programs. **ESSENTIAL** tool for Microdrive transfer.
Only £4.95
Both with **FREE** Header Reader.
Despatched by Return of Post.

MEDSOFT
PO Box 84, Basingstoke, RG25 2LW

SPECTRUM 48K
MAKE HOME VIDEOS

on ordinary C10 cassettes, WITH YOUR OWN TUNES!
Post them to friends who have 48K Spectrum.
Full animation and editing of every sequence including tunes . . . you get it right.
Order cassette 'MCA' £7.00 incl.
Also morse-code reading progs for Spectrum and ZX81-1K. s.a.e. for details.

Pinehurst Data Studios, 69 Pinehurst Park, West Moors, WIMBORNE, Dorset BH22 0BP.

MICRODRIVE TRANSFER TAPE

At last MAJORITY of your software can be transferred to Microdrive, even auto-start commercially made games WILL run as intended.

- The **NEW 007 MD** cassette enables you to also transfer Headerless programs.
- Includes an intelligent Header Reader which tells **you** if any special actions required.
- Does **not** require an additional Help tape.
- Semi-Automatic. Fully automatic systems have proved limited.

How it works: Copies Code to the Microdrive using its push-button copier. **You** make a few very easy changes to the Basic loader part. Save it to Micro-drive, and magic, **instant success.**

007 MD is just £5.95
(Europe + 50p Other areas + £1.50)
Special Offer: Membership of the **Microdrive Exchange** Newsletter club plus 007 MD for just £10.
(Or on cartridge for £15).

ZX-GUARANTEE (Dept SPU)
29 Chadderton Drive, Unsworth,
Bury, Lancs. BL9 8NL
Tel: 061-766 5712

EDUCATION and HOME MANAGEMENT SOFTWARE

for 16K and 48K ZX Spectrums (with or without Microdrives)

MULTI-CHOICE EXAMINATION: a suite of programs that allows you to write your own exams to test the knowledge of others (CSE, 'O', 'A' level, C&G). It can also be used as a quiz game. Min. 16K. Price includes EXAM program and a datafile editor program . . £11
MULTI-CHOICE EXAM DATAFILES: pre-written exams for the above (send S.A.E. for list of subjects) . . . . . £3 each
BANK ACCOUNT MANAGEMENT: keep a day-by-day check on your deposit and current bank account balances, building society account, etc. Can handle up to 40 separate accounts . . . . . ONLY £4.50

The above programs support the use of Microdrives and are supplied on cassette (supplied on Microdrive cartridge on request). All prices include P + P (in U.K.) and VAT.

MADE-TO-ORDER CABLE SERVICE

Printer cables (series, parallel), Video Recorder leads, Computer to Video leads, Cassette leads, TV Extension cables (place your computer at a comfortable viewing distance from your TV), Plug adaptors, etc. — made to YOUR specifications. Prices from £3.

S.A.E. for full details to:

D.G.R. Computer Products, Dept. 3.
29 Martin Crescent, Tonyrefail,
Mid. Glamorgan, South Wales, CF39 8NT.
Tel: (0443) 676 676 — 7 days a week until 8p.m.

HEARING IS BELIEVING
Tele Sound
SPECTRUM BEEP BOOSTER

TELESOUND is ready built and tested so that you can get the full sound of your Spectrum through any standard television set, black and white or colour. The unit is easy to fit in minutes without any previous experience as full fitting instructions are provided.

TELESOUND has been designed using the very latest ultra miniature components so it's size is an incredible 1 x 1.3 x 1cm. and fits neatly inside the Spectrum. Three easy push on connections are made to the Spectrum. The connections are clearly shown in a diagram that comes with full fitting instructions.

TELESOUND FEATURES

- SOUND AND VISION TOGETHER FOR GAMES PLAYING
- KEEP VOLUME CONTROLLABLE FROM A WHISPER TO A ROAR
- KEYWORD (SEE CLASSIC BOARD TO ASSIST PROGRAM ENTRY
- PROGRAMS CAN BE HEARD WHEN BEING SAVED – NO UNLOCKING OR LESS GETTING ACHIEVED
- ADDITIONAL AMPLIFIER NOT NECESSARY – SEPARATE POWER SUPPLY NOT REQUIRED
- YOU NO MONEY IS WORRIED WITH ALL PROBLEMS – COMPATIBLE WITH ALL OTHER ADD ONS INCLUDING MICRODRIVES

TELESOUND comes complete with easy to follow fitting instructions and costs £9.95 inclusive of post, packing etc. Please state your computer when ordering.

COMPUSOUND

DEPT: SU10 38-39 LANGLEY CLOSE, REDDITCH, WORCS. B98 0ET. TELEPHONE: (0527) 21439 (21439 Answerphone).

