A Dabhand Guide

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MASTER

512

User Guide

DABS PRESS

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et al

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Contents

This Book and You!

This book was written using the PC-Outline wordprocessor on a Master 512 microcomputer. The completed manuscript was transferred serially to an Apple Macintosh SE where it was typeset using MacAuthor. Final camera-ready copy was produced on an Apple Laserwriter II NT from which the book was printed by A. Wheaton & Co.

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Foreword

The BBC micro and BBC Master have become two of the most flexible small computers for general purpose use in the home, education, business and industry. However, there are two areas where BBC micros are lacking. First, the memory limitation, even the Master 128 leaves the programmer with little option but to resort to assembly language for large applications. Even more important is the lack of well developed business applications. The IBM PC and the MS-DOS Operating System which drives it have a large number of professional programs designed for them, often originally under the CP/M Operating System which was the world standard before DOS.

The Acorn 80186 co-processor attempts to fill this gap by providing compatibility with this wide range of business software, while minimising costs by utilising the keyboard, screen and other peripheral handling capabilities already provided by the BBC or Master micro.

The 512's Operating System is a customised version of Digital Research's DOS Plus, which is largely compatible with MS-DOS, specifically version 2.1. The 512 processor is an Intel 80186, which is code-compatible with the Intel 8088/8086 variant found in IBM PCs and most other IBM PC-compatibles.

While it is theoretically possible to run the majority of IBM PC applications on the 512, there are differences, and not all the software which you might expect to run will do so. This situation is complicated by the fact that many applications packages are simultaneously available in several different versions, necessitated by the multiplicity of versions of DOS.

It is probably beyond the scope of any book to attempt to list these differences in packages or to provide a comprehensive applications

explained to enable you to set up and maintain the system as well as to configure and run PC-compatible packaged applications.

This book was prepared using the Master 512. PC-compatibles were used for text entry and program development when no Master 512 was available. Typesetting was done with an Apple Macintosh desktop publishing system.

I would like to thank David Atherton and Bruce Smith for commissioning me to write this book, and Syd Day and Robin Burton for editing and adding to the text and, I am sure, improving it.

1 : Getting Started

The 512 Discs

The discs supplied with the Master 512 contain the DOS Plus Operating System, which provides the 512 with its PC-compatibility, and GEM (Graphics Environment Manager), the graphical 'WIMP' interface by Digital Research. The version of GEM provided with the 512 is specially written for it and works considerably faster than many versions on other PCs. The version supplied with the current release of DOS Plus is even further optimised over earlier issues.

For current purposes we need only note that the four issue discs contain:

DISC 1   DOS Plus boot and System Utilities
DISC 2   GEM applications
DISC 3   GEM data
DISC 4   Miscellaneous Utilities

DISC 1 contains the Operating System and a number of DOS Plus commands. If you are familiar with the BBC or Master, you will appreciate that the disc filing system (DFS or ADFS) and the Machine Operating System (MOS or OS) are both built into the computer, contained in a read-only memory chip (ROM or EPROM). In consequence the only action required to start the system is to switch on the power, since everything is ready and waiting for use.

In contrast many computers, like PCs, have only a small section of permanent program in ROM or EPROM. This is just enough to load the main Operating System and filing systems from disc. This small program is correctly known as a bootstrap loader, but this is commonly shortened to boot. Hence the expression 'booting a system', and so called boot files on the BBC, although these are slightly inaccurately named, as you'll see. Frequently the DOS Plus systems disc is also referred to as the boot disc, although the bootstrap loader is not even on the disc.

When you start the system with CTRL-BREAK (see below) the bootstrap loader is executed automatically. This action must be carried out by hardware, as the machine 'knows' nothing at this stage. The bootstrap loader is a small program that is only capable of accessing the disc controller in a very restricted way, but enough to load a file containing the full Operating System. After this is loaded, control is passed to it and the system is live and fully functional.

There are many advantages to having the Operating System on disc. Any version of the Operating System can be used by loading from the appropriate disc, and substantial improvements can be made without having to change any hardware. Furthermore, many different types and sizes of floppy and hard disc control software may be used. Of course there are also disadvantages. The disc must have a copy of the Operating System if it is to be used to boot the computer – this uses up some of your disc space. In addition, the Operating System must permanently occupy some of the computer's main memory. In the case of DOS Plus in the 512 this accounts for considerably more than 100k bytes of the original 512k. Another disadvantage is the possible inconsistencies which may arise if several boot discs are used, each perhaps containing an auto-running application, but containing different versions of the Operating System

Starting the System

Before attempting to connect and run the 512 you must ensure that your BBC hardware is suitable. For Master series machines this can be taken as read, but model B or B Plus users must ensure that they have a WD1770 disc controller, (8271 will not work under any circumstances) and are using an Acorn or compatible Advanced Disc Filing System (ADFS). The 'standard' or original non-hierarchical DFS is not suitable, even if it uses the 1770 controller.

You must also have a minimum of a double-sided 80-track disc drive. In practice, life will be very uncomfortable unless you have two such drives, or one and a Winchester 'hard' disc (any size of Winchester will do, 20Mb or more is recommended).

If the above conditions are met, the first operation is to ensure that the 512 hardware is properly connected. In the BBC Master the 512 board can be fitted in two ways. It can be connected internally by direct fitting to the circuit board using the pins and sockets provided, or it can be connected

externally, via the external Tube, (socket located in the recess underneath the micro) using an Acorn Universal Second Processor Unit. In Model B or B Plus micros the connection is always via the external Tube as no internal connections are provided as standard, nor can they be fitted as options.

At least two other manufacturers can supply an external Tube adaptor for the 512, and if these are used you should refer to their instructions for fitting and use.

Note that some magazines and advertisements have given the impression that the standard Acorn Universal adaptor is not an option for the 512 with Model B or B Plus micros. This is not the case. Not only is the Acorn adaptor eminently suitable, while reducing the likelihood of problems with guarantees in the event of hardware failure, it can, at the same time, be a less expensive option too. Bear this in mind if you are about to purchase.

The next step to using the 512 is to load the Operating System. The method used will depend on the type of hardware fitting used. Both methods are described below, first with the internal tube connection in a Master, followed by the external tube fitting for any machine.

Throughout this book the A> prompt is assumed as being the start point for all operations carried out after DOS Plus has loaded. In practice you may well be operating from drive B, drive M if you are running a memory disc (see Chapter Nine), or drive C if you have a hard disc (ie, a large capacity Winchester drive).

Internal Tube Start-up

If you have a Master 128, with Master 512 co-processor fitted internally:

1. Enable the Tube using:

```
*CONFIGURE  TUBE
*CONFIGURE  INTERNAL  (if required – see next page)
```

2. Insert DISC 1 into BBC drive 0.

3. Press CTRL-BREAK. This means press and release BREAK whilst holding down the CTRL key. The disc will be accessed and after a few moments the Digital Research logo will appear and the system will then be loaded. On completion the DOS Plus prompt will appear thus:

```
A>
```

External Tube Start-up

If running on a Master 128 type:

*CONFIGURE EXTERNAL

This may not be required if your Tube is already set to 'External'. To check type *STATUS TUBE. An external setting will remain until you alter it.

1. Turn on the Second Processor unit mains power switch.

2. Insert DISC 1 into BBC drive 0.

Press CTRL-BREAK. After a few moments the Digital Research logo will appear and the system will load. You will then be prompted for the time and date, unless you have an AUTOEXEC.BAT file (see Chapter 11) on your startup disc. This should be entered in the form DD/MM/YY followed by RETURN.

For example if the date were July 24th 1989 the entry would be:

24/07/89

Next you will be prompted for the time, based on the twenty four hour clock, in the format of HH:MM:SS followed by RETURN.

The seconds are optional (and pointless for manual entry) and will default to zero if omitted. For example, if it were 4.22pm your entry would be:

16:22

If you do not wish to supply either of these items, pressing RETURN (only) will allow the load to proceed. Be aware, however, that DOS Plus date and time stamps files whenever they are updated. Failing to supply an accurate date or time will render this valuable information useless. If you have a Master or BBC with Master-compatible Real Time Clock (ie, the PMS Genie Watch), then just pressing RETURN or omitting clock setting by using an AUTOEXEC.BAT file causes no problems. However, if you are working without a Real Time Clock, beware that the default time and date used by the system is midnight on 1st January 1980 (at startup - the clock is then internally incremented). In this case, it is worthwhile including TIME and DATE commands in any AUTOEXEC.BAT file.

If you have not already done so, you should copy the contents of a newly formatted disc as explained in the Acorn Master 512 User Guide in section 2.3 on page seven of Part Two, DOS Plus

2 : Discs and Formats

The chip used in the Master to control the disc interface is very versatile and can handle a number of different disc formats. For example, the Master allows single and double density disc formats via DFS and ADFS respectively. All DOS formats are double density. When you remember that the memory of a DOS system is about 512k, it makes sense not to limit the capacity of a disc to less than this, if at all possible.

DOS disc formats can apply equally to both 3.5 inch and 5.25 inch drives, so no distinction is made here. Both can be used on the Master and 512 but quite clearly a 3.5″ drive cannot be used by a 5.25″ disc and vice versa so clearly a physical incompatibility exists. However combined 3.5/5.25″ disc drives are readily available nowadays and such problems can be avoided.

For the remainder of this discussion it is assumed that the physical size of the disc is irrelevant, though of course DOS disc formats were originally based on 5.25 inch discs, since DOS pre-dates widespread use of the 3.5 inch disc.

Standard PC discs are 40-track double-sided with a capacity of 360k. As 80-track discs are common with Master systems, Acorn provides for both 40 and 80 track formats. All DOS formats and all Master 512 formats use double density – commonly called MFM encoding.

The most important format for the 512 user is the 640k bootable DOS system disc. DOS, unlike the BBC micros Operating and Filing Systems, is contained on disc and not ROM. Hence, the Master 512 must be able to load the Operating System from disc (in this case DOS Plus) before full function is available.

All PC-compatibles operate in this way, and only have a relatively small program in ROM called the bootstrap. This bootstrap contains only sufficient code to load and run DOS from a cold start, ie, when turned on for the first time. The 512 initially calls standard ADFS routines to load DOS Plus from disc, consequently the BOOT disc must be in a format which ADFS recognises, in this case ADFS 640k. Looking at the disc from ADFS, it appears just like a standard ADFS 640k disc, but with a single DOS file on it.

The disc size is set larger than normal to make the disc recognisable, and to prevent overwriting from ADFS. Hidden away behind this ADFS front, is a DOS partition, an area of disc which is reserved for DOS use only.

In addition to the 640k format, which itself is not seen on any other DOS system, there is an 800k format which maximises available disc space. Due to the way in which it saves data onto the disc, this format is very much faster than the others, and, as such, is possibly the best one to use whenever possible.

There are other formats to consider, a complete list is given in Table 2.1, and all these formats are fully explained in the Master 512 Technical Guide (see Appendix G).

Format Type	Capacity	Equivalent
Acorn DOS format	800k	800k ADFS
Tandy DOS format	720k	
Olivetti DOS format	720k	
IBM DOS format	720k	
Nimbus DOS format	720k	
Altos CP/M format	720k	
Acorn bootable DOS	640k	640k ADFS
ADFS Acorn Z80 CP/M format	400k	400k DFS
IBM DOS format	360k	
IBM CP/M format	320k	

Table 2.1. The Master 512 disc formats.

No special commands have to be given to use a particular disc format. The DOS Plus software will automatically detect the format size of a PC disc. This means that it is possible to have different format discs in the disc drives. The main format used by the Master 512 is the 800k format so this is checked for first. The DOS then works its way down the list until it has checked all the formats available. If the disc is not recognised an error message will be generated.

As a rule, if you wish to transfer data or software to or from other PCs but are unsure of the format to use, 360k is almost certain to be supported. Failing certain knowledge this is the best guess. However, if you seem to have trouble with this format it may be because two closely related forms were used as standard (!), and you have chosen the wrong one.

If you need to transport files by this means and are sure that you have the correct format but still encounter difficulty, you may find it solves your problem if you use discs formatted on the PC in question, rather than on the 512. This seemingly strange state of affairs can occur because there are minor differences between in the speeds of the different disc drives, and while a fast disc drive has no trouble with a slow formatted disc, the reverse is not true.

Finally, in spite of its considerable facility in this area, there are two PC disc formats that the 512 cannot handle. These are generally seen on the more recent PCs and particularly on 386 machines. These are 1.2Mb and 1.44Mb, which are often referred to as 'high density' (HD) because they literally write twice as much data in each track of the disc. The Western Digital 1770 or 1772 controllers, used by Acorn, cannot support quad density, so there is absolutely no way these formats can be accommodated by the 512.

You can however format blank HD media to the lower formats on a 512, but it is a waste of money to do so, as HD blank discs cost much more than double density discs.

3 : Files and Directories
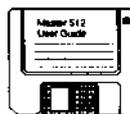
DOS Plus Directories

DOS Plus uses a hierarchical filing system similar to the one used by the BBC Advanced Disc Filing System (ADFS). Unlike ADFS no special command is needed when a new disc is loaded because DOS Plus always checks the disc on each access, so there is no need for an equivalent of *MOUNT. To change from one default drive to another you only need to enter the drive name followed by a colon. If the current drive is A and you wish to select drive B as the default drive, your entry would be simply B: as shown in the sequence below, and the drive will change.

```
A>B:
B>
```

Drive names can also be part of any command line entry, so to access a file on any disc it is not necessary for that disc to be the current drive.

Arranging Files

You will probably have noticed that many of the files on your discs are arranged into groups of like files. These directory structures will be familar to ADFS users.

Arranging your files neatly in this way is vital if you want to operate efficiently. At home or in the office, you group your files into separate, but distinct, areas, ie, electricity, gas, bank, tax and so forth, so that you instantly know where to find them.

For the same reasons it makes good sense to group your personal and program files together so that they are readily available to you. Before we go further on the laying out of these directories, let's examine the way in which the DOS Plus directory structure works in more detail. It's well worth learning as you will reap the benefits in the long run.

Directories

DOS (Disc Operating System) files are organised into directories, as we have already said. However, directories themselves may also contain directories. These sub-directories, as they are called, may also contain more directories and so on, all the way 'down' until the very last item is the file itself. Now if you are working in one directory you can only get at the files that are held in your currently selected directory, or those located in directories below you, that is, directories which have their origin in the current directory.

Suppose, at the point where this string of directories start, we had created another directory – which itself contained other directories, sub-directories and files – we would effectively have two different directory paths. If we are some of the way down one directory path, there is no way we can access files in the other directory path without going back via the start directory – that is, the point where they split. Now if we have several of these directory paths we get a structure like that illustrated in figure 3.1 – turn it upside down and you have a tree structure and that is often how this hierarchical type of filing system is referred to.
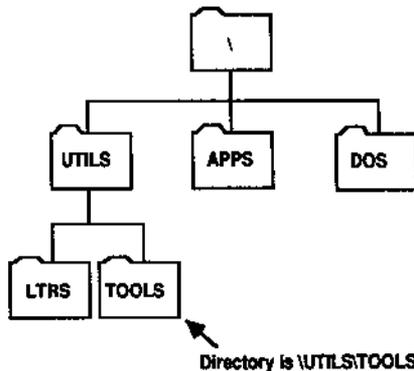

Figure 3.1 – The Tree structure.

Creating Directories

Obviously directories do not just appear on your disc, it is up to you, as the user, to create them. For the purposes of this book and so that you can

practice, take a new disc and format it if it is not already formatted – if you do not know how to go about formatting a disc then see page 14 of Part Two of the Acorn Master 512 Guide. If you have a hard disc then you are okay, as this has a great deal of space which we can use.

The DOS Plus command to create a directory is MKDIR (short for MaKe DIRectory), and as the book contains 'examples' that is the directory name we shall use. So to create the directory called Examples type:

MD Examples

and press the ENTER key. To ensure that the directory is there, type:

DIR

after the prompt (MD is a short form of MKDIR). If you are using a floppy disc the response on screen should be a little like this:

```
Volume in drive A is Master 512
Directory of A:\

EXAMPLES    <DIR>10-12-89              18.12
              1 File(s)      530432  bytes free

System files exist
```

If you have created it on a hard disc the directory will be present with many others!

The directory can be seen clearly and is marked as such, along with the date and time it was created (obviously these will be different for you!), the number of files on the disc and the space remaining. Note that, although we used upper and lower case letters when the directory was created, and there is no problem is using lower case, DOS Plus has changed the letters to all upper case (capital letters) – in fact DOS Plus cannot tell the difference and only sees characters as upper case.

Creating sub-directories—directories within directories—is just as easy. Enter the directory using the CHDIR (or CD for short) command and then MD. As an example, suppose we wish to create a sub-directory in EXAMPLES called MOON, proceed as follows. First move into the EXAMPLES directory with:

CD EXAMPLES

and make the new directory:

MD MOON

Now catalogue the disc with DIR and you should see something like this:

```
Volume in drive A is Master 512
Directory of A:\

.              <DIR>10-12-89          18.12
..             <DIR>10-12-89          18.12
MOON           <DIR>10-12-89          18.17
        1 File(s)      528384  bytes free

System files exist
```

The MOON directory is visible along with two others called . and .. These two have special meanings – "." is the current directory, and ".." is the 'parent' of the current directory. If you're not sure what a parent is, look again at Figure 3.1 – UTILS is the parent of TOOLS, and \ is the parent of UTILS.

The CD command used above changes the current directory. To move up to the root directory, simply enter:

CD ..

and press ENTER.

(The CD .. command means 'go up one level', so if the current directory was \UTILS\TOOLS, then CD .. would make \UTILS the current directory. CD \ will always directly select the root directory.)

All directories on the disc belong to, or are contained within the root directory. This does not have a name, but is designated by a back-slash character (\). This is equivalent to the $ root directory in ADFS. The \ character is also used as the delimiter between directories, in the place where the full stop is used in ADFS.

Note that all directory specifications are within, or subordinate to, the currently-selected directory unless explicitly stated to the contrary. In other words if you wish to refer to a file or directory which 'belongs' to the current directory, your start-point in the structure is assumed to be the

current directory by default, no matter how many 'levels' you have descended.

However, if you wish to refer to a file on a completely different branch of the structure without changing the currently-selected directory, your name specification must start from the last common point in the tree. If this is the root directory you must use the initial \ to indicate this. For example:

\dir1\dir2\dir3

specifies the directory dir3 no matter what the current directory is. (The ADFS equivalent would be $.dir1.dir2.dir3.)

Dir1\dir2\dir3 specifies the directory marked * if the current directory is the root (\). It will also specify the directory marked ** if the current directory is dir0. The ADFS equivalent is dir1.dir2.dir3.

At this stage a number of commands are worthy of comment, and can be directly compared with their ADFS equivalent for illustration:

DOS Plus	ADFS Equivalent
CHDIR – Change Directory	DIR – (change) Directory
MKDIR – Make Directory	CDIR – Create Directory

When using these commands, the following have special meaning:

DOS Plus		ADFS Equivalent
.	the current directory	@
..	the current directory's parent	^
\	the root directory	$
\	directory name delimiter	.

Filename Syntax

Filenames are very important. When used correctly, you'll easily find your files. Badly selected filenames could mean you'll lose important work or data. The most common filename format consists of a drive identifier, a filename, and filename extension:

{<d:>}<filename>{<.ext>}

The meanings of the symbols are as follows.

{<d:}   is the drive name, This is only necessary if the file is on another drive, but it may be supplied anyway.

<filename>   is the first part of the filename, which must always exist. It can be from one to eight characters in length.

{<.ext>}   is an optional extension to the name, and can be up to three characters long.

For example, assuming A as the current drive:

SORTFILE   is a file on drive A: with no extension
PROG.EXE   is a file on drive A: with an .EXE extension
B:TEXT.DOC   is a file on drive B: with a .DOC extension

Filenames, extensions or directory names, can include any characters selected from the following:

0-9
A-z
` $ % & ' () - @ _ ~

You should use the non-alphanumeric characters with caution, especially if you are likely to want to transfer files to either DFS or ADFS, as you will note that DOS Plus allows, for example $. This is an illegal character if transferred to native BBC filing systems. Although the name can be changed during transfer, these characters are unlikely to improve the readability of any filename, and hence are generally best avoided.

Directory names can be the same length as filenames, and in both cases if fewer than eight characters are used, the name is padded with blank spaces. This will be apparent when you display the name by using a 'DIR' command, or a command like 'COPY' or 'FSET', both of which echo their actions, and the names involved, to the screen.

Although the names on disc are physically padded with spaces, and these commands do not remove the spaces from the display (so that all names and extensions line up), under no circumstances should you enter spaces when you enter any filename in any command. Doing so may cause damage to files. See the notes accompanying 'COPY' in Chapter Six for the reasons.

Wildcards may be used with certain operations to reduce typing when commands are to operate on a group of related files. Two wildcards are supported, these are:

*   which can be used to replace the remainder of the field in either a name or an extension

? which can replace any single character in the position used.

In addition, under certain circumstances, the powerful defaults available in DOS Plus commands can be used to further reduce effort. If the command requires a source and a destination filename, it is not necessary to retype the name for the destination file if it is not to be changed. The minimum destination specification can be as little as just the drive name.

For example:

```
copy text*.txt b:
```

would copy any file from the current drive to drive B, which has text as the first four characters of its name and any other four characters up to the extension, including spaces, provided that the extension was '.txt'.

```
copy text?.TXT b:
```

would copy any file from the current drive to drive B, which has text as the first four characters of its name, any other single character as the fifth, but only spaces in positions six, seven and eight. Again the extension must be .txt.

```
copy text.* b:
```

would copy any file from the current drive to drive B, which has text as the first four characters of its name, andt only spaces in positions five, six, seven and eight. The extension may be any allowable combination.

Paths

The full statement of a file specification may include a list of directory names, as noted in the discussion of the tree structure earlier. Wherever filenames are supplied as parameters to commands it is always acceptable, even if not always necessary, to supply the full path name.

<filespec> = {<d:>}{<path\>.....}filename{<.ext>}

For example:

```
C:\dir1\dir2\prog.exe
```

Strictly speaking, the pathname is C:\dir1\dir2\ in this case, and the filename identifies only the file within the path. DOS Plus provides a command called PATH, which can be used either to set a path semi-permanently, or, if called without parameters, will report the current path

setting. It should be noted that the current path need not lead to the current directory, nor even to the current drive.

PATH sets up a default directory specification, which DOS Plus will use whenever a command is issued which involves a file not found within the current directory. If the named file is not in the directory set by PATH, then an error results. If the file is found in the specified path, that file will be used as if it were in the current directory.

PATH can be regarded as analogous to the *LIB command in ADFS.

File Types

The filename extension can be used to group together particular types of file. It is largely up to the user how to take advantage of the filename extension. However, DOS Plus uses certain extensions for special purposes:

.CMD	CP/M command file
.COM	MS-DOS command file
.EXE	MS-DOS executable program file
.BAT	Batch file consisting of DOS Plus commands

Each of these extensions tell DOS Plus that the file can be executed. Just type the filename at the command prompt, eg:

```
A>PIP.CMD
```

or more normally:

```
A>PIP
```

If the extension is not specified, DOS Plus looks for a file using one of the special extensions (in the order shown in the table), then executes that file if it is found. If there is more than one file with the same name and an extension, only the first is executed. Another extension with a special meaning is:

.SYS	This extension is used for special system files

The four discs supplied with the 512 contain other 'standard' filename extensions. They only have a special meaning within the particular application program which uses them. There is no fundamental restriction on using a similar extension for other purposes. However, the application

usually groups files together using the extension so it can distinguish between files for the user's benefit.

For example, in GEM Paint, the file extension .IMG is used to denote an image file. When a new image is loaded the program offers a menu of all .IMG files for the user to choose from. If a file is not an image file, but is named .IMG it will appear on the menu. This requires the user to know that such files should not be loaded as an image. Clearly, it is better to choose more appropriate file extensions to avoid problems like these.

Some other 'standard' or accepted conventions for file extensions are shown below in table 3.1. None are in themselves significant to DOS Plus, but may be to other 'standard' software, for example the '.HLP' extension. You should relate their suitability for your files to the applications packages or programs with which they may be used, and any other specific extensions used by your software (eg, Supercalc uses '.CAL' and '.XQT').

Ext	Signifies
.HLP	Usually relates to an application's help text file
.DOC	Usually a wordprocessor document
.TXT	Usually a ASCII document (you can TYPE it)
.BAK	Usually a backup file (eg, the back-up of textfile.doc would be called textfile.bak)
.DEF or	
.CFG	Usually an application parameter definition file
.WRK	Usually an application's work file. Caution, if such a file exists it may be overwritten entirely at the discretion of the application.

Figure 3.1. Common DOS Plus extensions in use.

Devices

The keyboard, screen and printer are all devices which allow input or output to or from the computer. These physical devices may be mapped to logical device names so that they can be specified for use in commands in place of filenames.

For example, a file may be copied from disc to screen, keyboard to disc, or any other combination, just as if it were being copied from disc to disc. For example:

```
COPY text.doc CON:
```

Copies the file called TEXT.DOC to the device called CON: which is by default the screen in this case.

The standard device assignments are listed in table 3.2 below:

Device Name	Device Type	Physical Device
CON:	Console I/O	Keyboard or screen
CONIN:	Console input	Keyboard
CONOUT:	Console output	Screen
AUX:	Auxiliary I/O	Serial in or out
AUXIN:	Auxiliary input	Serial port
AUXOUT:	Auxiliary output	Serial port
PRN:	List output	Parallel Printer

Table 3.2. Standard device assignments.

The device assignments can be changed with the DEVICE command explained in Chapter Seven.

Attributes

Each disc file has a number of attributes. Attributes are status flags which allow, or disallow, certain things to happen to a file:

RO   Marks a file as read-only. This prevents overwriting or deleting of the file (except when PIP is used with certain directives, in which case RO can be over-ridden.)

R W   Marks a file as read-write. This allows overwriting or deleting.

SYS   Marks a file as a system file. This prevents it being shown in a normal directory display.

