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disk USER

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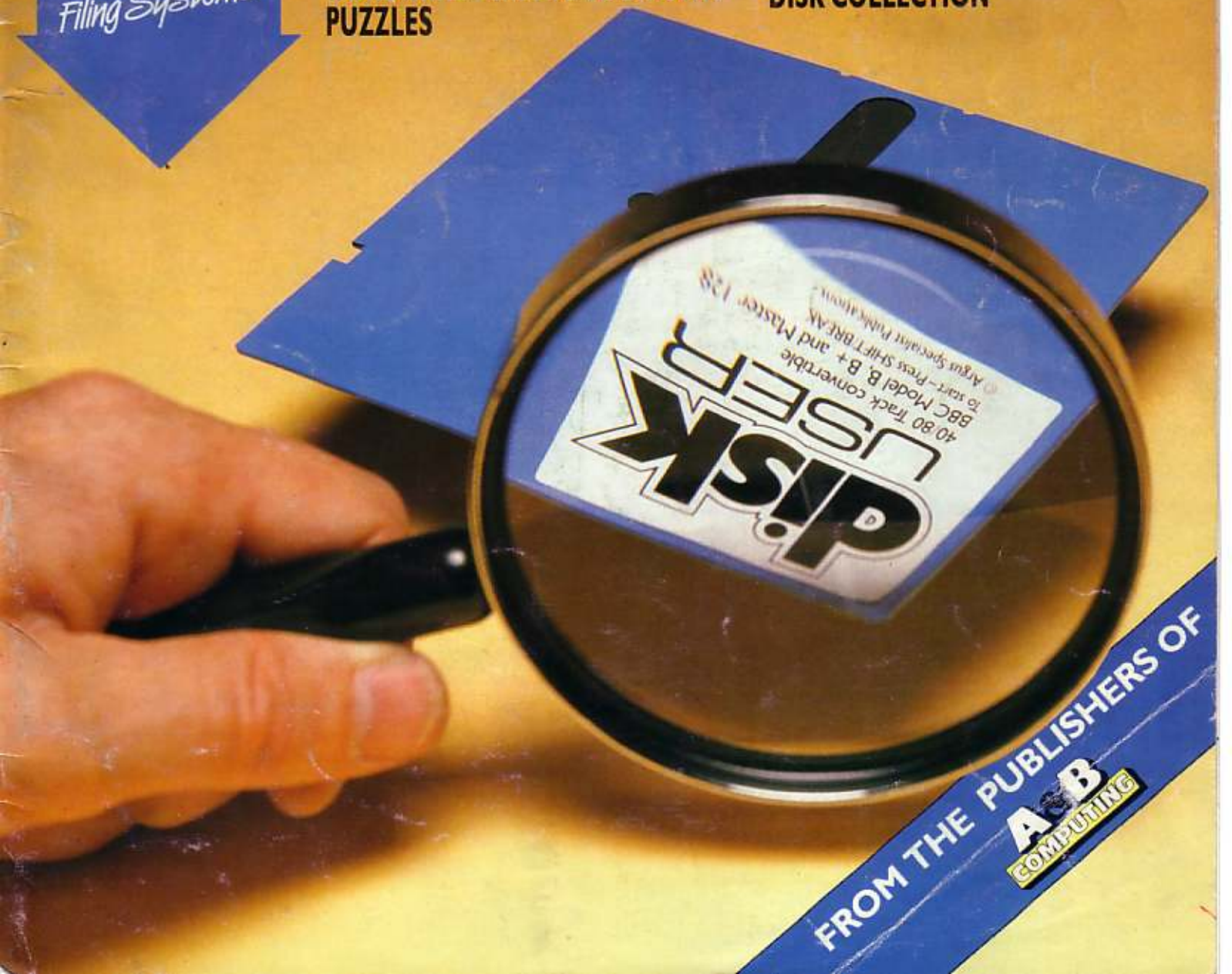

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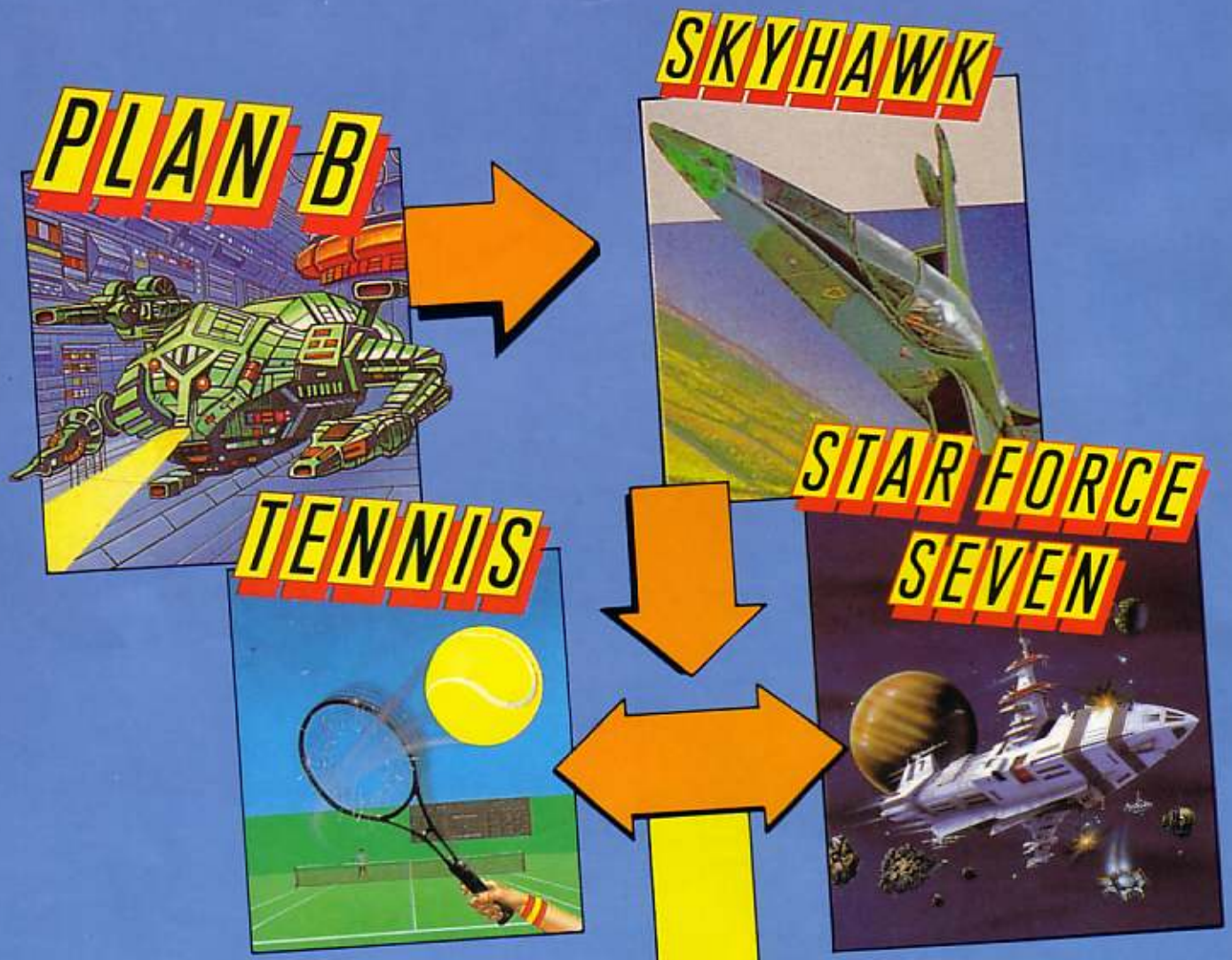

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disk USER

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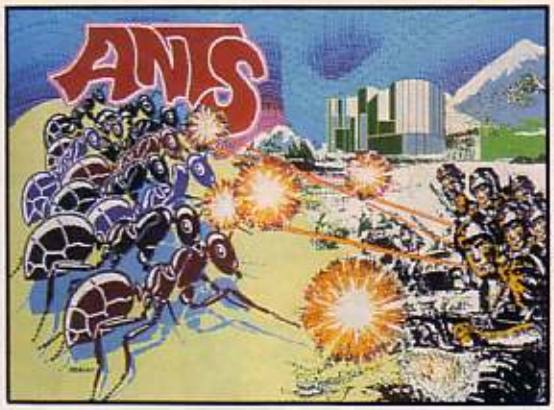

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**Disk User is supplied on a 40 track disk format and can be run without conversion on a 40 track drive.
If you have 40/80 switchable drives then make sure the drive is switched to the 40 option.
For 80 track only drive owners, a conversion program is provided – see Disk Instructions**

IN THE MAGAZINE

DISK DOCUMENTATION

DISK INSTRUCTION

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, called CHANGE.

Conversion for 80 track drives

CHANGE is suitable for Acorn DFS on a Model B, B+ and Master Series. If you have a filing system which allows double stepping to read 40 track disks in 80 track drives then use your system's own command. As a general rule, built-in 40 to 80 convertors should be used where available. Note that all programs in Disk User magazine which need to write to disk (see below) should be copied to another disk before use. Therefore copy to a 80 track disk.

The conversion program, CHANGE, is provided for those with 80 track disk drives and no conversion or double stepping facility in their DFS.

Disk User's *CHANGE (Acorn DFS)

The standard Acorn DFS has no double stepping mode. A program called CHANGE is therefore supplied on Disk User.

If you have a 40/80 switchable disk drive then make sure it is switched to 80 track before conversion. Insert Disk User and type:

*CHANGE and hit the <RETURN> key

The program will prompt you to insert source disk (Disk User) and destination disk (new blank formatted 80 track disk).

40/80 switchable drives

If you have two switchable drives then you can use the 40 track setting on drive 0 and the 80 track setting on drive 1. Insert Disk User in drive 0 and a blank formatted 80 track disk in drive 1. Type

*COPY 0 1 *.* and hit the <RETURN> key

Set the boot option on drive one by typing *DRIVE 1 and hit <RETURN> *OPT 4 3 and hit <RETURN>

Acorn 1770 DFS

Depending on the version of the DFS, there may be a *DRIVE 0 40 command to double step in a 80 track drive. If this *DRIVE (40) (80) command is not present when a *HELP is issued then use the CHANGE utility supplied on Disk User. Full instructions for CHANGE can be found in the documentation and program description in these instructions.

Master 128/B+ 128

This Acorn DFS has a software double stepping mode for a 80 track drive. Set it with the command

*DRIVE 0 40 <RETURN> 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. All programs in Disk User magazine which need to write to disk should be copied to another disk before use. Therefore copy to a 80 track disk. Alternatively you may use the CONVERT command available on the Master 128 (some machines). Insert Disk User in drive 0 and type: *CONVERT and hit <RETURN> Further prompts/instructions will appear on screen before converting the disk to 80 track. If possible use a backup copy of Disk User for conversion purposes.

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.

Opus DDOS/Challenger 3

If you are using the Opus DDOS disk filing system or Challenger 1.0/DDOS then issue the command

*4080 and hit the <RETURN> key

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 and hit the <RETURN> key

to achieve the same result. Disk User will work effectively from the RAM disk. Use

*COPY 0 4 *.* *CONFIG 4=0 *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 and hit the <RETURN> key

Disk User will then work without any need for conversion.

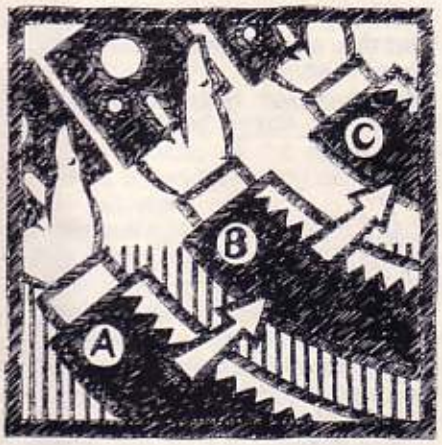
Watford DFS

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

Converting DFS to ADFS on a double disk drive system

(If you have 80 track drives then first use CONVERT or CHANGE to convert your copy of Disk User to 80 tracks).

We have done our best to make Disk User available to a wide range of BBC disk drive owners. Before booting Disk User see below for full instructions for your system. All programs work on BASIC 1 except the Word Perfect demonstration.



Place a blank, formatted ADFS disk (small, medium or large as suits your drives) in drive 1 of your system and type

*DIR :1 and hit the <RETURN> key
*CDIR P and hit the <RETURN> key
*CDIR A and hit the <RETURN> key
*CDIR B and hit the <RETURN> key
*CDIR C and hit the <RETURN> key
*DIR :0 and hit the <RETURN> key

Place your ADFS utility disk in drive 0 and boot it. Choose the COPYFILES option.

Once loaded, remove the utility disk and place your copy of Disk User in drive 0.

Source filing system is DFS
Destination filing system is ADFS
Source drive is 0 Destination drive is 1
Source directories are $, P, B, C and A
Destination directories are $, P, B, C and A
Select List mode and type in *.* for each directory you copy
You will have to repeat the process for each directory
It may be possible to use a utility such as Advanced Disk Toolkit to make the transfer for you.

Bear in mind that Disk User is designed for DFS systems only. BASIC and machine code programs will run from ADFS disks but DFS based utilities may not run successfully.

Disk failure

If for any reason your copy of Disk User will not work on your system then re-read the instructions given specifically for the software and the general instructions above.

If you still experience problems then:

1 If you are a subscriber, return it to Disk User, Infonet, Times House, 179 The Marlowes, Hemel Hempstead
2 If you bought it from a newsagents, return it to Disk User, ASP, Number One Golden Square, London W1R 3AB.

You can make telephone enquiries about Disk User on 01 437 0626. Enquiries in writing will be dealt with as promptly as possible and replacement disks sent out immediately. 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.

Disk hints

Why not speed up your disk access speeds by either:
1 permanently changing the startup links in your computer or 2 issuing the software command *FX255,15 <RETURN>?

The former is available by taking off the lid and following instructions in your User Guide. The latter software effect lasts until <CTRL><BREAK> is pressed. This extra speed is only possible with the latest disk drives – the half-height and slimline drive types.

Disk User files

- 40 track to 80 track convertor
  author: Michael Spalter files:
  CHANGE machine code file. *RUN
- Disk User – Disk magazine title page animation
  author: Abbas files:
  P.RUNDISC BASIC file A.DISC machine code file
- Menu – What's in store this issue
  author: Matthew Fifield files:
  MENU BASIC file
- Collector's Items – Abbas' A to Z of animation
  author: Abbas files:
  P.RUNB BASIC file B.ALPHA machine code file P.RUNC BASIC file C.ALPHA machine code file
- Ants! – Destroy the mutant ants
  author: Ian Waugh files:
  LOADER BASIC file ANTCHAR BASIC file ANTS! BASIC file
- Expert Examiner – Search, edit and recover disk sectors
  author: Michael Spalter files:
  DISC BASIC file
- Autoindex Utilities – printer utilities and analysis
  author: Geoff Turner files:
  UTILS BASIC file
- Software Manager – software collection database
  author: Lawson B. Wakefield files:
  SoftMan BASIC file
- Wordbox – wordsearch puzzle generator
  author: J. Dewar files:
  WORDBOX BASIC file
- Selective Copy – copies files selected from catalogue
  author: Dov Rosner files:
  SELCOPY BASIC file scopy machine code file
  NOTE: This program does not work with the OPUS Challenger!
- Eye Catcher – eye catching logo displaying routine
  author: Margaret Stanger files:
  HEADER BASIC file
- Recover – recover BASIC and text files from corrupted disks
  author: David C. Reilly files:
  RECOVER BASIC file
- Disk Sector Display – Display any disk sector
  author: Michael Spalter files:
  PROGRM1 BASIC file
- Direct Disk Titler – Title disk by writing direct
  author: Micheal Spalter files:
  PROGRM2 BASIC file
- Disk Sector Editor – Edit any sector on the disk
  author: Michael Spalter files:
  DISCZAP BASIC file
- Rescue – Rescue *DELETED, *WIPED and *DESTROYED files
  author: James Slater files:
  RESCUE BASIC file
  WARNING!! DO NOT RUN THIS PROGRAM WITH DISK-USER DISK IN THE DRIVE
- Advertisements – Newly available software
  files:
  DEMO BASIC file DEMO1 compacted screen file WPFCT machine code file

Note that Disk User almost fills a 40 track disk. Any software that may need extra disk space to save information must be copied onto a blank disk, eg Software Manager, Recover and Wordbox.