SPECTRUM CABINET
Convenience with a touch of class

An elegant aluminium and plastic cabinet finished in matt black with gold flashing:- accommodates the Spectrum + Interface 1, 2 Microdrives and power adaptor complete with mains isolating switch. All components remain in original cases therefore the guarantees are not invalidated.
Price, including VAT and postage: £24.50
Please write to:

S.R.A. DEVELOPMENTS LTD
BREMRIDGE FARM, ASHBURTON, S. DEVON TQ13 7JX
TEL: (0364) 52426

CONTRACT BRIDGE
SPECTRUM 48K and COMMODORE 64

Complete Contract Bridge single-handed against your Spectrum or Commodore 64. Random hands. Unsurpassed bidding and play. Full scoring. Unlike others, this takes the game seriously.
Did you know our major rival cannot even play as declarer?!! Here you play exactly as you would with friends.....if you want. Otherwise, choose amazing options not in lesser programs:

- Define your own hands
- Display everyone's cards
- Make computer bid or play for you
- Lay down a hand
- Re-bid or replay any hand
- Change sides
- Bid all four hands yourself
- Play all the cards yourself

It must be good to offer so much. Why settle for less? Send or phone today.
£9.95 (cheque or Barclaycard or Access) fully inclusive. Only available direct from us, by return.

CONTRACT BRIDGE – the definitive name on the definitive game.
HIGHLIGHT SOFTWARE
3 Nether Court, Halstead, Essex CO9 2HE. Tel. (0787) 475714

YOUR SPECTRUM DOES NOT CONDONE SOFTWARE PIRACY

CLASSIFIED INFORMATION

CALL DAVID BASKERVILLE FOR RATES AND DETAILS ON ADVERTISING

MICRO WORK SHOP

★ JOYSTICKS
★ DISKS
★ KEYBOARDS
★ RAMPACKS
★ TAPES
★ LIGHTPENS

AND MANY OTHER ACCESSORIES FOR YOUR COMPUTER. WE STOCK MOST POPULAR BRANDS INCLUDING BBC, SPECTRUM, AMSTRAD, COMMODORE 64 ETC.

EXPORT ORDERS WELCOME

REPAIRS UNDERTAKEN

273 MOTSON LANE
MOTSON, MANCHESTER
LANCS M10 9WJ

SPECTRUM ARCADE GAMES FOR ONLY £2.99

Yes it's true . . . we are offering 2 super arcade games for the Spectrum at an unbelievable low price of £2.99. Just look at the first two titles in our new low price high value range.

1) **'ZAPPER' 48K SPECTRUM . . .**
This fantastic game has to be seen to be believed . . . If you have nimbie fingers, lightning reflexes, and don't give up easily when given a challenge then this one's for you . . . Just look at these features . . .
60 WAVES OF 60 DIFFERENT ANIMATED ALIENS . . .
Everything from invaders to faulty TV sets, to baked bean cans, manic perfume bottles, in fact just about everything you ever had a nightmare about is in this super game bent on your destruction. If you can reach level 60 then we would like to hear from you . . . 100% machine code with super smooth graphics and ultra fast action .....only £2.99

2) **'FLIPWIND' 48K SPECTRUM . . .**
This must be the ultimate experience in fruit machine games on any computer . . . This fast action game has all the features found on the real thing. Holds, nudges in both directions, swapping of reels, full size graphics, gambles, etc, etc, this one has the competition beaten.....only £2.99

Only available by mail order from:

Ancosoft (Dept Y1)
25 Corsewall Street, Coatbridge, ML5 1PX.

For return of post delivery, please send uncrossed P. Order

SPECIAL AGENT DE-LUXE SPECTRUM COPIER

A multi-purpose yet extremely easy to use tape copier. Ideal for the experienced or absolute beginner.

★★★★★ 5 STAR RATINGS ★★★★★

1. Copies multipart programs all in one Loading.
2. Copies Basic, M/Code and even the Headerless programs upto 51K.
3. Cannot be fooled by weird names or false Headers. (Other copiers would crash).
4. Can remove Autostart from Basic.
5. You can determine Pauses between sections if desired.

Once you've experienced this super DE-LUXE silk smooth copier, you'll never want to use any other.

£5.95

KERR
24/25 High Street, King's Lynn, Norfolk PE30 1BP

Software Exchange

Bored with your present software? Then swap it via our club for something to suit your tastes in programs

- Spectrum & Dragon
- Discount offer
- FREE club membership
- Huge program base

SAE please for details

UK SEC (Y.S.),
15 TUNWELL GREAVE,
SHEFFIELD S5 9GB

HACKERS

Reached a Dead End? Want to know the tricks of the trade? Then you need the **Prowler Pack**. Get to the heart of unstoppable Spectrum software with a package which enables **You** to stop and list all programs, even M/C. This access allows you to modify and examine listings. Included are full, easy instructions and an excellent back-up copier, free. Really get to know your software this Xmas with ths 4 program package, only £5.95 from:

PRIDE UTILITIES
7 Chalton Heights, Chalton, Luton, Beds.

