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disk USER

**Number Seven
May 1988**

Editor: Andrew Brown
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WIN A COLOUR PRINTER



**MULTI-SCREEN ARCADE
ADVENTURE AND
SCREEN EDITOR**

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Disk User is published monthly on the third Friday of the month preceding cover date. Advertising enquiries to Disk User, Number One Golden Square, London W1R 3AB. ☎ 01 437 0626. Editorial enquiries to Disk User, 6C Belgic Square, Peterborough, Cambridgeshire. ☎ 0733 53355. Contributions should include full source code and instructions file on disk. Payments are extremely competitive. Distributed by SM Distribution Ltd., 16-18 Trinity Gardens, London SW9 8DX. ☎ 01 274 8611. The contents of this publication including all articles, designs, plans, drawings and programs and all copyright and other intellectual property rights therein belong to Argus Specialist Publications Ltd. All rights conferred by the Law of Copyright and other intellectual property rights and by virtue of international copyright conventions are specifically reserved to Argus Specialist Publications Ltd. Any reproduction requires the prior written consent of Argus Specialist Publications Ltd. Typesetting and artwork by Island Graphics, Chesham. Cover design and design by the ASP Design Studio. Colour by Croxons, Chesham. Printed by Chase Web, Devon. Duplication by DisCopy Labs, 20 Osyth Close, Brackmills, Northampton, NN4 0DY. ISSN 0953-0606. © Argus Specialist Publications Ltd 1988. Disk User is supplied on a 40 track disk format and can be run without conversion on a 40 track drive. If you have 40/80 switchable drives then make sure the drive is switched to the 40 option. For 80 track only drive owners, a conversion program is provided – see Disk Instructions. All files can be copied to and used on ADFS systems.

DISK INSTRUCTION

CATALOGUE

With a new idea like Disk User, nothing stays the same for long. We know it's hard to keep you away from the disk contents but we hope you can spare a few moments to consider a new feature we have introduced this time around.

So that we can pack even more value onto the surface of the floppy disk we deliver to you each issue, we have linked together a number of program and data files. In order to use them you will need to use the *expand* option as described when you choose a program from the disk menu. This is a fairly automatic procedure but full details and instructions are given in the "Transfer" article.

We shall continue to develop new ways of bringing you both more data on your disk and more reviews, news and tutorial in the magazine.

None Better

I'm sure nobody could find me a better disk system than the BBC Micro's in the

same price range. Despite the advent of the 16 bit breed of grey, characterless American boxes, the BBC Micro disk system continues to be the fastest and most practical to use. Do you know why all the Amiga and Ataris in the high street stores have blank screens? Because it takes so long for the software to load that none of the sales assistants can spare the time!

The IBM machines are better but the programs are so huge and the disk software so unwieldy that a hard disk is needed to make them workable. The 3 inch non-standard of the home Amstrads is turning disks into rare commodities and correspondingly expensive.

Only the more expensive business machines and the new 3.5" modern drives can improve on the BBC Micro's disk system. Other computer owners have even been known to buy Disk User for the BBC Micro. We assumed this was by mistake. Were they in a hurry? Or didn't they see the clearly labelled cover? Or were they hoping something might rub off on their own micro's disk system?

Disk Instructions

To get the best from your copy of *Disk User*, please carefully read the instructions below. We have made *Disk User* able to run on a very wide range of systems.

All Users

Please make a **Backup copy** and keep the original in a safe place with a Write-Protect tab on. You should use this copy as your working copy, as many of the programs need to write to the disk, and doing this will diminish the usefulness of the original, and may not be possible anyway due to the 31 file limit imposed by many DFSs.

New Users

If you are a new user **Don't Panic!**, first find out whether you have 40 or 80 track drive(s) attached to your computer (ask someone knowledgeable if you don't know). Then go to your User guide or Welcome Manual and read the chapter on filing systems. In particular find out how to use the *COPY command. Next re-read the section above **All Users**, and then go to the appropriate section dealing with your particular filing system and follow the instructions listed there.

40/80 Switchable Drives

If you have this sort of drive, you can use *Disk User* straight away with the drive switched to the 40 track setting; don't forget to make a copy for normal use. However, you may wish to copy the disk on to 80 track format, in which case, with a single drive, you should follow the instructions for 80 track systems.

With two switchable drives, or one switchable drive set to 40 track and an 80 track drive (or even a 40 track drive and an 80 track drive), you can easily copy *Disk User* on to 80 tracks; put *Disk User* into drive 0 (40 tracks) and a blank formatted 80 track disk into drive 1 (80 tracks) and type:

```
*COPY 0 1.*<RETURN>
```

Here <RETURN> means hitting the return key. You can set the boot option to drive one by typing:

```
*DRIVE 1<RETURN> *OPT 4 3<RETURN>
```

Advanced Users

You do not need help to run *Disk User*, but do refer to the instructions for the filing system you are using, and **Don't forget to make a Backup copy.**

40 Track Drive Systems

Disk User is supplied on a 40 track disk so will work on any 40 track BBC Micro system (at least, any that we know of!) straight away. Remember to make a working copy before use.

80 Track Drives

Because *Disk User* is supplied as a 40 track disk, 80 track disk drives have to double-step through the disk. Probably the most convenient thing to do is to copy *Disk User* on to 80 track format. This can be done in two ways.

If your filing system allows double-stepping, we recommend using the system's own command. As a general rule, built-in 40-to-80 track converters should be used where available; the documentation for your filing system or utility ROM will give full instructions, and we give suggestions for some better-known systems further on.

Not all filing systems have facilities for double-stepping; Acorn's DFS is one such system. To overcome this, a program called CHANGE is supplied on the *Disk User* disk in a section which can be accessed by 80 track drives.

Using CHANGE

Insert *Disk User* into an 80-track drive (or 40/80 switched to 80-track) and type:

```
*CHANGE <RETURN>
```

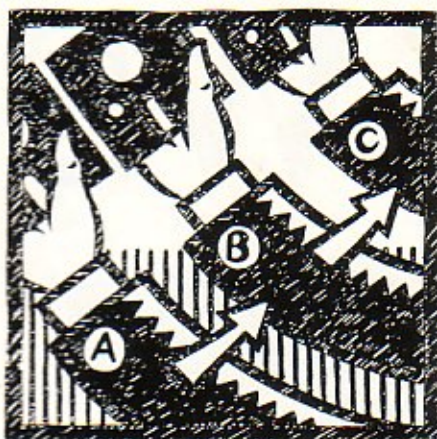
The program will prompt you to insert a pre-formatted blank 80 track disk when it is ready to write to it (you will have to swap back and forward between the two disks several times if you are using only one drive). Once this is completed, you can use the newly created 80-track version of *Disk User* and keep the original as the back-up.

Our suggestions on how to use *Disk User* on some popular DFSs now follow.

Master 128

This Acorn DFS has a software double





stepping mode for a 80 track drive. Set it with the command
***DRIVE 0 40 <RETURN>** and then hit **<BREAK>**
 Disk User will then work without any need for conversion. However this may not allow writing to the disk in 40 track mode; in any case, you should make a working copy, so copy to a 80 track disk.

DFS on Master Compact

The DFS is supplied as an image on some versions of the Master Compact Welcome disk (or is available from Acorn on disk) and this may be used in conjunction with a 5¼ inch 40 track disk drive to run Disk User. Please note that we **cannot** at present supply *Disk User* on a 3½ inch disk (if there is sufficient demand, we may be able to in the future).

Opus DDOS/Challenger 3

If you are using the Opus DDOS disk filing system or Challenger 1.0/DDOS then issue the command
***4080 AUTO <RETURN>**
 or
***ENABLE 40/80 <RETURN>**
 and Disk User will work without any need for conversion.

Challenger 3

If you have the later ROM version Challenger 1.1 then issue the command
***OPT 8,1 <RETURN>**
 to achieve the same result. Disk User will work effectively from the RAM disk. Use
***COPY 0 4 *.* *CONFIG 4=0 0=4**
***OPT 4 3**
 to run from RAM disk

Solidisk DFS

With the Solidisk DFS 2.1 and 2.0 you can set a software double stepping mode for a 80 track drive with the command
***ENABLE 80 <RETURN>**
 Disk User will then work without any need for conversion.

Watford DFS

The Watford DFSs also have a software double stepping mode for an 80 track drive. Consult your manual for the appropriate FX call or command. Disk User will then work without any need for conversion.

Disk failure

If for any reason your copy of Disk User will not work on your system then please carefully re-read the instructions given above.

If you still experience problems then:

1. If you are a subscriber, return it to:
INFONET LTD, 5 River Park Estate, Berkhamsted, Herts HP4 1HL.
2. If you bought it from a newsagents, return it to: **Disk User Replacements (BBC), Diskopy Labs, 20 Osyth Close, Brack Mills, Northampton NN4 0DY.**

Please use appropriate packaging, cardboard stiffener at least, when returning a disk. Do not send back your copy of the magazine. Only the disk please.

Editorial/Technical Enquiries

You can make telephone enquiries about *Disk User* on 0733 53355 (please ask for *Disk User* Editorial). Enquiries in writing to the following address: **Disk User, 6C Belgic Square, Off Padholme Road, Peterborough PE1 1XF.**

Disk User MAY '88

All change – 40 track to 80 track converter.

Files:–
CHANGE – Machine code file.
 To use type ***RUN CHANGE <RETURN>**
 Disk User – Disk magazine title page animation (yes we know it goes in backwards!).
 Author: Abbas Files:–
P.RUNDISC – BASIC program A.DISC – Machine code file
 Disk Menu – Easy selection of the software.
 Author: Matthew Fifield Files:–
DUMENU – BASIC program

Theme Music – Groovy tune to get you in the mood.

Author: Ian Waugh Files:–
LOADER – BASIC program Theme – Data file
 Animation – The letter 'H' is motivated to action.
 Author: Abbas Files:–
P.runH – BASIC program H.ALPHA – Data file
 Genie Junior Demo
 Author: Permanent Memory Systems Files:–
DEMO – Machine code file keys – Machine code file **MENU** – Machine code file
 Superfont – Your printouts will never be the same again.
 Author: Dov Rosner Files:–
EXPAND – BASIC program **SUPFONT** – Compressed files **FONTLTD** – BASIC program

System Wadgebury – Winglebith needs your help.

Author: A. J. Cook Files:–
EXPAND – BASIC Program **SYSWAD** – Compressed files **SYSLD** – BASIC program
 Procedure Library – A host of helpful routines.
 Author: G. D. Hawkins Files:–
EXPAND – BASIC program **ADDPR** – Compressed files **ADDLD** – BASIC program

Hit Game Demo. – How to write a blockbuster.

Author: Rob Anderson Files:–
ADEMO – BASIC and Assembler

Background Printer – Do two jobs at once.

Author: Mark de Weger Files:–
BACK-PR – BASIC and Assembler

*CLOSE Command – Close all open files.

Author: Mark de Weger Files:–
CL.SRC – BASIC and Assembler

Formatter – Customise your disk format.

Author: Neil Craven Files:–
FORMAT – Machine code file

Animations Menu – Easy access to the A-Z of animations.

Author: Abbas Files:–
I.MENU – Data file **P.MENU** – BASIC program
 Pulsating Colour – Add a living colour to your palette.
 Author: Kevin Mortimer Files:–
PULSATE – BASIC and Assembler

Grey Screen Background – Yet another new colour.

Author: M. Fifield Files:–
GREYSCR – BASIC and Assembler

Multicoloured Mode – Seven into two will go.

Author: M. Roberts Files:–
MULMODE – BASIC program

BASIC 1 Music Tutor fix See DISCUSSION text. File: **MUSICAD**

ADFS Users

All files on this disk except 'FORMAT' work on the ADFS.

Note:– Disk User 7 almost fills a 40 track disk. Any software that may need extra disk space to save information must be copied onto a blank disk. ie Superfont, System Wadgebury, Procedure Library, Background Print and *CLOSE Command.

DISK NEWS

Low cost head cleaner

Parrot have developed a disk drive head cleaner and priced it at £3.90 plus VAT. The disk is bonded in a transparent jacket – so that you can see the dirt your heads used to carry!

The disk is suitable for up to 50 operations. The disk has to be formatted like any other. Over a period of time it gathers particles of media and debris which could, if left in place, harm your data disks.

Business letters

Eclipse Software Projects have come to the aid of the businessman who writes his letters on a BBC Micro wordprocessor. Their *Instant Business Letters* software provides the standard texts for subjects close to the heart of the small business – overdue payment complaints, letters to the bank, finance application, air freight enquiry, order acknowledgement, replies to enquires and so on.

There are four overdue payment complaints, starting with a gentle reminder and on to a threat of order cancellation.

