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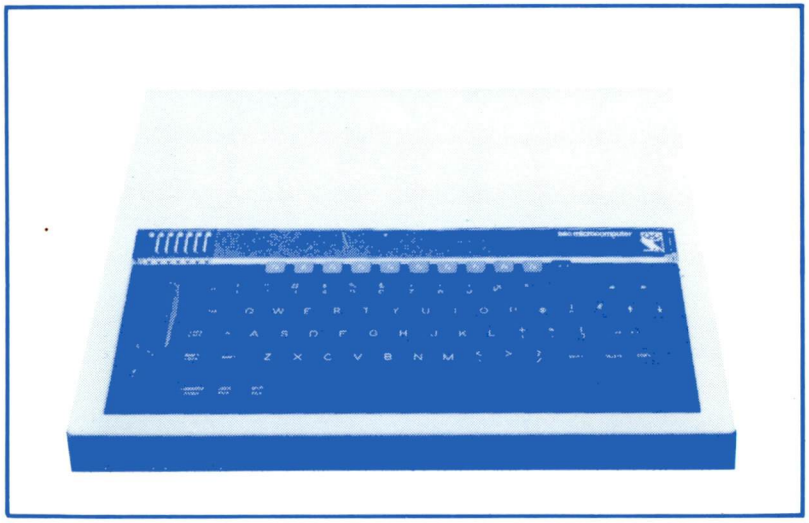
DISK MANUAL

FOR THE (BBC) COMPUTER



GOOD COMPANY SOFTWARE

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DISC MANUAL

for the

(B.B.C.) COMPUTER

CONTENTS

INTRODUCTION

The purpose of this booklet is to enable you to use the powerful disc operating system with your BBC Machine. This will enable programs to be loaded and saved much faster than cassette operation. Included with this is a special 'Utility' Disc which contains programs for setting up and checking the discs prior to storing data and programs.

The booklet will give a description of the various disc commands and their uses.

The modifications to your machine consist of adding IC's and changing links and may also require soldering work in some cases. We would recommend that only competent persons who are used to working with electronic equipment carry this out although the actual work involved is fairly straightforward.

Your computer should have been supplied with a Disc Operating System fitted. In many cases an increase in the speed of operation can be gained by fitting links 3 and 4 on the keyboard. The Opus 3" Microdrive has a track to track search time of 3 milliseconds (three thousandth of a second).

To carry out these modifications a Model 'B' Machine fitted with the 1.2 Operating System must be used. Model 'A' Machines may be used but these must be upgraded to the 'B' version first.

To establish which operating system is fitted inside your machine, enter *FX0. To work a disc system you also require a Utilities Disc and at least one blank disc on which to store your programs.

Switch on and listen for the double bleep. If all is well the screen should display a legend similar to:-

BBC Computer 32k

Acorn DFS
BASIC

Having obtained the correct opening message you are now ready to connect up your disc drive unit. The descriptions which follow cover normal 5¼" floppies as well as the 3" Microdrive. This is done in order that the user becomes familiar with both systems.

There are various types of drive configuration. These are:-

single sided,	40 track drive
double sided,	40 track
single sided,	80 track
double sided,	80 track

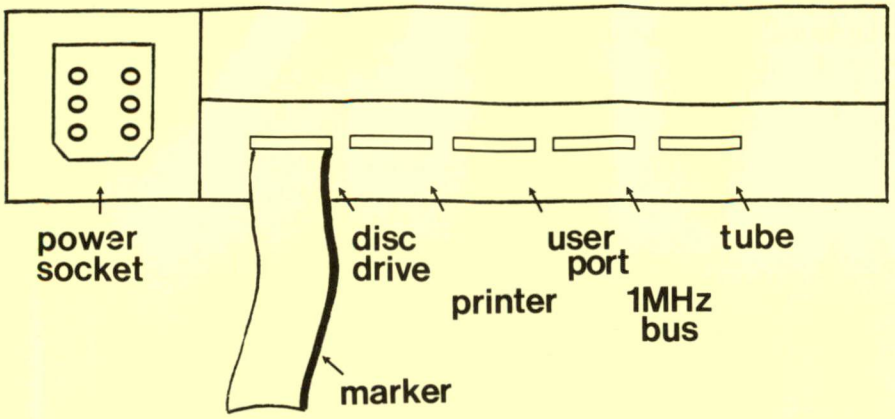
These can come either singly or as dual units. The BBC can cater for up to 4 drives (allocated as DRIVE 0,1,2 or 3) with the 4 drive option normally consisting of two doubled-sided drives mounted in a single housing.