DISCUSSION

Disk User Two already, and already massive interest from readers in this new concept. Many thanks for the thousands of surveys (literally!) you returned to us with all sorts of positive ideas which we will follow up as best and as quickly as we can.

Upgrade ROMs from Acorn

We mentioned "BASIC 2 and upwards" last issue. Sorry BASIC 1 owners, point taken and all the programs on DU Two will work on BASIC 1. It is undoubtedly an expensive exercise to upgrade to BASIC 2 at over £20.00 and,as some of you have pointed out, there is little difference from a programming point of view.

This set us wondering why BASIC 2 and the Graphics Extension ROM, as planned extensions to the BBC system, should not be a bit cheaper than other ROMs so that, having become a standard, software houses could confidently use their facilities.

According to your replies, Disk User One seems to have worked consistently across all the standard DFS filing systems. We are happy to hear from anyone who does encounter any idiosyncrasies. We can use these to build up a picture for all disk users. Acorn certainly got it right with their move onto the 1770 DFS because the price of an interface has remained reasonable which, with low drive prices, has contributed to the disk drive becoming the standard storage medium for the BBC Microcomputer.

Letters

Each issue of Disk User we are giving away five exclusive Disk User data disks to the most stimulating correspondence received.

Dear Sir

I think that it would be fair to say that the majority of Acorn computer users are now using disk drives. The continual slide in prices over the last few years must have tempted most to take the plunge. This rise in popularity has been fully supported by most software houses, with new releases (except budget software) being available on tape and several disk formats. Unfortunately, this rise has also been exploited by all such software houses, with disk versions usually having at least £2 added to the price.

When the disk suport first began, there were a few murmerings from the public about this surcharge, but these were quickly dismissed by the argument that disks were more expensive. Surely this argument has now become false. Over the last 18 months disk prices have tumbled, and that is just on small numbers, the savings must be far greater on the large quantities used by software houses.

I believe that the time has come for disk software surcharges to be reduced in line with disk prices. A surcharge of only 50 pence would be quite feasible. Perhaps the surcharge could be removed altogether.

Software piracy is bound to become the publisher's next defence argument, but with the new complicated protection systems, the amount of piracy will become insignificant.

I hope that the reaction of other readers can be brought to bear on the publishers of software so that they at least think of their customers a little more when pricing their products. Who knows, they might increase their sales, especially to those who have spent all their money on drives, only to find they can't afford the software.

Yours faithfully

Mark Lambert Tyne and Wear

Dear Sir

I would like to make a few points about software piracy.

*I have an Opus Challenger on which some disk software will not run owing to software protection, eg Firebird's Sentinel and A&B Computing's free XOR disk (*OPT8,0 does not work on my version 1.01) making it necessary to buy the tape version and transfer it to disk myself. (Some, but by no means all software houses are considerate enough to provide versions compatible with non-Acorn DFS although this is rarely clear from advertising anyway!) Vine Micros' Replay ROM provides the ideal way to perform the transfer without making it possible for me to make disk copies that will run on someone else's machine.*

Secondly, software houses charge anything up to£5 extra for a program on disk – using Replay can provide a considerable saving for those of us on a low budget. Incidentally, my Replay ROM (version 1.14 purchased February 1986) transferred Psycastria to disk without any problems after reference to a data sheet supplied by Vine Micros.

Finally, tape software can be copied and distributed easily by anyone with two tape recorders – I have found it necessary on several occasions (eg Psycastria) simply to produce a recording of high enough quality to be loadable!

Until protected disks will run on any DFS (surely this is possible!), are guaranteed for life (well done Audiogenic), and are available at reasonable cost there will be a demand for a product such as the excellent Replay ROM.

Yours faithfully

Dominic Moore Suffolk

PS I have no connection with Vine Micros other than being a customer!

The debate about price differentials between tape and disk will no doubt

continue, bringing howls of protest from the customers and carefully argued accounts of costs incurred, volumes sold and 'specialist' markets from the publishers.

There is no doubt that, with the evolution of software on the BBC Micro, helped and often inspired by the widespread use of disk storage, prices have gone up. This often reflects the new level of power available to the user and the extra effort put into development. These factors especially apply to specialist software, developed for low volume sales.

When a major games company sells a disk based game they have the advantages of scale but they also have duplication and packaging costs considerably higher than those associated with tape – still the truly mass produced medium for software.

True, prices are coming down. So how can companies give value for money to disk users? Answer: they can use the medium to full effect with added extras like maze creators, printer dumps and, why not trailers for the next release?

On the subject of piracy, there are now many ways of protecting the software publisher's investment. Companies such as Rainbird provide a complete package of disk, instructions and novella. The protection works by demanding that the user type in a particular word from a particular line on a particular page of the novella in order to go on with the game. How many people have a photocopier in their front room or are prepared to copy a complete book? Perhaps the BBC market will see something akin to this protection in future, and undoubtedly at a price!

I'm sure you have your own ideas of what could be done to improve the value of disk based software and have views on software piracy. Drop us a line and we will air those opinions to fellow disk users.

Dear Sir
I have a few comments to make on the first issue of Disk User, but first I must state my approval for this publication. It is a welcome development since the demise of Model B Computing in 1985, which also had my full backing. The format of magazine and disk at a reasonable price certainly appears to be a recipe for success. My own preference is for a magazine that be read as time permits, but coupled with having all the programs quickly in the machine makes for a definite must buy.

There are a couple of points about this issue that I wish to highlight. The Automatic Disk Catalogue program appears to have been compacted by an excellent utility which I hope will be reported on in a future issue of Disk User. This has, however, rendered all references in the accompanying article somewhat obscure. I have identified the following changes and would be obliged if you could confirm the alterations:

line	variable
420	max%
430	dfs%
460	record%

new line	new variable
320	e%
320	f%
450	h%

My other point concerns the Cube of Zoth and the early versions of the Watford DFS. Version 1.3 which I have installed in the heart of my BBC, and other such versions have a bug which prevents the use of the standard Acorn maximum for open Disk files, and returns the message Bad Sum. The cure is to use another DFS (I used STL's excelent STL0e00) or get an upgrade from Watford. I hope that you do not get many returns due to this fault, indeed you are probably already aware of this problem, but this is only the second time that I have encountered this bug. Just another drop of incompatibility in an ocean of mismatch.

Overall, I feel that the balance of this publication hits a happy medium between utilities, information and games and I wish you every success for the future.

Looking forward to the next issue,
Yours faithfully
Malcolm A Gant Dundee

Thanks for your positive comments Mr Gant and how right you are about the Automatic Disk Catalogue program. In our efforts to get everything we possibly could onto Disk User we shortened some variable names we shoudn't have shortened. In these cases the documentation did not correspond with the listing. I can confirm your findings for lines 420, 430 and 460.

As to your other comments, there is no doubt that, despite testing on a large number of disk filing systems, the 'ocean of mismatch', as you aptly put it, will catch us out now and again. We must however thank software companies in the BBC Microcomputer field who supply disk filing systems for their help in ensuring Disk User works with their products.

Thanks also to all those who returned our survey. Your opinions about Disk User (all your opinions!) will be a great help in developing the winning formula for all users. We are aware of many exciting possibilities created by the combination of disk and print and we will be doing our utmost to make them realities in Disk User over the next few months. We have truly interactive tutorials, data compression and flippy disks all on our agenda. Watch this space!

Dov Rosner

SELECTIVE COPY

Selective copying is a facility we always need but is missing from our Disk Filing Systems. Disk User fills the gap

When copying files from disk to disk you can use the wildcards

* – instead of a group of letters
# – to replace a single letter

The wildcards allow you to specify more than one filename. Suppose, for instance the files that you want to copy have similar letters. BERT1, BERT2 and BERT3 can be copied using

COPY 0 0 BERT

The problem begins when a general file specification covers files that are not to be copied, for instance in the above example a filename such as BERTha. Or more seriously when you wish to copy a random selection of files that cannot be specified in one *COPY using wildcards. Typing a separate command for each filename can be boring and time consuming.

The routine implemented in this article is very similar to the *WIPE command. When called, it will ask for source and destination drives. You have to key in a number between 0 and 3. Remember that you are restricted by the facilities of your DFS. On the Acorn DFS, if the source drive is 0 and destination drive is 2 (or vice versa) the DFS will assume that you are copying on the same disk.This rule also applies when using this selective copy program.

Scanning files

The program will read from disk all of the files in the current directory and display them one by one on screen. If you want a specified file to be copied, press Y (or y), otherwise press N (or n) and the file will not be copied.

When the files are all scanned, the program will issue a *COPY for each file to the MOS.

The method used to read the files is by the operating system call OSGBPB (Operating System Get Byte Put Byte) with the accumulator set to 8. This is documented in the (BBC) Advanced User Guide page 339. In general, this routine reads a specified number of filenames from the current directory. The user has to specify a control block (cblk) of 13 locations that contain

- the file handle (byte 0)
- the address of a return block (rblk) in which the filename will be transferred (bytes 1-4)
- the number of filenames to be transferred (bytes 5-8) – in our case one file each time
- the last 4 bytes contain a pointer value for transfers. This pointer is set before the first file is read to 0 and is updated automatically by the MOS routine to point to the next filename.

Finally, OSGBPB is called with the X and Y registers pointing to the LSB and MSB of the control block (lines 430-470).

On exit, byte 0 of the return block contains the length of the filename and is followed by the filename itself. If there are no more filenames to read, byte 5 of the control block is not reset to 0, otherwise 0 will be stored there. the program reads this location and exits if applicable (lines 480-500).

The rest of the program is easy to follow and has a lot of REM statements to help.

Because the program uses documented OS calls to read the filename and does not read the catalogue directly, it is compatible with any DFS that is compatible with the Acorn DFS. It was tested with the Solidisk DFS in double density mode and coped with its unlimited catalogue entries system successfully.

Program on Disk

There are two programs on disk for Selective Copy. The first is SELCOPY. This is the source file, written in BASIC and assembler. This is the form in which the author wrote the program and is the listing to which you should refer while reading the explanation above. The second is SCOPY, the object code. Object code is a set of machine code instructions generated by the source listing. To execute the utility you have to type

***RUN SCOPY**

or just

***SCOPY**

If you were to load and run SELCOPY it would save the assembled machine code under the same filename, SCOPY.

Finally, I'll give you a challenge: try to modify the routine to read ALL the filenames in the disk and not only the ones in the current directory. You should write a loop to go through the characters that are permitted by the DFS, issue a *DIR and execute the code in lines 390-900 (with some modifications) to read the files in the chosen directory. Good luck!

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Dave Reeder

FLOPPY

If we are honest with ourselves, then I suppose that most of us bought disk drives so that the tiresome wait for our favourite games to load would vanish.

After all, one of the main delights of !BOOTing is the extra time it gives to zap a few aliens or solve another couple of puzzles!

Well, this column understands. After nearly a year providing exclusives, mega-reviews and bundles of tips for readers of *A&B Computing* in The Arcade, I'm delighted to have a little more space in *Disk User* to concentrate on games on disk – reviews, surveys, tips, pokes and the rest.

It may take a couple of issues to get the mixture right but, if the experience of The Arcade is anything to go by, I will soon be deluged by your comments and tips!

An essential disk collection

For my first column it makes sense, I think, to provide you with a list of games that are either essential for disk players' libraries or use the easy access of disks to great advantage.

First up has to be *Elite,* of course. Originally released by Acornsoft as the first really major game for the BBC (exciting packaging complete with novel, playing booklet, poster, function key strip, etc), it was instantly acclaimed as the game for the machine and, uniquely I think, has since been converted over to all the other popular machines.

The game is a splendid mixture of strategy and arcade skills – you must trade across the universe accumulating credits and equipment whilst coping with the ubiquitous docking procedure and space fights with other ships. Progress through a number of classes (Harmless up to Elite) encouraged the cult feeling and the game really stretched the player as it progressed – sudden opportunities to volunteer for special missions, and so on.

How anyone ever managed to play the game on tape is a mystery to me! Disk users notice an almost constant disk access to load in details of planets and space sectors, etc and the ability to save and reload game positions makes a disk version essential.

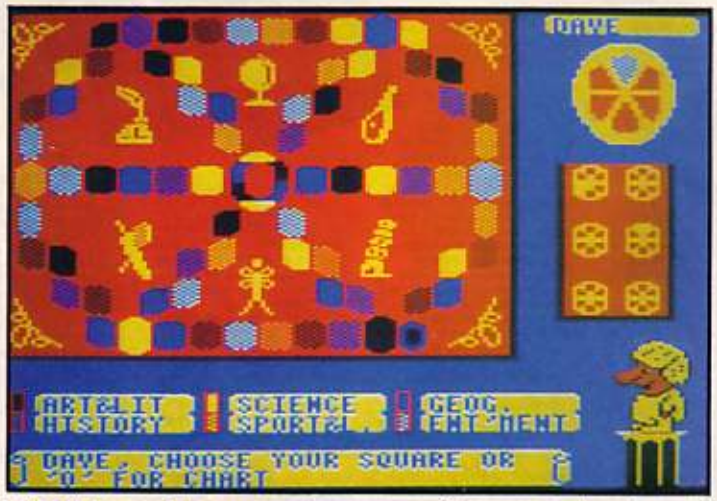
Rereleased last year by Superior with a rather cut down package of goodies, it should be in everybody's collection.

After *Elite* other games become a little harder to sort out into a desirability order but I think I would put *Revs/Revs 4 Track* next.

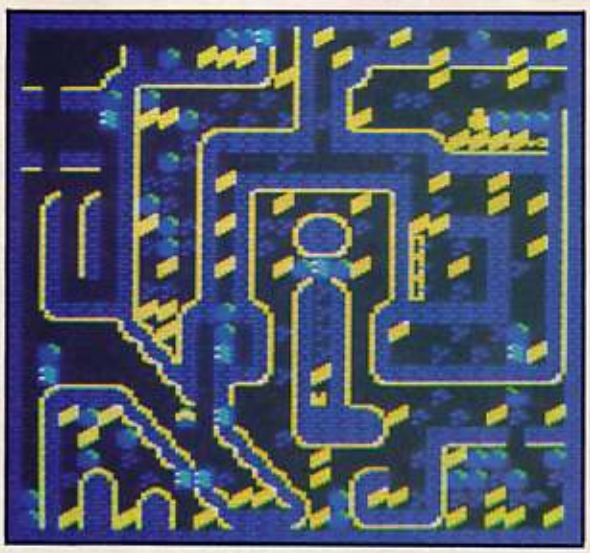
Again Acornsoft releases (now available on one disk from Superior), these games introduced an element to sports simulations noticeably lacking in other games – realism! Once more a chunky booklet became essential reading before !BOOTing the game as knowledge of the Formula One car's capabilities and the circuits' peculiarities was the only path to victory.

The opportunity to preset wing settings on the car (thus affecting its performance on corners) allows you to trim the car to suit your own style and the game plays very realistically even though the graphics are, of necessity, a little basic. The choice of five tracks to race around widens the appeal of the game and, once again, instant disk access allows you to get on with playing.

A recent addition to the essential collection is Firebird's *Cholo,* hailed by many as the new *Elite.* The game involves a search through a ruined cityscape of the future to discover a way of releasing humans trapped



Trivial Pursuit has proved a successful conversion from the board game



The Repton screen designer ensures that the cult goes on

FUN!

The first of a regular column for games players who would rather !BOOT from disk than CHAIN from tape

beneath the surface. All control is through a series of robots which can be accessed, taken over and whose knowledge can be transferred to other robots.

Although the vector line graphics can be a little confusing at times, the game is very complex and, even when solved, offers a great deal of pleasure. The disk in my drive whirrs constantly as new areas are entered and new robots are encountered, though I never seem to remember that I should be saving game positions frequently.

A good sign of a game's appeal to

me is whether it can be played with enjoyment from !BOOTing – I can always return to the packaging later and find out what I should be doing! *Cholo* passes that test and, judging by the number of solutions and tips I've been sent, it also passes the critical judgment of a great many A&B readers.

Disk users feeling a little more intellectual should, naturally, have a copy of Domark's computer conversion of *Trivial Pursuit*. Allowing for the difficulty of converting a board game to computer format, this is excellent and the massive database of questions (since enlarged by both the *Baby Boomer* and *Young Persons* sets) demands disks to make the game fast enough to retain your interest.

And where would we be without a mention of Superior's classic character *Repton* in any kind of

Repton - loveable character, difficult challenge

listing? All four *Repton* collections are available on disk and, of the three I've seen so far, I would pick *Repton 3* for a place in your collection.