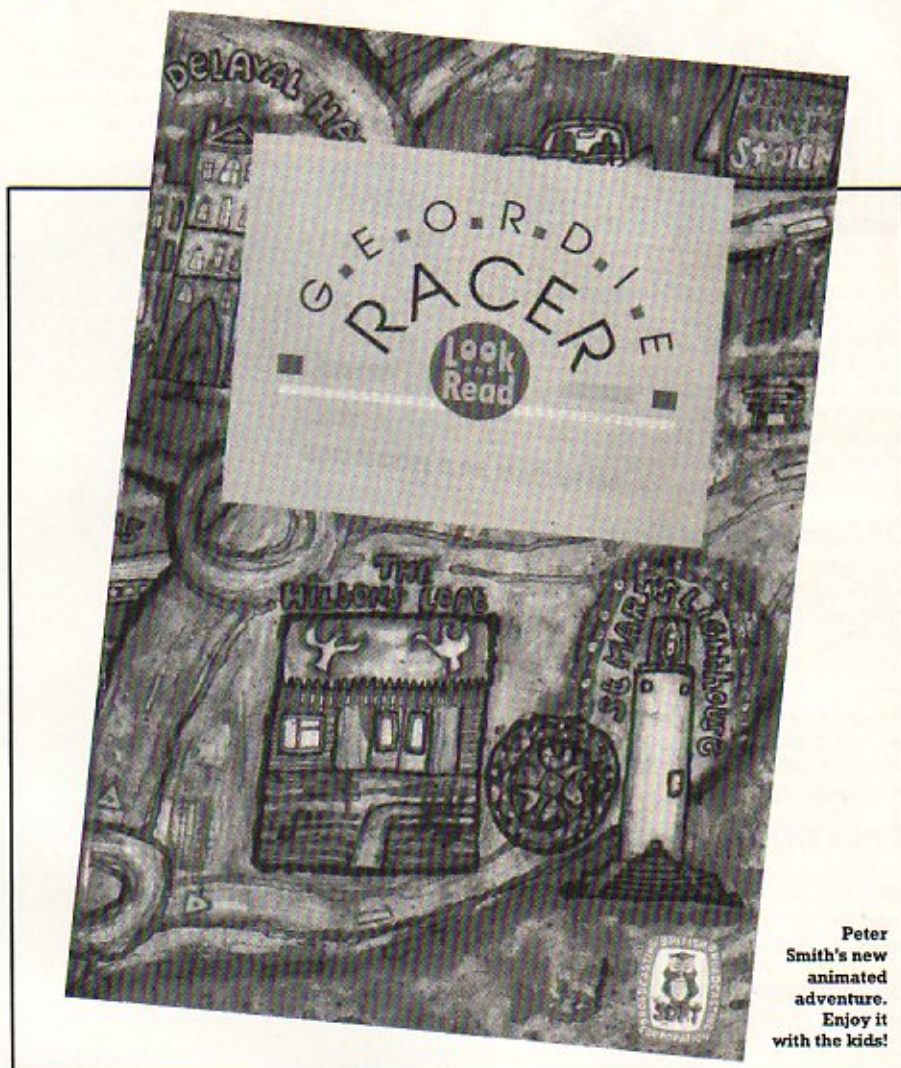
In all there are over 100 instant business letters for £19.95 inclusive. Details on ☎ 0922 692258.

Designer Dialler

The latest modem off the Dataphone factory line is the *Designer* modem. Based on the Demon II, the Designer has a number of new features such as over-ride buttons for use with manual software, a call progress monitor and a telephone socket on the rear which permits a telephone to be connected in parallel.

Like its predecessor, Designer handles 1200/75, 300/300 and 1200/1200 half duplex. There is also an auto-answer feature for unattended operation such as a bulletin board. The Designer has full BABT approval. The hardware comes with manual and Dataphone support. Control software for Prestel or Telecom Gold type services is available at under £50.

Details from Dataphone, 22 Alfric Square, Woodston, Peterborough, PE2 0JP. ☎ 0733 230240.



Peter Smith's new animated adventure. Enjoy it with the kids!

Overlay BASIC

Elsevier Biosoft's Overlay BASIC is a utility ROM and disk which manages procedure building blocks, calling them up individually into a program and, once used, clearing room for the next one.

The unique feature of the program is that procedure calls can be made without any special consideration for line numbers or naming conventions. This leaves the programmer free to develop libraries of procedures for his/her own use.

The procedure files can be distributed with a *run time* program to other computers which do not have the ROM installed. Tested on all major filing systems, Overlay BASIC is especially effective on hard disk. Price is £29.95

Details from Elsevier-Biosoft, 68 Hills Road, Cambridge, CB2 1LA.

Slimmer Sectors

Amcom Software have introduced a new range of half-height ADFS compatible Winchester drives. Plugging into the 1MHz Bus a 20Mbyte drive occupies about the same space as a normal floppy disk drive.

Utility disk-manager software is included in the price of £430. Also available; a tape back-up system for £599.

Details from Amcom Software Ltd, 35 Carters Lane, Kiln Farm, Milton Keynes, MK11 3HL. ☎ 0908 569212.

Survival Kit

Are you worried in case the Russians attack?, or having trouble calculating the effect an atomic bomb would have on house prices in your town? Well don't worry because there is a

new software package available for the civil defence minded amongst BBC Micro owners. Called, *Nuclear Attack Effects Estimation Package* and coming complete with three weighty HMSO manuals it is intended to 'stimulate informed discussion on the subject of nuclear attack'. The package is divided into programmes, each of which assesses the effect of *blast on people*, or property in various different contexts.

The jargon used throughout is that terrifying deadpan type used by the military to draw a veil over things that should not be covered up. But for those, for example teachers, who have an interest in this field, and a strong stomach, then a lot of information is provided.

Price £27.50 for private and educational users, £79.50 for others (the same in Roubles).

Available from **M. Baker M.Sc., Green College, Oxford, OX2 6HG.** Trade enquiries welcome! ☎ 0865 722297.

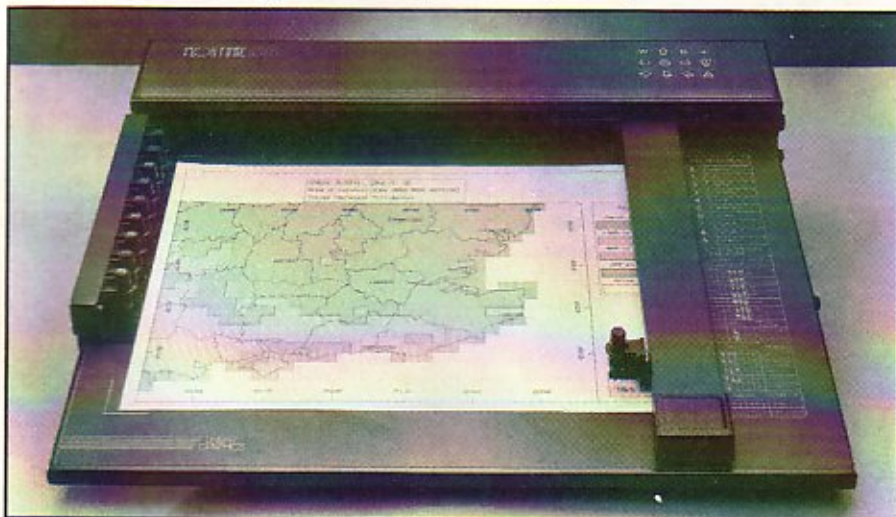
Miteyspice gets Tough

Miteyspice the dc and ac circuit simulator for the BBC Micro and Archimedes series machines has gained extra muscle with the addition of features to make use of shadow RAM and 80 column screen modes. Also updated are the plotting routines, allowing the user to display up to twenty five parameters on screen, or redirect the results to a printer.

The program allows engineers to test and design circuit boards without ever going near a soldering iron. Powerful editing features allow *whatif* scenarios to be recorded and dumped to disk for later analysis.

Miteyspice commands are compatible with those used by SPICE, the mainframe based circuit designer

Plotmate plotters can now be upgraded with a 10 pen automatic pen-change.



One of 8,000 120DS already manufactured at Citizen's Scunthorpe factory.

as used by professionals. It therefore represents a teaching standard for those interested in analogue circuit simulation. Price is £119.00 (including comprehensive manual).

Further information from: **Charles Clarke, Those Engineers Ltd, 106a Fortune Green Road, west Hampstead, London NW6 1DS.** ☎ 01 435 2771/3757.

Master Emulation ROM

The *Master Emulation ROM* from Dabs Press, or MER for short is not some kind of French swearword but a very clever way of giving BBC

Model B/B+ owners almost complete software compatibility with a Master 128 or Compact. The 16k ROM written by David Spencer is aimed at owners who already have sideways or shadow RAM fitted. 99% compatibility is claimed for the product, with the exception that GXR graphics are *not* supported. OS 1.2 or greater and DFS 1.2, or any 1770 DFS is required to work with MER.

Prices are £14.95 5.25" disc; £16.95 3.5" disc; £19.95 ROM. Available from local dealers, or direct from DABS press.

Dabs Press, 76 Gardner Road, Prestwich, Manchester, M25 7HU. ☎ 061 773 2413.

Morley ROM/RAM Board

A new piece of hardware you Master 128 owners will be interested in is the Morley AA board. The board fits neatly into one of the ROM sockets of the 128 taking up the space reserved for the Econet socket – so beware network users.

There are a number of permutations of ROM, RAM and RAM disk and, most impressive, you can switch any bank between RAM and ROM use through a software command.

Details from **Morley Electronics, Unit 3 Maurice Road Ind. Estate, Wallsend, Tyne and Wear NE28 6BY.** ☎ 091 2627507.

DISCUSSION



Ceefax News

From chatting at computer shows, it seems that many otherwise dedicated computer users are unaware that the BBC's Ceefax service has a computing news section. Now this seems a shame especially as I contribute to it!

The computing pages start at 701 (BBC2). J. Taylor W. Midlands

Thanks for the reminder. The Ceefax news and reviews service is available to anyone with a teletext television. If you have a teletext adaptor then you can also download software. Error detection routines check that the computer programs are correctly transmitted before being automatically placed by the adaptor's filing system onto disk. Morley Electronics and Solidisk Technology both supply teletext adaptors for the BBC Micro.

The standard software is BBC Soft's ATS (Advanced Teletext System) which can do very clever things such as search for subject areas and download information (share prices for instance) other than software. And of course, with a teletext adaptor, you have access to all the other teletext information such as program timings, sports results puzzle pages and so on.

Program Protection

Congratulations! Your disk magazine is indispensable for every BBC user. The musical introduction in your fifth issue was a pleasant surprise. I need your help with two problems.

Firstly I have an Akhter 40/80 switchable drive and I am afraid I may damage it because sometimes I forget to switch it to the right tracks and the drive crackles awfully. Is there a way to have a warning message on the screen before that happens.

Secondly is it possible for you to come up with a protection utility which will protect any piece of software from copying, listing or backing up.

John Ioannides Greece

There's no feedback from the drive switch to the computer so there is no way to detect the position and issue a warning. A straightforward

tip is to put a label on the front of the drive indicating which switch position is 40 and which 80. At least you can quickly check the setting before using a disk.

Protection can take many forms. The variable skew formatter in *Advanced Disk User Guide* this month is the sort of utility with which a specialised disk format can be created to prevent copying or backing up. Preventing a BASIC program from being listed is usually achieved by inserting some control codes which turn off the screen display. Disk catalogues can be hidden with similar techniques.

Encryption of files is a more interesting programming topic and *Disk User* plans to go into the subject in detail later this year.

Basic One Routines

I was very impressed with my first disk user, number three, but had problems with the Music Tutor in the following issue. A syntax error kept re-occurring.

T. Gregory Luton

Your problem with Music Tutor is due to the use of the BASIC 2 command EQU which is not available in the BASIC 1 ROM which you have in your machine. Since BASIC 2 upgrades still cost a great deal of money, we make a point of having BASIC 1 compatible programs on *Disk User* - except we didn't quite achieve this aim with Music Tutor. Our apologies. This issue's disk contains some routines which make up for the lack of certain commands in BASIC 1. They are also listed here for your information. Once the routines have been installed they can be called in place of the BASIC 2 commands.

Follow these instructions to change your Music Tutor program: LOAD "MUSIC" *EXEC MUSICAD (no quotes)

The additional lines will scroll up the screen. When completed type SAVE "MUSIC"

MUSIC now has the relevant routines installed and can be used successfully on a BASIC 1 machine.

Drive configurations

I enjoy your new magazine and am a keen BBC Micro user. The problem is I have a single sided 40 track drive, which is fine for running *Disk User*, but I wish to upgrade. How best can I go about it?

P. Wiggin Hants

Undoubtedly more tracks and more disk surfaces are desirable these days. Disk based applications like databases and continuous file word-processing (where disk files are used for large documents), use up a lot of space.

If you wish to keep hold of your current drive then it may be possible to add a second by attaching a suitable cable. An Acorn dealer or local computer repair shop will be able to help. The DIP switches inside

Single drive, single sided, 40 track 100K 25 pages of A4 approximately Disk User format
Two drives, single sided, 40 track 200K 50 pages of A4 approximately Single drive, double sided, 80 track 400K 100 pages of A4 approximately Two drives, double sided, 80 track 800K 200 pages of A4 approximately

the new drive will have to be set to make it act as drive 1 (and 3 if double sided).

Go for an 80 track so that you can use either type of disk. Eighty track is also suitable for upgrading to ADFS. There is no problem copying between different track disks, although you cannot use *BACKUP only *COPY.

SYSTEM WADGEBURY

Being a nuclear waste disposer was never a very demanding job in **System Wadgebury** . . . full of spills and thrills **PLUS** your own game designer!