You will find that there are two cables attached to the drive. One of these cables will be a flat ribbon cable which is the data cable and the other is a power cable with a small 6-way connector attached. Both these leads are connected into the BBC Machine. Your OPUS 3" Microdrives are doubled-sided 40 track drives.

Connections

Firstly, switch OFF the computer. The ribbon cable must be plugged into the 34-way connector underneath the BBC Machine marked "disc drive". The correct orientation of the connector is with the ribbon cable downwards away from the machine. Some connectors will have a raised 'key' on the top which engages with a slot in the BBC connector. Again the ribbon cable should come downwards away from the machine, (see diagram on Page 3). When correctly fitted the clips at either end of the plug will spring upwards to hold the socket in place. To release the socket press both clips outwards.

View from underside of BBC Machine



The power cable supplied with the single drive units plugs direct into a connector mounted underneath on the power supply on the left of the computer. This connector is 'polarised' and will therefore only fit one way round.

Re-check that all connectors are correctly fitted.

Using the Disc Drives

Switch ON the computer and the disc drive unit (dual drives with separate mains supply) and then if all is well you should again hear a double bleep and see the message:-

BBC Computer 32k

Acorn DFS

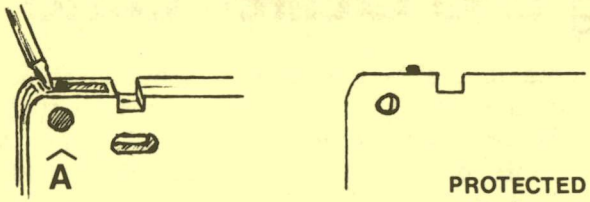
BASIC

You are now ready to try out the disc drive.

Carefully remove the protective packing card (if fitted) from the drive by opening the door flap and pulling the card out. The idea of the card is to prevent the two read/write heads from banging together during transit.

Check that a Utility Disc is supplied with your drive unit. Without this it may not be possible for you to use the system. Two types of $5\frac{1}{4}$" floppy discs are available, 40 and 80 track and must be used with the correct drive. Some drives however, typically the 80 track drives, are sometimes fitted with a Switch Option which allows 80 and 40 track discs to be used.

3" Microdrive discs are inserted in the drive with the label marked 'A' uppermost. Should your drive be mounted vertically the 'A' side would face to your lefthand side. The Utilities cartridge has a protection notch which is covered by pushing a small plastic lug across. Use the tip of a ball point pen or similar object.



$5\frac{1}{4}$" floppies are inserted with the label uppermost for drives mounted with the slot horizontally or with the label to the right in drives mounted with the slot vertically. There is also a small notch cut in the side of the disc (on the Utility Disc this notch has been taped over to prevent any accidental overwriting of information similar to the way in which cassettes can be prevented from being recorded over). This notch should be towards the left hand side of the slot for single drives, or towards the top of the slot for vertically mounted drives. For dual drive units the disc should be inserted into the LEFT hand drive. The disc MUST be inserted the right way round otherwise the computer will be unable to access information on it. Then close the door flap. Incorrect insertion however should not damage the disc or the drive.

The computer allocates drive numbers, as mentioned earlier, in the following way:-

Single drive,single sided	DRIVE 0	
Single drive, double sided	DRIVE 0 & 2	
Dual drive, single sided	DRIVE 0	(l.h.drive)
	DRIVE 2	(r.h.drive)
Dual drive, double sided	DRIVE 0 & 2	(l.h.drive)
	DRIVE 1 & 3	(r.h.drive)

Each particular drive can be accessed by specifying its drive number, and this will be discussed later on. If no drive number has been specified, then DRIVE 0 is assumed to have selected and the programs on the Utility Disc have been formed to operate when Drive 0 is selected.

Using the Utility Disc

An automatic start-up option has been included on the disc and this means that you can gain access to the programs via a "MENU" program which will display a list of the programs available on the disc. To use this, hold down the SHIFT key and press the BREAK key. This is called 'Auto-booting'. Try it now.