(As if you didn't know), the game involves controlling a lizard character around a number of screens collecting diamonds and crowns, whilst avoiding monsters, falling boulders or being trapped in an inescapable position. This third version includes a character and screen designer which is both easy to use and suggests a disk drive is essential.

Another new release that saves to disk is Micro Power's *Imogen*, an arcade adventure with the added novelty of icons controlling character choice, password entry and disk access. Condemned by some as too easy to solve, I think its interesting graphics and unusual gameplay make it worthy of consideration in any collection.

Introduced to many by a free demo disk with January 87's A&B, Logotron's *Xor* has recently been joined by the *Xor Construction Set*. Amusing maze puzzles like this seem to have caught people's imagination and, once again, disk access is called for.

Although none of their games, except *The Big KO* with its design element, demand disk access, Tynesoft are to be commended for introducing the idea of reasonably priced disks – a couple of pounds more than the tape versions. This is how life should be, of course, as there is no apparent reason apart from greed that suggests a pricing level of £12 to£14 as appropriate.

What else? Well, for value, you ought to look at collections from Audiogenic, the *Superior Collections* and the *Micro Power Magic* compilations. Sadly some companies do not release on disk and thus classics from Ultimate and Aardvark, very playable games from US Gold, Ocean and Imagine as well as many budget games will mean that you'll have to hang on to that cassette player for a while yet!

Cheaper games

Disk pricing levels are in a wilder state of flux this year than ever before! Just as we'd got used to be surcharged considerably for disk versions of games (although when a package offers lots of extras likes maps, booklets and so it does seem a little more reasonable), a flood of budget disk games software approaches.

Of course, Tynesoft have for a long time priced their disks at about£9 but with Superior now releasing *Around the World in 40 Screens* at£7.95 it looks as if the pricing floodgates are about to shatter.

Bug-Byte, for instance, have agonised long and hard at the right level for their proposed disk *Bug-Byte Compilation*, containing four games. They've settled on£7.95 which, if my calculator doesn't deceive me, is a saving of 1p over four tapes at budget level£1.99.

Players have released a two-game *Zap-Pack* for£4.95, Audiogenic are planning hard for a budget disk label releasing from the Autumn and so on.

Great news for us, of course, but

will this multiplicity of prices and formats confuse the poor old retailers even more? I suspect that this all marks yet another retreat of BBC software from the High Street shops back into the ghetto of mail order.

Still, if you can't see the games in the shops then you'll have to read my column to discover what they're like and software companies will have to advertise more, thus strengthening the magazine market!

Tip Time

Each issue I'll be providing you with a range of tips and hints, pokes and cheats for disk versions of games, together (starting next issue) with some general hints about how you can start working out your own pokes.

Of course, software companies get worried by disk versions, especially when users start messing around with ROM utilities allowing access to disks byte by byte. All pokes, etc in this column are intended for your own use, NOT to allow you to start life as a pirate!

We start with a couple of useful cheats from Michael Mooney from Bolton to give immortality in *Stryker's Run* and infinite lives in *GalaForce*. Note that you should not save these listings on your original games disks!

Type in listing 1 and then RUN it when *Stryker's Run* disk is in the drive.

Type in listing 2 and save it. Set PAGE=&1200 and load cheat. RUN it when *GalaForce* disk is in drive.

XOR - a true original

XOR demo for the price of a disk

XOR is the game which was exclusively previewed by giving away demo copies to all the readers of the February issue of *A&B Computing*. It caused a real stir and massive interest in XOR and now XOR Designer is still being generated.

For the benefit of *Disk User* readers who missed the demo, Logotron are making copies available mail order for those who want to give the game a try. A demonstration copy costs £1.50 (which covers media, postage and packing) and entitles the owner to a full copy of XOR for£9.95, discounted from£12.95. Make postal orders or cheques payable to Logotron and send them along in an envelope marked 'XOR demo offer' to Logotron, Dales Brewery, Gwydir Street, Cambridge, CB1 2LJ ☎0223 323656

♦LISTING 1♦

```
   10REM GALAFORCE CHEAT
   20REM BY MICHAEL MOONEY
   30REM
   40REM CHECK PAGE=&1200
   50REM BEFORE RUNNING
   60*KEY 0 PAGE=&1900 |M OLD
|M 210 CALL&1100 |M RUN |M
   70FORA=&1100 TO &1122:READB
:?A=B:NEXT
   80*LOAD"GFORCE"
   90*FX138,0,128
  100DATA162,28,160,17,32,247,
255
  110DATA169,20,141,250,9,169,
17
  120DATA141,251,9,76,112,9,16
9
  130DATA173,141,155,28,76,0,6
4
  140DATA76,46,71,65,77,69,13
```

♦LISTING 2♦

```
   10REM STRYKER'S RUN CHEAT
   20REM  BY MICHAEL MOONEY
   30*DIR S
   40MODE7
   50FORA=&900 TO &951:READB:?
A=B:NEXT
   60CALL&900
   70DATA162,75,160,9,32,247,2
55
   80DATA169,42,141,250,9,169,
9,141
   90DATA251,9,162,66,160,9,32
,247,255
  100DATA169,32,141,202,30,169
,112,141
  110DATA203,30,169,9,141,204,
30
  120DATA76,113,30,169,169,141
,223,41
  130DATA141,240,43,141,139,40
,169
  140DATA141,241,43,169,208,14
1,225,41
  150DATA76,111,87,76,46,115,1
01
  160DATA116,115,99,114,13,76,
46
  170DATA103,97,109,101,13
  180DATA77,73,67,72,65,69,76,
32
  190DATA77,79,79,78,69,89,32,
79,75,33
```

That's all folks!

Join me again next month for another column dedicated to the best in disk gaming.

Send in any disk cheats you may have or just write to me with your thoughts on the future of disk games, pricing policies, etc to:

Dave Reeder
Floppy Fun
Disk User
ASP Ltd
1 Golden Square
London W1R 3AB

WORD PERFECT INSTRUCTIONS

Included on the disk is an almost complete copy of this marvellous little program — it will do everything except print or save. To try it out type ***RUN WPFCT** — when the prompt **Length, Width** appears enter **66,80** (i.e. 66 lines per page, 80 characters per line) and press *RETURN*.

WORD PERFECT is really easy to use. Just type away as you would on a typewriter — but don't worry about what happens when you get to the end of a line, WORD PERFECT will automatically move the word you are typing onto the next line if it won't fit! Here's a list of some of the more important functions:

EDIT MODE

CTRL changes to Control Mode
f1 selects teletext mode
shift-f1 gives double-height characters
f2 selects 40 column display
shift-f2 selects 80 column display
DELETE deletes a character
shift-DELETE inserts a space
TAB moves to the next tab
shift-TAB moves to the previous tab
ESCAPE goes to top of the next page
shift-ESCAPE moves to the previous page
COPY switches underlining on

CONTROL MODE

shift-CTRL goes back to Edit Mode
[and] set left and right margins
C centres line, **shift-C** left justifies it
shift-f0 erases the text below the cursor
+ and **-** set and remove tabs
DELETE rebuilds the current paragraph
shift-DELETE inserts a blank line
Up and **down** insert/delete/move lines
W allows you to enter a 'search string'
F searches for the string
ESCAPE exits to BASIC
L loads text you have saved

Watch the top two lines of the screen. The second line shows margin and tab positions.

We hope you'll like WORD PERFECT. If you'd like to turn your free copy of the program into a fully working copy all you need to do is telephone 01-861 1166 and quote your Access or Barclaycard number - we'll tell you over the phone how to PRINT and SAVE your text. Alternatively send a cheque for £19.95 to:

SUPERSOFT, Winchester House, Canning Road, Wealdstone, Harrow HA3 7SJ

Either way we'll send you a complete copy including disk and comprehensive manual by First Class Post. WORD PERFECT is also available on tape, price £17.95.

SAVE £5 — ORDER BEFORE 30TH SEPTEMBER AND PAY JUST £14.95!

SWIFT - SOLUTIONS AT YOUR FINGERTIPS!

There are plenty of spreadsheets — but there's only one SWIFT! For just £29.95 you get a plug-in ROM that makes budgeting, forecasting, costing, quotations and all sorts of financial planning a piece of cake. SWIFT is powerful enough to be used in multi-national companies - and simple enough for use in the home.

Pop-up menus make it quick and easy to find your way round the program. Individually variable columns widths give you the flexibility that you need. And the enormous spreadsheet (A1 to Z126) gives you over 3000 cells.

There are lots of formatting options - negative numbers can be displayed with minus signs, brackets, or using Cr/Dr notation; zero values can be displayed or supressed; large numbers can be displayed with or without commas; you can use £, $ and % symbols. A 'split screen' facility allows you to see two different parts of the spreadsheet at one time - move from one to the other with a single keypress!

There are too many features to list here. To find out about sorting, lookup tables and the rest you'll just have to wait to read the comprehensive but comprehensible manual.

SPECIAL EDITION FOR DISK USER READERS!
Normally the four example application templates that come with Swift are supplied on tape. However, for readers of Disk User we have produced a special edition with the templates on disk (40 track). Please remember to quote Disk User when ordering.

To order using your Access or Barclaycard phone 0734 303663, or write to:

Audiogenic Software Ltd.

Unit 12, Chiltern Enterprise Park, Station Road, Theale, Berkshire RG7 4AA

STOP PRESS: MASTER VERSION NOW AVAILABLE — £24.95 ON DISK

Geoff Turner

AUTOMATIC DISK CATALOGUE UTILITIES

Enhancements to your disk catalogue

I hope by now that you have got your Disk Catalogue (published in Disk User number one) up and running, and that you now have a complete catalogue of your disk collection. Now we are going to add some utilities to the datafile, so that you may access the catalogue and interpret the data in several different ways. The utilities are mainly designed for use with a printer, but nevertheless if you don't have a printer, you may still find some sections of the program quite useful.

The program follows the same format as the original catalogue program. Once again, there are some variables which you may need to change to suit your particular system. The variable 'record%' at line 380 should be amended to the number of disks stored in your catalogue, whilst 'max%' at line 360 needs to be 800 for an 80 track disk system.

If you are using dual catalogue disks such as that created by the Watford DFS, then 'dfs%' at line 370 must be changed to a value of 2. It is important that all these variables are set to the same values as in your original catalogue program.

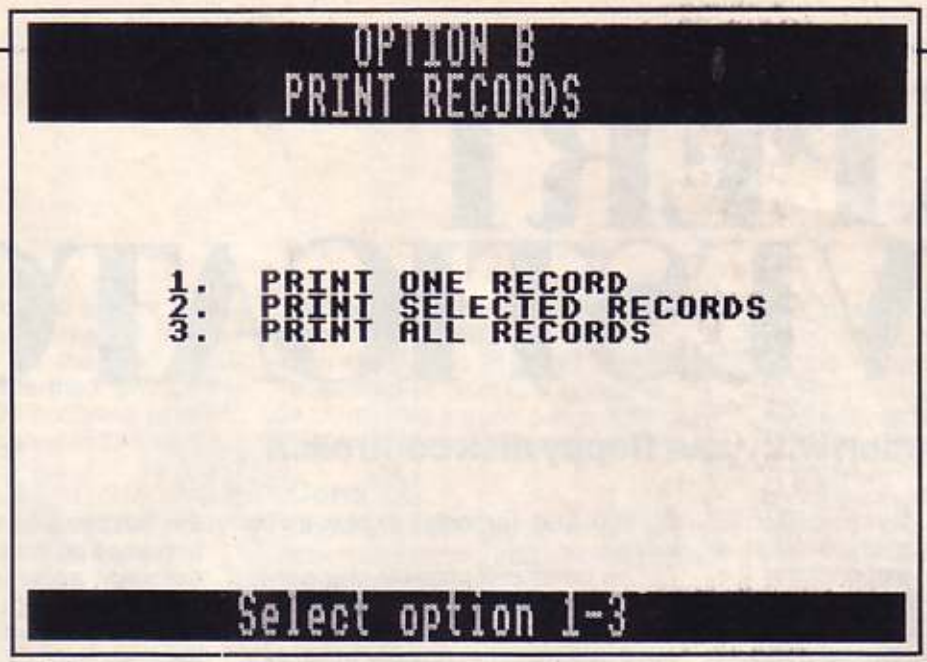
There are four utilities provided by this program, and these are selected from the menu which is presented at start up. There is a reminder on the menu screen to switch on your printer before selecting from the menu. You should also set the 'top of form' on the printer before switching on.

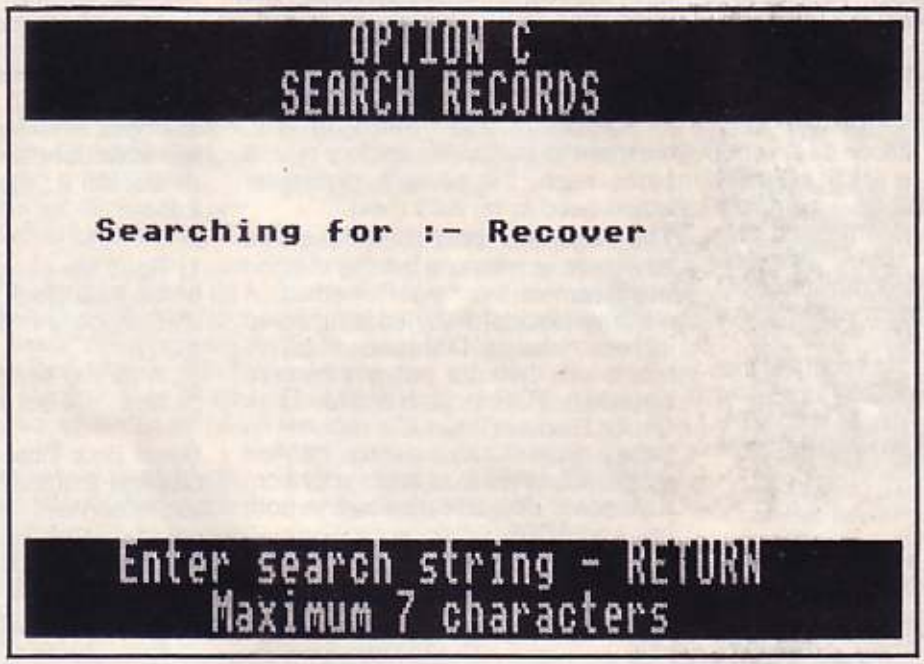
Option A from the menu analyses all the records in the catalogue, and prints out a list containing the basic data from the records, including disk number, number of files, amount of space and of course the disk title. This represents a summary of all your disks, without printing the actual filenames. The analysis also informs you how many records you have stored in the catalogue.

Option B produces printout of all the data stored against each record, including all the filenames. This allows you to keep a complete printed record of the disk catalogue. It's possible to print out a choice of any single record, a selection of records, or all the records stored on the disk. If opting for a selection, then you must enter start and stop record numbers. The program will then print out all records between these numbers.

If using 31 file catalogues, the printout is designed to fit three records on one sheet of paper and a form feed is issued after every three records. It is important therefore to correctly set 'top of form' when using this facility. However when using 62 file catalogues, a form feed is issued after every record.

I have avoided using any specific





printer codes in the printout routines, as these vary on different printers. The printouts are therefore produced in standard 80 column print. Of course you may like to amend the routines in order to produce a more customised printout using facilities which may be available on your machine.

Option C is a search facility which allows you to search the disk catalogue for any given text string. It is possible therefore to search for any filename or disk title using this option. The search uses the INSTR facility. This means that any string you enter as a search string will result in a comparison being found if the string is found to be contained in any filename or title.

Suppose that you enter the name FRED as a search string. This would be recognised in all the following words. FRED, FREDA, ALFRED, WILFRED, WINIFRED etc. All comparisons found, are displayed on the screen and also sent to the printer. The screen display contains a scrolling window, so that the last half dozen or so comparisons may be seen.

The final option, D, is used to find space on your disks. Assuming that you wish to save a program which is 20 sectors long, then you need to enter 20 as the search value. The program will then find all disks which contain at least 20 free sectors, thus allowing you to find the most suitable disk for your program. Incidentally, if you are not sure how to find the number of sectors required for your program, enter the command:

PRINT (TOP-PAGE)/256

This calculates your program length and divides by 256 to give the number of sectors required.

Finally, if you don't have a printer and you still wish to make use of the program, then you will need to remove all reference to VDU2 and VDU3 in the listing. All output will now be sent to the screen, but some changes will inevitably need to be made to tidy up the screen displays.

