

# AMSTRAD

# COMPUTER

# USER

THE OFFICIAL AMSTRAD CPC MAGAZINE

November 1990  
£1.45

## POLE POSITION

RACE FOR THE CHEQUERED FLAG WITH ACCOLADE'S EPIC GRAND PRIX CIRCUIT EXTRAVANGANZA

## DREAM DRIVING

UNDER 17? NO PROBLEM - A SENSATIONAL DAY OF EARLYDRIVE DRIVING LESSONS AT BRANDS HATCH IS UP FOR GRABS IN OUR FAB COMPETITION.

## CARTOON MAYHEM

GET TO GRIPS WITH TURRICAN IN OUR FANTASTIC NEW GAME LEVEL WALK-THROUGH

## COPY CATS

HOW TO MAKE THE MOST OF YOUR 24 PIN PRINTER WITH THE LATEST UTILITY FROM SEVEN STARS.



9 770952 304013

RED HOT BUMPER GAMEPLAN  
13 GREAT GAMES INSIDE

ATARI ST  
AMIGA  
IBM P.C. AND  
COMPATIBLES

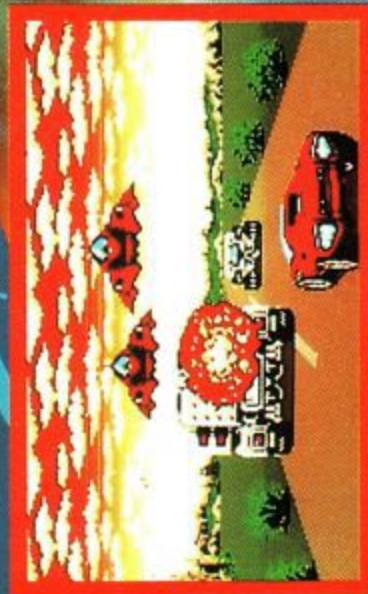
THE ARCADE EXPLODES!

AMSTRAD CPC  
SPECTRUM  
COMMODORE 64  
SEGA

# FIRE & FURY™

THE DEATH CONVOY

As the pilot of an all powerful combat vehicle, you are engaged in the hot pursuit of terrorists. Go into combat and be confronted by enemies as different in their appearance as in their combat techniques. The ability to take to the air will be your strength, use this to outmanoeuvre the enemy. Pick up weapons, ammunition and fuel. You'll have to work your way through the entire convoy and destroy the leading vehicle, before the ULTIMATE EXPLOSION.



NUCLEAR threat... Stop. DESTROYER CONVOY detected... Stop. Wipe out the TERRORISTS... Stop. Scientists in DANGER... Stop. IMMEDIATE ACTION!... End of transmission.



**QUICK REFLEXES, SPEED, INGENUITY AND NERVES OF STEEL ARE REQUIRED TO OBLITERATE THE OPPRESSOR.**

**SUPER FAST 3D ACTION.  
15 INGENIOUS MUSICAL SCORES.  
50 DIFFERENT TYPES OF ENEMIES.  
5 SQUAD LEADERS TO DESTROY.  
BONUS LEVELS  
A MULTITUDE OF ARMS AND AMMO  
LAND AND AIR COMBAT.**

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**TITUS  
A R C A D E**

**A FABULOUS  
ADAPTATION  
OF THE  
ARCADE GAME**



# BrunWord

## BrunWord 6128 £30

BrunWord 6128 is a complete word processing package with word processor, spelling checker and card filing programme. BrunWord 6128 out performs all other word processors for the CPC6128. It has its own high speed screen routine, giving it a very fast screen response and the editor features are logically arranged to be easy to learn. The spelling checker, with its dictionary, load into memory at the same time as the word processor, making access very convenient and exceptionally fast. It is supplied with an introductory tutor file.

### BrunWord Features

\*40, 80 or 128 column display. \*Touch typing speed over 200 words/min. \*True insert or overwrite. \*Justify or unjustify paragraph or whole text. \*Justified text has balanced appearance. \*Instant word wrap. \*Block save, move, copy, insert and delete. \*Local editing with word delete/undelete. \*Adjustable margins and TABs. \*Column/Line/Page display with file name. \*True word count. \*Find and replace. \*Help menus. \*Memory filing system. \*Single character embedded printer commands (18 with 3 codes and 21 with 10 codes). \*Page throw markers. \*Multiple copies. \*Odd/even page headers/footers with page numbers. \*Multi file printing (new page or continuous). \*Print specified pages. \*Works with any printer. \*True display superscript and subscript numbers. \*User defined print characters. \*Load/Save ASCII files from/to other word processors. \*Files can be encrypted. \*Maximum file size about 9 pages of text.

### BrunSpell Features

\*Memory resident. \*Checks 4,000 words/min. \*30,000 word dictionary. \*No American spellings. \*Add up to 5,000 of your own words. \*Instant lookup. \*Helps to find correct spelling. \*Automatic correction.

### DataFile Features

\*Alphabetical, numerical, date sorting. \*User defined headings. \*Search routine. \*Data merging. \*Label printing.

## Free Booklet

Our 16 page free booklet explains all about our programmes. No need to write a letter, just send a large (A4 size) SAE to 'BrunWord & Printer', Brunning Software, at the address below.

## Comparisons

We have tested BrunWord 6128, Protex and Tasword 6128 with the same file of 3366 words.

The first test was to compare the scrolling speed of the screen, using line by line scrolling. This is a vital performance test as the CPC6128 tends to be naturally slow at this task. BrunWord scrolled 40% faster than Protex which in turn scrolled 19% faster than Tasword.

Protex was the fastest to justify but used a simple process that added spaces at the centre of each line, giving the middle of the text a bulging appearance. It did not display as it went along and so needed a separate operation to see the result. BrunWord displayed as it justified and produced the best appearance of all three. BrunWord was 30 times faster than Tasword.

Our simulated typing test achieved 218 words per minute. Both BrunWord and Protex had no trouble at this speed but Tasword was very slow inserting text into the start of a paragraph and could only handle 16 words per minute.

The spelling test checked all 3366 words. BrunSpell took 52 seconds and needed no disc changes. Prospell took 6 min 24 sec and needed 8 disc changes. Taspell took 18 min 46 sec and needed 3 disc changes.

## Info-Script £50

Info-Script is a complete data processing package and includes all the features of BrunWord 6128 and BrunSpell. The word processor and database can be resident together giving the speed and convenience of access to both programmes with no disc delays.

### Database Features

\*Very fast (e.g. takes 1 second to search 2000 addresses for surname 'Smith', initial 'B'). \*Specific field search and/or progressive general search. \*Instant sort on any field, alphabetical, numerical, date or reverse order (takes no time as the data does not move). \*3 sets of user defined headings for each file. \*4 markers for instant selection, plus one temporary marker. \*Markers can be cleared or inverted and any pair can be added (allows complex searches to be quickly and easily performed). \*No setting up of field type or length. \*Efficient storage. \*Relational records, Parents, Sons and Daughters. \*Simple field to field arithmetic with running total. \*Direct data merging into BrunWord. \*Easy direct label printing, 1 across, 2 across, left of 2 or right of 2. \*Single or multi-step.

### Data Merging Features

\*Simple intelligent system, &N &A &D construct full name, full address and date. \*&1 &2 etc specify individual fields. \*Insert or fixed format merging. \*Automatic justify after merging. \*Single step (see before printing) or multi-step. \*Stop any time, go to word processor, restart same place. \*Merge data from several records for summary, invoice, purchase order etc. \*Simple arithmetic. \*Running total. \*Running VAT total. \*Conditional loading. \*Conditional printing. \*Repeat patterns.

## Quotes

*"It may seem that I have just written a very long advert for BrunWord 6128 but I haven't, I'm just so impressed."* (Phil Craven, ACU Feb 90, page 25).

*"One such is Peter Brunning's BrunWord 6128 which is without doubt in my mind, the most powerful and friendly word processor available for the 6128 today, with the possible exception of.... BrunWord Elite!"* (David Dorn, ACU July 90, page 43).

## BrunWord Elite £55

Most word processors, including BrunWord 6128, are able to drive both daisy wheel and dot matrix printers. This creates the need for a style of printer control that is acceptable to two very different types of printers. BrunWord Elite does not have this restriction as it is specifically written to be used only with dot matrix printers. This gives it a unique advantage over other word processors and as a result it is able to provide much more advanced printer control. This is taken even further, as BrunWord Elite is supplied with an 8 Bit Printer Status Port which allows the programme to continuously monitor the status of the printer, (and provides the missing 8th bit for the original CPC6128). This enables the programme to respond in a more sophisticated way than normally possible. It will wait for ON LINE or <ESC> if the printer is initially OFF or OUT OF PAPER but automatically returns to the editor if the printer is turned OFF.

## 24 Pin Fonts

Before we designed the fonts for BrunWord Elite, we studied several good magazines. Finline and Finetype are our variations of the two styles commonly used. Finline is supplied in 3 sizes and Finetype in 2 sizes. To these we added a display font in computer style and a straightforward 'Heavy' font. Altogether there are 7 fonts supplied, 4 are full 24 pin, 2 are middle size 21 pin and one is a small size 16 pin font.

## BrunWord Elite Features

BrunWord Elite has all the features and speed of BrunWord 6128 and BrunSpell, plus:-

\*Print in columns \*Specify page layout \*Use special high quality proportional fonts \*Use advanced micro justification with proportional text \*Set printer margins independently \*Move print head up or down paper, specified in inches from top \*Set micro line spacing within text \*Print line or box by specifying size and line thickness \*Use absolute TABs with proportional text \*Download a file directly from disc during printing. \*Can be supplied with Info-Script for data merging.

## Headline

Headline is a print enhancement utility for use with low cost 9 pin printers. It enables virtually all the features of BrunWord Elite, including the 24 pin fonts, to be used with any 9 pin Epson compatible printer with quadruple graphics (that's all well known modern 9 pin printers). Features include micro justification of proportional text, single, double or eight times height and 1 to 9 times width.

## How They Compare

	BrunWord 6128 & BrunSpell	Protex Disc & Prospell	Tasword 6128 & Taspell
Typing into 241 word paragraph	218 w/m	218 w/m	16 w/m
Typing into start of text	218 w/m	218 w/m	150 w/m
Scroll to end, line by line	1 min 27 sec	2 min 2 sec	2 min 25 sec
Justify paragraph of 241 words	1 sec	0.2 sec	34 sec
Change appearance to format and Appearance to Format	17 sec	17 sec	53 sec
Spelling check 3366 words	52 sec	6 min 24 sec	18 min 46 sec
Average speed	3883 w/m	526 w/m	179 w/m
Disc changes	None	8	3
Spelling help 'NECESERY'	1 sec	12 sec	Not possible
Spelling check word at cursor	0.5 sec	Not possible	Not possible
Screen format - columns	40, 80, 128	40 or 80	80 only
Page boundaries	Shown	Not shown	Shown

## 9 Pin Elite

The Elite system for 9 pin printers consists of BrunWord Elite, BrunSpell, Headline, 8 bit printer status port and 7 'type setting' fonts (fonts are 24 pin in size but only for 9 pin printers). Total price £55.00 inclusive.

## 9 Pin Elite+Info

The Elite system as above but including Info-Script and a backup disc. Total price £92.00 inclusive.

## 24 Pin Elite+Info

BrunWord Elite, BrunSpell, Info-Script, back up disc, 8 bit status port and 7 'type setting' fonts for downloading to a 24 pin printer. Total price £90.00 inc.

Send cheque/PO/Access number/Visa number to:

## Brunning Software

34 Helston Road,  
Chelmsford, Essex, CM1 5JF  
Telephone (0245) 252854 (24 Hours)



BrunWord 6128 with BrunSpell & DataFile. . . £30.00  
Info-Script with BrunWord 6128 & BrunSpell. . . £50.00  
9 Pin BrunWord Elite . . . . . £55.00  
9 Pin BrunWord Elite with Info-Script. . . . . £92.00  
24 Pin BrunWord Elite with Info-Script. . . . . £90.00  
100 Letters (needs Info-Script). . . . . £15.00

Supplied on 3in Disc for CPC6128 or CPC6128 Plus.

You must state which computer.

All prices are inclusive for UK. Overseas orders sent insured air mail - Europe add £2.50 : Rest add £7.50

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## REGULARS

### LETTERS 6

Ziggy puzzles over some more enigmas dragged out of the bottomless mailbag.

### NEWS 10

Stop the press for the latest fanzine, phonline and release news in the ACU happen' guide.

### COMBAT ZONE 16

John Cook storms the arcades for more hot action on the coin-op front.

### HAIRY HACKER 22



Hairy's been away on his hols but he's still had time to put together a little something special for you.

### 10-LINERS 29

More packed pages of 10-liner goodies for your delectation, all done by your own fair hands.

## FEATURES

### COMPETITION 12

Here's your chance to win some sensational driving lessons at the famous Brands Hatch circuit, as well as some groovy Accolade summer wear. Get doodling.

### WINNERS 20

Have you won the fantastic chance in a lifetime gliding course? Turn over and find out now.

### CARTOON TIME 56

Tune in to our newest fab feature – a walkthrough guide to one of the hottest games of recent times, Turrigan.

### BIG BROTHER 60

Andrew Banner, printer investigator extraordinaire, takes a peek at the latest 24 pin goody from Citizen.

### GAMEPLAN 33

Thirteen may be unlucky for some, but not for us dudes. Just take a glance at our sizzling Gameplan this month and decide for yourself.

### COMMS 46

Gallant gordon struts his stuff again, but we've tried to steer him clear of the mailbag after last month's little incident.

### APPLICATIONS 49

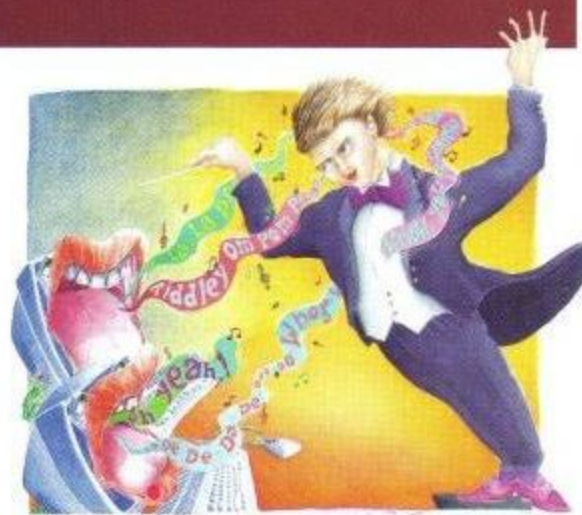
More inspirational hints on what to do with your new CPC, plus the answers to last month's posers.

### LISTING 52

Calling in tote fans, here's a little gem that'll help you run your competitions and take part too!

### AUNTIE JOHN 64

Eyes down all you budding game makers, Auntie's got all the gen to get you going, as well as a little proggie into the bargain.



### SOUND ZONE 67

Ian Waugh begins a brand new superseries bringing you everything you need to know about music and the CPC.

### COPY CATS 27

The latest utility allowing you to make the most of your 24 pin printer, Miracopy, receives the full attention of techie buff John Taylor.

## List query

I seem to remember that once upon a time you could write in and get a listing on disc/tape. Can you still get these? Was it even ACU?

By the way, what does PD mean?

PS. If anyone out there wishes to make a robot, your best bet is to use the printer port.

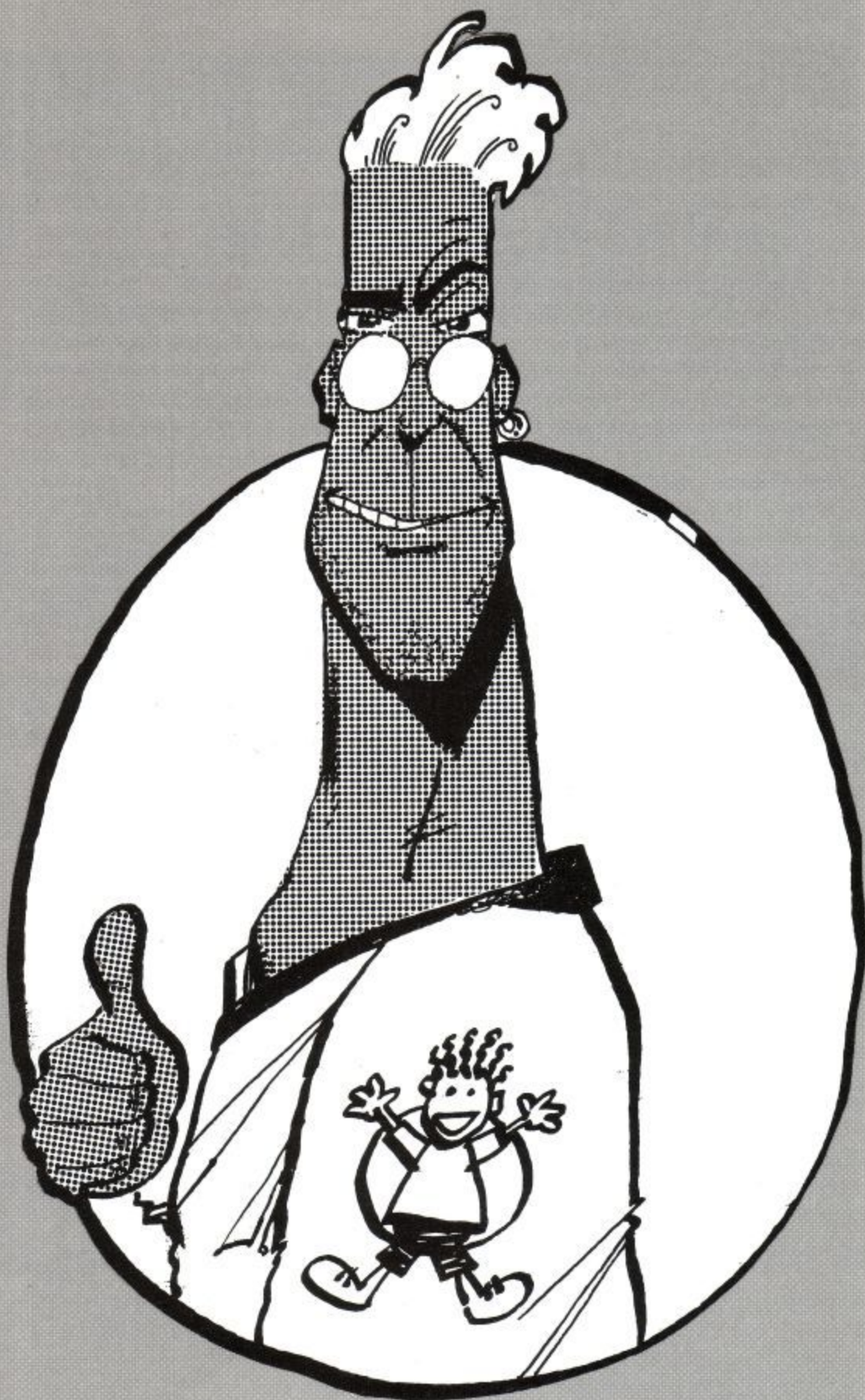
PPS. How about a photograph of the columnist.

*C. Sandiford, Leyton, London.*

**Ziggy:** Hmm, not sure if it was you know, but never mind. What the ACU team intends to do, is make all listings and 10 liners available on the Maxwell House Bulletin Board for downloading. The number, in case you've forgotten, is 071 828 1577, so keep your eyes peeled. PD is the shortened form for Public Domain, which are programs available for copying and using free of charge from boards up and down the country, as opposed to copyrighted games and utilities. Thanks for the robot tip, but as for the photograph, please spare us. The only reason I'm done in cartoon style is to spare you readers the awesome reality of my ugly mug, so there.

## Mega mag

We were hoping to start a small magazine called 'RoSo is it' up and we were wondering what the cheapest printer for the Mega CPC 464 was. Please tell



us because we are fed up with getting different answers. By the way, ACU is fab, just like Thunderbirds.

*Robert and Sean Pritchard, Ingatestone, Essex.*

**Ziggy:** Golly, the ACU boys are truly honoured to be mentioned in the same sentence as the International Rescue team, the only problem being that Hairy and Auntie John have just started a big row about who's going to be Virgil. Never mind, one of the cheapest printers around for your purposes is the Star LC10, which you can pick up for around £170. However, shop around, and even keep your eyes open for second hand items, which will mean forking out a lot less for your new mag. Good luck.

# ZIGGY'S MAILBOX

## Showtime

I have been an avid reader of your magazine since issue 1 and I think it is fab. The only thing is, why are all the computer shows in England? Why not, for instance, hold one in the SECC in Glasgow for a change?

*Martin Sutcliffe, Glasgow.*

**Ziggy:** Good point indeed! Do any of you readers know of any local shows up there that Martin might be interested in? At present, Amstrad tell me that they have no news of any shows scheduled in Scotland, but you never know, next year might see something coming up your way.

## Upgradeability

I feel that this subject is probably a regular topic of correspondence but I would appreciate your comments on the pros and cons of upgrading our current family 464, which is now approaching four years old. Originally bought as a toe dipper in the pool of computerisation, it has proved a good success in terms of family entertainment and as a word processor for business and hobby use.

For business use, I am now regularly using an Amstrad portable PPC640, courtesy of my employer and like many others, I suspect, I am greatly im-

pressed by the speed of the disc work as opposed to tape. The children are clamouring for quicker loading and more detailed games—a cousin has the Amiga 500 package — and the time is probably right to upgrade, but how?

Does one simply look to a direct replacement by purchasing a 6128 or is there an effective means of upgrading to 6128 facilities by way of disc drive/64k memory expansion?

*Derek Hall, Solihull, West Midlands.*

**Ziggy:** Well, you certainly have a few options, but probably the cheapest is to upgrade for the time being. From Datel Electronics, regular advertisers in ACU, you can get 64K, or even 256k, memory expansion packs, which simply plug into the back of your machine. At the same time, disc drives, which used to retail at around £150, seem to be plummeting down in price at the moment and I'm told you can pick one up for as cheap as round £30 nowadays. You could try ringing the Amstrad User Club on 091 510 8787 about that. So, there you are, not too expensive all round.

The other option, of course, is to get hold of one of the new CPC 6128 + machines, which will set you back around £429 with a colour monitor. The choice is yours.

## Odd conversions

The 10 liner CONVERT was pretty neat (ACU September). I had done a conversion program myself last month, it covered more conversions but was not nearly so compact in design. However, I trust no quantity surveyor decides to use yours because it would produce a very remarkable result. It gives 1 cubic foot equal to 35 cubic metres! The fault lies in line 80, where the items "cubic feet, cubic metres" should be reversed, as should the items "cubic yards, cubic metres". This should be obvious as lines 60, 70 and 90, the metric measurement appears before the imperial.

*P. Reynolds, Penarth, South Glamorgan*

**Ziggy:** Ooops, we'll be tripping over our own imperial feet next! Thanks for pointing out the error Mr Reynolds.

## Summing up

I am a secondary Mathematics teacher of a local school and constantly looking to incorporate microcomputers into children's learning experience. A great deal of educational software exists for many machines and yet one of my pupils told me that he had not been able to find any educational Mathematics software for his Amstrad 6128 CPC.

Do you know of any companies that produce such products and if so could you please tell me their address?

*Mr A.J. James, Southend-on-Sea, Essex.*

**Ziggy:** Sounds like a touch of the old Lazyitis to me, (I know, I used to suffer from it at school too. School Software do indeed produce exactly what you are looking for in the shape of Maxi Maths, which is aimed at the 9-15 year olds and includes sections on triangles, angles, sin, cos, tan, rectangles, circles, a bit of basic algebra and even a full GCSE revision course.

For just £16.95, plus £1 postage and packing, you can get a copy from School Software at the Tait Business Centre, Dominic Street, Limerick, Ireland.

Alternatively, fill in the appropriate coupon on page 66 of the September issue of ACU. No problems.



# DATEL ELECTRONICS



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- Simple plug in memory expansion gives instant extra memory.
- Features bank switching software for easy use by the programmer or for use as a data storage area.
- The software also features some extra BASIC commands.
- 64K unit expands 464 to 128K. The 256K unit takes your 6128 to 320K!!
- 64K unit brings 464 up to CPC 6128 memory configuration making a much larger software base available. Will work straight off with many programs designed for this unit (including OCP Art Studio - see Ad.).
- Ideal for use with the CPM 2.2 etc.
- Bank switching done automatically by software (cassette 464 - disk 6128).

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**ONLY £99.99**  
256K FOR 464 OR 6128 (PLEASE STATE)

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AVAILABLE FOR ANY COMPUTER



## music machine

- It's an echo chamber & digital delay line. Create some very interesting effects.
- It's a two voice music/sound synth.
- The Music Machine can also be used as a drum machine - eight drum sounds are already provided for you, but you can easily produce more of your own.
- The extremely powerful software allows you to compose tunes from individual bars of music. You can edit your creations on screen & Save/Load sounds, instruments & rhythms.
- Fully MIDI compatible. The Ram Music Machine supports full MIDI In, MIDI Out &

MIDI Thru.

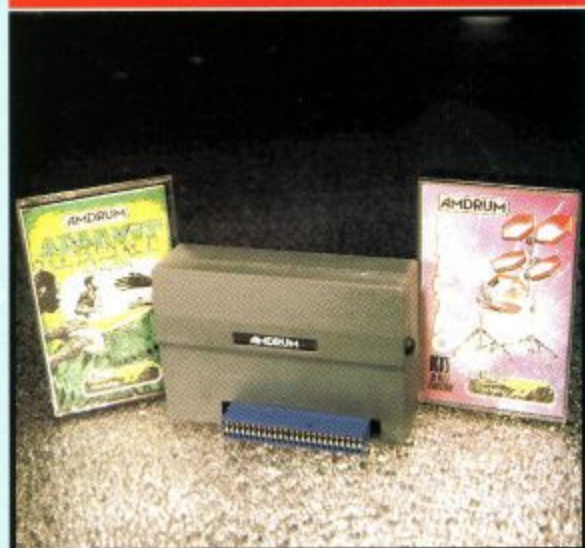
- Output through your Hi-Fi or Headphones. Comes complete with microphone.
- Use a full size MIDI keyboard to play the Music Machine.
- Sounds produced by the Music Machine can be mixed with a MIDI synthesiser's own sounds.
- On screen Sound Editor can produce MIDI data from your own compositions.
- Various sampled sounds are provided in order to get you going.
- No other product can offer so much in one unit - it's the TOTAL SOLUTION!!

- It's a full sound sampling system allowing any sound to be recorded digitally into the computer RAM. Once stored, the sound can be replayed at different pitches with many varying effects.

**ONLY £49.99**

FOR THE BEST MUSIC ADD-ON AVAILABLE FOR THE AMSTRAD

## AMDRUM



- Now you can turn your Amstrad into a real Digital Drum Machine.
- AmDrum from Cheetah Marketing is a superb plug in device that produces "real" drum sounds via its unique digital system.
- On screen menu driven drum kit makes composing drum sounds easy for anyone to do!
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- This easy to use Speech Synthesiser includes a powerful Stereo Amplifier and two pod speakers which are an enormous improvement on the sound supplied by the internal mono speaker.
- Speech output is monorial but directed to both speakers. Booster gives stereo to computer internal sound output.
- Using the SPO/256 Speech Chip the unit has almost infinite vocabulary.
- Text to speech software is provided in ROM to make speech output simplicity itself.
- Voicing is transparent to the user and the computer can carry on with other program tasks as necessary.