Meet the craziest gang of characters in **System Wadgebury**

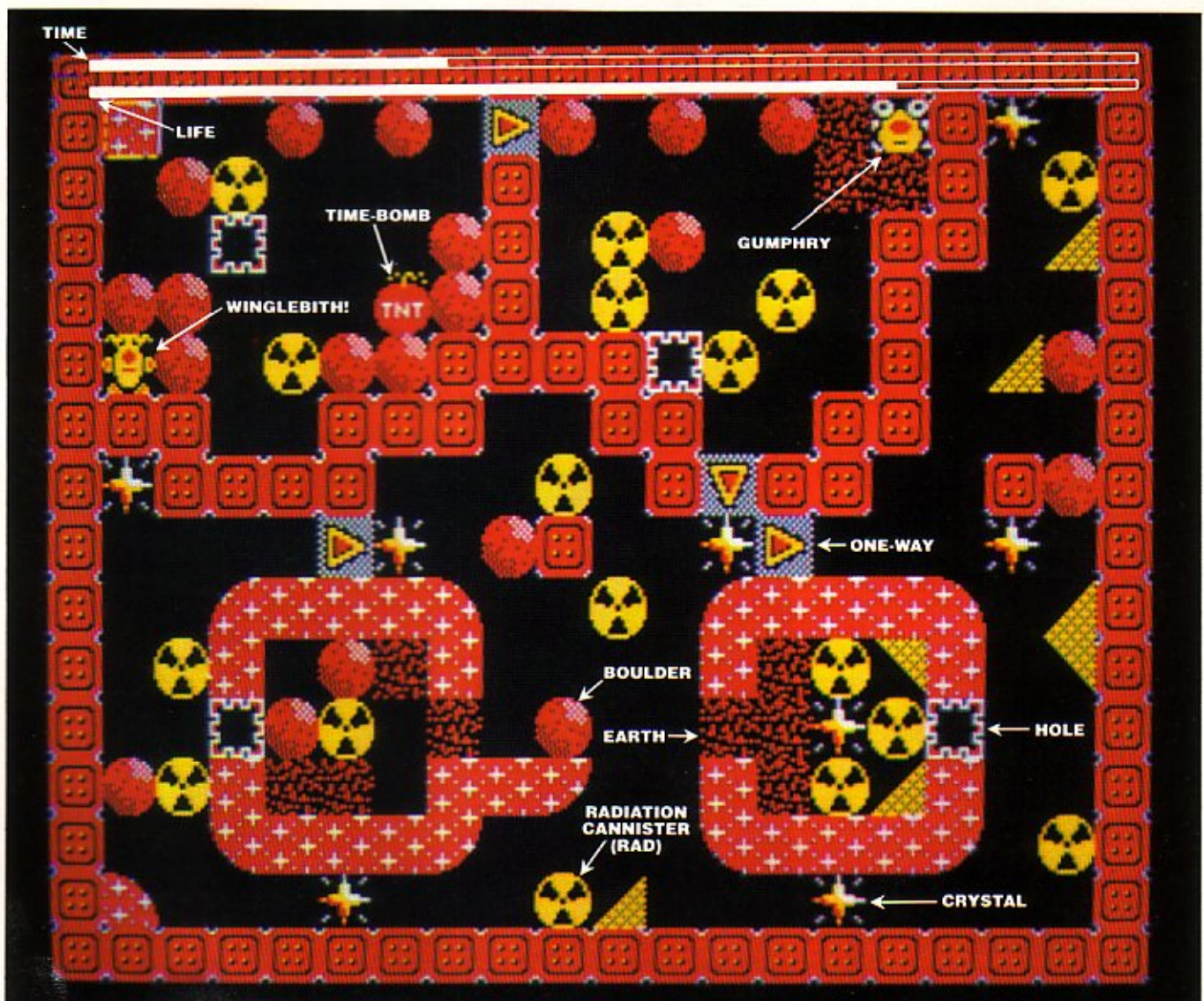
System Wadgebury – the game

To load the game, press "G" when the title screen appears. The computer will then ask you for the filename of the set of four screens to

load – there are four example files on this disk, called "SCR1", "SCR2", "SCR3" and "SCR4".

It is not possible to load screens during the game because of memory limitations, so you will have to re-load the game.

When the game has loaded, you have the option to select the difficulty level (1 to 9). To start playing, select the screen (A to D). The bars at the top represent the *time-bomb*, and the life left in *Winglebith* – if any of these reaches zero the game ends.



Rules of the game

1. Winglebith can only push one boulder at a time.
2. Winglebith can push any number of rads (radiation cannisters) at a time.
3. Winglebith can push a rad into a slope if the way is clear. This is not true of boulders.
4. To get rid of a rad, it must be pushed onto a hole.
5. Boulders cannot be pushed into holes.
6. The anti-radiation crystals give Winglebith more life.
7. Only Winglebith can travel through one-way systems.
8. A Gumphry can only be killed by excessive radiation. This is achieved by surrounding one with 4 rads.
9. The time-bomb is made safe by surrounding it with 4 boulders.
10. Winglebith is killed by Gumphries, holes, exploding time-bombs, and lack of life.
11. To complete a screen, Winglebith must diffuse the bomb, kill all Gumphries, remove all the rads, collect all the crystals, and dig away all the radioactive earth.

Scoring

- Killing a Gumphry - 2000 pts
 - Diffusing the bomb - 1000 pts
 - Pushing rad into hole - 200 pts
 - Collecting crystal - 100 pts
 - Digging earth - 20 pts
- On completion of each screen, a bonus is given depending on how much time and life is left. When the game finishes (either by Winglebith dying or completing the last screen) the score may be good enough for the high-score table.

To examine the sample screens on the disk press "L" and enter the file-name ("SCR1" to "SCR4"). To change screens just press the screen letter, A to D. Whilst editing, remember that you may have no more than one Winglebith, one time-bomb, and three Gumphries on any one screen.

System Wadgebury - scenario

Being a nuclear waste disposer was never a very demanding job in System Wadgebury, because there was simply never any nuclear waste to dispose of. That was until the Gumphries invaded this solar system with the intention of dumping all of their nuclear waste on the eight planets.

You, as Winglebith (native of one of these planets), must dispose of the radioactive cannisters as quickly as possible by pushing them into holes. You must also clear all the radioactive earth, collect all the anti-radiation crystals, diffuse the time-bomb (with which the Gumphries hope to blow you up!), and kill any Gumphries. You are the planet's only hope of survival. Good luck!

Game controls

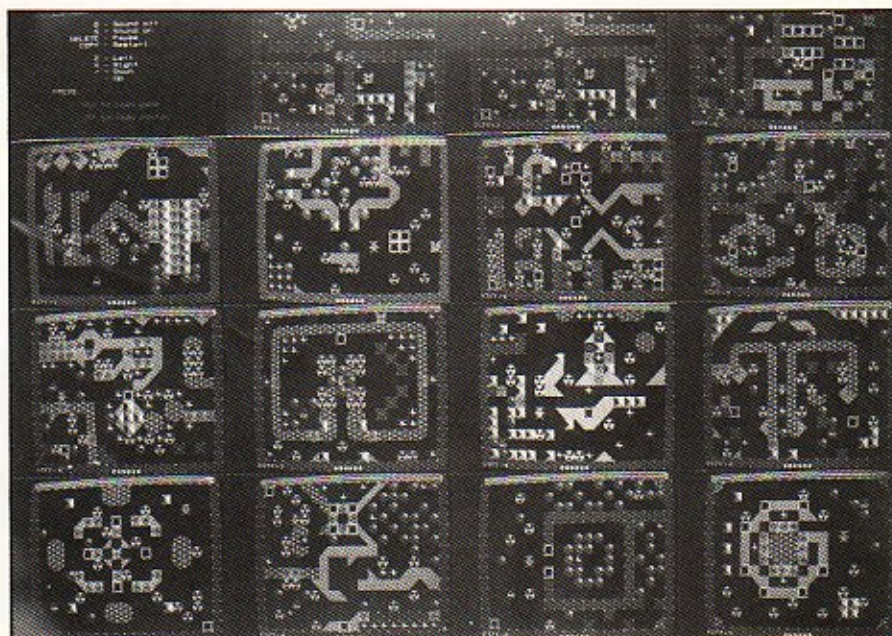
- Z - left
- X - right
- :
- / - up
- down
- S - sound on
- Q - sound off
- DELETE - pause
- COPY - restart

Remember, all the screens are possible!

System Wadgebury - the editor

The editor is loaded by pressing "E" when the title screen appears. The controls for using the editor are:

- Z - left
- X - right
- :
- / - up
- down
- RETURN - place character
- SPACE - blank location
- <> - select next character
- A B C D - change screen
- 0 1 2 3 - change colours
- L - load screens
- S - save screens



C.O.M.P.E.T.I.T.I.O.N

Design a screen and win a Voltmace multi-button joystick. Ideal for games players everywhere

Five runners up will win Disk User T-shirts.

You can be the first on your block with one of the fabulous new Disk User T shirts we are giving away to Disk User readers who get in touch.

Design a game

The game designer in *System Wadgebury* gives us a tremendous opportunity to see what you are capable of. Full instructions are given on how to use the built-in features.

What we are looking for is attrac-

tive and original design. You can design just one screen to enter the competition but feel free to enter as many as you wish.

The winning entry and any runners up of merit will be published on a future copy of *Disk User*, thus ensuring fame and fortune as well as the fabulous prizes.

Send in your game design entry on disk (all disks will be returned) to:

**Game Designer, Disk User,
6C Belgic Square, Off Padholme Road,
Peterborough PE1 1XF.**



We will not acknowledge receipt of your disk but you can phone to check if you wish. The closing date of the competition is 20th May and we will announce the winners in the Disk User which comes out in July.

Coming Soon

Watch out for another incredible value issue: June issue – OUT MAY 20 1988

A fast search database with a useful data file to get you started.

Beginners guide to databases and a roundup of disk based products.

More **pop-up utilities** demonstrated.

The *Advanced Disk User Guide* brings us a **disk editor** and calls up BASIC programs with * commands.

Among others, there's also **Life** and new fonts for your printer. **PLUS** a DABS Press *Hyperdriver* demo



GENIE PRICE LIST

Write or phone for information sheets.
Prices include VAT.

GENIE MASTER CARTRIDGE	£79.35
(Extra 16K sideways RAM)	£15.00
GENIE IN A BOX (battery backed)	£79.35
GENIE JUNIOR (disk based)	£25.00
GENIE WATCH (RTC for the BBC)	£29.90
GENIE UTILITIES DISK	£9.95

Carriage: under £50 – add £1, over £50 – add £2.

ORDER FORM

Please supply:

Quantity	Item	Price
_____	_____	_____
_____	_____	_____

Post and Packing _____

I enclose cheque/postal order for _____

OR Debit my ACCESS/VISA/BARCLAY by _____

CARD No. _____ Expiry Date _____

NAME (please print) _____

ADDRESS _____

POST CODE _____

MY COMPUTER SYSTEM (Please circle as appropriate)
 BBC B/BBC B+/MASTER 128/MASTER COMPACT
 5.25"/3.5" DFS/ADFS – ACORN/WATFORD/SOLIDISK/other _____
 Other relevant hardware _____



Permanent Memory Systems
 38 MOUNT CAMERON DRIVE
 EAST KILBRIDE G74 2ES
 SCOTLAND

0352-32796



(24 Hour)

YOU COULD WIN AN INTEGREGX COLOUR PRINTER WORTH OVER £550

Hello from the Disk User team – Take part in our Reader Survey and win a £550 colour printer from Integrex



We need you!

Back in issue three Mr Wheeler from Hertfordshire did the decent thing and praised Disk User for "cutting out the jargon". If we write anything you don't understand, drop us a line, give us a call and we'll do our best to research the subject and present it clearly in a later issue.

Mr Wheeler, demanding reader that he is, asked for "some means of storing more than 31 files on one side of a disk". In issue four we published a dual catalogue system for up to 62 files per side. Next month we'll show you how to link a number of small files, BASIC, data or code, into one big one. Our EXPAND program – which separates the files out again – is already in use.

Mr Wheeler, ever inventive, wanted to be able to print a screen at any time. Well we didn't supply the dump but we did provide the means – a Hot Key which gives instant access to any * command. Mr Wheeler need only buy the print ROM for his particular printer and problem solved.

Reader survey

We didn't mind Mr Wheeler asking. In fact we need more Mr Wheelers. We need you to tell us what you want from Disk User. Hence the Reader Survey this month. We know that you will all complete and send off the survey if you can. The comprehensive range of questions allows us to get an accurate picture of who you are and what you want from Disk User.

Turn to page 17 to complete the Disk User Reader Survey

HOW TO WRITE A HIT GAME

A do-it-yourself guide to writing an arcade classic

Rob Anderson is the author of TAZMAN, a machine code game which appeared in issue three (back issues are available from our Services pages).

Presented here are a few fundamental ideas on how to write machine code games. Various articles have been written showing sprite routines, collision detection methods etc., but little emphasis has been given on how these are actually pieced together to form a whole game.

So, while TAZMAN (written entirely in machine code) is used as an example throughout, BASIC programmers may also be able to pick up a tip or two on how to structure a game. In fact, the mixture of BASIC and machine code can often be a winning combination, so if you've been trying to write a game in BASIC, don't be afraid to throw in the odd machine code routine here and there to liven things up a bit.

```
.entertazman
JSR titlepage
JSR initialisewgame

.mainloop1
JSR setscreen

.mainloop2
JSR moveman
JSR movebullets
JSR movenasties
JSR score
JSR swapcolours
LDA mandiedflag
BEQ checkfornewscreen
JSR deathroutine

.checkfornewscreen
LDA newscreenflag
BEQ mainloop2
LDA numberofmen
BNE mainloop1
JSR gethighscore
JMP entertazman
```

Figure 2. "moveman" algorithm.

- Decrement counter by one.
- If counter <> 0 then return from subroutine.
- Reset counter to initial value.
- Take the spaceship off the screen.
- IF "Z" pressed AND spaceship is not at left boundary THEN decrement X coordinate by one frame.
- IF "X" pressed AND spaceship is not at right boundary THEN increment X coordinate by one frame.
- IF "." pressed THEN increment Y coordinate by one frame.
- IF "/" pressed THEN decrement Y coordinate by one frame.
- IF the pixels around the ship are not black, set death flag.
- Place the spaceship back on the screen at the new coordinates.
- Return from subroutine.

Figure 1. The main program loop.

Cabriolet

First of all let's consider the top-down approach to writing a game, which applies equally well to BASIC or machine code. Figure 1 shows the main loop that was actually used for TAZMAN, comprising a few nested loops and a number of subroutine calls to perform various tasks (Figure 1). A number of these are presented below in the form of algorithms. An algorithm is a set of well-defined rules or instructions for the solution of a problem (eg how to get the bullets from one side of the screen to the other).