List of procedures

message Displays screen messages
menu Displays menu
Initialise Initialise variables
analysis analyses records stored
delay Delay routine
print Print records selection
one Prints one record
select Prints selection of records
all Prints all records
retrieve Retrieves a record from catalogue for printing
feed Form feed
search Searches for filenames
found Displays comparisons
space Searches for space
found2 Displays space found

List of main variables

m$ Teletext control codes
files$(64) Filenames
totalnames% Total filenames per disk
flag% Disk in use flag
max% Maximum number of sectors
dfs% Type of DFS in use
record% Number of records stored
count% Printed records per page

M Spalter

EXPERT INVESTIGATOR

Direct interaction with your floppy disk controller!

Your Disk Filing System (DFS) comprises two main chips (plus a number of minor components): the floppy disk controller (FDC) and the disk filing system (DFS). The former is the hardware chip which actually moves the disk drive motors and the latter is the software which tells the FDC what to do and takes instructions from the user.

Disk filing systems are very sophisticated and allow easy data retrieval. However, a DFS will only allow you to load and save complete files, so if you want to write your own utilities to "doctor" disks, then you need to be able to program the FDC directly to enable it to do exactly what you want.

Although there is no facility within BASIC to allow us to do this, there is an OSWORD call within the DFS software which will pass commands directly to the FDC.

OSWORD &7F

When the operating system receives a an OSWORD &7F instruction, it relays it to the DFS for interpretation. The two most common functions of OSWORD &7F are reading and writing single sectors but there are many other functions such as format and verify. The instructions for the FDC must be stored as a block somewhere in memory. OSWORD is entered at &FFF1 with the accumulator set to &7F and the X and Y registers pointing to the data block. The accumulator and the X and Y registers can be set from BASIC by setting the resident integers A%, X% and Y% respectively. There are seven parameters in the OSWORD control block. They must always be in the same order and are as follows:

1) Drive number to be acted upon (0- 3)
2) 4 bytes indicating where the transferred data is to be put or taken from. If you are only loading one sector then page 12 (&C00-&CFF) can normally be used for storing sectors.
3) the number of other parameters required by the FDC (always 3 for read and write).
4) Either &4B for write or &53 for read.
5) The track containing the sectors.
6) The first (or only) sector to be loaded.
7) This parameter consists of one byte split into two nibbles (4 bits each); one indicating the size of the sector and the other indicating the number of sectors to be read (1-10). Sectors on all BBC disks are of 256 bytes long and as a track is 2560 bytes long, a maximum of 10 sectors can be loaded. The code for sectors of 256 bytes long is 2, therefore to load three sectors of 256 bytes each, the seventh parameter would need to be &23 (hex).

The parameter block can be stored anywhere in memory but the method used here is the "legal" method. A memory block of 10 bytes is reserved in memory using "DIM space 10". This block will then be put somewhere between TOP and HIMEM. Disk Sector Display (Disk User option 4 on page 2 of the menu) is a demonstration program and will load any sector from a standard disk and display it in both hex and ASCII.

On an Acorn DFS (and most others), the disk catalogue is held on the first two sectors of track zero: the filenames on sector zero and the load/ execution addresses and lengths on sector one. Figure 1 is the dump produced of a disk catalogue using the Disk Sector Display.

If we load a sector into memory, we can edit it and then save it back again. This is the basis of all "DZAP" routines found in utility ROMs. As an example, we will try to change the disk title which is held in the first eight bytes of sector 0. The procedure is as follows:

1) Read the sector (with parameter 4 of the data block set to &53).
2) Change the bytes from &C00 to &C07.
3) Write the sector back to disk (with parameter 4 set to &4B).

Direct Disk Titler (Disk User option 5 on page 2 of the menu) is this routine implemented. The load and save parameter blocks are identical for both read and write, except parameter 4.

Actually only the first eight bytes of

```
Track: 0
Sector: 0
44 49 53 4B 5F 55 53 45    DISK_USE
48 45 41 44 45 52 20 A4    HEADER..
57 4F 52 44 42 4F 58 A4    WORDBOX.
41 4E 54 43 48 41 52 A4    ANTCHAR.
41 4E 54 53 21 20 20 A4    ANTS!...
4C 4F 41 44 45 52 20 A4    LOADER..
21 42 4F 4F 54 20 20 A4    !BOOT...
52 55 4E 44 49 53 43 D0    RUNDISC.
44 45 4D 4F 31 20 20 A4    DEMO1...
44 45 4D 4F 20 20 20 A4    DEMO....
55 54 49 4C 53 20 20 A4    UTILS...
44 49 53 43 20 20 20 A4    DISC....
53 6F 66 74 4D 61 6E A4    SoftMan.
44 49 53 43 20 20 20 C1    DISC....
52 55 4E 42 20 20 20 D0    RUNB....
41 4C 50 48 41 20 20 C2    ALPHA...
41 4C 50 48 41 20 20 C3    ALPHA...
52 55 4E 43 20 20 20 D0    RUNC....
73 63 6F 70 79 20 20 A4    scopy...
53 45 4C 43 4F 50 59 A4    SELCOPY.
52 45 43 4F 56 45 52 A4    RECOVER.
52 45 53 43 55 45 20 A4    RESCUE..
50 52 4F 47 52 4D 31 A4    PROGRM1.
50 52 4F 47 52 4D 32 A4    PROGRM2.
44 49 53 43 5A 41 50 A4    DISCZAP.
57 50 46 43 54 20 20 A4    WPFCT...
4D 45 4E 55 20 20 20 A4    MENU....
43 48 41 4E 47 45 20 A4    CHANGE..
00 00 00 00 00 00 00 00    ........
00 00 00 00 00 00 00 00    ........
00 00 00 00 00 00 00 00    ........
00 00 00 00 00 00 00 00    ........
```

Figure 1

the title are held in sector 0. The rest are at the beginning of sector 1. But we only need change the first eight to illustrate the method.

Experiment with the routines to become familiar with using OSWORD &7F. However, please note: all experiments with disks could be potentially disastrous if you are working with disks containing valuable data, therefore we suggest that you use a disk containing unimportant data for all experiments. Disk Sector Editor (option 6 on page 2 of the menu) is a complete Disk Sector Editor which will enable you to edit any part of a disk.

Expert Examiner

Expert Examiner (option 4 on the first page of the menu) is a utility which will allow you to zoom in on the surface of your disk, search for specific data, recover data into memory and edit data directly on your disk.

This utility consists of three inter-related routines each entered via a sub-menu, by pressing either ‹E› (edit), ‹R› (recover) or ‹S› (search).

Disk search routine

This routine will search any specified disk for the occurrence of a string of any length. You will be asked to enter the string, the number of tracks and which track to start at. If the string is found, the sector containing it is displayed and you have the option of carrying on the search or aborting to use the recovery routine. This routine is particularly useful in finding BASIC programs accidentally deleted.

Recovery routine

When a program is deleted using *DELETE, *WIPE etc it is only wiped from the catalogue, and the actual program remains on the disk. Therefore, by knowing where on a disk the program was, it can be recovered, provided that it has not been written over or formatted. (See RESCUE and RECOVER both in this issue.) The program can be found using the search routine to find a particular word in the program eg in a REM statement. The routine will ask you for the starting track and sector and also the number of sectors to retrieve. This is the length of the program divided by 256. If you are not sure how long it was, type 100 and that should cope with almost any BASIC program.

Note: this will work with BASIC programs only.

Disk editor

This routine will allow you to edit the contents of any sector with ease. You type in the track, sector and drive and it will be displayed in both ASCII characters and hexidecimal notation. By scrolling over the screen with the cursor keys, the sector can be edited, by simply typing over the existing data, in either ASCII letters (ABCD etc) or in hexidecimal numbers.

When first run, you edit ASCII letters (a letter 'A' appears in the top right corner). To change to hex editing press ‹TAB› and the flag at the top of the screen will change to 'H'. (Press ‹TAB› again to go back to ASCII). To move forwards or backwards a sector or track, you can press the cursor keys together with the ‹CTRL› key. If you have edited the sector you are given the option to save it before advancing to the next. The actual functions are:

CTRL-UP	**Advance 1 track**
CTRL-DOWN	**Back 1 track**
CTRL-LEFT	**Back 1 sector**
CTRL-RIGHT	**Advance 1 sector**

Once you have finished the editing and you wish to save the sector back to the disk, press ‹ESCAPE› and type ‹Y› when it asks.

Disk Sector Editor

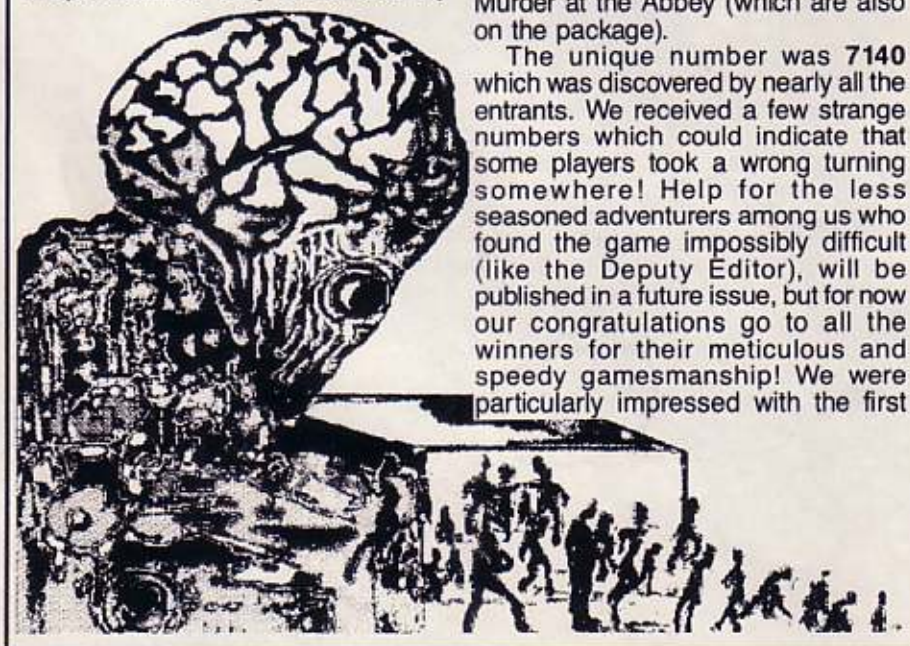
The above cursor controls also apply to the disk sector editor, program six on the second page of the Disk User menu. You can specify drive, start track and sector. The editor will not wrap round from track 0 to track 39, or 0 to 79 or vice versa.

COMPETITION RESULTS

Cube of Zoth competition winners

Judging by the number of entries we've received and the comments on your Disk User surveys, the Cube of Zoth was a real winner!

The competition was to find a unique number only obtainable by completing three-part adventure and defeating the mighty Zoth. Up for grabs to the senders of the first 30 correct entries was a double disk copy of Jonathan and Jane Evans' *Adventurescape* system, with which they created the Cube of Zoth and the adventures Xanadu, Amnesia and Murder at the Abbey (which are also on the package).



The unique number was **7140** which was discovered by nearly all the entrants. We received a few strange numbers which could indicate that some players took a wrong turning somewhere! Help for the less seasoned adventurers among us who found the game impossibly difficult (like the Deputy Editor), will be published in a future issue, but for now our congratulations go to all the winners for their meticulous and speedy gamesmanship! We were particularly impressed with the first correct entry from S J Gardner of Cardiff which arrived just two days after Disk User was first on sale at the last Micro User show!

The other winners were: Rhys Jones from Gwynedd, P Hudson from York, L M Lightfoot from Exeter, Peter Haywood from Leicester, Darren Stewart from Carlisle, Gavin Inglis from Renfrewshire, P Brandon from Winsford, Keith McAlpine from Portadown, Paul Meling from Bath, Neil Shipman from Bristol, P N Beckett from Dyfed, P Hawthorne from Co Armagh, C A Williamson of Stubbington, R J Milton (aka Dr Bob) from Stoke Gifford, Andrew Asker from Notts, Richard Forster from Hale, Mark Fishpool from Impington, R L Bush from Plymouth, A J Wills from Aylesbury, Gary Powell from Abingdon, David Roberton from Gotham, A M Harris from Cheam, Steven Cape from Bedlington, Alan Hale from Wirral, Mr J Thorpe (Junior) from Chatham, I H Cook from Tyne and Wear, Lee McGinty from Newport, Jeremy Aston from East Preston and Andrew Hague from Sheffield.

Are we going to see any games created with your prizes in future issues of Disk User?


ANTS
Abbas

Pit your wits against rampaging radioactive ants in this nailbiting strategy game. The future of mankind is at stake!

ANTS

Ian Waugh

A small crack in the joint of a pipe in a Nuclear Power Station went undiscovered for two hours. This would normally have been of little consequence but illegal experiements deep inside the Power Station had produced a new and different type of radiation which filtered underground and found a small colony of ants. These, too, went unnoticed until a large mound resembling a giant anthill was found in some wasteland near to the station. The entrance to the hill confirmed traces of ants – giant ants.

Scientists calculated that if there was a Queen Ant down there it would not be long before it laid giant ant eggs and then mankind would have a real fight on its hands. To pre-empt that possibility, a team of underground sabotage specialists, used to smash the Embleton Colliery hijack of '86, were drafted in to destroy the ants.

Ants! simulates the underground battle between the Ants and the Humans. The Ants must protect their Queen while the Humans must destroy it before it lays its eggs. The number of game turns before the Queen Ant lays her eggs – and consequently ends the game, is revealed at the start of each game. The computer controls the Ants and you control the Human team.

The rules to Ants! are divided into major topics arranged in the order in which they are likely to occur during the game. Although there are many options for the player, the computer will not allow any illegal moves. You are free, therefore, to attempt moves without memorising the rules as only legal moves will be accepted.

Map and units

The board and information about the units are shown on the screen. Combat results and the results of special actions are shown at the bottom of the screen.

The map displays the barren underground wastes in which the ants take refuge. Tunnels are dug (and collapse) in this wasteland and are shown on the screen unless the hidden movement option has been selected. It is not possible to move off the map except for human units which surface (see Movement below).

There are three types of ant unit each with a different Resilience Value (R) and a Morale Value (M):

Queen: R:6 M:4
Soldier: R:8 M:4
Worker: R:5 M:4

An ant's attack strength is its current Resilience Value which will decrease if it is wounded. An ant's Morale Value never changes.

There are also three types of human unit. Their attack strength (AS) depends upon their weapon. This is a fixed value and not shown on screen:

Lasers: R:7 M:9 AS:4
Bazookas: R:7 M:9 AS:8
Bouncers: R:7 M:9 AS:0

The Resilience of Human Units is lowered if they are wounded and Morale can be reduced under certain circumstances (see Morale and Surprise below).

Sequence of play

The first two phases are the Ant Dig-In phase and the Ant Placement phase and are performed by the computer. You will then be told how many phases until the Queen lays her eggs. The Human player and the Ants take turns moving and engaging in combat until one of the victory criteria is reached (see Winning below).

- After the board is drawn you will be asked if the Ants should be hidden. It will be best to answer N (No) until you become familiar with the game.
- If you press N, a Worker will appear and dig tunnels between adjoining hexes. The outline of the hex which houses the entry to the tunnel complex, the starthex, will turn the same colour as the ants. When the tunnels have been dug, the ants will appear on the board in hexes containing tunnels.
- The ants will not set up in the starthex or in a hex adjacent to it. If the Ants take over two minutes to set-up it may be that they are unable to do so satisfactorily and you may need to run the program again. This is unlikely but could happen.

Movement

Movement Points (MP) are calculated from a unit's Resilience Points: MP=R/2. Halves are rounded up. As a unit is wounded, so its MP may reduce.

- After each move, the human unit's status is updated and displayed. The ants' status is not displayed except for its Resilience after combat (see below).
- No two units, even friendly units, may occupy the same hex.
- Movement or attempted movement from one hex to another linked by a tunnel costs 1 MP.
- A human unit can surface if in the starthex at a cost of 1 MP. This will end that unit's turn.
- All ants and Human Laser units can dig tunnels. Digging a tunnel costs an ant 2 MP and a Laser unit 3 MP.
- If an attempt is made to move into a hex occupied by an enemy unit, either by moving through a tunnel or through digging a tunnel, combat will take place. Normally movement will cease after combat but certain results allow ants and Laser units to continue moving after combat (see below).

The human phase

Once a unit has been selected it can not be de-selected. If you choose not to move it, its move will be forfeit and it cannot be moved again until the next phase.