**ONLY £29.99**

464 OR 6128 (Please state which)

**dktronics**

## LIGHTPEN/GRAPHICS SYSTEM

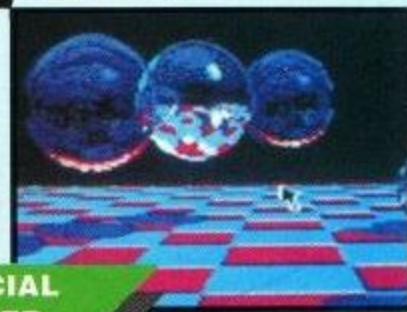
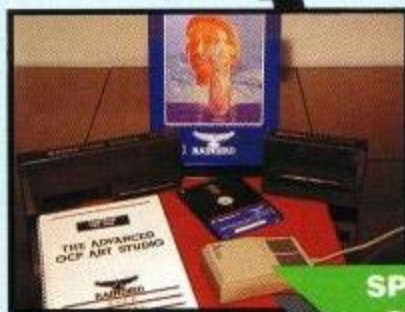
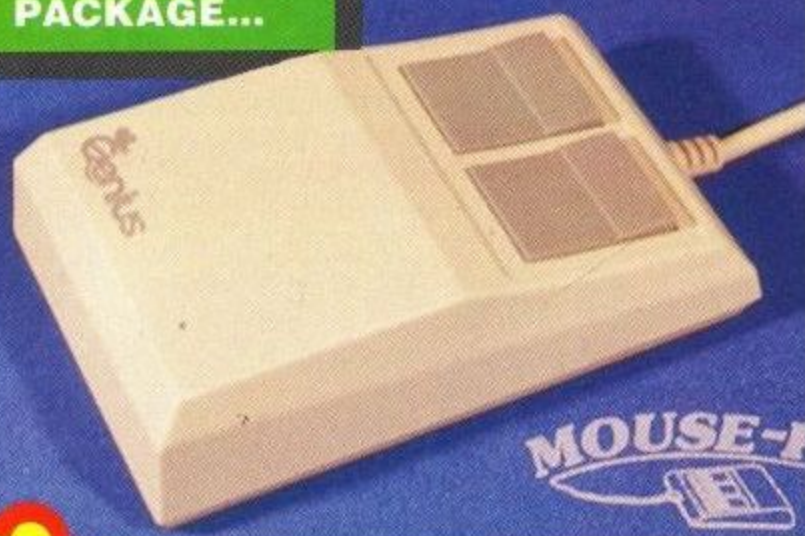


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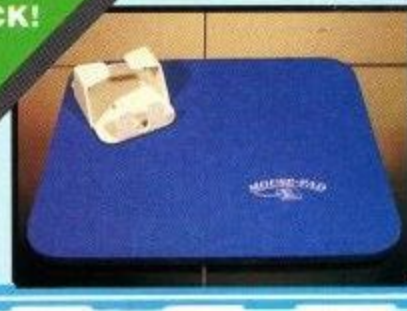
**ONLY £14.99** CASSETTE  
OR **£24.99** WITH SOFTWARE ON ROM - NOTHING TO LOAD 464 OR 6128 (Please state which)

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THE ULTIMATE GRAPHICS PACKAGE...



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COMPLETE WITH

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Genius Mouse is a high resolution two button mouse featuring optical counting, teflon guides, microswitches, rubber coated ball and high quality interface.

When combined with OCP Advanced Art Studio this graphics package is quite simply the best system available. The features are unmatched...

Create an image - shrink it, expand it, move it, rotate it, copy it, colour it etc., etc.

Spray patterns or shades, make elastic lines - stretch and manipulate shapes.

Zoom in to add detail in fine mode.

Pulldown/Icon driven menus for ease of use.

Mouse operation, plus joystick and keyboard control.

16 pens, 8 sprays, 16 brushes - so flexible anyone can create superb graphics easily.

Full cut and paste facilities plus excellent printer support.

Pixel edit, font editor, flip, invert, rotate, solid or textured fill and professional manual make Advanced Art Studio simply the best graphics package.

TAPE OR DISK FOR 464 OR 6128 (PLEASE STATE WHICH REQUIRED) N.B. 464 NEEDS DK' 64K RAM PACK

ONLY £49.99

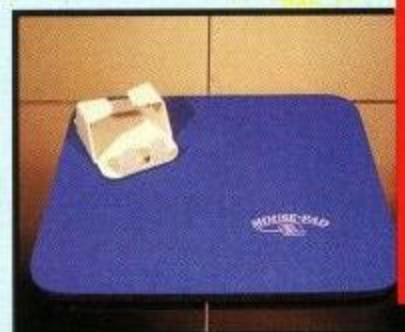
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C.T.W.

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# LOTUS ACTION

Here's some more excellent news for race fans! Gremlin Graphics has got together with Group Lotus to produce a red hot two player, 3D action chase in *Lotus Esprit Turbo Challenge*.



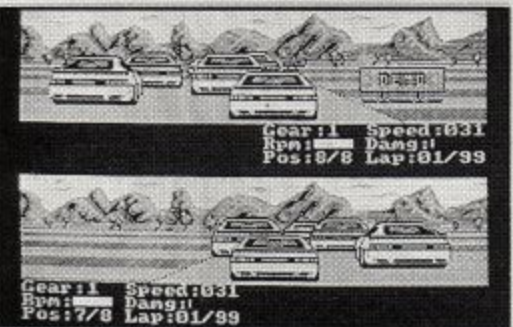
Using split screen graphics, the game can be played against the computer or a friend and features thirty two different tracks over three increasing levels of difficulty.

The aim of the game is to qualify for the Lotus License, which can only be achieved by winning the championship on the hardest level. To make it even more tricky to win, if you finish first on any race, you start the next one right at the back of the grid.



Tricky, what?

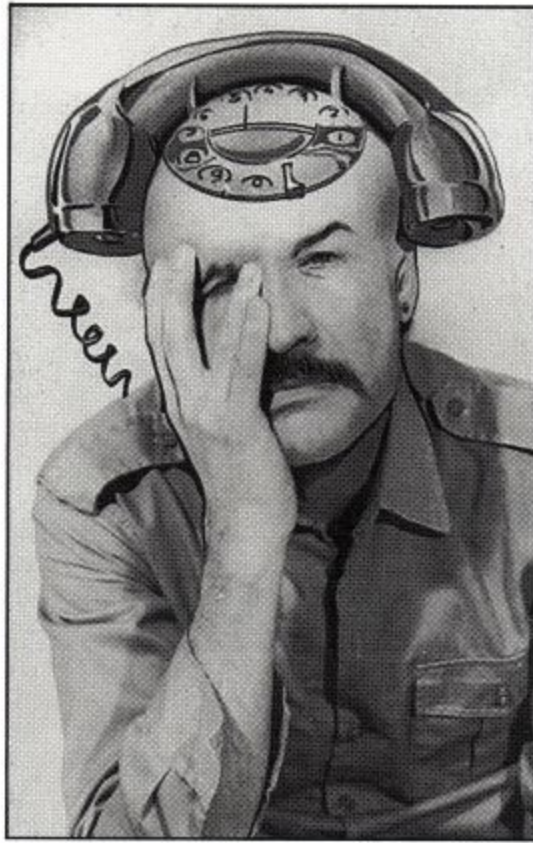
Throughout the race, you'll also need to check on your fuel status. Stay too long in the pits and you may lose out, but it beats running out of



gas on the last lap.

To cap it all, if you qualify for a licence, you can send in a special form to Gremlin, in return for which you'll get a certificate made out in your name.

Lotus Esprit should be in the shops soon, so get ready to put your driving skills to the ultimate test.



# TIP TOP TIPS

Those of you who have tried out Mel Croucher's computer fan line will no doubt of heard of the mega hot Mega-tip Gamesline from Hot Shot Entertainments. Giving you all the latest hints on your favourite games, why not give it a try on 0898 299388. You could just find that elusive clue you've been searching for for hours.

# GREEN PRINTING

If you're worried about the environment (aren't we all), then why not chuck out your old printer ribbon and replace it with something more environmentally friendly from Kores.

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Can't say fairer than that, can you? So if you want to help our planet out, even if it is only a printer ribbon, ring Kores on 0279 454455 and put some green into your printing.

# CHALLENGING MOVES

Games and utilities experts Challenge Software have moved on to pastures new in sunny Cheshunt.

The new address if you want to get hold of up to the minute programs, utilities, as well as the latest offerings on the E & J budget label is:

Challenge Software  
Hatton House  
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Cheshunt  
Herts  
EN8 0DW

If you want to make any orders by phone, the new number is 0992 640600.

# FAVE REVIEW

Yes, the popularity of our favourite machine has given rise to yet another fanzine, this time called Review and based in Staffordshire.

Packed full of games, machine code tutorials, technical tips, adventure, hardware projects and reviews, this little lot is managed by 15 year old Simon Williams, with a little help from his friends.

The Fanzine has just celebrated the launch of its first issue, so if you want to get in on the action, do it now and follow each series from the start, there should be plenty of goodies in there.

To get hold of your copy of Review, write to Simon Williams at 24 Chalcot Drive, Hednesford, Staffs., WS12 4SF.



## UPGRADE FOR FREE

Those of you who have sent off for the Blitz BASIC compiler from SPM Soft-

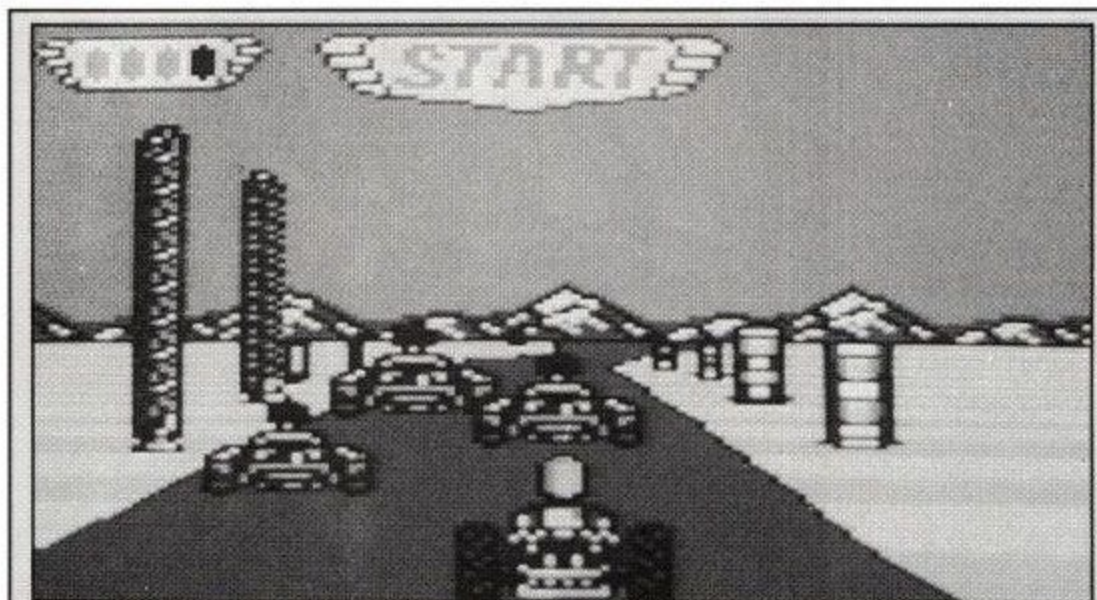
ware recently may have experienced some delays in getting hold of your copies.

Never fear, SPM assure us that any problems have now been ironed out and everyone should by now have their copies of Version 1.1.

Hold on, this is the good part! Just to show what generous people they are,

SPM are now offering an upgraded version free of charge and all you have to do is send in your master disc with an SAE to get it.

Here's the address for those of you lucky people who sent off for the original Compilers: SPM Software, 32a Albert Street, Seaham, County Durham, SR7 7LJ.



## RACE MANIA

Just when you thought it was safe to venture back out onto the pelican crossings, Domark has once more struck terror into the hearts of Sunday morning drivers with news of its latest smash racing compilation, *Wheels of Fire*.

In one incredible package, the Putney based games house has put together the four biggest selling driving games of the last year to create the Definitive Driving Pack.

First up is Domark's own *Hard Drivin'*, which sees you taking your

life in your hands against the Phantom Photon and the awesome loop-the-loop.

Ocean's blockbuster *Chase HQ* puts you in charge of the turbo-charged Porsche in a frantic battle to bring the bad guys to task.

For sheer variety, you can't go wrong with US Gold's 16 stage Ferrari bash across America and, if that weren't enough, hold onto your seat as you try out the 27 gruelling circuits in Acti-vision's whacky *Power Drift*.

Race fans prepare to be knocked out with this amazing package, which should be out sometime this month for just £19.99 on disc and £14.99 on



## MASTER GOLF

Look out for the latest budget release from Code Masters in the form of *Pro Golf Simulator*.

Featuring all of the hazards of championship golf, roughs, bunkers, trees, lakes and realistic fairways, you can choose from all the usual clubs, as well as zoom in when you get to the putting arena.

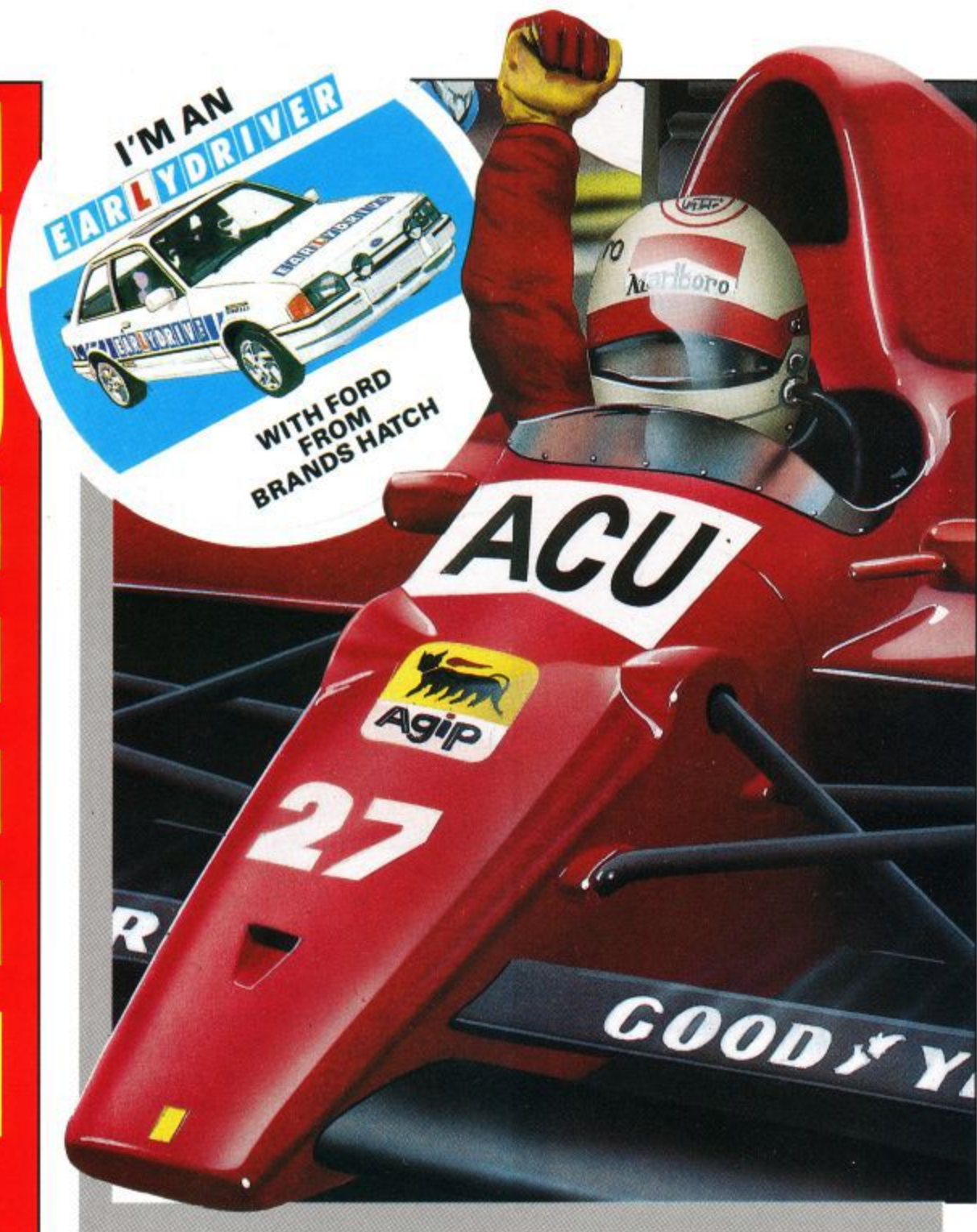
For just £2.99, no serious golf lover can afford to be without this excellent taste of the real thing.

## SCREEN HEROES

by Jules



# COMPETITION



**T**o coincide with this month's fab Grand Prix Circuit spread, here's your chance to get in a spot of driving practice of your own around the famous Brands Hatch racing course.

Earlydrive, a special scheme allowing under 17's to get a feel for the road, has been set up by the Brands Hatch Leisure Group together with Ford Motors and offers expert tuition both in the classroom and on the road. So, if you want to get ahead of the rest with one of your parents, just send in your best drawing of a formula 1 racing car to win this great day out.

Don't worry if you don't win, there are 10 sets of fantastic Accolade Summer Sweat-shirts and Shades to be won by the runners up.

The editor's decision is final.  
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## COMBAT ZONE

I wandered lonely as  
a cloud, as I stood on  
the burning deck, and  
then I saw these daf-  
fodils, and gave them  
to the Queen Mum  
for her Birthday.

There you are – belated Combat Zone tribute to Britain's fave ninety year old royal – but that's enough of high art for this issue. On to the latest coin-op releases that are setting pulses racing in Arcade Land.

Many of you might have been waiting with vast anticipation for the newest Sega release, a new motorcycle racing game called Racing Hero. Chances are, however, you might be a little disappointed at the end of the day.

Now, it's not that Racing Hero is anything other than yet another splendid piece of professionally put together arcade entertainment for the Sega stable. It's a distinct improvement from their last motor racing game (considered brill in its time) Super Hang-On, with all the fab sprite technology which had its last outing in super Monaco Grand Prix, fine graphics and an altogether playable style.

However, it turns out to be a conventional, 'behind the bike' view of the



action, racing game. Lean into a corner and your sprite-on-a-bike, nicely animated, leans too. Scenery stays straight and level. Cast your mind back to a couple of months ago when we reviewed a game from Taito, World Grand Prix – Real Race Feeling. This is a racing game with a difference. It brings the perspective to over the handlebars – and when you lean into a corner, the horizon and all the scenery tilts with you! Just like it does when you ride a real bike. This is only achieved, by the way, by a world allocation of silicon being inside the cabinet and some pretty nifty programming.

Having played this one – going back to ordinary bike racing games is really a bit dull. Even a fine effort like Racing Hero pales by comparison....so even-though that one is the second best motorbike racing game around, WGP is so far ahead that – if you can get access to one – it's by far recommended above poor old Racing Hero. The good news is that Racing Hero is much more

likely to make an appearance on the CPC!

I suppose you're getting a bit sick of vertically scrolling shooters, eh? You are? Well you are very much the exception then chum, because according to the trade, boards like Raiden – tedious to the extreme 'though they are – sell



like the proverbial thermally excited confectionary.

Yup, vertical scrollers, ever since Xevious, are the coronation Street of video games. And Raiden is the Len Fariclough of vertical scrollers. But if you're into that sort of thing, you might want to give it a go.

Competent graphics, obligatory power-ups and end of level nasty to zap, uninspiring if your after something different, although if you're just after a jolt of adrenalin, it works. What more can you say?

Now then, Data East – other than coming out with some neat pinball recently – has had the odd success or two in the coin-op department, Midnight Resistance going down particularly well with the punters. Now they're having a go with something called Dark Seal. The bad news is that it's a pseudo RPG jobbie played in isometric 3-D, just like Escape from the Planet of the Robot Monsters. Bad news because it's not very good.

The basic premise is fine – picking a character type out of the four on offer (Wizard, Warrior, Ninja, Bard) then

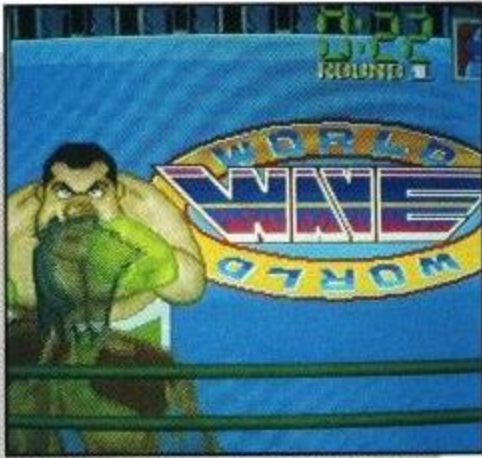


you – or you plus a friend – travelling around zapping baddies, saving the pixie world from the bad guys. Trouble is, the gameplay is as uninspiring as the storyline.

This kind of stuff goes a bundle in Japan – in the more demanding (in its own way – European market, this is going to get the big thumbs down, despite an innovative magic system. Not at all compelling, avoid unless you are an RPG fanatic.

Capcom's Final Fight appears to be retaining a following long after release – shows that the beat-em-up genre has its die hard appeal, same as ever. Technos have delivered up the newest alternative called Combatribes. Done in very 'punk' graphics, there are certainly worse games about, but I found the style a bit wearing on the eye after a couple of goes. Nothing new here, I'm afraid.

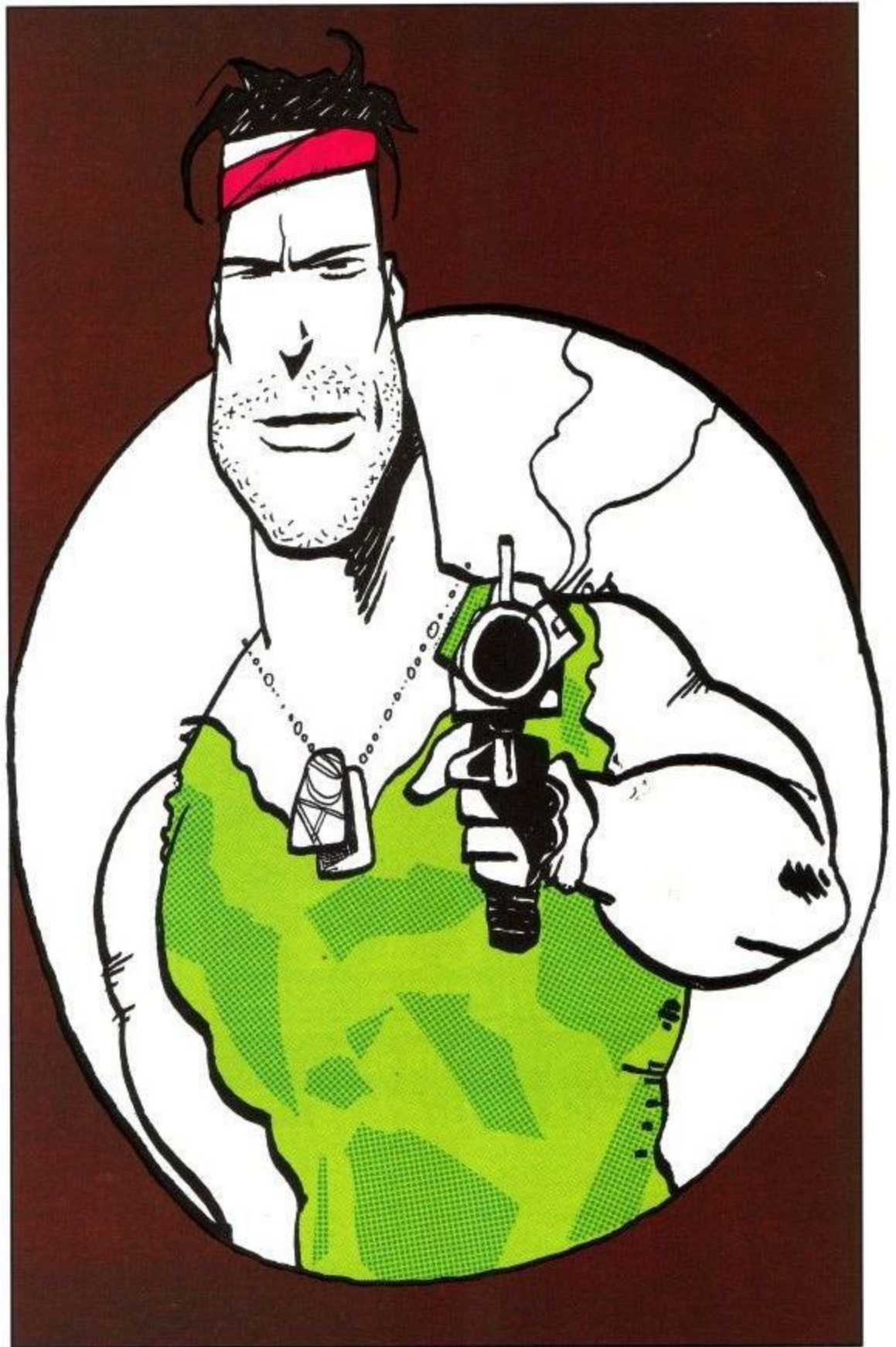
If you're tired of this street fighting stuff, though, you could try Success



Joe, a real live boxing simulator. With a good user interface and some attractive intro graphics, this is going to be quite a success, I predict. Coming to a Jamma cabinet near you soon!

Finally this month, a game that has just got to be a hit, both on coin-op and on home format, if there's any justice.

Called Mega Twins, from Capcom, it's a cutesie jumpy-jumpy, shooty-shooty, which is both playable and fun.



Sure, it could be criticised as being a little formulaic – but these babies are the things that the Japanese do best. Lots of hidden tricks, weird graphics and monsters you'd rather pick up and cuddle than zap to bits (although you do anyway). Grab a mate and get on down to play this – you won't go far wrong.

Finally for this month – yet another opportunity to "have an arcade machine in your own home." (Part 25 of a series). Only this time, it's true! Industry veteran Robert Stallybrass of Active Sales has teamed up with Coin-op cabinet makers Silverline to bring you the Powercode – an industry standard upright arcade cabinet with a differ-

ence. No monitor!

You supply the monitor (or TV) and buy JAMMA arcade boards from Active, specially packaged for easy connection to your cabinet. And there you are, playing real live arcade games, identical to those in your local arcade.

Problem is, the price. OK, so the unit itself is £299, including a free board. But new arcade games come at about £600 each – so you'll have to content yourself with playing the older games, that you'll be able to pick up for £50 to £100 each. Worth it if you're a fanatic. Available from the proverbial good software shops, you can bet that I'll be at the front of the queue! See you next month!

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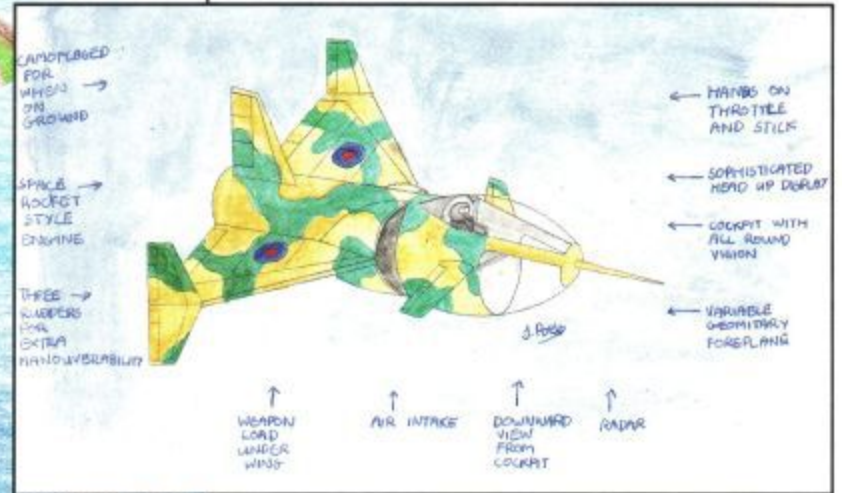
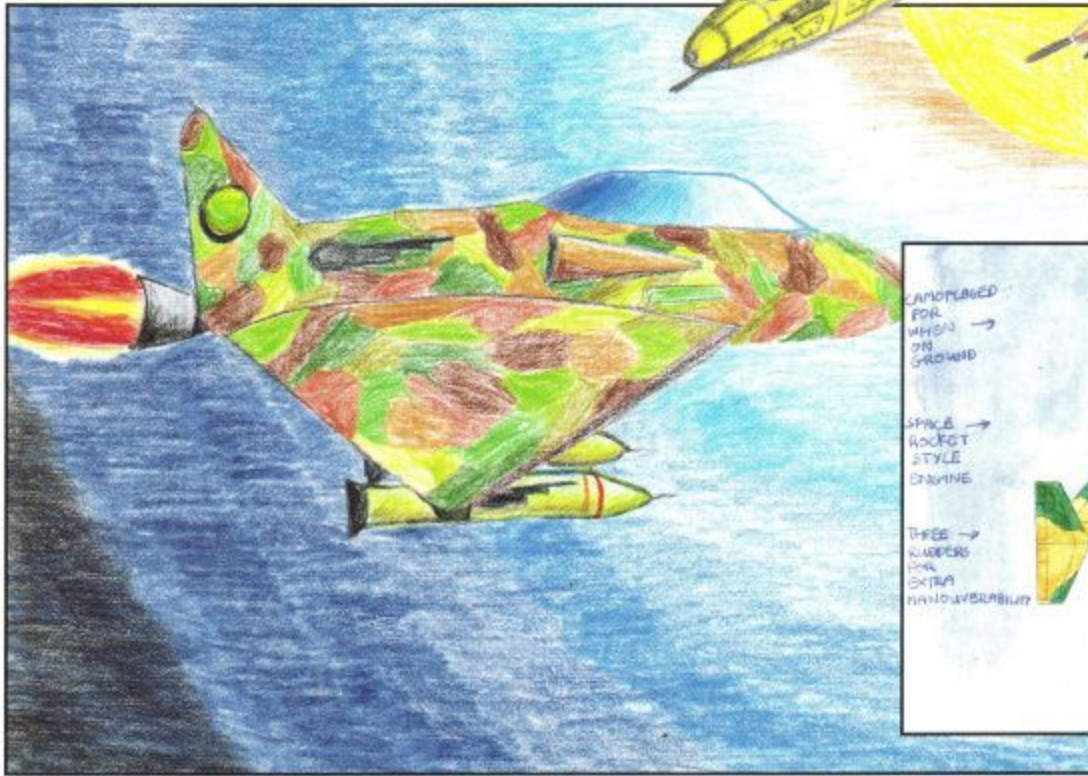
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# WINNERS

Time to give prizes away and this time it's the one you've all been waiting for with baited breath – the fantastic gliding course.