DIR   Marks the file as a directory entry. This points to another area of disc for the directory contents, which may be files or more directories.

ARCHIVE Marks the file as having been updated. This is used with the BACKUP command which is used to back up hard disc files. Only files marked as updated are copied by BACKUP. The syntax is ARCHIVE=ON or ARCHIVE=OFF.

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Anatomy of a Directory

Being able to read and understand the contents of a disc directory is a fundamental task in computing. Shown below is the beginning and end of the display resulting from issuing two 'DIR' commands with DISC 4 in the drive. The first was a simple 'DIR' with no path supplied, the second was 'DIR \DEMOPROG'. Only part of the display from the first command is shown so as not to waste space. The purpose and meaning of each part of the volume or directory information displayed is explained. Each item is numbered ([1], [2] etc) with an expansion below to expand the points identified.

DIR

```
A>DIR

Volume in drive A is DISK    #4                          [1]
Directory of A:\                                         [2]

DEMOPROG     <DIR>       25-05-86  21:53                 [3]
Z80          <DIR>       25-05-86  21:55
GEMSETUP APP     33280   25-05-86  21:56                 [4]
GEMSETUP RSC     18432   25-05-86  21:57
ACORNBW  SYS     55808   25-05-86  21:57
```

(More files here)

```
A>DIR \DEMOPROPG

[5]        [6]      [7]       [8]        [9]
EPSHTR36 FNT     54400   25-05-86  22:03
EPSHSS07 FNT      2688   25-05-86  22:04
GEMSETUP TXT     12544   25-05-86  23:49
        38 File(s)       8192 bytes free                 [10]
```

DIR \DEMOPROG

```
Volume in drive A is DISK    #4
Directory of A:\DEMOPROG                                 [11]

.            <DIR>       25-05-86  21:53                 [12]
..           <DIR>       25-05-86  21:53                 [13]
SIREN    A86      4096   25-05-86  21:55                 [14]
SIREN    EXE      2560   25-05-86  21:55
        4 File(s)        8192 bytes free                 [15]
                                                         [16]
```

[1]   Shows the label of the volume as set by the LABEL command.
        This is up to 11 characters long, and is documentary only, (ie, for
        your use). It is directly comparable to the title on BBC filing
        systems.

[2]   Shows the current directory name or the name specified with the
        DIR command. In this case the 'A:\' shows this is the root
        directory.

[3]   Is an entry for a directory called 'DEMOPROG'. This directory is
        subordinate to the current directory. All directory entries in the
        current directory are shown as <DIR> to distinguish them from
        file entries.

[4]   Is an entry for a file contained in the current directory.

[5]   Is the first part of the filename, which may be up to eight
        characters long. If the name is less than eight characters the
        display is padded with spaces as for example both 'SIREN' files
        shown above. Padding the names allows all the file extensions to
        line up. When you enter filenames for any command, you should
        not enter spaces, even if they are shown by this or any other
        display.

[6]   Is the file extension, which may be up to three characters long.
        Files do not necessarily have to have an extension, although
        some, like '.CMD' or '.EXE' are significant to DOS Plus, and should
        not be used for general purposes. When full filenames are
        entered a dot (.) is used to indicate where the first part of the
        name ends and the extension begins. Spaces should never be
        entered. For example to enter the first 'SIREN' name in a
        command it should be entered as 'SIREN.A86' at the appropriate
        point.

[7]   This is the total file length in bytes. Note that this is not
        necessarily the exact space occupied by the file. File space is
        allocated in minimum sized units, for example 1024 bytes for
        800k format, therefore even a 20 byte file will use a minimum of
        1k bytes of disc space.

[8]   This is the date (as held in the DOS clock) of the last update
        written to this file. Note that if the file is copied to another disc

the date is taken with it, it is not revised to the date the copy was carried out.

[9]   This shows the time as held in DOS's clock of the last time this file was written to. All the comments for [8] above apply.

[10]   This is always the last line of a 'DIR' display, and shows the total number of objects (files plus directories) listed in the output. The bytes free value refers to the entire disc, as space is not pre-allocated or reserved, but simply used, as needed, by anything on the disc. The only way to 'reserve' disc space is by creating a dummy file of the required size.

[11]   Is the directory name. For any directory subordinate to the root directory the full path is shown, in order, from the root to the current directory inclusive, with '\' separating the entries if necessary.

[12]   This is the entry for the current directory.

[13]   Shows the parent directory immediately above the current directory. In this case the parent is the root directory.

[14]   Shows a file within the current directory. Details as for [5] to [9].

[15]   Shows the summary of objects displayed within the current directory. Note that the free space is the same as is shown in [10], because, as noted, it applies to the whole disc.

[16]   In this case this line is empty, showing that the DOS Plus system is not resident on this volume. If for contrast you issue a 'DIR' with the system disc in the drive this line will contain the message "System files exist" showing that the system files (those with a '.SYS' extension) are present.

4 : GEM Update

This chapter provides information missing from the User Guide supplied with the Master 512. As the Guide covers GEM Paint, GEM Write and the Desktop Accessories in reasonable detail, they are not covered here other than to provide vital information missing from the Guide. For full tutorials your are referred to the books listed at the end of this chapter.

GEM Setup

There are what seem to be 'random' problems with GEM Setup in that the settings selected are not always saved correctly. This manifests itself when you come to save selections when GEM Setup requests you to swap discs which are obviously not related to the process! Eventually you will be requested to enter DISC 2 where the setup file will be saved.

When the GEM is subsequently booted it will either cause and error or hang-up the computer. Equally it may well work – it's a suck-it and see situation. There are no plans to release a new version of GEM Setup.

Mouse Drivers

Programs which run from the GEM Desktop will be able to use the mouse supplied with the Master 512, however, those programs that make use of a Microsoft mouse will not be able to use the supplied mouse. This is because a suitable Microsoft driver is not supplied due to hardware and software limitations. The MOUSE.COM file that is supplied with a number of packages will, therefore, not be recognised by DOS Plus.

Memory Size

The version of GEM supplied on the 512 may limit the use of some applications due to memory limitations. When running, DOS Plus takes 154k of space and the GEM Desktop a further 333k – a total of 487k from 512k. Thus packages running under GEM will often have only very limited space for data storage. As an example, when running, GEM Write has less

than 25k available for text files and must, therefore, rely heavily on disc access for all but the shortest files. This restriction can be overcome with the installation of a Solidisk PC Plus board.

GEM Write CMD

As standard GEM Write will only allow the use of underline, bold and italic styles within text. Most printers, especially dot-matrix, will allow a wide range of special effects to be used, for example, superscript, subscript etc. ..CMD is a GEM command in GEM Write that allows the special control characters needed to obtain these to be sent to the printer.

..CMD is used as an embedded command. This is typed directly into the text at the start of a line ensuring that it is preceded with the two full-stops which identify it as an embedded command. The ..CMD must then be followed directly by the printer control codes needed to obtain the effect required. The relevant control codes must be extracted from your printer manual and some guidance on doing this is given below.

For example, the control code sequence needed to turn italic print on and off on an Epson FX80 printer is:

> Turn on: ESC 4
> Turn off: ESC 5

Within GEM Write the embedded command codes would be:

```
..CMD<4
  Italic print now on......
..CMD<5
  Italic print now off!
```

The '<' character represents ESCAPE and is obtained by pressing the ESCAPE key at that point. Please note that there are *no* spaces anywhere within the command line.

Single Line Feeds in GEM Write

One problem that often rears its ugly head is that of double line feeds during printing and getting a form feed between pages. This is caused by GEM Write sending an extra RETURN character at the end of each line or indeed a form feed at the end of each page of text.

The easiest method to overcome this with most printers is to set the 'CR from host' DIP switch to off, so that the printer ignores carriage returns sent from the host computer. The technique for doing this will be outlined in your printer manual.

If, however, the printer does not have such DIP switches, or other packages that are used in the BBC mode require this DIP switch to be on, then you can tell GEM Write not to send carriage returns. This is done as follows, and only needs to be done once as the setting is remembered:

1) Boot DOS Plus and GEM as normal, then load GEM Write, but do not load a file.

2) Move the pointer to FILE on the menu bar and move down to TO OUTPUT. Select TO OUTPUT, which will give you a menu box labelled Create .OUT file.

3) Select Start on this menu box. This will give you the output screen with another menu box labelled START OUTPUT.

4) Select Cancel, which will leave you with the OUTPUT screen.

5) Move the mouse pointer over OPTIONS on the top menu bar, then move down the menu to Printer and select this. You should now get a large selection box, labelled PRINTER OPTIONS.

6) Make sure that the options are set up as follows:

Scale:	Best fit
Initial Form Feed:	NO
Final Form Feed:	NO
Horizontal Justif:	Center
Vertical Justif:	Center
Print in background:	NO

7) Then select OK.

8) Reselect the OPTIONS menu, but move down to MAKE DEFAULT and select this. Your new options will then be saved.

9) You can now go back into GEM Write by selecting QUIT from the bottom of the FILE menu.

When you come to print out a letter that you have written or loaded, you should do the following before going to the output stage:

MS12—C

1) Move the pointer onto PAGE on the top menu bar. Then move down to FORMAT and select this. You will get a selection box titled PAGE FORMAT OUTPUT. Change the settings so that it is set up as follows:

Document mode:	OFF
Pagination:	OFF
Justification:	OFF
Line Spacing:	1
Page length:	66 lines
Text begins on:	6_ ends on: 60
Left margin:	1_ characters

You may wish to change some of the above, if you do then make sure that Pagination, Document mode and Line spacing are as above.

2) To use these settings, click on OK. You can now print out your text with single line spacing and no final form feed.

Printer Control

All printers respond to a very basic language which takes the form of numbers. When a printer receives a certain sequence of numbers it will act upon them. The telephone exchange recognises the numbers you dial on the telephone and uses this to select one particular phone in the whole world. Use a different sequence of numbers and a different phone is called. Send a different sequence of numbers to the printer and a different effect is selected, or perhaps a selected effect is cancelled. The numbers that are sent to the printer are called control codes or ESCAPE codes.

When you select a certain printer effect in GEM Write, bold or underline for instance, GEM Write automatically sends the control codes to the printer for you. However, it is worth understanding how to interpret and use these control codes, as it means that you are able to use many other effects that may be supported by your printer using the ..CMD embedded command in your GEM Write document as described earlier.

To select the effect that you want, you must look at your printer manual to extract the necessary codes – not as painful as it seems – and then send them to the printer using the CMD format.

Printer manuals will normally provide control code sequences in one of two ways, ie, ESC or CHR$ codes – most printer manuals have both, so concentrate on the row of CHR$ codes. For example, in a typical Epson

printer manual the table to select emphasised (bold) text might look like this:

CODE :   ESC E
PURPOSE :   Select emphasised print
FORMAT :   CHR$(27) "E"
REMARKS :   This command causes the printer to print in
              emphasised (bold) mode.

All the information needed to produce emphasised text is here! The line we are really interested in is the line marked FORMAT:

FORMAT :   CHR$(27) "E"

Indeed all we have to do is place the sequence:

        . . CMD>E

at the appropriate point in the document and then print it!

Up to a Point

When a printer effect has been selected with an output control sequence, the printer will continue to act on it until it is switched off or cancelled by another command. The manual entry to turn emphasised (bold) print off might look like this:

CODE :   ESC F
PURPOSE :   Turn emphasised print mode off
FORMAT :   CHR$(27) "F"
REMARKS :   This command causes the printer to cancel the
              emphasised print mode

To cancel emphasised print, the following embedded command must be inserted in the text:

        . . CMD>F

More Effects

Of course bold text is already built into GEM Write but it is one effect that virtually all printers support. To gain other effects you will need to examine your own printer's manual. The majority of dot-matrix printers are Epson compatible – if your printer is sold as such then the list of CMD codes that can be found in Appendix C could well prove to be quite

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invaluable. If you are not sure if your printer is Epson-compatible or not then simply create a GEM Write document and embed each command into it with some suitable text to follow, print it and see the results for yourself!

Books on GEM

The following books outline the use of GEM and GEM Write and are available direct from Dabs Press:

Using GEM on the Amstrad PC by Kathy Lang.
Published by Glentop.
ISBN 1 85181 065 X

WP Using GEM Write by M O'Reilly.
Published by Glentop.
ISBN 1 85181 067 6

5 : DOS Plus Commands

One of the potentially confusing areas of using PC software concerns the close similarities, but minor differences between MS-DOS, DOS Plus, and DOS Plus as supplied with the Master 512. This is especially so if you use other PC machines, perhaps at work, and a Master 512 at home.

Transient Commands

The first point to appreciate is that not all DOS Plus commands are permanently resident in the Operating System. This means that some of them must be loaded from disc every time that they are required. These commands are in effect specialised utilities which extend the Operating System, but are held on disc so as not to permanently consume memory. Generally they are called transient commands, since they exist only at the time they are in use. If they are called twice in succession, they are loaded twice. (Of course you may have a RAM disc, so they might not actually be loaded from a physical drive.)

All the standard Master 512 DOS Plus utilities and transient commands are provided on DISC 1. You should make a copy of this disc to be used as your working 'boot' disc, while retaining your original as a safe write-protected backup. You may, in addition, find it helpful to copy some of the more commonly used transient commands to your working applications or data discs. It is possible that some applications may assume the presence of these commands, or you may wish to use them yourself.

For example, you might wish to change the access permissions of a file to read-write, to allow updating. After use you might reset the file to read-only again for safety. Both operations require the use of the FSET command, which is a transient, hence it must be on a current disc at the time the command is issued. Copying the file FSET.CMD to your applications disc is all that is required in this case. This would avoid the need to swap discs when file access permissions are to be changed.

The usual method of keeping these files separate from your applications software or data files is to set up a directory to contain only these files.

Commonly, the directory name used is DOS. If you also use the PATH command (see Chapter Three) to set this as the directory to be searched for any files not contained in any current directory (this works like the library directory in ADFS), DOS Plus will ensure that all transient command calls are actioned without further explicit reference to this directory.

One special command which is a transient, but is loaded by default and therefore is usually 'transparent' (ie, it is not usually explicitly called by the user) and can largely be treated as permanent, is COMMAND. This is the program which interprets keyboard command entries and can be regarded as responsible for calling and running other commands. You may occasionally find that, after running an application that requires all the memory, exiting the application causes immediate access to the disc. If the system disc has been removed in favour of an application disc, and your application disc does not also contain the file, you will receive the message:

```
Cannot load command.com
```

DOS has allowed part of the area previously occupied by COMMAND.COM to be overwritten so as to free more memory for your application. Within the application the processing of keyboard input is under the control of the application itself, so COMMAND.COM is not needed. However, on attempting to return to the normal input prompt, DOS can now no longer interpret commands until a disc is inserted containing COMMAND.COM, which must be reloaded before work can resume. If you encounter this situation you should place a suitable disc in the current drive and simply press return, which causes DOS to retry the load. When successful the standard prompt re-appears and normal processing of commands can resume.

There is one other occasion when COMMAND.COM, or its absence, may make itself known, and again it is concerned with running applications. Many applications permit a temporary exit to DOS, allowing normal commands to be issued from the normal prompt while the application is still active. The usual method of returning to the application is to enter the EXIT command.

Two possible situations can interfere with this facility. The simplest is that COMMAND.COM is not present on the disc, when the application should tidily handle the event by reporting a controlled error, displaying a message similar to the DOS message above before continuing. This problem is easily solved by ensuring that COMMAND.COM is available when required. The second situation is more of a problem, and that is when

COMMAND.COM is present but there simply is not enough memory to load it concurrently with the application. In this case the message will be clear and the situation should again be controlled, but unless you are able to free some memory this facility must remain unavailable with the application in question.

Command Compatibility

It should be noted that some commands, or their precise actions, are either unique to the Master 512 or are familiar DOS commands altered in function because of the special architecture of the co-processor. Wherever possible, due regard has been taken of the differences between the Master 512 and 'true PCs', and you will find that certain commands are included only for application compatibility. This allows packages that call these utilities to do so without crashing (exiting unexpectedly), even though the command may have a modified function, or none at all, on the Master 512.

Specialised Facilities

Some commands are written so they may be called either with or without parameters. Depending on the nature of the command one of two types of action usually results. For commands like ADDMEM, BACKG or SLICE, the current setting will be displayed if no parameters are supplied and the command terminates. Others, for example TIME, will display the current setting then prompt for a replacement value, which may be entered in the usual format, or omitted by pressing RETURN, when the existing value remains unchanged.

Yet another possibility is the action of commands like STAR or PIP, both transients, but both of which also may be called without parameters. These can then be used repeatedly without the need to reload. For example if STAR is loaded without parameters the A> prompt is replaced by a * prompt and a star command may be supplied, followed by RETURN, as many times as required. Each star command is executed, then the * prompt returns. To exit press RETURN without supplying any further data, when STAR terminates and the A> prompt reappears.

Command Conventions

The next few chapters describe all the standard system and DOS Plus commands provided in Acorn Master 512 implementations of DOS Plus.

You should note that there are both deletions and additions in the latest release of the software, DOS Plus 2.1, when compared with earlier issues. See the page opposite for details of obtaining an upgrade to DOS Plus 2.1.

The syntax of each command is given in the following chapters using the following standards to indicate parameters or variables:

DIR	A directory attribute. Where this is shown the entry of a directory name is implied.
<n>	A variable decimal number must be supplied.
<opt>	Indicates that options can be supplied.
[]	Option delimiters, when supplied to a command the entered options are enclosed in square braces.
()	The range of options is shown within round braces.
RO	A file read-only attribute.
R W	Read-write attribute
<s>	A variable character string
SYS	A system file attribute. Some commands accept /S to indicate this.
{}	An optional entry. The braces are not entered, but the enclosed item(s) can be, if required.
...	The previous item shown can be repeated as necessary.
|	Shows alternative mutually exclusive entries, which may or may not be optional.
^ or CTRL	The CONTROL key
RETURN	The RETURN key
*	The 'rest of field' wildcard
?	The single character wildcard

The format used to explain each command first gives the name as entered when calling the command. Next is shown the full syntax of the command, using the above conventions as required. This is followed by the minimum abbreviation (if any) by which the system will recognise the command. In

practice very few commands can be abbreviated, and never any of the transients. If a default value applies to the command this is shown next.

Any such default is the status, setting or value automatically adopted by the system on initial load. In general this will be replaced by a value supplied with the latest use of the command. Some such commands may be entered without parameters, when they will display the current setting. The versions entry shows the versions of 512 DOS Plus with which the command was issued. Three versions have been released by Acorn, 1.2, 1.2a and the current 2.1. DOS Plus as supplied by Solidisk with the PC Plus is effectively 1.2a, but see also below for 2.1.

The standard Digital Research command name is shown next, followed by the equivalent MS-DOS command when applicable. Where 'None' is shown for both entries the command is specific to the Master 512, and is necessary because of the hardware in either the 512 or the BBC host. If a Digital Research equivalent is shown, but 'None' is shown for MS-DOS, this indicates that the command is a DOS Plus command only. DOS Plus has two features that are not present in MS-DOS, namely limited multi-tasking and CP/M86 compatibility. Such commands are mainly concerned with these features.

Examples of use are then shown, with an explanation of the action of the example. This is followed by any relevant messages, or message types, likely to be output as a result of using the command. Where applicable, notes are included to add further comment or explanation. The final item 'See also' only appears where two or more commands are similar or related, in which case the other commands are cross referenced.

DOS Plus Version Upgrade

If you are using an earlier release than DOS Plus 2.1 you can obtain an upgrade for just £15.00 by sending your original system disc - DISC 1 – directly to Acorn.

As well as containing a number of additional facilities and commands over earlier versions, release 2.1 has all known bugs fixed. Solidisk PC Plus owners should note that no amendment is required to version 2.1 to allow for the memory expansion, as the memory map is already modified to cater for this.

6 : Permanent Commands

This section of the book describes all the built-in commands in DOS Plus and all the standard utilities provided on DISC 1 supplied with the Master 512.

The commands are listed alphabetically however for ease of reference the following table lists where each command description can be found:

8087

Description:	Select 8087, or check existence and usage.

Syntax:	`8087`
	`8087 = ON`
	`8087 = OFF`

Abbreviation:	None
Default:	8087 = OFF
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	8087
MS-DOS Equiv.:	Does not exist
Example:	`A>8087=ON` `8087=OFF`

(The 8087 does not exist and can't be turned on)

Error messages:	(DR definition only – see notes)

8087 not installed
The 8087 is not installed. Most programs do not require the 8087, but those that do will use it if present, or simply run slower if it is not.

8087 in use
A background program is using the 8087. Do not run another program which requires it.

Notes:	This command is only included for compatibility with other versions of DOS Plus. As there is no provision for a maths co-processor in the 80186, this command always returns the message:

  8087=off   (DOS+ V1.2)

or

  8087 not installed   (DOS+ V1.2a/V2.1)

ADDMEM

Description:	Allocate the maximum memory that the foreground program may use.
Syntax:	ADDMEM {n}
Abbreviation:	None
Default:	ADDMEM=0
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	ADDMEM
MS-DOS Equiv.:	None

Examples:

```
A>ADDMEM=0
Additional Memory Allocation = 0
A>
```

Allocates all available memory to the foreground .EXE program.

```
A>ADDMEM=333
Additional Memory Allocation = 333
A>
```

Allocates 333k to the foreground .EXE program.

```
A>ADDMEM
Memory Allocation = 333
A>
```

Returns the present memory allocation.

Notes: This command is used to allocate extra space for EXE programs by reserving memory. The memory so reserved may be used only by a foreground .EXE program, and is unavailable to others.

BREAK

Description:	The equivalent of CTRL-BREAK on a PC.
Syntax:	BREAK {ON │ OFF}
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	BREAK
MS-DOS Equiv.:	None
Example:	A>BREAK
	BREAK is off
	A>

Notes: This command is only included for compatibility. It has no effect, but is recognised to prevent batch files converted from other machines from crashing.

IMPORTANT: Note that what is being simulated in this command is CTRL-BREAK on a PC, not CTRL-BREAK on a BBC micro. The key combination on a PC causes termination of the current program, like ESCAPE in the BBC micro. The same effect can be obtained on a PC by CTRL-C. The equivalent of the BBC's CTRL-BREAK is achieved on a PC by simultaneously pressing CTRL-ALT-DEL. Just to confuse you even further, CTRL-ALT-DEL doesn't function on the Master 512 -- to reset the system, press CTRL-BREAK.

CHDIR

Description: 1. Change directory
2. Assign floating drives
3. Display current path

Syntax: CHDIR {<d:>}{<path>}

Abbreviation: CD

Versions: 1.2, 1.2a, 2.1

DR Equivalent: CHDIR

MS-DOS Equiv:. CHDIR

Examples: C>CD C:\dir1

Change current directory to \dir1.

A>CD dir1\dir2

Change current directory to dir1\dir2.

A>CD ..

Change current directory to parent of current directory.

A>CD ..\..

Change current directory to parent of parent directory.

C>CD A:\dir1

Change the current directory of another drive.

C>CD N:=A:\dir1

Assign floating drive N: to a:\dir1.

A>C:CD
C:\dir1

Display current directory (in this case \dir1).

C>CD A:
A:\

Display current directory of another drive.

Notes: If the floating drives N:, O: and P: have not been set by CHDIR, they default to the drive from which DOS Plus

was booted, A: if booted from floppies, or C: if booted
from hard disc. Floating drive assignment allows an
application to run as if the drives assigned were actually
present in the system. This extension of the CHDIR
command replaces the MS-DOS transient command
SUBST.

CLS

Description:	Clear the screen and move cursor to top-left.
Syntax:	CLS
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	CLS
MS-DOS Equiv.:	CLS
Example:	A>CLS

Clears the screen and moves the cursor to the top-left
corner of the screen and displays the current DOS Plus
prompt.

Notes: On some PC systems the command also resets the
default screen mode and colours.

COMSIZE

Description:	Allocate or display memory for .COM files.
Syntax:	COMSIZE {n}
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equiv	COMSIZE
MS-DOS Equiv.:	COMMAND

Examples:

```
A>COMSIZE
Memory allocation = 0
```

Displays the current memory allocation.

```
A>COMSIZE = 0
Memory allocation = 0
```

Allocate all available memory.

```
A>COMSIZE = 200
Memory allocation = 200
```

Allocate 200k to .COM files.

Notes: This command is used to allocate extra memory for .COM programs by reserving memory. The memory so allocated may be used only by .COM programs, and is unavailable to other programs.

COPY

Description:	Copy and/or merge files.

Syntax:

```
COPY {/A}{/B}{d:}<filespec>{/A}{/B}{/S}
{+<filespec>{/A}{/B}} ... {<filespec>}{/A}{/B}{/V}
```

The filespec may be substituted with a device. For example:

        AUX: CON: PRN: NUL:

Options:	/A	Treat the file as an ASCII file, terminating at the first CTRL-Z character.
	/B	Treat the file as binary data.
	/V	Verify the copy after writing the destination file.
	/S	Indicates that the source file is a SYS file.
Abbreviation:	None	
Versions:	1.2, 1.2a, 2.1	
DR Equivalent:	COPY	
MS-DOS Equiv.:	COPY	
Examples:	`A>COPY TEXT.DOC B:`	

Copy the file TEXT.DOC from the current directory on drive A to the current directory on drive B.

`A>COPY A:text.doc B:letter.doc`

Copy the file text.doc from drive A to drive B, naming the new file on drive B letter.doc.

`A>COPY B:text.doc`

Copy the file text.doc from drive B to the current directory on the current drive.

`A>COPY CON GO.BAT`

Copies keyboard input to the file GO.BAT until a CTRL-Z character is typed.

```
A>COPY text.doc letter.doc
```

Copies text.doc on drive A to a file called letter.doc, also on drive A.

```
A>COPY txt1.doc+txt2.doc+txt3.doc b:letter.txt
```

Copies the three files, txt1.doc, txt2.doc, txt2.doc in sequence from drive A into a single file called letter.txt on drive B.