- The Human units are displayed on the board at all times. Those not on the map are 'stepped through' at the bottom left of the screen.
- At the start of a phase you are in Unit Selection Mode and the following options are available: 1) Select a unit to move 2) End that phase 3) Quit the game
- Selecting a unit. Units free to move are stepped through by pressing the Space Bar and overprinted with a flashing cursor. As each unit is highlighted, its status will appear on the bottom of the screen:

: Unit Number(1-9)
R: Resilience (1-7)
MP: Unused Movement Points (1-4)
M: Morale (0-9)
W: Weapon A (Armed) or E (Empty)

A unit is selected by pressing S and a

direction indicator will appear on the lower right of the screen. If the unit was previously off the map, it will appear in the starthex unless the starthex is alrady occupied in which case you will not be able to select that unit.

• After selection, a direction is chosen with the following keys (see Summary of Controls):

D:East
C:South East
Z:South West
A:West
Q:North West
E:North East

• The arrow will point in the selected direction and a move in that direction is made by pressing <RETURN>.

• Special Movement Rules, Laser units can dig a tunnel by pressing T. This costs 3 MP.

• If a unit is on the starthex, it can be made to surface by pressing U for Up. This will end its move. A unit on the surface will regain one Morale Point per turn up to its maximum of 9. Its weapon will also be immediately re-armed.

• If a unit's full movement points are used, play will automatically pass into Unit Selection Mode again or to the Ant phase if all Human units have moved. If you want to end a unit's movement phase before using all its Movement Points, press F.

• If you want to end a phase before all the units have moved, press L.

• If you want to quit the game, press @.

Morale and Surprise

• The Morale of a unit determines whether or not it is able to surprise the enemy. A '10-sided dice' is thrown. If the result is less than or equal to the unit's Morale, the unit is considered to have attacked unnoticed.

• If a Human unit is surprised when attacked, a '16-sided dice' is thrown. If the result is greater than the unit's Morale, the unit is considered to have been shocked and loses 1 Morale Point.

Panic

• A Human unit may panic when firing. Panic is determined by throwing an '11-sided dice'. If the result is greater than the unit's Morale, it is considered to have panicked and discharged all its ammunition. It will be re-loaded if it surfaces.

• A Bouncer unit may panic when throwing a bouncer, in which case the tunnel will collapse, or during a normal attack. In either case it is considerd to be totally unarmed.

• Ant units never panic and their Morale is never reduced.

Combat

Combat takes place when a unit attempts to move into a hex occupied by an enemy unit.

• The results of combat are determined by the Combat Results Table (CRT) (see below). This is handled automatically by the computer which will print combat details at the bottom of the screen.

• The result of an encounter is calculated as follows:

AS + dice – def

where AS is the attack strength, dice is a random number between 1 and 6 and def is the defending unit's Resilience. If the attacking unit does **not** suprise the defender (see Morale and Surprise above), 2 is deducted from the result which is shown on the screen and can be checked on the CRT.

• If a human unit attacks with an empty weapon (see Panic above), its attack strength is -2.

• If a unit is wounded, its new Resilience Value will be shown. This is the only time information about ant units is given.

• Normally, engaging in combat will end a unit's move. However, if Human Laser units or any Ant unit achieves a combat result of 8 and it has remaining Movement Points, it can continue to move.

• Special Combat. Bouncers were specially developed for underground warfare. They are small grenades covered with a thick coating of man-made rubber which causes them to travel down tunnels and round corners far more efficiently than a normal grenade.

A bouncer is thrown by pressing B and it will travel down the tunnel indicated by the direction indicator. You can not release a bouncer into a hex containing a friendly unit nor into the starthex. Throwing a bouncer costs 1 MP.

If an enemy unit is in the hex, it is automatically destroyed. There is a 1 in 10 chance that the tunnel will collapse.

The Ant phase

The Ants' movement is totally controlled by the computer.

• Unless hidden movement has been selected, the ant under consideration for movement will be shown by the flashing cursor.

• All ants can dig tunnels at a cost of 2 MP. They can also cause a tunnel to collapse behind them at a cost of 1 MP. If the hidden movement option is selected, you will see a ripple effect across a hex when a tunnel collapses. This will help you pinpoint the Ants' location.

Ant Combat

When a human unit is under attack, it will be highlighted by the flashing cursor and the direction from which it is under attack will be shown at the bottom of the screen.

Winning the game

The following conditions will end the game:
1) If the Queen ant is still alive at the end of the stipulated time: Ants win. 2) If the Queen ant is killed: Humans win. 3) If all the human units are killed: Ants win. 4) If the human player quits: Ants win.

• When the game ends, if hidden movement has been selected, the remaining hidden tunnels and ants will be revealed. You will be given the option of another game.

• You can choose to play a completely new game or you can play again with the tunnels and ants in the same starting positions.

Combat Results Table

Result	Effect
0 or less	**No Effect**
1	**1 Damage**
2	**2 Damage**
3	**3 Damage**
4	**4 Damage**
5	**5 Damage**
6	**6 Damage**
7	**7 Damage**
8 or more	**Unit Destroyed – Advance***

*Laser Units and Ants may continue moving if they have remaining Movement Points.

Summary of Controls

SPACE BAR Step through units which are free to move
RETURN Move
U Unit surface (if in starthex)
T Dig Tunnel (Lasers only)
B Throw bouncer (Bouncers only)
F Finish Unit's Movement
L End phase
@ Quit

WHICH RAM DISK?

What's the RAM disk desireability factor for your system? RAM disk may sound good but should it be an alternative to a second disk drive or in addition. And with all that RAM, couldn't it be put to more than one use?

Morley RAM disk

One or two megabyte options are available on the Morley disk. It has its own power supply and can therefore retain data. Software control is supplied in EPROM in the form of * commands for archiving BBC main memory to RAM, returning it to memory, loading data blocks (not DFS format) from floppy and direct editing of RAM. When you want a disk lookalike, the RAM needs formatting with RAMFORM. It supports DFS but not ADFS as orginally advertised. The RAM disk can be assigned (RDRIVE) to any logical drive number between 0 and 9 and can thus pretend to be the program or data drive your software expects to find. DEF forces default drive 0.

DFS commands DIR, INFO and WIPE operate on the RAM disk and there are other new and useful features. Up to 256 subdrives can be created and used as such at any time and CFIND used to find a filename, useful with potentially thousands of files! UNWIPE recovers wiped files before a COMPACT.

FBACK makes use of the RAM as a buffer for your floppy to floppy copying – just one pass! RTEST does a continuous RAM test, REDIT a sector edit, RSTAT provides a useful set of catalogue information and SCAN will find a string in the RAM disk memory. The catalogue structure allows upto 2,688 files and software such as MB Software's 'VU-FAX' 1000 page Teletext information system can be accommodated.

Not in our possession but just announced for Master owners is a 256K RAM disk cartridge which can be configured as sideways RAM banks.

ACP Advanced DFS RAM disk

Master owners may be aware that the four available banks of sideways RAM can be configured to hold data, and that this data will appear 'whole' despite being physically apportioned to pages of 16K. The Advanced Computer Products Advanced 1770 DFS redefines available RAM as a RAM disk, drive 8. The command SRDRIVE is provided to change the drive number to allow software to find the 'correct' drive where it expects one in particular. Prior to use you have to format the RAM with SRFORM, which gives an option for single or dual catalogues. If the four by 16K RAM available seems a little on the low side for disk applications then ACP can supply extra RAM in the form of plug-in cartridges.

Solidisk RAM disk

Both two-meg 128K and four-meg 256K boards from Solidisk allow the use of sideways RAM as RAM disk. This is the only RAM disk we know of which ADFS can make use of although it has to be a Solidisk ADFS chip. RAM disk is also available to DFS with both 8271 and 1770 disk controllers.

Opus Challenger 3 in 1

The Challenger probably needs no introduction because its been around for nearly two years. It remains the unit which most closely fits the bill as disk drive, on RAM.

The basic unit consists of an eighty track double sided 5.25" disk drive, a double density disk interface based on the well proven OPUS DDOS and a 512K RAM disk. All of these items are housed in a single unit which plugs straight into the 1MHz bus and takes its power from the Beeb's own power supply. The only item which has to be installed inside the Beeb is the Challenger ROM, which contains the modified version of DDOS. Opus' major selling tactic is the "plug in and go" philosophy, however there are far more advantages than just that.

The disk interface is capable of supporting a further two drives (which can each be double sided) although at present the Challenger ROM will only support two drives plus two RAM disks of 256K each. The additional drive is attached to the system by opening up the case and attaching the disk drive cable to the socket on the Challenger's PCB.

Also inside the case is an extension socket for the 1MHz bus, so that other peripherals can be attached. In practice however this has proved impossible with any of the major products which work on the bus.

RAM filing

The Challenger ROM is a modified version of OPUS DDOS A comparison with the original shows only two additions and a number of omissions. The main reason for this has been a rationalisation of the commands to conserve space and squeeze all the code into 16K. However you do not lose any of the original facilities. For instance commands such as *DENSITY, *4080 and *SROM are now all included as further extensions to the *OPT command.

Other improvements over DDOS can be found in *FORMAT and *VOLGEN. *FORMAT now offers the opportunity to format another disk, while *VOLGEN is much friendlier in now accepting volume sizes to to allocated by sector. This certainly avoids the confusion which arose in the DDOS version. However space on a track can still not be split over two volumes.

*MAP is one of the new commands, which is similar to the command now found on the new Acorn 1770 DFS. It displays a map of the used and free space on a disk surface. *CONFIG is the other new command, which has been implemented to aid the use of the RAM disk. It is used to configure a physical drive to appear as a different logical drive.

Confused? Well think of the way you change colours with VDU19. The command can be really useful when using commercial software which either doesn't recognise a drive number greater than 3 or expects the programs or data to reside in drive 0.

For example *CONFIG 0=4 will make the RAM disk (physical drive) appear to the software as drive 0 (logical drive).

Physical disk

The RAM disk is a block of RAM chips which to all intents and purposes behaves as if it were a floppy drive, except for two distinct differences. Firstly accessing the disk is very fast indeed, in our tests up to 18 times faster. Secondly the memory is volatile (ie when you switch off, goodbye memory). For the more initiated into the internal workings of the Beeb, the memory is arranged in pages of 256 bytes on the JIM bus (&FD00 – &FDFF) and uses addresses &FCFF and &FCFE on the FRED bus as paging registers.

The advantages of having a RAM disk are quite considerable, though there are obviously disadvantages as well. The first main advantage is obtained, not directly from the RAM disk, but because of the way Opus have designed the system. Of the 256K of RAM available, only 253K is allocated to the RAM disk. The other 3K has been given over to the disk filing system, thereby allowing PAGE to remain set at &0E00. This is a very real advantage when you are transferring tape software to disk – no worries at all about using downloading routines. This advantage though does have its drawbacks in some situations, where disk software is expecting to find a copy of the disk catalogue at page &0E00 of the Beeb's memory. However Opus have overcome this with an extension to the *ENABLE command. *ENABLE CAT will copy the current catalogue into page &0E00 and move the OSHWM up to &0F00.

The remaining 253K forms the RAM disk and is configured as a single density drive (ie max 31 files and imaginary tracks of 10 sectors each). Disk based software such as databases, spellcheckers and wordprocessors naturally show great improvements in speed when using the RAM disk. If you develop software then Challenger can speed the process of loading and saving files and libraries and compiling or assembling on to disk. Challenger has proved a very practical fast disk.

Seawell Sacram

Looking like a half height disk drive, the Sacram unit has its own power supply, as well as an edge connector socket for the 1MHz bus cable. Short of a power cut, or major mains spike, the data can stay in RAM indefinitely.

Now this is where your programming will need to come into play because the controlling software, although helpful, is merely the equivalent of a series of well documented commands. With Sacram, the programming is left up to you. In order to write to the Sacram unit, you have to address the right registers with the right values, so the way to write to the address &FD00 (documented as JIM in the 1MHz bus application note by Acorn and the Advanced User Guide), is to use either indirection operators, and CALLs to &FD00, or simple direct mode calls in assembly language.

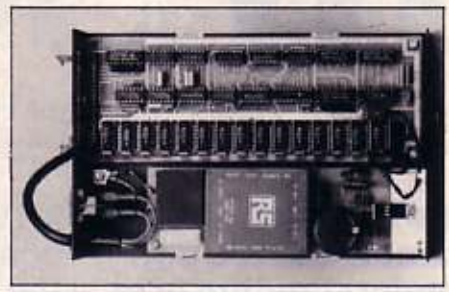
One nice use for Sacram is to load, at very high speeds, a graphics screen, to make a slide show. This has its applications for business and education, where graphics screens can be saved and transferred to the Sacram unit, and the saved diagrams can be flashed up on screen throughout the course of the lesson or lecture for all to see, without the time consuming problems associated with plotting complicated diagrams.

Another slight modification to the slide show program is as a database for PRESTEL and CEEFAX screens, this way, an interactive Viewdata-base can be created. It would be possible to store up to 512 individual screens, which would be ideally suited for many home applications, school bulletin boards or small businesses with point of sale or notice board requirements.

The four OS commands stored in the EPROM are *DISKRAM, used to transfer a file from disk to Sacram and *RAMDISC, the direct opposite, allowing either sections, or the whole of Sacram, to be backed up onto disk.

*BEEBRAM is used to load, from the BBC Micro's RAM, data for use in the Sacram unit – in the form of programs, ROMS, graphics screens, or even system information such as time and date. The opposite command, *RAMBEEB is used to retrieve the RAM data from Sacram for the program to use.

One thing becomes clear however: although the 1MHz bus is reasonably



well implemented, there is no free socket to plug directly into another device. This means that Sacram must lie at the end of a chain and relies on other devices to have the extra socket. This is a somewhat annoying habit which is becoming more popular with 1MHz bus driven hardware, which is a shame as the 1MHz bus was designed to handle more than one device on the end of the connectors and Acorn recommendations are, as yet, not being adhered to properly, other than in their own products.

The price for the 128K model is £145 and includes a manual and an EPROM containing four commands. Should you require such huge quantities of RAM. The upgrade path is simple and also very cheap in comparison to other memory systems, from 128K to 256K models which costs £68, but you can buy the full 256K model at £199 and two 256K models can be chained together with ease. Seawell have also developed a number of software enhancements for their RAM disk.

Disk data

Advanced Computer Products
6 Ava House
High Street
Chobham
Surrey
GU24 8LZ
0276 76545

Morley Electronics Unit
3 Maurice Road
Industrial Estate
Wallsend
Newcastle upon Tyne
091 2627507

Opus Supplies
55 Ormside Way
Holmethorpe Industrial Estate
Redhill
Surrey
0737 65080

Seawell Automatic Controls Ltd
The Old School
7 St James Street
Ludgershall
Andover
Hampshire
SP11 9QF
0264 790911

Solidisk Technology
17 Sweyne Avenue
Southend-on-Sea
Essex
SS2 6JQ
0702 354674

James Slater

RESCUE

We all make mistakes but with this program you needn't be too sorry, because a little understanding of how the Beeb's DFS works will enable you to put some things right

It doesn't take long for a new disk user to realise that the designers of the Beeb's disk filing system have provided no less than three ways of deliberately deleting information from a disk. Useful as the *DELETE, *DESTROY, and *WIPE commands are, there comes a time in all our lives when the wrong push of a key sends our favourite program to oblivion, and *CAT then seems to show that the program has been wiped from the face of the earth, or at least from the surface of the disk.

Previous articles about disk catalogues have shown how all the vital information about each of the files, such as its name, directory, load and execution addresses and its length, is stored on the first two sectors of the outermost track on the disk, track 0.

Whenever a file is deleted with one of the above commands, all references to that file in the disk catalogue on sectors 0 and 1 are removed, and the information about subsequent files on the disk is automatically moved up the catalogue to take the place of the deleted data. Notice, however, that only the disk catalogue has been amended, and that the actual data part of the program, which resides further along the disk, has not been touched. Until such time as the part of the disk containing this program is overwritten by another program or the disk is compacted the original program remains intact, and it is this knowledge that gives us the clues as to how to go about recovering the program that we have inadvertently 'lost'. If your computer is fitted with a disk editor such as Disc-Doctor or Discmaster, or if you have access to one of the disk-editor programs that have appeared in this magazine, it is instructive to browse through the various sectors of the disk, and you should be able to prove for yourself that the 'missing' program is still present somewhere on the disk, even though *CAT doesn't show it.

As things stand, however, we cannot gain access to that program because it has been removed from the catalogue, in much the same way that you would be incommunicado if you had a new telephone number but this was not shown in any directory.