Well, we'll put you straight out of your misery by telling you that Christopher Dale of Sherfield English in Hants is the extremely lucky chappie



# Supersonic

who'll be visiting the Booker Gliding Club in Marlow for the sensational first prize.

The three runners up, who will be getting groovy US Gold goodies are, Johnathan Poels of Malvern, Simon Cartwright of Worksop, even though he doesn't seem to realise that by bombing London there'd be no more ACU. Shock! Horror! and, finally, Peter Rowlands of Cross Lane, Head, Shropshire.

That's it unfortunately, although we'd love to be able to give away prizes to all of you who sent in such fabulous entries. Who knows, next time it could be your turn to win one of the super ACU prizes.



See page 20 for details of this month's fab ACU competition.

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# Hackers Revenge

Not even a vicious hairy sausage attack can keep Vax down.

Read on...

Welcome once more, hackfans, to this meagre column. A very fast column too today, due to food poisoning preventing me from staying at the keyboard too long. Yes folks, I have been stricken by The Revenge of the Mutant Salami; a sell-by sausage with a growth so luxuriant, it was classified as a site of special scientific interest. Still, the show must go on or I'll never empty the mailbag..

A very nice letter we have too, from

a Milton Keyneite by the name of Anthony Jones. He's hacked several games with a combination of Multiface and Insider.

Hacker is the first game he mentions, which he has extracted the passwords from. The first one you want is AUSTRALIA, which should last you to the security checks. These require the following answers:

1. MAGMA, LTD.
2. AXD-0310479
3. HYDRAULIC
4. AUSTRALIA

There, and if I typed any of that wrong, I'm going to look a right idiot, aren't I?

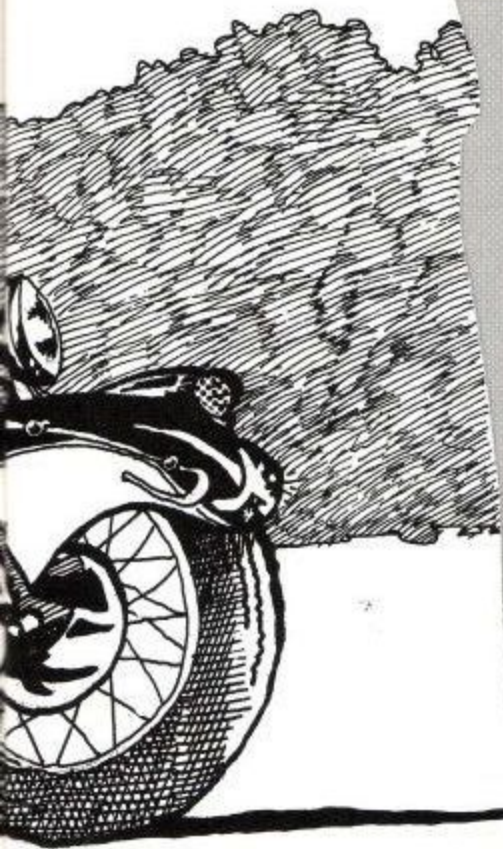
Ghost Hunters isn't a game I've played, but Tony says that pressing

DEL pauses the game, and typing COMPLEX tops up your energy. It also lets you select any screen you feel like by pressing A-Z and ENTER.

Now Ghostbusters is one I've tinkered with from time to time, and so has Tony. His account number of 11637466 gives \$362700 in your account. If I'm on holiday in the Bahamas next month, you know it works on Abbey National hole-in-the-wall machines too.

Tony has ravaged savage too, and the passwords for that one are SABATTA for part 2, and FERGUS for level 3.

Do you want a silly one for Solomon's Key? Well I don't, so you can have it: Enter your name in the high score table, wait for the demo to start, hit ESC twice, and enter your name



a strange proggy concealed within called Stix, much more familiar to Atari users as a game in its own right (or so

I'm told; me no Atari). Just for kicks (kix?) you might try controlling the thing with a joystick or keyboard, but the only keys that have much effect are: Space stops it, CLR clears the screen, and T turns the trail on and off.

Sorcery and Sorcery + are so old that they seemed new when I played them recently. Couldn't even remember what killed the ghosts, but I got there in the end. If you get a high score (especially in Sorcery +) you may discover that some names change when you type them in. Roback changes to Growbag, for instance (Peter Roback bought Sorcery + for Amstrad) and I'll let you discover what Hugh turns into. Got to keep you in suspense somehow, haven't I?

Tony's assault on Saboteur II reveals the following codes for the different missions. I think there is a common link between them all:

- Mission 1 Just hit enter
- Mission 2 JONIN
- Mission 3 KIME
- Mission 4 KUJI KIRI
- Mission 5 SAIMENJITSU
- Mission 6 GENIN
- Mission 7 MI LU KATA
- Mission 8 DIM MAK
- Mission 9 SATORI

And the link is: The names all sound like aftershave lotions (yes Tony, I'm quite mad pineapple).

Finally, Tony has a few Multiface pokes as yet unpublished. Look carefully on this page, and you'll spot them under the heading "Multiface Pokes."

The wriggler poke is for the Computer Hits 3 version, but might work on others; no time to test at this end as the deadline is gaining on me again.

To round the column off nicely this month, we'll have two of many goodies sent in by Graham Smith from Brookside. There'll be oodles of his stuff next month, but I can just squeeze these two in today. Elven Warrior and Saigon Combat Unit tape pokes. They're checksummed in case of pinky failure, and here they are:

```

1 ' Elven Warrior -tape-
2 ' By Graham Smith
3 ' Infinite health,keys
4 ' & ammo
5 '
10 DATA c4,14,ac,af,32,5b
20 DATA 13,32,df,18,32,26
30 DATA 1b,fb,c9,3e,8f,32
40 DATA 7f,41,3e,b3,32,cc
50 DATA 41,21,62,46,36,92
60 DATA 2b,36,83,2b,36,df
70 DATA c3,05,40
80 FOR j=0 TO 38:READ a$
90 x=VAL("&" + a$):y=y+x
100 POKE j+48640,x:NEXT j
110 IF y<>3807 GOTO 140
120 MEMORY &3FFF:LOAD"
130 CALL 48655
140 PRINT" data error
  
```

```

1 ' Saigon Combat Unit
2 ' By Graham Smith
3 ' Infinite lives,
4 ' ammo & bombs
5 '
10 DATA c4,14,ac,3a,16,71
20 DATA fe,02,20,0c,af,32
30 DATA fe,a3,32,12,a4,32
40 DATA 98,a3,fb,c9,af,32
50 DATA 2d,a5,32,41,a5,32
60 DATA c7,a4,fb,c9,3e,8f
70 DATA 32,7f,41,3e,b3,32
80 DATA cc,41,21,5e,46,36
90 DATA f2,2b,36,db,2b,36
100 DATA 0f,c3,05,40
110 FOR j=0 TO 57:READ a$
120 x=VAL("&" + a$):y=y+x
130 POKE j+48640,x:NEXT j
140 IF y<>6344 GOTO 170
150 MEMORY &3FFF:LOAD"
160 CALL 48674
170 PRINT" data error
  
```

Oh well, that's it for another month. Keep the letters coming, and wake me up when it's time for the next Hackerzzzzzzz....

Luv 'n' stuff,  
Vax, Suz & Co.

again. I told you it was silly.

We've dealt with Spindizzy before, but that was a while ago now, and some of you have probably bought it since then only to find that your ACU collection has been turned in to hamster bedding by your sister. Life is tough.

### Multiface Pokes

GAME	EFFECT	Addr	POKE
Subterranean Stryker	Inf. lives	7D36	A7
Bigfoot	Inf. lives	1016	A7
Ghouls	Inf. lives	18C4	00
Ikari Warriors	65 lives	5CEB	41
Savage part 1	255 lives	033C	FF
Savage part 2	256 lives	2611	00
Savage part 3	256 lives	0CB3	00
Solomon's Key	128 lives	0760	80
Wiggler	256 lives	8018	00
Start Wars	Inf. shields	44C1	00

Relief is at hand. Merely place said hand on the F and X keys simultaneously, and at the same time. Lo, there is

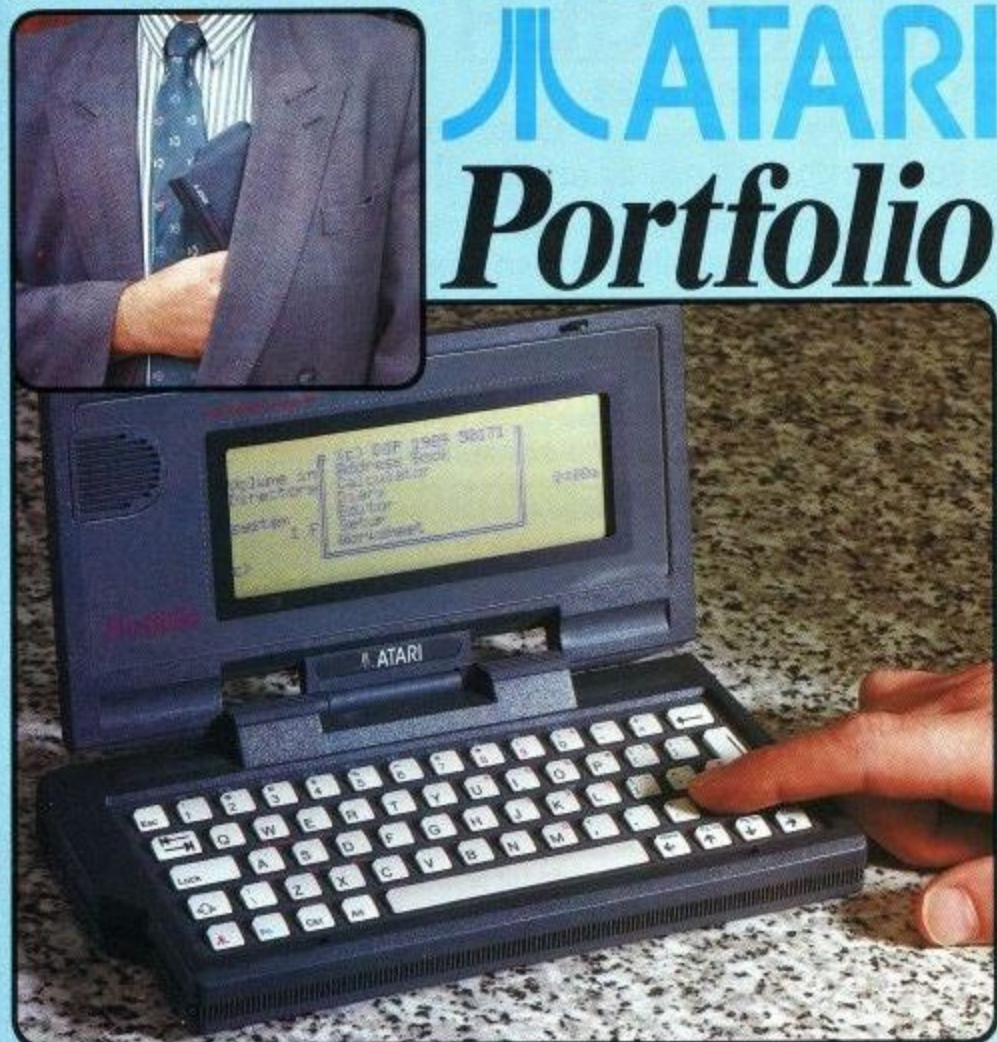
The Savage poke is a bit dodgy, because Savage in general is fussy about Multifaces. Just try it a few times.



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In addition to the excellent software built-in to the Portfolio Free of Charge (see right), other software and peripheral products, such as the sophisticated Pocket Finance package and serialcentronics interfaces are available. And it doesn't stop there. Many manufacturers have recognised the potential of the Portfolio and have already started to design new peripherals and software. Products currently under development include: Serial interface with built in mini modem, Apple Macintosh interface, business, utility and programming software plus a range of adventure and battle strategy games. For further free details on the Portfolio range, fill in the coupon below and return it to Silica Systems now.



### MEMORY CARDS

Portfolio can store and retrieve data and programs from its own RAM, or from small credit card size memory cards, that slot into its built-in card drive. The cards are available in three sizes, 32K, 64K and 128K, so you can carry a library of data in your pocket. The card drive also accepts ROM cards, which can contain commercial or custom software.



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Portfolio is powered by three AA batteries which will run for up to six weeks with normal use, or from the mains using an adaptor. All the peripherals take their power from the Portfolio, so no extra batteries or adaptors are required. A "battery-low" warning and memory back-up ensure that information is not lost when the batteries are changed.



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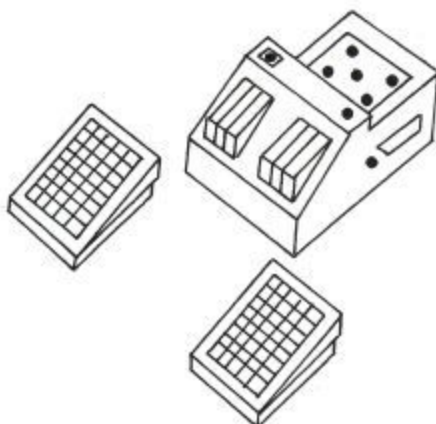
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# Down in the Dumps

**Seven Stars, producer of the Miraprint font utility, has addressed the problem of producing high quality screen representations of screen files and produced Miracopy, a screen dump utility tailored to 24-pin printers.**

**M**iracopy is capable of producing 16 grey shades from standard colour screen files e.g. (TEST.SCN). Mode 0,1,2 screens can be printed in small (55x90mm) and medium (110x180mm) screen dump sizes. Mode 0 screens also can be printed in large (270x170mm) size. The large size fits neatly onto an A4 sheet filling most of it. For high quality dumps 2 or 4 pins modes are available with a 24-pin mode for fast proofing.

Two sets of gray shades, patterned and gray, are available to increase the output options and enhance plain screens or lettering.

Positioning of copy is attached by adjusting the left margin via menu-driven option.

## Operation

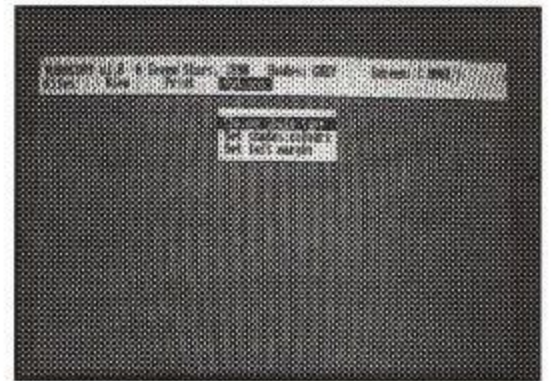
Miracopy is easy to load and operate. It is a straightforward application pro-

gram for which you will either have a use for and cannot live without or will never need. If you are in the first category then you need look no further as this application is clear, concise and



easy to use. All options are available from one opening screen, which is simple and uncluttered. The opening screen presents you with a status line that informs you of the current file loaded for printing, if any, and the method of shade in use (pattern or grey). The second line is the heading line for the drop-down menus, which seem to be well idiot-proofed.

The sub-menus prompt for further information using the standard dialogue box approach and you can return



to a submenu if you find yourself in the wrong one by using the ESC key.

## Loading screens

Available screen files can be displayed by selecting Directory from the files menu. They can be loaded by selecting the appropriate screen mode option and then filling in the name of the file. You can also add a drive prefix to the file name if needed.

## Previewing screens

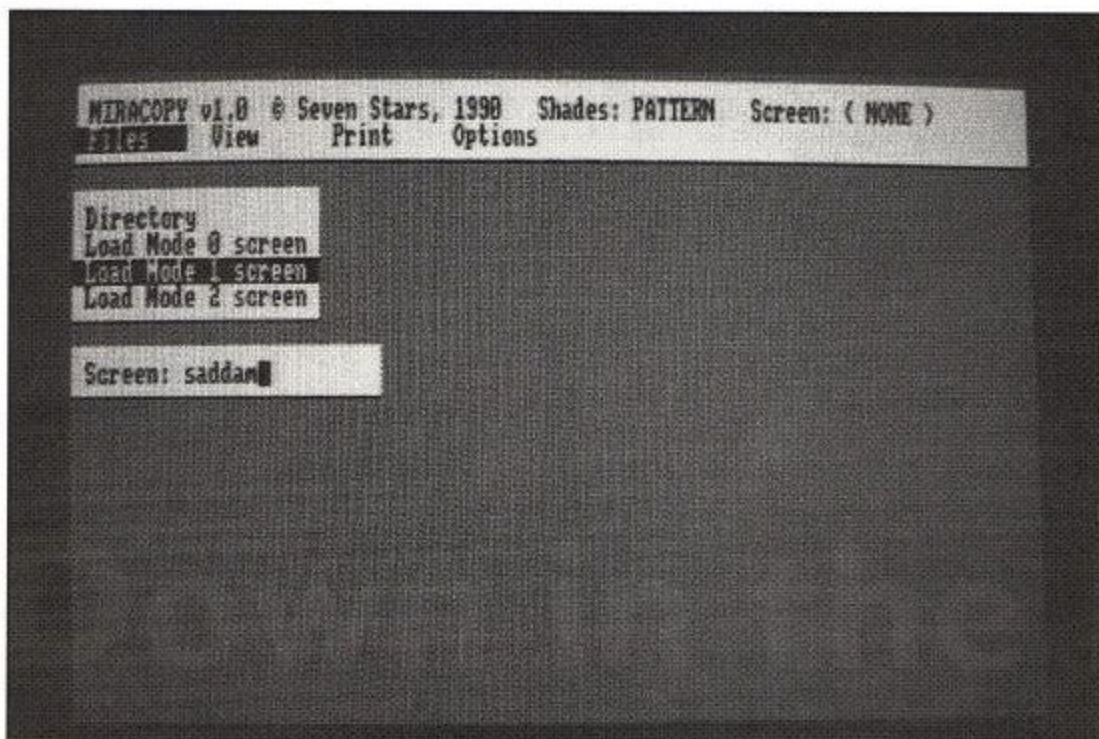
Screens to be printed can be viewed by selecting the view menu from the main screen. The colours shown will be assigned shades of grey and different shades can be assigned to different colours. Any key gets you out of the view screen.

## Printing screens

To print a screen file it is possible to select print from the main menu. Then pick the dump size and screen mode. Printing can be interrupted at any time by pressing any key. Options 2 and 4-pin printing are available when in this mode. A nice touch is that the pins used are randomized in order to minimize pin and ribbon wear.

## Conclusion

Miracopy is an excellent printing utility, which is very workmanlike with no frills. It does the job. If you are looking for a 24-pin printer with print dump facilities, then I recommend you take a look at Miracopy.



**Product:**  
Miracopy  
**Price:** £16.99  
**Available from:** Seven Stars

# Exclusive! Multiface 2 espionage shock!

## ROMANTIC ROBOT IN A SPY SCANDAL

By our own intelligent correspondent

A Third World diplomat was expelled from Britain last week for engaging in industrial espionage on behalf of an unnamed East European country, Foreign Office officials confirmed in London early this morning.

The diplomat was caught red-handed, using a unique computer add-on, known in the business as MULTIFACE 2. The device is used to freeze, inspect and back-up running CPC programs, sources familiar with the case said.

### Magic button

Although seemingly just a small black box, it is apparently full of hi-tech wizardry and even sports a so called MAGIC BUTTON.

Some sources suggested MULTIFACE could have been embargoed from exports to any non-NATO country, but Cocom officials could neither confirm nor deny the instrument had been included on the list of banned equipment.

Cocom is a Paris based inter-governmental agency set up to monitor trade in strategic goods and create lists of such equipment whose sale to potential enemy countries is prohibited.

The unorthodox use of MULTIFACE by the diplomat, whose identity and country of origin remain hidden for fear of reprisals against British nationals, had been detected when a nurse in the envoy's Kensington Gardens estate reported a change in the man's habits to her Foreign Office contact.

"He visited a computer outfit, called ROMANTIC ROBOT, came back with a black box and has been spending every free minute in his den ever since," the 30-year-old woman, whose identity is protected under the Official Secrets Act, said.

"I've even heard him screaming 'Multiface, oh, Multiface' in his sleep," the nurse added.

Contacted in his office at ROMANTIC ROBOT, a company spokesman said the question had put him on the spot.



"There's a saying one oughtn't believe any rumours until they have been officially denied, so I can neither confirm nor deny your story. I personally think it is utterly preposterous, but it's up to you to decide," the spokesman said.

He said he would rather not comment on reasons for the diplomat's strange behaviour.

"He seemed perfectly normal. He was, obviously, very keen to get the MULTIFACE, in fact he also bought the Insider disassembler and RODOS System, which we have on special offer

of £9.95 and £19.95 respectively. But nobody at Romantic Robot has ever detected anything out of the ordinary in the envoy's manners."

"Your readers might find it interesting to try Multiface themselves," the spokesman said. "I hope their reaction would be just as ecstatic. Obviously they should exercise some degree of self-control - in their own interest!"

### Not an advert

"Of course, I'd rather not if this were to sound as an advertisement but I am given to understand MI5 are considering seeking an injunction on the sales of our device, so it might be wise to send for a Multiface now, before they find a co-operative judge. At £37.95 (£10 below RRP) plus £1 p&p it is a real bargain - some may say it is even more than one bargained for."

Foreign Office officials declined to comment, saying they would not debate cases where a judicial decision might be pending.

The Romantic Robot spokesman said his company could not accept responsibility for any mishaps occurring to anyone visiting its premises at 54 Deanscroft Ave, London NW9 8EN.

"We seem to be getting most orders through the post, anyway," he added.

He said also those who'd rather use their ACCESS/VISA cards and order by telephone, at 081 200-8870, should be extremely cautious in their choice of words.

"You never know who's listening in," he observed.

# GRAPHICS GALORE

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# DEMON DRIVERS

BY DAVID HALL

It's Tron racing time again. I know we've had something similar before, but this incredibly stylish version from David Hall will be hard to better. As a two player game, using the joystick and control keys to move the race lines, try and force your opponent to crash first over nine gruelling rounds.



```

10 CLS:PRINT "+ WAIT +":1=20000:FOR m=1 TO 18:READ a$:FOR t=1 TO LEN(a$) STEP 2:P
DKE 1,VAL("&"+MID$(a$,t,2)):1=1+1:NEXT:NEXT:MODE 0:PAPER 0:BOARD 0:CLS:x=28:y=7
2:a=312:b=586:c=4:d=4:GOSUB 100:x=14:y=4:a=36:b=200:c=12:d=9:GOSUB 100 [5E]
:x=428:c=11:d=3:GOSUB 100 [5E]
20 INK 5,15:INK 14,13,26:LOCATE 5,22:PEN 15:PRINT "Press <FIRE>":CALL 20000:PEN
14:LOCATE 5,12:PRINT CHR$(22)CHR$(1)a$(PEEK(19000))" has won!"CHR$(22)CHR$(0):FO
R t=1 TO 20:SOUND 1,t,6,15:FOR k=1 TO 40:NEXT:NEXT:INK 15,0,11:WHILE 1 [5B]
NKEY(76):WEND:GOTO 20 [5B]
30 DATA CD344FCDEE4ECDC14E3E0F010007CD32BCCDB64ECCD074F3E4CCD1EBB2BF33E0F010000CD
32BC3E0132E1473C32E247215AC3227E472134C3227C47CDC14ECD4F50CDC84FCD074F215A50CDA
BC216350CDAABCCD674F3AE047FE002B05CD624F1810CDE54FCDB64E3AE047FE0028D5 [E6]
CD5C4FCDA7BC216C50CDAABC [E6]
40 DATA 3A5446FE3920063E0132384AC93A5546FE39C2294E3E0232384AC90E7806280010FD0D20
F8C92154C006072252460E09C5225046117950CDF44E2A504611080019C10D20EB2A52460E16CD26
BC0D20FA10D9C92A75501129510E16E506081A77231310FAE1CD26BC0D20F0C92A7550 [B4]
3A7750FE01280B2B7EFE0020 [B4]
50 DATA 1422755018D2110800197EFE0020062A75502318EC3A7750EE03327750C9213030225446
3E01CD90BB211804CD75BB3A5446CD5ABB3E03CD90BB211811CD75BB3A5546C35ABB2154463418D8
21554618F8AF32E047CD24BCCB472026CB4F2015CB57202BCB5F202F3AE147FE012828 [28]
FE03381C280D2A7C47CD26BC [28]
60 DATA CD26BC3E04181B2A7C47CD29BCCD29BC3E03180E2A7C472B3E0218062A7C47233E01227C
4732E147CDD34FFE01C8CD26BCCDD34FFE01C82A7C473633CD26BC3633C97EFE302807FE332803FE
CCC03E0132E047C9AF32E0473E0BCD1EBB202F3E0ECD1EBB201B3E14CD1EBB202E3E04 [AD]
CD1EBB202F3AE247FE012828 [AD]
70 DATA FE03381C280D2A7E47CD26BCCD26BC3E04181B2A7E47CD29BCCD29BC3E03180E2A7E472B
3E0218062A7E47233E01227E4732E247CDD34FFE01C8CD26BCCDD34FFE01C82A7E4736CCCD26BC36
CCC901000000040C0C05000200000A04000C050002000000001E0F780004D701000F0F [40]
0F1E0D0F0F0F0F0F0F1E0D0F [40]
80 DATA 0F0F0F0F0F1E0D0F0F0F0F0F0F1E0D0F0F0F0F1A0F1E0D1A0F0F0F0F051E0D0F050F0F0F
0F1E0D0F0F0F0F0F0F1E0D0F0F0F0F0F1E0D0F0F0F0F0F1E0D0F0F0F0F3C3C3C3C1C3C3C3C0C0C
0C0C0C0C0C0C0F0F0F1E0D0F0F0F0F0F0F1E0D0F0F0F0F0F1E0D0F0F0F0F0F1E0D [D1]
0F0F0F0F1A0F1E0D1A0F0F0F [D1]
90 DATA 0F051E0D0F050F0F0F0F1E0D0F0F0F0F0F0F1E0D0F0F0F0F0F1E0D0F0F0F0F0F0F1E0D
0F0F0F00000000003000000000000000300000000000001000200000000000100020000000000020
0010000000000020001000000000002000100030000010000000300020001000000000 [BD]
0020001000000000000100020 [BD]
100 INK 0,0:INK 15,0:PLOT x,y:FOR t=1 TO 2:DRAWR 0,a,c:DRAWR b,0:DRAWR 0,-a,d:DR
AWR -b,0:MOVER -4,2:NEXT:a$(1)="Tom":a$(2)="Jerry":PEN 12:LOCATE 3,23:PRINT a$(1
):PEN 11:LOCATE 15,23:PRINT a$(2):RETURN:DATA 00000000010002000000000 [1B]
000030000000000000000030 [1B]

```

# 3D SHADOWS

BY J. ARROWSMITH

Here's a very simple graphics demo, showing you the ease with which you can obtain 3D lettering effects. Run it, play around with it and see what you can come up with.

```
10 x=100:y=202:INK 6,6:INK 0,2:PAPER 0:INK 1,26:INK 2,6:INK 7,6
20 a$="S H A D D W S":b$=STRING$(LEN(a$),143)
30 MODE 0:PRINT CHR$(23)CHR$(1):TAG
40 PLOT 0,0,3:MOVE 0,0:MOVE x-5,y-5:PRINT a$:
50 PLOT 0,0,5:MOVE 0,0:MOVE x,y:PRINT a$:
60 PLOT 0,0,3:MOVE 0,0:MOVE x-5,y-25:PRINT b$:
70 PLOT 0,0,5:MOVE 0,0:MOVE x,y-18:PRINT b$:
80 TAGOFF:PEN 1:LOCATE 4,21:PRINT"PRESS ANY KEY":TAG:PLOT 0,0,4:MOVE 0,0
90 CALL &BB18:y=200:FOR x=1 TO 522 STEP 2:MOVE x,y:PRINT CHR$(143);:CALL &BD18:
NEXT
100 TAGOFF:PRINT CHR$(23)CHR$(0)
```

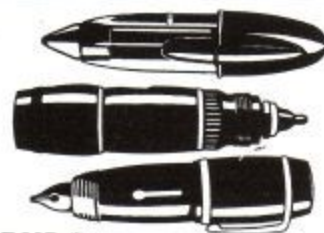
# COLOUR SCRIBBLE



BY GARETH BOWNES

Run the proggy and keep pressing the letter p for some excellent random scribbles and enough colours to send your brain reeling. It's called colour scribble and you certainly gets what you pays for.

```
COLOUR SCRIBBLE By Gareth Bownes 1990
10 REM"***COLOUR SCRIBBLE By Gareth Bownes ***"
20 MODE 1:BORDER 5:INK 0,5
30 INK 1,12:PRINT:PRINT"          COLOUR SCRIBBLE"
40 FOR a=1 TO 10:NEXT
50 c=d:a=INT(RND*30):BORDER a:b=INT(RND*30):INK 0,b
60 n=INT(RND*15):FOR n=0 TO 15:INK 1,n:DRAW RND*320+INT(RND*
190)*COS(a),RND*200+INT(RND*190):NEXT n
70 PEN 2:LOCATE 17,20:PRINT"PRESS p":WHILE INKEY$<>"p":WEND
80 CLS:GOTO 20
```



# PRINTER CONTROL

BY DANIEL GRIFFIN

Here's an excellent utility which gives you three extra commands to the existing BASIC keywords, enabling you to print text to the printer using shorter commands than the default PRINT #8,"text" system.