*(Interestingly Oxford Science Publications' Dictionary of Computing says that the word algorithm is thought to derive from the name of the ninth century Persian mathematician **abu-Ja'far Mohammed ibn Musa al Khuwarizmi** - honest! Ed.)*

The routines shown in Figures 1, 2, 3 and 4 are in *pseudocode*, which is a kind of simplified computer language often used for instructional purposes. *(It won't do anything for the computer but it is half-way understandable for you and I - Ed.)*

Subroutines

Each subroutine must be written in

such a way so that upon a call, it is only *visited* for a short time, enabling other subroutines to have some processor time so that more than one thing can happen on the screen at once. For example, the "moveman" subroutine must update the spaceship's coordinates according to any key depressions, and then return control back to the main program loop so that a different subroutine can be called to perform some other concurrent task (e.g. moving the aliens).

So, the algorithm for the "moveman" subroutine involves checking the four movement keys *once* while only allowing *one* frame of animation to be performed for every call to the routine. Figure 2 shows this algorithm. Note that a count down timer is also used to enable the speed of the ship to be controlled. This works by decrementing the counter once every time the routine is called, and only allowing the ship's position to be updated upon a certain value of this counter being reached. A count down timer should be placed in every subroutine that is called from within the main program loop to enable different processes to receive varying amounts of processing time.

Thus, "moveman" has a very fast

count down so that the ship appears to be very responsive, whereas the score display routine "score" has to be called maybe ten times before the display is updated, due to changes in the score being very slow compared to animating the spaceship.

Having got the relative timing of the separate features in the game sorted out, it is simply a matter of placing a delay routine in the main program loop to enable the overall timing of the game to be controlled. Initially this delay should be large so that the game plays slowly, but as time goes on this delay should decrease (in TAZMAN the initial value of the delay counter is decremented by a value after every completed screen), so that eventually the

table	- 1st bullet X coordinate (0 = not moving).
table+1	- 1st bullet Y coordinate.
table+2	- 1st bullet change in X coordinate.
table+3	- 1st bullet change in Y coordinate.
table+4	- 2nd bullet data.
table+8	- 3rd bullet data.
table+12	- 4th bullet data.
table+16	- 5th bullet data.

Figure 3. Bullet data table.

cause larger values will mean larger jumps between frames (however, making these values too large results in jerky movement).

Thus, moving the bullets using this data table is relatively straight forward, as can be seen from Figure 4. (note that the contents of a

rapid machine gun fire bullets to be entered into the data table defined in Figure 3.

The algorithm in Figure 5 may look suspiciously like a circular queue (a first-in first-out data structure) in that as one bullet finishes its flight, so there is room for another one to be entered into the table. This would hold true if a bullet's time of flight was constant, in which case the first bullet placed onto the queue would indeed be the first one to be finished. However, a bullet's flight may be cut short if it hits an obstacle, so the first bullet into the table may not necessarily be the first to be terminated, hence the reason why the whole of the table has to be searched from the beginning when a new bullet is required.

Note the use of the variable "counter", which is used to prevent the bullets coming out one after the other when the fire key is held down, which would otherwise result in a line of concatenated bullets. By using this, a delay is placed between the generation of each bullet if the fire key is held down, but single shot

```

- REPEAT
- Take bullet currently at (?table,?table+1) off screen.
- ?table = ?table + ?(table+2)
- ?(table+1) = ?(table+1) + ?(table+3)
- IF ?table = maximum or minimum x coordinate, or the bullet has hit
  something, then let ?table=0 to signify the bullet is finished.
- IF ?(table+1) = maximum or minimum y coordinate, or the bullet has
  hit something, then let ?table=0 to signify the bullet is finished.
- IF ?table<>0 place the bullet back on the screen at the new
  coordinates.
- UNTIL all the bullets have been processed.

```

Figure 4. Algorithm to move the bullets.

game will be running at maximum speed to help make the game increasingly hard.

Keeping track of data

Now lets turn our attention to the bullets. These are perhaps the hardest part of the game to program, because each bullet (a maximum of five on screen at any one time) can move independently in one of four directions, so a data table concerning the current status of each bullet must be maintained. Figure 3 shows the format of the data table that was used to keep track of the TAZMAN bullets.

Reserving two bytes for each bullet to hold the change in X and Y coordinates simplifies the process considerably, because updating the bullet position is simply a matter of adding the contents of table+2 to table, and table+3 to table+1. For example, a bullet moving left would be indicated by a negative value in table+2 and zero in table+3. Using this method also enables diagonal bullets to be implemented easily by simply specifying non-zero values in both table+2 and table+3. The required velocity of the bullet can be determined by the magnitude of the value in table+2 and table+3, be-

location is specified using a "?" as usual).

However, this table must be kept up to date, and new bullets must be placed in the table whenever the fire key is pressed. Figure 5 shows an outline algorithm to enable details of

```

- counter = counter - 1
- IF counter <> 0 THEN return from subroutine.
- IF fire key is pressed
- THEN
  counter = 10 (the delay before another bullet can be released.)
- REM find next free space in table.
- REPEAT
  Obtain next bullets X coordinate.
- UNTIL (X coordinate is zero) OR (the last space in the table has
  been examined)
- IF X coordinate <> 0 THEN return from subroutine because the
  maximum number of bullets are in motion.
- REM a new bullet can be placed in the table at this position.
- Place the X and Y coordinates of the space ship into the X and Y
  coordinates of the bullet, so that the bullet appears to originate
  from the ship.
- Enter the bullets direction (by poking the X and Y velocity locations
  of the table for this bullet) according to the current direction
  that the ship is pointing in.
- ELSE
- counter = 1 (minimal delay because fire key has not been pressed)
- Return from subroutine.

```

Figure 5. Bullet data-table updating.

firing is still possible without any such delay, resulting in a responsive "machine gun".

Which routes?

Which Operating System routines should be used? The operating system (O.S.) contains many useful routines which may be used from machine code by simply using the JSR instruction followed by the routine entry point (or call address). However, because the routines are "legal" (which usually implies that they will work in any screen Mode and across the TUBE), they do tend to be a bit slow.

The following O.S. routines (whose use is demonstrated in the program "ADEMO") tend to be fast enough for machine code games, and were all used in TAZMAN.

OSWRCH - call address &FFEE.



This routine can be used to print out the current score of a game, as shown by option 1 of the demonstration program. Three bytes are used to hold the score which is held in Binary Coded Decimal (BCD) for-

mat. By using BCD, the conversion of a binary number into a decimal form is easily accomplished by simply masking off the most significant nibble (the top four bits) for one digit, and the least significant nibble for the other digit. The routine listing contains many remarks to show what is going on.

OSWRCH is not a terrifically fast routine, but for tasks that are not performed very often, such as the score, it provides an easy way of outputting text and numbers.

OSBYTE &81 - INKEY equivalent. This can be used to check keyboard input, and is fast enough to be used in machine code games. Each key that the game uses should be checked individually by supplying this routine with a negative value, which is placed in the X register. e.g. to test the <SPACEBAR> (which has an INKEY value of -99), we must place &9D into the X register. This value can be obtained by typing **PRINT --99**

Option 3 of "DEMO" shows how an OSBYTE call can be used.

OSWORD call with A=&7 By using the OSWORD routine with the accumulator set to 7, sound can be

generated as is done in BASIC. Option 4 of "DEMO" shows it in use, and the listing provides a full explanation of how this is achieved.

Further exploration

If you are interested in exploring machine code game writing further our Services offer a *Getting into Assembler* disk and manual which goes into sprites, music, scoring and key detection.



Further reading for hit game writers

Mark de Weger

BACKGROUND PRINT

This handy utility prints text files in the background while you carry on computing

One of the most frustrating things about wordprocessing is the long wait for the text to be printed out. If you are lucky then you have a large print buffer. For those who sit, tensely tapping their fingers, here's an answer to a prayer.

As usual the *source code* for the background print utility is on your Disk User disk. When you run it, either by choosing it from the menu or via CHAIN, it will save the *object code* - the machine code - to the disk. It saves the machine code as BPRINT. The command can now be called from disk by typing

***BPRINT <filename>**

where <filename> is a text file on

the currently selected drive. The file must be an ASCII file. Most wordprocessors normally save their files with control codes in them which can confuse a printer. Equally all wordprocessors have an option to *spool* the text as an ASCII file, a sequence of ASCII numbers representing keyboard characters with no other special meanings for the printer.

Because BPRINT works with ASCII, it is best used for printing draft text or other text which does not need precise formatting on paper.

This is where the background print utility really comes into its own, printing away while you continue your work.



PROCEDURE LIBRARY MANAGER

Programming is hard grind but a set of useful procedures can be put to work for you over and over again. *Procedure Library Manager* takes procedures off the shelf and dusts them down ready for your programs

The *Procedure Library Manager* is a utility to help make quick and effective use of a collection of ready made BASIC procedures. These procedures will generally be written by yourself but we've provided a large selection for you to get going. There are 25 different procedures in the file on this Disk User.

Collection

The collection of procedures can be easily added to your own programs. All parameters are explained by the use of REMs in each procedure. To load the routine of your choice simply press the appropriate letter key. Then press f0 to recall the menu and load in the next procedure. The listing can be checked at any time by pressing f4. When the procedures you require are loaded simply press f9 to delete the merge routine. This will leave you with your chosen procedures, a solid foundation for your latest BASIC masterpiece.

First page

The first page of ADDPROC contains a number of useful routines, some very simple. You may delete any that you do not require and replace with your own. Page two contains only DUMMY lines. Again replace these with your own routines saving each file with a two letter file name eg ZA,ZB,ZC etc.



Extra files

If you have an ordinary DFS you will not be able to use procedure files beyond the 31 file limit. If you have a DFS which is capable of having 62 files on a disk (Watford, Solidisk), then ADDPROC will make use of your built-in DFS facility.

However Acorn DFS users do not despair. ADDPROC can make use of Disk User's recently published *SWAP routine to allow more than 31 procedure files. The program was published in the October/November 1987 issue (available from the SERVICES page at the back of your magazine).

If you have the Dual Catalogue (*SWAP) program, format a disk using it and then copy the Procedure Library Manager files to that disk.

Then
LOAD "ADDPROC" LIST 770
770REM*SWAP
Remove the REM
LIST 790 790REM*SWAP
Remove the REM
SAVE "ADDPROC"

You can now use the Library Manager with more than 31 files.

Format

When saving your own procedures be sure to keep to the following format. Always number from 9000 in 10s. Lines 9010-9100 either REMs or blank.

Demonstration

There is a demonstration of some of the procedures from ADDPROC on this disk. Just type CHAIN "PROC".

Disk Library

A set of vital disk filing routines were published on Disk User Six (back issues are available from our Services pages). They can be easily combined into the Procedure Library Manager. Just load the complete disk routine listing and save each individual procedure under a two character filename to a disk with ADDPROC already on it.

Transfer

See the transfer article this month for details of transferring the Procedure Library Manager to its own disk.

disk

USER

READERS'

SURVEY

Please enter your name and address below if you wish to enter the Integrex printer competition: Details on page 12.

Name:

Address:

Postcode:

1. How long have you been a Disk User reader?

- Since the first issue
 About 6 months
 Less than 6 months

5. How do you normally obtain your copy?

- Chance purchase
 Newsagent shop collection
 Newsagent home delivery
 Subscription
 Passed on copy

2. With respect to the articles in Disk User, how do you rate the following?

	POOR	AVERAGE	GOOD	EXCELLENT
Floppy Fun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disk Instructions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
News	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beginner's Guide to Disks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transfer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sector Zero	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desktop Accessories	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2a. With respect to the programs on the Disk User disk, how do you rate the following?

	POOR	AVERAGE	GOOD	EXCELLENT
Collectors Items	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Theme Tune	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
System Wadgebury	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Superfont	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Background print utility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Formatter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
*CLOSE utility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Procedure library manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Star routines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2b. Did you buy this issue of Disk User for a particular program or for the magazine as a whole?

- Magazine
 Program (please state)

2c. Is there any feature of Disk User you would like improved?

.....

3. Are you aware of scheduled publication day?

- Yes No

4. If the answer to question 3 is yes, do you attempt to purchase the magazine on that day?

- Yes No

6. If you are a subscriber, on which date did you receive this issue?

//

7. If you do not obtain your copy by subscription, is it due to one of the following?

- Subscription too expensive
 Not every issue required
 Not aware subscription service available

7a. Are you aware that to subscribe to this magazine in the UK, is the same cost as purchasing it in a shop?

- Yes No

7b. Would you like to receive further details on taking a subscription?

- Yes No

7c. If you do not subscribe, from which type of newsagent do you most often obtain your copy?

- High Street shop
 Estate shop
 Corner shop
 Travel point
 Other (please state)

7d. If you have subscribed to this magazine but now lapsed, is it due to?

- Subscription too expensive
 Every issue no longer required
 Lateness in receiving subscription copy
 Poor service from our subscription bureau

8. Which other computing magazines do you read and how do you rate them?

	NEVER READ	READ OCCAS.	READ REGULARLY
Acorn User	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Micro User	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beebug	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A&B Computing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electron User	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Educational Computing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Times Ed. Supplement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer Trade Weekly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8a. If read how does it compare with Disk User?

	NOT AS GOOD AS DISK USER	AS GOOD AS DISK USER	BETTER THAN DISK USER
Acorn User	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Micro User	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beebug	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A&B Computing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electron User	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Educational Computing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Times Ed. Supplement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer Trade Weekly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Which disk drive configuration do you own?

- Single drive, single sided, 40 track
- Single drive, double sided, 40 track
- Two drives, double sided, 40 track
- Single drive, double sided, 80 track
- Two drives, double sided, 80 track

10. Do you keep your copies of Disk User for:

- Less than one month?
- One month?
- Three months?
- Six months?
- A year or more?

IF KEPT, please answer the next question.

10a. How often do you refer to back issues of Disk User?