You should find that the light on the drive comes on and you should hear the motor on the drive running. A few seconds later the motor should stop and the light go out and an introductory message display come up on the screen. If this fails to happen and the message "Disk Fault" comes up, then you need to check that:

i) The drive connectors are correctly inserted and in the case of the dual drives, that the mains switch on the drive unit is ON.

ii) The disc has been inserted into the correct drive and that it is the RIGHT WAY ROUND. Check earlier for mention of the way to insert the disc.

After about 15 seconds the display should be replaced with a "menu" listing all the programs available. The first thing you need to do is to make a back-up copy of the Utility Disc. This is advisable in case anything goes wrong when you are using the drive and data on the disc gets corrupted, and also for safeguarding any important programs you may have.

Assuming that you have bought a batch of blank discs, you will need to 'format' them ready to accept data in a form understandable to the computer. In general, like cassette tapes, a disc produced on one computer may not necessarily work on another manufacturer's one.

Data is recorded as a series of 'tracks' and these can be either 40 or 80. Each track is sub-divided into ten 256 byte blocks called 'sectors'. 40 tracks will hold up to 100k bytes of data and 80 tracks will hold up to 200k bytes. These tracks and sectors are absent on blank discs and therefore need to be recorded before you can save any programs.

40 track double sided drives such as the Opus 3" Microdrive will hold 100k bytes per side, giving a total of 200k bytes. 'k' in computer terms means kilo and represents 1024 bytes. Thus the drive has a memory capacity of 204,800 bytes. It is the intention of OPUS SUPPLIES LTD. to bring out what is known as 'double density' early in 1984. This will provide a method of increasing the capacity to 400k bytes. Club Members will be kept informed as usual.

There is a program on the Utility Disc called "FORMAT" and by loading and running this program you can pre-record the required tracks and sectors. The program is also used to set-up the Catalogue required for holding the information about files saved on the disc.

To run the program is simply a matter of typing the appropriate letter next to the program name as it appears in the menu listing. The Menu program will automatically load and run the program. Try it now.

You should find that the disc drive will start-up again and the formatting program will be loaded and run. You could also access the formatting program direct by using the CHAIN command as used with cassette files, i.e:-

CHAIN"A.FORMAT"

(The significance of the 'A' in front of the filename - the filename 'directory' letter - will be described in the next section).

The program will then ask you a series of questions about the disc you wish to format:-

Drive No.?

Type 0 to indicate that you want to use drive 0.

The message "REMOVE FORMAT DISK" will appear to remind you to remove the Utility Disc other wise all the information on it could be erased were it not protected by the notch cover.

The message:

Insert blank disk into drive 0

will appear to prompt you to put your blank disc into the drive.

The next question asked will be:

No. of tracks required (80,40,35)?

Type the number 80,40 or 35 depending on what type of drive you are using. 80 track drives may however be used for formatting 40 and 80 track discs if you have a "Switch Option" fitted. Make sure this switch has been set for the correct number of tracks. This is important particularly when formatting 40 track discs as it is possible to format for 40 tracks with the drive switched for 80 tracks without any error being detected. You would then find that the disc would produce error messages when used on a 40 track drive. However, trying to format for 80 tracks using a 40 track drive would produce error messages by the formatter program. Select 40 when using 3" Microdrives.

You will then be asked:

Ready to format drive (Y/N)?

Type Y and the program will start with the acknowledgement:

Formatting Drive 0 - Please wait

As the program proceeds, a series of numbers (hex) will appear. These represent the track numbers as they are being formatted.

On completion you should see:

Drive 0 formatting complete
0 Format errors
0 Verify errors
Format another disk(Y/N)?

The 'format errors' count gives the number of errors encountered when attempting to write to the tracks. The 'verify errors' count indicates any errors encountered when reading back the information recorded when the tracks were formatted. These errors can be seen as '?' appearing next to the track numbers:

e.g. 00? 01. . -format error on track 0
00 ?01. . -verify error on track 0
00??01. . -format and verify errors

If errors have occurred, you will be asked:

Another try(Y/N)?

Type Y and the formatting process will be repeated. The program will assume the same Drive number and the same number of tracks. If after three attempts you are still getting errors then the disc is probably faulty. If you are getting '??' after each track number, check that the drive unit is correctly connected. Check also that the disc is not write protected.

If no errors have occurred you can format another disc by replying 'Y' to the message:

Format another disc(Y/N)?

The program will assume you want the same drive number and number of tracks.