DATA-SAVE

If you own a 16/48K SPECTRUM you cannot afford to be without this program. **DATA-SAVE** ensures that you produce top quality BACK-UP tape copies of ALL types of programs & data files with **ABSOLUTE SIMPLICITY.**

Advanced features include: Continuous Loading, Saving & Verifying of single & **MILTIPART** programs up to 41.8K. MENU DRIVEN with comprehensive On-Screen information.

Programs up to a massive **48,900** bytes in length can easily be transferred & **VERIFIED** using the unique DATA 48.9K facility (highest program address is 65303).

Interface one is compatible but doesn't require the use of Microdrive.

Also included FREE **CHARACTER GENERATOR** Program. (Create & Save your own Sprite designs.)

Send cheque/PO for £6.00 to:

GREENBANK SOFTWARE
2A Curzon Park, South
Chester, Cheshire, CH4 8AB

MICRODRIVE CARTRIDGE STORAGE

AT LAST, A LOW-PRICE ANSWER

Strong plastic box with lid holds 12 cartridges with label end up to select. Neat fit. No wasted space. **ONLY £2**

SHOP WINDOW DISPLAY
WINDOW - EXHIBITION - POINT OF SALE

48K Spectrum two window TV display, your set banner message below scroll up to 100 lines of data above, input data, add, insert or erase lines vary scroll speed. Change banner message, alter in seconds, as your stock moves. Menu driven. All instructions built in. Load and save to cassette or microdrive.

£10 on cassette £15 on microdrive cart

Cheques etc. to: G. Thomson
THOMSON DATA
MORRISBANK
DEANS ROAD, BATHGATE
WEST LOTHIAN, EH48 1JU

All prices include post and packing

SPECTRUM REPAIRS

We expertly repair Spectrums for £15 inclusive of parts, labour and return postage. Spectrums upgraded to 48K for £24 including post.

All keyboard faults cost only £10.

R.A. ELECTRONICS
50 Kimberley Road,
Lowestoft, Suffolk.
Tel: (0502) 66289

MICROBASE

SPECTRUM 48K

COMBAT LYNX	7.55
SHERLOCK HOLMES	12.70
ZAXXON (US GOLD)	6.75
DANGERMOUSE (DOUBLE TROUBLE)	5.90
AVALON	6.70
DEUS EX MACHINA	12.70
KOKOTONI WILF	4.95
DECATHLON (DALEY)	6.55

Many more programs available for Spectrum (CBM 64) all at discount prices.

Write or phone for a price list and send cheque or P.O. to:

MICROBASE YS12, PO BOX 28,
NEWCASTLE NE3 1NG.
TEL: 091-285 9855 (24hr)

ZX-81 & SPECTRUM REPAIRS ADD ON SPECIALISTS MOST COMPUTER COMPONENTS SPECTRUM REPAIRS £15.

Why do Spectrum users from London, Devon, Essex and other places send their micros to us for repairs?

Average price £15.00

- **Only company in UK** offering while you wait service.
- Or 24 hour turn around. Every micro insured from return journey.
- Phone or send for free estimate Enclosing £1.60 UK, I.O.M. EIRE C.I.
- **No hidden handling charges**
- Special rates for schools

MANCOMP LTD (Dept YS)
Printworks Lane, Levenshulme
Manchester M19 3JP
Tel: 061-224 1888.

CHIMERA
19 TOY STREET • BRIGHTON • EAST SUSSEX BN1 4EL
TEL: (0273) 60808

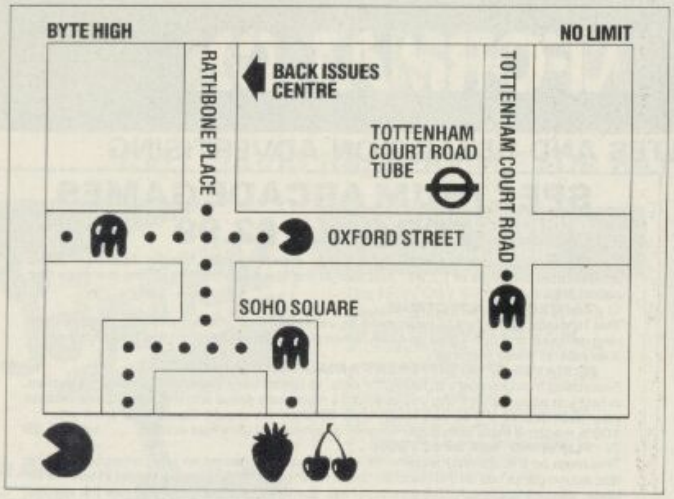
Jewellery from the Darkside

DEATHS HEAD pendant. (95mm across) £10.