The first is PRNT,"text", using the <CR><LF> code to start new lines. Take note that this is only for text, not graphics, when you could use PRNT,STR\$(1+1), which will print 2.

LF will perform a <CR><LF> on the printer to start a new line, and CHK,@p% checks if your printer is on-line or not.

Handy eh? One more note; 464 users should enter in different commands due to the way in which the 464 handles RSX's, eg:

CPC6128 & 664 - PRNT,"HELLO"  
CPC464 - a\$="HELLO": PRNT,@a\$

```
1 ' Printer Control RSXs - !PRNT , !LF , !CHK - (c) D. Griffin 1990
10 SYMBOL AFTER 256:MEMORY &9C39:SYMBOL AFTER 240
20 FOR A=&9C40 TO &9D36:READ A$:POKE A,VAL("&"+A$):NEXT:CALL &9C40
30 DATA 3E,04,CD,5A,BB,3E,02,CD,5A,BB,01,EA,9C,0A,FE,FF,28,06,CD,5A,BB,03,18,F5,
01,62,9C,21,6D,9C,CD,D1,BC,C9,71,9C,C3
40 DATA 7B,9C,C3,AA,9C,C3,BF,9C,00,00,00,00,50,52,4E,D4,4C,C6,43,48,CB,00,FE,01,
20,65,DD,6E,00,DD,66,01,46,78,FE,00,28
50 DATA 59,23,5E,23,56,1A,CD,D9,9C,CD,31,BD,13,10,F6,3E,0D,CD,D9,9C,CD,31,BD,3E,
0A,CD,D9,9C,CD,31,BD,C9,FE,00,20,36,3E
60 DATA 0D,CD,D9,9C,CD,31,BD,3E,0A,CD,D9,9C,CD,31,BD,C9,FE,01,20,21,DD,6E,00,DD,
66,01,3E,F5,DB,00,E6,40,FE,00,28,03,36
70 DATA 00,C9,36,01,C9,F5,3E,F5,DB,00,E6,40,20,F8,F1,C9,3E,07,CD,5A,BB,C9,20,20,
20,20,20,20,20,20,50,72,69,6E,74,65,72
80 DATA 20,43,6F,6E,74,72,6F,6C,20,52,53,58,27,53,20,28,A4,29,20,44,61,6E,69,65,
6C,20,47,72,69,66,66,69,6E,20,31,39,39
90 DATA 30,20,61,72,65,20,6E,6F,77,20,69,6E,73,74,61,6C,6C,65,64,2E,0D,0A,0D,0A,
FF
```

# HEIGHT

BY CHRIS WOOTTON

Big letters are the norm in this little program. Put the text into text\$, the height (from 1-8) in h and the screen coordinates into xp & yp, then GOSUB 70. You can input letters of any size and there's also a handy demo included.

```
1 'Enlarged-Height Character Generator [71]
2 '(C) Chris Wootton, 1990 [72]
3 ' [73]
10 MODE 1:SYMBOL AFTER 256:SYMBOL AFTER 32 [1E]
20 text$="Double Height":xp=14:yp=2:h=2:GOSUB 70 [A5]
30 text$="Triple Height":xp=14:yp=5:h=3:GOSUB 70 [32]
40 text$="Quadruple Height !!":xp=11:yp=9:h=4:GOSUB 70 [44]
50 END [E7]
60 ' Printing routine (Parameters: text$,h,xp,yp) [F6]
70 FOR ch=1 TO LEN(text$):ch$=MID$(text$,ch,1):GOSUB 90:FOR y=1 TO h [B6]
80 LOCATE xp,yp+y-1:PRINT CHR$(247+y);:NEXT y:xp=xp+1:NEXT ch:RETURN [E7]
90 p=UNT(HIMEM+(ASC(ch$)-32)*8+1):b=UNT(HIMEM+1729):FOR y=0 TO 7 [C1]
100 FOR z=1 TO h:POKE b,PEEK(p):b=b+1:NEXT z:p=p+1:NEXT y:RETURN [B7]
```

# SHOOT-EM-UP

BY PAUL FAULKNER



This little gem is for all of you out there who want to write shootie games but don't quite know how to approach it. As Paul points out, the bullet collision isn't too hot, but there's plenty of scope for you to work with.

```
10 INK 0,0:INK 1,26:INK 2,20:INK 3,18:BORDER 0:PAPER 0:PEN 1:MODE 1:ship$=CHR$(1
43):alien$="@ " :b$=" -":x=1:y=1:DIM bx(500):DIM by(5
00):bot=1:top=0:score=0
20 ay=1+INT(RND*23):FOR ax=39 TO 1 STEP -1:LOCATE ax,ay:PEN 2:PRINT alien$;:LOCA
TE x,y:PEN 1:PRINT ship$;:n=x:m=y:x=x+(INKEY(27)-INK
EY(34)):y=y+(INKEY(69)-INKEY(67)):LOCATE 1,25:PRINT "SCORE :";score
30 IF x<1 OR x>40 OR y<1 OR y>24 THEN x=n:y=m
40 IF x<>n OR y<>m THEN LOCATE n,m:PRINT " ";
50 IF INKEY(47)=0 THEN top=top+1:bx(top)=x:by(top)=y
60 FOR n=bot TO top:LOCATE bx(n),by(n):PEN 3:PRINT b$;:bx(n)=bx(n)+1:IF bx(n)=39
THEN LOCATE 39,by(n):PRINT " ";:bot=bot+1
70 IF bx(n)+1=ax AND by(n)=ay THEN score=score+20:GOTO 20
80 NEXT:IF x=ax AND y=ay THEN GOTO 100
90 NEXT:LOCATE 1,ay:PRINT " ";:GOTO 20
100 FOR v=15 TO 0 STEP -1:BORDER 6:SOUND 1,0,3,v,,31:BORDER 0:SOUND 2,1000,3,v,
,,31:NEXT:RUN
```