To change to a different drive number, e.g. to format the other side of a disc in a double sided drive, or to change the number of tracks required, simply press 'ESCAPE' and type 'RUN' and the Formatter will re-start.

This concludes the explanation on the formatter and it is a good idea to format all your blank discs at the same time. Included on your Utilities Disc are programs which will dump High Resolution Pictures from the monitor screen on to various types of dot matrix printers. Also to move long programs (originally on tape) down memory, after a disc load, before a RUN commences. Full instructions explaining the use of these programs are included on the disc.

Now you have formatted some discs you can now make a back-up copy of the Utility Disc. To do this, there are two commands:

*ENABLE
*BACKUP <source drive><destination drive>

The command *ENABLE must be used in this and for certain other disc commands which have drastic effects on disc files.

In the *BACKUP command the <source drive> is the drive which contains the disc you wish to copy from and the <destination drive> , the drive containing a blank (but formatted) disc ready to be copied to.

If you only have a single drive unit you need to specify source and destination drives as being number 0 (or 2 if you have a double sided drive). When you enter the command, the computer will prompt you to insert the source disc and then ask you to remove this disc and insert the blank (destination) disc. This will happen several times as the computer only transfers one file at a time. Be careful that you do not get the discs mixed during these transfers. To help you, place a small adhesive label (normally supplied with blank discs) over the "Write Protection" notch (mentioned earlier on) cut in the side of the Utility Disc if this is not already fitted. This will prevent any information being overwritten on the Utility Disc.

An error message will be produced if an attempt is made to write to protected disc:

Disk write protected

For single drive users enter the commands:

```
*ENABLE
*BACK 0 0
```

and then follow the instructions given by the computer.

For those with dual drives, you can insert the Utility Disc in Drive 0 (left-hand drive) and the blank disc in drive 1 (right-hand). In this way, unlike the single drive unit, the computer will transfer all the files from one drive to the other without any intervention.

Use the commands:

```
*ENABLE
*BACK 0 1
```

You will be able to see the two drives being activated alternately (watch the drive LED lamps where fitted).

You now have a copy of the Utility Disc which you can use when needed whilst keeping the original as a master.

Another program on the Utility Disc is VERIFY which is used for checking the entire disc for any errors (or 'corruptions') which may have occurred. This works in a similar manner to the Formatter by asking you for the Drive number containing the disc to be checked.

You can access the program from your Utility Disc by calling (or 'booting') the Menu program. This is done by holding down the SHIFT key and pressing the BREAK key the same way as before. Pressing the appropriate letter when the Menu is listed will load and run the program. Alternatively you can enter:

CHAIN"A.VERIFY"

The program should load and you should get the message;

Drive No.?

Leave the Utility Disc in the drive and for this exercise verify the Utility Disc you have just made. Type 0 if the disc is in Drive 0.

The following message should appear:

Ready to verify drive(Y/N)?

Type 'Y' and the program will start. There is no need to specify the number of tracks as the program reads the disc size from the Catalogue sectors recorded on track 0.

As with the Formatter a series of numbers corresponding to each track as it is checked will appear. When complete, the results of the verify will be displayed:

40 Track Disk

Drive 0 verify complete
0 Verify errors

This is what you should get if successful (this is assuming Drive 0 selected and a 40 track disc used).

Any errors found, again, will be shown by a '?' following the track number. If a disc does contain errors then all the files on it should be transferred to another disc if possible and the problem disc re-formatted.

The message '40 Track Disk' tells you the number of tracks the disc has been formatted for. If the program has not read a valid disc size i.e. 35,40 or 80 tracks then you would get the message:

Disk not formatted

This verify program can therefore prove useful for checking discs that apparently fail to work by detecting corruption of the data on them or if you have forgotten to format them before use.

Disc File Commands

The filename is at its best when composed of six letters and a number. The name cannot be any length as with the cassette filenames. Symbols can also be used but not *:!.#or spaces, since these all have a special meaning.

The names as applied to discs usually involve more than the mere name, the Drive number <drv> and the directory letter <dir> are also used. This combination is called the File Specification <fsp>. The format would therefore be:

:<drv>.<dir>.<filename>

Note the use of ":" and "." as part of the fsp. Thus for a full load command you might type:

LOAD ":0.$.FRED"

In practice, however, the fsp can be shortened.