Send S.A.E. for illustrated price sheet of other nightmarish pewter pendants!

Dealers enquiries welcome.

YOUR SPECTRUM DOES NOT CONDONE SOFTWARE PIRACY



BACK ISSUES BLITZ

You can now obtain any back issue of *Your Spectrum* simply by filling in the coupon below and enclosing £1.10 for each issue you require. A complete selection of back issues of *Your Spectrum* is available from our shop in London's West End, two minutes' walk from Tottenham Court Road tube station. As well as saving you the postage and packing charge, a visit to the shop will allow you to see the extensive range of computer books we carry.

The shop is open Monday to Friday 9.30am to 5.30pm. The address is 14 Rathbone Place, London W1P 1DE.

VOL 1/1 (DEC/JAN 1984)

REVIEWS
Currah's MicroSpeech, general computing books, joysticks.

FEATURES
Speech synthesis, Toni Baker's machine code break-out, Spectrum communications, DIY keyboard buffer, machine code scrolling.

GAMES
Chess packages.

VOL 1/4 (JUNE 1984)

REVIEWS
Spectrum disk drives, QL roadtest, adventure programming books.

FEATURES
DIY joystick interface, synthesiser control, *ZIP* compiler [pt. 2], colour simulation screendumps.

GAMES
Hacker's review plus full map of *Jet Set Willy*.

VOL 1/5 (JULY 1984)

REVIEWS
British Micro's Grafpad, DIY computing books.

FEATURES
Computerised bulletin boards and modems, software for printer interfaces, *ZIP* compiler [pt. 3], DIY joystick interface.

GAMES
Gilsoft's *The Quill*.

VOL 1/6 (AUGUST 1984)

REVIEWS
Spectrum toolkits, games programming books.

FEATURES
Hacking into *Jet Set Willy*, explosion routines, *ZIP* compiler [pt. 4], files on Microdrive, DIY Centronics interface [pt. 1].

GAMES
Ultimate's *Sabre Wulf*.

ORDER YOUR BACK ISSUES NOW!

Please send me the following back issues of *Your Spectrum* (£1.10 each including postage and packing).

☐ Issue 1/1 ☐ Issue 1/6 ☐ Issue 1/8 ☐ Issue 1/9
☐ Issue 1/4 ☐ Issue 1/5

Issue 2,3 and 7 are now sold out, so don't waste your time ordering them!

I enclose a cheque/Postal Order for £_____ made payable to Sportscene Specialist Press Ltd.

Name_____

Address_____

_____ Postcode_____

Date_____

Please fill in this form and mail it immediately to:
Your Spectrum, Back Issues, 14 Rathbone Place, London W1P 1DE.
You can use a photocopy of this form if you don't want to deface your issue.

VOL 1/8 (OCTOBER 1984)

REVIEWS
Graphics toolkits, programming languages books.

FEATURES
Microdrive recovery, Project 3 revisited, multi-tasking your Spectrum, *YS MegaBasic* [pt. 1].

GAMES
Vortex's *TLL*.

VOL 1/9 (NOVEMBER 1984)

REVIEWS
The Spectrum+, Spectrum speech synthesisers.

FEATURES
Spectrum and QL link, *YS MegaBasic* tutorial.

GAMES
Frank N Stein, Astronut, Monty Mole, Lords of Midnight and *Sherlock*.

ONLY £129.95 INC. VAT & POSTAGE

How much would you expect to pay for a dual 128K fast access storage system for your Spectrum that included Centronics and RS232 interfaces and free word processing software as standard?

Chances are it's a lot more than £129.95. But this is what will buy you the incredible Rotronics Wafadrive unit. There are no extras – this price includes VAT and postage.

A fast reliable dual-drive storage system

Integrated System

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

Fast and Reliable

The Wafadrive achieves very fast loading and saving, but not at the expense of reliability. Extensive research and the use of high grade materials ensure that the Wafadrive will give years of dependable operation. Data integrity is on a par with floppy disk. The fully interchangeable wafers are available in three sizes – 128K, 64K and 16K. Low capacity wafers give faster access. They are therefore most suitable for program development applications. The high capacity wafers are suitable for more general data storage. Loading rate is well over ten times as fast as cassette!

Software

Armed with the comprehensive user manual, blank wafer and word processor supplied, you can use your Wafadrive straight away. There is also a rapidly growing range of software to enable the programmer and games player to exploit the Wafadrive system to the full.