Notes:

IMPORTANT: COPY overwrites any existing file with the same name *without* informing the user, provided that the destination file attributes are set to read-write. If in doubt, check the destination disc to see if a file already exists with the same name, unless you are sure you intend to overwrite. Better yet, keep all important files set to read-only, unless they are specifically being updated.

See also:

PIP and DISC.

Caution:

Never include spaces in a destination file name. There is a bug in DOS Plus (1.0 and 1.2) such that failure to observe this rule can result in a destination file length of zero, with no error reported.

Worse still, if you supply *no* destination name, DOS Plus first assumes that the destination name is all spaces but then *also* uses the source name for the destination as normal, setting the file length of the new file to zero before writing to it. If this is the same name as the source, the file by then zero length, is copied to itself, resulting in a zero length file and no error.

If you meant to type

```
COPY *.EXE *.BAK
```

but just typed

```
COPY *.EXE
```

you would lose all the .EXE files in that directory on your disc – permanently! At this stage you do not have a destination file copy, and the source file is lost too!

DATE

Description:	Read/write system date.
Syntax:	`DATE {dd-mm-yy}`
	Note that the dash delimiters (-) may be replaced by full stop (.) or back slash (/).
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	DATE
MS-DOS Equiv.:	DATE

Examples:	`A>DATE 1-1-88`
	`A>DATE 01/01/1988`
	`A>DATE 12.3.1987`

Notes:	The BBC Master has a real-time battery backed clock (RTC). The DATE command refers to the DOS system clock which is not always the same value as the RTC. The date and time are only read from the RTC (if available) at initialisation.
	If the Master 512 is used without an AUTOEXEC.BAT file, initialisation is automatically requested during start-up. (see page 14) Manual entry is required. Some third party alternative RTCs, such as Genie Watch (which supports the correct system calls) can also be used, or you could write your own RTC code as a Sideways ROM program on the BBC micro.
See also:	TIME

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DEL

Description:	Delete file(s).
Syntax:	`DEL <filespec>`
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	DEL
MS-DOS Equiv.:	DEL
Examples:	`A>DEL File.*`

Delete all files with the name 'file', on the current drive, but any extension is acceptable.

`A>DEL B:*.BAK`

Delete all files with the extension .BAK, on drive B: but any filename is acceptable.

`A>DEL *.*`

Delete all files! This will cause the reponse:-

`Are you sure (Y/N)?`

Only if you respond with Y will the operation take place. Any other key aborts the deletion.

Notes:	Deleting a file only removes the name from the directory. By using the correct method (a disc sector editor, or an appropriate utility, it is possible to recover a deleted file.

DEL does not delete files with access permission set to read-only.

This command is functionally the same as ERASE.

See also:	ERASE, DELQ, ERAQ.

DELQ

Description:	Delete files(s), with query.
Syntax:	DELQ <filespec>
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	DELQ
MS-DOS Equiv.:	DELQ
Example:	A>DELQ B:*.DOC

Erase all files with the .DOC extension in the current directory of drive B. As each filename is presented deletion is queried by:

```
filename.ext (Y/N)?
```

Answer Y to delete the file, or N to omit it from the delete operation.

Notes:	This command is functionally the same as ERAQ.
See also	DEL, ERASE, ERAQ

DIR

Description:	Display a directory's contents.
Syntax:	DIR {d:}{<filespec>}{/L}{/S}{/P}{/W}

Options:

/L	Long display, the default
/S	Lists all .SYS files in the directory
/P	Pauses the display every 24 lines.
/W	Lists the display in wide format. This shows four files per line (in 80 column mode), but omits file sizes and date stamps.

Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	DIR
MS-DOS Equiv.:	DIR
Examples:	A>DIR

Display the contents of the current directory.

```
A>DIR *.BAK /W
```

Display all files with a .BAK extension in the current directory using the wide display format.

```
A>DIR B:text.doc
```

Display information about the file text.doc on drive B.

Notes: If a DIR command can't find a file which matches the optional file specification the message displayed is:

```
File not found
```

The command DIR *.* is the same as DIR without any parameters.

ERASE

Description:	Erase file(s).
Syntax:	ERASE <filespec>
Abbreviation:	ERA
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	ERASE
MS-DOS Equiv.:	ERASE
Example:	C>ERASE *.BAK
	Delete all files with the .BAK extension in the current directory, any filename is acceptable.
Notes:	Be careful with ERASE *.* when using a hard disc. Erasing everything from the root directory will result in the loss of COMMAND.COM, and the system will no longer be bootable from the hard disc.
	This command is functionally the same as DEL.
See also:	DEL, DELQ, ERAQ.

ERAQ

Description:	Erase file(s), with query.
Syntax:	ERAQ <filespec>
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	ERAQ
MS-DOS Equiv.:	ERAQ
Example:	A>ERAQ *.BAK

Erase all files with the .BAK extension in the current directory of drive A. As each filename is presented erasure is queried by:

```
Filename.ext (Y/N)?
```

Answer Y to delete the file, or N to omit it from the erase operation.

Notes:	This command is functionally the same as DELQ.
See also:	ERASE, DEL, DELQ.

EXIT

Description:	Return to the calling program from DOS.
Syntax:	EXIT
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	EXIT
MS-DOS Equiv.:	EXIT
Example:	A>EXIT
Notes:	When an application allows the user access to the DOS command interpreter from within an application, type EXIT at the DOS prompt in order to return to the application. If your application allows DOS commands to be executed while still under application control, (ie, you do not see the normal system prompt) the EXIT command is not required.

MKDIR

Description:	Create a new directory.
Syntax:	MKDIR {d:}{path}
Abbreviation:	MD
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	MKDIR
MS-DOS Equiv.:	MKDIR
Examples:	A>MKDIR words

Create a new directory called words, subordinate to the current directory.

```
A>MKDIR words\letters
```

Create a directory called letters, subordinate to the directory called words, which must be subordinate to the current directory.

PATH

Description:	Change directory search path.
Syntax:	PATH {d:}<path>{;{d:}<path>} ...
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	PATH
MS-DOS Equiv.:	PATH
Example:	A>PATH C:\DOS;B:\UTILS

Tells DOS Plus to look for commands in the DOS directory on drive C, or the UTILS directory on drive B, if they are not found in the current directory.

Notes: When a command is issued, DOS Plus first looks for the command in its table of resident commands. If no such command exists DOS assumes the command to be a transient and next searches the current directory, looking for a filename the same as the command name with an extension of .CMD, .COM, .EXE or .BAT.

If the file is not found DOS next searches all the directories in order, as specified in the PATH command. If the file still cannot be found DOS finally searches the root directory.

If at any stage a file is found it is executed. If no such file could be found DOS reports 'Bad command or filename'.

By convention the transients are placed in a directory called \DOS and this is set in the PATH to be searched for unrecognised commands.

PROMPT

Description:	Set the DOS prompt.
Syntax:	PROMPT {s}
Options:	The characters below can be preceded by a $ in the PROMPT command to produce a new systems prompt. They will appear in the order specified, and will cause the following to be included in the new prompt:

t	Time
d	Date
p	Current directory
v	DOS Plus version
n	Default drive
u	User number
$	$
g	>
l	<
b	I
q	=
e	ESCAPE character
h	Backspace
_	Carriage return, line feed

Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	PROMPT
MS-DOS Equiv.:	PROMPT
Example:	A>

PROMPT pg	gives:	A:\dir1\dir2>
PROMPT $G	gives:	>
PROMPT ng	gives:	A>
PROMPT	gives:	A>

Notes:	The text string must not contain the following characters:

<, >, I or =

RENAME

Description:	Rename a file.
Syntax:	RENAME <old filespec> <new filespec>
Abbreviation:	REN
Versions	1.2, 1.2a, 2.1
DR Equivalent:	RENAME
MS-DOS Equiv.:	RENAME
Example:	A>RENAME text.dta text.txt

Renames the file 'text.dta' to 'text.txt', both within the current directory. Note that the syntax is reversed from the original CP/M command.

Notes: If the new name already exists, the file can't be overwritten and an error message is displayed. The command is terminated on error.

The command is very similar to the BBC MOS *RENAME command.

RMDIR

Description:	Remove directory.
Syntax:	RMDIR {d:}<path>
Abbreviation:	RD
Versions	1.2, 1.2a, 2.1
DR Equivalent:	RMDIR
MS-DOS Equiv.:	RMDIR
Example:	A>RD dir1\dir2

Deletes the directory 'dir2', which is subordinate to 'dir1'.

A>RD B:\temp

Deletes the directory 'temp' from drive B.

Notes: A directory can only be deleted if it contains no files or sub-directories (even if these are empty). If you try to remove a directory which is not empty the error message:

```
Dir. not empty
```

will result. No alteration is made to the disc.

SET

Description:	Set or display operating environment.
Syntax:	SET {<name>={<s>}
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	SET
MS-DOS Equiv.:	SET
Examples:	

```
A>SET
PATH=
COMSPEC=A:\COMMAND.COM
OS=DOSPLUS
VER=1.2
PROMPT=$u$n$g

A>SET COMSPEC=B:\COMMAND.COM

A>SET PROMPT=$p$g
```

Notes: The path shown is the current setting as defined in the PATH command. 'COMSPEC' refers to the name of the current command processor transient. The OS and VER entries identify the operating system, while PROMPT reflects the current prompt definition as set by that command or the default.

SLICE

Description:	Allocate time split between foreground and background programs.
Syntax:	SLICE {n}
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	SLICE
MS-DOS Equiv.:	None
Examples:	A>SLICE 10
	Allocate 10 time units to foreground for every unit allocated to background.
	A>SLICE
	Foreground time slice = 16
	Display current slice value:
Error Messages:	Invalid Slice Specification (1 – 255)
	SLICE has been followed by a number which is not a number between 1 and 255.
Notes:	System help suggests that time-slicing is on the basis of 16 units. This contrasts with the error message shown above, which suggests that slices may be defined in 255ths.
	In fact SLICE does accept values up to 255, but if a value greater than 127 is supplied in 2.1 a subsequent SLICE request (without parameters) shows a corrupted value.
	DOS plus allows certain tasks to be run in background mode. The system shares processor time between the main (foreground) task and any background tasks, based on the time-slice set by this command. The default setting is 16, which means that 16 time units are spent executing foreground tasks for every single unit spent on each background task.

TIME

Description:	Display and/or set time.
Syntax:	TIME {hh:mm{:ss{.xx}}}
Abbreviation:	None
Versions	1.2, 1.2a, 2.1
DR Equivalent:	TIME
MS-DOS Equiv.:	TIME
Example:	A>TIME

```
Current time is 15:24:07.44
Enter new time:
```

If no time is entered then the existing time is retained.

Notes: The time is set using the 24 hour clock. On a Master TIME is automatically initialised to the value given by the micro's real time clock. The seconds and hundredths are optional when manual amendment is requested, or when booting the system on a micro without an RTC.

See also the notes on page 14, concerning the AUTOEXEC.BAT file.

See also: DATE

TYPE

Description:	Display ASCII file(s).
Syntax:	TYPE <filespec> {/P}
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	TYPE
MS-DOS Equiv.:	TYPE
Examples:	A>TYPE text.doc

Display the file text.doc on the screen.

A>TYPE text.doc /P

Display the file text.doc, pausing at each screenful (24 lines).

Notes:
The keys CTRL-S and CTRL-Q pause and re-start the TYPE command during execution. CTRL-C abandons the command, and CTRL-P toggles the printer on and off. To print a file use CTRL-P after entering the TYPE command, but before pressing RETURN. At the end of the display, which still echos to the screen, press CTRL-P to disable printer output again.

Unlike MS-DOS, DOS Plus will accept a wildcard argument when typing files, so if you issued TYPE FILE?.DOC and two files existed in the current directory, FILE1.DOC and FILE2.DOC, they would both be typed, in alphabetical filename order, each file's output being preceded by it's name in inverse video.

USER

Description:	Change or display user number.
Syntax:	USER {n} USER
Abbreviation:	None
Versions	1.2, 1.2a, 2.1
DR Equivalent:	USER
MS-DOS Equiv.:	None
Examples:	A>USER User number=0

Displays the current user number.

A>USER 1
User number=1

Changes the current user number.

Notes: This command is only provided for compatibility with CP/M produced discs. CP/M allows discs to be partitioned by user number, each of which cannot access files held under a different user number. DOS Plus defaults to user zero, like CP/M, but this may be changed to allow reading or updating of CP/M discs. On DOS formatted discs the command is non-functional.

VER

Description:	Display DOS Plus version number.
Syntax:	VER
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	VER
MS-DOS Equiv.:	VER
Example:	C>VER

```
DOS Plus version 1.2
```

Notes:	This command is provided only for compatibility with applications which may interrogate the operating system for the purpose of auto-configuration.

VERIFY

Description:	Set or display disc write verification status.
Syntax:	VERIFY (ON | OFF)
Abbreviation:	None
Versions	1.2, 1.2a, 2.1
DR Equivalent:	VERIFY
MS-DOS Equiv.:	VERIFY
Examples:	C>VERIFY ON
	C>VERIFY OFF
Notes:	This command is non-functional. It is included for compatibility with MS-DOS, so that batch files written for MS-DOS applications do not return an error which would cause them to fail.

VOL

Description:	Display the disc volume label.
Syntax:	VOL {d:}
Abbreviation:	None
Versions	1.2, 1.2a, 2.1
DR Equivalent:	VOL
MS-DOS Equiv.:	VOL
Example:	VOL A:

```
Volume in drive A: is MASTER 512
```

Displays disc volume label as set by the formatting or copying of a disc, or by the transient LABEL. (Version 2.1 only.)

Notes:	Disc labels are beyond the control of the user in all versions of DOS Plus prior to 2.1.
See also:	LABEL

7 : Transient Commands

This chapter describes all the DOS Plus commands which are transient, that is they are loaded from disc when required and discarded after use. They are the standard utilities provided on Issue DISC 1, as supplied with the Master 512. Each command is described in the following pages:

ALARM

Description:	Set time and date for alarm messages.	
Syntax:	ALARM {option}	
Options:	/ON	Enable alarm
	/OFF	Disable alarm
	/T	Terminate all alarms
	DD/MM/YY HH:MM /C	Cancel specified alarm
	DD/MM/YY HH:MM {s}	Add alarm and message
Abbreviation:	None	
Default:	ALARM OFF	
Versions:	1.2, 1.2a, 2.1	
DR Equivalent:	ALARM	
MS-DOS Equiv.:	None	
Examples:	ALARM	

Display list of alarms, or message, if none set.

```
Date        Time    Message
--------------------------------------------------------
01/01/88    12:00   Meeting
--------------------------------------------------------
```

ALARM ON

A>ALARM 12:30 Lunch with Fred
Set message for 12:30 today.

A>ALARM 30/01/88 12:30 Ring Fred
Set message for time and date.

A>ALARM /ON
Load and run alarm if not already running.

A>ALARM /OFF
Suspend alarm action. When restarted, all alarms which should have been displayed during the inactive time are lost.

A>ALARM 30/01/88 12:30 /C
Cancel alarm entry for the given date and time.

A>ALARM /T
Terminate (ie, cancel) all stored alarms.

Notes: ALARM is a background program which uses the system
time and date functions to provide a timed message
facility while running other programs. Note that there
are two clocks if the co-processor exists in a BBC Master:
the real-time clock (RTC) and the DOS system clock. On
start up, DOS reads the RTC and uses that time and date
unless altered by the user. When the message appears,
wait for a while and the system will remove the
message, then continue running the foreground
program.

BACKG

Description:	Background program maintenance utility.
Syntax:	BACKG {RUN │ STOP} {<program>} {<options>}
Abbreviation:	None
Versions	1.2, 1.2a, 2.1
DR Equivalent:	BACKG
MS-DOS Equiv.:	None
Examples:	A>BACKG

Display information about all background programs:

```
Name      Memory Used State      Description
--------------------------------------------------------
ALARM     17k                Running  Alarm clock
PRINT                        Stopped  Print Spool utility
--------------------------------------------------------
Available:    341k
```

A>BACKG <progname>
Display the status of a specified background program.

A>BACKG STOP <progname>
Stop a specified background program.

A>BACKG RUN <progname>
Run a program in the background.

Notes: Any valid program parameters may be added to the
program name, for example:

A>BACKG RUN ALARM /ON.

BACKUP

Description:	Back up hard and floppy discs to floppy.
Syntax:	BACKUP
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	BACKUP
MS-DOS Equiv.:	BACKUP and RESTORE
Example:	A>BACKUP
Notes:	The program asks a number of questions, eg, back-up or restore, which drive to back-up or restore and so on. Back-up may be restricted to an individual directory, with or without its associated sub-directories.
	The final option available works only with files which have been updated since the last back-up (strictly those which do not have the archive attribute set), or those files which have been created or modified after a specified date. Each option is displayed on the screen. Simply select the appropriate answer when prompted.

BYE

Description:	Parks hard disc prior to shipping.
Syntax:	C>BYE
Abbreviation:	None
Versions: ˙	1.2, 1.2a, 2.1
DR Equivalent:	System dependent
MS-DOS Equiv.:	PARK, SHIPDISK etc (System dependent)
Example:	A>BYE
Notes:	This command should be used to park the hard disc heads prior to shipping, or even general movement around the office, to prevent damage to heads or the disc surface.

CHKDSK

Description:	Check a disc and repair it if possible.
Syntax:	CHKDSK {d:} {option}

Options:
- /B   Check for bad sectors/clusters.
- /D   Locate all directories.
- /F   Fix errors. If CHKDSK finds a loose chain of clusters, it will assign a filename to them to assist data recovery.
- /L   Link clusters. CHKDSK will try to rebuild a damaged File Allocation Table (FAT).
- /R   Recover directory entries in a damaged root directory.
- /V   Display more information.

Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	CHKDSK
MS-DOS Equiv.:	CHKDSK

Example:
```
A>CHKDSK
Volume DISK #1 created 27 Mar 1987 16:56
811,008 bytes total disc space
731,136 bytes in 40 user files
 79,872 bytes available on disc
```

Notes: Further information about disc formats is contained in the Master 512 Technical Guide (see Appendix G).

Note that unlike the MS-DOS version of this command, the amount of available memory on the system is *not* reported.

COLOUR

Description:	Change screen colours.
Syntax:	COLOUR <mode> <physical colour>

Mode:
0	80-column background
1	80-column foreground
2	GEM (CGA high-res) background
3	GEM (CGA high-res) foreground
4-7	Four colour modes

Physical Colours:

0	Black	8	Flashing black/white
1	Red	9	Flashing red/cyan
2	Green	10	Flashing green/magenta
3	Yellow	11	Flashing yellow/blue
4	Blue	12	Flashing blue/yellow
5	Magenta	13	Flashing magenta/green
6	Cyan	14	Flashing cyan/red
7	White	15	Flashing white/black

Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	None
MS-DOS Equiv.:	None
Examples:	A>COLOUR 0 7
	A>COLOUR 1 0
	Change screen colours to black text on white.
Notes:	The default screen colour is white text on a black background.

DEVICE

Description:	Assign physical to logical device relationships.
Syntax:	DEVICE {NAMES I VALUES I <phys device> I <log device>
	DEVICE <log device>=<phys device> {opt}
	DEVICE <log device>=NULL
	DEVICE <phys device> {opt}
	DEVICE CONSOLE [PAGECOLUMNS = n I LINES = n]

Physical devices: CON0   PRN0
                       AUX0   RAW0

Logical devices: CONIN: CONOUT:
                       AUXIN: AUXOUT:
                       PRN:

CON: is used to denote CONIN: and CONOUT:
AUX: is used to denote AUXIN: and AUXOUT:

Options: DAT{ABITS} = 7 I 8
PAR{ITY} = NONE I ODD I EVEN
SP{EED} = (tx{,rx})
where speed =75, 150, 300, 1200, 2400, 4800, 9600, 19200.
ST{OPBITS} = 1 I 2

Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	DEVICE
MS-DOS Equiv.:	None. See MODE
Examples:	A>DEVICE AUX0 [SP=(9600,9600)]

Set the serial port to 9600 baud for transmit and receive.

A>DEVICE VALUES

```
Current assignments:
CONIN:  = CON0
CONOUT: = CON0
AUXIN:  = AUX0
AUXOUT: = AUX0
LST:    = PRN0
```

Displays current assignments.

DISK

Description:	Floppy disc format and copy utility.
Syntax:	DISK
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	DISK
MS-DOS Equiv.:	None. See FORMAT and DISKCOPY.
Examples:	Formatting.
Notes:	When formatting a 40-track 360k DOS disc, the DISK utility formats all 80 tracks. Do not be tempted to switch a 40/80 drive to 40 track. The system takes care of the track IDs.

Do not expect a 360k disc formatted on the Master 512 to be read reliably in an IBM PC compatible. Format a disc in a PC 360k drive, and then write to it on the 512 if you wish to transfer data between the 512 and an IBM PC. This is not necessarily due to the problems associated with incompatibility between 40 and 80 track drives, but with floppy disc drive hardware and the differences between the NEC µPD765 controller on IBM hardware, and the WD1770 used on the BBC, specifically relating to speeds and the inter-sector gap sizes written.

DISKCOPY

Description:	Copy a disc.
Syntax:	DISKCOPY {d:} {d:}
Abbreviation:	None
Versions:	None in 512 DOS Plus. Use DISK.
DR Equivalent:	DISKCOPY
MS-DOS Equiv.:	DISKCOPY
Example:	A>DISKCOPY A: A:

Copy a disc using drive A, and prompt for source disc and destination disc when needed.

Notes: This command is not found on the 512 discs, but the equivalent functions can be found in the DISK transient command.

The reason that the standard command is not used is that the DR command does not support the special 640k and 800k formats allowed on the 512.

ED

Decription:	Text file editor.
Syntax:	ED {d:}<filespec> {{d:}<filespec>}
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	ED
MS-DOS Equiv.:	EDLIN
Example:	See Chapter 15 and the *Master 512 Technical Guide* where this command is covered in more detail.

EDBIN

Description:	Binary file editor.
Syntax:	EDBIN {d:}<filespec> {(d:}<filespec>}
Abbreviation:	None
Versions:	2.1
DR Equivalent:	None
MS-DOS Equiv.:	None. Use DEBUG.
Example:	This transient is a special programmer's utility, and is beyond the scope of this book. Information is available in the *Master 512 Technical Guide*, also by Dabs Press – see Appendix G for full details.

FIDDLOAD

Description:	Set up system for installable device drivers.
Syntax:	Not applicable
Abbreviation:	None
Versions:	2.1
DR Equivalent:	None
MS-DOS Equiv.:	None
Example:	Not applicable.
Notes:	If applications require non-standard hardware devices (eg, Mouse, X-Y Plotter, Analogue to Digital input) they must supply their own device driver software interface. This is naturally unknown to DOS, so 'FIDDLOAD' is provided to permit these alien devices to be added to DOS's list of hardware devices attached.

FMG

Description:	Menu driven file management utility.
Syntax:	FMG
Abbreviation:	None
Versions:	1.2, 1.2a.
DR Equivalent:	FMG
MS-DOS Equiv.:	None. Use third party utilities, eg, XTREE, PCTOOLS
Example:	A>FMG
Notes:	This command is explained in more detail in Chapter 12. Users should note that it is not included with DOS Plus 2.1 because the product has been withdrawn by Digital Research. It is therefore only available for use with versions 1.2 and 1.2a and, as a general rule, should be avoided to ensure compatibility.

FORMAT

Description:	Floppy disc formatter for 800k discs.
Syntax:	FORMAT {d:} {opt}
Options:	/S Copy the DOS system to the disc after formatting. Note: This is not applicable to 512 as an 800k disc can't contain the system.
	/V Prompt for the volume (disc) label. Again, not available to the 512.
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	FORMAT
MS-DOS Equiv.:	FORMAT
Example:	A>FORMAT A:
	Format the disc in drive to 800k. Before formatting, the user is asked to enter the disc into the relevant drive.
Notes:	This program can be found on the Acorn DISC 2 (GEM) in the \GEMSYS directory.
See also:	DISK.

MS12—F

FSET

Description:	Set file attributes.
Syntax:	FSET {d:} [attribute, ...] FSET <filespec> [attribute, ...]

Attributes:	RO	Read only
	R W	Read write only
	DIR	Directory entry
	SYS	System file, not directory
	ARCHIVE=ON	Mark file as archived
	ARCHIVE=OFF	Mark file as updated

No SPACE UPPER CASE

Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	FSET
MS-DOS Equiv.:	ATTRIB
Example:	A>FSET TEXT.DOC [RO]

Make file TEXT.DOC read only. This prevents over writing or deletion of the file.

A>FSET *.TMP [RW,ARCHIVE=ON]

Make all files with a '.TMP' extension in the current directory read-write, and marked as archived.

GETFILE

Description:	Copy BBC DFS or ADFS format file to DOS format.
Syntax:	GETFILE <BBC filespec> <DOS filespec>
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	None
MD-DOS equiv	None
Examples:	A>GETFILE :1.text A:text.doc
	Copies the file text on drive 1 in ADFS format to text.doc on drive A in DOS format.
	A>GETFILE :1.text A:text.doc /disc
	Copies the file text on drive 1 in DFS format to text.doc on drive A in DOS format.
Notes:	In version 1.2, GETFILE has severe bugs and should not be used.
	In version 1.2a, GETFILE does not work correctly in ADFS or ANFS under any circumstances, unless it was loaded from a hard disc. The comments for 1.2 apply to this version also.
	All bugs are fixed in 2.1, but even so the program seems to be what can best be described as 'delicate', frequently throwing up a 'channel' error from ADFS, without any obvious cause. The program is however robust if run from drive C (hard disc), or if drives A and B are used carefully, which means allocating one drive to DOS and one to BBC format, so the GETFILE program and the destination file would be on, say Drive A (a DOS disc) and the source file would be on Drive B (a BBC DFS/ADFS disc). This avoids the need to swap discs.
See also:	PUTFILE, MOVE

HDISK

Description:	Hard disc partition and system transfer utility.
Syntax:	HDISK
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	System dependent
MS-DOS Equiv.:	FDISK, SYS. System can also be transferred with FORMAT /S.
Example:	A>HDISK

Displays a menu of hard disc partition sizes to choose from. HDISK also has an option to make the hard disc bootable, ie, transfer the system file.