- Once a week or more
- About once a month
- Once every three months
- Less often
- Never

11. How much of the time do you use your computer for the following purposes? (Please tick one box on each line):

	ALL THE TIME	MORE THAN HALF THE TIME	SOMETIMES	NEVER
Writing programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Playing games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Graphics/DTP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Educational (as Teacher) (as Student)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business (wordprocessing, data base, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Which of these computers do you own? (Tick box).

ELECTRON	BBC B	BBC B+	MASTER 128	MASTER COMPACT	ARCHIMEDES
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12a. Please tick the box for any of these computers if you are thinking of buying one within the next 12 months.

ELECTRON	BBC B	BBC B+	MASTER 128	MASTER COMPACT	ARCHIMEDES
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12b. How long have you owned your computer? (In months).

.....

12c. Approx how many hours per week do you use your computer? (In hours).

.....

14. With regard to the advertisements in Disk User, do you:

- Read or look through most or nearly all the ads
- Read or look through some of the ads
- Just read or look through the occasional ad
- Very rarely/never look at the ads

15. How long do you spend reading Disk User?

- Over 2 hours
- 1 1/2-2 hours
- 1-1 1/2 hours
- 1/2-1 hour
- Less than 1/2 hour

16. Approximately how much will you spend on computing in the next year?

- Nothing
- Up to £50

- £51-£100
- £101-£200
- £201-£500
- £501-£1,000
- £1,001-£2,000
- £2,001+

13. Please study the product groups shown, and tick any of the columns that apply to you.

Tick column (1) if you already own the product.

Tick column (2) if you do not yet own the product but definitely intend to buy one within the next 12 months.

Tick column (3) if you may buy the product within the next 12 months but are not yet sure.

In column (4) please indicate how often you use the product regardless of whether you own it or not.

PRODUCT	1 OWN	2 WILL BUY	3 MAY BUY	4 FRE-QUENTLY	INFRE-QUENTLY
INPUT DEVICES					
Light pen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trackerball/mouse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Joystick	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Touchpad/concept keyboard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OUTPUT DEVICES					
Dot Matrix printer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Daisywheel printer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plotter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Colour/Ink Jet printer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Laser printer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PERIPHERALS					
Mono monitor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Colour monitor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Modem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Robotics/control devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CONSUMABLES AND ACCESSORIES					
Paper/labels/stationery/ribbons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blank disks/Disk storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spares/leads/connectors/components	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dustcovers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Furniture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Books	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AUDIO					
Music s/w or h/w	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Speech s/w or h/w	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ADD ONS					
Coprocessor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Extra RAM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
STORAGE					
Floppy d/drives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hard d/drives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Econet system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SOFTWARE					
Adventure Games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arcade Games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Programming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Languages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Educational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Graphics/DTP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Word Processing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business Administration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
School Administration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. Thinking specifically about the advertising content, would you please rate the three main types of advertisement:

	DISPLAY	DISK LINK	DISK DEMOS & ADS
Very useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quite useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not very useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not at all useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17a. Would you like to see more advertisements?

	Yes	No
On the disk	<input type="checkbox"/>	<input type="checkbox"/>
In the magazine	<input type="checkbox"/>	<input type="checkbox"/>

18. Apart from yourself, who else reads or looks at your copy of Disk User? (Please record the age and sex of each person, other than yourself, who reads the magazine).

	PERSON 1	PERSON 2	PERSON 3	PERSON 4
SEX: Male	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Female	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AGE: 9-14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15-24	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25-34	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35-44	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45-54	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55-64	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65 plus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. How often do you visit computer outlets or buy mail order?

	OUTLETS	MAIL ORDER
Once a week	<input type="checkbox"/>	<input type="checkbox"/>
Once a month	<input type="checkbox"/>	<input type="checkbox"/>
Once a quarter	<input type="checkbox"/>	<input type="checkbox"/>
Less often	<input type="checkbox"/>	<input type="checkbox"/>
Never	<input type="checkbox"/>	<input type="checkbox"/>

19a. Other than items purchased for your computing have you bought any other types of goods by mail order during the past 12 months?

Yes No

19b. If the answer to the above question is yes, please state the type(s) of goods purchased:

.....

20. How often have you ordered or bought items after reading an advertisement in the magazine or using a demo on the disk?

Regularly
 Occasionally
 Never

20a. Is a demonstration on the disk more likely to encourage you to buy a product than an ordinary advertisement in the magazine?

Yes No

21. Which of the following newspapers do you read?

The Times
 The Daily Telegraph
 The Financial Times
 The Guardian
 The Independent
 The Daily Express
 The Daily Mail
 The Daily Mirror
 The Sun
 TODAY
 None

21a. Which of the following Sunday newspapers do you read?

The Sunday Times
 The Observer
 The Sunday Telegraph
 The Sunday Express
 The Mail on Sunday
 The Sunday Mirror
 The People
 The News of the World
 News on Sunday
 Sunday Sport
 None

29. Where do you buy MOST of your drink from?

An Off-licence
 A supermarket
 A Public House
 Other, please specify:

30. How many of the following items do you buy, on average, over a month?

	LESS THAN 1 PER MONTH	1 or 2	3 or 4	5 or 6	MORE	NEVER BUY
A book	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A record	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A tape	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. Do you own your own home, rent, or live with parents?

Own
 Rent
 Live with parents
 Other, please state:

23. If you own your own home, what is the approximate value (your principal residence if you have more than one)?

More than £200,000
 £100,000-£200,000
 £75,000-£99,999
 £50,000-£74,999
 Less than £50,000

24. Please tick the box which represents the annual total of your gross income:

Under £6,500
 From £6,501 - £8,000
 From £8,001 - £10,000
 From £10,001 - £12,500
 From £12,501 - £15,000
 From £15,001 - £19,000
 From £19,001 - £25,000
 Over £25,000

25. Please indicate below when you last did any of the following:

	IN LAST WEEK	IN LAST MONTH	LONGER AGO
Ate out in a restaurant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Entertained at home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Went to the theatre/ opera/ballet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Went to a music concert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Went to the cinema	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attended a sporting event	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visited an art gallery/ museum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Went to a pub	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Had a short break in a hotel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overseas holiday last 12 months	YES <input type="checkbox"/>	NO <input type="checkbox"/>	

26. Which, if any, of these sports and activities do you play or take part in nowadays?

Cricket
 Fishing
 Golf
 Rugby
 Soccer

Sailing
 Skiing
 Shooting
 Swimming
 Squash
 Tennis
 Weight training
 Windsurfing

27. Which of these stores listed below have you been shopping in during the last six months?

Boots
 W.H. Smith
 John Menzies
 Dixons

Currys
 Laskys
 Rumbelows
 Burtons
 Austin Reed
 Hornes
 Next
 Fosters

28. Which of the following do you drink?

	MORE THAN ONCE A WEEK	ONCE A WEEK	LESS OFTEN
Beer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sherry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Port	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brandy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vodka	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whisky	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liqueurs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DON'T DRINK	<input type="checkbox"/>		

31. Are you a member of a book club?

Yes No

32. Are you a member of a record club?

Yes No

33. Are you a member of a computer club?

BEEBUG
 MICRONET
 LOCAL U.G.
 Other, please specify:

34. Do you listen to commercial radio stations?

Yes No

If Yes, please specify stations:

35. Do you smoke...?

Cigarettes
 Cigars
 Pipe
 Don't smoke

36. Do you own a:

Stereo/Hi-Fi system
 Tape player/recorder
 Video recorder
 TV
 None of the above

37. Which of the following do you have?

Bank current account
 Bank deposit or savings account
 Life assurance policy
 Any stocks or shares
 Access card
 Barclaycard (Visa)
 American Express
 Diners Club
 Unit Trusts
 Private medical insurance
 Personal accountant
 Building Society account
 A mortgage
 Any HP agreements
 Telephone

38. How many cars are there in your household?

- None
- One
- Two
- Three or more

39. What cars do you own?

.....

.....

.....

40. Is one or more of your cars a company vehicle?

- Yes No

40a. Do you usually buy your cars new?

- Yes No

41. How often do you tend to change your car(s)?

- Once a year or more often
- About every two years
- About every three years
- Less often

42. Name the three television programmes you watch most regularly.

.....

.....

.....

43. Have you used the Disk User software service?

- Yes (please answer part a)
- No (please answer part b)

43a. If you have used it, have you been satisfied with the software and the service you have received?

- Yes No

43b. If you haven't used it, why not?

- Too expensive
- Limited choice
- Delivery period too long
- Other reason, please write in below:

44. Are you ... ?

- In full time employment
- In part time employment
- Not employed at present
- Retired
- Student - full time
- Student - part time

44a. If in full time employment, state your occupation:

44b. If student, what subjects studied?

.....

.....

.....

44c. Are you employed in a job where you influence the buying of Computer equipment?

- Yes No

45. Age (please tick)

- Under 15
- 15 - 18
- 19 - 21
- 22 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64
- Over 64

46. Are you?

- Male Female

46a. What is your marital status?

- Married
- Single
- Divorced

46b. If you have children please indicate their age and sex (give details of the four youngest if you have more than four).

	FIRST	SECOND	THIRD	FOURTH
Age:				
1- 3 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4- 8 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9-12 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13-16 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Over 16 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sex:				
Male	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Female	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

46c. If you have children do they follow your interest in Disk User

- Yes No

47a. If yes, please specify which ones:

.....

.....

.....

.....

47. Do you attend computer exhibitions?

- Yes No

TUCK INTO A THIRD FOLD

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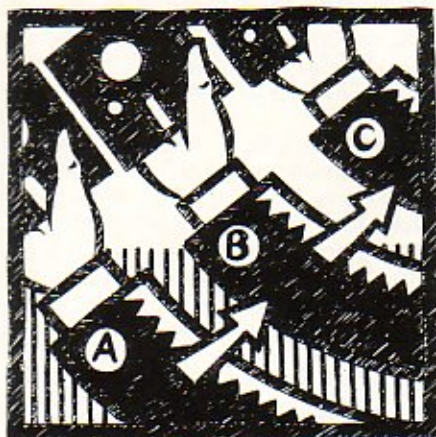
FIRST FOLD

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SECOND FOLD

SUPER FONT



Superfont, the combined Printer Driver and Font Generator

Superfont is compatible with *View*, *Wordwise*, *Wordwise Plus* and text editors such as Acorn's *BASIC* editor. *Superfont* may be used with Epson or Epson compatible printers on any 8 bit BBC Micro. *Superfont* controls the style features of your printer from commands embedded in a text file. It also gives access to new font designs. A new font is provided but you may also design your own.

Printer driver

A *printer driver* is a program that acts as an interface between the computer and the printer, an electronic translator, if you wish. Epson compatible printers can be controlled by *Escape* codes, but these are very hard to remember and use, so you need a program that accepts more reasonable commands from you, the user, and takes care of the codes by itself.

To simplify matters, let's consider an example: to set enlarged characters the printer requires the control codes 27,14. With *Superfont* you may use instead the embedded command ES (Enlarged Start) — much easier to remember and use.

Printer font generator

A *printer font generator* is a program that allows you to create new sym-

bols such as mathematical symbols, or complete alphabet sets. *Superfont* contains a font editor that allows you to define these new characters with ease, and then the printer driver discussed above allows you to incorporate these into any text.



The *Superfont* suite of programs has to be copied to a blank disk before use. This month's *Transfer* article on page 24 explains the procedure.

Once you have expanded the files on the disk you will find four programs:

Hipage
Superfont editor
Superfont test
Superfont printer driver

There is also an example font file and a complete new set of alphabet and mathematics characters to get you started.

Master 128 and **Compact** owners can now skip to the *Using the Superfont editor* section.

Using Hifont

Model B and **B+** owners should now type **CHAIN Hipage**. After a few seconds a machine code

file called *Hifont* will be saved on the disk.

Hifont reserves extra workspace required by the other programs if used on the BBC or B+. It should be run before you use any of the other files.

As a result of typing ***hifont** (or ***/hifont**) you'll be prompted to press <BREAK> upon which PAGE will be increased by 1Kbyte. When you wish to remove *Hifont* from memory (and thus claim the memory back) simply run it again or turn the BBC off for a few seconds.

Using the *Superfont* editor

Running the program will prompt you to choose between editing an old font file or creating a new one.

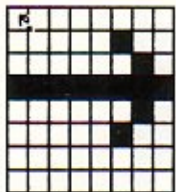
The first option will enable you to edit an existing file. The second option should only be selected when you wish to start designing a new fonts file from scratch.

Both options will ask you for a font filename, and then the main screen is shown. On the top half of the screen the 128 characters allowed by *Superfont* are shown, with their sequential hex number. Note that the numbers are from &80 to &FF (in decimal 128-255) and not from 0 to 128.

You'll be asked to enter a charac-

CHARACTERS DESIGNER FOR SUPERFONT!

80	□	81	▲	82	○	83	●	84	≈	85	▼	86	▲	87	▼
88	□	89	▲	8A	○	8B	●	8C	≈	8D	▼	8E	▲	8F	▼
90	□	91	▲	9A	○	9B	●	9C	≈	9D	▼	9E	▲	9F	▼
A0	□	A1	▲	AA	○	AB	●	AC	≈	AD	▼	AE	▲	AF	▼
A8	□	A9	▲	BA	○	BB	●	BC	≈	BD	▼	BE	▲	BF	▼
B0	□	B1	▲	CA	○	CB	●	CC	≈	CD	▼	CE	▲	CF	▼
B8	□	B9	▲	DA	○	DB	●	DC	≈	DD	▼	DE	▲	DF	▼
C0	□	C1	▲	EA	○	EB	●	EC	≈	ED	▼	EE	▲	EF	▼
C8	□	C9	▲	FA	○	FB	●	FC	≈	FD	▼	FE	▲	FF	▼
D0	□	D1	▲												
D8	□	D9	▲												
E0	□	E1	▲												
E8	□	E9	▲												
F0	□	F1	▲												
F8	□	F9	▲												



<CR> to finish , ESC to abort

Symbols unavailable from the keyboard can be designed.

ter number to design or edit. You must enter a two digit hexadecimal number exactly as shown on the left of each character. The next question asks if you want to edit the character or start from scratch (ie all grids are clear). after you have made this selection, an eight by eight grid will be shown.