If we could find a means of reconstructing the original disk catalogue so that it once again contained the name of the 'missing' file and all its relevant vital statistics, we would be back where we started and would have brought our lost program back into the land of the living. This simple program does just that, and as well as helping you out of many an uncomfortable spot it will increase your understanding of how the DFS works.

Having typed in the 'RESCUE' program, and you will see that it only consists of about 60 lines, following the simple instructions below will automatically provide you with a disk containing the lost programs that you deleted in error.

1 Make a backup of the disk which contained the files which you have deleted in error. This is not just a precaution, but is essential, since only the previously deleted files will be left on this disk at the end of the operation.
2 Insert disk with 'RESCUE' program on into drive 0.
3 Load 'RESCUE', then remove disk.
4 Insert disk containing deleted files.
5 Type Run. Press Return. The disk will whir and after a few seconds the RESCUE program will have created a new file in each place on the disk where there was previously a space, ie where you accidentally deleted a file, and, incidentally, at the end of the disk. These files are automatically given the names 'Gone-1', 'Gone-2', etc, depending on the number of previously deleted files. You can examine your missing file using '*DUMP Gone-1', and can then confirm that this was indeed the file that you had been seeking. If it is a BASIC file, you can LOAD "Gone-1" and then SAVE it under its original name, or if it is a Wordwise file you can load 'Gone-1' as a normal text file. Some View files may be a little more tricky, since although they are recovered correctly the GONE file will contain some superfluous information at the end. This causes View to give a "No Text" message. To overcome this difficulty the GONE file should be *LOADed into memory and then only the text part of it needs to be *SAVEd back to the disk. Machine-code files can be rescued in the same way, but will need *LOADing and *SAVEing in the usual manner.

The 'RESCUE' program is based around OSWORD &7F, a multi-purpose DFS call which is entered at &FFF1 (line 40). This is used to load and save sectors to and from the disk using PROCosword(command), where command equals either &53 to read, or &48 to write.

Line details

- Lines 10 to 60 Initialise the program. Notice that in order to make use of the OSWORD command we have to specify a buffer area and also an area for data.
- Lines 70 to 130 read the disk catalogue into memory and calculate the start sectors and the the lengths of the programs which have not been deleted.
- Lines 140-190 erase the old catalogue, and adjust the new catalogue so that the disk contains the same number of tracks as before.
- Lines 200-230 work out where gaps between programs occur and call PROCmissing for each one.
- Lines 240-250 use PROCosword with command = &4B to save the new catalogue of the missing files back to the disk, and then end the procedure.
- Lines 260-430 define PROCosword. The buffer is filled with various pieces of information including the drive number, the address of the data area in memory and the number of sectors to be loaded or saved. If an error is detected during the OSWORD call then the last byte in the buffer will not be equal to 0 . Line 420 checks this.
- Lines 440-580 define PROCmissing which creates the GONE files in the area of memory which is later to become the new catalogue on the disk. The variable MN contains the number of the GONE file.
- Lines 520-570 store the start-sector and length of the file in the format which the DFS requires, ie Start-sector as a ten-bit number, and length as an 18-bit number.

COLLECTORS' ITEMS

Stunningly collectable animations

This month Abbas has produced both B and C in his series of Mode 7 animations for the BBC Micro. He also created the Ants! artwork for the magazine on his BBC Micro and Prisma 2 computer graphics system. And he has been working recently with Millipede Electronic Graphics' Prisma 3 system. The high resolution screen picture shown here was drawn by Abbas using this hardware.

These high powered systems are designed for research, image analysis, television and video. The BBC recently used four Prisma 2 units to generate real-time animated graphics for their election coverage.

When configured for television format Prisma 3 supports a display resolution of up to 1536 by 574 pixels. The numbers go crazy when you learn that 256 colours can be displayed simultaneously from a palette of 16.7 million! Drawing speeds are 900,000 pixels per second with a potential of 30 million per second with complex hardware BITBLT.

The picture power of Prisma 3

Incoming video pictures from camera, tape or disc can be directed into up to four separate screen areas, whilst Prisma 3 can continue all other functions. Smooth zoom and pan, programmable windows, transparent colours, contrast enhancement, pseudo colouring and digital keying are all supported.

Up to four screen areas can be animated in real time with 32 colour palette definitions and 16 window overlay definitions may be preprogrammed and cycled at field rates. Prisma 3 can also automatically convert wire frame outlines into solid objects. Prisma 2 worked with the Model B and Master and interfaces for Prisma 3 are under development.

Millipede Electronic Graphics 12 Pryor Close Milton Cambridge CB4 4BU 0223 862066

Blind Man - Mode 7 in motion

Carter - he must be in a hurry

J Dewar

WORDBOX

Create your own word puzzles with this program that will also solve anagrams and word search competitions – you could be on to a winner!

Wordbox uses Mode 1 with 40 characters across the screen: the best compromise between 80 characters, which is difficult to read on a domestic television set, and twenty characters, far too few for a reasonable screen layout. Two lines are used at the top of the screen to provide a heading, another two are used at the bottom for instructions. A menu appears on the right leaving enough space on the screen for a grid size of 26 by 26 characters, which is more than adequate for the majority of grids.

Advantage can also be taken of the four colours available in this mode so that after a successful search, the word found can be displayed quite clearly in colour.

Wordbox is menu driven and there are twelve options to choose from. Any selection which threatens a grid on display will result in a warning message and flashing screen. Various prompts and instructions are given throughout the program, these will vary according to which option is in use at the time.

The use of each option is as follows.

1 Create
Requires the width and depth of the new grid to be entered, a maximum of 26 letters each way is permitted. The grid positions of these letters will be marked with a dot and a box drawn around the whole area.

Note that if a grid exists, the screen will flash displaying a message which asks for confirmation to erase the present grid in order to begin again. The screen stops flashing when an answer is given, a reponse other than 'Y' will return the user to the menu.

2 Modify
Using the arrow keys it is possible to move around the grid inserting letters at will, any incorrect character at the cursor position can be replaced simply by over-typing. The Delete key will act as normal, that is, when it is pressed the letter before the cursor is removed leaving a dot to mark that position. To exit back to the menu press the return key.

3 ...Fill
Searches the grid for any dots and

replaces them with a random letter from A to Z. Ideal when designing your own puzzles.

4 Search
Requires a search word, the length of which is limited by the longest side of the grid. If the search word is more than one letter the grid will be searched in all four diagonal directions as well as up, down, backwards and forwards. If the word is found, it will turn red and a reminder prints the number of words found so far.

If the search word is only one letter then the grid is searched for all occurrences of that letter. The final result is printed at the bottom of the screen. Pressing the Space Bar will allow another search word to be entered. Normally any word found will become white again before the next search is carried out.

To exit back to the menu press the Return key when asked for a search word.

5 Black
Blacks out any words that have been found in the grid leaving only the unused characters showing. These words are not lost, they are only printed in black.

6 White
This is the default setting, all letters in the grid turn white before a search is made to enable a successful search to show the position of the new word clearly.

7 Red
Displays in red all the words that have been found in the grid and will continue doing so until option 5 or 6 is chosen.

8 Juggle
Intended to help with the solution of anagrams. After entering the letters of the anagram they can be re-arranged in a random order with every press of the Space Bar.

9 Save
Requests a filename in order to save the grid information. The length of filename acceptable will depend on the filing system in use. A file is then opened and the grid width, depth and letters are saved but words found and their grid position are not.

10 Load
If a grid exists the screen will flash and the usual confirmation message will be presented. To continue, enter the filename you wish to load, information will be read from that file and used to create a new grid.

11 Print
First asks if all words found should be emphasised on the print-out. Letters from the grid are then sent to the printer with words emphasised if necessary. This is not a screen dump, there is no need to high-light words on the screen to provide an emphasised print-out.

12 Quit
Apart from pressing Break, Quit is the only way to exit from the program. If a grid exists, the screen will flash and confirmation to continue will be requested. Any answer other than 'Y' will return the user to the menu.

Program functions and procedures

210 init Sets variables, displays the heading and menu.
330 menu Accepts any sensible choice from the menu.
430 create Asks for width and depth of grid then calls PROCgrid.
510 grid Draws grid and marks the positions for each letter.
570 modify Allows letters to be placed anywhere inside the grid.
740 fill Replaces any dots with random letters.
810 search Accepts a search word of one or more letters.
960 first Finds the first letter of search word in the grid.
1080 rest Tries to find the other letters of the search word.
1220 print Prints words in the grid when found.
1310 colour Changes logical colour yellow to black, white or red.
1380 juggle Accepts letters and re-arranges them at random.
1530 save Saves width and depth of grid plus all the letters.
1630 load Loads width and depth, reads and displays all letters.
1730 hard Sends a copy of the grid to the printer.
1880 FNin U%=-1 for letters, U%=0 for numbers. Max N% letters.
1990 sure Options 1, 10 and 12 erase the grid. Continue?
2060 tt Prints instructions teletype style in bottom window.
2120 error Reports errors for 10 seconds then returns to menu.
2170 big Displays shadows behind headings.
2210 box Draws boxes with double sides for clarity on TV screens.
2260 mid Creates a window in the middle section of the screen.
2280 osbyte Reads the ASCII value of character at X%,Y%
2320 get Waits for a key press and masks it to upper case.

Program Variables Integers

A% for USR CALLS
B% bottom value in PROCbox
C% current menu choice
D% depth of grid
F% number of words found in the grid
H% horizontal search displacement -1,0,+1
K% ASCII value of key pressed
L% left value in PROCbox plus LEN($)
M% maximum length of search string
N% loop counter.
O% channel to save/load file information
P% permissible length of filenames
R% right value in PROCbox. Random value
S% system in use cassette/disc
T% top value in PROCbox
U% upper case letters (-1) or numbers (0)
V% vertical search displacement -1,0,+1
W% width of grid
X% horizontal position in the grid
Y% vertical position in the grid

Strings

Menu$ contains all options for the menu
Gen$ second general string variable
G$ first general string variable

Flags

Found TRUE if search word is found else FALSE.
Used TRUE if grid exists else FALSE.

Lawson B Wakefield

SOFTWARE

An easy to operate database that will keep track of all your programs and utilities

As a disk user you will no doubt have discovered how difficult it is to keep track of your ever growing software collection. When you save your latest handy utility as HNDYUTL, how do know its purpose six months later? And when you need that program which writes double height text backwards in Mode 1, how do you find it? Wouldn't it be nice to consult a database of all your files, browse through your graphics utilities and find the precise file name, and disk reference number for the program you need. Or perhaps you would like to print off a list of all the files on a particular disk, describing them in English! Better still, you'd like to know which magazine they came from when that obscure bug appears! All these things and more are possible with Software Manager.

Using the program

Software Manager is a disk-based random access database program which will help you to keep track of all those programs you've accumulated. It allows you to create, search and edit data files, each holding up to 256 records. Each record consists of the following data:

- Program title
- File name (name of first part in case of multi-part program)
- Brief program description
- Source (eg name and month of magazine or name of software house)
- Disk reference number (cassette files are also allowed for)

Creating/organising your data files

Before you can enter any data on your database, you must select the 'Create a New File' option on the 'SELECT MAIN DATA FILE' screen, at the beginning of the program. You will then be asked for a file name for the database, plus a brief description of the types of programs to be held on that file. This might be 'Commercial Games', 'Graphics Utilities', 'Educational' or whatever classification you prefer to use. The description you give here will be displayed every time you run the program, on the 'SELECT MAIN DATA FILE' screen. An index file and a main data file will be created (in the I. and M. directories). The index file holds the program titles and the main file holds the remaining data.

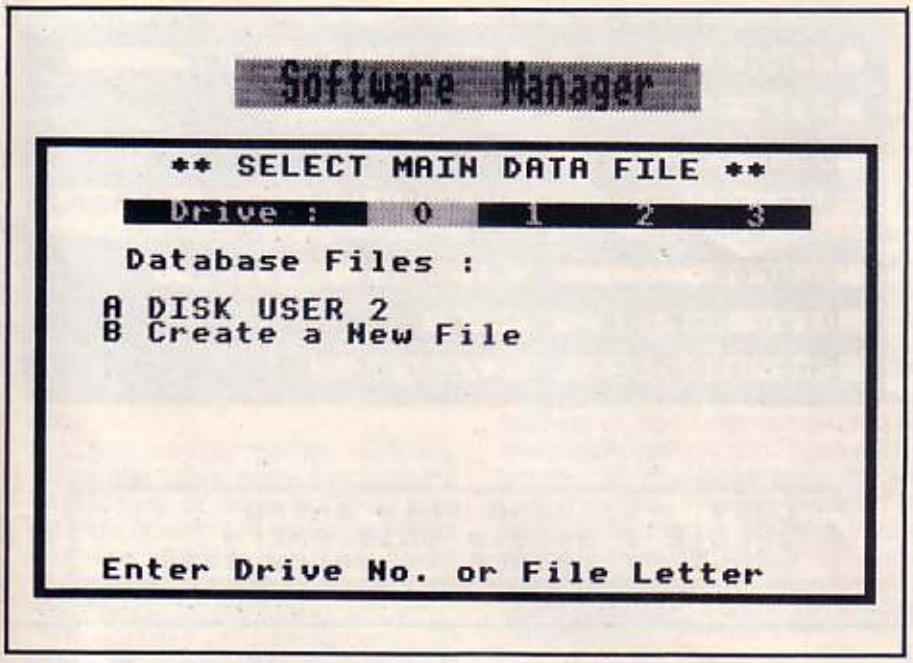
It is a good idea to keep the database files on a disk of their own, and back them up regularly. Each pair of files requires 31K of space on disk, so up to six separate index/main file pairs can be stored on one surface of an 80 track (200K) disk, on a single density system. The program allows for up to 10 database files on one disk surface, so it can be used with double density (320K) disk filing systems. Database files can be accessed on all four drives (0 to 3). For instance, on my own double sided single density 80 track system I store five databases on drive 0 and five on drive 2.

Entering new records on the database

Having created a file, it becomes the currently selected database. The main command menu will then be displayed. Use the Write option to enter new data. You will be asked for the date, so that the entry on the database can be 'date-stamped'. Note that you should use the format shown in the prompt, ie Dy/Mn/Yr. For the 3rd of May 1986 enter 03/05/86. Software Manager does perform a partial validation on the date entered, though you will probably get away with 31/02/87, so take a little care.

When entering a new record, you will be presented with a screen form to

MANAGER



fill in. The first field is the program title, which will be stored in the index. The second field is the filename of your program, (or the first part in the case of a multi-section program). The program description (third field) can be up to 70 characters long and should be entered in one go without pressing RETURN at the end of the first line. The source can be the name/month of a magazine, an author's name, a software house, etc. Finally, give the disk reference number, which should be in the range 1 to 255. Pressing RETURN for the disk number, causes Software Manager to treat the program as being stored on cassette. It is not possible to use non-numeric codes for the disk reference.

Viewing records

Once you have put some information on your database, there are two ways of looking at the records on the currently selected database file. These are the Retrieve and Browse options.

The Retrieve option allows single records to be inspected, modified or deleted. Pressing R at the main command menu will present you with a list of all the program titles. You can scroll up and down through this list using the cursor keys or press any letter key to move to those program names which begin with that letter. Pressing COPY will retrieve the data for the currently selected record. You will then be given the option of editing the record, deleting it from the database or returning to the program list.

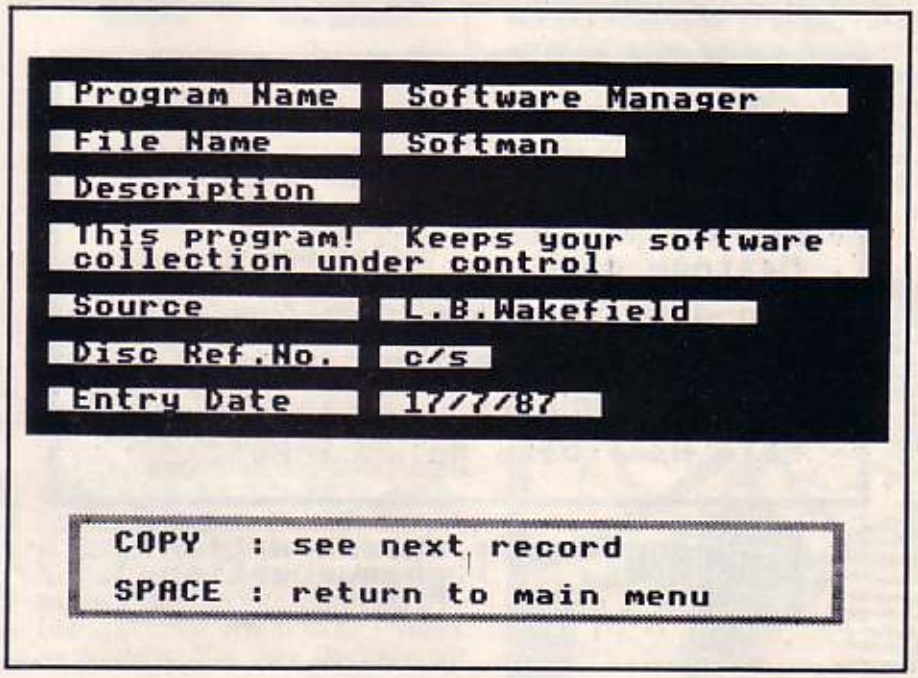
Selecting Browse from the main command menu provides an alternative to the Retrieve option for viewing records. It allows you to define a search range by date of entry and disk ref. number. You will then be shown each record on the database which matches that range, one at a time, in alphabetical order. The default search range at the beginning of a run will match all records on the database. Pressing COPY retrieves the next record. SPACE terminates the search, returning you to the main menu.