Notes: A DOS partition is an area of the hard disc which is not available to ADFS, but can be used with DOS.

Partitioning a hard disc will result in loss of all data. To make the disc bootable, an option can be used to transfer a new version of DOS Plus without losing the contents of the partition.

If you wish to allocate space to ADFS in front of the partition, use *CREATE to reserve disc space and delete the created file after using HDISK.

Version 2.1 of DOS Plus allows an additional range of partition sizes over earlier versions.

HELP

Description:	Help utility.
Syntax:	HELP
Abbreviation:	None. You can, however, use f0 when at the DOS command line to invoke HELP.
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	None. HELP can be found in the File Manager – FMG
MS-DOS Equiv.:	None
Example:	A>HELP

Calls the initial HELP menu.

A>HELP CHDIR

Calls directly for help on the CHDIR command.

Notes: The help system displays explanatory text on a number of DOS Plus commands. It can be used directly by following the HELP command with the command name required. Most topics also offer further subtopics and examples of command use.

Pressing return only will return you to the systems prompt. However, this causes an unnecessary reload of COMMAND.COM, it is therefore quicker to use CTRL-C, which does not.

HELP FMG will result in the message 'NOT FOUND' being returned. You must type HELP FILEMANAGER for help with the FMG command.

INITDIR

Description:	Initialise a CP/M disc for time stamping.
Syntax:	INITDIR <d:>
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	INITDIR
MS-DOS Equiv.:	None
Example:	A>INITDIR B:
Notes:	This command is only relevant to CP/M. DOS always date and time stamps files.

LABEL

Description:	Disc volume labeller.
Syntax:	LABEL
Abbreviation:	None
Versions:	2.1 only
DR Equivalent:	None
MS-DOS Equiv.:	LABEL
Example:	A>LABEL INVOICES
	Labels the volume in drive A as 'INVOICES'.
Notes:	Any disc, hard or floppy may be given a label. This exactly matches the *TITLE command in native BBC filing systems. The volume label is non-functional, but simplifies disc identification, as the label is displayed when any catalogue operation is performed.
	The volume label may be up to 11 characters in length.

MEMDISK

Description:	Reserve memory for use as a RAM disc.
Syntax:	MEMDISK {n}
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	None
MS-DOS Equiv.:	Use device driver RAMDRIVE.SYS
Example:	A>MEMDISK 128
	Create a RAM disc of 128k. The RAM disc is always referred to as drive M in the 512.
Notes:	When created the RAM disc can be used as a very high speed floppy disc drive.
	Once installed the RAM disc cannot be removed without re-booting DOS Plus.
	See Chapter Nine for further details of using a RAM disc.

MODE

Description:	Set device characteristics.
Syntax:	MODE \<device\>
	MODE \<device\>:=\<device\>:
	MODE \<device\>:baud {,parity,databits,stopbits}
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	MODE
MS-DOS Equiv.:	MODE
Examples:	A>MODE PRN0:=AUX0:

Reassign printer output to the serial port.

A>MODE AUX:12,,,

Set serial port to 1200 baud with defaults:
> parity=EVEN
> databits=7
> stopbits=1

Notes: See DEVICE for an explanation of serial port set up.

MOVE

Description:	Move files between DOS Plus and other BBC filing systems.
Syntax:	MOVE <source><–fs> [/option] <dest.><–fs> [/option]
Options	<–fs> is one of the following:

DOS Plus	–dos
ADFS	–adfs
DFS	–disc
ANFS	–net

</option> may be:

/c　Only valid for BBC source files to be copied to BBC filing system destinations. It specifies that subdirectories are to be included in the copy.

/1　Only valid for BBC source files to be copied to DOS. It specifies that BBC subdirectories should be ignored.

/s　Allows DOS Plus sytem files to be copied.

/r　Allows the destination to be a filename instead of a directory.

Abbreviation:	None
Versions:	2.1 only
DR Equivalent:	None
MS-DOS Equiv.:	None
Examples:	A>MOVE text.doc –dos :1.$.letters.dostext –adfs /r
	Copies the DOS Plus file 'text.doc' on drive A to the ADFS disc in drive 1, placing the data in a file called 'dostext' in directory '$.letters'.
Notes:	The move utility is much more complex than 'GETFILE' or 'PUTFILE', both of which are still supplied with 2.1. for this reason. This program is separately documented in the *Master 512 Technical Guide*, also by Dabs Press. See Appendix G for details.

NETPRINT

Description:	Print to Econet print server.
Syntax:	NETPRINT <filename> {<filename> ... }
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	None
MS-DOS Equiv.:	None
Example:	A>NETPRINT chap1.doc chap2.doc
	Queues the files 'chap1.doc' and 'chap2.doc' for printing on the printer attached to a network fileserver.

NOTUBE

Description:	Deselect Tube and return to BBC mode.
Syntax:	NOTUBE
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	None
MS-DOS Equiv.:	None
Example:	A>NOTUBE
Notes:	This command is functionally equivalent to:
	*CONFIGURE NOTUBE
	or the DOS Plus command:
	STAR CONFIGURE NOTUBE
	In both cases the action is not taken until CTRL-BREAK is pressed.
	This command is only relevant to BBC Master micros.

PCSCREEN

Description:	Change (BBC) screen mode.
Syntax:	PCSCREEN {n}
Options:	0-6 IBM CGA compatible modes
	7 BBC native mode 3
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR Equivalent:	None
MS-DOS Equiv.:	None
Example:	A>PCSCREEN 7

Select BBC native screen mode 3.

Notes: This command can be used after another command or
program has changed mode. Native mode 3 increases
screen handling speed. Note that the native screen
mode must be used only for text display.

The Master 512 supports IBM MDA (Monochrome
Display Adaptor) and CGA (Colour Graphics Adaptor)
screen modes.

BBC mode 3 is chosen because it matches the standard
IBM MDA mode, which provides a text display of 80
characters by 25 lines. Unlike other modes, the text is
not flattened.

See also: COLOUR

PIP

Description: Peripheral Interchange Program

Syntax: PIP <dest fspec>=<source fspec> {opt}
                PIP <dest fspec>=<source fspec>{,<source fspec>}..

Options:

A Archive. Copy only the files which have been changed since the last file copy.

C Confirm each file before copying.

Dn Delete any characters after column n of each line in the source during transfer. The source remains unaltered.

E Echo to screen.

F Filter (remove) form feeds.

Gn Get source from USER n.

H Transfers Intel hex format data.

I Ignore :00 hex data records in the transfer of Intel hex format data.

L Translate all upper case to lower case during transfer. The source is unaltered.

N Adds line numbers to the output during transfer.

O Transfer non-ASCII object files. The normal end of file marker (ASCII 26) will be ignored.

Pn Insert a page break every n lines of data transferred to the output and start the transfer with a page break. If n=1, or is omitted, page breaks will default to every 60 lines. If F is also used the form feeds are removed from the input before the new ones are added to the output.

Qs Quit the transfer after a string 's' followed by CTRL-Z is encountered in the input data.

R Read files with SYS attribute.

Ss Start transferring data from the source to destination only after string 's' followed by CTRL-Z is encountered in the input data.

Tn Expand embedded input tabs to n output spaces.

U Translate lower case to upper case.

V Verify all data transferred, after ouput is complete. The output must be to a disk file for this option.

W Overwrite read-only files without reporting an error or requesting confirmation.

Z Zero the parity bit for ASCII characters only.

Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR equivalent:	PIP
MS-DOS equiv:	None. Use COPY
Examples:	A>PIP LST:=text.doc Copy file text.doc to logical device LST:
	A>PIP letter.txt=lettera,letterb Merge lettera and letterb into file, letter.txt
Notes:	PIP is a CP/M utility, and in keeping with CP/M standards always has the destination file first in the command line, the reverse of normal DOS Plus practice.

The PIP options listed here are shown for completeness, but PIP, as you may notice, is a far more powerful, but more complicated data transfer utility than COPY, which is why COPY was introduced, and also why PIP is retained.

Unless you are familiar with PIP, especially if simple disc to disc copying is all that is required, you are advised to use COPY.

More details on the use of PIP can be found in Chapter 14 and more advanced information in the *Master 512 Technical Guide*, also by Dabs Press.

PRINT

Description:	Background print utility.
Syntax:	PRINT {<d:>}<filename>{,{<d:>}<filename>} ... {opt}
Options:	/H Header on
	/N No header
	/T Remove all files from print list
	/C Remove specified file from print list
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR equivalent:	PRINT
MS-DOS equiv:	PRINT
Examples:	A>PRINT
	Display list of jobs in the print queue.
	A>PRINT text.doc
	Add the file text.doc to the print queue.
	A>PRINT text.doc /C
	Remove the file text.doc from the print queue.
	A>PRINT /T
	Cancels the print queue. If a document is printing at the time it is terminated.
Notes:	A maximum of 32 files may be queued at one time. The files must all be in the current directory of the specified drive.
	If a specified filename does not exist, a message is output and the next file in the list is printed.

PUTFILE

Description:	Copy DOS format files to BBC format (DFS or ADFS).
Syntax:	PUTFILE <DOS filespec> <BBC filespec> {/disc}
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR equivalent:	None
MS-DOS equiv:	None
Examples:	`A>PUTFILE A:text.doc :1.text` Copy the file text.doc from a DOS disc in drive A to a BBC ADFS disc in drive 1.
	`A>PUTFILE A:text.doc :1.text /disc` Copy the file text.doc from a DOS disc in drive A to a BBC DFS disc in drive 1.
Notes:	In version 1.2 PUTFILE has severe bugs and should not be used.
	In version 1.2a, PUTFILE does not work correctly in ADFS or ANFS under any circumstances, unless it was loaded from a hard disc. The comments for version 1.2 apply to this version also.
	See the notes on GETFILE concerning use of the utility in DOS Plus Version 2.1. The same comments apply to PUTFILE.
See also:	GETFILE, MOVE

SDIR

Description:	Display file information.
Syntax:	SDIR
	SDIR <filespec> {,<filespec>} ...
	SDIR [opt{,opt} ...]
	SDIR <filespec> ... {opt} ...

Options:

ATT	Displays the file attributes
DATE	Displays date and time stamp of file
DIR	Displays only files with the DIR attribute
DRIVE=ALL	Displays files on all accessed drives
DRIVE=(d,d,)	Displays files on all drives specified
DRIVE=d	Displays files on the drive specified by d
EXCLUDE	Displays files that do not match the files specified in the command line
FF	Sends an initial form-feed to the printer device if it has been activated by CTRL-P
FULL	Shows the name, size, number of 128-byte records, and attributes of the files. If there is a directory label on the drive, SDIR shows the password protection mode and the time stamps. The display is alphabetically sorted. (See FSET for a description of file attributes, directory labels, passwords and protection modes.)
LENGTH=n	Displays n lines of printer output before inserting a table heading. n is a number between five and 65536
MESSAGE	Displays the names of drives and user numbers that SDIR is searching for.
NOPAGE	Continuously scrolls information on screen
NOSORT	Displays files in the order found on disc.
RO	Displays only the files that have the read-only attribute set.
R W	Displays only the files that have the read-write attribute set.
SIZE	Displays the filename and size in kilobytes

SYS	Displays only the files that have the \SYS attribute.
USER=ALL	Displays all files in all user numbers for the default drive.
USER=n	Displays the files for the user number specified by n.
USER=(0,1,...15)	Displays files for the user numbers specified.

Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR equivalent:	SDIR
MS-DOS equiv:	None
Examples:	A>SDIR C: [FULL] Display full set of characteristics for all files in user 0 on drive C.

A>SDIR C: [SIZE]
List all files on drive C and their size.

A>SDIR [DRIVE=C,FF]
Sends a form-feed to the printer before displaying the files on drive C.

A>SDIR D: [RW,SYS]
Display all files on drive D with read-write and SYS attributes.

A>SDIR C: [USER=ALL]
Display all the files in all user numbers (zero to 15) on drive C.

A>SDIR [USER=2]
Display all the files under user number two on the default drive.

A>SDIR C: [USER=(3,4,10)]
Display all the files under user numbers 3, 4 and 10 on drive C.

A>SDIR [DRIVE=ALL]
Display all the files under user zero on all the drives
currently in use.

A>SDIR [DRIVE=C,USER=4]
Display all the files under user four on drive C.

A>SDIR [DRIVE=(B,D)]
Display all the files under user zero on drive B or D.

A>SDIR [exclude] *.CMD
List all the files on the default drive and user zero that
do not have a file-type of CMD.

A>SDIR [user=all,drive=all,sys] *.PLI *.CMD *.A86
Instruct SDIR to list all the system files of type PLI, CMD,
and A86 on the system in the currently active drives for
all the user numbers on the drives.

A>SDIR X.SUB [MESSAGE,USER=ALL,DRIVE=ALL]
Search all drives under each user number for X.SUB.
During the search, SDIR displays the drives and user
numbers.

A>SDIR [drive=all user=all] TESTFILE.BOB
Instructs SDIR to display the filename TESTFILE.BOB if it
is present on any drive under any user number, together
with all file information.

SETFMG

Description:	Set the File Manager environment.
Syntax:	SETFMG
Abbreviation:	None
Versions:	1.2
DR equivalent:	None
MS-DOS equiv:	None
Notes:	This command always seems to return a 'file not found' error, and has been withdrawn from DOS Plus version 1.2a onwards.

SHOW

Description:	Display drive information.
Syntax:	SHOW {d:} {SPACE │ LABEL │ USERS │ DIR │ DRIVE}
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR equivalent:	SHOW
MS-DOS equiv:	None
Examples:	A>SHOW A: Display the access mode and free space on drive A.
	A>SHOW A:[LABEL] Display the label of drive A.

SKS

Description:	Sidekick loader.
Syntax:	SKS
Abbreviation:	None
Versions:	2.1 only
DR equivalent:	None
MS-DOS equiv:	None
Example:	A>SKS Initialise system for running Sidekick.
Notes:	The Master 512 implementation of DOS Plus has problems when used with Sidekick, the popular 'pop up' utility from Borland International. Due to user demand Acorn have supplied SKS.CMD. It must be run before attempting to run Sidekick. If, as is often the case, you install Sidekick from an AUTOEXEC.BAT file be sure to include the SKS command first.
	'SKS' may work with other 'pop-up' software, but this is strictly on a try and see basis. The version of Sidekick should not be later than 1.50, or it will fail.

STAR

Description:	Execute BBC micro native star commands.
Syntax:	STAR STAR <BBC * command>
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR equivalent:	None
MS-DOS equiv:	None
Examples:	A>STAR STAR version 1.00 *FX6,0 *(RETURN only) A>

Tells the BBC to send linefeeds to the printer. DOS Plus will recognise this...

```
A>STAR BUILD -DISC-:1.notes
    1 A quick note
    2 on my DFS disc
    3 (ESCAPE pressed at this point)
A>
```

Create a short note on a Master disc in DFS drive 1.

Notes: If STAR is issued without parameters a * prompt replaces the normal DOS prompt. A series of BBC * commands may then be issued until RETURN is pressed without an entry, when the normal DOS prompt returns.

As each command is issued it is passed to the BBC Operating System for immediate execution, after which control returns to DOS.

Unfortunately STAR clears the screen and moves the cursor to the bottom line before executing any command, making it impossible to use normal BBC screen capture software (invoked by a * command) to save a DOS Plus screen for later retrieval.

TREE

Description:	Display tree structure of directories.
Syntax:	TREE {d:} {<filespec>}
Abbreviation:	None
Versions:	1.2, 1.2a, 2.1
DR equivalent:	TREE
MS-DOS equiv:	TREE
Examples:	A>TREE B:

Space	Files	Pathname
27,136	2	b:\
208,788	21	b:\gemsys
75,157	6	b:\gemdesk
112,104	5	b:\gemboot
234,754	7	b:\gemapps
37,632	14	b:\gemapps\patterns
A>		

Lists the tree structure of the disc in drive B.

8 : Using DOS Plus

The Concepts

In the preceding two chapters the commands are examined one by one, with the syntax shown and examples of their use. However, to a user fresh from a different machine, (including the BBC in native mode) there are certain standards expected for command entry which may differ from other systems.

As you will see in the next three chapters, DOS Plus allows commands to be used in a variety of ways, not only from the keyboard. However, the style of entry and the characters expected or allowed doesn't vary with the way in which the commands are used. This chapter explains the syntax and entry rules seen in the last two chapters, with examples of what is, or is not, legitimate. In addition, although most errors are specific to the function called, rather than to DOS, there are a few prompts or messages which you will see much more frequently than others. These too are explained.

In essence DOS consists of three parts. The BIOS, we have already mentioned. It is concerned with mapping DOS logical peripherals on to the physical devices attached to the machine. The core, or main part of DOS is concerned with managing fixed functions, like foreground and background time sharing, memory management and so on, and finally the console command processor, also known as the CCP for short. This is in effect the transient called COMMAND.COM.

COMMAND.COM is responsible for taking any command entry and converting it to an action, or reporting Bad command or filename if this can't be done. Because all input commands are handled by the CCP, the rules governing entry do not vary from utility to utility, so the user always sees a consistent interface in DOS, much like the way in which applications and peripherals are linked by the BIOS.

For the entry of a command into COMMAND your standard prompt must be on screen. This defaults to the current drive identifier, followed by a

right pointing chevron as already seen, assuming A: is the current drive. The prompt can be changed (See the PROMPT command) but this has no effect on command entry.

Generally COMMAND attempts to be as helpful as possible, so that many items can be defaulted, the values being supplied by the CCP before the command is passed on, or by the command program itself. In addition it is completely tolerant of extra spaces in entries (so long as they are not in significant locations). For example to copy a file called LETTER.TXT from drive B: to the current drive, A: any of the following will do:

```
A>COPY  B:LETTER.TXT  A:LETTER.TXT

A>COPY  B:LETTER.TXT  A:LETTER.*

A>COPY  B:LETTER.TXT  A:

A>COPY  B:LETTER.TXT  LETTER.TXT

A>COPY  B:LETTER.TXT
```

The first command is specified in full and is completely explicit about the required action. In the second example an asterisk is entered, so the default extension is taken. In the third command only the drive is entered as the destination, so the file name is supplied automatically, while in the fourth case we have supplied the filename but not the drive. In the last case no part of the destination is specified at all, but again everything is taken care of. In all cases the result will be the same, a file called LETTER.TXT will appear on drive A: or an existing file of that name on drive A: is overwritten.

Optional Items

Some commands can take additional instructions to modify their actions, though these modifiers are optional and do not affect the essential function. For example if you TYPE a long file (equivalent to *TYPE on the BBC) you may wish to pause the output so as to be able to read it. This can be done ad-hoc, as on the BBC by pressing CTRL-SHIFT, when the screen will stop as long as the keys are held, or you can add a directive to the command to put the screen in paged mode, when it will stop on every page until you press a key. For example, if we TYPE our file, to pause it we could enter the command as:

```
A>TYPE  LETTER.TXT  /P
```

The {/P} means pause, and this can be appended to any DOS command which outputs to the screen. Try, for instance, putting your working copy of the boot disc in drive A: and type:

```
A>DIR /P
```

and the directory display will be paused at a screenful, until you press a key to tell it to continue. (A transient called MORE fulfils this function in MS-DOS – this transient is not available in DOS Plus.)

Control Keys

Other DOS Plus CCP facilities operate in a similar way but don't rely on a modified command. For example if we TYPE LETTER.TEXT but don't want to hold CTRL-SHIFT, we can instead press CTRL-S, which will stop the scrolling, until we release it by CTRL-Q.

The Master 512 DOS Plus control keys are shown below. These keys can be used to edit entry or to modify the action of commands. Although some of these keys may make entries appear on screen as separate lines, all lines are passed to the system which buffers them until RETURN is pressed, except CTRL-J and CTRL-M which both have the same effect as return.

CTRL-C   Terminates input, or a command and returns to the current DOS prompt. The input or command is discarded.

CTRL-E   Sends a carriage return to the screen, but does not affect the command line buffer.

CTRL-H   Deletes the character to the left of the cursor.

CTRL-I   Inserts spaces up to the next screen tab stop.

CTRL-J   Terminates input and sends the line to be processed.

CTRL-M   Same action as CTRL-J

CTRL-P   Echos all screen output to the printer device.

CTRL-Q   Releases the screen after it is stopped by CTRL-S.

CTRL-R   Retypes all characters to the left of the cursor onto a new line.

CTRL-S   Stops the screen display (every 25 lines) until CTRL-Q is pressed.

CTRL-U   Deletes all characters on the current line and starts a new one without updating the buffer.

Every command executed is retained in a 'last command' buffer, and can be retyped automatically by merely pressing CURSOR-RIGHT. The retyped command line does not include the terminating RETURN and so will not be executed automatically. When the line has been retyped (as far as you need) you can edit it as if you had just entered it, and pressing RETURN will execute it. During manual input CURSOR-LEFT behaves like the DELETE key.

9 : The Memory Disc

Memory Discs in General

All versions of DOS provide, as standard, the ability to allocate a memory disc. These are often referred to as RAM discs. It is of course not a disc at all, but an area of memory set aside to appear to an application, or its user, like an extra disc drive. When created, the memory disc can be treated exactly like any other drive on the system, and can have directories and files for any purpose stored on it. However, there are several points to bear in mind when contemplating the use of a RAM disc, and these are explained in this chapter.

The main benefits of using a memory disc can be felt on floppy disc only systems, where the need to swap discs for even the most routine of tasks can be caused by the limited amount of on-line storage available, even when using the 800k format. Indeed, within some applications, you may not be able to swap discs at all. You may need to first save your work, leave the application, carry out the operation and then reload. In these cases the presence of a third disc drive can be even more useful, not only saving much time, but considerably increasing the flexibility of your system.

Some implementations of DOS have a (semi) permanently configured default memory disc. This appears (or not, as configured) automatically when the system is loaded, but to change the setting is a tedious and inconvenient process, since it usually requires the running of a special program, followed by the need to re-boot the entire system. This type of option is not available on the 512, but a rather more flexible approach is provided. The 512 requires no permanent settings and, given the limited memory for larger applications, the 512's chosen method provides a more easily configured system than the former.

Setting up the Memory Disc

To set up a memory disk you need to run the program called 'MEMDISK', initially provided on Issue Disc 1 as a transient command. If you might want to set up a memory disc with an application, you will find it more convenient to include the program (MEMDISK.COM) on your application's program disk, perhaps included in a batch file along with the command for the size of memory disc required (or allowable) with the application. Chapter 10 explains batch files in more detail, so for the moment example commands can be used manually. Assuming, as usual, that the current drive is A: and that the disc contains 'MEMDISK.COM' setting up a memory disc is simplicity itself. You may care to follow the examples if you are unfamiliar with the memory disc.

As is usual with .COM files the command takes the form of the filename, without the extension, and in this case uses a single parameter to define the size of the required memory disc in kilobytes. For example, to create a 100k memory disc you would enter:

```
memdisk  100
```

Note the spelling of disk with a 'k' this is how the file is named on the disc.

The 'MEMDISK' transient will execute and, on completion, confirm that a 100k memory disc is installed. The above example is the only form of the command, and the only variable is the required memory disc size. One fixed item that you cannot specify the drive name you would like to use, the resulting memory disk is always drive M and this cannot be altered. This may have implications for some applications, since they may well expect to see their other modules only on the drive from which they were loaded, so not everything can be run from the memory disc.

Another point to note is that, no matter what size you tell 'MEMDISK' to allocate, the resultant size is always an even number. For example, if you need a 49k memory disk for your current purposes you must allocate it as 50k. Any attempt to create it as an odd number size will always be rounded down by the system. This may not matter, but if you are, perhaps, being careful with memory your RAM disc may now be too small.

The final important point to note about the 512's implementation of memory disk is that after it's created you cannot remove it or even change its size, in fact, you can't change anything about the memory disc even when it's empty. To do this requires the system to be re-booted. It should be

noted, however, that this restriction is peculiar to neither the 512, nor even to DOS Plus.

Limitations of a Memory Disc

Most of the limitations of the memory disc are likely to be caused by the combination of the 512's memory size and the applications software you are using. However, before considering this there is one overriding factor that should always govern how they are used.

A memory disc can save considerable quantities of time if used correctly, but it is not a real disc and neither it, nor its contents should be regarded as permanent. Unlike any external 'real' disc a machine failure is fatal to the memory disc, and the contents are lost. Use it, therefore, only for temporary storage, for example to hold transient command software or batch files, but never for data files, unless these are also temporary or fully recoverable (ie, fixed contents, copied from elsewhere).

When deciding on the suitability of a memory disc for your applications bear in mind that programs designed for MS-DOS, (even a 512k machine) will normally find more memory available than in a DOS Plus system. This, rather than hardware compatibility, explains why some programs run in a 512k MS-DOS machine but not in the 512. If you have one of these applications and it's already borderline, it clearly is not a suitable candidate for use with a memory disc.

Other programs (even DOS programs) need all or most of the available RAM in the 512, especially if the software was originally designed to expect a 640k machine. Comments for these are as above. Some programs run in the 512, but require more space as they load than when finally installed. If you have applications like these you can be fairly certain that they will also fail if a memory disc is installed.

Unfortunately there are no easy guidelines so you must experiment with your own applications. A size that works with one application may possibly be unsuited to another. The smallest size of memory disc that is permitted is 16k, but even this might be useful, for example, to contain two or three of the smaller transients.

'MEMDISK' itself is, of course, a program, so in addition to the size of memory disc that you allocate you should add 90k. This overhead does not

vary and is always 'lost' to the system when 'MEMDISK' is used, in addition to the size of RAM disc requested.

If you reboot the system you can enter the following sequence of commands to demonstrate this for yourself.

```
backg
memdisk  40
backg
```

As you'll see from the difference between the figures produced by the two 'BACKG' commands, the memory reduction for a 40k memory disc is about 130k. As noted above, the amount of 'lost' memory does not vary with the allocated size of the memory disc, so even a 20k memory disc needs 110k. Bear this in mind when you decide on the suitability of a memory disk for your particular job. If you have a PC Plus from Solidisk the above limitations are unlikely to be relevant.