Wafadrive for the 16/48K Spectrum is available now. Versions for other popular home computers are under development.

Send a 16p stamp for a full colour brochure and information on software and accessories.

FOR USE WITH THE SINCLAIR SPECTRUM

YS 12

Please send me (enter as appropriate):

___	ROTRONICS Spectrum Wafadrive(s)	@ £129.95 each	___
___	16K wafer(s)	@ £3.45 each	___
___	64K wafer(s)	@ £3.65 each	___
___	128K wafer(s)	@ £3.95 each	___
___	Heathrow/Nightflite II (48K: Hewson)	@ £14.95 each	___
___	Space Wars/Seiddab Attack/Luna Attack (48K:Hewson)	@ £14.95 each	___
___	Bear Bovver/Wong's Loopy Laundry/ World Cup (48K:Artic)	@ £9.95 each	___
___	Starbike (48K:Softek)	@ £7.95 each	___
___	The Artist – graphic utility (48K:Softek)	@ £9.95 each	___
___	ZAP machine code development package (48K:Hewson)	@ £19.95 each	___
___	RS232 lead	@ £9.95 each	___
___	Centronics lead	@ £9.95 each	___

All prices include VAT and P&P — TOTAL £ ___

☐ I enclose a cheque/PO* made payable to SMT

☐ debit my Access/Barclay card* account no.

(*delete as applicable)

Signature: ___

Name: ___

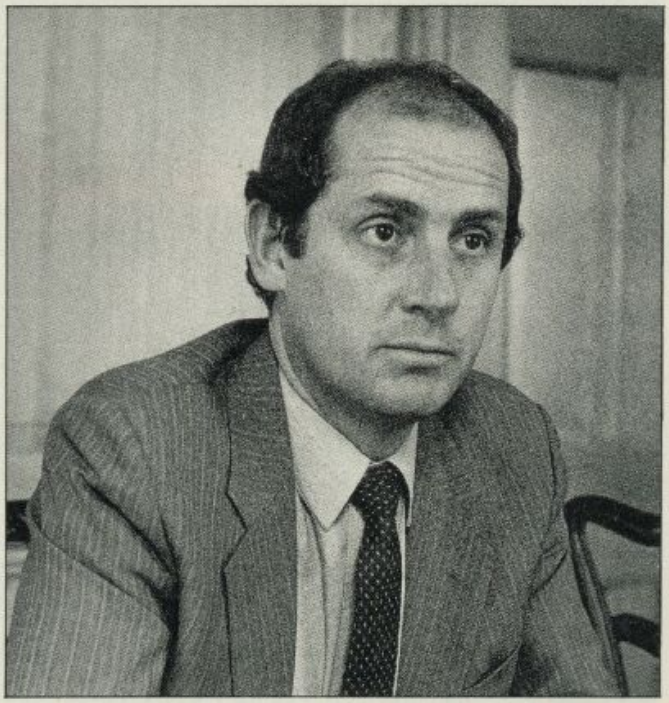
Address: ___

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

Please allow 28 days for delivery.

ACCESS VISA

SMT



THE SECRET THAT WAS SPECTRUM+

A SUE DENHAM EXCLUSIVE!

Just days after the launch, Sinclair Research's MD* Nigel Searle *explains the thinking that's gone into the ZX Spectrum+.

Pulling the wool over the computing industry's eyes isn't the easiest of tasks, but Sinclair Research seems to have managed just that over the past four months. Indeed, they may have given many magazine editors a justifiable opportunity to dredge up that old chestnut, 'hold the front page!'.

So, how did the news of the new machine remain so secret? "Well, for a start, it's amazing that it did stay so quiet for so long. A couple of weeks before the Spectrum+ was announced, one of our staff — I won't name names as I wouldn't want to embarrass him — left a whole load of promotional material in the back of a taxi.

"Another lucky break was the codename we chose for the Spectrum+ project. The chief designer of the machine was a Ford Thunderbird fanatic — so the in-house codename was 'TB'. Of course, if you were discussing the project and an outsider started listening in, it was easy enough to turn the conversation into one on TV!"

Moving on to the initial plans for the Spectrum+, how would you counter criticisms that it's not the upgrade everyone was hoping for? "We first started talking about the Spectrum+ back in June, although when the original Spectrum was launched we were very careful not to date its name — even though its in-house working title was the ZX82. The Spectrum is strong enough in the games market, but we were keen to upgrade it for 'adult' users — and that meant adding a proper keyboard.

"As for including the two interface devices and possibly a Microdrive into the design — yes, it's something we thought of. The reason we didn't do it was twofold — to begin with, our research showed us that sales of Interfaces 1 and 2 were comparatively small and it didn't seem commercial sense to offer a more expensive machine that only 25 per cent of users wanted. Our company also has to consider the price war that'll happen — just as it did in the States — and it's important we can match the competitiveness of other home micros in the market.