Editing is very easy. Just move around with the cursors keys and invert the colour of the grid with the <SPACE BAR>. You have two options to finish editing: <ESCAPE> will abandon the new design of the character and <RETURN> will accept the design as the new definition of the character.

If you want to edit more characters, answer Y to the next question "Again?", or type N and you will be asked for a filename under which to save the edited fonts file.

Using the Superfont test

The task of this program (TEST) is to print all of the Superfont characters onto paper with their equivalent reference number. The number is printed both in decimal - for use with the 'CH' embedded command and in hexadecimal - for comparison with the Superfont Design program. The character on the keyboard that represents each Superfont character is also printed out. This is for use in conjunction with the 'FS' embedded command. Some Superfont characters are not represented on the keyboard and can be accessed only with the 'CH' embedded command.

Run Superfont test, and when you are prompted to enter a filename type font (the font file supplied on the disk) or any other filename (if you have designed your own). The fonts will be shown on screen as well as being printed out on paper. Figure 1 shows the result of printing the font file.

Using the Superfont printer driver

The Superfont printer driver (SPD) asks, when CHAINED, for the names of a text file and a font file. Initially try

```

Words-204 Characters free-22304 I
@LL30 Another facility which may be used
is the ability to change the line
length, as you can see. @LL 60

@FE You may also use other facilities
which your printer has, such as @BS Bold
typeface, @BE @US underlined text @BS
and even underlined bold text!@BE @UE

@FS Any special characters can be
printed when you need them:

@FS
F@LSx@LE=@CH142 x
@CH136 F@LSx@LE @CH158 =@CH141 x+C

@CH150 36=6

x=4
3x@HS2@HE+2x+4=60

lim@CH143 x(x@CH147 0)=@CH152
lim@CH143 y(y@CH147 e)=1
End
    
```

Embedded commands in Wordwise Plus.

using the files text and font (both are on your disk). These files will produce a clone of Figure 2.

As mentioned earlier, SPD allows you to incorporate embedded commands which consist of two letters each into the text to be printed, such as BS for bold text. Commands must be in uppercase.

We need some way to tell SPD to treat these two letters as commands rather than to print them out. This is done by using the @ symbol. When SPD finds the @ symbol, it knows that a command follows.

An embedded command should be terminated with a space or a new line (<RETURN>) or SPD might get confused. Note that if a space is used to end the command, it is ignored when printing the text - it is used here only as an end of command code. However <RETURN> will actually enter a new line in the text as it is printed.

Legality

The two letter command can come directly after the @ or separated from it by a single space. Some commands take parameters, in which case the parameters are separated one from the other by a comma and the first parameter may be separated from the two letter command with a space or attached to it with no space. Here, again, a space or a new line must come after the last parameter to indicate the end of command. The parameters must be in decimal.

Examples

The following are allowed:
 @BS some words@BE @ LL20
 @LL 32 @OC 32,45,43 some text.

the following are not allowed:

- @ BS (two spaces between the @ and the command)
- @OC 23.,43 (two commas between the parameters)
- @BS@LL 45 (no space or new line after the first command)
- @bs (lower case characters are used)
- @LL &20 (The parameter is in hexadecimal. Only decimal is allowed)

Embedded commands

Some commands need little or no explanation at all. This is because their effect can be seen best by printing the *text* file (supplied on your disk) with the printer driver.

FS - *Superfont* Start - no parameters. This command enters the *Superfont mode* which allows you to enter the re-designed characters with ease. When selected, nearly every character on the keyboard represents a *Superfont* character.

Thus **A** represents character number 193 (hex &C1), **B** represents character number 194 (hex &C2) and so on.

Bear this in mind when designing new fonts. It is sensible to design *Superfont* characters 161 to 250 with the alphanumeric characters which represent them in mind, using the remaining keys for special symbols. This approach is taken by the *font* file on your disk - you can see it clearly in Figure 1.

FE - *Superfont* End - no parameters. Cancels the FS command so the standard printer characters are used.

BS - Bold Start - no parameters. Does not work if *Superfont mode* is selected. Will cause some printers to emphasise the characters it prints.

BE - Bold End - no parameters.

CS - Condensed Start - no parameters. Allows 17 characters per inch.

CE - Condensed End - no parameters. Returns to normal mode (10 characters per inch)

ES - Enlarged Start- no parameters. Allows five characters per inch.

EE - Enlarged End - no parameters. Returns to normal mode (10 characters per inch)

EL - ELite - no parameters. Allows 12 characters per inch.

PI - Pica - no parameters. Returns to normal mode (10 characters per inch).

US - Underline Start - no parameters. Underlines text. Does not work if *Superfont mode* is selected.

UE - Underline End - no parameters. **HS** - Hi Start (superscript) - no parameters.

HE - Hi End - no parameters.

LS - Low Start (subscript) - no parameters.

LE - Low End - no parameters.

LL - Line Length - one parameter. This command is used to set the maximum number of PICA characters that can be printed across the page. The size of each pica character is 0.1 inch. For example setting the line length to 60 (the default setting) means that the maximum line length is six inches.

OC - Output Code - any number of parameters. *Superfont* does not support all of the facilities that your printer has to offer, for example *italics*. This command bypasses the printer driver and allows you to send any sequence of codes to the printer. For example, italics mode is enabled on some printers by sending the sequence CHR\$27+CHR\$52. To do this, place the command @OC 27,52 in your text.

CH - CHaracter - any number of parameters. The parameters are in the range 128-255 and represent *Superfont* characters. For example, to print the SIN symbol (number 141) from the *font* file (which is not represented on the keyboard) you will use the command @CH141.

Technical details

I have used long and descriptive variable names so the programs should prove understandable.

There follow the functions and procedures used (in all four programs):

PROCshowchr - prints the 128 *Superfont* characters on screen.

PROCgetchr - reads the *Superfont*

characters definitions from disk.

PROCmessage - prints a message in a window located at the bottom of the screen.

PROCcreate - saves the *Superfont* characters definitions to disk.

PROCchoose(A\$,B\$) - prints two options on screen and wait until the user selects one.

PROCdesign - the main routine in the 'design' program that allows you to edit and design characters.

PROCtype(Z%) - prints the *Superfont* character Z% by calling an appropriate assembly routine.

The following procedures exist on the printer driver program only:

PROCsetup - enters the text and font filenames.

PROCprint - initialises various variables and calls PROCdecide.

PROCdecide - checks if the entry is a command or a word. If it is a command PROCcommand is called, otherwise prints the word.

PROCcommand - processes embedded commands.

FNnext - reads the next parameter in an embedded command.

FNreadstr(chars%) - if chars%=0 reads a word until space, new line or @ are matched, otherwise reads chars% characters.

The following are the assembly routines used in the *design* program:

.get - reads the definition of a character.

.eor - inverts the colour of a grid.

.disp - prints a magnified character on an 8x9 grid window.

```
At any point in the text, Fantasy characters can be turned on. they are slightly different from the standard printer characters, although they have the same size as pica fonts, or (when selected) elite, condensed or enlarged fonts. (Please note that you may change FONTASY characters as you wish and create italic, bold or other typefaces).
```

```
As mentioned, Fantasy text can be condensed, enlarged, or you may select elite characters by means of a single embedded command, and all of them can be mixed on the same line! Furthermore, you may use SUPERSCRIPT CHARACTERS OR SUBSCRIPT CHARACTERS.
```

```
Another facility which may be used is the ability to change the line length, as you can see.
```

```
You may also use other facilities which your printer has, such as Bold typeface
```

```
Any special characters can be printed when you need them:
```

```
Fu = #x  
/Fu = #x+C  
  
√36=6  
  
x=4  
3x2+2x+4=50  
  
limx(x+0)=0  
limy(y+e)=1
```

Superfont provides access to any printer feature.

SECTOR ZERO

WIN £25 with a "star routine" plus Acorn trivia and tips and tricks

Tipster

When you first buy a computer, keeping track of your disks isn't a problem because you have so few of them. Before long, however, you'll find your desk buried in disks unless you have a system for filing and storing them. Here are some simple ways of organising your disks:

1. Label each one clearly, Wordwise Disk One, Viewsheet Disk Three, Utilities Disk Six etc.
2. Date them too so that you know which is the latest version. There's nothing worse than copying an old version over the new!
3. Periodically print out a directory or list of files for each disk and store the printout along with the disk. Or keep a catalogue of your directories. You can do this automatically with the Disk User automatic disk catalogue. You'll need Disk User back issues one and two.

Acorn trivia

1. Who were the two personalities who founded Acorn? And what are their nationalities?
2. What was the name of the range of Acorn computers which were launched but never reached the shops?
3. How many different Acorn second processors have there been for the BBC Micro range?
4. What is the ~ character usually followed by in BASIC?

Why not send in your own favourite trivia questions and answers about your favourite micro?

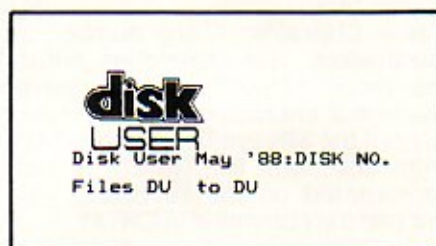
Tipster

If you are having trouble feeding paper into your printer then fold the first sheet double before inserting it. The paper is more rigid and slides through much more easily.

Reader's routines

In every issue we are going to include the best of the *reader's routines* you send in to us. There will be a £25 prize for the star routine every month. All other published routines will win 10 Disk User data disks for their authors. We are looking for short and sweet BASIC or

machine code programs. So get writing and send your routines into Sector Zero, Disk User, Number One Golden Square, London W1R 3AB.



Clearly label your disks. A collection can soon get out of hand.

```
*
DISK-USER-7 (31) FM
Drive 0                               Option 3 (EXEC)
Dir. :0.$                             Lib. :0.$

!BOOT                                ADDLD
ADDFR                                ADEMO
BACK-PR                              CHANGE
CL.SRC                              COLLECT
DEMO                                 DUMENU
EXPAND                               FONTLD
FORMAT                              GREYSCR
key                                  LOADER
MENU                                MULMODE
PULSATE                             SUPFONT
SYSLD                               SYSWAD
THEME

A.DISC                               H.ALPHA
I.MENU                               P.RUNDISC
P.RUNH

>
```

Keep a disk/directory printout with each data disk.

Tipster

Because many people are unsure of how their disk drive operates, they don't dare attempt to clean it. This simple job however can help the operation and life of your disk drive.

The disk drive head, like a tape recorder's head, can pick up debris from the magnetic recording material, and if the debris isn't removed, it can reduce the sensitivity of the head and its accuracy in recording and picking up data.

The easiest way to clean the head is with a special cleaning disk. Insert it into the drive just like a regular disk and it will clean the disk drive head as it spins.

May's star routines

To kick things off Kevin Mortimer has weighed in with a neat routine for printing coloured pulsating text to the screen.

Mike Roberts' ingenious program shows that colour in Mode 0 is not beyond the bounds of possibility!

Matthew Fifield has also contributed a fast "greymix" screen fill routine. Sounds like concrete to me! Very handy for those WIMP screens which must look the part.

We look forward to publishing your star routines next month and awarding the £25 prize to the best of the bunch.

Tipster

Keeping backups of your disks is a vital part of maintaining your disk collection. The cost of a few backup data disks has to be compared with the cost of your time re-writing a letter, rekeying 20 (or more) database records or losing (heaven forbid) a valued utility.

The grandfather, father, son technique should be used for your most vital data. The son disk is used for directly saving data. Then, in sequence, the father disk is backed up to the grandfather, the son is backed up to the father.

While the son is in use the disks maintain two levels of backup, the previous session's data (father) and, in case something went wrong last time, the data from the session before that (grandfather). After backing-up, there are two versions of the current data (son and father) and one of the previous session (grandfather).

It is tempting and handy to backup to the reverse side of a disk (side 2) but the data remains endangered by a physically damaged disk. A sleeve can always accommodate a second backup disk if you don't like labelling twice.

1. Chris Curry, Herman Hauser.
English, Austrian.
2. Acorn Business Computers
3. 65C02, Z80, 32016, 65C12
(Turbo), 80186, RISC.
4. A hexadecimal number.

TRANSFER

Taking your disk files one step further

Disk User programs can be so useful that you'll often want to transfer them to their own disks and use them separately, without title page or menu. To do this successfully you'll need to learn a little about BBC BASIC and the DFS (Disk Filing System). In Disk User we don't believe in referring you to the manuals to here's an explanation of how such a transfer can be achieved.

Let's take the *Procedure Library Manager* program as an example this month. The relevant file on Disk User is:

ADDPR

Make sure you have a blank data disk ready to receive the file. Insert Disk User and type

***COPY 0 0 ADDPR**

and press the RETURN key. Follow the keypress prompts on the screen until the > prompt returns. Now

***COPY 0 0 EXPAND**

and press the RETURN key. Follow the prompts.

Because ADDPR is a compressed file special to Disk User the first

thing to do with your new disk is to type

CHAIN "EXPAND"

and to choose the third option for the Procedure Library Manager. The program will now expand out the separate programs which make up the package.

On completion, place your new disk in the drive. Type

***BUILD !BOOT**

upon which the disk drive will whirr and a number will appear on screen.

Type

CHAIN "ADDPROC"

and press the RETURN key. Wait for a second number to appear and then press the ESCAPE key. Let the drive finish any activity and then type

***OPT 4,3**

and press the RETURN key. Once again wait for any drive activity to cease. Now you can press the SHIFT and BREAK keys together, releasing the BREAK key first, then the SHIFT key. This will boot your new disk into action, automatically

executing the command CHAIN "ADDPROC". The program loads and runs and the menu of procedures appears. For now, press the CTRL and BREAK keys together.