One other case where the apparent memory limitations are not so severe is if your application is capable of 'self configuration' to fit the memory constraints of the system. Again, some experimentation and the type of application may show that a reasonable size of RAM disc is still viable.

For example PC-Write by Sagesoft is a popular wordprocessor which runs well on the 512, provided that it is initially configured for a two colour display with a mono monitor. However, it is written to be capable of working on very small PC systems, many of which were commonly less than 512k a few years ago. In consequence, this software runs completely normally on the 512 with a 100k memory disk installed, while at the same time holding a 60k document in memory, about six times the length of this chapter. If the memory disk allocation is increased (after re-booting) to 128k, PC Write self-adjusts by reducing the maximum document size, in this case to about 42k, (roughly 7,000 words) which is still adequate for many purposes.

The Benefits

Used within its limitations and with the right application a memory disc can greatly increase both the speed and the operational convenience of your 512. This will be most obvious when commands call for the repeated loading of files, for example, when transient commands are used. With a RAM disc there is no noise and virtually an instant response when commands are issued.

If you decide to use a memory disc you can include its setup commands in your startup batch file. Include the command to create the memory disc and the commands to copy to it the most frequently used utility software and the batch files needed for your application. The installation of your memory disc can, therefore, both be customised to your application and automated at the same time. When utilities are needed you will no longer have to swap discs, nor will you need a copy of the utility on virtually every data or applications disc, often the only alternative to disc swapping.

The next chapter discusses batch files and examples of their use, including the way in which a memory disc can be used with these to speed up and simplify operation.

Removing the Memory Disc

Once a RAM disc has been installed it cannot be removed from DOS Plus simply by issuing a command. If you wish to free the memory allocated by DOS Plus to the RAM disc then it is necessary to re-boot DOS Plus itself.

10 : DOS Plus Batch Files

What are Batch Files?

One of the most powerful features of DOS Plus or MS-DOS is the ability to automate sequences of commands. You may have already come across this in principle on the BBC micro, where the *KEY command is sometimes used to simulate the pressing of ten or twenty keys, including RETURN. For longer sequences an EXEC file is used. This command (*EXEC) takes a normal text file, such as might be saved from a wordprocessor or text editor, and treats all the text in the file as keyboard input. In other words, it behaves as though you had typed in the text (ie, commands) directly.

The benefits of storing commands in this way are most apparent when the command sequence will need to be repeated from time to time. When stored in a file which is known to be correct, the sequence can be repeated on demand, with guaranteed results and no possibility of new errors creeping in. It is also rather easier than repeated retyping.

DOS Plus provides these facilities by means of batch files. These are files which, as above, contain commands of the type you would enter through the keyboard, for example to catalogue discs or to copy files. In practice you can regard batch files as a method of defining your own completely new automated functions. All normal DOS Plus commands, both permanent and transient, can be used together in any sequence, and can carry out any operation you would be able to control from the DOS prompt, including calling a batch file!

A DOS Plus batch file (always recognised by the '.BAT' extension) is essentially similar to the EXEC file on the BBC, although it is rather more powerful, having, as it does, a language structure to permit control of its actions from within. The batch language is simple but powerful, and provides for control of execution by means of 'IF' and 'GOTO' statements. The action of these can be altered by external factors such as, for example, the presence or absence of a specific file.

Another major difference between DOS batch files and BBC EXEC files is that a batch file can run a complete applications session from beginning to end. On termination of the application the batch file can still be in control. This means that applications actually can be run from within batch files, rather than simply being started by them as on the BBC. In addition, as noted above, one batch file can run another. This facility, together with the ability to execute programs and make variable decisions as execution proceeds, provides the DOS user with a comprehensive and powerful job control language which is simple to implement.

Here is a very simple example of a batch file, or is it a list of manual commands?

```
CD \WP
COPY *.txt A:
COPY *.doc A:
ERASE *.BAK
CD \
```

These commands, if entered from the keyboard, could be used to back-up text and document files from a wordprocessing directory called 'WP'. All files with a '.TXT' or a '.DOC' extension would be backed up to drive A, then any '.BAK' files (old versions of the files) on the current drive would be deleted to free the disc space. Finally the current directory would change to the root directory. These commands would have exactly the same effect if stored in a batch file. They would look the same, and would work in the same way.

It is much easier to group these commands into a batch file called, say COPYALL.BAT, than to use them manually. To execute them, all you would then need to do would be to type the command COPYALL at the DOS prompt, and all operations would be automatic.

Of course, as it stands, the above example is completely inflexible, it will always carry out the same operations on the same groups of files. However, further facilities are provided to allow variable information to be supplied to batch files, in much the same way that parameters are be supplied to manually entered DOS commands. Again, the use of these parameters is exactly the same in batch files as in manual commands.

One special batch file name is reserved by DOS, which looks for this file whenever the system is loaded. The filename is 'AUTOEXEC.BAT', and if present on disc will be executed, without intervention, as soon as DOS has loaded. In this way defaults for your own system, such as path names,

screen colours and so on can be actioned immediately as part of the start-up process.

The remainder of this chapter explores the development and use of the various facilities in batch files, providing examples of how they are constructed, what they do, and how the automated control facilities are implemented to vary the function of a batch file.

Creating a Batch File

A batch file can be created either by a line editor, such as ED, directly from the keyboard using COPY, or most easily by using your wordprocessor.

For very simple examples you may wish to enter directly from the keyboard. To do this directly you would use the COPY command. For example:

```
COPY CON: COPYALL.BAT
```

This tells the computer to copy all the input from the keyboard, line by line, to a file called COPYALL.BAT. You then type in each command line, ending with a RETURN. Finally, after all commands are entered, type CTRL-Z, followed by another RETURN to terminate input. A ^Z symbol will appear on screen but don't worry about that, nothing superfluous is added to the file. The command file will then be copied to disc. As is usual with COPY, any existing COPYALL.BAT file would be overwritten, or if it didn't exist before it would be created.

Batch files are most easily created or amended in your wordprocessor, and this becomes more useful when you start to develop longer batch files. Note, however, that your wordprocessor should not include format control codes in the document, like Wordstar and some others do. The presence of these would cause the batch file to fail at execution time. If this is the case, but there is an 'ASCII only' edit option, or an ASCII save option you should use that. Failing that, you could create the file in your wordprocessor and use ED finally just to tidy it up. ED is actually very easy to use, but it must be admitted it's not very user friendly. As a last resort you can create the file in native BBC mode, perhaps using View or similar, and then use 'getfile' to transfer to DOS Plus for final testing and editing.

Batch File Parameters and Variables

As mentioned, batch files can be supplied with variable information, typically filenames to be used during copying, deleting, loading and so on. For example, the COPYALL example above could be made much more flexible and general purpose by supplying the directory and filenames to be used, instead of having them fixed.

This is simply achieved by stringing the required names on to the end of the batch file name, separated by spaces, when it is first called. These 'parameters' can then be substituted at appropriate points within the batch file, and the entered names will be used in any operation.

You may think this defeats the object of keeping commands as simple as possible, but there is a trade-off between simplicity and flexibility. It is finally your choice to decide how best to use the facilities in the light of your your own needs and applications. In practice, supplying parameters to batch files is no more difficult than supplying them to manual commands.

A batch file can use up to ten parameters simultaneously. Although, in total more can be entered and used, only ten have names, so only ten can be referenced at once. The ten names are simply the numbers zero to nine, prefixed by a percentage symbol, so they are %0, %1, %2 and so on up to %9. The first of these, %0, always defaults initially to the name of the batch file itself, though you can change this later, as you'll see. The other parameters are numbered sequentially from one to nine, and any parameters entered when the batch file was called are substituted, in sequence, completely automatically.

Suppose we wanted to amend the COPYALL example used earlier, to allow the directory and the file extensions used to be variable, and specified when the batch file is called. It would now be written like this:

```
CD %1
COPY *.%2 A:
COPY *.%3 A:
ERASE *.%4
CD \
```

When we call this routine, it will now expect four variables to be supplied (%1, %2, %3 and %4). These are, in order, the directory, the file extension for the first and second COPY operations, and the file extension for the ERASE at the end. Note that we can still leave some items fixed, like the

destination drive and the reselection of the root directory. Although these too could be replaced by parameter substitution, only variable items need be substituted.

If we were to call COPYALL now, and wanted to COPY files with both '.IDX' and '.FIL' extensions in directory '\DATABASE\DATAFILE', finally deleting any files with a '.WRK' extension, our entry would be:

```
COPYALL \DATABASE\DATAFILE IDX FIL WRK
```

All you need to take care of is the order in which you enter the parameters, separating each from the next by a space.

Of course, even when jobs are controlled by batch files, errors can still crop up such that you need to stop the job at once. Any batch job can be terminated at any time simply by pressing CTRL-C. DOS Plus will automatically request confirmation, to which the usual Y or N response is required. The message takes the form:

```
Terminate batch job Y/N ?
```

Naturally if you answer 'N' execution continues, but if you confirm, all open files are closed, all operations are abandoned and you are returned to the normal DOS prompt. Note that your ability to enter CTRL-C may, at times, be restricted by the program currently running.

Batch Files and Discs

When a batch file is used to control a job, one constraint is that the batch file must remain on a currently available disc. If you are running the system from a hard disc this need not be a problem, but with only two floppy drives options are more restricted. Placing the batch file on your applications disc is one answer, but if you have also copied several necessary transients to this disc too, lack of disc space can soon become a problem.

A better solution, memory permitting, is to set up a RAM disc and copy both the batch file and the transient commands on to it. Remember too that you can set 'PATH' to point to the RAM disc, overcoming directory or drive name problems at the same time. As one batch file can call another, it is quite possible to have one batch file set up the RAM disc and copy all necessary software and batch files to it, before finally calling an appropriate batch file to start the required application if any.

11 : Batch Commands

As outlined in the previous chapter, apart from all the DOS Plus commands examined so far, batch files have a simple language to allow automatic control of the way they execute. Some of these are simply to make life a little easier, while others are to allow more complex operations to be performed. The batch commands are listed below with a brief description, followed by a more detailed explanation of each.

ECHO	Controls whether batch commands are displayed or not.
GOTO	A command which makes control jump from one point in batch file execution to another.
IF	A condition test in a file. The action taken can be controlled by the result of the test.
REM	A reminder or remarks line in a program.
PAUSE	Causes a delay in a program until a key is pressed.
FOR	A loop operation, similar to 'FOR...NEXT' in BBC BASIC.
SHIFT	Allows the limit of ten parameters to be extended.

ECHO

Description: ECHO is used to enable or disable the display of batch commands on the screen.

Syntax: ECHO {ON | OFF | <S>}

Options: ECHO ON

This allows all batch commands to be displayed as they are executed, and is the initial setting.

ECHO OFF

Turns off the automatic display of batch commands.

ECHO Now insert backup disc

Displays the message "Now insert backup disc".

Note that if ECHO is on, the message will be displayed twice...once as the command itself is executed and again as a result of the command.

ECHO

Displays the current status ECHO ON or ECHO OFF.

Notes   Unlike MS-DOS, the command ECHO. (ECHO full stop) does not generate a blank line, but just echos a full stop. Note that ECHO ignores any leading spaces from the text line, so

ECHO Normal Text
ECHO   Indented Text

would be displayed as

Normal Text
Indented Text

The command ECHO = behaves like ECHO without an argument ie, it displays the current ECHO setting. To display an = sign, the command ECHO == is used.

GOTO

Description: Alter the flow of control in a batch file.

Syntax: GOTO <label>

The flow of the batch file may be changed by the use of GOTO and labels. A GOTO may be unconditional, or may depend on the result of an IF statement. A label consists of a colon (:) and a string of characters. Only the first eight characters of a label are significant.

When GOTO is encountered in the batch file, if the label is found, execution resumes at the line following the label. If the label is not found, the batch file terminates with an error message.

Example:
```
ECHO OFF
A:
IF EXISTS init.bat GOTO SETUP
B:
IF EXISTS init.bat GOTO SETUP
ECHO Init.bat not present on A: or B:
GOTO END
:SETUP
INIT
ECHO Setup complete
:END
```

The above batch file SETUP.BAT will search drives A: and B: for the file INIT.BAT. If not found the message "Init.bat not present on A: or B:" will be echoed. If found INIT will be called and the message "Setup complete" will be echoed to the screen.

IF

Description: A condition test.

Syntax: IF {NOT} <condition> <command>

If the condition is true, then the conditional command is executed. Unless it is a GOTO the batch program continues execution on the next line. If the condition is false the conditional command is not executed and execution resumes on the next line.

NOT may be included in the expression, when the inverse of the condition test applies, ie, if the expression is false, then execute the conditional command.

There are three possible forms of <condition>:

1) ERRORLEVEL <n>

ERRORLEVEL <n> involves the use of an error code which is returned by a program to its caller. Thus, if a batch file calls a program, it may check the return code and, in this case, specify the highest error code allowed. The condition is true if the error code is greater than or equal to <n>.

2) <s1> == <s2>

<s1> == <s2> compares two character strings and is true if the strings are identical. Note also that this comparison does not ignore case - unlike most DOS Plus commands. For example "FILE"=="file" is not true.

3) EXIST <filespec>

EXIST <filespec> is used to check the existence of a file, allowing file-based actions to be carried out only if the specified file is found. This is probably the most common use. See GOTO for an example of the EXIST test.

REM

Description: A remark in the file which is totally ignored.

Syntax: REM {<Optional remarks entered here>}

This command allows a remark to be inserted into the batch program. With ECHO ON, the remark line is displayed on the screen and this can be used to provide a commentary as the program is executed.

Example: REM Remove all backup versions

PAUSE

Description: Pause execution until a key is pressed.

Syntax: PAUSE {<s>}

Programs sometimes need to wait for the user to perform some action, eg, change a disc, or to give the user the opportunity to abort the batch program before a certain command is executed. PAUSE may be suffixed by a message string, and when executed will wait for a key press. The message string is non-functional, but may be seen when ECHO is ON.

When pause is executed the automatic prompt:

                Strike any key when ready...

is displayed (whether ECHO is ON or OFF) and execution is suspended, pending a key press. If CTRL-C is pressed, the batch program can be aborted, so that a pause, with a suitable message displayed, is an ideal time to do this if such a decision is envisaged. If any other keys are used execution resumes.

FOR

Description: Loop construct to perform multiple operations

Syntax: FOR %%<variable> IN (<set>) DO <command>

The program performs the command for each member of the subset <set>. The use of %%<variable> allows <command> to act upon the current member of the set. At any time the variable is set to the filename currently being processed. The double %% is used to distinguish between FOR variables and those used as parameters in the command line. If FOR is used manually from the DOS Plus prompt, rather than within a batch program, only one % is needed.

FOR statements cannot be nested. Any commands which can be included in a FOR construct could equally be carried out as separate commands, but FOR offers economy of effort.

Examples: FOR %%f IN (*.BAK) DO ERASE %%f

This is functionally equivalent to ERASE *.BAK

FOR %%f IN (TEXT1.TXT TEXT2.TXT) DO COPY%%f A:

Copies each of the two files to A:

FOR %%f IN (*.TXT FIRST.HDR) DO NETPRINT %%f

Sends all '.TXT' files and 'FIRST.HDR' to the network printer. Note that the choice of the %%variable names is purely convention. Any other variable name (not case sensitive) would do.

SHIFT

Description: Re-assigns command line variables.

Syntax: SHIFT

The SHIFT command allows more than ten command line arguments to be used. This is possible because more than ten can be entered with the original command, but only ten can be referenced directly. The SHIFT command moves all parameters to the left by one place, so that the previous contents %0 are replaced by the contents of %1, %1 contents are replaced by %2, and so on. The one beyond %9, which was previously inaccessible can now be referenced.

It should be noted that, after the first SHIFT, the identity of the current batch file name is lost. Another SHIFT loses the original %1, and so on. Items lost in this way are not recoverable.

The main use of SHIFT is to perform the same action repeatedly on a number of different objects, rather than to permit batch programs that are so general purpose that they require more than ten variables.

Examples: REM ARCOPY.BAT – Copies files listed to \archive
:LOOP
COPY %1 \archive\%1
ERASE %1
SHIFT IF NOT EXIST %1 GOTO end
GOTO loop
:END

To use this command, which copies any number of supplied filenames, you would type:

ARCOPY fred.txt bill.txt letter.wpx

and these files (or it might be a dozen) would be copied to directory \ARCHIVE directory.

12 : File Manager

Important: The File Manager program has not been included with DOS Plus 2.1. This chapter is only of relevance, therefore, to earlier versions of DOS Plus.

The File Manager (FMG) is a menu-driven program which allows most of the commands so far described to be used by selecting the command name and any associated parameters from the screen, rather than using the command line.

Each command is selected from a list using the cursor keys and function keys. Files, or other parameters associated with the command, may be selected in a similar fashion. The main advantage of selecting files from a list is that a chosen set of files may be acted upon with a single copy command. For example, if COPY is used from the command line, it is only possible to copy multiple files using wildcards or by using multiple copy commands. In the file manager, a number of files may be selected and copied in one action.

The box in the top left-hand corner shows the disc format, eg, CP/M or DOS, and the remaining free space on the disc. The top centre box shows the current directory. The box on the right-hand side of the screen is the command panel from where commands are selected.

The main box in the centre of the screen is the object panel. It contains a list of files which may be selected for commands to act on.

The lower portion of the screen contains a prompt line which is used for a description of the highlighted command, or for keyboard input when required. This portion of the screen also shows a menu of function key assignments.

Moving Around the Menus

The following keys are used to select commands and objects:

ESCAPE	Aborts the current command or returns to a higher level menu
TAB	Toggles between command and object panels
Spacebar	Moves the cursor to the next item in a menu
Enter	Selects the highlighted object or executes the highlighted command
Up arrow	Moves the cursor up to the item above
Down arrow	Moves the cursor down to the item below
Left arrow	Moves the cursor to the previous item
Right arrow	Moves the cursor to the next item
< + >	Selects the highlighted object
DELETE	Deselects the highlighted object
F0 or ^W	Moves a command line prompt to the prompt line for command line entry
F1 or ^N	HELP
F2 or ^O	TYPE
F3 or ^P	Repeats the last selection
F4 or ^Q	Cancels selected objects
F5 or ^R	RUN
F6 or ^S	Edit the selected file
F7 or ^T	Select Dir1
F8 or ^U	Select Dir2
F9 or ^V	File directory

Selecting Commands

Use the cursor keys and/or spacebar to highlight a command and select using ENTER. If the command requires one or more objects, the cursor moves to the object panel. After objects are selected, the command is executed using ENTER.

If objects are already selected when the command is selected, the command may be executed immediately without needing to reselect.

Selecting Objects

Objects can be selected in three ways:

1) Use the cursor keys and/or spacebar to move to the object

2) Type the first letter of the object and any subsequent letters to uniquely identify the object

3) Type a wildcard file specification in the prompt line

After the cursor has been moved to the object, using any of the above three methods, press ENTER, or +, to select. Objects may be deselected using the DELETE key or F4.

Main Menu Commands

Command	Meaning
HELP	DOS Plus Help System
File Directory	Change to another file directory
Subset of files	Display files matching a wildcard specification
Drive selection	Change Drives A: B: C: L: M:
Type file(s)	Display contents of one or more files
Print file(s)	Print one or more files
Copy file(s)	Copy one or more files
Rename file(s)	Rename one or more files
Delete file(s)	Delete one or more files
Edit a file	Edit a file
Run a program	Run a program of type .BAT, .EXE, .COM or .CMD
Copy diskette	Make a duplicate copy of a disc
Format diskette	Format a floppy disc for use with DOS Plus
Stop background	Display or stop programs that are running
Size/date on	Switch between long and short directory displays
Set up system	Set up DOS Plus system defaults

The action of each of these menu options is described briefly in the pages that follow.

HELP

A screen of helpful and explanatory information on menu commands. Displayed by selecting the Help option from that menu. The type and amount of help given does vary.

Help about an individual command can be found by pressing the function key F1 when the command is highlighted.

File Directory

File directory allows general directory management.

Change Directory

The current directory is displayed along with all sub-directories and the current directory's files. To select a new current directory, move the cursor to the directory and press ENTER.

View Files

Allows viewing of the highlighted directory's files. Note this can also be selected by pressing F2:

Set Directory 1/ Set Directory 2

The File Manager allows two directories Dir1 and Dir2 to be selected for later use. These directories can be used as source and destination for COPY, and can be made the current directory using F7 and F8.

To select a directory as Dir1 or Dir2, highlight the appropriate command and move to the desired directory in the object panel. Select using ENTER.

Make Directory

This command is identical to the MKDIR command.

Remove Directory

Identical to RMDIR. This command removes a directory from the currently selected disc providing it is empty, ie, contains no file or sub-directories.

Subset of Files

A subset of files may be selected using the wildcard file specification. This command makes selection of files easier by limiting the number of files displayed in the object panel. For example, to select a file for typing is simpler if all text files have extension .TXT and subset *.TXT selected.

Note that these files must still be selected if a multiple file command is required. The subset of files only restricts the display in the object panel, it does not select those files for any command action.

Drive Selection

Change Drive

Selecting a drive is similar to selecting a directory. All system drive names are displayed, including the current drive. Select a drive by using the cursor keys and press ENTER.

View Files

This command works in the same way as View Files in the directory menu. It allows drive contents to be viewed without first selecting the drive.

Type File(s)

This command uses the DOS Plus TYPE command, repeating it for each file selected in the object panel. At the end of each page, the display is halted until ENTER is pressed. At the end of each file, ENTER must be pressed to start the next file.

If the command is aborted using ESCAPE, the files which have not been typed are displayed in the object panel. Press a key to return to the menu.

Print File(s)

Single or multiple files can be printed using this command. Just select the object files from the panel. Pressing any key aborts the command.

Note that this is not the same as the PRINT command described in the previous chapter.

Copy File(s)

> Copy to A:
> Copy to B:
> Copy to C:
> Copy to D:

These instructions copy the selected files to the current directory on the specified drive.

Copy to Drive
This command allows the drive to be selected from a menu and allows copying to M: (MEMDISK).

Copy to Dir1 Copy to Dir2
Allows copying to the previously selected directories Dir1, Dir2.

Copy to Dir
Select the destination directory from the object panel using the cursor keys and press ENTER.

Copy to New Name
This command allows a new drive and/or new name to be input at the prompt line for each selected file as it is copied.

Rename File(s)

This command allows a file, or files, to be renamed. For each selected file, the file manager prompts for a new name.

If ENTER is pressed without a filename, the file is not renamed. After the command finishes, a list of all the files which have not been renamed is displayed in the object panel.

This command cannot be used to move files to a different drive or directory. If you wish to do this, use COPY and then delete the old file.

Delete File(s)

Multiple files can be deleted using this command. Select the files to be deleted in the object panel using the cursor keys and +. Press ENTER to execute the command.

The selected files are displayed in the object panel, and confirmation is required before the files are deleted.

Edit a File

This option executes the line editor ED, which is described in the next chapter. A file may be selected from the object panel, or entered in response to prompts from the ED program.

Run a Program

Run can be used to execute a program selected from the object panel. Only files with the extensions .CMD .COM .EXE and .BAT can be used.

Copy Diskette

This command does not work on the 512, and returns to the main menu, but the function can be performed in DISC, using RUN from the menu, and choosing DISC.CMD from the object panel.

Format Diskette

This command does not work on the 512 but can be performed in DISC, using RUN from the menu, and choosing DISC.CMD from the object panel.

Stop Background

This selection invokes the BACKG command. It is used to start, stop and display the currently active background programs.

Size/Date ON/OFF

There are two possible forms of object file display, the abridged version, shown previously, and a long version. The long version displays the time, date stamp and length of each file.

Short and long formats are toggled with this menu option. For some unknown reason, the format displayed seems to be wrong — the long format showing size and date is displayed when size/date is OFF, and the short format (like DIR /W) is shown when size/date is ON.

M512—I

Setup System

Copy to System Disc

This copies a file to the system disc. If you are running from the system disc, it will copy to itself, which is fatal — see the warning in the COPY command elsewhere in this book.

System attributes

This option sets a file to have system attributes, and is equivalent to FSET <filename> SYS.

Local attributes

This option sets a file to have ordinary attributes, and is equivalent to FSET <filename> DIR.

Load Func Keys/Assign Func Keys

These options do not work on the Master 512, nor is there any help file associated with them.

Change Devices

This command invokes the DOS Plus DEVICE command, and allows the logical and physical device assignments to be changed as described in the previous section.

System Defaults
Hard disc Maint(enance)
Floppy disc Maint(enance)

These options do not work on the Master 512, nor is there any help file associated with them.

13 : File Transfer

With the wide variety of incompatible computers around today, it is important to have methods of transferring data between machines. The Master 512 is an excellent tool for this task. Data can easily be transferred between BBC and DOS formats, and if necessary, onward to other systems.

Copying DOS Files to BBC Format

A common requirement of 512 users is to be able to move a file created with a PC program to a BBC format disc. Possible reasons for doing this include, transferring PC files to a modem, using BBC-based terminal software, assembly of large machine code programs prepared in a PC-based text editor, and movement of other program data.

To transfer files to the BBC format, you should use the utility supplied called PUTFILE. This will take any PC disc file, and transfer it to a BBC format disc. The syntax is:

```
PUTFILE <DOS filename><BBC filename>(< /<filing system>)
```

PUTFILE does, however, have two serious limitations. Firstly, it does not provide you with a 'shell' environment that you can work from within. This means that it is the files you work with, and the source and destination media must be available on current media. Secondly, PUTFILE won't allow operations such as a transfer from Disc B of DOS to Disc 1 of DFS – obviously the same disc – and stop and prompt the user with a 'now insert DFS disc' message. Instead it just tries to write the file to the same disc, and fails with a Disc Fault error, as it is looking for a DFS disc, and finding only a DOS disc.