This can be accomplished by considering the following two commands:

i) *DRIVE<drv>

This command sets the drive number for any future disc operations and this saves you having to specify the drive number in the File Specification. On power-up the computer will assume Drive 0 until you change it using the above command.

The example load command can be reduced to:

LOAD "$.FRED"

Within the Catalogue files are placed in different 'directories'. This allows you to use files with the same name as long as they are in different directories. In the above command, the file FRED is stored in directory '$'. This particular directory is the one that is assumed by the computer unless changed using the following command:

ii) *DIR<dir>

The directory letter may be any alpha-numeric character, but again, *:!. should be avoided.

Using this command you can reduce the example command to:

LOAD "FRED"

With this you can see that the command is now the same as the cassette command and called the Alternative File Specification<afsp>.

The selected Drive number and Directory letter may be changed at any time and if you need to use an alternative drive or directory letter temporarily you can specify the full command.

WILDCARD FACILITY

This is a method in which you can process a group of files with similar directory letters or filenames. The following symbols are used: '*' and '#'. The '#' symbol is used to replace a single character and the '*' symbol, a group of characters.

For example, if you had the following group of files:

$.HELLO
A.HELP
A.HELP2

then by using an afsp of:

.HE

you would be able to use the *COPY, *INFO, *DESTROY, *WIPE, *ACCESS commands (described later) to operate on all files starting with the letters 'HE' and in any directory.

Another example might be:

*$.T##T

fsp = $.T##T

Operation on directory $ files:

$.TEST
$.TENT
$.THAT

would be allowed, i.e. all files in directory $ with filenames of four letters and the same first and fourth letter 'T'.

To see that files you have in the catalogue, use the command:

*CAT (which may be abbreviated to *.)

A listing of all the files in directory order will be produced. Files in the currently selected directory are listed first (without a preceeding letter). The catalogue heading will tell you the current directory and also the drive being used. All other files will be shown in groups with the directory letter shown.

Try putting the Utility disc in and asking for the Catalogue by typing *.

You will see files without a directory letter, e.g. !BOOT and MENU and other files such as FORMAT, VERIFY all listed under directory 'A'.

To obtain listings of other drive catalogues simply type:

*.<drv>

where <drv>can be a number 1 to 3 inclusive.

KEYWORDS

Keywords such as used in the commands just described are reserved for the Disc Operating System and the following is a description of the others available.

*HELP

The Operating System and Filing System version numbers will be displayed.

*HELP DFS

Used to list out all the available commands in the Disc Filing (or Disc Operating) system.

*HELP UTILS

A list of general purpose commands for special file operations. These will be described later on.

***ACCESS afsp L**

Access locks or unlocks a file. Locking a file prevents it from being accidentally overwritten. Omitting the 'L' will unlock the file. For locking all your files at once type using the 'wildcard' facility:

*ACCESS *.* L

***BACKUP src drv dest drv**

A means of copying all files from one disc to another, overwriting any files already on the destination disc. Any command that can cause this type of damage has to be preceeded by *ENABLE. ANY PROGRAM IN THE COMPUTER WILL BE AFFECTED therefore make sure you save any program you want beforehand.

e.g. *ENABLE
*BACK 0 1

***COMPACT drv**

This has the effect of moving all the files to the start of the disc to take up space left by files that have been deleted. This leaves all free space after the end of the last stored file. As the files are moved, information about load, execution addresses, length and sector start address will be displayed.

```
e.g. $.TONY  FF1900 FF801F 0000FF 002
     A.MIKE  FF1900 FF801F 0001FF 003
     A.STEVE FF1900 FF801F 0001FF 005
     B.LEE   002000 0020000 0000FF 007
```

This command need only be used if you do delete any files. Again any programs in the computer will be affected.

***COPY <src drv><dest dry><afsp>**

Copies are named program from one drive to another. Quote marks are not required on the fsp . A series of files all starting with the same letters can be copied using:

COPY<src drv><dest drv> .xx

where 'xx' are the start letters. Wildcard facility is allowed e.g.

*COPY 0 1 *.HE*

Note that computer memory is affected when using the COPY command.

***DELETE<fsp>**

This will delete a single file. Once deleted, a file cannot be restored.

***DESTROY<afsp>**

A whole series of files with the same starting letters can be deleted in one single action using the wildcard facility. This command has to be enabled:-

*ENABLE
*DESTROY *.xx*
(xx-starting letters)

The files to be destroyed will be listed and you will be asked to confirm the command e.g.