# WORDMAN

BY CHRIS WOOTTON

It's like hangman only without the man. The computer chooses a random word out of a vocabulary of 14, and your job is to guess the letters as quickly as possible. Check out the screen for your tally to date.

```
1 'word-Man [71]
2 'by Chris Wootton [72]
3 ' [73]
10 MODE 1:CALL &BC02:LIM w$(13),g(13):FOR a=0 TO 13:READ w$(a),g(a):NEXT [5C]
20 PEN 3:LOCATE 11,5:PRINT"WORD-MAN - C.Wootton":w=INT(RND*14):LOCATE 8,22 [11]
30 PRINT"ABCDEFGHIJKLMNPOQRSTUVWXYZ":w$=w$(w):h=LEN(w$):LOCATE 15-h/2,9 [82]
40 PEN 1:PRINT"The Word is "STRING$(h,45):c=0:g=0:WHILE c<h:WHILE a$<"A" [D6]
50 a$=UPPER$(INKEY$):WEND:LOCATE ASC(a$)-57,22:PRINT" ":FOR a=1 TO h [4A]
60 x$=MID$(w$,a,1):IF x$=a$ THEN LOCATE 26-h/2+a,9:PRINT a$;:c=c+1 [99]
70 NEXT:g=g+1:a$="":WEND:LOCATE 6,13:PRINT"Well Done. You Took" g "Guesses." [03]
80 sc=g(w)/g:LOCATE 15,15:PRINT"Score: "INT(sc*100)"%":CALL &BB18:CLS [EE]
90 PEN 3:GOTO 20:DATA AMSTRAD,6,CPC,2,ARNOLD,6,MICRO,5,ROM,3,RAM,3,BASIC,5 [DA]
100 DATA JOYSTICK,8,SOFTWARE,8,HARDWARE,7,BYTE,4,PORT,4,BIT,3,INTERFACE,8 [20]
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The ACU team dons racing leathers this month to take on the best of the rest in Accolade's fabulous Grand Prix Circuit, trembles at the wrath of dracula in Night Hunter and joins the Heroes on the road to glory.

## GAMEPLAN



### GRAND PRIX CIRCUIT

Are you tough enough to take on the challenge for the chequered flag?



### NIGHT HUNTER

Watch out, Dracula's about and this time he's hellbent on world domination.



### HEROES

Join in as four of the toughest heroes of all time get out and do their stuff.

## PLUS

Still want more? Then you've come to the right place. Check out the epic Iron Lord for starters, then try the other goodies.

- 1 (1) Pro Boxing  
Code Masters
- 2 (3) Paperboy  
Encore
- 3 (9) Big Trouble in Little China  
Alternative
- 4 (8) Temple of Doom  
Kixx
- 5 (10) Rock Star  
Code Masters
- 6 (7) Jack The Nipper 2  
Kixx
- 7 (NE) Match Day 2  
Kit Squad
- 8 (20) World Cup Challenge  
Players
- 9 (12) Vindicator  
Hit Squad
- 10 (NE) Question Of Sport  
Encore
- 11 (NE) Pro Tennis Simulator  
Code Masters
- 12 (11) Quatro Sports  
Code Masters
- 13 (2) Fantasy World Dizzy  
CodeMasters
- 14 (17) Road Blasterst  
Kixx
- 15 (NE) Rough And Reddy  
Hitec Software
- 16 (NE) Shadow Warriors  
Ocean
- 17 (NE) Escape From Singes Castle  
Encore
- 18 (NE) Turrican  
Rainbow Arts
- 19 (NE) Live And Let Die  
Encore
- 20 (5) World Cup Soccer '90  
Virgin



Look out adventure freaks. This one's gonna knock you for six. Included in this excellent package are two double-sided discs, cram-packed with action in a quest to restore goodness to the land.

The storyline? The wicked sorcerer Zolfahr has returned to reclaim the kingdom of his brother Tibor. Darkness reigns over the land, but the king's son has escaped the evil baddie, and he's determined to live up to the old legend that only one of Zolfahr's kin can restore light to the world.

OK, that's a very brief resumee indeed. In short,

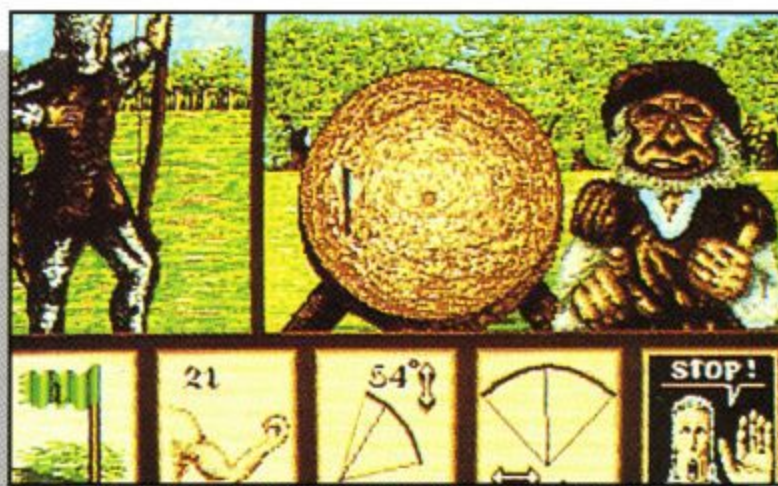
he's grown up and he's out on the prowl to raise an army to defeat his uncle and this is where you step in.

You start off the game with an overview of the old king's castle and the surrounding countryside. Using the joystick, move the cursor around to wherever you want to go and press fire. Try looking around the castle first.

In true adventure form, most of the minor action takes place in windows. You can just about make yourself out when you're stumbling

## Iron lord

**The age of chivalry returns in the shape of Tibor junior.**



around the grounds.

Next up, try one of the villages. There's a neat little horseriding sequence as you travel around. In Chatenay Malabre, you'll come across the grand old archery contest, where you can prove your mettle as a combatant. You'll also meet some very interesting people to chat to.

Get through the archery

and it's onto the arm wrestling. Beat nine adversaries and you're doing well. Next up comes the dice-throwing

and a much needed chance to make some money.

The idea is generally to impress as many people as possible so that you can as-

semble a fair sized army to take on Zolfahr.

Take care on leaving villages, you may be confronted by an assassin and challenged to a duel. If so, there's nothing to do except waggle your joystick to the death.

Having come through all of this adventure and more, through the use of some

excellent icon work, discussion and hunting about, you should have enough support to go back to the castle and levy your troops.

Position them well to ensure you don't get overwhelmed by your uncle's forces.

Once the great battle is over and, assuming you've been successful to date, it's time to dive into the sorcerer's labyrinth, six levels deep and full of danger. Watch your energy level here, as it reduces the longer you hang around.

Between each level of the labyrinth, you'll encounter an arcade sequence, where you'll have to be quick to destroy the monsters as they spit acid at you.

Last, but by no means least in this superbly styled adventure, you get to take on Zolfahr himself.

There you have it. An excellent offering of epic proportions, quite a rarity these days. With the clever mix of icon entry, arcade style screens and window, Iron Lord is exceptional value for money on the old CPC, and one game no serious game-player should be without.

**John Taylor**

ROUND-UP			
NAME	Iron Lord		
FROM	Ubisoft	PRICE	Disc £19.99
GRAFFIX	82%	SONIX	76%
PLAYABILITY	89%	VERDICT	



wait until you reach the final level.

Pick up the skulls to gain much needed extra lives and start hacking in this superb all-round smash-em-up.

Moving onto the bright lights and razzle dazzle of the game show world, here's your chance to take on the role of Ben Richards, a man wrongly accused of a crime he didn't commit, a man desperate to prove his innocence; the Running Man.

If you haven't seen the film, don't worry, there's plenty of action to keep you glued to your screen. Take on the likes of the Iceman, Buzzsaw and Dynamo in your efforts to escape from the four game zones. Your final quest is to break back into the studio and finish off that scumball show host Damon Killian.

In the meantime, you'll also be helping the rebel forces by deciphering the up-link code between levels in this fast moving, kicking, punching future shock.

Last, but by no means least, in this impressive menu is the golden oldie Star Wars. Taken directly from the film, the job in hand is to fight off the Emperor's nasty Tie-Fighters in a deep space dogfight, take on the might of the Death Star's tower laser emplacements and finally, get down into the trench and stick a missile down the exhaust port.

Combining frantic screen action with some marvellous sound effects, Star Wars is a brilliant game in its own right, but to round off this excellent compilation, its worth its weight in gold.

Chris Knight

Put away your Eleven-  
ses, this is no time for  
milk and biscuits. Plug  
in this masterpiece and  
you're on a non-stop route to  
hell and back with four of the  
biggest action blasts to date.

Flex your muscles, grease  
the firing trigger and get set  
to shoot in the Bond classic  
Licence to Kill for starters.  
Sanchez is the villain and  
your task is to stop the evil  
drug smuggler at all costs, in  
the air, overland and under-  
water.

Set over three different  
scenarios, Licence to Kill will  
have you leaping from heli-  
copters, onto planes, swim-  
ming for your life, waterski-  
ing and finally, taking on the  
fleet of big-wheel trucks as  
Sanchez makes a break for  
the border.

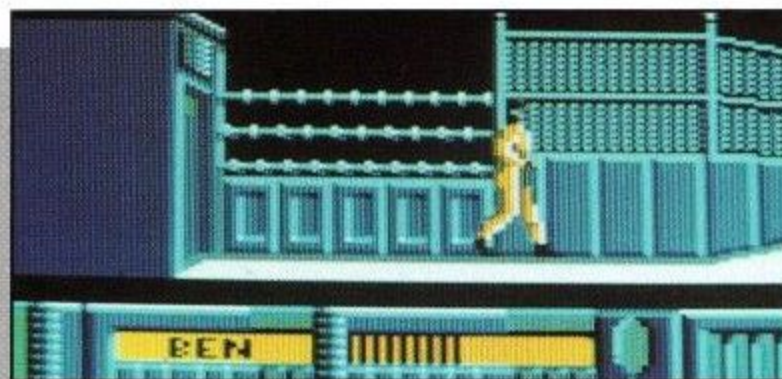
Graphically excellent, this  
Bond classic will have you on  
the edge of your seat at all  
times, but if the suave and  
sophisticated approach of 007

is not your style, try beefing  
it up in Barbarian II instead.

At the end of the last Bar-  
barian epic, you'd just res-  
cued the Princess Mariana  
from a fate worse than death.  
Now you've got to take her

## HEROES

When the going gets tough, the tough  
play Heroes.



back into the Dungeons of  
Drax to do away with the  
baddie himself.

You can decide whether to  
play the barbarian or the  
princess, whichever way you  
are inclined, and the idea is  
to battle your way through  
three maze levels before  
breaking into the Inner  
Sanctum.

Get used to the joystick  
movements first, then keep  
your eyes open for the magi-  
cal objects strewn around the  
screens which you need to  
survive in this inclement  
atmosphere. The opposition,

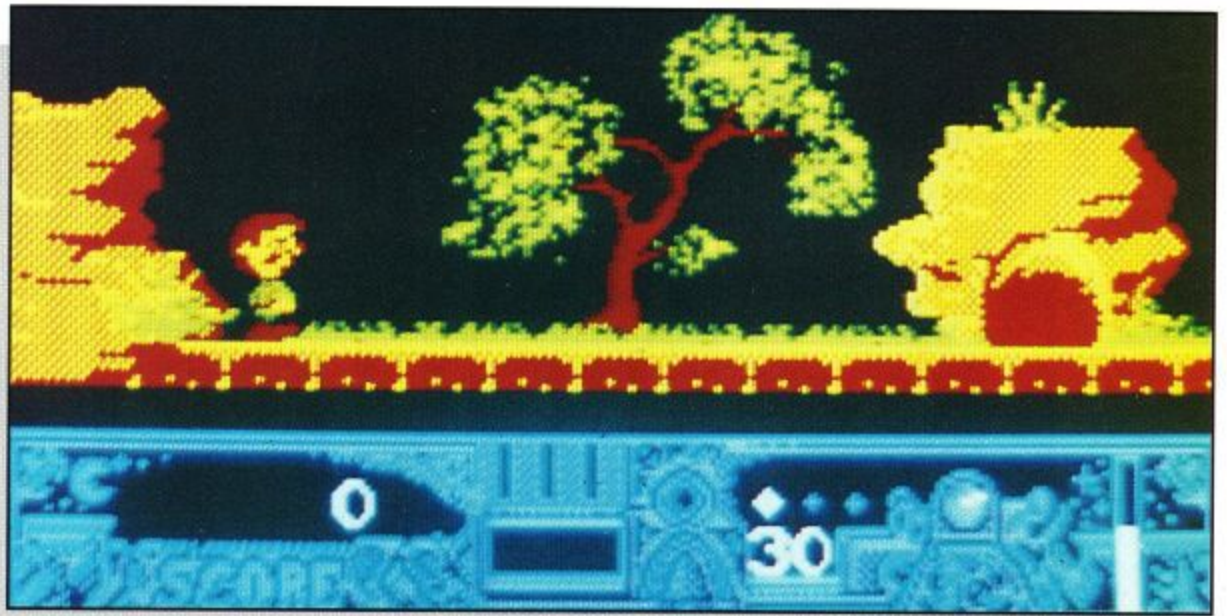
in the form of some fearsome  
and foul beasts, is tough  
enough to deter the most  
ardent of warriors, but if you  
thought that was bad enough,

ROUND-UP			
NAME	Heroes		
FROM	Domark	PRICE	Disc £19.99 Cassette £14.99
GRAFFIX	86%	SONIX	84%
PLAYABILITY	88%	VERDICT	

Forget about reality here for a second and imagine a time when fabled things abounded and magic and mystery were the norm. A time when the forces of good and evil survived together and a very thin line divided the powers of the two.

If you can conjure up that kind of image, then you'll begin to get to grips with the incredibly complex aura of Twin World.

For centuries, the Gaspards lived in their twilight world, under the fair rule of the Cariken. Now the



Carikens possessed a sacred amulet which kept badness at bay but, as is the norm with ancient relics, it slipped into oblivion, allowing the dark sorcerer Maldur to storm in and massacre the unsuspecting Gaspards and the Carikens.

A legend arose which told that if a single surviving Cariken could once more

hold the amulet, darkness would be driven away forever. To prevent this, Maldur split the amulet up into 23 pieces which scattered around the world.

Surprise, surprise, one of the Carikens did survive the massacre. Ulopa, brought up by an old servant of the dead king, has been primed for his quest, and he's ready for the

off. Grab your joystick and be prepared for some marvellous graphics and superlative gameplay in this fantasy adventure.

On route to the sorcerer's lair, you'll pass through some excellent scenery. You'll also meet a fair few baddies. Armed only with your magical stones to start with, battle your way through the wasteland taking on some wicked looking Goulous, amongst other things (well, all the names are in French, so I won't list them all here now).

If you manage to make it past four levels, you get the chance of a bonus round. The more bits and pieces you've retrieved, the more points you get. Then it's off to even weirder surroundings.

At the beginning of each new level, you'll see the status of the amulet and how well

## Twin world

Enter a weird and wonderful new world in the quest for good against evil.

you've done, so keep poking your nose into every corner for clues.

The amulet chips are usually diagonally shaped and exist only in the Twin Worlds, and you can jump in and out of these worlds to pick up the pieces.

Throughout the levels, pick up as many flutes as you can. These can be used to summon the merchant, who can sell you urgently needed supplies as well as extra lives. If you do eventually succeed in finding all 23 shards of the amulet, you'll need all the help you can get to take on the sorcerer at the bitter end.

For sheer imagination, Twin Worlds is a masterpiece. Controlling Ulopa is

simple, but you'll need to practice throwing the different types of stone he can acquire.

One of the minor drawbacks of the game is that, if you get zapped, you go right back to the beginning of the level and start again. This is a

touch infuriating, but it should drive you on to achieve better things.

The game is certainly addictive. It is also colourful, with some groovy monsters to keep you tearing across the screen. For high adventure stakes, get Twin Worlds and play it now.

**John Taylor**

ROUND-UP			
NAME	Twin Worlds		
FROM	Ubisoft	PRICE	Disc £14.99 Cassette £9.99
87%	78%	88%	
GRAFFIX	SONIX	PLAYABILITY	VERDICT



# Multi player soccer manager

**It's a game of two halves and you'll need to control both.**

**I**t's tough at the top. Your boys have played out of their skins to make it to the top of the League, with just a few games remaining. A sound thrashing of the local rivals leaves you amongst the final eight of the cup. Your bank balance has never looked so healthy. Your future is looking rosy until that is, you read the newspapers

and find out that your unruly followers have led to your team being banned from the glory of Europe.

Yes, all this and more could be yours in the latest footie offering from D & H games. Not only do you get the



chance to manage your favourite team to the top, but three of your mates get to do the same as well; should really hot up the competition.

OK, I know we've had just one or two footie management games before now, but from the looks of the menus in this one, it seems to be the ultimate.

There are 64 teams in all in

about everything really, and don't forget to keep the bank manager sweet, or things could go horribly wrong.

Beat the others to the best transfer deal and make sure your sponsors are happy with your wheeling and dealing before you get underway with the 30 week season.

If you've got your best squad out there, you've got a chance. Train them well, keep them happy with a few bonuses if they perform well, and for those that don't, there's always a sacking option open to you.

Continued success will

bring the crowds reeling in to see your boys. A televised outing will do you no harm either, but you'll have to be prepared for the likelihood of crowd violence in a capacity filled stadium.

At the end of the day, it's a funny old game and you'll need a fair amount of skill to do the double. Keep the crowd happy with your team performances and don't be miserly with your retirement deals, you need all the good press you can get to survive in the heady world of professional football.

For those of you who like the game and enjoy a fair amount of strategy, Multi-player soccer manager will be a joy to play, with some excellent icon controlled entry, clear graphics and a real atmosphere to savour. Even if you think you've had your fill of football games, get a copy of Multi-player Soccer Manager anyway; it'll be money well spent.

**John Taylor**

ROUND-UP			
NAME	Soccer Manager		
FROM	D&H Games	PRICE	Disc £14.99 Cassette £9.99
<b>76%</b>	<b>68%</b>	<b>72%</b>	
GRAFFIX	SONIX	PLAYABILITY	VERDICT



# Grand prix circuit

Go for the chequered flag in the ultimate performance car test.

It's hot, awful hot in the flameproof overalls. Keeping your helmet off until the last moment to savour as much fresh air as you can, you catch the signal from the engineer: start her up.

Pulling yourself firmly into the cockpit of your sleek Honda 1.5 V6 turbo McLaren, you feel the throb of raw power erupt into life as the switch is thrown on over 900 horsepower of engine. This is your chance to prove your mettle against some of the biggest names on the Grand Prix Circuit.

So the Ferrari tipped you to pole position in the qualifying lap, but you're not too

concerned about that. You know this Silverstone track like the back of your hand and, with the home crowd urging you on, you know this race is here for the taking.

The red light flashes once, twice and then it's green all the way and the chase is on.

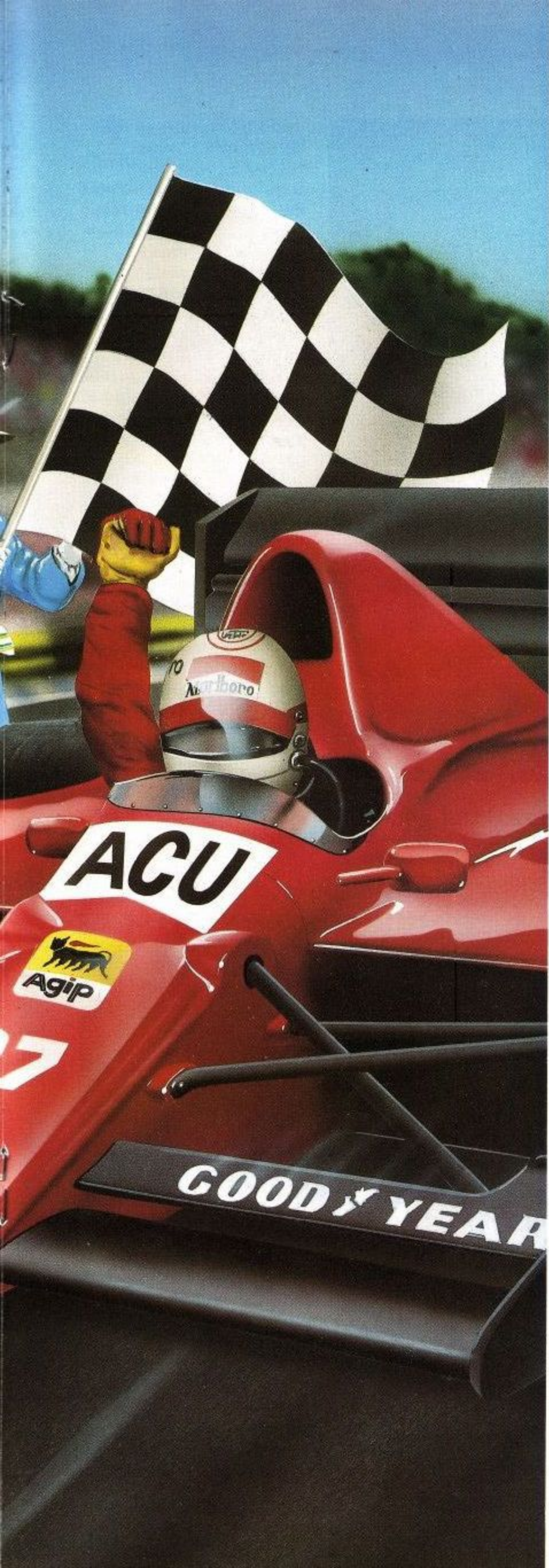
If you're into fast moving racing simulators, this is one beauty you won't want to

miss. It's jam-packed with options and before you know it, you'll be totally wrapped up with the Grand Prix scene, cursing the regular favourites on the track and rueing the fact that you've got to make pit stops just when you've managed to pinch the lead. yes, it's just like the real thing.

Starting off at the beginning of a new season, you get the chance to do a few practice spins in your authentic Formula One car. You decide which team you want to race for, so you can join Mansell in his last season at Ferrari if you like, or plump for the sleek Williams outfit.

All of the circuits are taken from real life, so take it easy





on the twists and turns of the streets of Monaco, and blast out on the fast straights of the German Nurburgring.

Moving on to Japan, you'll get a taste of driving in the dark through the tunnels in one of the toughest challenges to date.

Throughout the championship, you'll be competing against world-class drivers, each with their own distinctive styles, so study them well

and decide when and where to make your moves.

Inside the cockpit, the forward view of the track is exhilarating, but keep your eye on the special insets at the same time, to show you your location, lap number, current position and race time. Your rear view mirrors will also keep you in touch with the action behind you.

During each race, you need to decide just when you're going to make that all-important pit stop. Time it to perfection because seconds can mean the difference between first place and nine points, or a lowly fifth place.

If you think you can tame the awesome power of these sleek machines, then take your place with the best of the rest and compete for the prize - the title of World Driving Champion.

Some of the scenery in this excellent simulator are breathtaking, although you'll need to work hard to control the cars at first to make the most of the smooth scrolling. Keep your ears open for the roar of the engines and take care to time your gear

changes to perfection, it could make all the difference.

Although Grand Prix Circuit is only scheduled for disc and cassette release as yet, the new sound and graphics capabilities of the cartridge system of the new CPC machines, make this game an excellent candidate for the works, and let's hope we see it there soon.

In the meantime, get to know the feel of the car you've chosen, blast it for all it's worth around the practice track with uninhibited speed and try and survive until the end of the season. If you can do that and get yourself up in the rankings first time round, you're not doing badly.

As you come to know your competitors, you won't want to give up on a first attempt though. The next time round,

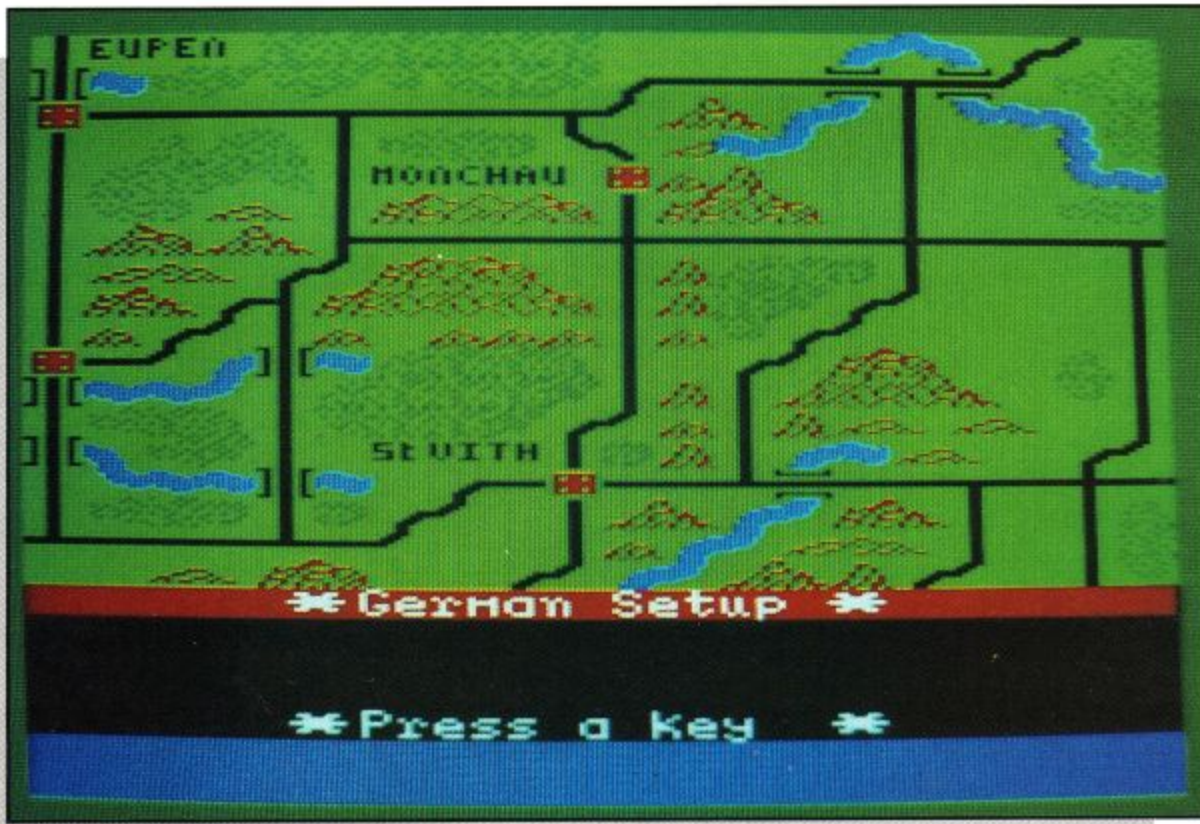


and the time after that, it becomes a grudge match as you try to topple the stars from their pinnacles.

After all, it's got to be worth it when you finally see yourself at the top of that table with the victory laurels around you shoulders, the chequered flag draped across your racing machine and the good old magnum of bubbly in your hands. Just mind you don't drink it all at once.

**Chris Knight**

ROUND-UP			
NAME	Grand Prix Circuit		
FROM	Accolade	PRICE	Disc £16.99 Cassette £9.99
<b>88%</b>	<b>82%</b>	<b>90%</b>	
GRAFFIX	SONIX	PLAYABILITY	VERDICT



As 1944 drew to a close and the allied armies appeared to be making progress after the long and bloody campaigns in Northern France and Belgium, three German armies made a surprise attack on one of the weak sectors in the allied line in a last desperate gamble to win the war.

It was a gamble which, had it not been for some heroic manoeuvres on the allied front, could well have paid off. As it happened, the Battle of the Bulge became the largest battle on the Western Front. Think you're up to it?

Right, take a hold of your battalions and prove it. As a one or two player game, you can relive the entire battle

just as it happened using the historical deployment option, but if think your tactics are better, try your own.

At the start of the game, you get to change the odds for, or against you. The poor weather option will disable your airfleet and stop you from making reconnaissance missions. Playing out the Command Crisis scenario will assume that Eisenhower did not make Montgomery Commander of the northern shoulder. In this eventuality,

## Battle of the bulge

Test your arm at the real thing in the mist and snow of the Ardennes - 16th December 1944.

you get no British troops coming to your aid.

If General Patton had not been able to swing his army north in such a short time, the outcome of the original battle could have been very different. Try this option and see the results!

Once you've sorted out your deployment and playing conditions, it's time to start moving. If the weather is good, send in your planes to recce, straff and bomb - it's nice to lower the opposition's morale a touch.

Throughout the game, you and the computer, or a friend, take turns to move your troops, tanks, gun emplacements and combat units. Once the moves have been simply made by moving the cursor over a unit and pressing the appropriate order key, it's time to take cover for the combat round.

You'll soon find out if you

made the right moves as the firing begins.

The idea of the simulation is to stop the Germans reaching the two road entry points

at the top left hand corner of the map near Namur. If this is reached, they've broken through to Antwerp.

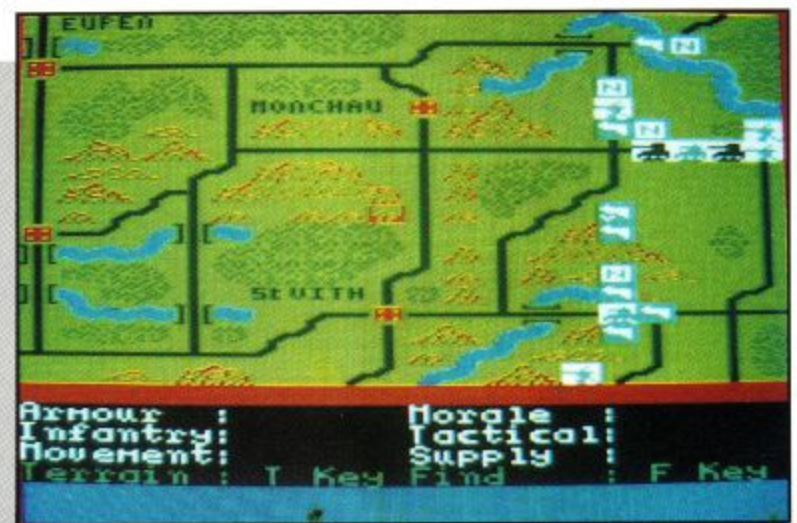
Your job is to prevent this, and also to prevent them capturing towns by making sure yours were the last units to pass through them.


Demolishing roads and bridges will hinder their progress, but keep an eye on your supply dumps when you start blowing things up.

The battle will finish on 2nd January 1945 if the Germans make the breakthrough, or any time before that if one of the sides has been obliterated.

As a taste of the real thing, Battle of the Bulge will be hard to beat. You'll need to utilise every last ounce of cunning and strategy to survive in this historically accurate masterpiece.

Dave Peach



ROUND-UP			
NAME	Battle of the Bulge		
FROM	CCS	PRICE	Disc £14.95 Cassette £12.95
72%	65%	78%	
GRAFFIX	SONIX	PLAYABILITY	VERDICT

A time of great darkness is settling upon us, the night air is alive with menace and the hills resonate to the howl of the werewolf; or is it just the wind.

For centuries, mankind has been protected from the wrath of the vampires by a number of sacred medallions

hidden within the walls of the towns, which served to balance out the forces of good and evil.

But Count Dracula is hungry for blood, and he's decided the time has come to put matters straight. Well, it's hard scratching a living as a vampire nowadays.

In this marvelously ghoul-



# Night hunter

**Beware the darkness when foul creatures are afoot and evil stalks the earth.**

ish tale, set over five 20 screen levels, you take on the role of the evil Count, determined to fight his way to the medallions and make a bid for world domination.

Standing in his way however, is that legendary Vampire Hunter Professor Van Helsing, who's not only got wind of this foul plan, but he's also alerted the townsfolk and got them out on the hunt for you.

The odds may seem a little stacked against you as you come across enemies armed with wooden stakes, priests with phials of holy water, archers and sorcerers, but don't worry overmuch, you have a few tricks up your sleeve as well.

Not only are you Dracula, but you also have the ability to transform yourself into a werewolf and a bat as well. Quite a party trick.

On each level, you need to pick up five coloured keys and three parchments. The keys will get you further into the game and, at the end of each level, you'll find the town where the medallions are

hidden. Go through the red and blue door and you've reached the next level.

Taking on the form of the werewolf, you'll find yourself impervious to some of the weapons of your adversaries, but watch out for the silver bullets. When taking on the form of the bat, you can get over some murky looking stretches of water, but you can only land again on terra firma, not on any of the platforms.

If you happen to get hit by any missiles whilst in your transformed states, you auto-

matically return to the form of Dracula. Time to get your teeth out and start biting.

Getting used to the transformation and biting techniques will take some time but, once mastered, you can certainly give the good guys a run for their money.

One tip: Professor Van Helsing is indestructible, so avoid him carefully when he appears at the end of each level.

Night Hunter is a splendidly thought out game, with plenty of fresh ideas to keep you glued to the screen. What there may be lacking in colour is more than compensated for by the action and if you get caught up in it, make sure you get to the crypt before Dracula come the morning, or you'll end up having many a sleepless adventure.

**John Taylor**



Fancy a bite to eat?

ROUND-UP			
NAME	Night Hunter		
FROM	Ubisoft	PRICE	Disc £14.99 Cassette £9.99
78%	76%	86%	
GRAFFIX	SONIX	PLAYABILITY	VERDICT

As the nights draw in, so have our designers and come up with the fab NEW LOOK ACU. Our editor has been driving his team to new depths just for you! He has sent the Hairy Hacker delving back into his murky past (Yuck!) in hot pursuit of every poke, cheat, hint and tip on your all time favourite games.

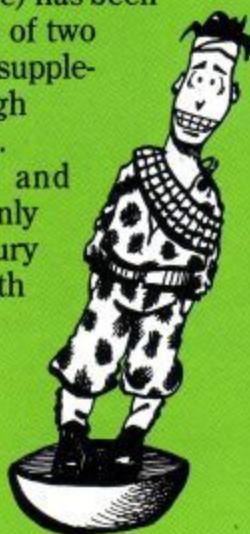
This furtive fruit of Hairy's misspent youth (and early middle age) has been hand-crafted into part one of two sensational 32 page colour supplements, to see you through those dark, wintery nights.

Christmas is comin' and Ziggy's getting fat. The only way to survive the festive fury is to go underground with the ACU crew. So what's in the pipeline?

# Get Down With the ACU Crew

Don't think that our editor only hangs out with very strange people. He found Doc Dorn buried under a thousand year project to program himself to Alpha Centauri and dragged him back to earth to help out us humble mortals.

Last, but by no means least, Gallant Gordon Bates, found trembling at the thought of a number two under a barber shop chair in Crewkerne, joins in to impart his inimitable know-how of the comms scene as payment for protection of his hallowed hairstyle.

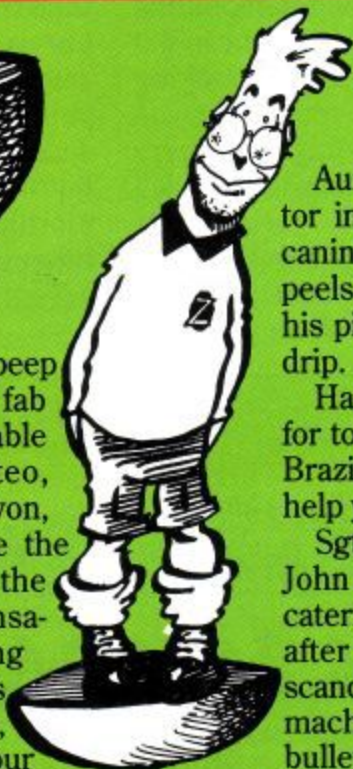


## Subbuteo

The Computer Game

# AMSTRAD ACU

An EXCLUSIVE peep at Electronic Zoo's fab conversion of that table top classic Subbuteo, prizes aplenty to be won, a chance to become the new New Kids on the Block with our sensational Music Making with the CPC series and lots, lots more, brought to you by your favourite people:



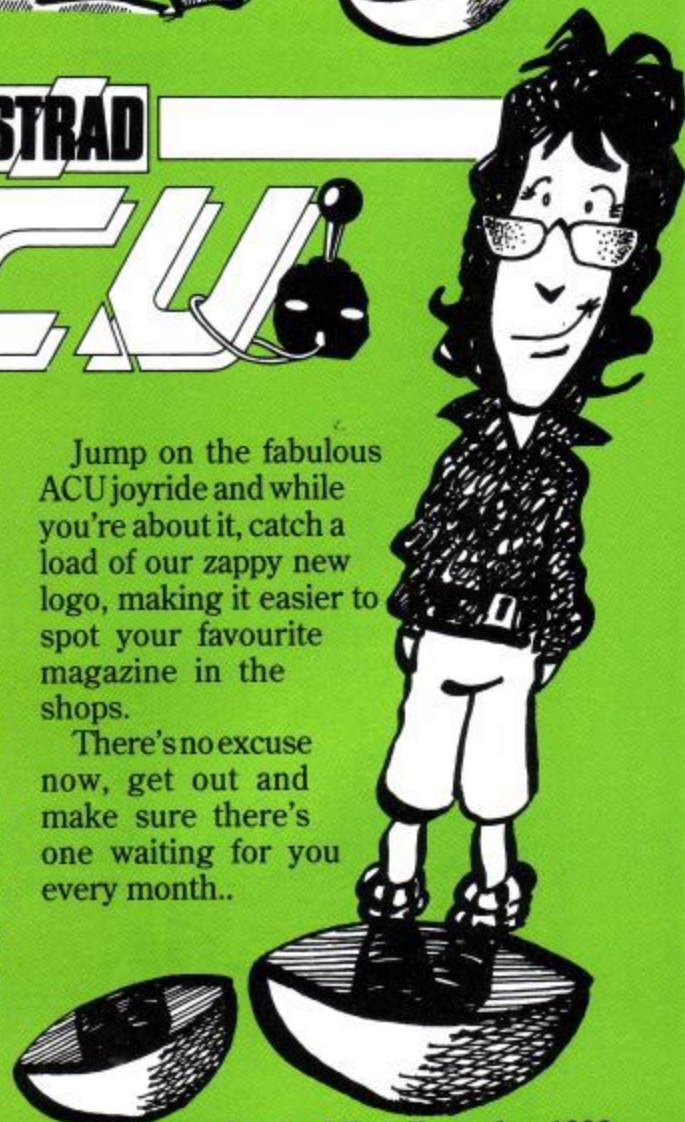
Auntie John (discovered by the editor in an all night perm parlour and canine coiffeur joint in Dakron, Ohio) peels back the mystery of the CPC with his pince-nez a-glitter and his nose a-drip.

Hairy Hacker (rescued from a home for toothless rottweilers in Sao Paulo, Brazil) puts the soft into software to help you get the high scores.

Sgt. Amstrad, in the hirsuit form of John Cook, recruited by ACU from the catering corps of the SAS immediately after the exploding bread pudding scandal of Iwo Jima, is your mucho macho mate through the mud and bullets of the arcade scene - and he grills a mean soya bean cutlet!

Jump on the fabulous ACU joyride and while you're about it, catch a load of our zappy new logo, making it easier to spot your favourite magazine in the shops.

There's no excuse now, get out and make sure there's one waiting for you every month..



Ice hockey's got nothing on this one boys and girls. If you thought Rollerball was grisly, then wait till you get hold of a copy of this one.

Coming into the arena, you are treated to an overview of the ice rink in glorious technicolour, just so that you know what you're up against.

On the first level, don't expect to be too daunted, all you get is the rink and the two goalmouths. Moving back into the centre, it's just you against the computer or a friend. The ball is waiting in the middle, the whistle goes and you're off.

There are nine rounds for you to compete in, each of them becoming progressively harder. In the first round, you've got the whole skating arena between your character and the opposition, as well as the goalies, so pick up some steam, use your sliding tackles and barges to put off your oponent, and slam the ball into the back of the net.

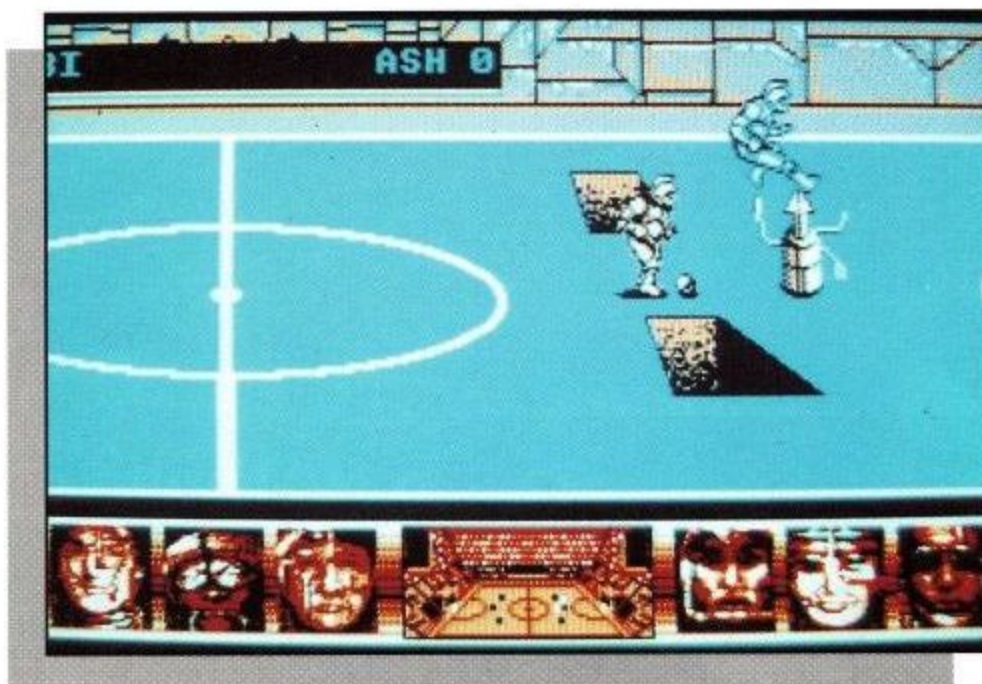
Each game finishes when either team scores five goals, and then it's up to the next level.

Coming into the second round, your first sight of the arena will tell you that something strange is hap-

pening. "I didn't see those strange bollard looking things last time", I hear you cry. Well, you're right, you didn't, but bump into them and you'll certainly know about it.

As you reach the higher levels, you'll discover pits in the ground, some lethal looking mines and, on the last level, some weird vacuum cleaner shaped objects that obliterate everything that touches them. Yes, that means you too.

Luckily enough, you do have some substitutes sitting on the bench to replace your fallen hero and before the game begins, you get the chance to sift through each character to see which ones



## Skate Wars

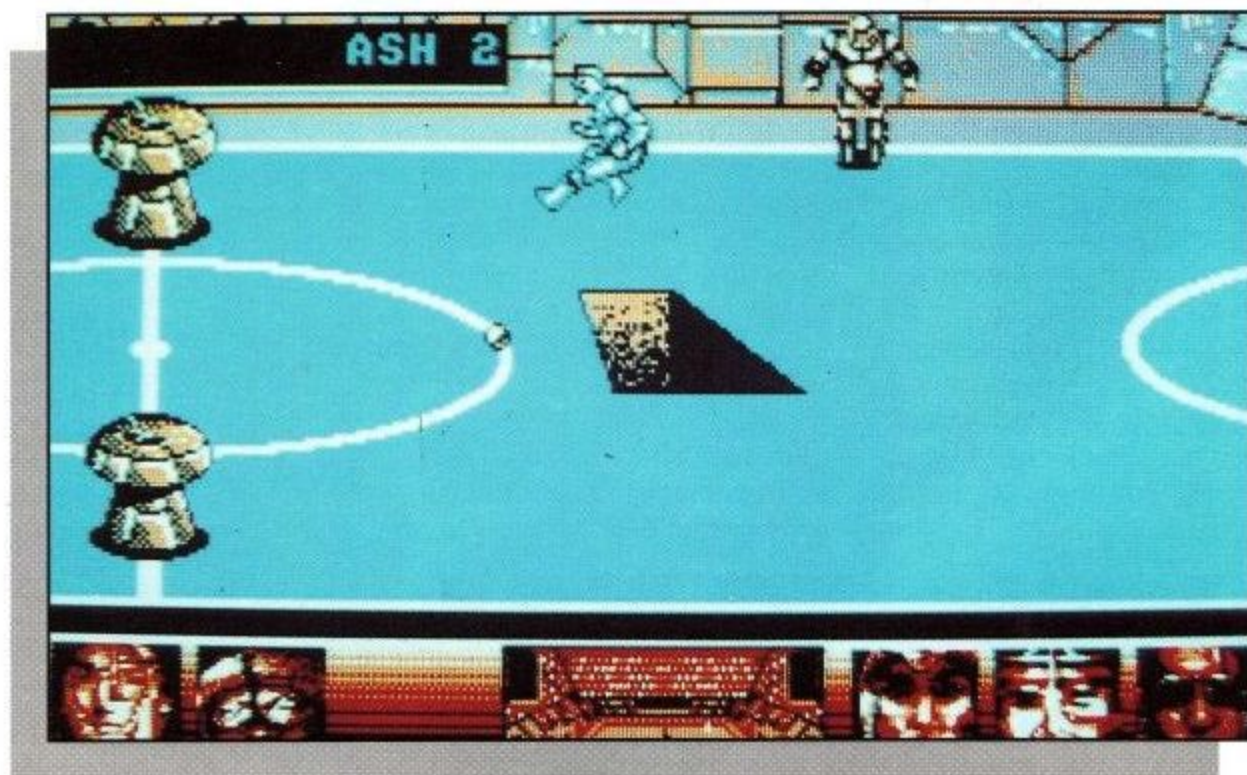
Keep your footing in this slippery-slidey battle to the death

With the two player option, Skate Wars will bring out the worst in you. Be warned, the competition is fierce, especially as you don't just stop at the end of each game. Each play is made up of all nine levels, with the aggregate score added up at the end to determine which of you has walked away with the honours,

so be prepared to make some enemies here as you shoulder barge your way to success.

The sound may not be up to much, but for pure excitement and competitiveness, go out and get this one as soon as possible.


Chris Knight



you want on your side.

There's also a handy practice option for you to get to grips with the playing surface and flick through the levels to see just what horrors await you.

Normal skating is fairly easy, but take extra care when the pits start appearing; they're awfully hard to avoid at full speed unless you've mastered the jump.

ROUND-UP			
NAME	Skate Wars		
FROM	Ubisoft	PRICE	Disc £14.99 Cassette £9.99
GRAFFIX	89%	SONIX	68%
PLAYABILITY	88%	VERDICT	

Have you ever had one of those days when you've played every single game in the house to ribbons, you're desperate for more action, but you know you're down to the last of your pocket money? I know I have, and it's certainly not nice.

Thankfully, you need

## Budget Basement

All the lowdown on Code Masters' superb Quattro series in this month's penny-saving section.



worry no longer. With Code Masters' ever increasing series of Quattro packages on the market, you can now get four sizzling hot games for the price of a cream tea!

For sport freaks, look no further than **Quattro Sports**, an excellent combination of two and four wheel race simulators, as well as some skiing and snooker thrown in for good measure.

Grand Prix will have you and a friend racing around 14 cunningly devised circuits against the clock, while the BMX Simulator puts the toughest to the test over the

bumps and ramps of seven wicked courses. Catch the action replay and slo-mo options for wacky results.

Staying in the great outdoors, match your skills against some of the fastest downhill ski slopes you could imagine. However, for the more sedate at heart, you can also take time out for a concentrated attack on the green baize of the snooker table.

The more robust amongst you might prefer the rough and tumble of **Quattro Power**, featuring dirt biking action at its best in Moto X,

day and night racing in Twin Turbo V8, wheelies and spins in the ATV quad racing simulator and a chance to blow your friends to pieces against the rocks of the superb Pro Powerboat challenge.

Yes, all that in one budget priced package can't be bad can it?

**Quattro Adventure** will have you leaping and jumping and pondering puzzles aplenty, and includes the classic smash Dizzy. Swashbuckle abounds in the legendary tale of Robin Hood, while for lovers of ghoulies and ghosties, there's more than enough to keep you happy in Vampire and Ghost Hunters.

Last but not least in the Quattro tally to date is **Quat-**

**tro Combat.** This one has got to be a must for shoot-em-up fans, if only for the sheer variety of zapping and blasting to be had in the sky and on the ground.

Get to grips with your fire-arm in Death Stalker and SAS Combat, try out a few moves oriental style in Ninja Massacre, and then take your jet fighter for a spin, or engage in a howling dogfight in Arcade Flight Simulator.

Whichever of these marvellous packages you choose, you can rest assured that your money has been well spent. Each of the games is produced with Code Masters' usual style of excellence, with superb graphics and unbeatable playability value, but if I were forced to pick my favourite, it would have to be the Adventure collection; the appeal of our little egg shaped friend Dizzy is just too strong to ignore. Apart from that, be sure that with this little lot on your shelf, you need never worry about rainy days again.

Chris Knight



### ROUND-UP

NAME	FROM	PRICE	RATING
Quattro Sports	Code Masters	£2.99	78%
Quattro Power	Code Masters	£2.99	82%
Quattro Adventure	Code Masters	£2.99	90%
Quattro Combat	Code Masters	£2.99	86%

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Collectors Issue 1

Film Comics

are!!!



# COMING - SOON

## Beware!

THURSDAY SEPTEMBER 27th



In which intrepid,  
handsome, and  
incredibly poor  
Gordon outlines ways  
to keep your  
telephone and online  
bills to an absolute  
minimum.

Greetings, fellow modem users (and those considering taking the first step). After many electronic messages all asking the

# Keeping the Share Price Down!

same question – along the lines of ‘How do I pay my phone bill and online charges now I’m a communicator?’ – it seems to be a good time to reveal a few of

the secrets of keeping online time to a minimum, and yet still using the systems to the same extent – and even more, come to that.

Now, we’ll start at the beginning, with a quick outline of what most people who get ginormous bills do – and why they get ginormous bills. There may be a few sums in amongst this lot, but you can cope with that, can’t you?? You can? Good!

OK – Bill Bloggs is first up. Bill logs onto three systems regularly. One is Maxwell House, another is Micronet, and the third is Telecom Gold (could be Microlink as well). He lives in Aberdeen, and has been happily married for thirteen years (which, as he says, isn’t bad for a feller that got married eighteen years ago.)

His day goes like this. At lunchtime – 12:15, he logs onto Maxwell House, long distance, using his manual dial modem at 300 baud. He reads his mail online, and answers each one as he reads it. He usually gets around five or six items of mail. When that’s done, he reads the public messages, and replies to any and all that he feels like, again online. His last excursion is to the files areas, where he goes the long way round, and lists all the files to see what he hasn’t got, instead of using the (N)ew command to see what’s been put there since the last time he logged on. This is a daily occurrence. He may or may not download, and may or may not upload. This all takes about an hour, 45 minutes of which is at peak rates, and 15 minutes of which is at standard rates, long-distance, into London.

At 17:30, he returns from his job in a local bookmaker’s, and, before he sits down with a cup of tea, logs onto Micronet. Here, he goes through exactly the same routine, except this time at 12/75 (his modem will handle only those two speeds). He reads mail, answers online. He reads public letters, answers online. He checks out Telesoftware – no need to upload. He reads any articles that interest him online, and any that inspire him, he makes comments on there and then, online. He usually finishes this first Micronet session at around 18:30.

His next port of call is at 20:00 hrs, when he logs into Telecom Gold. His modus operandi is more or less the same on here as everywhere else – he does everything online.

Next door, his neighbour Arthur Minute also uses the same three services, but his schedules are very different. He works at the same Turf Accountant’s offices, and works the same shifts as Bill. He NEVER logs onto



Arthur's fastest upload rate is nearly 4800bps - almost 16 times faster than Bill's. So, even if Bill were to decide to use Arthur's schedule and methods, he would still be worse off.

My advice to Bill would be as follows:

1. Get a new modem - allow a lot of money for it, and buy the fastest MNP can't stretch to an MNP modem, at the very least get one that can handle 2400bps. Forget 12/75, it's a waste of space, and not needed. 99% of services can offer you at least 1200/1200, if not 2400/2400, and the ones that can't probably aren't worth calling - they'll be too expensive for you to use.
2. Limit yourself to making calls only after 19:00 hours, unless someone else is paying the bills.
3. Stop writing letters online - prepare them offline, and use your software to send them quickly, at the highest speed the service you're using can accept.

4. Stop reading stuff online. Get on, grab it as a file, and get off. Read it offline - it costs you nothing then! BT can't bill you if you're not on the phone!

5. If your software won't handle it, change it, get something that will do what you want it to do. If necessary, use more than one package - it saves more than it costs in the long run.

6. Finally, LIMIT YOUR ONLINE TIME TO WHAT YOU KNOW YOU CAN AFFORD. Never dial a number if you don't know where it is. Irish BBS systems aren't always that easy to spot - I spent two hours online to one at one time, and only after I'd logged off did I realise where it was, and how much it cost me to use it.

Observe these six bits of advice, and

you'll be able to get lots out of your comms set-up, and still keep your bills at reasonable levels. Anyone that tells you that comms is expensive is a Bill Blogs type. Be an Arthur Minute, and you'll be able to look people in the eye and say, with confidence, 'Comms is only as expensive as you want it to be.' Gawd - Very serious for O' Bateasy, that lot. I make no apologies. But then, sometimes you just have to get serious! That's all we've room for - I'll be back next month with some more tantalizing tidbits from the comms scene - until then, keep those phone lines buzzing! Live long and prosper!

programmed it so to do.

At 22:30, he logs onto Maxwell House

again, and sends his mail and mes-

sages, and also downloads any soft-

ware he's decided he wants. He doesn't

read any messages, even though the

system tells him he has new mail. If he

doesn't download any software, he's off

the system in about five minutes.

His next port of call is Microlink,

where the same routine is followed, for

about the same length of time. Finally,

at 00:00 midnight, he logs onto Mi-

cronet again, and sends his mail auto-

matically, at 2400bps. If he feels like it,

he plays one of the MUGs for an hour

- it's cheaper after midnight.

When the end of the quarter comes,

and both Bill and Arthur get their re-

spective Prestel, Microlink and Phone

bills, Bill pays roughly four to five times

what Arthur has to fork out, yet Arthur

actually reads more, and gets much

more use out of all three systems. He

has an archive of useful information

that he can refer to, and still finds time

to play online games - something Bill

wouldn't dare do.

Do either of these characters ring a

bell with you? Are you a Bill, or are you

an Arthur? Think along these lines.

Arthur's gear cost him considerably

more than Bill's did - Bill got his modem

for free when he joined Micronet four

years ago. Arthur also got one at the

same time, but bought an MNP

equipped modem within six months -

when it cost him an enormous sum of

money - but the difference in the two

lads' bills over the last four years is

much more than the cost of the faster

and more fully equipped black box.

Bill just doesn't seem to realise that

peak rate phone calls are incredibly

expensive - every minute you spend on

the phone before 13:00 hours will cost

ANY system before 19:00 hrs, and once

he's got his modem online, he doesn't

even look at the screen.

At 19:00, he logs onto Micronet, and

captures any mail he has waiting into a

file on a disc he's set aside for the

purpose. He accesses the system at

2400 bits per second, a local call. He

also captures any articles that take his

fancy, in the same way, onto another

disc which is dedicated to that task he's

now got an archive of some twenty

discs, holding nearly eighteen months'

worth of Viewdata frames on all kinds

of topics, which he refers to constantly

when he needs information. When he's

captured the frames, he sets a com-

mand file into operation, that scans all

of the letters areas he uses, and cap-

tures that day's letters off onto yet

another disc that he has dedicated to

just that task. After roughly ten min-

utes, he logs off, having got all of the

info that Bill got, but without having

read any of it yet.

At roughly 19:15, he dials into

Maxwell House, this time at 2400 bits

per second line speed, but driving his

MNP level 5 equipped modem at 4800

bits per second (BPS). His actions are

more or less the same. He captures all

of his mail, and all of the public mes-

sages, then uses the files (NEW com-

mand to give him a list of the new files

and their descriptions, which he also

captures. Then he logs off, having spent

maybe ten minutes online, at long-dis-

tance off-peak rates.

His final port of call is Microlink,

where he does the same sort of thing

again, again taking maybe ten minutes

to get everything he wants. So far,

during the course of the half hour he's

been online, he hasn't sent ANYTHING

in the way of messages, and hasn't

downloaded a thing in the way of soft-

ware. He HAS got a permanent record

of his messages on disc, and can read

everything that Bill reads, but at his

own pace, and without incurring any

more time charges or phone costs.

The next hour or two are taken up

with Arthur reading his mail, articles,

and so forth, and deciding which mes-

sages he wants to reply to. He boots his

word-processor, and writes the replies,

plus any messages he wants to send to

public areas on all three systems he

uses. He saves the files off onto three

separate discs, and uses the same file-

names every time. His software looks

for those filenames - because he's

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## In the aftermath of the new Plus range excitement, the Doc gets down to some serious applications chatter.

Good morrow, gentle reader – have any of you managed to purchase one of the new machines yet?? Any 464+ owners wishing they could fit a disc drive – fear not, the Doc is here with a fix to the DD1 that will allow you to attach said unit to the back of the new machine. No fix for tape use on the 6128+ yet, but we're working on it!

Before that, though, I gave a couple of quick answers at the end of last month's column that I said we'd cover in more depth this time around, and here they are.

From Mansfield in Nottinghamshire comes this missive:

Dear Sir,

I own an Amstrad 464 with a DMP 2160 Printer, and I have a query. Is there any way possible to utilise the computer/printer into an Answering Machine whereby all messages received are printed directly on to the printer?

Initially I would need a Modem of some description and possibly a Software program to run it, but up to writing to you I have drawn a complete

# Doc'll fix it!

blank from local computer shops. When I ask them is it feasible, they look at me with vacant expressions! I even told them that a onetime friend of mine who used to travel abroad a lot had some sort of arrangement whereby he phoned home, read out his reports etc. and when he returned there they were all done via computer and printer.

I would be very grateful if you in your infinite wisdom and endless knowledge could let me know if it is possible, and then I can either pack the idea up or try and set it up.

The missive is signed Peter Matthews. As I hinted last month, what you describe is almost possible, but not on a machine such as the 464. You describe a system known as the Tone-talker, available on IBM PC compatibles, and, what happens with that is this. The PC is set up with a large hard disc (and yes, I know you can get one for Amstrad machines – I'm waiting patiently (huh!) for one coming from Germany as I write this) and an expansion card that allows speech to be digitised into a file.

The program that controls it all runs in the background, on a processor sharing arrangement, so that a secretary can listen to the speech while she or he (I watch Neighbours too, you know) is clattering away at the word-processor. It's nothing more than a computerised dictation machine when it's used like that.

Now, to my knowledge, nobody has come up with an effective time-slicing routine for the CPC range, neither is there an equivalent add-on to the Tone talker on the market, and I don't expect there will be. So, if you really need this



kind of functionality, you'd better get hold of our sister magazine APC and start getting into PC compatibles! Sorry to be the bearer of bad news, but even the CPC has its limitations!

## Robot CPCs?

Next up is a letter from Purley Sixth Form College (on headed notepaper, yet):

I am presently doing four "A" levels which include Technology. This course requires a practical project to be designed and made. I have chosen to design and make a computer controlled robot arm that will play board games. I have to make the entire thing myself and this includes interfacing the computer to the robot arm. I would greatly appreciate it if you could please give me any information on the output/input ports at the rear of my CPC6128 (the expansion and printer ports) along with how to read and alter the signals sent and received from these ports via programming. I own a Z80 machine code assembler (Maxam 1.5) and have been following AJ's machine code course so any machine code listings would also be gratefully accepted.

Owing to the fact that this and the interface has to be built by myself, I cannot use any interfaces on the market so this information would unfortunately be of no use to me. I would however be grateful of any precautions I should take in completing this task.

Whether you are unable to send or publish any information on this subject due to any reason or not, I would appreciate it if you could give me other addresses/telephone numbers/literature to try as these would be most helpful.

The nature of the course includes certain deadlines that I must meet in order to pass. Therefore I wish to state the need for a quick response to this letter. I thank you in anticipation of this.

Well, Peter Wise - it seems you are living up to your name! I suspect that you're likely to be using Leggo Technic in the mock up stages, before you get round to building the final arm, and that should pose no problems for you. The interfacing ought to be a fairly simple task. In essence, you're looking at a straightforward switching arrangement driven by port addresses - in other words, a digital to analogue (or digital) converter. There is a fair num-

ber of books around on the subject on interfacing between digital and analogue signals, and amplifying digital switch signals to levels that discreet components can use.

Certain things do spring to mind, though. I would be very tempted to use opto-isolation in this kind of project. The likelihood is that signals outside the computer (and voltage levels) could be dangerous to your CPCs health. Ergo, using opto-isolators in the interface will prevent any chance of injurious voltages blowing your CPC apart.



Second. You mention board games, but you don't say what type. I assume that you're looking at Chess, Othello, that kind of thing. This leads me to believe that we're talking fairly precise three dimensional movement on the arm, governed by stepper motors? What I'm not clear about is whether the program that controls the arm has to have the intelligence to actually play the game (in which case you're talking heavy programming, and yes, lots of machine code to do the trick) or whether human fingers will control the arm from the keyboard by co-ordinates, in which case you might get away with a BASIC program.

Either way, for the information you need on the port addresses and decoding signals, you will need SOFT 968, sadly out of print, but a copy of which I may be able to lend to you. There's also

a hardware guide, but I believe that's only available to registered repair shops. Give Amstrad a ring, and beg a copy, on loan if you have to.

And so to the disc drive for a 464+. In last month's review of the range, I said that Amstrad didn't intend for 464+ owners to stick a disc drive on the back of the machine, and, indeed, at first glance, it seems that they've so arranged things that you couldn't do it. However, that isn't the case. The DD1 interface is built with a disc ROM inside it. Now, the new machines also include a disc ROM (in position 7) alongside the rest of the firmware.

The problem lies in both disc ROMs fighting for control when a DD1 is attached to the 464+. The answer, therefore, is to prevent one or the other from working. My good friend Cliff Lawson, exceedingly clever technobod down there in Brentwood, has contributed quite largely to a debate on this in the Micronet news pages, and also on the Amster's Cage, and I'm indebted to him for helping me sort it all out.

The gist of it is this. It would be exceedingly foolhardy to tamper with the ROM in the Burnin Rubber cartridge - damage might easily ensue. However, to disable the on-board ROM in the Disc Interface is simply a matter of removing a diode - D110, as it happens. This particular little component is clearly marked on the circuit board, so it shouldn't be too hard a task to locate it, and either de-solder it (if you're handy with a soldering iron), or attack it with some fine wire cutters, and remove it that way.

If you've only just bought the interface, then, yes, you're likely to invalidate the warranty, but, having said that, they're available at very low prices at the moment, so the investment isn't going to be that great. If you're not sure how to go about the surgery, then either get the unit down to your local repair shop, and tell them what needs

removing (a diode-ectomy, perhaps?), or hang on until next month when I hope to be able to give you a pictorial guide to the job (in photos).

And that about winds it up for this month. Keep the letters coming in, and we'll keep on answering them. Also, if you come across any useful bits of info on the new machines, do, please, let me know. Mine have gone back to Amstrad now (sob, sob)! As my bruvver would say, 'Live long and Prosper'.

# TOTE

By R.E. Jones

Here's an excellent program which will appeal to fun lovers and serious clubs and charities alike. What you've got is something which will allow you to enter competitors into a contest, be it an egg



and spoon race or even a pie eating bash. Ticket prices can be altered and you can even have a flutter on the outcome.

In the event that bad weather should spoil your event, there's even a horse race game included for indoor sport. Just follow the simple instructions and you've got an awful lot wrapped up into one handy program.

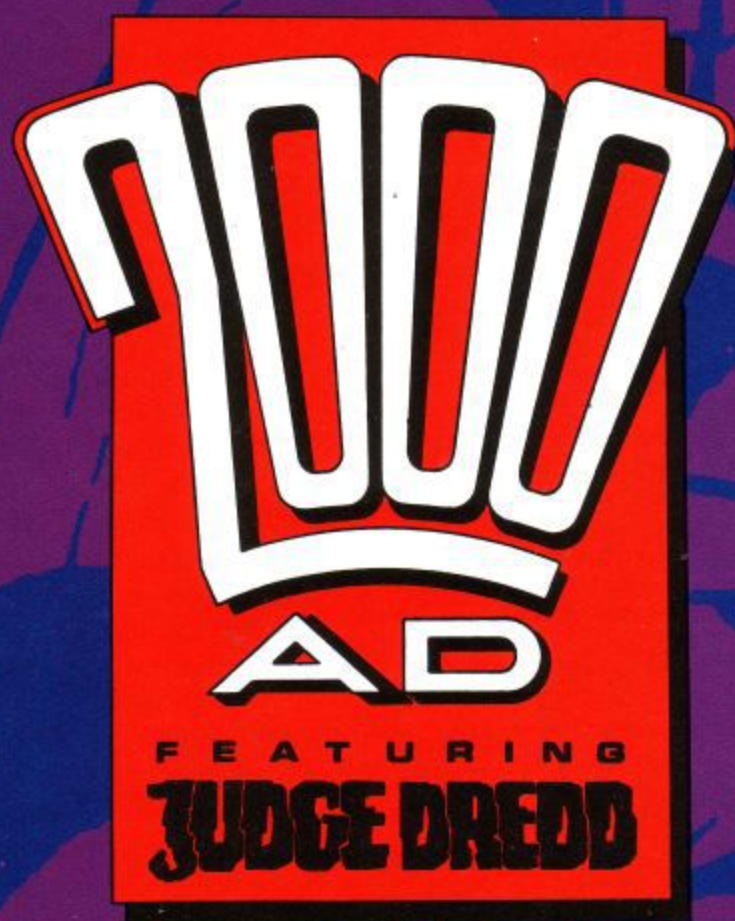
```