Give it a title

You can now type

***TITLE LIBRARY**

and press the RETURN key. Now type

***CAT**

and press the RETURN key and the screen will display the title LIBRARY lined up below along with EXPAND and ADDPR - which you can now delete - and the procedure letters A to Y. You may now use this as your procedure disk, saving other useful routines in the space available (space is something we don't leave on Disk User itself).

The process described above can be repeated for System Wadgebury and Super Font. Details are also given on screen.

disk USER

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issue

COLLECTOR'S ITEMS

Adding animations A to Z



The *Collector's Items* series will eventually form a complete collection of colourful animations. Any of this A to Z collection can be selected from the animations menu. This is the file COLLECT on this issue of

Disk User. Each month we include an animation and the A-Z menu will only accept a press upon the relevant keyboard key. This month it is **H** for **H**unter so the menu will only accept the letter H. Next month it will only accept the letter I.

As you build your collection of animations you will want to give access via the menu to the different animated letters. This involves typing in a few lines of BASIC.

LOAD the file COLLECT and study it. The key lines of the file COLLECT are

```
90A=GET
100IF A=72 THEN GOTO 1310
130GOTO90
1310*:0.H.ALPHA
1320A=GET:GOTO30
```

Line 90 tests for the key press and an ASCII value is returned in the variable A.

Line 100 tests whether the key is ASCII number 72, which, of course, is H. When it is 72 (H) the program GOes TO line 1310. At 1310 the menu *RUNs the file ALPHA in directory H on drive 0. This *file specification* can be adjusted for your own requirements. You may for instance wish to hold animations on drive 2. H would then be :2.H.ALPHA.

Additions

To add the letter A to this menu just add the lines

```
95 IF A=65 THEN GOTO 1300
1300 *:0.A.ALPHA
```

And so on for other letters you have collected.

FLOPPY FUN

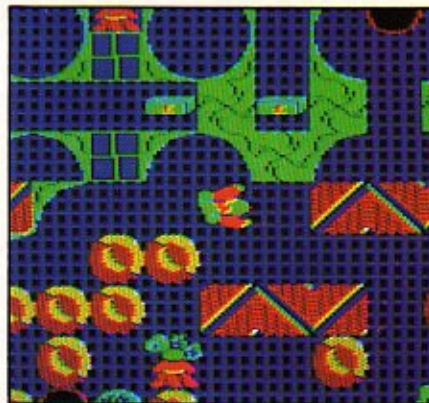
Two new game releases are due from **Superior Software** to enliven your Spring game playing

A gang of Superior Software programmers from Cambridge descended on the Disk User offices recently and brought with them what could be two of the hottest releases this year.

Pipeline

Pipeline has a *Ravenskull* style overhead view. But there the resemblance ends since *Pipeline* has a number of original features, not least a very very slick and attractively presented game editor. All the features of the game are available from the editor. Data files saved from the editor can be processed separately into a new game to test your friends.

The pipelines of the game's title are entered by the player, the screen scrolls very smoothly around the course of the pipe and the player pops out at the other end. The game should be on sale now.



Exile

For release later in the year is a game called *Exile*. A familiar arcade adventure format is enlivened by colourful graphics and a bundle of original puzzles to tackle. The game has an enhanced *Master Series* version which features speech of a sort and a larger screen display.

The animated astronaut hero of the game flies around by jetpack opening doors by laying mines and fighting off robots. The programming is technically of a very high standard. *Exile* features a mission to complete and will be packaged with a novella to set the scene.

Superior have two very strong games for their Spring releases and it's encouraging to see new life once again breathed into BBC games. Next month watch out for our Code-name Droid maps to coincide with the rerelease of *Droid* on Superior's *Play it Again Sam 2* compilation.

BEGINNER'S GUIDE TO DISKS

Our monthly "back to basics" column for beginners and casual users of the disk based BBC Micro

Last month we went down to tracks and sectors level and explained that a disk has a catalogue which holds information about the files on the disk for use by the disk filing system routines built into your BBC Micro. Some of those routines are now worth a brief look themselves as well as OPT, a command which seems a mystery to many users who have written to us.

The INFO command is a command obviously relying on the file information stored in the catalogue. INFO merely displays that information. In a not too friendly manner either we may add because the load and execution addresses are given in hexadecimal along with the length of the

file, while the sector at which the file begins is in decimal.

One aspect of the INFO command which can make it a great deal more useful is the addition of wildcards.

Wildcards

A wildcard is a word used to describe something which can be used in place of any other thing or set of things. For the disk filing system this means some of the less well used keyboard characters being used to represent groups of alphabetic characters.

Other systems have their own syntax but the use of wildcards is fairly consistent. The MSDOS standard, for instance, uses wildcards in

a similar fashion to Acorn DFS and ADFS.

These special characters are recognised by the disk filing system software:

* represents multiple characters
represents single characters

Other DFS commands which can make sense of wildcards are ACCESS, COPY and WIPE (use with care).

Examples

As you progress through our examples see if you can work out what effect each command will have before moving on to the new file information display for drives zero and one.

```

> WILDCARD (33) FM
Drive 0
Dir. :0.$
Option 0 (off)
Lib. :0.$

#AA
#A*
AUG.SHT
GRPHLP
JUN.SHT
MODHLP
TEXT2
TEXT3
TXTHLP

1.EX
3.EX
A.EX2
B.#
B.EX2

>
>*INFO B.*
B.# 00FFFF FFFFFFFF 00004D 011
B.EX3 00FFFF FFFFFFFF 000017 00A
B.EX2 00FFFF FFFFFFFF 000017 009
B.EX1 00FFFF FFFFFFFF 000017 008
>*INFO #.EX
3.EX 00FFFF FFFFFFFF 000023 00D
2.EX 00FFFF FFFFFFFF 000023 00C
1.EX 00FFFF FFFFFFFF 000023 00B
>*ACCESS TEXT# L
>

>* WILDCARD (34) FM
Drive 0
Dir. :0.$
Option 0 (off)
Lib. :0.$

#AA
#A*
AUG.SHT
GRPHLP
JUN.SHT
MODHLP
TEXT2
TEXT3
TXTHLP

1.EX
3.EX
A.EX2
B.#
B.EX2

>*INFO ###HLP
$.GRPHLP 00FFFF FFFFFFFF 00003E 010
$.TXTHLP 00FFFF FFFFFFFF 00003E 00F
$.MODHLP 00FFFF FFFFFFFF 00003E 00E
>
>*COPY 0 1 B.#
Copying from :0 to :1
B.# 00FFFF FFFFFFFF 00004D 011
>
>* 1
DISK-USER-7 (85) FM
Drive 1
Option 3 (EXEC)

Dir. :1.$
Lib. :0.$

B.#
>
>*COPY 0 1 #.EX*
Copying from :0 to :1
3.EX 00FFFF FFFFFFFF 000023 00D
2.EX 00FFFF FFFFFFFF 000023 00C
1.EX 00FFFF FFFFFFFF 000023 00B
B.EX3 00FFFF FFFFFFFF 000017 00A
B.EX2 00FFFF FFFFFFFF 000017 009
B.EX1 00FFFF FFFFFFFF 000017 008
A.EX1 00FFFF FFFFFFFF 000000 002
A.EX2 00FFFF FFFFFFFF 000000 002
A.EX3 00FFFF FFFFFFFF 000000 002
>
>
>*COPY 0 1 #.EX1
Copying from :0 to :1
B.EX1 00FFFF FFFFFFFF 000017 008
A.EX1 00FFFF FFFFFFFF 000000 002
>
>
>DRIVE 0
>
>*WIPE B.*
B.# : Y
B.EX3 : Y
B.EX2 : Y
B.EX1 : Y

```


DESKTOP ACCESSORIES

The BBC Micro disk system can respond to most office-based requirements, with the help of a little software . . .

Mailshots

The modern office cannot function without a good mailshot every now and again. *Labelmaster* from *Calderdata* is a series of disk based program modules which maintain a database for address label printing on Epson and compatibles.

The function keys can be setup to enter text for labels although, unfortunately, there is no "import" facility for taking names and addresses from other databases.

Message labels can be individually designed but are restricted to text output. Print codes can be entered which opens up colour and other available printer effects. The complete label can be reviewed on screen before printing. The software has a "PC" feel to it and is very friendly.

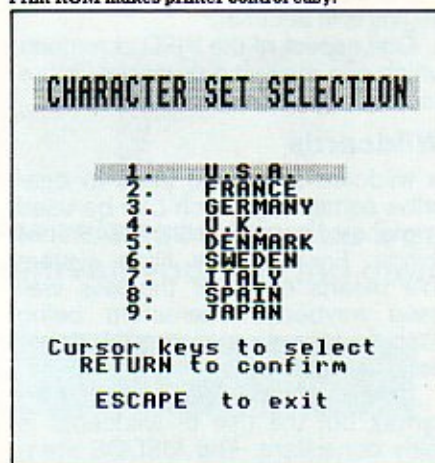
Keeping time

Your micro should be able to help you keep appointments but first it must be able to tell the time! Only the Master 128 and Archimedes in the Acorn range have battery backed real time clocks. However a new real time clock accessory is available for

Model B, B+ and Compact owners. PMS have introduced a miniature clock which plugs into a single ROM socket. The *Genie Watch* software supports the standard Acorn *TIME and TIME\$ and the OSWORDS (operating system routines) which read and write the time to and from the clock.

The time can be set with the command *SETTIME and *CLOCK ON displays a clock in the top right hand corner of the screen. The battery life of the clock is guaranteed for an amazing 10 years! Price

Print ROM makes printer control easy.



is £29.90 including VAT to registered Genie owners, £35.00 including VAT for others. PMS say that a £1.00 carriage charge should be added for mail order.

Print Roms

Printer owners, whose hardware needs often needs specialist attention from the software publishers, will be happy to hear of new sideways RAM or ROM software to help them get the most from their printer. With a no nonsense title, *Print ROM* from *Windmill* allows the user to call up a menu of printer control commands. Versions include Epson, Star, Panasonic, Brother, Juki and Canon. The * commands are also available in direct mode or from BASIC.

Sciways, from *Mayhew*, is a different animal. This ROM and disk combination allows new font definitions to be easily designed and incorporated into your text. Characters can also be viewed on screen. Wordwise and View demonstrations are included. Price £38.52 inclusive of P&P.

Office Mate

On your disk this month we've included a unique demonstration of the disk based *Genie Junior*. We hope it proves useful in assessing the software for your own needs. We hope to feature other BBC disk software in the future so that you can judge software for yourself as well as glean information from the magazine review or roundup.

Don't be fooled by our disk demo this month in which by no means all the functions have been included. We asked for a certain size demonstration and Derek Mathieson of PMS did well to show what he has within the editorial restrictions laid down.

Genie Junior comes on ROM but with program and data files on disk. The data files, which are in the D directory, hold the address book, diary and so on.

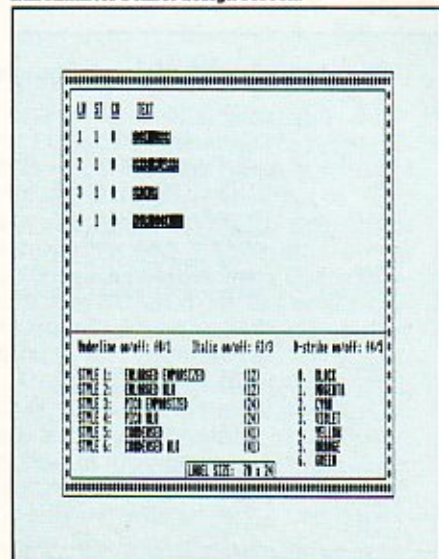
All the files can be copied to a "work disk" so that disk swapping is

Sciways creates new fonts for screen and printer.

Pos	DEC	HEX	Character no. 225
0	0	800	
1	4	804	
2	10	80A	
3	42	82A	
4	170	8AA	
5	234	8EA	
6	106	86A	
7	42	82A	
8	30	81E	
9	2	802	
10	0	800	

0	1	2	3	4	5	6	7	8	9	10

Labelmaster's label design screen.



not necessary when Genie is called up with a <SHIFT/CTRL/G> combination or *GENIE. It is a pity that you can't assign a disk drive number to the Genie Junior disk, allowing, say, a View disk in drive 0 with Genie Junior data in drive 1, accessed automatically on callup. Genie Junior has to be in drive zero.

The problem of reliability must of course be considered. Disks are unfortunately prone to the odd failure and Genie Junior does its best to recover from these. However, any disk it doesn't recognise it will reject. So the usual advice on keeping backups is pertinent. Similarly Genie is prone to the problems of "disk full". After this no further data can be saved so keeping a track of remaining disk space and creating new space with the TIDY utility is essential house keeping which should take no more than a few minutes out of your busy week.

RAM disks such as the Morley RAM disk and the Slogger Challenger range, come into their own with disk based utilities. And indeed the original Genie merely carried its own RAM disk around with it, like a tortoise and its shell. Genie Junior is available in ADFS format too so a hard disk directory could equally

well keep the software just a key press away.

In general Genie Junior maintains the high standards set by daddy. It takes a single ROM socket like the original and stores no less data. All the functions of Genie are in place. The overriding advantage of Junior is price. The only word that could be used of Genie senior and can't of junior is "instant". It is possible to maintain Genie Junior as a work disk but, even if this is possible, there are time overheads for disk access.

Take Note

Sidewriter from DABS Press is a modest utility which competes directly with the notepad element of Genie. At £7.95 for a 40/80 track disk it is hard to go wrong but you will need sideways RAM to run it.