*ENABLE
*DESTROY *.T*

$.TEXT1
$.TEXT2
Delete (Y/N)?

Typing 'Y' will delete all the named files. The message:

Deleted

is displaced when complete. Typing anything else will cancel the command.

***DIR <dir>**

dir can be any letter. After a BREAK keypress the computer will assume '$' as the current directory. After this command, saved files will be placed in the specified directory.

***DRIVE <drv>**

<drv> can be a number 0 to 3 representing up to four drive units. After a BREAK keypress, Drive 0 is automatically selected.

***ENABLE**

A command which is necessary before any destructive commands such as BACKUP or DESTROY are used.

***INFO**

This provides additional information about a file in the following order:

<dir><fsp> (L) <start><exec><length><sb>

where 'start' is the start address, 'exec' the execution address, 'length' the length of the file in bytes and finally 'sb' the start block or sector address where the file is located on the disc.

All files on the disc may be accessed using:

*INFO *.*

***LIB :<drv>.<dir>**

Sets the library option on the currently selected drive to transfer action to the selected drive and directory, e.g. if you ran a program on drive 0 which required to access a program from drive 1, directory A then you would enter the command:

*LIB : 1.A

When Chaining in the main program, it would be loaded from Drive 0 and run and then Drive 1 would be activated to load in the other program.

***RENAME<old fsp><new fsp>**

In addition to just changing the basic name, it is also a facility for moving a file from one directory to another e.g.

*RENAME G.Prog E.Prog

If a file already exists with the new name then an error message will be produced.

***TITLE<disc name>**

A method of giving a useful name to your disc when the programs on the disc are all related to a particular topic, e.g. UTILITY, DATA etc. The title can be 12 letters long, but if the title contains spaces it must be placed inside quotation marks, e.g.

*TITLE "OPUS UTILITIES"

***WIPE<afsp>**

Removes all files starting with the same specified letters. This is similar to the DESTROY command but will list out each file in turn and ask you to confirm deletion of that file.

e.g. *WIPE *.HE*

UTILITY COMMANDS

The list given in response to the keyword *HELP UTILS are explained below, in the order in which they occur.

***BUILD<fsp>**

Used to construct text files consisting of ASCII text as opposed to say machine code or BASIC programs. The file is closed by pressing ESC. Line numbers are presented automatically. Colour may be added to the text (Mode 7 only) by using the SHIFT key together with one of the user function keys (see User Guide pages 153,154).

If the fsp = !BOOT and drive 0 is selected with option *OPT 4,3 set (explained later), then the lines will be treated as program lines and executed:

```
1. CHAIN MENU
2. ESCAPE
```

This will execute if BREAK is pressed whilst the SHIFT key is held down. This is how the Utility disc menu is brought onto the screen. It is important to note that !BOOT is a reserved filename and should not be used as a general file.

***DISC**
***DISK**

Changes the current filing system to disc operation. Note that on power up, the computer will assume disc operation and NOT tape. To regain tape operation simply type *TAPE.

***DUMP<fsp>**

Produces a hexadecimal listing of a file with ASCII equivalent characters where possible. Mainly used for examining machine code programs.

***LIST <fsp>**

Lists a text file such as produced by *BUILD or *SPOOL (used for producing ASCII text of a BASIC program) with each line numbered. Not to be confused with the BASIC List command.

***TYPE <fsp>**

This again gives a listing of text files but no line numbers are given. If you try this with a 'tokenised' BASIC program i.e. as Saved under BASIC you will find that rubbish is produced as the 'tokenising' process replaces the BASIC keywords with special internal codes.

***OPT N n**

These options enable you to set certain actions on the computer. This command should not be confused with the BASIC OPT N command.

1. *OPT 0 0 The default (or start-up) condition.
2. *OPT 1 0 Disable the *INFO command
3. *OPT 1 n n 0 = enable *INFO
4. *OPT 2 n Tape error detection
5. *OPT 3 n Interblock gap command
6. *OPT 4 0 Auto start Option off
7. *OPT 4 1 Load !BOOT file
8. *OPT 4 2 Run machine code file !BOOT
9. *OPT 4 3 Execute !BOOT file

Options 2,3 are used to prevent information about the files being disclosed to another user if you wish to protect your files. This like other commands may be included in your BASIC programs.