10 MODE 2:INK 0,11:INK 1,0:BORDER 11:INK 2,0,26:pc1=10:pc2=50:pc3=30:pc4=10:sum=
100 [05]
20 DIM name$(25),n(25):d$="OFF":price=5 [70]
30 CLS:PRINT"
                                COMPUTOTE" [32]
40 PRINT"
                                *****":PRINT [A4]
50 PRINT"Computote is a utility to aid fund raising for charities, clubs, PTA's
etc. The program is written in basic so that it may readily be altered to suit i
ndividual requirements." [8F]
60 PRINT"The program enables the competitors of a contest to be entered and for
tickets to be sold (betting) on the outcome of the contest. This can be used th
erefore" [BF]
70 PRINT"for any type of contest be it an egg and spoon race, cross country run
or even a pie eating contest." [E1]
80 PRINT:PRINT"In the event that the function suffers from bad weather or, in th
e evening in the club house, the simple horse race game can be used for fun or
fund raising." [79]
90 PRINT [2B]
100 PRINT"Following this is the menu which allows the price of the ticket to be
altered, the percentages for the charity or club and the winners to be set, and
for the contestants data to be entered. You need to enter the number [18]
of contestants"; [18]
110 PRINT"and then the number, colour or title by which they will be known. Whi
le on the same screen, you can sell tickets against each entry listed by reading
the prompt. Item 4 on the menu allows the tickets sales to be di [69]
isplayed if required."; [69]
120 PRINT"You can return to this display from the menu at any time to sell more
tickets." [3E]
130 PRINT:PRINT"The program allows for 20 entries but only 8 entries can be used
for the game." [C7]
140 GOSUB 1370 [8F]
150 ***** MENU ***** [A
8]
160 CLS:INK 0,25:INK 1,0 [71]
170 LOCATE 1,1:PRINT"
                                Menu" [D5]
180 PRINT"
                                ---- " [A4]
190 LOCATE 15,5:PRINT"
1. Ticket price. "CHR$(24)price"pence "CH
R$(24) [C9]
200 LOCATE 15,7:PRINT"
2. Set Percentages. " [20]
210 LOCATE 15,9:PRINT"
3. Input Data." [EB]
220 LOCATE 15,11:PRINT"
4. Tickets sold display. "CHR$(24)" "d$CHR$(
24) [AE]
230 LOCATE 15,13:PRINT"
5. Return to Display." [B0]
240 LOCATE 15,15:PRINT"
6. Display Winners." [44]
250 LOCATE 15,17:PRINT"
7. Game." [BB]
260 LOCATE 15,19:PRINT"
8. Quit Programme." [F5]
270 GOSUB 1460:LOCATE 25,25:INPUT "Please make your selection";sel$ [7C]
280 IF sel$<CHR$(49) OR sel$>CHR$(56) THEN 270 [91]
290 sel=VAL(sel$):IF sel<1 OR sel >9 THEN 270 [72]
300 ON sel GOTO 310,1060,330,1470,1590,910,1640,1550 [E5]
310 GOSUB 1460:LOCATE 28,25:INPUT "Enter Price of Ticket";price [71]
320 LOCATE 49,5:PRINT price"pence ";GOTO 170 [74]
330 ***** INPUT ***** [A9]
340 CLS:INPUT" Input number of competing components, 8 only if using game";nc%
[0D]
350 IF nc%<2 OR nc%>20 THEN 340 [AF]
360 FOR x=1 TO nc% [DD]
370 CLS:PRINT"Enter Name, colour or designation of competing component";:PRINT"
No"x;:INPUT:name$(x) [DA]
380 NEXT [3F]
390 CLS:PRINT "
                                Entry List
                                Ticket Price. "pri
ce" Pence" [FD]
400 PRINT"-----"
                                " [F5]
410 PRINT [25]
420 GOSUB 1490 [B4]
430 ***** Selection ***** [AA
]
440 LOCATE 16,25:INPUT "Please make a Selection or 999 to finish";z [7A]

```

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# NEW

```

450 IF z=999 THEN z=0:GOSUB 2450:GOTO 150 [E1]
460 IF z<1 OR z>nc% THEN LOCATE 56,25:PRINT "":GOTO 440 [6]
8]
470 GOSUB 1460 [97]
480 LOCATE 25,25:INPUT "How many tickets ";t [BC]
490 IF d$="ON " THEN LOCATE 55,3:PRINT"Tickets Sold," [D7]
500 IF z=1 THEN n(1)=n(1)+t [9A]
510 IF d$="ON " AND n(1) THEN LOCATE 60,5:PRINT n(1) [84]
520 IF z=2 THEN n(2)=n(2)+t [D3]
530 IF d$="ON " AND n(2) THEN LOCATE 60,6:PRINT n(2) [F8]
540 IF z=3 THEN n(3)=n(3)+t [OC]
550 IF d$="ON " AND n(3) THEN LOCATE 60,7:PRINT n(3) [6C]
560 IF z=4 THEN n(4)=n(4)+t [45]
570 IF d$="ON " AND n(4) THEN LOCATE 60,8:PRINT n(4) [E0]
580 IF z=5 THEN n(5)=n(5)+t [7E]
590 IF d$="ON " AND n(5) THEN LOCATE 60,9:PRINT n(5) [54]
600 IF z=6 THEN n(6)=n(6)+t [A4]
610 IF d$="ON " AND n(6) THEN LOCATE 60,10:PRINT n(6) [99]
620 IF z=7 THEN n(7)=n(7)+t [DD]
630 IF d$="ON " AND n(7) THEN LOCATE 60,11:PRINT n(7) [OF]
640 IF z=8 THEN n(8)=n(8)+t [16]
650 IF d$="ON " AND n(8) THEN LOCATE 60,12:PRINT n(8) [85]
660 IF z=9 THEN n(9)=n(9)+t [4F]
670 IF d$="ON " AND n(9) THEN LOCATE 60,13:PRINT n(9) [FB]
680 IF z=10 THEN n(10)=n(10)+t [83]
690 IF d$="ON " AND n(10) THEN LOCATE 60,14:PRINT n(10) [A7]
700 IF z=11 THEN n(11)=n(11)+t [AF]
710 IF d$="ON " AND n(11) THEN LOCATE 60,15:PRINT n(11) [OE]
720 IF z=12 THEN n(12)=n(12)+t [EE]
730 IF d$="ON " AND n(12) THEN LOCATE 60,16:PRINT n(12) [88] [88]
740 IF z=13 THEN n(13)=n(13)+t [2D]
750 IF d$="ON " AND n(13) THEN LOCATE 60,17:PRINT n(13) [2]
760 IF z=14 THEN n(14)=n(14)+t [6C]
770 IF d$="ON " AND n(14) THEN LOCATE 60,18:PRINT n(14) [7C]
780 IF z=15 THEN n(15)=n(15)+t [AB]
790 IF d$="ON " AND n(15) THEN LOCATE 60,19:PRINT n(15) [F6]
800 IF z=16 THEN n(16)=n(16)+t [D7]
810 IF d$="ON " AND n(16) THEN LOCATE 60,20:PRINT n(16) [E2]
820 IF z=17 THEN n(17)=n(17)+t [16]
830 IF d$="ON " AND n(17) THEN LOCATE 60,21:PRINT n(17) [5C]
840 IF z=18 THEN n(18)=n(18)+t [55]
850 IF d$="ON " AND n(18) THEN LOCATE 60,22:PRINT n(18) [D6]
860 IF z=19 THEN n(19)=n(19)+t [94]
870 IF d$="ON " AND n(19) THEN LOCATE 60,23:PRINT n(19) [50]
880 IF z=20 THEN n(20)=n(20)+t [BD]
890 IF d$="ON " AND n(20) THEN LOCATE 60,24:PRINT n(20) [1C]
900 t=0:GOTO 440 [44]
910 ***** Winners Screen ***** [AB]
]
920 IF nc%=0 THEN CLS:LOCATE 20,10:PRINT"No contestants have been entered yet.":
GOSUB 1370:GOTO 150 [BE]
930 CLS:GOSUB 1490 [DF]
940 LOCATE 25,25:INPUT"Please Select 1st Place Winner";xx [4E]
950 IF xx<1 OR xx>nc% THEN 940 ELSE GOSUB 1460 [CC]
960 LOCATE 25,25:INPUT"Please Select 2nd Place Winner";yy [A6]
970 IF yy<1 OR yy>nc% THEN 960 ELSE GOSUB 1460 [3C]
980 LOCATE 25,25:INPUT"Please Select 3rd Place Winner";zz [DD]
990 IF zz<1 OR zz>nc% THEN 980 [46]
1000 GOSUB 2450 [8F]
1010 CLS:PRINT:PRINT:PRINT:PRINT " 1st Place. "name$(xx):LOCATE 55,4:
PRINT USING " # ##,##";win1:PRINT:PRINT:PRINT [31]
1020 PRINT " 2nd Place. "name$(yy):LOCATE 55,8:PRINT USING " # #
#,.##";win2:PRINT:PRINT:PRINT [36]
1030 PRINT " 3rd Place. "name$(zz):LOCATE 55,12:PRINT USING " #
#,.##";win3 [D8]
1040 GOSUB 1370 [9E]
1050 GOTO 150 [91]
1060 ***** Percentages ***** [
93]
1070 CLS:INK 0,14:INK 1,0:BORDER 14:PRINT " Percentage
s.":PRINT:PRINT:PRINT:PRINT [A7]
1080 PRINT " House. "pc1" %":PRINT:PRINT [22]
1090 PRINT " 1st. "pc2" %":PRINT:PRINT [DD]
1100 PRINT " 2nd. "pc3" %":PRINT:PRINT [0]
1110 PRINT " 3rd. "pc4" %":PRINT [E2]
1120 PRINT:PRINT " total "sum" %" [FD]
1130 GOSUB 1460 [9C]
1140 LOCATE 12,25:INPUT"Change House percentage,Return to pass or 999 to finish"
;p1 [F8]
1150 IF p1=999 THEN 1330 [62]
1160 IF p1=0 THEN 1180 [88]

```