Printing

The Print option assumes you have an 80 column printer attached to your system. A search range can be set up in the same way as the Browse option, except that you can also define the combination of information you wish to have printed (eg Program source plus description, but not file name/disk number etc). The program assumes an Epson-type printer is in use, though this is not essential. For non Epson-compatible printers remove the **VDU1,27,** etc codes in PROCprint, which are intended to give a three-line skip over perforations.

Transferring records between data files

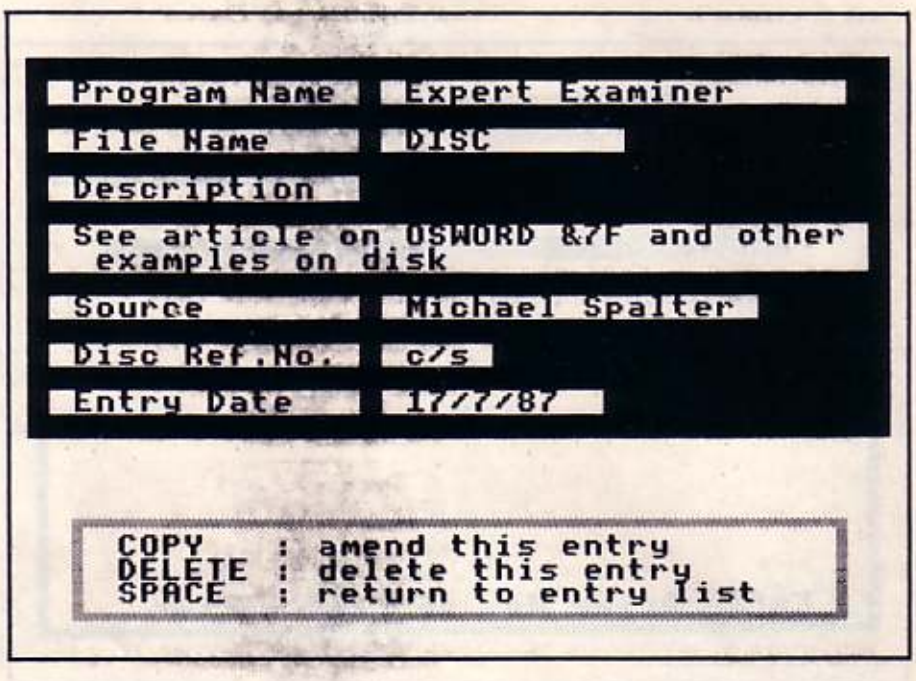
You may occasionally find that you wish to transfer a record from one data file to another or you may wish to selectively copy a subset of the records on the current database to a new file. This is achieved using the



Extract option. This offers the same search range facility as the Browse option, and also asks you to select the second database to which you wish to transfer the records. This need not be on the same drive as the currently selected database. Indeed, the second database need not even exist yet, since you will be given the opportunity to create a new file. For each record retrieved, you can copy it directly to the second database, ignore it, amend it and then copy (this only changes the record as written to the second data file, leaving the original unchanged) or you can quit before all the records have been retrieved.

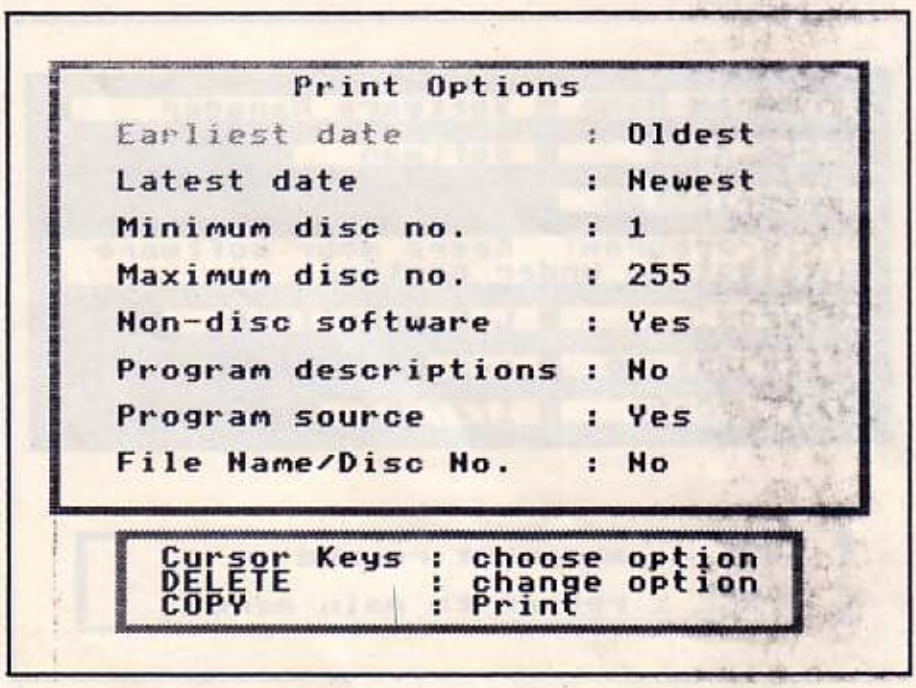
It's usually worth leaving enough space on the disk to create another database using the 'Create New File' option, without having to load up another disk or change drives.

The Extract option can also be used to sort the data on the disk. (Initially data is stored on file in the order in which it is entered.) To sort the contents of a database in this way, select Extract from the main menu, set the search options to retrieve all the records on the database, and extract all the records onto a new database. Then, delete the old version of the database. Sorting the database files in this way will reduce disk-head movement during the Browse, Print and Extract operations, since these search the database alphabetically.



Changing to a new database

This is achieved by pressing O for the Open option at the main command menu. This simply returns you to the 'SELECT MAIN DATA FILE' screen.



Exiting from the program

When you have finished using the program, either use the Quit option (which is mug-trapped with a Y/N prompt) or press ESCAPE, which will close all files etc and should be safe 99% of the time. As a general rule I would recommend using the Quit option.

Do not press BREAK since you may well corrupt the currently selected database.

Procedures

PROCaltopt Alters any one of the search-range options

PROCamend Allows any field in a record to be amended

PROCbox Draws a frame using teletext graphics chars and defines a text window within that frame

PROCbropt Prints keys in browse option after retrieving a record and gets input from keyboard

PROCbrowse Reads all the records on the database and displays those which match the search range selected by the user

PROCcopyopt Offers copy/amend options, when extracting records onto a second database. Calls amendment and write-record procedures if requested

PROCcreate Enters filename for new database, checking that the file does not already exist. Enters description of

the database, then creates index and main files

PROCdelrec Deletes currently selected record, after checking that the user is sure

PROCdescrips Reads description of each database on the current drive, held as a header record on the index file

PROCeditopt Allows editing of record r%, using PROCamend. If changes are made, the record is written to disk and the index is sorted in memory

PROCerror Error handler. Restores VDU driver, switches printer off, clears screen, restores default print width and closes all files. If program error has occurred, it is reported

PROCextract Allows data to be extracted from the current main database, amended if required, then copied to a second (new or existing) database

PROCfile Prints currently selected drive number, plus a list of databases found on that drive. Drive can be changed

PROCform Prints screen form for individual record

PROCgetdate Prompts for today's date and stores it in today%

PROCgetfield Enters field number P% for record number r%

PROChead Clears screen and prints double height screen heading

PROCinit Declares arrays, teletext colour characters, defines field lengths, etc

PROCletter Finds first entry in index of program names which starts with the character chr%

PROCmenu Prints main command menu

PROCmsg Prints database full/empty messages

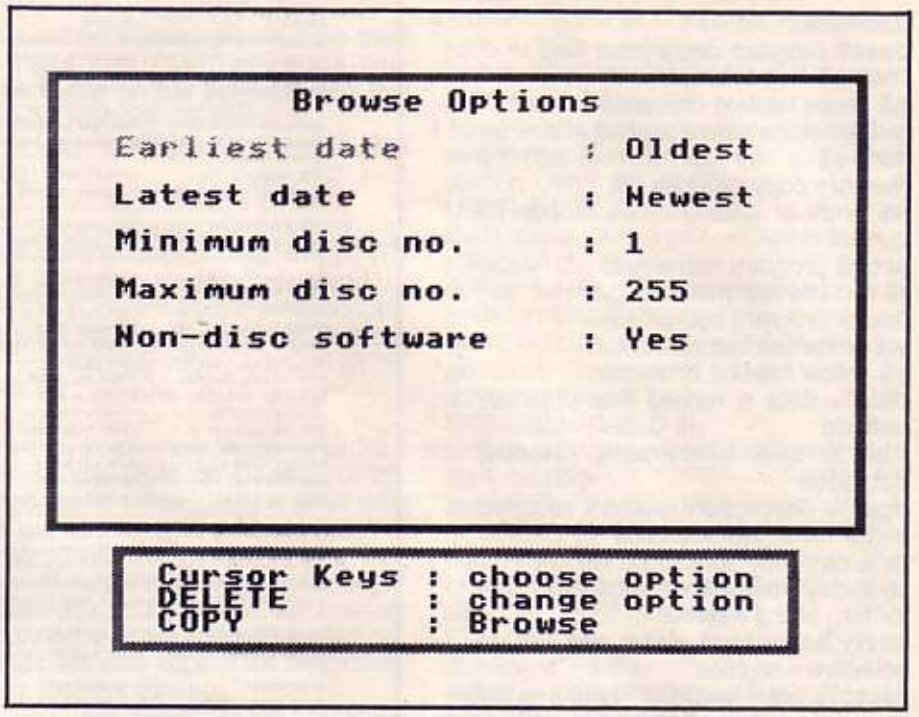
PROCopen Calls PROCfile to select main database, then opens index file and main file. Calls PROCreadindex to read the index file. If the database is not empty PROCsort is called to sort the index

PROCoscli Passes the OS command in c$ to the command line interpreter. (Ensures compatibility with both BASIC I & BASIC II)

PROCprfdnp Formats file name and disk number on printer output

PROCprint Prints heading. Reads all records on database, calling PROCprrec for each one

PROCpropt Displays currently selected printout options. Also allows these options to be changed before calling PROCprint to actually do the printing



PROCprrec Prints a record on the printer if it matches the search range selected in PROCpropt

PROCquit Mug trap in case Q has been pressed in error at main command menu

PROCreadcat Reads catalogue entries in directory I on the current drive and stores the file names in n$()

PROCreadind Reads program names from index file. Terminates when a name consisting entirely of %'s is found

PROCreadrec Reads record number r% from the main database file. Filename, description and source are extracted from the single string record$

PROCretrieve Displays names of all the programs on the database. Allows full up and down scrolling through list, and simple searching by initial letter of name. Records can be retrieved for further inspection and/or amendment

PROCsearopt Allows user to restrict search range for Browse, Print and Extract options

PROCshow Displays all the information for record number r%

PROCsort Quick sort, used to sort index entries

PROCwrite Controls the 'write new records' option. For each record enters all five fields, writes record on database and sorts index in memory

PROCwriterec Writes one record, number r%, on the specified index and main files at record position ptr%. The memory copy of the program name is changed if chmem is TRUE

Functions

FNdatein Enters a date in form DD/MM/YY. Performs partial validation. Returns numeric value in form:
10000*(year-1900)+100*month+day

FNdatestr Converts an integer date into a string of the form: DD/MM/YY

FNhit Returns TRUE if a particular record matches the search conditions set up in PROCsearopt

FNinput General purpose input function. Enters a string of max length len% characters at position (x%,y%). Allows proper functioning of DELETE and CTRL/U

FNpad Returns a string passed as an argument padded with spaces to a length of L%

Major variables

b$ blue teletext character
bl$ teletext block character
date$ date string as entered by user
dbname$ name of currently selected

database
desc$ program description field
fname$ filename field
g$ green teletext character
gy$ graphics yellow teletext character
name$ array containing sorted memory copy of index file
n$ array of database file names on current drive
prog$ program name field
r$ red teletext character
sour$ program source field
w$ white teletext character
y$ yellow teletext character
date% date a record was originally entered
dbdr% drive of currently selected database
dopt% description is/is not required flag in selective searches
dr% currently selected drive
dy% day – used when converting date to/from string format
early% earliest date allowed in selective searches
fdesc% max length of database file description (index header record)
fdnp% file name/disk number is/is not to be printed
field1% length of filename field
field2% ditto description field
field3% ditto source field
index index file channel number
index2 2nd index file channel number, used during Extract
late% latest date allowed in selective searching
main main file channel number
main2 2nd main file channel number, used during Extract
maxd% max disk number in selective searches
mind% min disk number as above
mn% month – used when converting date to/from string format
nf% number of database files on current drive (counting from zero)
nond% non disk software is/is not to be retrieved
nr% number of records on current db (counting from zero)
nr2% number or records on 2nd db when Extracting num disk number field
reclen% record size on main file recno byte array holding record numbers
sopt% program source is/is not to be printed
today% todays date (initially -1 to indicate 'not entered')
yr% year – used when converting date to/from string format

♦ Sample Printout 1 ♦

```
**********************************************************
*  Sideways ROM/RAM Software        *  Date : 26/8/86  *
**********************************************************

AMX Mouse              (Adv.Memory Sys.)    File: R.AMX       Disc: 23
Superb Macintosh-style windows and icon graphics,with mouse + disk S/W
----------------------------------------------------------------------------
AMX Super ROM          (A.M.S.          )   File: R.SuprAMX   Disc: 23
Improved 16k version of mouse ROM, with colour ART/icons. Superb.
----------------------------------------------------------------------------
Acorn DFS 1.2          (Acorn           )   File: R.DNFS1.2   Disc: 23
The DNFS chip,faster than DFS 0.9, bugs cleared up.Not V different tho
----------------------------------------------------------------------------
B+/View 2.1 Patch      (Acorn User 7/85)    File: B+Patch     Disc: 23
Enables View 2.1 to be used with   Shadow Screen memory on BBC B Plus.
----------------------------------------------------------------------------
BASIC I                (Acorn           )   File: R.BASIC-1   Disc: 23
Original Acorn BASIC - 1981 version
----------------------------------------------------------------------------
Eprom Programmer       (Beebug 4.5      )   File: Eprom       Disc: 51
BASIC program to drive d-i-y Eprom Programmer described in Beebug.
----------------------------------------------------------------------------
Guardian SLM/TLM       (Guardian S'ware)    File: R.STLM      Disc: 23
Source & Text library managers on  one ROM. 399 files per 80T disk!
----------------------------------------------------------------------------
ISO Pascal Pt.1        (Acornsoft       )   File: R.Pascal1   Disc: 23
First of two ROMs for Level 8 ISO  Pascal language.
----------------------------------------------------------------------------
ISO Pascal Pt.2        (Acornsoft       )   File: R.Pascal2   Disc: 23
Second of two ROMs for Level 8 ISO Pascal language.
----------------------------------------------------------------------------
ISO Pascal-Level 1     (Acornsoft       )   File: see below  Disc: 40
Disc based version for 6502 second processor in dpascal and dcomp.
----------------------------------------------------------------------------
MASTER Rom Loader      (Beebug 5.3      )   File: M,RomLoad   Disc: 51
Simple but effective menu for disc based ROMs, for MASTER s'ways RAM.
----------------------------------------------------------------------------
RAM Print Buffer       (PCW July 85     )   File: A.RAMBuff   Disc: 10
Extends printer buffer to a max of 15K using s'ways RAM. Needs BASIC 2
----------------------------------------------------------------------------
RFS Formatter          (BBC ROM Book    )   File: FormRFS    Disc: 23
Puts any no. of BASIC or m/c files into ROM Filing System format.
----------------------------------------------------------------------------
ROM Controller         (Beebug 5.3      )   File: RomCont     Disc: 51
Highly effective ROM disabler. Dead ROMs stay off even thru CTRL/Break
----------------------------------------------------------------------------
ROM/RAM/Disc Utils.    (Ac.User 6to8/85)    File: R.RAMUtil   Disc: 20
V.good set of utils:kill ROMs,print buffer extended,safe BACKUP/COPY..
----------------------------------------------------------------------------
Rom Menu/Utilities     (L.B.Wakefield   )   File: RomMenu     Disc: 20
Lists ROMs in machine/on disc.Load/copy/compare/kill/enable/enter ROMs
----------------------------------------------------------------------------
Save Program to RAM    (Beebug 4.9      )   File: A.RamSafe   Disc: 23
Creates ROM image which allows save/load to & from sideways RAM.
----------------------------------------------------------------------------
Starstick              (Microtest       )   File: R.StarSti   Disc: 23
Runs many games with contact-type  j/stick via user port + extra cmnds
----------------------------------------------------------------------------
Toolkit                (Beebugsoft      )   File: R.TOOLKIT   Disc: 23
Superb BASIC programming utilities,inc screen editor.Indispensible!!!!
----------------------------------------------------------------------------
```