"It's also a matter of production. At the moment, we're producing something like 200,000 Spectrum boards a month — but it's at a relatively late stage in development that we actually have to say whether it will turn out as a Spectrum+. As far as we can tell at the moment, the Spectrum+ seems to be outselling the Spectrum about two to one . . . but it's early days yet.

"Obviously, once we've turned production purely to the Spectrum+ — or rather, I should add, *if* we turn production solely in that direction — we will have the opportunity to make alterations to the basic design and incorporate other features, such as a built-in Microdrive, Interface 1 and joystick port."

Steering the subject back to the gaffe about the Spectrum+ production, how long can we expect to see the Spectrum gracing the high street shelves, and what, pray, has happened to the 16K Spectrum? "Let me first say that there are no definite plans to stop manufacturing Spectrums. I forsee the Spectrum being in the market just as long as software houses keep writing *good* software for it. As far as the 16K version is concerned, it's still available from us — but the retailers don't want to distribute it through the shops. Computer users in this country want the extra 32K memory, especially as most of the software is written for the 48K machine. Of course, overseas sales are a different matter entirely — for example, we had an order from France the other day for 19,000 ZX81s; I couldn't sell 19 in the UK!"

What's the industry reaction been to the Spectrum+? "I can't imagine that the add-on keyboard manufacturers are very happy. I doubt the Spectrum+ will affect their sales in the near future — there are too many Spectrums around — but long-term sales must look pretty bleak. One thing we're thinking of doing is to allow hardware manufacturers to buy empty Spectrum+ cases from us and then offer an upgrading service for Spectrum users.

"As you know, our company has been giving software away with our computers. That idea came from Clive who, on hearing any notion that's half-sensible, has a knack of coming up with a way of making it work, however outrageous the original suggestion. I thought we'd have a lot of people after our blood, especially chain stores like WH Smiths who've shelves full of the same product for sales that we're *giving* away. However, everyone was very reasonable — I suppose no-one loses out."

And what of the future? "We're now in a position to offer two competitive machines in the home market and, of course, the QL in the business market. In the future, we'll be using the 'ZX' as the logo for our home computers and 'QL' for . . . err, machines other than home computers."

On a final note, what would the managing director of Sinclair Research like for a Christmas present? "What I'd really like to have is the name of the person who sabotaged my chair at the QL launch. Sitting in my cushioned chair, waiting for Clive to finish his introduction so that I could kick off the proceedings, I became aware that the chair was absolutely soaked. Someone had filled the cushioning with a few gallons of water so that it looked perfectly alright before you sat in it — but as soon as you did . . . well, need I say more? When I stood up to make my speech, I had rivers of water pouring down my legs. Just give me his name, that's all, and I'll be a happy man over Christmas." YS

Editor Roger Munford; **Deputy Editor** Tina Boylan; **Technical Editor** Peter Shaw; **Editorial Consultant** Andrew Pennell; **Software Consultant** Gavin Monk; **Contributors** John Torofex, Tony Samuels, Trevor Marchant, Ross Holman, Dave Nicholls, Roger Willis, Ian Beardsmore, Martin Evans, Robert Stockton, Max Phillips, Terry Bulfib, Mike Leaman, Toni Baker; **Art Editor** Hazel Bennington; **Art Assistant** Steve Broadhurst; **Group Advertising Manager** Jill Harris; **Advertising** David Baskerville; **Typesetters** Carlinpoint; **Group Art Director** Perry Neville; **Publisher** Stephen England; **Published by** Sportscene Specialist Press Ltd, 14 Rathbone Place, London W1P 1ED. **Telephone (all departments)** 01-631 1433. **Telex** 8954139 BunchG. **Reproduction** Graphic Ideas, London; **Printed by** Chase Web Offset, St Austell, Cornwall; **Distribution** Seymour Press, 334 Brixton Road, London SW9. Telephone 01-733 4444. All material in *Your Spectrum* © 1985 Felden Productions, and may not be used in whole or in part without the written consent of the publishers. *Your Spectrum* is a monthly publication.