```

1170 pc1=p1:LOCATE 30,6:PRINT pc1          [68]
1180 GOSUB 1460 [AB] [AB]
1190 LOCATE 12,25:INPUT"Change 1st place percentage,Return to pass or 999 to fin
ish";p2 [BA]
1200 IF p2=999 THEN 1330 [5F]
1210 IF p2=0 THEN 1230 [33]
1220 pc2=p2:LOCATE 30,9:PRINT pc2          [D4]
1230 GOSUB 1460 [9E]
1240 LOCATE 12,25:INPUT"Change 2nd place percentage,Return to pass or 999 to fin
ish";p3 [5F]
1250 IF p3=999 THEN 1330 [78]
1260 IF p3=0 THEN 1280 [B5]
1270 pc3=p3:LOCATE 30,12:PRINT pc3        [BC]
1280 GOSUB 1460 [AD]
1290 LOCATE 12,25:INPUT"Change 3rd place percentage,Return to pass or 999 to fin
ish";p4 [69]
1300 IF p4=999 THEN 1330 [75]
1310 IF p4=0 THEN 1330 [5D]
1320 pc4=p4:LOCATE 30,15:PRINT pc4        [2C]
1330 sum=pc1+pc2+pc3+pc4:LOCATE 29,18:PRINT sum [BB]
1340 IF sum<>100 THEN 1430 [BF]
1350 GOSUB 1370 [A7]
1360 GOTO 150 [9]
1370 GOSUB 1460:LOCATE 25,25:PRINT"      Press any key":z$=INKEY$ [B3]
1380 FOR t=1 TO 150:NEXT [37]
1390 GOSUB 1460:LOCATE 25,25:PRINT"
" [B8]
1400 FOR t=1 TO 150:NEXT [21]
1410 IF z$="" THEN 1370 [DF]
1420 RETURN [69]
1430 GOSUB 1460:LOCATE 20,24:PRINT"Total must be 100% please correct" [67]
1440 GOSUB 1370 [A6]
1450 GOTO 1060 [6B]
1460 LOCATE 10,25: PRINT"
":RETURN [52]
1470 IF d$="OFF" THEN d$="ON ":GOTO 170 [F3]
1480 IF d$="ON " THEN d$="OFF":GOTO 170 [5A]
1490 FOR x=1 TO nc% [58]
1500 IF x>9 THEN 1520 [DA]
1510 PRINT"      "x".      "name$(x):GOTO 1530 [89]
1520 PRINT"      "x".      "name$(x) [3A]
1530 NEXT [FF]
1540 RETURN [71]
1550 LOCATE 15,25:PRINT"ARE YOU SURE ARE YOU SURE ARE YOU SURE":z$=INKEY$ 3
5]
1560 IF z$="" THEN 1550 [EE]
1570 IF z$="y" THEN 1580 ELSE 150 [3B]
1580 CLS:LOCATE 16,12:PRINT"      To resume without loss of data - goto 80":END
[2C]
1590 CLS:PRINT "      Entry List      Ticket Price. "pr
ice" Pence" [F0]
1600 PRINT"-----"
" [7F]
1610 PRINT [5C]
1620 GOSUB 1490 [CD]
1630 GOTO 490 [E8]
1640 ***** GAME ***** [
99]
1650 MODE 1:CLS:INK 0,9:INK 1,0:BORDER 9 [1A]
1660 SYMBOL 240,3,38,31,31,63,112,128,128 [B2]
1670 SYMBOL 241,128,128,128,128,128,128,128,128 [B0]
1680 SYMBOL 243,144,120,252,227,225,124,3,1 [08]
1690 PRINT [74]
1700 FOR a=1 TO 8:PRINT CHR$(a+48);CHR$(240);CHR$(243):PRINT:PRINT:NEXT [91]
1710 FOR x=1 TO 24:LOCATE 40,x:PRINT CHR$(241):NEXT [DE]
1720 *FOR l=1 TO 8:LOCATE 1,1:PRINT CHR$(240);CHR$(243):NEXT [95]
1730 LOCATE 10,25:PRINT"Press any key to start" [92]
1740 a$=INKEY$ [14]
1750 IF a$="" THEN 1740 [9C]
1760 LOCATE 10,25:PRINT" " [55]
1770 h1%=2:h2%=2:h3%=2:h4%=2:h5%=2:h6%=2:h7%=2:h8%=2 [16]
1780 LOCATE h1%,2:PRINT" ":LOCATE h1%+1,2:PRINT CHR$(240);CHR$(243):IF h1%=38 TH
EN 1980 [DD]
1790 LOCATE h2%,5:PRINT" ":LOCATE h2%+1,5:PRINT CHR$(240);CHR$(243):IF h2%=38 TH
EN 1980 [09]
1800 LOCATE h3%,8:PRINT" ":LOCATE h3%+1,8:PRINT CHR$(240);CHR$(243):IF h3%=38 TH
EN 1980 [19]
1810 LOCATE h4%,11:PRINT" ":LOCATE h4%+1,11:PRINT CHR$(240);CHR$(243):IF h4%=38
THEN 1980 [55]
1820 LOCATE h5%,14:PRINT" ":LOCATE h5%+1,14:PRINT CHR$(240);CHR$(243):IF h5%=38
THEN 1980 [8D]

```



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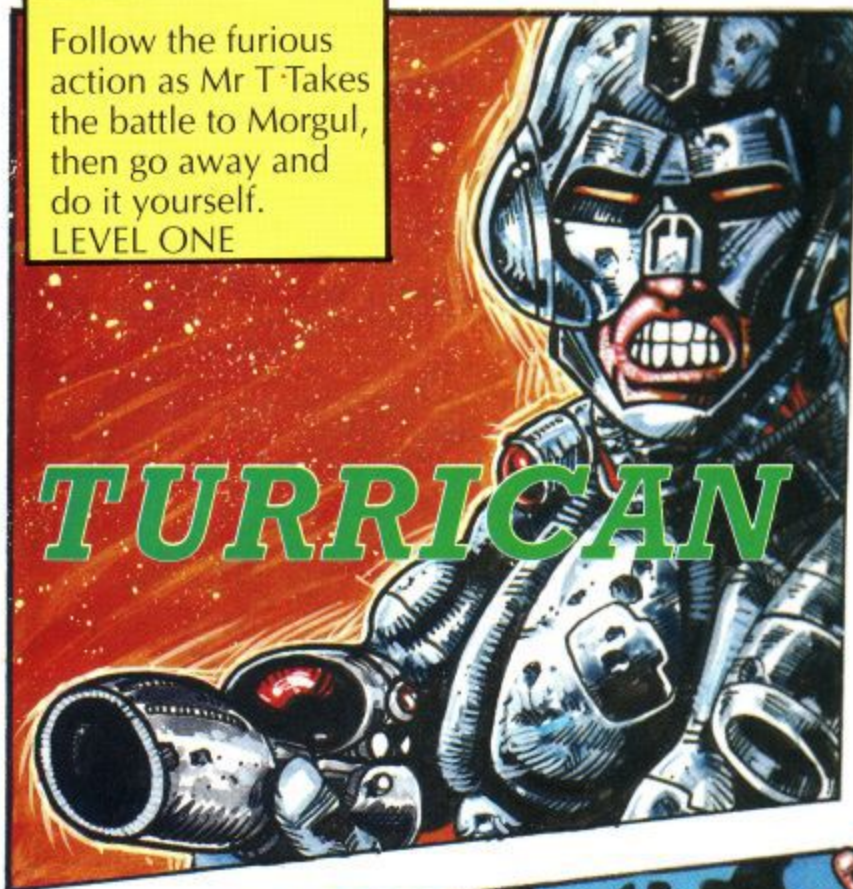
1830 LOCATE h6%,17:PRINT " ":LOCATE h6%+1,17:PRINT CHR$(240);CHR$(243):IF h6%=38
THEN 1980 [C5]
1840 LOCATE h7%,20:PRINT " ":LOCATE h7%+1,20:PRINT CHR$(240);CHR$(243):IF h7%=38
THEN 1980 [D6]
1850 LOCATE h8%,23:PRINT " ":LOCATE h8%+1,23:PRINT CHR$(240);CHR$(243):IF h8%=38
THEN 1980 [OE]
1860 RANDOMIZE TIME [55]
1870 b=INT(RND*8+1) [37]
1880 IF b<1 OR b>8 THEN 1860 [CE]
1890 IF b=1 THEN h1%=h1%+1 [OE]
1900 IF b=2 THEN h2%=h2%+1 [2A]
1910 IF b=3 THEN h3%=h3%+1 [62]
1920 IF b=4 THEN h4%=h4%+1 [9A] [9A]
1930 IF b=5 THEN h5%=h5%+1 [D2]
1940 IF b=6 THEN h6%=h6%+1 [OA]
1950 IF b=7 THEN h7%=h7%+1 [42]
1960 IF b=8 THEN h8%=h8%+1 [7A]
1970 GOTO 1780 [E9]
1980 r(1)=CINT(h1%):r(2)=CINT(h2%):r(3)=CINT(h3%):r(4)=CINT(h4%):r(5)=CINT(h5%):
r(6)=CINT(h6%):r(7)=CINT(h7%):r(8)=CINT(h8%) [BD]
1990 p(1)=r(1):p(2)=r(2):p(3)=r(3):p(4)=r(4):p(5)=r(5):p(6)=r(6):p(7)=r(7):p(8)=
r(8) [D0]
2000 LOCATE 10,24:PRINT"Press space bar for placings and prices." [5]
2010 WHILE INKEY(47)=-1:WEND [BE]
2020 MODE 2 [B2]
2030 REM ***** Sort results ***** [C1]
2040 FOR x=1 TO 8-1 [C4]
2050 IF r(x)>r(x+1)THEN 2080 [BB]
2060 NEXT [F]
2070 GOTO 2130 [5A]
2080 f=r(x):r(x)=r(x+1):r(x+1)=f [CF]
2090 x=x-1:IF x<1 THEN x=1:REM back up [9E]
2100 GOTO 2050 55]
2110 GOSUB 2450 [95]
2120 INK 0,22 [E0]
2130 FOR w1=1 TO 8 [B0]
2140 IF p(w1)=r(8) THEN xx=w1:LOCATE 13,3:PRINT"1st Place. No." xx;:PRI
VT USING " # ##, .##";win1 [F3]
2150 NEXT [FE] [FE]
2160 PRINT" -----":PRINT:PRINT [O6]
]
2170 y=0 [BA]
2180 FOR w2=1 TO 8 [CA]
2190 IF p(w2)=r(7) THEN y=y+1:yy=w2:y=y+7:LOCATE 13,y:y=y-7:PRINT"2nd Place.
No." yy [OB]
2200 NEXT [F1]
2210 PRINT" -----":PRINT [C2]
2220 win2=win2/y:FOR y1=1 TO y:LOCATE 51,y1+7:PRINT USING"# ##, .##";win2 [44]
2230 NEXT [FA]
2240 z=0 [B9]
2250 IF r(6)=r(7) THEN 2310 [49]
2260 IF r(5)=r(7) THEN 2340 [8F]
2270 IF r(4)=r(7) THEN 2370 [D5]
2280 FOR w3=1 TO 8 [D7]
2290 IF p(w3)=r(6) THEN z=z+1:zz=w3:z=z+12:LOCATE 13,z:z=z-12:PRINT"3rd Place.
No." zz [C0]
2300 NEXT:GOTO 2390 [O3]
2310 FOR w3=1 TO 8 [C4]
2320 IF p(w3)=r(5) THEN z=z+1:zz=w3:z=z+12:LOCATE 13,z:z=z-12:PRINT"3rd Place.
No." zz [9C]
2330 NEXT:GOTO 2390 [OC]
2340 FOR w3=1 TO 8 [CD]
2350 IF p(w3)=r(4) THEN z=z+1:zz=w3:z=z+12:LOCATE 13,z:z=z-12:PRINT"3rd Place.
No." zz [94]
2360 NEXT:GOTO 2390 [15]
2370 FOR w3=1 TO 8 [D6]
2380 IF p(w3)=r(3) THEN z=z+1:zz=w3:z=z+12:LOCATE 13,z:z=z-12:PRINT"3rd Place.
No." zz [8C]
2390 PRINT" -----":PRINT [DC]
2400 win3=win3/z:FOR z1=1 TO z:LOCATE 51,z1+12:PRINT USING"# ##, .##";win3 [7
3]
2410 NEXT [F8]
2420 LOCATE 25,24:PRINT"Press space bar for Menu" [4E]
2430 WHILE INKEY(47)=-1:WEND [CC]
2440 GOTO 150 [97]
2450 pool=(n(1)+n(2)+n(3)+n(4)+n(5)+n(6)+n(7)+n(8)+n(9)+n(10)+n(11)+n(12)+n(13)+
n(14)+n(15)+n(16)+n(17)+n(18)+n(19)+n(20))*price [33]
2460 house=pool*(pc1/100):win1=(pool*(pc2/100)/100):win2=(pool*(pc3/100)/100):wi
n3=(pool*(pc4/100)/100) [72]
2470 RETURN [79]

```



Follow the furious action as Mr T Takes the battle to Morgul, then go away and do it yourself.  
LEVEL ONE

# TURRICAN



The wilderness...

Gotta get past these robot sentries...

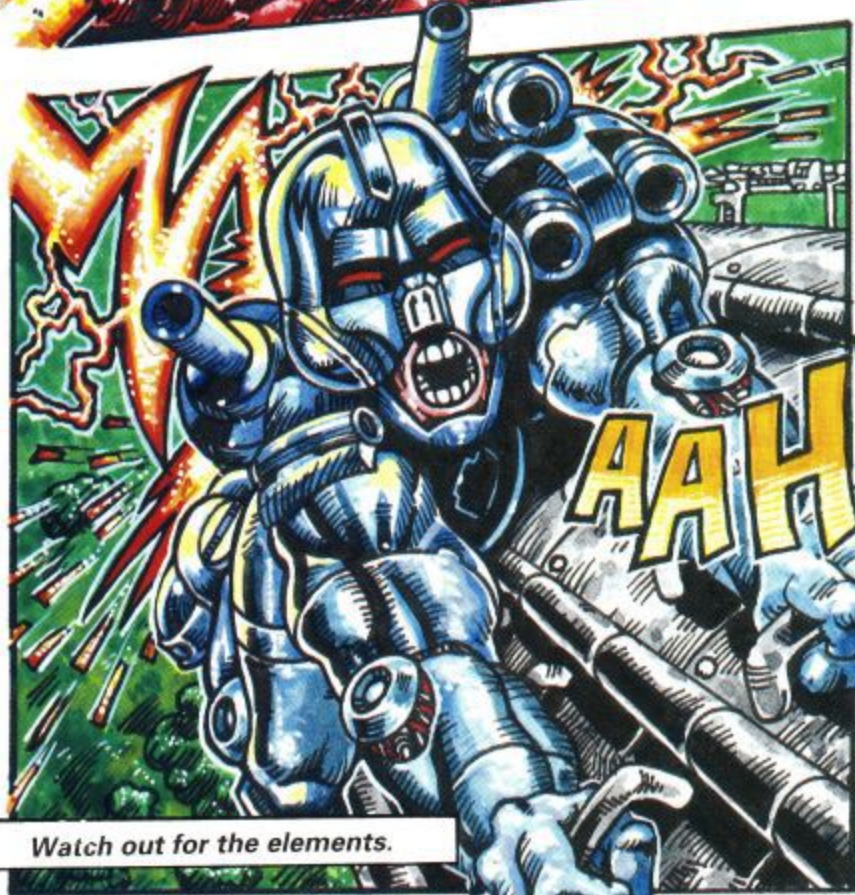


Eat lead, suckers.

Bat attack in the caverns!



Enrichment time.

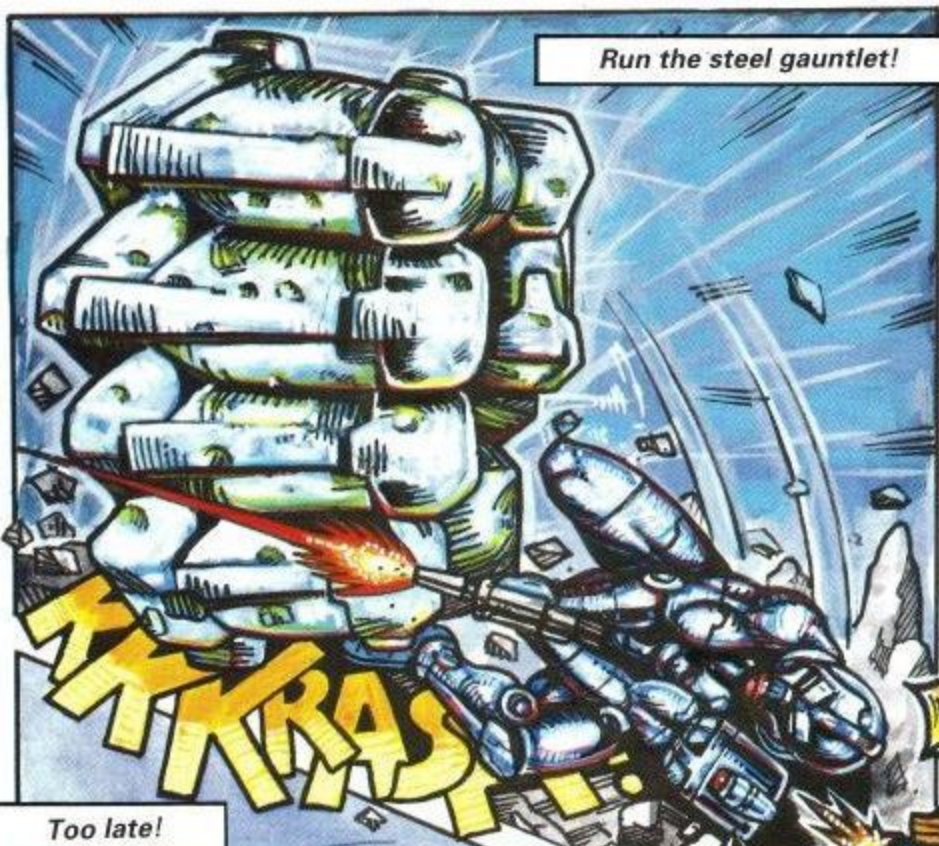


Watch out for the elements.



Unnh! Rocket emplacement!

Keep your footing at the waterfalls.



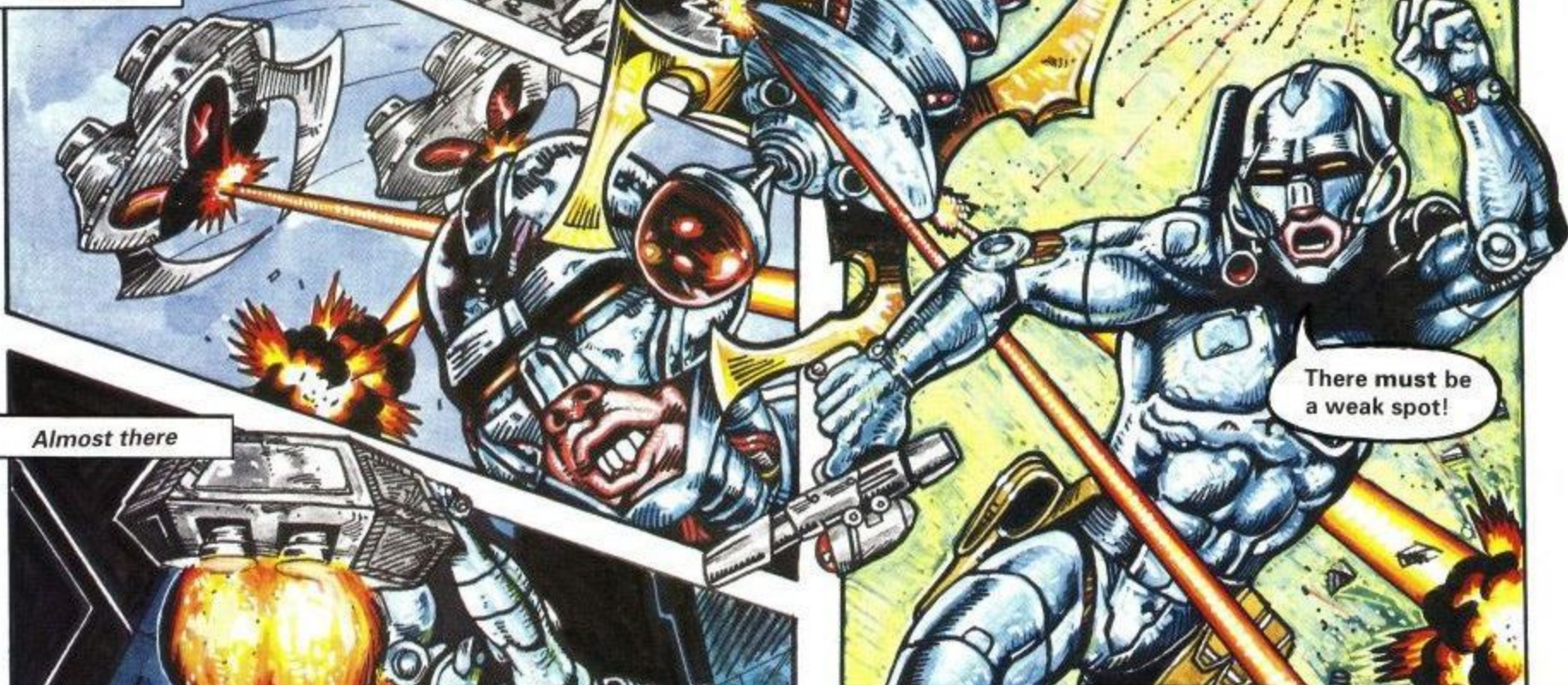
Run the steel gauntlet!



Gantry city!

Quietly does it.

Too late!



There must be a weak spot!

Almost there



Whoa! That was too close for comfort.

The challenge of the flying scarab.



OK Morgul, I'm coming down.



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Citizen's success was based on the 120D printer. Now four years later, Andrew Banner reviews it's new counterpart; the 124D.

Amstrad's philosophy used to be make 'em cheap, sell 'em cheap regardless of quality or reliability. Then along came the Amstrad CPC computers, and (to my mind) the philosophy changed. The computers provided a reliable, quality alternative to the C64, Spectrum, Atari 8-bit and a few other machines that never actually made it. The CPC quickly became an enthusiast's machine as many users



# Big Brother

discovered it's talents. Amstrad particularly enjoyed the interest gathered by the standard Centronics interface which is an integral part of the unit (something which no other computer at that time had). The CPC was not a games machine, it was used seriously. But after spending the best part of £500 on the computer, proud new owners were left with little with which to buy a printer or any other device.

Now Citizen have come up with the answer to the problem. The company famous for watches has developed a cheap 80 column 24-pin printer that'll knock spots off the competition and won't punch holes in your bank account.

Citizen have been producing top quality printers for some years now. The company's success began with the 120D; four years ago this printer sold in droves. Most serious home computer owners had a printer and a great deal

owned the 120D. This low cost 9-pin found it's way into education as well with ILEA buying large quantities to stock the London schools.

Now the same company that brought you that successful printer has done it again with the 124D. With a price tag of just £270 (plus VAT), the 124D hits the high street as one of the cheapest 24-pin printers around. With all the major computer suppliers attempting to undercut each other, £270 plus VAT will more than likely make the end user price something like £250 inclusive, if not less.

Now, to be fair, two hundred and seventy quid is still a lot of money, but not when you consider to the cost of comparative printers. Also in the interests of fairness, the 124D is nothing special. It's features are limited and it's not on par with a Lister 7-litre MK3 (which incidently has a 0-60 acceleration rate of just 4.5 seconds!). In fact it's

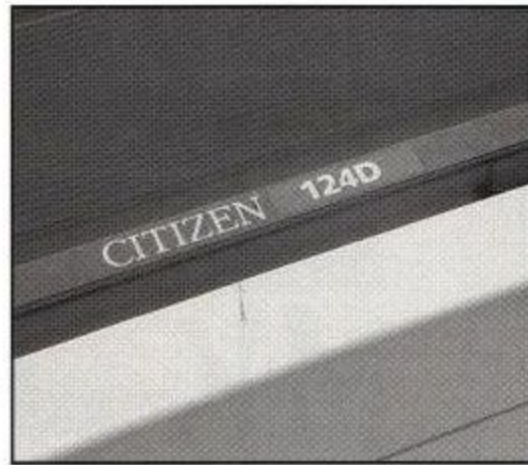
really quite slow at 144 characters per second in draft mode. There are two near letter quality modes (NLQ); Times Roman and Courier. The 124D will handle these fonts up to 48 characters per second and it's enhanced Citizen command set also allows it to print in the usual italic, condensed, emphasised and double-strike styles and the more unusual shadow print, outline or even outline with a shadow, underline and overscore and even reverse (white on black) printing.

The style of the 124D may look familiar to you. Well it will do if you read the Swift 9 review a few months back anyway. Yes, you guessed it, the 124D is housed in a Citizen Swift case. To this end, it is substantially cheaper for Citizen to produce the printer as the company will not have to waste money making a new mould. And why not? The case is elegant, well designed and practical. It helped the Swift 24 walk

away with a few awards so why not use it again.

Because it's the same case, many of the Swift series features are included such as paper parking with a short tearoff function. Looking at the printer, I discovered a bottom paper aperture that was undocumented in the ridiculously shaped user's manual. This hole is simply there because it's a Swift case - it serves no purpose as the 124D is not capable of accepting bottom fed paper. Neither is it able to accept continuous, tractor feed sheets using the pull tractor method. Form paper must be fed from behind onto the push tractor.