♦ Sample Printout 2 ♦

```
**********************************************************
*  Graphics Utilities and Demos     *  Date : 11/9/86  *
**********************************************************

3-D Bar Charts         (Beebug 2.10/LBW)  3-D Rotation          (Beebug 1.10/2.3)
3-D SIN/COS Plot       (Beebug 1.1      )  3-D Surfaces          (Beebug 3.8      )
3-D Text #1            (Beebug 4.3      )  3-D Text #2           (Acorn User 6/85)
AMX Art                (AMS             )  AMX Art Pic. Strip    (L.B.Wakefield   )
AMX Art Screen Dump    (L.B.Wakefield   )  AMX Art Slide Show    (L.B.Wakefield   )
AMX Art Utilities      (AMS             )  AMX Colour Sketch     (AMS             )
AMX Icon Designer      (AMS/Elliot S'wr)   AMX Pattern Design   (AMS             )
AMX Super Art          (A.M.S.          )  Animator              (Acorn User 5/85)
Astaad CAD Program     (Beebug 2.1/2.9  )  BUDGE Char. Definer  (Acorn User 4/85)
Body Popping           (Beebug 3.9      )  British Isles Map     (Beebug 5.4      )
Character Definer      (Micro User 1.4  )  Character Shaper     (Beebug 2.6      )
Chequer Board          (Beebug 2.7      )  Colour Fill           (Acorn User 1/85)
Colour Fill Demos      (Acorn User 1/85)   Dancing Lines         (Beebug 2.8      )
Dot Fill               (Acorn User 1/85)   Dot Fill Bar Charts   (Acorn User 2/85)
Dot Fill Demos         (Acorn User 1/85)   Dot Fill Pie Charts   (Acorn User 2/85)
Double Height Chars    (Beebug 2.1      )  Double Width Chars    (Acorn User 7/85)
Down to Earth          (A&B Comp. Jul85)   Earth from Space      (Beebug 4.8      )
Ellipto                (Beebug 2.2      )  Fabric Patterns       (Beebug 2.5      )
Fast Colour Fill       (Beebug 5.3      )  Fractal Generator     (Acorn User10/85)
Global View            (A&B Comp. Jun85)   Harmonograph         (Beebug 1.7      )
Hot Air Balloons       (Beebug 2.3      )  Icon Art              (A&B Comp. 8/85  )
Icon Art Pic. Strip    (A&B 3/86 & LBW  )  Icon Art Pixel Edit  (L.B.Wakefield   )
Icon Art Scrn.Dumps    (L.B.Wakefield   )  Icon Art Slide Show   (A&B 3/86 & LBW  )
Icon Art Utils Menu    (L.B.Wakefield   )  Icon Colour Art      (L.B.Wakefield   )
Inbetweening           (Beebug 4.10     )  Irregular Area Fill   (Acorn User 8/83)
Landscape Generator    (Acorn User12/83)   Life (Game of)       (Beebug 1.10     )
Life 3-D               (Acorn User 3/84)   Mandelbrot Graphics  (Beebug 5.1      )
Mathematical Graphs    (Beebug 3.1      )  Mickey Mouse          (Micro User 3.5  )
Mixed Screen Modes     (Beebug 3.10     )  Mode 7 Graphics       (Acorn User 3/85)
Mode 8                 (Beebug 2.6/AUG  )  Mode7 Graphics Demo  (Acorn User 3/85)
Owl                    (Micro User 2.2  )  PLOT extension       (Beebug 3.7      )
Paintbox-Acorn User    (Acorn User 2/85)   Pixel Editor         (Acorn User 3/86)
Polar Curves           (Beebug 4.1      )  Recursive Trees       (Beebug 4.5      )
Rotating Planets       (Pe.S'ware Spr83)   Scrolling Demo #1    (Micro User 2.6  )
Scrolling Demo #2      (Micro User 2.6  )  Shapes               (Micro User 1.1  )
Snowflakes             (Beebug 2.4      )  Sorcerer's Castle     (Your Comp.Dec82)
Spirals                (Beebug 1.2      )  Spiro Plot            (Beebug 1.9      )
Spiro Windows          (Micro User 2.3  )  Sprites Definer      (Beebugsoft      )
Sprites Demos          (Beebugsoft      )  Sprites Intro         (Beebugsoft      )
Sprites Mach. Code     (Beebugsoft      )  Square Dance          (Beebug 1.10     )
Super Painter          (Acorn User 1/86)   The Train            (Your Comp.Nov82)
Triangle Patterns      (Acorn User 6/83)   Union Jack           (Beebug 1.6      )
Zoom Graphics          (Beebug 3.2      )
```

Margaret Stanger

EYE CATCHER

An eye-catching Mode 7 teletext logo

In this program a teletext logo is put on the screen with a choice of a BASIC or a machine code routine.

The data for this header is stored from location &2E00 and is read in as follows:

LOCATION	CONTENTS	MEANING
&2E00	31	PRINTTAB
&2E01	6	Sixth column
&2E02	10	Tenth row
&2E03	147	Yellow graphics
&2E04	154	Separated graphics
&2E05	32	Space
&2E06	32	Space
&2E07	106 and so on	

The BASIC program reads in the contents of each location and uses the VDU command to print each item on the screen. The machine code uses the OSWRCH (Operating System Read/Write Character) routine at &FFEE to achieve the same result. The data is read sequentially from its location into the accumulator and the OSWRCH routine called. This loop can be written more efficiently by using Indexed Addressing.

X	Accumulator
0	31
1	6
2	10
3	147
4	154
5	32
6	32
7	106 etc

LDA&2E00,X loads the accumulator with the contents of address (&2E00+X), so the same command can be used as X varies from 0 to 149. The program increases X each time and repeats the loop if X has not reached 150. This is comparable to a BASIC FOR NEXT loop.

Variables

A%	item of data
I%	loop variable
PASS	loop variable for two pass assembly

Main program

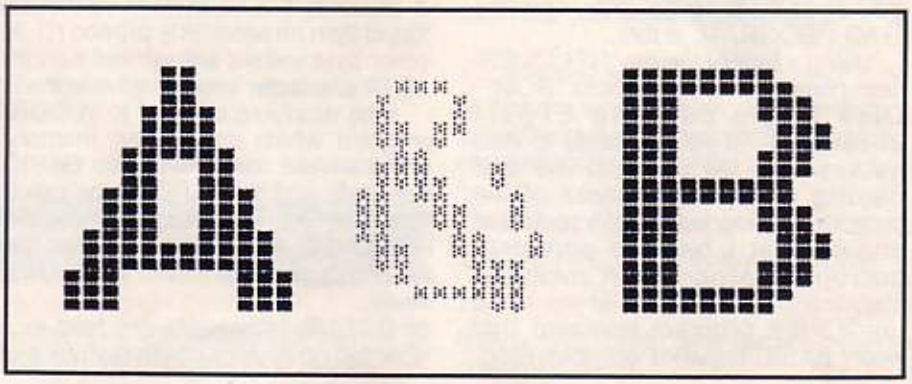
20-50	reads data into store
60	assembles machine code
70	sets Mode 7
80	calls machine code
90	moves prompt down one line

Procedures

PROCCHEAT - contains the BASIC routine to VDU each item of data

PROCAS - (170) two pass assembly
(180) sets the program pointer to start the machine code at &A00
(190) start of machine code
(200) loads X register with zero
(220) loads the accumulator with the contents of (&2E00+X)
(230) and sends it to the screen via OSWRCH routine at &FFEE
(240) increases X register
(250) compares X for 150
(260) branches to LOOP if X less than 150
(270) return to BASIC
(280) end of machine code
(290) next pass of assembler

DATA - the six program lines of DATA correspond to the six lines of the display.



David C Reilly

QUICK RECOVERY

A tip or two and a handy program for recovering corrupted BASIC files corrupted while stored on disk

While entering a program from a magazine or devising my own software I try to follow the correct safety procedure of saving my efforts at regular intervals. As Murphy's Law would have it, the Beeb got a mains spike in a delicate spot just as it was writing to the disk with the latest version of my program. The damage to the disk data was such that the Beeb wouldn't even look at the disk when the catalogue command was issued, instead it spun the disk for a while and eventually reported a disk fault. Upon closer investigation using a disk editor I first noticed that the catalogue information was actually still on the disk but the file starting addresses were wrong. Secondly, on examining the actual program file on disk it appeared that 90% of the program was fine and that only 10% had actually been corrupted beyond recovery.

With 90% of a 16K program still on the disk and relatively OK there was no way I was going to re-type the complete program. I had to find a way of recovering the disk.

Firstly I edited the start sector address information for the files on the disk. Now the disk would give a proper catalogue reading, but would not allow loading of the program, only reporting 'BAD PROGRAM' errors.

Using a facility like the 'RECOVER' command on the 'Disc Doctor' ROM – Disk Users can use Expert Investigator – it was possible to load sectors from the disk into memory. Starting with the first sector of the program file I loaded enough sectors to ensure that I had the complete corrupted program in memory. Examining the memory where I had loaded the program revealed that every BASIC keyword was tokenised.

Recovery Process

A *SPOOL file is opened called NEWPROG which will hold the recovered version of the program. The program then runs through memory and checks each byte. If a byte has a value of &0D (13, carriage return) then this signifies a new line number and is followed by three bytes. The first two are combined to give the actual line number and the last one is a count of the number of bytes which make up the program line, including the three bytes and &0D. The program translates the line number into decimal and prints it to the *SPOOL file.

If a byte has a value between 0 and &C or &E and &1F then it is regarded by the program as a corrupted character and a <@> is printed instead of a direct translation of the value.

If a byte has a value greater than &7F then it is a BASIC token and is translated into its equivalent keyword. If however, the equivalent cannot be found then an asterisk is printed (*). All other byte values are printed as their ASCII character value equivalents.

Line numbers referred to in GOTO program which could read memory and translate the tokens into BASIC keywords and then SPOOL the result to a disk file. That program is called RECOVER and it's listed on the second page of this month's Disk User menu.

or GOSUB statements are held in a none too obvious four byte fashion and as a result I have not been able to translate them, so the program prints a row of @ or * markers instead. Once the recovery has taken place these markers may be replaced by the correct line numbers.

Running Recover

To run the program from command mode rather than the menu type

MODE 7

then, type

CHAIN "RECOVER"

ensuring that you have previously loaded the BASIC program into memory starting at no less than &3000 (12288 decimal), as the program requires this much space for itself and its variables.

The program will prompt for the starting address at which you loaded your program. Next enter the number of bytes to be recovered, this should be the length of the program plus a little extra.

The program will now spool the recovered program to the NEWPROG file and then list the lines it knows are incorrect in some manner. Type

NEW

You may now type

***EXEC NEWPROG**

to load the recovered program and proceed to add in the lost lines, correct the GOTO line numbers and take out any unwanted junk.

You should now have a fully recovered program.

FROM LOTHLORIEN

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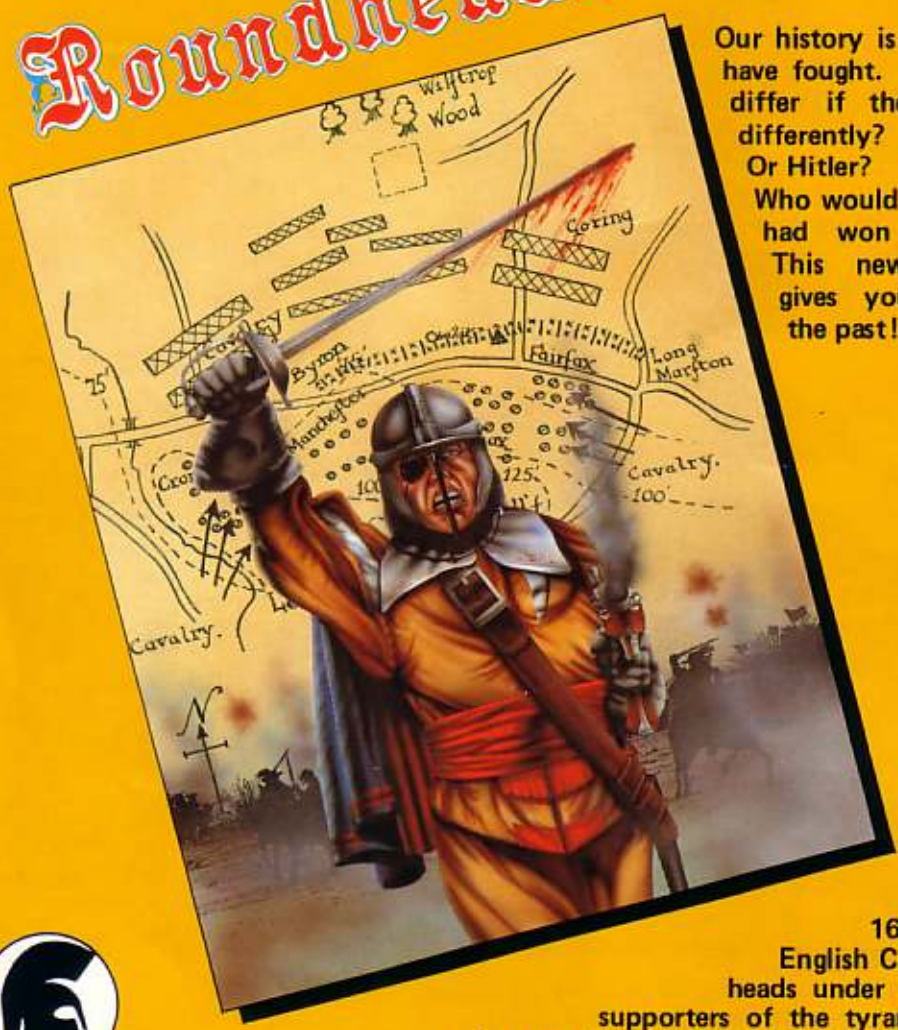
Roundheads



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CODENAME: DROID

Stryker's Run - Part 2


The Dramatic Loading Screen


Climbing up a rope (SURFACE DEFENCE)


Flying with a jet-pack (ANCIENT SHRINE)


The elusive "Herbert" Droid (CREW'S QUARTERS)


Crawling under a crane (MISSILE FACTORY)

Commander John Stryker is back in CODENAME: DROID

Stryker's Run was one of our most successful releases of 1986. It stayed at the top of the BBC Micro software charts for six weeks and received several glowing reviews: "The graphics are stunning . . . This should be in every collection" enthused A & B Computing.

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As Stryker descends below the planetary surface, he will pass through 4 different zones of Volgan activity:-

- The Surface Defence — an array of steel girders, ropes and chains lies coldly between the crusted white rock walls.
- The Ancient Shrine — a stone-walled temple bedecked with hideous gargoyles and rusting chandeliers.
- The Crew's Quarters — the Volgans' relaxation area: tables and chairs are arranged invitingly amongst the essential ventilation pipes.
- The Missile Factory — clinical psuedo-metallic walls surround the missiles, bombs, and computers of the evil Volgan race.

Your character in the game can jump, run, kneel, crawl, climb up and down ropes, fire his laser blaster and drop mines. He can also fly for short distances using his jet-pack, and access information via his wrist terminal computer.

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The screen pictures show the BBC Micro version of the game. The graphics of the Acorn Electron version are indentical.

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