This means that, unless you are using a hard disc, you *must* either place PUTFILE in the memory disc (see Chapter Nine), or on the same disc as the file(s) you are going to transfer. With a memory disc installed copy PUTFILE into it as follows:

1)   Place the DOS DISC 1 in drive A

2) Type: MEMDISK

3) Type: COPY A:PUTFILE.CMD M:

4) Place the DOS disc containing the files to be transferred in drive A

5) Place a DFS or ADFS disc in drive B (drive 1)

6) Type M:PUTFILE A:<filename> :1.$.<filename> /<fsname>

7) Repeat Step 6 for each file to be transferred

If, for example, you were copying a file called WORK.TXT to the BBC, where it would be stored on the ADFS disc as 'Work' in directory $.Text, you would type at Step six:

```
M:>PUTFILE  A:WORK.TXT  :1.$.Text.Work  /ADFS
```

The /ADFS is in fact optional, as the PUTFILE command selects ADFS by default. Alternative filing systems should be specified exactly as they are invoked, eg, /NET, /IEEEFS. The TAPE system seems to work insofar as the file is transferred, but the system then hangs and does not return to DOS. For ADFS, the program insists on a full file specification, ie:

d:{<dir>.{<dir>...}.} <filename>

The other filing systems are not trapped, and whatever you type is simply passed to the filing system.

If you are using the DFS filing system, the PUTFILE command *must* be suffixed with /DISC or /DISK, each time you use it. Remember when transferring files that you must use suitable names. If you transfer FRED.TXT as it is, ADFS will try to save the file as 'TXT' in a directory called FRED. If directory FRED doesn't exist, you will get an error. Similarly with DFS, this will accept full stops in the middle of filenames, for example JOB.DOC would transfer under that exact name, but there you are limited to seven characters in total.

A useful method for transferring a group of files at once is to use the DOS Plus batch command FOR (see Chapter 11). This does have a few limitations, although these are not a problem. To perform a batch file copy, place all the files you wish to transfer on the same disc, in the same directory, and give them all a null suffix, ie, rename them without a suffix, for example, if all the relevant files currently have the suffix TXT, type:

```
REN  *.TXT  *
```

Working again from our example of the memory disc, if drive M contains only the following files:

```
PUTFILE.CMD
TEXT1   .
NOTES   .
TEXT2   .
SUMMARY.
```

the latter four needing transfer, and they were all to be transferred to DFS drive 1, type at the prompt:

```
FOR %A IN (*) DO PUTFILE %A :1.%A /DISK
```

This single command will transfer all the files. The (*) means 'all the files without a suffix (in this directory)', and the FOR command assigns each file IN that description in turn to the variable %A, and then DOes the task, inserting values for variables. This is why the files need to have BBC-compatible names before you start.

If you have a dual drive, an alternative to using a memory disc would be to keep a special disc just to handle file transfers. You could keep PUTFILE, and maybe a batch file to handle transfers on the disc, and copy all the files to be transferred to it.

If you have a hard disc, then PUTFILE will transfer files perfectly successfully from drive C to the ADFS portion of the hard disc, which is, of course, drive 0. Note that with a hard disc, floppy drives are referred to as 4 and 5 in ADFS, not 0 and 1. DFS discs are still 0 and 1, as DFS does not recognise the hard disc.

It is possible to check afterwards that the files have been correctly copied to DFS/ADFS using the STAR command in DOS. With a disc containing STAR present, type STAR and press RETURN. The '*' prompt can then be used to CAT, EX, TYPE etc. from the BBC. The 512 system reselects ADFS before every operation, so even if you have just copied a file to a DFS disc, you will still have to type *DISC before cataloguing the disc.

Copying BBC Files to DOS Plus Format

This is also an important requirement, for incoming modem data, transferring old BBC files to your new PC packages and so on. The method of transferring BBC files to the 512 format is more or less the reverse of the above. Within DOS, the command is:

```
GETFILE <BBC filename> <DOS filename> /<BBC filing system>
```

where <BBC filename> is the full specification of the file on the BBC disc, <DOS filename> is the full specification of the file as saved to the DOS disc, and the <BBC filing system> is as above, optional for ADFS, but explicitly necessary for DISC, TAPE, IEEEFS, ROM, VFS, and so on. Again, if you are not using ADFS, you must specify the filename correctly. With ADFS you will get a GETFILE error message if the full path is not given.

For example, to transfer the file 'jobs' in directory $.Software.Diary, on the ADFS portion of your hard disc, to a file of the same name in the root directory of the DOS portion of your hard disc, the syntax would be:

<div align="center">

C>**GETFILE** **:0.$.Software.Diary.jobs** **C:\JOBS**

</div>

The FOR...DO loop for transferring multiple files cannot be used for moving files in this direction, as it is DOS which is providing the 'wildcard' facility, and this can only be done by reading an existing DOS directory.

The equivalent procedure to that above for transferring a group of files from a BBC disc to DOS is as follows:

1) Place the DOS DISC 1 in drive A

2) Type: MEMDISK

3) Type: COPY A:GETFILE.CMD M:

4) Type: COPY A:STAR.CMD M:

5) Place the DOS disc onto which you will copy the files in drive A

6) Place the DFS or ADFS disc containing the files in drive B (drive 1)

7) Type: M:STAR. A '*' prompt will appear

8) If the BBC disc is DFS, type *DISC

9) Type: *CAT :1 and make a note of the filenames to be transferred

10) Type: M:GETFILE :1.$.<filename> A:<filename> /<fsname>

11) Repeat step 10 for each file to be transferred

If you forget a filename, repeat steps seven to nine.

If you are sure of the filenames to be transferred, omit steps five, seven, eight and nine.

Note that early versions of the GETFILE and PUTFILE utilities did not work properly. The version supplied with DOS Plus 2.1 does work correctly, and if you have a earlier version of DOS Plus, you should seriously consider upgrading to the latest version.

The GETFILE and PUTFILE utilities will work with any length of file. They are not restricted to the amount of memory in the BBC, or even in the Master 512. Note however, that if you have a very long file (say a 60k text file) created by PC software, you may have difficulty loading it in to any BBC software. You should consider this and possibly break up the file with your PC program before transferring it.

Text Files

The GETFILE and PUTFILE utilities do not alter the files in any way. Naturally, BBC and DOS programs are not the same, and a file created by one system may not be recognised by another. This is fairly obvious when dealing with graphics, numbers and so on, but even with text files there may be some inconsistency. The most common problems are padded lengths and linefeed characters.

The PUTFILE utility always transfers files in exact page sizes. This means that the length of the file copied onto the BBC disc is an exact multiple of 256 bytes, being padded with extra bytes to make up this length. The value of the padding byte is 26 decimal, the DOS 'end of file' character. The effect of this is to add a few bytes of 'garbage' to the end of the file. Wordprocessing packages will generally suffer no ill effect with these bytes in place, but you should, nevertheless, remove the characters after copying. In Wordwise, these will appear as '|' characters at the end of the file, and in VIEW they will be 'soft' spaces.

The other difficulty is linefeed characters. On the PC, the end of each line of text is signified with a carriage return byte (ASCII 13) *and* a linefeed byte (ASCII 10). On the BBC most packages only require the first byte, although no harm is usually done by having the linefeed there as well. However, if you do have problems, both padding characters and linefeeds can easily be removed.

If you have a Master, and the file to be cleaned up is less than about 25k in length, then the system editor – EDIT – offers the quickest method of removing the offending bytes. If the text file just transferred was called JOHN, then follow these steps:

1) Switch off the 512 co-processor by running NOTUBE on DISC 1

2) Press CTRL-BREAK

3) Place the disc containing JOHN in drive 0 and select the correct filing system

4) Type: *EDIT JOHN (if this gives Bad Command, is the ROM unplugged?)

5) Press f5 (Global search/replace)

6) At the f5 prompt type |J/

7) Press RETURN

8) Press f5 again, and at the prompt: |Z/

9) Press f3 then COPY then RETURN. The amended file is saved.

10) Press f1 and type: BASIC then RETURN

Step six replaces CTRL-J (ASCII 10) with nothing, and step eight replaces CTRL-Z (ASCII 26) with nothing. You can, if you wish, actually type CTRL-J and CTRL-Z as key sequences, in which case they will appear on the prompt line as J and Z in inverse video. If you haven't got EDIT, or the file is too big, the following program will create a file with the offending bits removed. Note that the program does not check that the source file actually exists, or that the right filing system etc. is selected.

```
10  REM Remove LFs and EOFs
20  REM Master 512: A Dabhand Guide
30  REM by Chris Snee
40  REM (c) Chris Snee 1989
50  :
60  INPUT "Existing text file name : " I$
70  INPUT "New text file name      : " O$
80  I%=OPENIN I$
90  O%=OPENOUT O$
100 REPEAT
110 C%=BGET#I%
120 IF C%=10 OR C%=26 ELSE BPUT#O%,C%
130 UNTIL EOF #I%
140 CLOSE #O%
150 CLOSE #I%
160 PRINT O$;" created without EOFs and LFs"
170 END
```

Non-text Files

The technique described above should not be used for non-text files, because, in these, the 10 and 26 characters may have some significance. If you are handling PC application formatted data on the BBC side, you probably already know what you are doing, but it is worthwhile saying that the padding characters can easily be removed by checking the length of the file on the PC side, and altering the length of the BBC file accordingly, with this program which only works on DFS systems.

```
10  INPUT "Name of file just transferred : " I$
20  INPUT "Length on PC side (as shown by DIR) : " L%
30  I%=OPENUP I$
40  EXT#I%=L%
50  CLOSE #I%
```

It is possible to make sense of non-text data transferred between the BBC and DOS environments. This is covered below.

The MOVE Command

On the DOS Plus 2.1 disc, there is a new command MOVE, which provides a much more flexible method of transferring files between DOS and the BBC filing systems. The MOVE command is fully documented in the *Master 512 Technical Guide*, also published by Dabs Press.

PC to BBC Connectivity in General

There are other ways of moving files between the BBC and DOS. One utility called DOSCOPY by Baksoft (all addresses at end of chapter) runs on the BBC, and moves files in both directions, performing the linefeed addition and removal, all in the same disc drive. DOSCOPY does not require a Master 512 to operate, but is of limited appeal to Master 512 owners. It does, however, support a wide range of other disc formats such as CP/M, Atari ST, Nimbus etc.

BEEBDOS, from BOSS Software, is a PC-based program, which performs the operations from a PC. The disc reading facilities are not of great interest, but the conversion utilities are. Not only will it handle incoming text files, inserting the linefeeds as it goes, but also the program will handle graphics, converting a BBC screen to IBM format, so that it may be read, for

example, by IBM display programs. Even more useful, you can design your own filters with BEEBDOS, and perform just about any conversion you like.

Another item of interest to those moving data between the PC and BBC is the PC version of BBC BASIC, published by M-Tec Computer Services. This will run virtually all BBC BASIC programs on the 512, using the extra speed and memory available. An in-line 8086 assembler is also provided. Existing programs written on the BBC can be transferred, as they are, with GETFILE, and a supplied utility will make the slight token changes required.

Another area of compatibility is available for users of View Professional on the BBC. This package has a more powerful PC cousin – PipeDream from Colton Software, which has a totally compatible file format, and can therefore accept View Professional files transferred via GETFILE.

Other Computers and Formats

The Master 512 can read some CP/M formats, and equipped with a 3.5" disc drive, can read discs from an Atari ST, which conform to the 720k (IBM 512x9) format. The Archimedes PC Emulator also reads the 720k format, and so, again subject to having a 3.5" drive, you can read discs for this system. The 512 can read a host of PC formats, as shown on the list in the FORMAT option of the DISK program. Not shown, but readable, are the single sided versions of the the 320k and 360k formats. This means that you could use your 512 as a disc conversion machine, providing a bridge between two incompatible machines.

The only PC formats that cannot be handled by the 512 are the special high-density formats used on the IBM AT and other 80286/80386 machines – 1.2Mb for 5.25" drives, and 1.44Mb for 3.5" drives. Even if you fitted the right kind of disc drive, the 1770 controller on the system just cannot handle the way these discs are formatted.

Conversely the 640k and 800k formats supported by the 512 are unique to this system, and cannot easily be read by other PCs. If you intend to swap discs with standard PC owners, stick to the 5.25" 360k (IBM 512x9) and (normally) 3.5" 720k (IBM 512x9) formats, which are common to all PCs.

All Master 512 formats are technically capable of being read by the BBC in native mode. The 640k mode is sector-compatible with ADFS, and can be read with an ADFS disc sector editor, or by using the standard OSWORD calls to read and write ADFS sectors. To read the other modes, you need

special software such as the Advanced Disc Investigator by PRES, which can read any format which the 1770 can support. (It is possible to read the 800k format using ADFS OSWORD &72 but not straightforward) If you wish to unravel the directory structure of the DOS disc, you could write your own direct conversion utilities, and with the 640k format, you wouldn't even have to do anything complicated on the disc reading side. This subject is handled in more detail in the *Master 512 Technical Guide*.

Addresses

Baksoft, 20 Leys Avenue, Cambridge CB4 2AW.

BOSS Software, 3 Hadleigh Rd Frinton Essex CO13 9HG.

M-Tec Computer Services, 4 Church Hill, Reepham, Norfolk, NR10 4JL.

Colton Software, 149-151 St. Neots Rd, Hardwick, Cambridge, CB3 7QJ.

PRES Ltd, 6 Ava House, Chobham, Surrey, GU24 8LZ.

14 : PIP - The File Copier

PIP is the Peripheral Interchange Program and is used to transfer or copy files from one device to another. You can copy a complete disc onto another one, perhaps to make a backup copy, or more sedately transfer a file from one disc to another. In addition PIP can also combine several files to form a new file, and is also capable of modifying the file or files as it copies. PIP is a transient command; its syntax is:

        PIP
        PIP <command line>

In both instances PIP is loaded. The former method will result in an asterisk being displayed – this is the PIP prompt at which PIP commands can be entered and executed. To return to the 'warmth' of DOS Plus press CTRL-C. The PIP command mode is useful if you anticipate performing a great deal of information swapping and to-ing and fro-ing, but for most applications the simple command line approach is best.

The basic format of the PIP command line is:

        PIP d:<afn>=d:<afn>

As with most DOS Plus commands the destination details are stated first, to the left of the equals sign, followed by the source details to the right. For example, if we wished to copy the PIP command itself from a disc in drive A to a disc in drive B we would use:

        PIP B:PIP.COM=A:PIP.COM

In the course of this command we could rename the file, by specifying a new name in the destination half of the command. To transfer a file called TEST.HEX on drive A to drive B, but changing its name to TESTBAK.HEX we would use:

        PIP B:TESTBAK.HEX=A:TEST.HEX

An important point to remember when using PIP is that the source file is not affected in any way by the transient command, it merely makes or takes a copy of the original.

Using PIP

PIP can be used to make a complete copy of a disc in one drive to an empty disc in a new drive. To copy all the files on the disc in drive A to the new disc in drive B, you can type:

```
PIP  B:=A:*.*
```

the screen will then display:

```
COPYING-
```

with the name of each file following as it is copied from drive A to drive B.

By specifying a parameter in brackets at the end of the command line, it is possible to have PIP verify the data it has transferred against the original (data does not normally become corrupted at this point, especially if quality discs are being used – but for peace of mind it may be worth using). The parameter is V for verification, and would be used thus:

```
PIP  B:=A:*.*[V]
```

Note that the parameter is typed hard against the command, ie, with no spaces in between. Now each file transferred will be checked against the original to ensure validity. If an error is detected an error message is displayed. In this instance you can try re-copying this file – if this fails then it is likely that your disc has become damaged and a newly formatted one should be sought and the transfer sequence performed again. Discard the problematic disc.

Groups of files can be copied by using suitable wildcard combinations. The command:

```
PIP  B:=A:*.COM
```

will copy all of the command files present on the disc in drive A to the disc in drive B. Note that if COM files of identical names exist then they will be destroyed, but not the source files. In the past examples we have always used drive A as the source and drive B as the destination - this is not meant to be misleading, as it is quite possible to copy from a source disc in drive B to a suitable destination disc in drive A, simply by arranging the command line in the correct sequence. To copy all the COM files on drive B to drive A use:

```
PIP  A:=B:*.COM
```

File Concatenation

As mentioned at the start of this chapter, PIP can also be used to join several source files into a single destination file, a process known as concatenation. The format of this command is:

PIP destination=source1,source2, etc

The source files are referenced by name, separated from each other by commas and there must be no ambiguity. The resultant file will be titled as defined by destination. If drive A contained the ASCII files FILE1 and FILE2 they could be concatenated onto a single file called TEXT, on drive B as follows:

PIP B:TEXT.ASC=A:FILE1.ASC,FILE2.ASC

When files are concatenated in this manner they are joined together in the order specified by the command line. In the example above FILE2 will be added onto the end of FILE1. By reversing the filename order FILE1 can be made to combine onto the end of FILE2:

PIP B:TEXT.ASC=A:FILE2.ASC,FILE1.ASC

Command Mode

Just typing 'PIP' at the keyboard will invoke the command mode. This is signified by the PIP prompt of an asterisk being displayed on the screen thus:

A>PIP
*_

The asterisk can be thought of as being a shorthand for PIP itself, you now need to type just the command line itself without entering the PIP command. Once you enter a command it is executed, but instead of returning to the DOS Plus prompt on completion, you are returned to the PIP prompt where further PIP commands can be entered.

To leave PIP and return to DOS Plus simply press RETURN or CTRL-C. The following dialogue between man and machine shows how some of the commands we have used already would be entered at PIP command Mode level:

A>PIP

```
*B:PIP.COM=A:PIP.COM
*B:=A:PIP.COM
*B:=A:*.*
*B:=A:*.COM
*B:TEXT.ASC=A:FILE2.ASC,FILE1.ASC
*

A>
```

PIP Parameters

The PIP parameters concept was introduced earlier when one of them, V, was used to verify a file had been copied correctly from one disc to another. There are a number of parameters and they may be used in combinations – provided they make sense. And they must, of course, be totally enclosed within [ ] at the end of the command line to make sense.

One useful parameter is E, which stands for 'echo'. It is quite often useful to include this with other parameters so that everything that the PIP command is doing will be shown on the screen. This does tend to slow down the operation of PIP, but if speed is of the essence then the echo parameter can be omitted.

To illustrate how parameters may be combined, we can look at an imaginary example. There are two parameters that allow text files to be translated from upper case to lower case characters and vice versa. The parameter letters are L and U respectively. Suppose we wish to copy a text file on a disc in drive A, called FHELP.ASC to a disc in drive B , converting all characters to lower case and displaying the operation on the screen. We would use:

*PIP B:=A:FHELP.ASC[EL]

In the above example the parameters have been entered with no spaces between them, however they may be included for readability if so required. Although combinations are generally allowed, some parameters can only be used with certain types of file, as in the above example. It would be pointless using character translation on anything but an ASCII file. The various PIP parameters are outlined briefly below.

Dn - Delete Characters

This parameter expects a numeric value, n. It will delete any characters after the nth column. For example, Dn can be used to truncate long lines that are being sent to a narrow printer or VDU, or you might only need to see the first nth columns of a file.

E - Echo to Screen

This parameter enables you to see the 'write' operation to the specified destination. Example:

```
PIP   B:FILE.TXT=A:FILE.TXT[E]
```

F - Remove Formfeeds

The F parameter is used to remove, or filter, formfeeds from a file. A formfeed is a page eject type character, with ASCII code 12. It is quite often used with the P parameter as detailed below.

H - Hexadecimal Data

This is used to transfer hex data, and PIP checks to ensure that only valid hexadecimal characters are contained within the file. Any non-hex characters encountered during the transfer are reported, and you are prompted for corrective action:

```
PIP   B:MCODE1.HEX=A:MCODE.HEX[H]
```

I - Ignore Any :00 Characters

This parameters invokes the H parameter in its action but will also ignore any :00 records in the file transfer.

L - Force to Lower Case

Forces any upper case characters in the source file to lower case, before transferring them to the destination file. Only valid for use of files of ASCII text. Example:

```
PIP   B:=TEXTLC.TXT=TEXTUC.TXT[L]
```

N - Number All Lines

This adds line numbers to the file being output, the number being followed
by a colon. Example:

```
PIP   B:MEMO.TXT=B:MEMO.TXT[N]
```

A typical output might be:

```
1: This is line number one
2: This is line number two
3: This is line number three
4: ...and so on...
```

N2 - Number All Lines With Zeros and Tabs

This adds line numbers to each line but includes leading zero's with a tab
being added after each line number. If the destination of the file is disc then
tab is set to eight, otherwise the printing device set tab is used. Example:

```
PIP   B:MEMO.TXT=B:MEMO.TXT[N2]
```

The typical output might be:

```
000001:    This is line number one
000002:    This is line number two
000003:    This is line number three
000004:    ...and so on...
```

O - Object Files

This is used when non-ASCII files are to be transferred from one device to
another. It specifies that the end of file marker used by DOS Plus, a CTRL-Z,
is to be ignored when concatenating files.

P - Page

This parameter is used to force a formfeed after every 60 lines of text.

Pn - Page Length

This sets the length of a page to n lines after which a formfeed will be
generated. Used with the F parameter it can be used to issue a formfeed at
a desired point in a file. Example:

M512—J

```
PIP  LST:=MEMO.TXT[FP45]
```

will issue a formfeed after every 45 lines. Any other formfeeds are filtered out.

Q - Quit File Copying

This strange looking parameter is used when you do not wish to copy an entire file in a PIP operation. Used in conjunction with the parameter Ss^Z parameter (see below) it can be used to inform PIP where to start (S) and quit (s) copying the file. If you use Q but not S then the copy will start at the beginning of the file and quite where you specify. The starting or quitting location is specified as a string of characters. In an imaginary file we might wish to copy the file up until the word TESTING, which might be a subheading or a keyword placed there by you, in the file BRIEF.TXT This can be performed using:

```
PIP  B:=A:BRIEF.TXT[QTESTING^Z]
```

Remember the ^Z character is in fact, CTRL-Z and must be inserted into the parameter by pressing the CTRL and Z keys together. Note also that the parameter string used in this way is case independent and all letters will be translated to uppercase. If you wish to search for a lower case character string you must do so by first entering the PIP command mode by typing PIP. Now entering the same command will allow lower case character strings to be sought. The above command will copy the file called BRIEF.TXT from drive A to drive B until it encounters the word TESTING. This word is not transferred to the new file.

S<string>^Z - Start File Copying

This parameter allows you to copy part of a file starting at the specified string up until the last character in the file. To copy a file called BRIEF.TXT in drive A to drive B from the word TESTING use:

```
PIP  B:=A:BRIEF.TXT[STESTING^Z]
```

The notes on CTRL-Z and character case, detailed above, also apply here. Enter PIP command mode to search for lower case character strings. Used in conjunction with the Q<string>^Z parameter, a section from within a file can be copied to another file:

```
A>PIP
*B:BRIEF.SEC=A:BRIEF.TXT[SToday^Z QTESTING^Z]
*

A>
```

In the above example, a copy of a portion of a file called BRIEF.TXT is made from drive A to drive B, renaming the filename extension, SEC for section. The starting point of the section to copy is the word 'Today' while the quitting point is at the keyword TESTING. Because 'Today' uses lower case characters PIP command mode has been used to perform the transfer.

Tn - Tab to n

This parameter allows you to set the tab width, to the nth column.

U - Force to Upper Case

Forces any lower case characters in the source file to upper case, before transferring them to the destination file. Only valid for use of files of ASCII text. Example:

PIP   B:=TEXTUC.TXT=TEXTLC.TXT[U]

V - Verify

All data copied is compared to the source to ensure against corruption. The comparison is performed after reading and writing the data byte, and comparing the byte read with that in the output buffer.

W - Write

This parameter allows write protected files to be over written without being prompted about the validity of such a request. Normally if you try to overwrite an existing file that is write protected, you will be asked if you wish to overwrite it. This option in effects turns this safety net off. Use with care!

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15 : ED – The Text Editor

ED is a text editor which can be used to create and edit plain text files. It does have a number of basic editing functions but in no way can it be considered a fully fledged wordprocessor. ED can be found on DISC 1.

When you enter ED it must have a file name specified after it. This file name refers to an existing file, or is the name of a new file which you are about to create. The syntax for the command then is:

ED <afn>

It is worth making a copy of ED to an empty formatted disc at this stage, and labelling it as your ED working disc. You can use this to edit and save new text files as you go along – and also experiment as you work through this chapter. To make the copy, first format a new disc and place this in drive B and DISC 1 from the Master 512 disc set drive A. ED can be transferred using PIP thus:

PIP B:=A:ED.CMD

As PIP is itself often used in conjunction with ED, it is worth transferring a working copy of this onto the ED working disc:

PIP B:=A:PIP.CMD

A Test Run

The best way to learn how to use ED is to experiment typing and editing text with it. First ensure that you are typing in capital letter mode, ie, ensure that the CAPS LOCK light is illuminated. As mentioned above ED expects, and indeed must be followed by, a filename. When ED is loaded into the transient program area it searches the disc in the logged on drive for the filename specified in the command line. If it finds it then it assumes that you require to edit this, otherwise it assumes that you wish to create a new text file of that name, and therefore does so. In addition, ED creates a dummy file, using the same filename specified but with the file extension

\$\$\$ – this is used by ED as a temporary workfile. When you have finished with ED, this file will automatically be erased. Thus if you entered:

```
ED  DEMO.TXT
```

at the keyboard, ED would open two files on the disc called:

```
DEMO.TXT
```

and:

```
DEMO.$$$
```

With the newly prepared disc in drive A enter:

```
ED  DEMO.TXT
```

After a few moments the screen should clear to show:

```
NEW FILE
   : *_
```

The first line denotes that a new file has been created on the disc. The second line forms part of the ED prompt, which at this stage is waiting to receive a command. There are several ED commands and these will be discussed in the pages that follow.