The advantage of using a push tractor over a pull tractor is that little paper is wasted and that paper parking can be put to use. However, push tractors often snag up on thicker sheets such as labels and this is where a pull device comes in. Unfortunately, the 124D will not allow you to pull paper through the machine. However, after quite extensive testing, I found the push motion to be very effective and even with labels



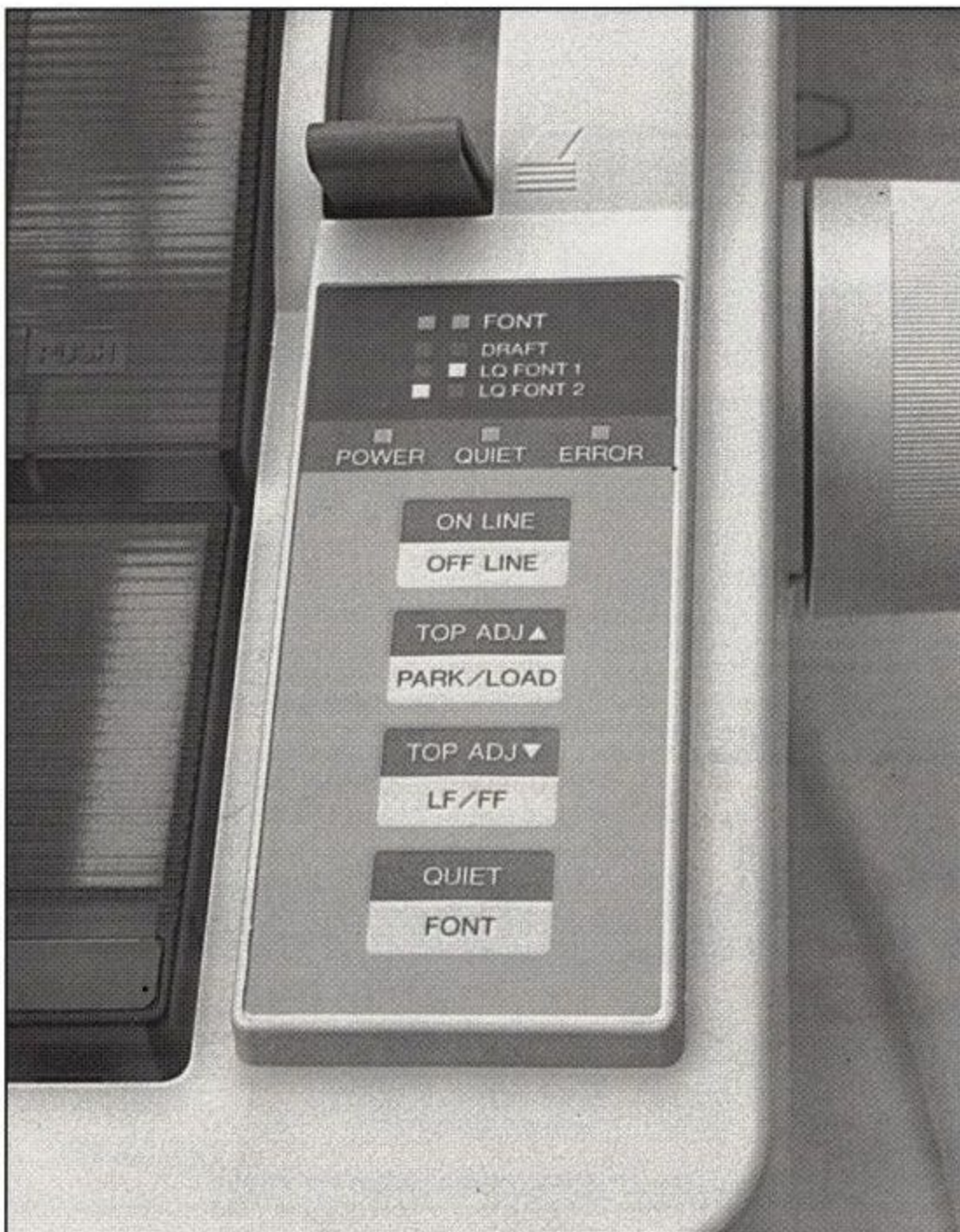
refused to misfeed and waste paper.

Controlling the printer is very easy. A simple touch pad panel on the front of the printer allows you to change font, adjust the top loading position of the paper, park and load sheets and turn the printer on and off line. Further printer controls are located under a removable cover at the rear. These are the printers DIP switches and these control the international character set as well as the emulation mode of the machine.

Table of comparable printers

MODEL	PRICE	PRINTSPEED DRAFT/NLQ	COLOUR	No.OF PINS
Citizen 124D	£270	120/40	No	24
Citizen Swift 9	£269	213/40	Option	9
Star LC10mkII	£229	180/45	No	9
Panasonic KX-P1124	£399	192/38	No	24
Citizen Swift 24	£389	160/53	Option	24
Amstrad LQ3500di	£249	135/45	No	24

Prices do not include VAT.



The Citizen will emulate an Epsom LQ or an IBM Proprinter. Both emulations can be selected from the DIP switches or alternatively, you can issue a software command to temporarily change mode. Likewise, you can issue commands to change font, lock the font, set the type style (eg. pica, elite or condensed) and even set zeros to be slashed or open.

Supplied with a Centronics interface as standard, the 124D has a number of additional options. A user installable RS232 serial interface costs just £30 while a specially designed printer stand will set you back just £23 and an additional 32K buffer expansion a mere £12. If you intend to do a lot of single sheet work, the 124D has complimentary sheet feeders. An automatic cut sheet feeder costs £84 while a semi automatic unit retails at £40.

Made up North at Citizen's Scunthorpe factory, the 124D is backed up by Citizen's unique two year warranty. I don't know about you, but in my experience of computer equipment and the extensive use I put it to, a two year guarantee is a godsend.

Still, the Citizen 124D, although nothing special, is a good printer. It's not brimming with features but then again it's not lacking either. The print quality is outstanding for a unit costing so little and it's a recommended purchase for anyone wanting power without the price (wasn't that Atari's logo a while back? Ed).



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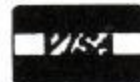
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# Play time with auntie

How are you doing, machine code fans? Have you been having fun with the Z80? Good, glad to hear it! Me too!

One of the reasons you may have for learning machine code is the deep desire to write your own action-packed ar-

cade games on the CPC. There is absolutely nothing wrong with this - it is a very commendable way of using your new found skills. Nothing tests a programmer's skill more than writing a challenging, enjoyable and successful game. Unless you count making lots of money out of writing such a game.

If you are thinking of writing the next chart buster, you must remember to spend a great deal of time with the graphics. The graphics are the most important part of a game, because if it doesn't look good no one will want to go near it, never mind have a go. The gameplay may be superb, the sound effects may be sensational, but if the player's spaceship is a capital letter A and the aliens lower case letter p's, then the game is a loser.

(Unless of course you happen to be programming a ZX81, where the lack of graphics means you do indeed have to make creative use of the character set).

The new CPC range just announced (don't they look lovely!) pay even more attention to graphics by redesigning the screen display hardware to provide more colours and "sprites". Sprites are graphical shapes that the hardware of the computer handles itself - wonder-

ful stuff that makes games so much easier.

But how does this all fit into our vast machine code plan? Does the firmware have a routine like:

Address: & BEDO

Input: Star System, Nastiness quotient

## Get a grip with auntie John's step by step guide to game making.



Output: Horribly beweaponed alien fight craft

Output: Causes a fleet of flying saucers to swoop down the screen, dropping bombs and generally making a nuisance of themselves (corrupts the BC registers)

Unfortunately, the answer is no. There is no such firmware call, and so we will have to construct our own code from what actually exists.

As you probably know by now, the number of characters you can fit on one screen line depends on the screen

Mode you have chosen. For example, in Mode 1 you can have 40 characters across the screen, whereas in Mode 2 you can have up to 80.

Now imagine that we have a Mode 1 screen set-up, all ready to go. In our hypothetical game, a small ball is going

to bounce around the screen. If the ball was a standard character, like a letter A for example, then we can move the ball anywhere in a grid of 40 by 25 places.

This kind of movement can lead to the graphics appearing a bit juddery, because the amount the ball moves is equivalent to its own size.

If you don't believe me, type in listing number one into your assembler and run it. Hardly state of the art, is it?

It works by drawing a ball on the screen (well, ok, it's a star) and then erasing it by drawing a space over the top of it. By performing a call to Frame (see last month's issue to see what this does) we can get the illusion of movement.

The program needs four co-ordinates: two to hold the ball's X, Y position on the screen, and two to hold the direction values. For example, when the program starts, the X co-ordinate is 1, and the X direction is also 1. The program adds the direction onto the co-ordinate, and then checks to see if the ball has reached the edge of the screen.

If it has, the direction is made the negative of whatever it was: in other words, if it was 1 it becomes -1, and if it was -1 it becomes 1. This is achieved by

some cunning binary maths - don't worry if you can't understand it, we'll come back to it soon.

You'll notice that I am only changing the X co-ordinates in this program. It will be a good exercise for you to update the program to include the Y co-



call EraseBall  
call MoveBall

```
ld a,.47
call TestKey
jr z, loop
ret
```

MoveBall

```
ld a, (ballx)
ld b,a
ld a, (dx)
add b
ld 9ballx), a
cp 1
jr z, boing
cp 40
ret nz
```

```
boing
ld a, (dx)
xor 255
ld (dx), a
ret
```

PrintBall

```
ld a, (ballx)
ld h,a
ld a, (bally)
ld l,a
call Locate
ld a,42
call PrintChar
ret
```

EraseBall

```
ld a, (ballx)
ld h,a
ld a, (bally)
ld l,a
call Locate
ld a,32
call PrintChar
ballx db 1
bally db 2
dx db 1
dy db 1
```

ordinates. If you do, the star will bounce around the screen in a very Pong-like way. Remember that the height of the screen is not the same as the width, and so you'll need to change the checking value.

The solution is to move the ball in much finer steps: if possible we would like to move it pixel by pixel. Why a pixel's width? Well this is the smallest possible bit that can be displayed on-screen. We simply couldn't move the ball any more smoothly.

And guess what? Yup, we'll look at a program to do it next month. That is assuming I make it back from touring around Wales on my motorbike safe and sound. Bearing in mind that I fell

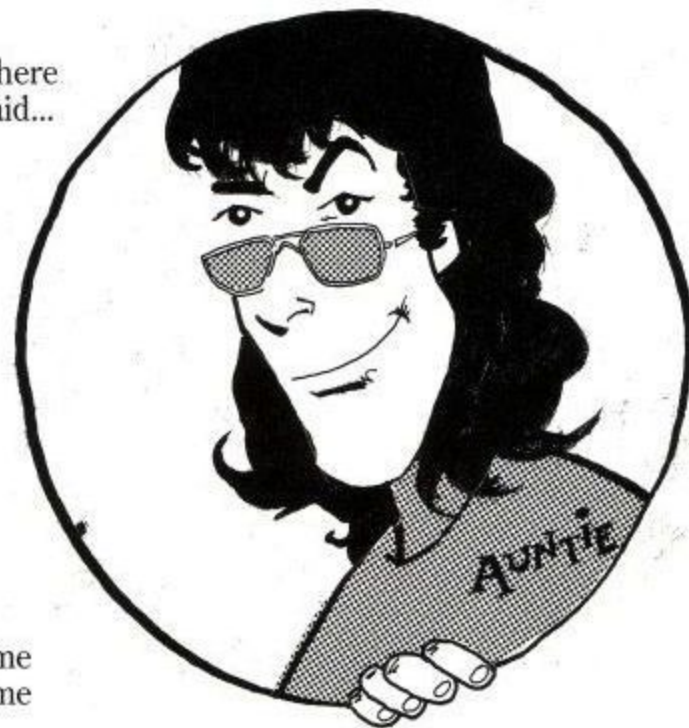
off it whilst I was in the driveway, there doesn't seem much hope I'm afraid...

Listing

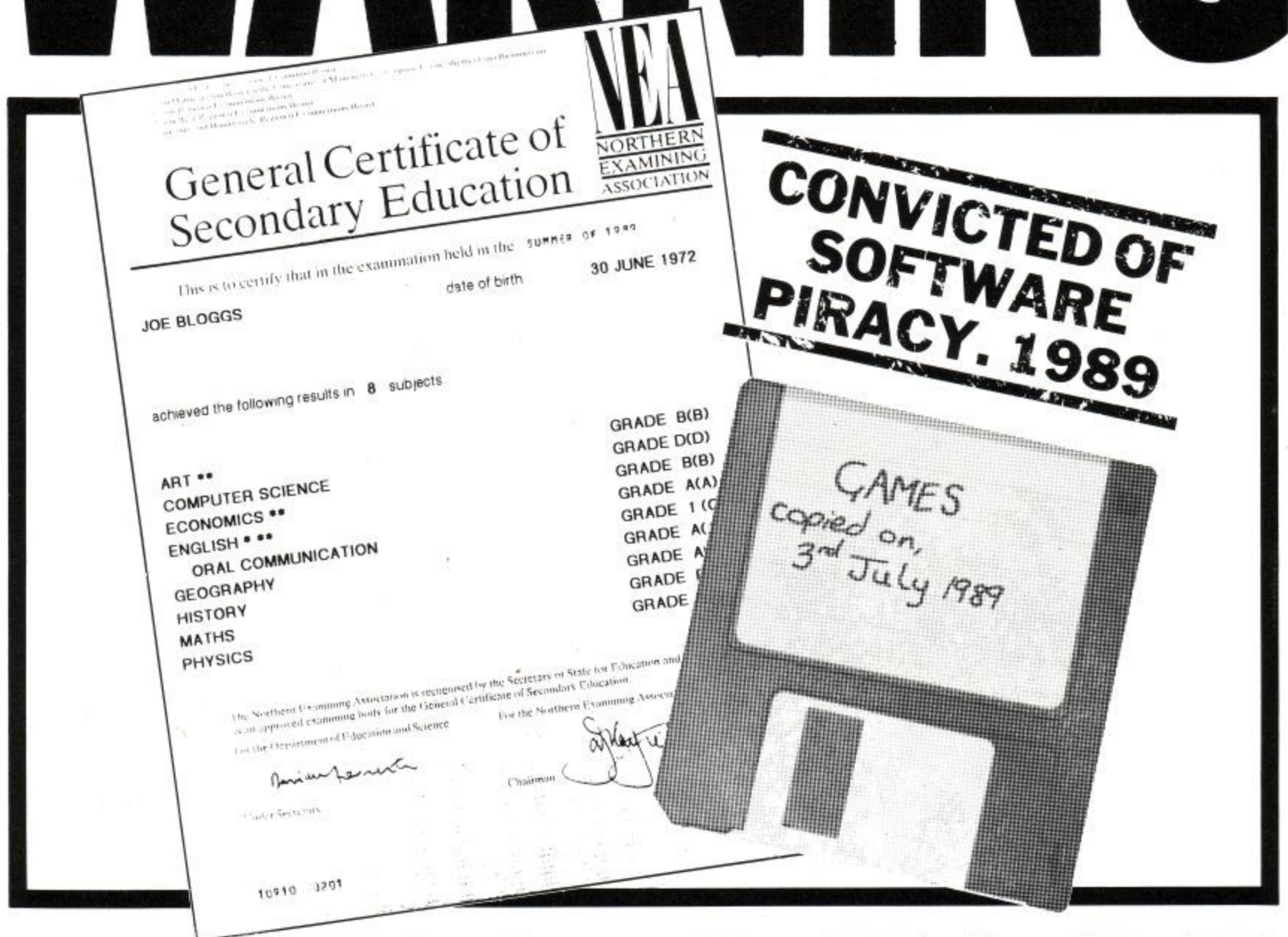
```
org &8000
Mode equ &BC0E
PrintChar equ &BB5A
Locate equ &BB75
TestKey equ &BB1E
Frame equ &BD19
```

```
ld a,1
call Mode
loop
```

```
call PrintBall
call Frame:call Frame
call Frame:call Frame
```



# WARNING



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Over 75% of all information we receive from the outside world comes through our sense of sight so it is hardly surprising that computer graphics tend to dominate computer advertisements. But what is a missile exploding without a bang and what is a flight simulator or powerboat race without the whine of the engines? Ian Waugh guides you through the process from tyro to master Amstrad muso in this new series.

Music and sound have a greater effect upon us than you may realise. It is a case of the sum of the parts being greater than the whole and the addition of sound to any computer program, even a utility program, can more than double its enjoyment and effectiveness.

As well as sound effects, the Amstrad can be programmed to produce music. This opens up a totally new area for exploration, an area without prece-

## THE SOUND OF MUSIC



dence in the world of personal computing. Armed with the ability to produce ordered sequences of notes we have a complete music system which can not only play tunes in three-part harmony but which is imbued with the speed and decision-making attributes of a computer.

### About this series

The aim of this series is to act as a springboard for further experiments and programs which, I hope, you will write and develop. The accent is on sound and music and how you can get the best from the powerful sound generating system incorporated in the Amstrad.

The programs are written in a fairly structured manner and are documented so you can understand the workings behind them. Generally, they will not have many frills, which should minimise the time required to enter them and should help cut down on mistakes. The overall appearance of a program is as important as the performance and suggestions regarding the finishing touches are made where relevant. These can be added later to suit your own taste and style. Suggestions for further experiments, alterations and developments are also made, usually in such cases where a subject has too many aspects and is too complex to tackle completely – without writing another book. It is hoped that you will explore further those areas of special interest to you.

Whether you are looking for a new laser sound for your latest arcade game, whether you want to write a new tune for your musical doorbell, whether you want to use the computer to help you learn about music, whether you want to add something to the business utility program you've written or whether you simply want to see what you can do with the sound facilities, I hope this book contains something for you and will encourage you to carry on experimenting from where I leave off.

### What is Sound?

This installment looks at sound from the computer's point of view.

Amstrad BASIC is a fast and powerful language. It includes several commands to help the user program the sound generator. Even a few casual experiments with these commands will reveal how complex and difficult they can sometimes be to control. They have been well designed, however, because we do not always need to specify every

single parameter; those we omit default to sensible values. This means we can learn how to use the sound generator quite painlessly, adding parameters as required.

The User Guide devotes only a few pages to the sound facilities and a lot more information is required to get the best from the system. Unfortunately, Amstrad's Concise BASIC Specification has little to add. The problem here is exactly the same as the one we faced when we started to learn BASIC. The computer has a set way of operating and in order to control it we must give it instructions in its own terms. This means we need to know something about the properties of sound and how to convert this information into a program the computer can understand.

### The nature of sound

Sound is sometimes difficult to understand because we are dealing with something we can not see. A sound is produced when an object is struck or rubbed or, in scientific terms, otherwise excited. This causes the object to vibrate which in turn causes the air to vibrate. These vibrations are sensed by the ear and we perceive them as sound.

Musical instruments which produce sound by being struck include the drums, piano, gong and xylophone. Stringed instruments such as the violin produce sound by being rubbed with a bow. Brass instruments such as the trumpet and trombone are played by blowing and vibrating the lips. This excites the air inside the instrument which vibrates at a pitch proportional to the length of the brass tubing. The flute is played by blowing across the mouthpiece to excite the air column inside it. The same principle is at work when you blow across the mouth of a bottle. Instruments such as the oboe, clarinet and saxophone contain a reed which vibrates in response to vibrations from the lips.

Just as sound is caused by vibrations in the air, so the sound chip generates its sounds with electrical vibrations. Basically, it sets up a series of oscillations, the higher the pitch, the faster the oscillations. These oscillations are sent to the loudspeaker which vibrates at the same frequency and produces a sound. It is not necessary to know exactly how it does this and we'll leave it at that but the result is, perhaps obviously, a little electronic. We'll examine these vibrations a little closer.

### Looking at sound waves

Sound vibrations travel in a series of

waves and different sounds produce different waveforms. If we play a sound through a microphone and feed it into an oscilloscope we can see what its waveform looks like.

A sine wave is a pure tone of a single pitch or frequency which is usually only produced by a tuning fork or by electronic means. It is possible to produce many sounds by combining sine waves in the right proportions. This process is known as additive synthesis because waves are added together and it is used in some commercial synthesisers. Because of the large number of sine waves it is often necessary to add, it is a costly and time-consuming process.

### The sound of the Amstrad

One form of synthesis, known as subtractive synthesis, takes a waveform and filters out certain harmonics. This method is more common than additive synthesis and is in general use in most synthesiser systems. A tone control is a simple filter and blocks out the higher frequencies as you increase its effect.

Before you can start filtering, you need something to filter. A sine wave, consisting of only one frequency, would be of little use. The best waveforms are those which contain a lot of harmonics which give you plenty of body to chip away from. Most synthesisers offer triangular, square and sawtooth waveforms. The triangular wave is very like a sine wave but contains a few harmonics, the square wave sounds a little like a clarinet and the sawtooth wave produces a sound with reed-like qualities. Try this short program:

```
10 FOR pitch=1600 TO 20 STEP -10
20 SOUND 1,pitch 30 NEXT pitch
```

This plays some of the pitches the sound chip can produce, albeit in a very uneven fashion, but it serves to illustrate the waveform produced by the sound chip. Can you tell which type of waveform it is? It's not a terribly easy task because the low pitches sound like a rasp and the high pitches are 'plinky'. The middle range, however, is quite mellow and if you alter line 10 to:

```
10 FOR pitch=500 TO 100 STEP -10
```

you may sense a clarinet-like quality about the tone and you'd be right in thinking that the sound generator produces a square wave. It's not quite a perfect square wave, however, and you can hear how the tone varies as the pitch changes.

Next month, we'll take a look at the individual parts of a sound, and examine how Amstrad Basic treats and uses each part.



**Table 1 - Notes, Frequencies and Pitch Numbers**

In the table which follows, the octave numbers used in the note names follow the User Guide's specification. The numbers in parenthesis offer an alternative octave numbering system.

The frequencies listed are those produced by notes in the western scale. The pitch numbers do not produce these frequencies exactly but the differences are so small as to be virtually unnoticeable. For those interested, the relative errors are listed in Appendix VII of User Guide.

**Middle C lies in octave 0, ie C0.**  
**NOTE NOTE FREQUENCY PITCH**  
**NUMBER IN HERZ NUMBER**

**OCTAVE -3 (1)**

1	C-3	32.703	3822	
2	C#-3	34.64		3608
3	D-3	36.708	3405	
4	D#-3	38.89		3214
5	E-3	41.203	3034	
6	F-3	43.654	2863	
7	F#-3	46.24		2703
8	G-3	48.999	2551	
9	G#-3	51.91		2408
10	A-3	55.000	2273	
11	A#-3	58.27		2145
12	B-3	61.735	2025	

OCTAVE -2 (2) 13 C-2 65.406 1911 14 C#-2 69.296 1804 15 D-2 73.416 1703 16 D#-2 77.782 1607 17 E-2 82.407 1517 18 F-2 87.307 1432 19 F#-2 92.499 1351 20 G-2 97.999 1276 21 G#-2 103.826 1204 22 A-2 110.000 1136 23 A#-2 116.541 1073 24 B-2 123.471 1012

OCTAVE -1 (3) 25 C-1 130.813 956 26 C#-1 138.591 902 27 D-1 146.832 851 28 D#-1 155.564 804 29 E-1 164.814 758 30 F-1 174.614 716 31 F#-1 184.997 676 32 G-1 195.998 638 33 G#-1 207.652 602 34 A-1 220.000 568 35 A#-1 233.082 536 36 B-1 246.942 506

OCTAVE 0 (4) 37 C0 261.626 478 38 C#0 277.183 451 39 D0 293.665 426 40 D#0 311.127 402 41 E0 329.628 379 42 F0 349.228 358 43 F#0 369.994 338 44 G0 391.995 319 45 G#0 415.305 301 46 A0 440.000 284 47 A#0 466.164 268 48 B0 493.883 253

OCTAVE 1 (5) 49 C1 523.251 239 50 C#1 554.365 225 51 D1 587.330 213 52 D#1 622.254 201 53 E1 659.255 190 54 F1 698.457 179 55 F#1 739.989 169 56 G1 783.991 159 57 G#1 830.609 150 58 A1 880.000 142 59 A#1 932.328 134 60 B1 987.767 127

OCTAVE 2 (6) 61 C2 1046.502 119 62 C#2 1108.731 113 63 D2 1174.659 106 64 D#2 1244.508 100 65 E2 1318.510 95 66 F2 1396.913 89 67 F#2 1479.978 84 68 G2 1567.982 80 69 G#2 1661.219 75 70 A2 1760.000 71 71 A#2 1864.655 67 72 B2 1975.533 63

OCTAVE 3 (7) 73 C3 2093.004 60 74 C#3 2217.461 56 75 D3 2349.318 53 76 D#3 2489.016 50 77 E3 2637.021 47 78 F3 2793.826 45 79 F#3 2959.955 42 80 G3 3135.963 40 81 G#3 3322.438 38 82 A3 3520.000 36 83 A#3 3729.310 34 84 B3 3951.066 32

OCTAVE 4 (8) 85 C4 4186.009 30 86 C#4 4434.922 28 87 D4 4698.636 27 88 D#4 4978.032 25 89 E4 5274.041 24 90 F4 5587.652 22 91 F#4 5919.911 21 92 G4 6271.927 20 93 G#4 6644.875 19 94 A4 7040.000 18 95 A#4 7458.621 17 96 B4 7902.133 16



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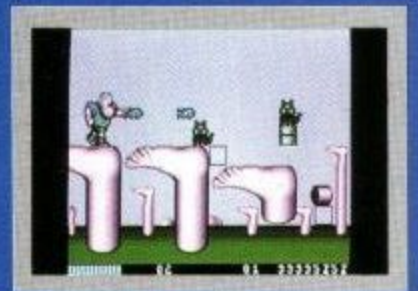
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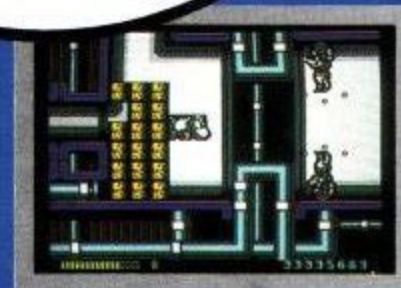
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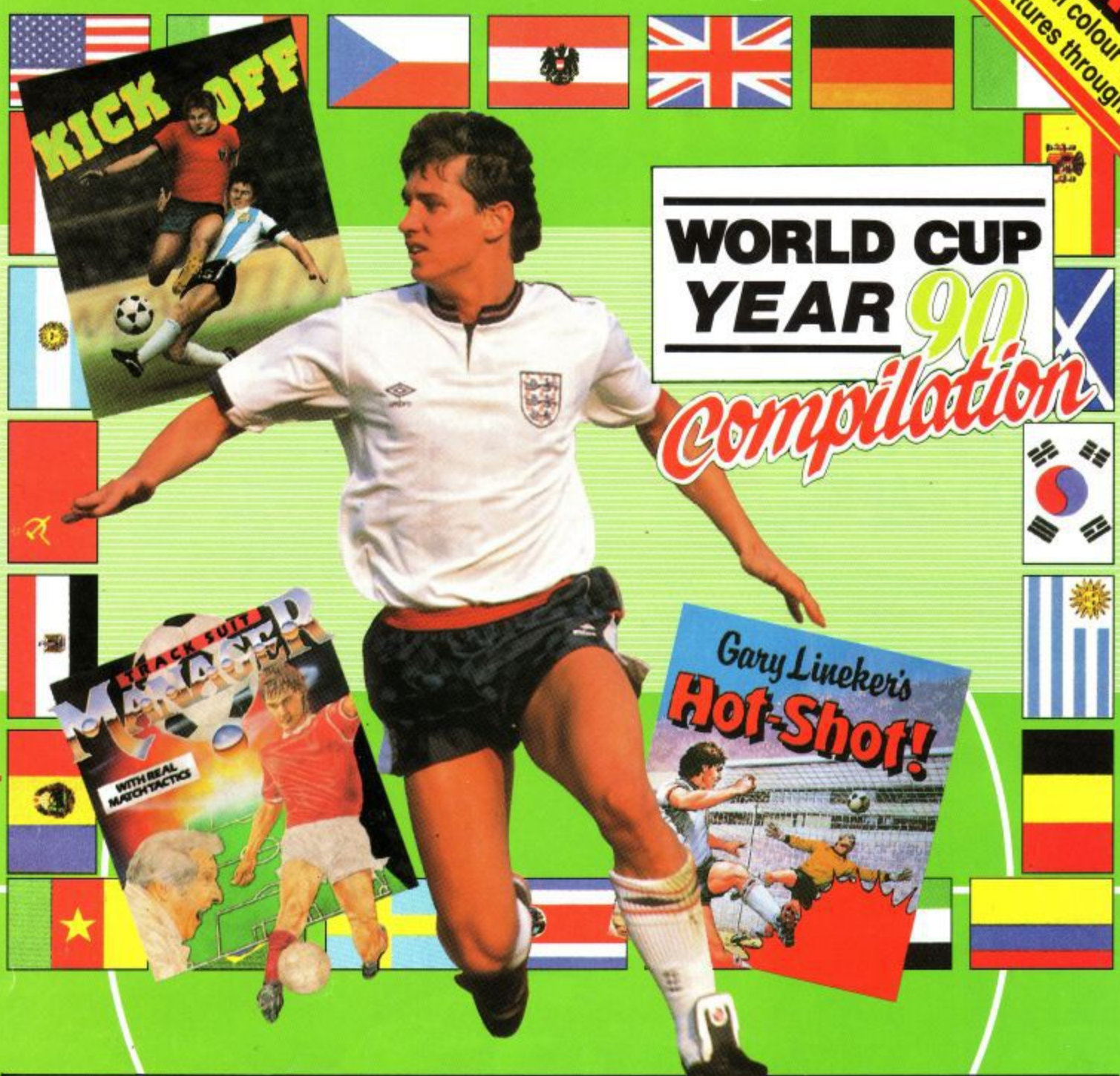
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