Options 4,5 are only of importance for users trying to produce tapes that can be read by other computers and therefore not of use for the ordinary user.

Options 6,7 are used to enable or disable the file !BOOT which you have seen can be used, for example, to load in the Menu program on the Utility Disc.

Option 8 is used to enable loading of a machine code program placed in the !BOOT file.

Option 9 is used to Execute commands contained in the !BOOT file as you have seen in the setting up of the Utility Disc.

!BOOT

See under *BUILD

Care of Discs

1) Always replace discs not in use into their protective wallets.

2) Magnetic fields can damage your disc, so do not place them on top of equipment or near magnets.

3) Never touch the disc surfaces where they are exposed through the black case or attempt to remove the disc from its case.

4) Never write on the case or onto the wallet whilst it contains the disc with a ball-point pen or other sharp object. Use only a felt-tip pen and employ only light pressure.

5) When the drives are not in use, keep the access doors closed.

6) Keep the discs away from sources of heat such as radiators or the sunlightthrough windows.

7) Do not fold or roll up the disc.

8) Try to keep the disc free from dust and other contaminants.

9) 3" discs are encased in a rigid plastic sleeve from which they are never removed.

Transferring tapes to disc

A BBC Computer fitted with a disc filing system automatically assumes disc operation. To load a Tape program, the user must first change the filing system by entering *TAPE. To restore the disc filing system, enter *DISC or *DISK. If you wish to transfer a lot of programs, it helps to define the red user keys as follows:-

```
*KEY 0 "*TAPE |M"
*KEY 1 "*DISC |M:*DRIVE <drv>|M"
```

<drv> = Drive No. (0-3)

You can now press f0 for tape and load in the program, then press f1 for disc and SAVE <fsp>. Remember, the name can only be seven characters with no spaces allowed in the middle of the filename.

Operating System calls

FILE HANDLING

For file handling in BASIC, command *CAT(or *.), OPENIN, OPENOUT, OPENUP (later versions of BASIC), INPUT#, PRINT#, BPUT#, PTR#, EXT#, EOF# and CLOSE are all available.

Operating System calls such as OSFIND, OSARGS, OSGBPB etc. may be used for discs files as standard (see User Guide pages 451-456 for full details). Note that the OSFIND call will return the opened file channel number IN THE 'A' REGISTER. Error codes are listed in the next section.

DISC TRACK AND SECTOR ACCESS

In addition to the above OS calls, there is an OSWORD call which enables you to read from or write to single or multiple sectors.

OSWORD call with A=&7F

On entry to this routine the X register (low byte) and Y register (high byte) must point to an instruction block in memory. The contents of the block given as an 'offset' is as follows:

Offset	
0	Drive number (0-3)
1-4	Start address in memory of Source or Destination of the data
5	The number of parameters required for the complete command
6	Command (&53 = read, &4B = write)
7+n	Parameters
8+n	Result of operation

Example:

Command = &53 (read), &4B (write)
No. of parameters = 3

Parameter 1 = Track address
Parameter 2 = Sector address (&00-&09)
Parameter 3 = Sector length/number of sectors to access

The 3rd parameter bits are made up:

Bits 0-4 = No. of sectors to be accessed
Bits 5-7 = n, where length of sector = 128 x 2n
(e.g. n=1 for 256 bytes (standard)

This would give &21 for a single sector of 256 bytes.

On exit from the routine, the Result parameter will contain &00 if the operation was successful, otherwise one of the following disc error codes will be present:

DISC ERROR CODES

&BD	Not enabled
&BE	Catalogue full
&BF	Can't extend file
&C0	More than 5 files (max) open
&C1	File read only
&C2	File already open
&C3	File locked
&C4	File already exists
&C5	Drive fault
&C6	Disc is full
&C7	Faulty disc
&C8	Wrong disc inserted
&C9	Disc read only
&CA	Bad Checksum
&CB	Bad Option
&CC	Bad File Specification
&CD	Bad Drive number
&CE	Bad directory
&CF	Bad attribute
&D6	File not found
&FE	Bad Command

FOR FURTHER READING AND A

GREATER UNDERSTANDING TRY:

The BBC Microcomputer Disk Companion

BY

Tony Latham

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Available from THE COMPUTER USERS CLUB,
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