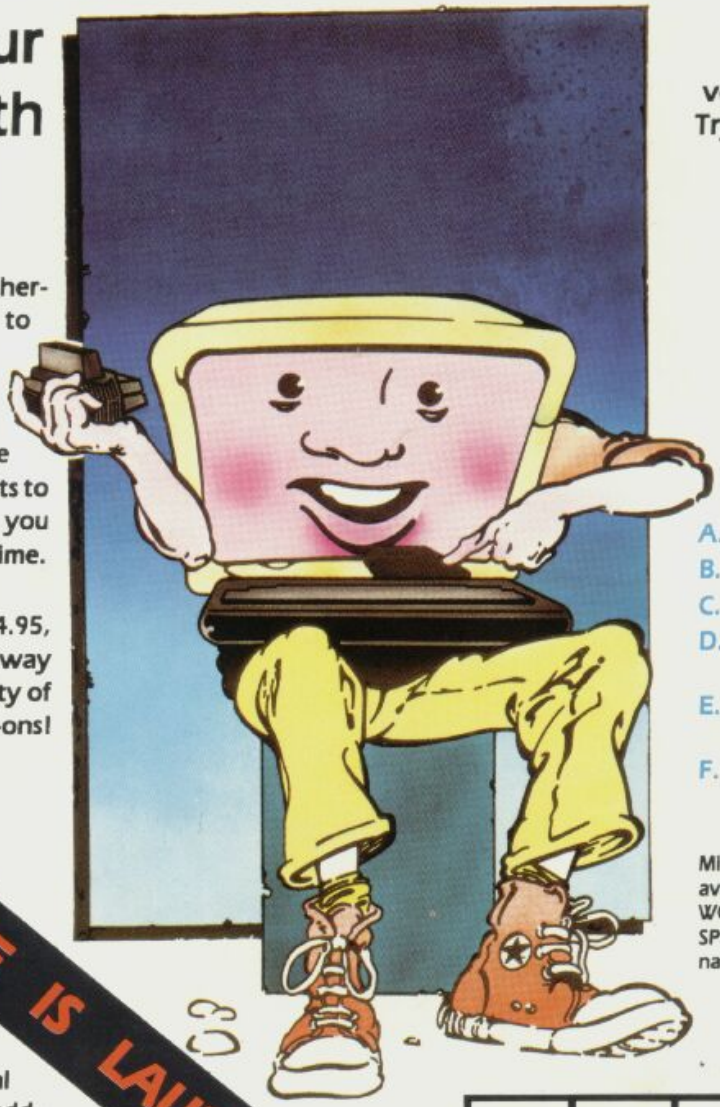
DO YOU WATCH TELEVISION WITH THE SOUND TURNED OFF?

Bring life to your graphics with sound, the needed dimension to games and educational use of the Spectrum. Microspeech is easy to use and allows you to incorporate voices and sound prompts within your software and games. With simple allophones and intonation you can add an extra dimension.

Expand your Spectrum with Microslot!

Microslot is a two-way mother-board elegantly designed to allow you the freedom to incorporate as many add-ons as you wish. The sound construction will give you the scope to add further Microslots to take all the peripherals you require, and all at the same time.

Priced at just £14.95, Microslot is the gateway to flexibility of add-ons!



Software publishers appreciate the need for voice messages and speech. Try some of the top selling games like "LUNAR JETMAN" from Ultimate.

Send off now for details of all the software available with speech!!

A.	Microspeech	£29.95
B.	Microslot	£14.95
C.	Microsource	£44.50
D.	Microspeech & Microslot	£35.50*
E.	Microsource & Microslot	£49.95*
F.	Microsource & Microspeech & Microslot (Bumper Pack)	£79.99*

Microspeech, Microslot & Microsource are available from COMET, W.H. SMITH, BOOTS, WOOLWORTHS, GREENS, JOHN MENZIES, SPECTRUM STORES and good dealers nationwide, or by using the coupon below.

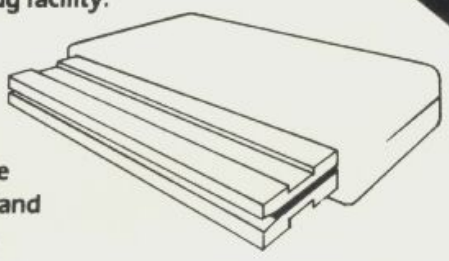
Information on all products can be obtained from: Currah Computor Components Ltd., Hollymount, Wooler Road, Hartlepool, Cleveland TS26 0HA

* D, E, F only available at these prices direct from Currah.

MICROSOURCE IS LAUNCHED!

FORTH, Assembler and Debug to ZX Spectrum

Microsource is Currah's radical new concept in computer add-ons. Microsource allows you to enter Assembler and FORTH source languages directly into BASIC lines and run these separately or layered together in an integrated BASIC / FORTH / Machine Code program. Microsource also features full macro assembly and a comprehensive Debug facility.



At £44.50, Microsource will be an indispensable ally to all those who wish to progress to more advanced languages for the production of ultra fast and highly compact programs.

CURRAH

To: Currah Offer, P.O. Box 1, Gateshead, Tyne & Wear, NE8 1AJ

Please Supply ☐ A at £29.95 ☐ B at £14.95 ☐ C at £44.50

All prices include VAT and P&P ☐ D at £35.50 ☐ E at £49.95 ☐ F at £79.99

Name (please print) .....