The paperless office is certainly not around the corner if my printer bound home office is anything to go by but Sidewriter is a handy electronic notepad onto which you can jot at any time without coming out of your current work, or play. The otherwise impossible to perform combination of CTRL, SHIFT and TAB pulls Mike Ginn's Sidewriter into view.

The screen is simply a 40 charac-

ter Mode 7 window onto a much larger writing area. The claimed total capacity of 10,000 characters should be enough for some fairly heavy note taking. TAB takes you out of the notepad and back to your previous task. *PADCLEAR wipes the sheet clean and *PADPRINT prints the entire 127 by 75 text area to an Epson compatible printer in condensed mode.

Of course sideways RAM can not be relied upon to maintain the data when the machine is turned off so a utility loads and saves the data to a disk file. And a very welcome addition to the package at the price are some ready-to-load "pads".

Disk Data

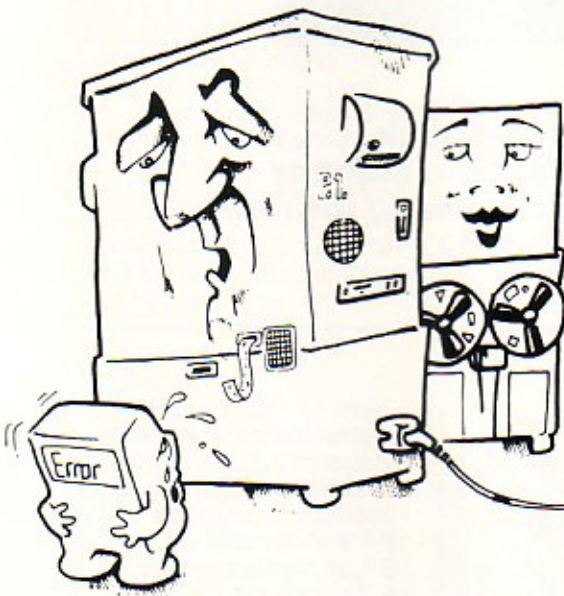
DABS Press, 76 Gardner Road, Prestwich, Manchester, M25 7HU. ☎ 061 773 2413


PMS, 38 Mount Cameron Drive, East Kilbride, G74 2ES. ☎ 03552 32796.

Windmill Software, Smock House, Hull Lane, Terling, Chelmsford, Essex, CM3 3QD. ☎ 0245 33371.

Calderdata, The Old Farmhouse, High Lee, Luddenden Foot, Halifax, HX2 6LB. ☎ 0422 885202.

Mayhew Telonics, 376a Ringwood Road, Poole, Dorset, BH12 3LT. ☎ 0202 747695.





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ADVANCED DISK USER GUIDE



Learning about the outer edges of disk programming. This month a variable stagger disk formatter and a *CLOSE command for those DFS systems which lack the facility

Specialised disk formatting

Before a disk can be used to store information we are obliged to place certain marks on it which serve to identify the type of data we wish to store. This process is called *formatting*. Specifically, we need to state the length of each block of data and the number of blocks per track. Each block should then be numbered uniquely. It is how to go about numbering these blocks to improve disk performance that is the subject of this article.

Let us consider a single track formatted to the Acorn DFS stand-

ard. This track will have 10 blocks of data each of 256 bytes length. Together with certain disk housekeeping marks these are known as sectors. In order to appreciate the usefulness of sector staggering we should take a look at the sector identification field (id) which pre-

cedes the data to which it relates. The sector id consists of four bytes, in order:

1. Logical track number
2. Head number
3. Logical sector number
4. Data size.

If the DFS is to be able to make

Track	Logical sector number
00	00 01 02 03 04 05 06 07 08 09
01	00 01 02 03 04 05 06 07 08 09

Figure 1 (Sector stagger = 0).

sense of the disk we must ensure that the logical track number in the id equals the physical track number and that the logical sector numbers run from zero to nine. (Disc access speed is optimised if they run consecutively).

Also, the data size should reflect the 256 bytes standard and is consequently set at one. The head number is usually irrelevant though in practice we set it to zero. It is by providing custom loading routines and tinkering with the sector id that software houses prevent convenient disk access and copying.

Soft sector

Let us now consider how the sectors on any track should be logically numbered. That is, the values we should give to the logical sector numbers in the sector id. In a simple case they may be as in Figure 1.

Imagine we wish to read data from track zero. The disk drive head needs to be positioned over this track before a read can take place; this occurs automatically. If the data resides on more than one track we need to continue the read on the next track. Again the head is automatically positioned over the appropriate track. While this repositioning is taking place however the disk is rotating at about 300 rpm. Therefore having just read from track zero sector nine we need to resume the read at track one sector zero.

If the sectors are arranged as in Figure 1 then while the head is being brought over track one, since this does not happen instantaneously, sectors 9,0,1 and 2 (and perhaps a few others) of track one have rotated out of the way. We now have to wait almost a complete revolution before sector zero is beneath the disk head and the read can continue.

Staggering

Alternatively if we arrange the logical sector numbers to be staggered as in Figure 2, in the time taken to move the head over the new track sectors 6,7,8 and 9 of track one have disappeared and as the head arrives over track one sector 0 is just coming into view. Which saves us having to sit and watch sectors we are not interested in.

A sector stagger of three as in Figure 2 is the DFS standard and is a compromise between speed and reliability. Older type disk drives cannot operate as fast as the newer half-height drives and a too finely tuned sector stagger can actually result in worse performance on some drives!



It should be noted that it is not only the mechanism of the disk drive that affects performance. The DFS uses default timing parameters (arranged such that operation is geared for the slowest expected drive) but can be changed using *FX 255. (See Disk Instructions page 4).

Experiment

The program on this month's Disk

Track	Logical sector number									
00	00	01	02	03	04	05	06	07	08	09
01	07	08	09	00	01	02	03	04	05	06

Figure 2 (Sector stagger = 3).

User will format a disk with a variable sector stagger. It is a compact machine code utility which resides in pages &09 and &0A, will not corrupt any memory other than &02F0 - &02FF (which is used to build OSWORD control blocks), and is TUBE compatible.

Syntax: *FORMAT
 <drive>
 <tracks>
 (<skew>)



If you have a formatter already lodged in your machine the command *FORMAT may well clash so use */FORMAT instead. The first two arguments expected by the routine are self explanatory. The third argument (<skew>) is optional and if omitted a default sector stagger of three will be assumed.

FORMAT expects decimal arguments and is extensively error trapped. Following formatting the first two sectors of track zero are written with the catalogue information which consists of the number of tracks on the disk. Pressing <ESCAPE> will abort formatting possibly leaving the catalogue unwritten.

You will have to investigate the optimum skew for your particular disk drive. Current slimline drives are perfectly happy with a stagger of one if preceded by *FX 255,0,207 (the fastest DFS setting). 80 track drives will benefit most; as the tracks are physically closer together the head can be positioned quicker than with 40 track drives, though both types show improvements.

MENU PAGE TWO. OPTION TWO.

Mark de Weger

*CLOSE command

Alternative DFSs to Acorn's own have featured the *CLOSE command and in the Master 128 Acorn themselves included it in the list of routines. *CLOSE is simply the disk filing equivalent of the BASIC filing command CLOSE#0. It closes down all files open in the current filing system. On the Master 128 there is also a *SHUT command which closes down files on all filing systems.

Sometimes a text file or BOOT file can be left open and you are unable to access it for further editing. This is because the codes which flag the end of the file have not been inserted. *CLOSE tidies things up, transferring any data left in buffers to the file and adjusting file lengths accordingly.

*CLOSE does this by calling the operating system routine OSFIND with A=0 and Y=0 (see lines 130 and 140 of the routine).

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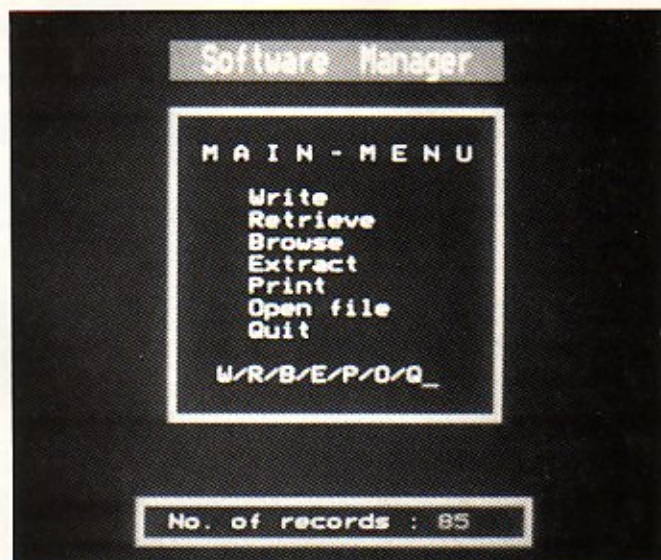
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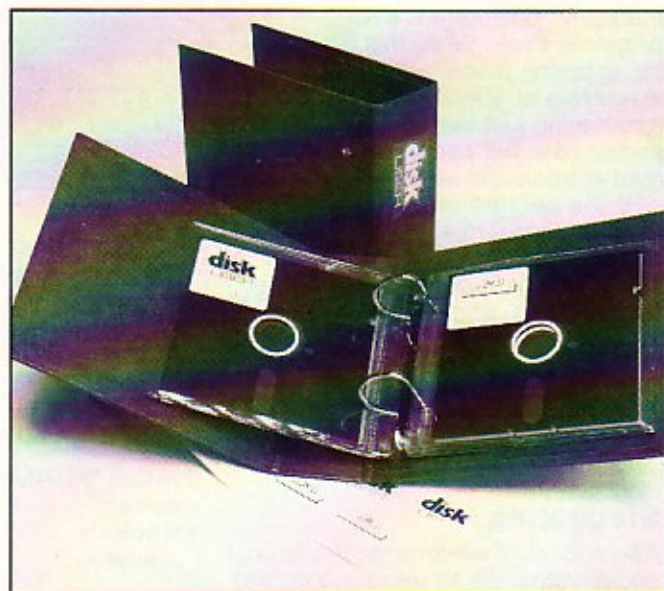
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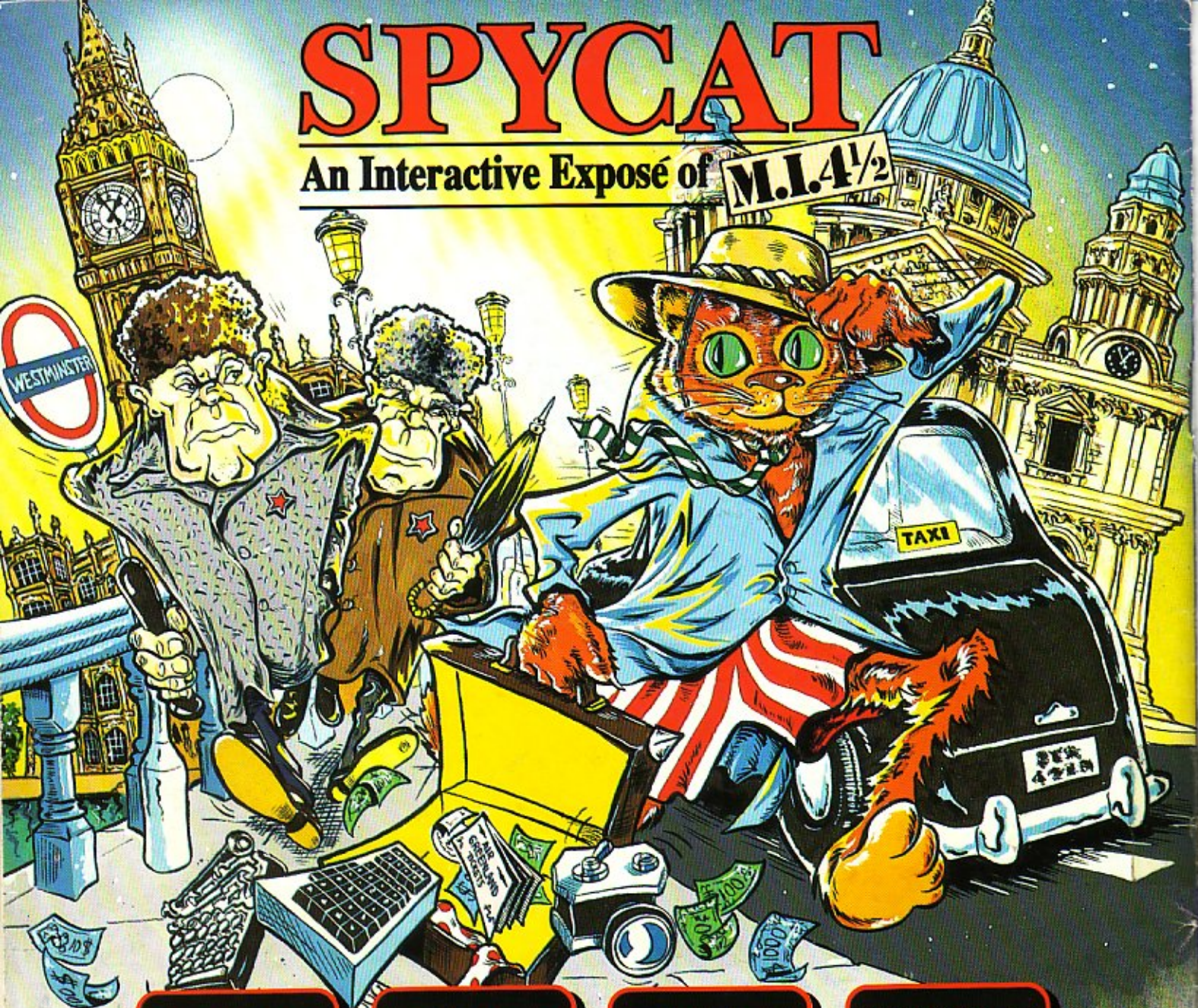


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