Address (please print) .....

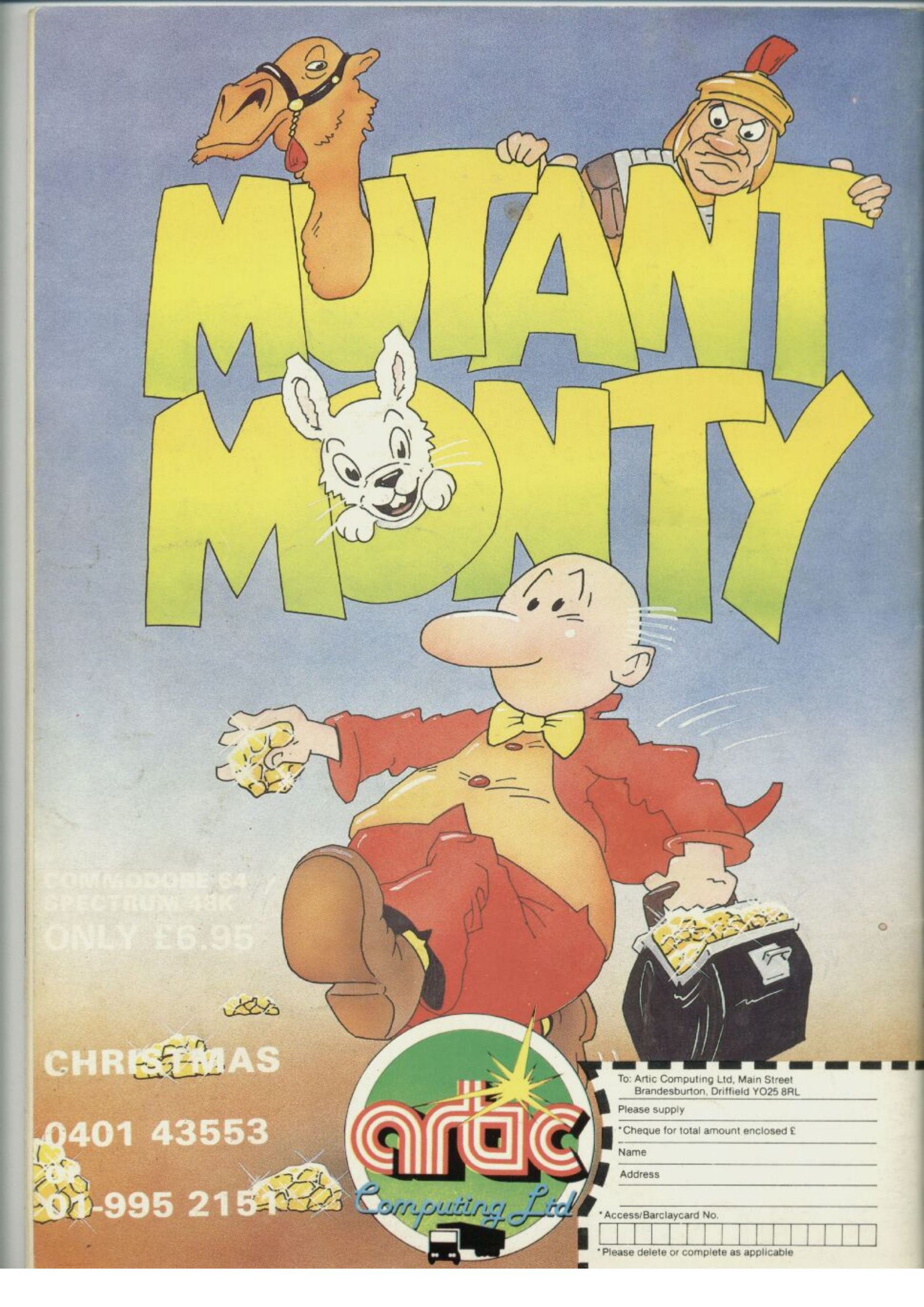
Postcode .....

I enclose a cheque/PO payable to 'Currah Offer' value £ .....

or debit my Access/BarclayCard No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Cardholder Signature .....

Credit Card Hotline 091 - 482 4683 Please allow 28 days for delivery. Offer valid UK only


MUTANT
MONTY
COMMODORE 64 /
SPECTRUM 48K
ONLY £6.95
CHRISTMAS
0401 43553
01-995 2151
arc
Computing Ltd
To: Artic Computing Ltd, Main Street
Brandesburton, Driffield YO25 8RL
Please supply
*Cheque for total amount enclosed £
Name
Address
*Access/Barclaycard No.
*Please delete or complete as applicable