The first thing to do is to insert some text in the file, to do this use the command 'I', for Insert. The display should now look like this:

```
NEW FILE
   : *I_
```

Press RETURN, and all being well you will be prompted with a line number thus:

```
NEW FILE
    : *I
   1:_
```

The line number is for reference only, it is not included in the text file, and it enables you to keep track of just where you are and to mark the beginning of a new line of text. For all intents and purposes just ignore it for the time being, and enter several lines of text, terminating each line with a RETURN. You might like to try entering the following text:

```
NEW FILE
    : *I
   1: USING ED ON THE MASTER 512
   2: CO-PROCESSOR RUNNING UNDER
```

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```
3: DOS PLUS.
4:
5: DABS PRESS
6: ^Z
 : *_
```

Line 4 appears to be blank – in fact it just contains a RETURN character – a useful way of placing line gaps in between lines of text.

If, at any stage, you make a mistake or typing error, then CTRL-H will erase the character immediately to the left of the cursor. Note that DELETE does not work. ED contains a number of editing facilities and these are discussed later on. Finally, once the text has been entered, return to the ED command mode by pressing CTRL-Z, as depicted in line six.

The text that has been entered is not, as of yet, stored on disc, it remains in memory. There are three commands that will facilitate this, each operating in a slightly different manner. The commands are:

E   Save text on disc and leave ED returning to DOS Plus.

H   Save text on disc, but remain in ED editing current file. This allows the file just saved to be altered and/or re-worked.

W   Write a number of lines of the current text to the temporary $$$ file. W may be preceded by a number indicating the number of lines to be saved in this manner. Thus 12W will write the first twelve lines to the file. The lines remaining will be 'moved' up and renumbered. #W will write all lines to the $$$ file.

Clearly each of these commands serves a different purpose. The function of E is self evident. The H command is used when you have finished writing a text file, but you want to go back and edit it. It is also often used for backing up purposes, just in case of power failure or inadvertently hitting BREAK. The W command is used to empty memory, but allowing you to keep on adding to the new file. This is useful in long text files where the memory in the transient program area might not be enough for your needs!

At this point it is worth mentioning that there is another method of leaving ED command mode – by pressing the Q key. Q is for quit and this *does not* save your text to disc; it eliminates the temporary $$$ file, and wipes out your text from memory, before returning to DOS Plus. Because of the somewhat drastic nature, when you enter Q in ED at command level it will prompt you with:

```
Q - (Y/N) ?_
```

Once again this is a safety net for you. If you entered Q by mistake then press the N key, and everything will stay as it was. If you entered the Q(uit) command on purpose then pressing Y will carry out its function.

But back to our demonstration text. Type E to save the current text to disc and then exit ED, your screen should look like this:

```
A> ED DEMO.TXT

NEW FILE
    : *I
  1: USING ED ON THE MASTER 512
  2: CO-PROCESSOR RUNNING UNDER
  3: DOS PLUS.
  4:
  5: DABS PRESS
  6: ^Z
    : *E

A>_
```

If you now type:

DIR

you should see that the new file DEMO.TXT has been added to the disc and that the temporary file $$$ has been erased. We can now have a look at the text file by typing it onto the screen. To do this enter:

TYPE DEMO.TXT

the file will then be accessed and printed to the screen:

```
USING ED ON THE MASTER 512
CO-PROCESSOR RUNNING UNDER
DOS PLUS.

DABS PRESS
```

This shows how simply an information file could be pieced together and used to provide instructions for some future development, perhaps in a batch file.

Adding to Text Files

Suppose we now wished to add some more lines of text to this file, a line containing completion date of the manuscript for example. To do this we must first load the old text file into memory, move the editing cursor to the end of the file and type in the new line or lines, prior to re-saving the amended text. To re-open the file to be added to type:

```
ED  DEMO.TXT
```

Remember that ED will look to see if the file exists on disc, which in this case it does, it will not overwrite it, but open it up for further use. As the file does exist the NEW FILE message will not appear and the screen will show:

```
A>ED DEMO.TXT

     : *
```

ED will not load in the existing file unless we tell it to do so. To load the file back into ED for re-editing, we have to use a rather odd looking command:

```
#A#T-BI
```

In fact this is not a single command but a series of commands which have the following operations:

#A   A means Append. It tells ED to load the existing file into the memory buffer. #A means bring the entire file into memory.

#T   T is for Type. The # stands for 'all', so we can read #T as saying type all the file lines onto the screen (you can halt this at any time with CTRL-S).

–B   B is used to move the ED cursor to the beginning of the file currently in memory. By preceding the B with a minus sign, we can move the ED cursor to the end of the file.

I   I stands for Insert and informs ED that we wish to insert text into the current file.

Looking at the command overall then, #A#T-BI reads (deep breath) 'Load current file into memory, type all lines to the screen, move ED cursor to the end of the file and make ready to insert some more text' (breath out!). Once you enter this command string the screen will show:

```
A> ED DEMO.TXT
   : *#A#T-BI
 1: USING ED ON THE MASTER 512
 2: CO-PROCESSOR RUNNING UNDER
 3: DOS PLUS.
 4:
 5: DABS PRESS
 6: _
```

The ED cursor is now positioned at line six, so any text we enter will be positioned from herein. Let's add a couple of lines, a RETURN at line six and the extra line of text on line seven, so that the screen shows:

```
A> ED DEMO.TXT
   : *#A#T-BI
 1: USING ED ON THE MASTER 512
 2: CO-PROCESSOR RUNNING UNDER
 3: DOS PLUS.
 4:
 5: DABS PRESS
 6:
 7: FINISHED DECEMBER 1988
 8: ^Z
   : *E

A>_
```

Again type CTRL-Z to return to ED command mode and enter E to end the current ED session. The amended file will be saved to disc and the DOS Plus will reappear.

More on Append

When we used the append command above we prefixed it with a hash:

#A

The hash is a wildcard that, when used in this context, means 'all'. Normally ED expects a number in the range 1–65535 to be present before the A. By placing a number before A then, we can specify just how many lines we are loading into memory. Suppose we wished to load just the first four lines of the file DEMO.TXT into memory and carry on from there. We would use:

4A#T-BI

Re-open the DEMO.TXT file in ED and try it, this is what happens:

```
A> ED DEMO.TXT
   : *4#A#T-BI
  1: USING ED ON THE MASTER 512
  2: CO-PROCESSOR RUNNING UNDER
  3: DOS PLUS.
  4:
  5: _
```

The first four lines of the text file are displayed, with the cursor now positioned at line five. Try entering a few more lines before ending the edit as follows:

```
A> ED DEMO.TXT
   : *4#A#T-BI
  1: USING ED ON THE MASTER 512
  2: CO-PROCESSOR RUNNING UNDER
  3: DOS PLUS.
  4:
  5: ALSO COVERS HOW TO
  6: USE PIP AND OTHER
  7: DOS PLUS COMMANDS
  8: ^Z
   : *E

A>
```

The new file contents will now be saved back into the DEMO.TXT file – but what about the 'other' lines that were not appended? Enter:

TYPE DEMO.TXT

to show the file on the screen:

```
A>TYPE DEMO.TXT

   USING ED ON THE MASTER 512
   CO-PROCESSOR RUNNING UNDER
   DOS PLUS.

   ALSO COVERS HOW TO
   USE PIP AND OTHER
   DOS PLUS COMMANDS

   DABS PRESS
   FINISHED DECEMBER 1988

A>
```

Surprise, surprise, the lines just entered have not overwritten the previous lines as one might have expected. This is because the new text has been

Inserted into the current file, and ED has moved the undisplayed text up beyond it. Using this method text can be inserted anywhere within an existing file as required. Occasionally, it may occur that ED can't load all of a file into memory – though this would be a very long file indeed. If this is the case then you'll get an error message similar to this:

```
BREAK ">" AT A
```

In cases such as this you'll need to load smaller sections of the file into memory with commands such as:

```
100A
```

to work on.

A special command is:

```
0A
```

this causes ED to load lines into memory until the memory area is about half full, or until all lines have been loaded, if this happens first.

Line Numbering

Line numbering occurs when we enter ED's Insert mode, however this feature can be turned on and off if so required. The commands are ,

V	turn line numbering on
–V	turn line numbering off

Both of these commands should be used in ED command mode and typed directly after the asterisk prompt thus:

```
*-VI
```

means, 'turn line numbering off and enter Insert mode.

Case Translation

So far everything you will have typed in will have been in upper case. Now create a new file and enter text using lower case characters, ie, with the CAPS LOCK light extinguished. Create the new ED file thus:

```
ED CASE.TXT
```

When the prompt appears enter Insert mode and type the following text, exiting the file with E.

```
A> ED CASE.TXT
NEW FILE
   : *I
  1: this text is entered entirely
  2: in lower case characters
  3: ^Z
   : *E

A>
```

What happens if we now type this file to the screen?

```
A>TYPE CASE.TXT

     THIS TEXT IS ENTERED ENTIRELY
     IN LOWER CASE CHARACTERS

A>
```

What a lie! The text that we did initially enter in lower case is now in uppercase. This is because ED automatically converts all lower case characters into upper case after they are entered, unless we instruct otherwise. The commands to turn this translation on and off are:

U   Turn lower to upper translation on
-U   Turn lower to upper translation off

To ensure that lower case remains lower case –U should be entered in command mode, before Insert mode is selected, ie:

```
*-UI
```

Now any text entered will keep the case assigned to it, be it upper or lower case.

16 : Software Compatibility

Almost without exception, software for PC compatibles is written to run under the MS-DOS Operating System, produced by Microsoft, and it's PC-DOS variant produced by IBM, but also written by Microsoft. For all intents and purposes, PC-DOS and MS-DOS are identical. DOS Plus is written by Digital Research as a closely compatible system to MS-DOS, but with extensions which allow CP/M 86 compatibility and background program running. These features mean that DOS Plus occupies some 90k more than MS-DOS when running.

Due to slight differences between MS-DOS and DOS Plus, it is not always easy to install and configure MS-DOS applications. There are many reasons why packages won't run, but these are often due to the unusual hardware of the Master 512, rather than differences with DOS Plus itself. This chapter explains the various reasons why software designed for MS-DOS machines may not run on the Master 512, and what, if anything, you can do about it. The areas which cause problems fall broadly into the following categories:

1)   DOS Plus
2)   Memory requirements
3)   80186 processor
4)   Disc protection
5)   Serial port
6)   Sound
7)   Keyboard
8)   Mouse control
9)   Screen modes and colours
10)   Character set
11)   Maths co-processor

DOS Plus

As stated above, DOS Plus is *not* the same as MS-DOS. Whilst the majority of the function calls remain the same, there are subtle differences which can

cause problems. These are, however, fairly rare – what is more noticeable is that DOS Plus does not have installable device drivers, and a CONFIG.SYS file, in the same way that MS-DOS has, so programs which attempt to modify the CONFIG.SYS file will not work as expected. Note that the main alteration to the CONFIG file required by most DOS programs is the setting of the number of open files and inclusion of an ANSI device driver. This is present anyway in the 512 system (see below) so references to adding the driver to your CONFIG.SYS file should be ignored. The number of open files is fixed by DOS Plus at 18 which is enough for most programs.

Another problem stems from the fact that the 512 system is, in fact, several years old, and when it was released, DOS Plus was compatible with the then current MS-DOS, version 2.11. The current version 3.30 is greatly upgraded, and programs are starting to appear that mandatorily require DOS 3.0 or higher. These programs will *not* run on the Master 512.

There is, incidentally, a simple way of testing whether having DOS Plus, rather than MS-DOS is the reason why a program will not run if you have access to an Amstrad PC1512. The Amstrad PC1512, a highly standard IBM compatible, which runs almost everything, comes with both MS-DOS and DOS Plus as optional Operating Systems. Try the same program under both to see the result. If the program doesn't work DOS Plus is probably the culprit. However, if it does work, the problem *may* still be DOS Plus as the Amstrad version is not quite the same as the Master 512 version.

Memory Requirements

The maximum memory which can be recognised by a standard PC is 640k (although there are expansion systems which follow a similar system to the 'paged' RAM on the BBC/Master). No DOS program requires more than 640k of memory. However quite a few packages (Javelin, Ventura Publisher) do require the full 640k. Many more packages require at least 512k. The Master 512 is obviously only a 512k device, and as stated above, DOS Plus takes up 90k more memory than MS-DOS, leaving the equivalent available memory at 422k.

Packages which don't require 512k are usually marked as requiring 256k or 384k, (which are also convenient hardware sizes), and these will fit into the available memory on the 512.

A possible solution to this problem is to fit the Solidisk 1Mb memory expansion, which expands the available RAM to (at least) the full 640k.

Note that some of these memory-hungry programs may just fit in the machine, and appear to run, but cannot correctly return to DOS, as they have overwritten the memory used by COMMAND.COM. Crashes with an 'invalid opcode error' are often a symptom of memory shortage, although the information provided with this message is of no practical use to the user.

80186 Processor

The 80186 is totally compatible with the 8086 and 8088 processors used in IBM PCs and compatibles. It does contain a few extra instructions, but it is extremely unlikely that the different processor would cause any problems.

Disc Protection

Until fairly recently, software publishers used copy-protection systems on software, so it could only be used on one computer, and unauthorised copies could not be made. There are many forms of disc protection, most involving unusual track and sector numbering, which requires direct access to the disc controller to interpret correctly. On the 512, the disc controller is the 1770 provided in the BBC Master, which is not the same as the Intel 8272 (Rockwell 6765, µPD765 or its variants) used in PC-compatibles. The controller in the Master can't be accessed in the same way as the controller in the PC.

The only way round the disc protection problem, is to ask the publisher to supply an unprotected copy. Thankfully, more software publishers are producing unprotected discs nowadays, due to user demand. You might occasionally find that a protected package can be 'installed' onto unprotected discs, or a hard disc, and not require the original disc to run. If this is the case, and you also own a normal PC, you could install the software first on the normal PC, and copy the installed version to your Master 512.

Serial Port

Due to the slow speed and limited control of the serial communications part of the Operating System on standard PC's, most programmers illegally access the serial port, which means that most comms programs will not work on the Master 512. Also, even when programs use the legal DOS calls, they still seem to fail when they find the PC serial chip to be

absent. Some programs also insist that you select a serial port COM1: or COM2:, and cannot deal with AUX:, the DOS Plus serial port. Although it is perfectly possible to write your own serial port programs on the 512, and operations such as COPY CON AUX: work correctly, it is generally accepted that standard communications software will not work with the machine.

If you do write your own programs in this area, remember that the BBC serial hardware will not work at more than 19,200 baud, unlike the PC hardware which can be driven, on direct links, to as much as 115,200 baud.

If you have a serial printer, then you can often run into the COM1: problem. If this is the case, and you simply cannot get reliable serial printing, then if your program has an option to spool a file to disc, do this, and then send the file to the printer from DOS using:

```
COPY <filename> AUX:
```

This is not a very elegant solution, but it does work. Alternatively, you could use the PIP program, which offers further alteration of the file whilst it is being printed. See Chapter 14, and the accompanying programs disc.

Sound

This is an area which is almost always performed 'illegally' on the PC, and thus the majority of sound-producing programs will run silently on the 512 system. Ordinary text beeps do work correctly, and are heard according to the various BELL settings on the Master system, ie, *CONFIGURE LOUD, and the *FX212-214 values. You can hear the 512 beep by typing ECHO CTRL-G (the CTRL-G will appear on screen as ^G) at the DOS prompt.

Keyboard

The keyboard is another device which is often read 'illegally' by DOS programs. Sometimes this can be solved. The usual symptom is that the program appears to start on screen but will simply not recognise keypresses. This is because keyboard hardware, on a real PC is quite different to that on a BBC/Master, and the DOS Plus keyboard support is consequentially less than perfect.

To solve this problem, check the documentation to see if there are any options concerning the keyboard. These may be in the form of switches (parameters added to the program name) or a separate configuration

program, which allows you to change the way the keyboard is used, or which keys do what.

If the program offers 'DOS' instead of 'direct' keyboard reading, then select the DOS option. This is included in many programs to deal with other non-standard keyboards, or multi-user systems. If it is a question of which key does what, then you have a better chance of success if programs can be operated from standard alphabetic keys, rather than control or modifier keys. For example, if a program requires you to press CTRL-ALT to start, and this can be changed to 'S', then the program may work.

This is particularly important with 'terminate-and-stay-resident' utilities, often called pop-up programs, which sit in the background, and are activated by a certain key. The default key is usually something like ALT-SHIFT or CTRL-/. If these do not work, trying selecting the 'change hot key' option, usually done from a separate utility program to be a normal function key or similar. Note that a special utility SKS is provided with the DOS 2.1 release disc to allow the use of Sidekick, one of the most popular pop-up programs.

There is one unresolvable keyboard problem with the Master 512. Unlike standard PCs, both of the BBC/Master SHIFT keys are hardwired to the same port, and it is impossible to tell that both keys are pressed. What happens is that either SHIFT key has the effect of the left key on a PC keyboard. Some programs require that both SHIFT keys are pressed to achieve a certain effect – this is, therefore, not achievable on the 512. A similar problem exists if software expects an IBM AT keyboard, which has two ALT keys. This doesn't cause much trouble in practice, as these key combinations can usually be redefined.

Mouse Control

The use of a mouse with software usually is optional. However, a few programs will only run with a mouse (or other hardware pointing device). In these cases the package will not run, as the Master 512 mouse driver is specifically written to interface with GEM. If the package is a GEM application, however, it will use the mouse via the GEM environment provided with the co-processor on discs 2 and 3.

M512—K

New GEM applications usually come with a version of GEM supplied, almost certainly this new version of GEM will *not* work – you must stick to your Master 512 version. As a consequence it is likely that such packages will not run. Some packages will test for the presence of the GEM system already, but in all cases, read the documentation carefully. You *must* end up with the GEMVDI in GEMSYS directory as the one which came on the Master 512 discs, and not one supplied with the package.

The GEM supplied with the 512 is version 2.0, which is older than the current version 3. Applications written under GEM/3 will not usually run with GEM 2.0, which means that, following the rule above, you will not be able to use GEM/3 packages on the Master. The mouse driver is, in fact, the only known problem, but until a GEM/3-compatible Master 512 mouse driver appears, the modern desktop publishing and graphics packages which have appeared with GEM/3 cannot be used.

Outside GEM, the mouse cannot be used at all, as no software will recognise it. At the time of writing, Dabs Press are working on a standard mouse driver, which will allow the mouse to be used with GEM/3 and other DOS software. Contact Dabs Press directly for further details.

Screen Modes and Colours

There are quite a few problems associated with the way the Master 512 handles screen output. The 512 system only supports three of the IBM PC screen modes, MDA (80x25 text only), CGA lo-res (320x200 four-colour graphics) and CGA hi-res (640x200 two-colour graphics). Obviously any software which can only run on one of the higher graphics modes (EGA, VGA, MGCA, PGC etc.) cannot run on the Master 512, and there is no solution to this. Some graphics-intensive programs write directly to the graphics memory for these higher modes, and will seem to run correctly in their text mode on the 512, but just present a blank screen when working in graphics mode.

Within the MDA mode there are also problems, although these are more of an aesthetic nature rather, than anything fatal. A PC-compatible with a colour monitor can display the 80x25 text mode using sixteen colours, or more strictly, eight colours in two intensities (normal and 'bright'). Because of the limitations of the BBC hardware, the 80x25 text mode can only display two colours of text. Whereas you can set these colours to

anything you like (using the PCSCREEN program), you still only have two colours, and no shades of grey.

Acorn have made a small attempt to represent the coloured nature of the screen, by printing characters in a bold face whenever the 'intensity bit' is set, ie, if the colour is one of the 'bright' range on a PC. This is analogous to IBM mono systems, which support brightness and inverse (and blinking – not supported on the 512), and quite a lot of software works quite satisfactorily using the method. However, there is plenty of software which uses screen colour quite imaginatively, and gives a somewhat unsatisfactory display on the 512.

Also, the bold face used by Acorn is actually less readable than the standard character set, and so some software, printing in bright white as its default colour, ends up being quite difficult to read. The solution to these two problems lies with the options which the program may offer. If you are offered the choice of 'mono' or 'colour' for your display in text-based programs, always choose the 'mono' option. Also, if the program contains ways of redefining the screen colours used, then changing output from 15 (bright white) to 7 (ordinary white) will remove the boldface effect.

The CGA modes, being fully equal in colour and resolution to their IBM equivalents, are less troublesome. One problem you may notice, especially with the four-colour mode, used in many games, is that the screen seems to flash and update itself in large chunks. This is a consequence of the method used by the 512 Operating System to copy screen information to the BBC screen hardware, and nothing can be done about it. Some programs may not select CGA properly, easily rectified by selecting it yourself first with the PCSCREEN command. Many programs leave the computer in 40-column CGA mode after use, but again the PCSCREEN program will put you back in 80-column text mode.

A very popular monochrome graphics standard on PCs is 'Hercules', named after the company which invented it, and one of the few PC third-party suppliers, other than Microsoft, to achieve a standard in this area. Many clone machines contain Hercules-compatible video controllers. The Hercules standard is 720x348 monochrome text and graphics, and is *not* compatible with the Master 512.

The DOS Plus system, as supplied with the Master 512, always uses ANSI (VT52) control codes for cursor movement, inverse video, etc. These are ESCAPE sequences (strings of ASCII characters preceded by the ESCAPE (27)

character), which allow simple programming of highlighted and inverse video displays, and positioned text. The ANSI system also deals with colour, but not on the 512. Most text-based software uses the ANSI codes to work, and everything should work normally. MS-DOS machines need a driver loaded called ANSI.SYS to achieve the same effect. The only problem which might occur is if a package specifically needed ANSI.SYS to be absent.

Character Set

The character set used on the Master 512 is the ordinary BBC one, and not the standard IBM set, as far as the first 128 characters. The top 128 characters are redefined to match standard IBM character graphics, as most software uses these to draw lines, boxes etc. on text screens. Unfortunately, Acorn have not redefined character 96 to its normal ASCII value of ' (close single quote), and left it as a £ sign. This means that you might get the odd program display messages like 'TITLE£ when what they mean is 'TITLE'.

Maths Co-processor

The lack of a maths co-processor usually causes no problems. However, a number of maths intensive applications are becoming available that rely on its presence. Again, there is little prospect of making the program work without a major program rewrite. However, maths co-processors are a rarity even on standard PCs, so don't worry too much about this one.

Choosing the Correct Configuration

Many programs when they run, ask you for information concerning your system. These are the answers you should give.

Screen type:	Text, or CGA (Colour Graphics Adapter)
Keyboard:	84-key UK
Font:	System
Pointing Device:	None
Disc Drive:	(as fitted)
Hard Disc Drive:	C
Printer Port:	PRN (if possible or LPT1)
Printer Type:	(as fitted)
Serial Port:	None or COM1: (Try AUX: if possible)

If you are offered BIOS or DIRECT for any output option, choose BIOS. Although strictly the DOS Plus printer device is called PRN, rather than LPT1, in practice, any software which writes to LPT1 will work correctly with the BBC/Master parallel interface.

If Installation Fails

If you cannot get a software package to install correctly, you should first look at any configuration programs. These are often in the form of batch files, and would be called INSTALL.BAT, CONFIG.BAT etc, and are readable in a normal text editor. Sometimes there will be single operation which has to be changed (for example, trying to write to a CONFIG.SYS file), and then the program will install. Another ploy for difficult installations is to install it first on a real PC, and then copy the installed files onto the 512.

Floppy disc installation is usually a configuration process followed by deletion of unnecessary files. The 'installed' floppies can then be transferred to the 512, where they may run. Larger programs, which require a hard disc or 1.2Mb floppy will often run on the 800k 512 special format discs, in which case the program should be installed on the real PC's hard disc, and then the exact file structure noted. The files can be copied off in parts using the common medium of 360k discs, and reconstructed on an 800k 512 disc. This method should also be used when transferring installed hard disc software from a PC hard disc to a Master 512 hard disc.

Note that, when copying installed software in this way, the installation program will probably put all the files you need in one directory, but also a startup file, or other low-level files, may be placed in other directories, usually those pointed to by the PATH command. The only surefire way to check that you have copied off all the files required to make a list of all your files on the hard disc both before and after installation.

Finally, please take note of the copyright notices. Most software may only be run on a single machine, therefore if you install the program on a PC first for transferring to a Master 512, then the PC installed version may have to be deleted to avoid infringement of the manufacturers copyright. Please check and obey the rules.

17: Shareware & PD Software

It is a fact of life that PC software is generally much more expensive than BBC software, and in many cases more expensive than the price paid for the Master 512! Once paid for, unless it appears in our compatibility list in Appendix A, you are not entirely sure that it will function and behave as it should.

There is, however, a wide source of software for IBM-compatibles, including the Master 512, which you can 'try before you buy' for the cost of the media it is supplied on and p&p. If the software doesn't work, you haven't lost anything. This is public domain software and shareware. The main differences between this type of software and normal commercial software are:

- Distribution is not through dealers, but through other sources
- You only have to pay for the software if you like and use it
- It's much cheaper than commercial software
- It's often the only source of those obscure little useful items

About Shareware

Shareware is a software distribution system which originates from the USA, which works on a principle of honour. The software is distributed by the author to the computer-using community at large, through specialised shareware distributers and bulletin boards. Shareware distributers make charges to cover the cost of discs, postage and packaging and so on, but these are small compared with the true value of the software. If you like what you have tried, you can then register, and again the costs are small in comparison with a similar commercial product. For example, a small disc management utility might have a registration cost of $5 (£3), against say, a cost of £20 as a commercial product. A full-blown word processor may cost $75 (£50) to register, whereas the commercial equivalent would be several hundred pounds.

When initially distributed, the idea is that the software is 'on approval', effectively a free trial. Each program will contain information about registration and a disc based text file providing enough documentation to allow you to use it effectively. Registration means that you pay a more realistic price for the software, by sending payment to the author. In return, you will receive the benefits of a normal, commercially available package, such as updates, printed manuals, extra facilities and so on.

Because you, the customer, are dealing directly with the author, the registration fee is usually much lower than the cost of similar commercial packages. Even major packages cost only about £30–£40, and small ones may be as little as £3. It is even reported that (some) shareware authors are often better at providing customer service than (some) commercial firms. Naturally, registration is a matter of trust, and no-one is going to know if you don't register, however, if you are serious about a particular shareware program, you are likely to want the full documentation and extras that are available, so there is a natural incentive to register.

Payment is not the problem it might have been a few years ago. Most of the authors will accept Access and Visa card payments, or have European agents. It is fairly straightforward to obtain dollar cheques for a small charge at your local bank. Dabs Press are publishing a book in 1989 dealing with PC shareware. Details of *Shareware: A Dabhand Guide* can be found in Appendix G, and should prove to be invaluable reading for all Master 512 users.

Public Domain

Another category of software is 'Public Domain' – often referred to as PD. This is similar to shareware and is distributed in a similar fashion, but unlike shareware, it is completely free of charge! Once you have it, there is never anything more to pay. This is because the author is genuinely giving you something for nothing, or more usually, the software originates from a source, such as education or industry, where the actual author doesn't own the software, perhaps because it was written in 'work' time, and the 'owner' is not set up to receive registrations.

Shareware and PD Sources

There are five ways of getting hold of shareware and public domain software:

- By copying friends' discs
- By downloading it from a bulletin board
- By sending off to a shareware distributor
- From Dabs Press
- From magazine discs

Copying from friends is the quickest and cheapest way of obtaining material. Unlike normal commercial software, for which passing between friends is illegal, you are positively encouraged to copy shareware. The authors desire the widest possible distribution, as this increases the number of people who may possibly register. As the Master 512 can read standard PC 360k discs, you can copy it, not only from fellow 512 owners, but also by swapping with standard PC owners. Possible sources are colleagues at work, computer user groups and clubs, and your computer-owning friends.

There are two points to remember when exchanging discs with regular PC owners. Firstly, if you are giving a shareware disc to someone else, the only formats common to both the 512 and standard PCs are the 360k (512x9 IBM) format for 5.25 inch discs, and the 720k (512x9 IBM) format for 3.5 inch discs. Secondly, if receiving discs from an 'XT' owner – that is someone with an 8086/8088 processor based PC, such as the Amstrad 1512/1640 or RM Nimbus, then there will be no problem, but if someone with an 'AT' computer – one with an 80286 or 80386 processor – gives you a disc, it must be in the 360k (720k for 3.5") format, and not the 1.2Mb (1.44Mb for 3.5") format also supported by the AT, which cannot be read by the 512 under any circumstances.

If your AT-owning friend is not sure, tell them to format the disc they are giving to you using the command:

FORMAT A: /4

before copying software onto it. This will format the disc in 360k format. The IBM AT and compatibles, like the Master 512, can automatically sense the disc format, so once a disc is formatted in this manner there should be no problems.

A slight hiccup can sometimes occur when a disc formatted on one machine cannot be read by another. The most common problem is that a disc formatted on an 80-track drive, such as a Master 512 or an IBM AT, will sometimes not allow writing, and sometimes even not reading, on a standard 40-track XT drive. The way around this is to format the disc on

the XT, rather than any other machine. If you do have this problem, work with fresh unformatted discs, rather than those which have already been formatted or contained data.

Downloading From a Bulletin Board

To download software from a bulletin board, you will need some communications software, and a modem. Note that, because of the problems with serial communications on the 512, this will have to be done with either native BBC software, or another PC. Most people will take the former option.

If you are unfamiliar with communications ('comms'), don't worry, it is all fairly straightforward. A bulletin board is simply a computer and modem connected, normally permanently, to a telephone line, which is capable of answering the phone when it rings. Because the noises generated by a modem make no sense to the human ear, the telephone line is normally separately installed, and dedicated to the bulletin board. Full details on how to use a bulletin board can be found in Appendix D if you are unfamiliar with the world of comms. If you are familiar with comms then you should have few problems, however, to save download times files have often been compressed into one large file that must be un-compressed before it can be used. Appendix D contains details on how to go about doing this.

Shareware Distributors

Naturally, using a bulletin board runs up your telephone bill, so another method of obtaining shareware is to order it from a shareware distributor. You send your money and get discs in return, just like commercial software, but with one big difference – the money you pay to a shareware distributor covers only the cost of the discs themselves, plus carriage, and the distributor's overheads. The software on the discs is not being paid for, and you are still expected to pay the author if you register.

Shareware distributors come in all shapes and sizes, from hobbyists doing it for fun, to highly professional firms with large and detailed catalogues. Naturally, a professional firm employing staff and printing catalogues will have more overheads, so you might expect to pay a little more per disc for the material. Costs range from about £1.50 to £10 per disc, although virtually all the distributors at the higher price bracket reduce the unit price

if you order several discs at once. In practice, the cost of blank media plus duplication is usually the smaller part of the distributors' overheads, the larger part being staff to fulfil orders and answer telephone calls, and advertising and printing. There is, incidentally, no law preventing anyone actually making a profit from shareware distribution, but natural competition has brought the charges to a very fair level. Some distributors have a 'club' system, whereby as a member, you obtain better prices. For example PC-Serve currently charges £5 per disc, but only £2.50 to members.

Many authors have actually specified a maximum charge (usually $10) to be made for the distribution of their disc, and shareware distributors generally have charges which are below these levels. Some authors even go as far as to specify that no charge whatsoever may be made -- you will normally only find these programs on bulletin boards, or bundled on discs with other programs, as even blank floppies cost money!

Most shareware distributors have no involvement with the author registration process, and once you have purchased discs from them, that is the end of it -- if you want to obtain updates, you have to contact the author direct. However, one leading distributor, Shareware Marketing, of Tonbridge, also acts as UK, and in some cases European registration agent for many North American shareware titles. Therefore, if you wish to register, you would send your money, and obtain the full manual etc. from them, even if you obtain the 'free' copy from another distributor or a bulletin board.

Brown Bag Software, a leading shareware author, have actually set up their own office and bulletin board in the UK to receive registrations, and supply manuals etc. There are signs that more of the 'upper echelons' of shareware authors will do this. Because of the disappointing level of registrations from Europe, some shareware authors have made their product shareware in North America only, and insisted that the programs be sold on a normal commercial basis in Europe. Shareware Marketing, through their registration connections, are UK distributors for many of these programs. Full details are given in their regular catalogue.

UK Shareware Distributors

The following companies are the leading shareware distributors in the UK and you can obtain a free catalogue on request.

Shareware Marketing,
87 High Street, Tonbridge, Kent.
Phone: 0732-771344

PC-Serve,
1147 Greenford Road, Greenford, Middx. UB6 0DP.
Phone: 01-864 2611

Seltec,
Northumberland House, Staines Business Centre, Gresham Rd,
Staines, Middx. TW18 2AP.
Phone: 0784 64257.

Dabs Press

When you obtain shareware from one of the above outlets there is no guarantee that it will actually run on a Master 512. Dabs Press have already released a Shareware Collection containing five discs of Master 512 tested software and full details of this can be found in Appendix G.

Magazine Discs

There is, increasingly, a fifth method of obtaining shareware, and that is through the monthly hobbyist magazines for PC owners, such as Personal Computing with the Amstrad, and PC Plus. These magazines often contain a free disc affixed to the front of the issue. Be careful though – not all these programs are shareware. Both the magazines mentioned include a mixture of shareware, and reader-submitted, or staff-written programs (the equivalent of the printed listings in BBC magazines) and these latter programs are not shareware, and you cannot pass them around.

CP/M Shareware

DISC 4 of the Master 512 discs contains an emulator for CP/M 2.2, the Z80-based operating system which preceded 8086-based MS-DOS and DOS Plus. Quite a bit of CP/M software will work with this emulator, albeit slowly, and there is a fair amount of CP/M shareware. Unlike DOS, CP/M does not have a standard disc format, so if you are obtaining this through a shareware distributor, you must get the disc in one of the CP/M formats that the Master 512 can read. These are the last three items in the format list given in the FORMAT section of the Master 512 DISK program on DISC 1.

How Do I Know?

If a friend gives you are program, or you obtain one from a magazine disc, and you are in doubt as to whether a program is shareware, look for the author notice. If it doesn't say anything about sending contributions, or that the program is in the public domain, or 'freeware', then you had better assume that it isn't shareware, and don't pass it around. There is very little public domain material around for the IBM PC relative to shareware — the majority of program authors do ask for a contribution, and therefore will always place a message to that effect fairly prominently in the program.

If a program is shareware, you may pass it on to whom you like. If you do this, especially if you do it on a regular basis, take note of the author's requests in the documentation – for example some authors insist that all the files must be given (fairly obvious), and some insist that the programs be distributed in .ARC form, or with no other programs on the disc, or some other conditions. You should honour these requests, not just because they are morally justified, but also because the author retains copyright, and has only permitted shareware distribution subject to those conditions.

There are many thousands of shareware programs available for the IBM PC and compatibles. Most of them will work correctly on the Master 512, and just about every application you could ever want is there. It's a very exciting area.

18 : Expansion

Econet

Acorn have released (Summer 1988) a version of DOS Plus modified to allow the 512 to be used on an Econet local area network. The software is based on Digital Research's DR-NET, suitably adapted to take account of the 512 hardware and the Econet fileserver requirements. When used, this software permits a BBC or Master fitted with a 512, to run DOS Plus in the normal way, but at the same time provides shared access to the fileservers' disc drives and printers. Connection is via the standard Econet port in the I/O processor.

The package consists of the adapted software and a site licence for its use. The software comprises a new version of DOS Plus, together with the additional transient commands to take advantage of the network's facilities. The use of DOS Plus with Econet has no effect on any other machine in the network, any or all of which may be run in native mode, or if fitted with a 512, as a DOS Plus system, at the same time. The package's title is DOS Plus with Econet Software, and it can be ordered under code AES39 from Dabhand Computing on 061-766-8423.

The Solidisk PC Plus

At various points through this guide consideration has been given to the memory constraints of the 512 running under DOS Plus. This limit on the memory available applies to all transient programs (ie, software loaded from disc), and is, in part due, to the memory requirements of DOS Plus – 90k larger than, for example, MS-DOS. Some applications need 512k or even 640k when running under MS-DOS – so these clearly will not run on the 512.

Solidisk has produced an upgrade for the 512 which overcomes these problems, the PC Plus, by adding an extra memory board to the 512. In order to have this upgrade fitted, you must send your 512 board to Solidisk, who will fit the PC Plus to the existing 512 board, as it requires a number of

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soldered connections. The following points are made for information only, and no criticism of the PC Plus is implied or should be inferred. In fact, reports on the issue two board by Acorn staff, who have examined the product with regard to power consumption, build quality and operation, are very favourable.

You should be aware that, altering the hardware in any way necessarily invalidates any Acorn warranty applying to the original board, and you must sign a disclaimer acknowledging this. This does not absolve Solidisk of the consumer's rights in terms of the supply of goods, standard of workmanship and fitness for purpose, but neither does it transfer responsibility for the original board to Solidisk. You may wish to seek clarification from Solidisk and, if appropriate, take further advice before signing the disclaimer. The PC Plus requires no additional documentation and is attached in exactly the same way as the original 512 board, as shown in the Acorn documentation.

Should you be running a version of DOS Plus earlier than 2.1, you will also need to return the DOS Plus disc (Issue DISC 1) so that the software may be altered to allow the extra memory of the PC Plus to be used.

In use, the PC Plus behaves just like the original 512 upgrade, but with the benefit of the extra memory, which will be used automatically by most software. The only real change concerns the memory map, if you are using version 1.2. It is identical to DOS Plus version 2.1 which is already amended to allow for this upgrade.

The additional memory provided by PC Plus may be used by any program running under DOS Plus, so long as that program does not itself impose a limit. For example, Lotus 123 will happily use the full 700k left after loading DOS Plus. This means that PC Plus actually provides more memory than the 640k available under normal operating conditions with MS-DOS. However, this is an exception, and most software will not use in excess of 640k, even if it is available.

All the applications tested which need more memory than that provided by the standard 512 upgrade (and which are not prevented from running by other problems, such as hardware addressing), run on the PC Plus. As with any product, if the information is not available for a specific package that you wish to acquire, ensure that you can test it before purchase, or better still, obtain from the retailer a guarantee of a refund if the package proves unsuitable.

19 : Questions and Answers

This final chapter provides answers to some of the most frequently asked questions by Master 512 users.

Q: Can I write a !BOOT file which will turn on the Master 512 and load DOS Plus?

A: Not from floppy disc, because there is no room on DISC 1, the DOS boot disc to fit a !BOOT file. You can do it from hard disc with the following lines:

```
*BUILD !BOOT
0001 *BASIC
0002 *CONFIGURE TUBE
0003 *FX151 78 127
0004 CALL !-4
```

This will re-boot the machine with the co-processor turned on, which will in turn load DOS. IF you have an AUTOEXEC.BAT file in your root directory, this will also be executed.

Q: Can a floppy disc be partitioned in the same way as a hard disc?

A: Yes, but not with the HDISK program. The method to do this is fairly complicated, and is not stable – ie, when a disc contains both ADFS and DOS data, each does not know of the other's existence, and so writing to one format can overwrite the other. If you have a good under-standing of disc formats, what you must do is:

a) Format the disc in DOS, using 640k format.

b) Copy any files you require onto the DOS disc.

c) Exit DOS, and examine the disc with ADFS.

d) There will be free space, but *FREE reports all space to be used.

e) Alter the free space map, by directly editing the disc (Sectors 0–1), to show the true free space.

f) Create a dummy file entry – by editing the $ directory sectors, not *CREATE – which uses up, say, half the disc.

g) Save ADFS files on the remaining portion.

Note, however, that if you fill the DOS disc, you may well overwrite the ADFS files. The technique is perfectly good, however, for read-only discs, and has been used, for example, on my Master 512 Utilities disc.

Q: *Can I transfer my ED files to VIEW or Wordwise on the BBC?*

A: Yes. This is done with the PUTFILE command. Copy the PUTFILE.CMD file from DISC 1 onto another disc, and place this in Drive 0. Save your ED file onto this disc as well. Put an ADFS disc in Drive 1. If your ED file is called TEXT.TXT, and the ADFS filename is to be Textfile, then, at the DOS prompt type:

```
A>PUTFILE  A:TEXT.TXT  :1.$.Textfile
```

The file will be transferred. Note that, like all PC text files, there will be linefeed characters (ASCII &0A) after the carriage returns at the end of lines. These can be removed by loading the file into Master EDIT and using the global search and replace command as follows:

```
Replace:|J/
```

(ie, replace CTRL-J with nothing). If you are using VIEW, you can ignore this, and READ the file directly into VIEW – the linefeed characters will be automatically removed.

The process is, by the way, much simpler if you install a memory disc, and copy the PUTFILE program, the ED program, and/or the ED file created into the memory disc.

Q: *Can I use my modem with the Master 512?*

A: Not normally. Most PC comms packages use an MS-DOS assignment for the communications port called COM1: (or COM2:, COM3: or COM4:). DOS Plus does not support these. The serial port in DOS Plus is called AUX:, 'Legally written' software addressing COM1: will in fact be directed to AUX:, and thus to the serial port, but very little PC comms software is legally written, because of speed problems. This topic is covered in more detail in the Dabs Press *Master 512 Technical Guide*.

Of course, simple serial port transfers using such commands as:

```
COPY <filename> AUX:
```

will work perfectly well, as would your own comms program written to use DOS Plus. Remember than most comms work is neither space nor speed-hungry, and the job can usually be done perfectly adequately using the BBC in native mode.

One comms package that has been found to work correctly is COMM+ by Margolis & Co, 105 Foundling Court, London WC1.

Q: *My mouse is not moving freely, and the ball seems to be sticking. Can I cure this?*

A: Yes, by turning the circular plate underneath the mouse, you can remove the ball, and clean both it, and the roller mechanisms inside. A 'baby bud' soaked in alcohol or some other evaporating solvent will do the job. Particularly sticky lumps of dirt should first be removed gently with the end of a pin or penknife. Generally, it is the rollers, rather than the ball, which pick up the dirt.

If your mouse is for any reason totally destroyed, you may be interested to know that the standard AMX Mouse is compatible with the 512 mouse, which means, of course, that you can use the Master 512 mouse with AMX software in BBC mode. Note that the 512 mouse is 'lower-geared', ie, it takes more desk movement to move a given distance on screen, than AMX mice, which actually makes for more accurate positioning when using the mouse with software designed for the AMX device.

Q: *Is the 512 board expandable?*

A: A RAM expansion system is available from Solidisk Technology, which increases the available RAM to 1Mb. This is accessed by using a special version of DOS Plus supplied by Solidisk, or DOS Plus Version 2.1, which works automatically with the upgrade if present. See Chapter 18 for more information.

Normal PC expansion is done through hardware 'cards' which contain such things as extra RAM, modems, digitisers, hard discs, and so on. There is no way of plugging such cards into the Master 512. Some custom expansion projects are provided in the *Master 512 Technical Guide*.

M512—L

Q: Do I really need two floppy disc drives?

A: Not if you have a hard disc, and in most cases, not if you are running programs which still have sufficient memory to run when a memory disc is installed.

The DOS Plus system, including, command interpreter, stays resident in memory once loaded, and as long as you don't need the transient utilities, you can get away with a single drive. DOS operations like copying, formatting, and so on, and running small utilities can quite easily be done from one drive.

The problem usually arises when you are running a program, such as WordStar, which requires two drives because the software will literally not fit on a single 360k disc. However, even this is avoidable, as a two-disc program can often be copied onto an 800k drive, and run from one disc. Sometimes, the software may have to be installed on a hard disc, and copied back to an 800k floppy for this to work.

What you must have is a double-sided 80-track drive. The system simply will not work with 40-track drives, nor with single-sided drives.

Q: Can I use the 512k of RAM with BBC programs.

A: Yes, the 512k of RAM is accessible using the standard Tube protocols, or by directly accessing the Tube port. Programming through the Tube ports is explained in another Dabs Press publication – *'Master Operating System:A Dabhand Guide'* by David Atherton. Using the memory is however, highly dependent on special software being written – programs such as VIEW and Wordwise do not automatically recognise the RAM.

Q: What is the difference between MS-DOS and DOS Plus.

A: MS-DOS is the Operating System supplied with standard PCs. It is published by Microsoft. When supplied on a genuine IBM PC, it is called PC-DOS. DOS Plus is an alternative Operating System from Digital Research which is highly compatible with MS-DOS, but not completely so. However, DOS Plus also has two important features which improve on MS-DOS, the ability to run background programs, and compatibility with the earlier PC operating system CP/M 86.

Quite a lot of IBM software does not run on the Master 512 – by and large, however, this is due to illegal programming techniques, directly

accessing hardware which simply isn't there on the Master 512, or expecting more memory than is available. If you have access to an Amstrad PC1512 or PC1640, then you can check whether software incompatibility is a DOS Plus problem, or a hardware problem, by loading DOS Plus, the alternative Operating System supplied by Amstrad, and seeing if the software works.

Q: Tell me which BASICs will run on the Master 512.

A: M-TEC's BBCBASIC(86) interpreter works well, and provides a very BBC-like environment. It is quite fast, and has a run-time module for producing stand-alone programs. Microsoft QuickBASIC 3.0 also works well. This is a true compiler, and produces stand alone .EXE files. It is reported that Microsoft QuickBASIC 4.0 also works – certainly it seems to, but this version has not been in use long enough to give a definitive confirmation that everything is supported. The Microsoft editor will not, unfortunately, work with the mouse.

Borland's Turbo BASIC, and Locomotive Software's BASIC 2 for the Amstrad do not work. GWBASIC and BASICA seem to work to a certain extent, but there are problems with printing.

In general, compilers for other languages (including Borland products) seem to work well. Zortech C, for example, is a favourite of many 512 users.

Q: Can I add a maths co-processor?

A: No, the 80186 chip is incapable of supporting a maths co-processor, and so no provision has been made for one on the circuit board.

Q: If I write programs for the Master 512, will they work on other PCs?

A: Unless you use the special OSWORD calls provided, the answer is yes. The only problem is that doing this, you would almost certainly do everything 'legally', which may be quite fast on the Master 512, but very slow on a real PC. Screen text, for example, is almost always produced by direct memory writing.

Q: Can I use GEM/3, the latest version of GEM, and all the new desktop publishing software which works with it?

A: No. GEM/3 will load on the Master 512, but unfortunately, will not read the 512 mouse, making it practically useless. Therefore Finesse, Timeworks DTP, Artline, and other GEM/3 only programs cannot be

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used. GEM Draw will work, as this can perform under GEM 2, the Master 512 version.

Q: *To what extent are MS-DOS or PC books and magazines relevant ?*

A: If discussing software, for example, the wide range of books on Lotus 1-2-3, then they are almost totally relevant. Books on using and programming in MS-DOS are useful, although there are quite a few differences. There are some technical manuals on DOS Plus from Amstrad, as this operating system is offered as an alternative on their PC1512/1640 range.

Q: *Can I network the Master 512?*

A: Yes, but you need a special version of DOS Plus, available from Acorn or dealers at £150, and the networking is done through Econet, and is not compatible with Microsoft networking protocols, so network versions of PC software may not run correctly.

Q: *How does the Master 512 compare in speed to Amstrads etc.?*

A: The Amstrad PC1512 runs about twice as fast as a standard PC. The Master 512 runs about four or five times as fast, although some operations, such as writing text to screen are much slower. The net result is that most programs run about twice as fast as on an Amstrad.

Glossary of Terms

Address	A specified location, usually in the computer's memory, or on disc.
Address bus	A specialised data channel used to pass addresses from one part of a microcomputer to another.
Addressing	The convention or method of using addresses in a micro. This varies from machine to machine.
ADFS	Advanced Disc Filing System. One of the two standard disc filing systems on Acorn micro-computers. ADFS is the later, and is used by the 512 when initially loading DOS.
Architecture	Literally the hardware design concepts used in a computer.
Assembler	A program which reads assembly code and translates it to machine readable instructions. Also used, colloquially, for the code itself.
AUX	DOS abbreviation for auxiliary. In standard systems it refers to both the system's auxiliary input and output devices, AUXIN and AUXOUT. These are normally assigned to RS423 receive and transmit. See also Serial port.
AUXIN	The logical serial input device, by default the RS423.
AUXOUT	The logical serial output device, by default the RS423.
Batch	A group of items which logically belong together.
Batch-file	A DOS file used to hold a sequence of instructions which can be read by DOS in such a way as to run programs and perform a series of related tasks automatically.
Batch-processing	A method of processing bulk information.

Block	A group of bytes in memory or on disc which form a logically addressable unit.
Bootstrap	Properly 'bootstrap loader'. A small, usually permanent (ie, electronically encoded on a chip) program provided to load the operating software required by a computer. The term derives literally from the concept of the machine pulling itself up by its bootlaces.
Bus	An electrical connection along which data of various types may be passed from one area in a micro to another. Literally a common communication path.
C	A high level, compiled computer language.
Character	Literally, any single byte of information. Colloquially often used to describe only displayable items of data, eg, A, B, C, etc.
Clock	Either the function which the user sees as providing the time of day, or the device within a computer which provides regular pulses to all other time dependent devices within the machine, so as to orchestrate and synchronise their actions.
Cluster	An area of disc storage, allocated as the minimum sized 'extra' unit when a DOS file requires more space. The size of a cluster is 1 kilobyte, but, therefore, the number of sectors per cluster varies, depending on the disc format.
CON	DOS abbreviation for console. In standard systems it refers to the default systems input and output devices, CONIN and CONOUT, the screen and keyboard. In use in commands it is suffixed by a colon.
CONIN	The logical input device, by default the keyboard.
CONOUT	The logical output device, by default the screen.
CP/M	Control Program for Micros. The 'standard' operating system for 8-bit business machines prior to DOS systems, and the direct ancestor of DOS.

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CPU | Central Processing unit. In micros this is often a single chip, a microprocessor. In larger systems it is usually a logical unit which may contain many chips and may require several boards.

Current directory | The directory presently known by the system to be used when reading or writing files, unless explicitly instructed to the contrary. However, see also 'Path'.

Data bus | A specialised type of bus used to pass data from one unit in a micro to another which requires the information.

Delimiter | Literally a separation character, used to distinguish between one logical part of an area of information and another. For DOS commands requiring parameters, each item is delimited by a space.

Device | In DOS a device is any logical unit attached to the computer for input or output.

DFS | Disc Filing System. One of the two standard disc filing systems on current Acorn microcomputers. DFS was the original system, but is not compatible with the later ADFS.

Directory | A logical unit which must be named and created on disc, and which can hold filenames or other directories. See also 'Current directory'.

DOS | Disc Operating System. The name of the type of operating system used by the 80nnn family of processors, so named because it is loaded from disc. There are three popular versions, all of which share a common base but exhibit sufficient differences to preclude complete software compatibility.

File | A logical group of information stored on disc. It is the smallest unit which can be accessed by name by the user or applications.

File allocation table
A table of information used by the portion of DOS responsible for disc storage, to record where the first

	fragment of of each file is physically located on the disc, and which areas are free to be used for new data. The minimum fragment is a cluster, and each cluster contains a pointer to the next, so DOS can retrieve the data. If either the FAT or a Cluster are corrupted, data may be lost.
Filename	Either the complete 11 characters by which DOS can identify data stored on disc, or more correctly the first eight of these characters.
GEM	Graphics Environment Manager. A front-end to DOS providing a highly formalised interface between a user and the operating system. Theoretically easier to use, but not always convenient and always slower than direct command line entry.
I/O	Input/Output. A term used to refer to any computer activity or device which is concerned with this type of process.
Interface	The intermediate device or process between two communicating parts of a computer's hardware or software.
Interrupt	A hardware triggered function based on the system clock interval, which permits servicing of various internal activities on a regular basis. Typically, for example, the keyboard is scanned every 10 milli-seconds to check if a key has been pressed.
Label	In 512 DOS Plus this is the name of a command used to add a title to a disc. The title so added is known as the volume label.
Logical device	A notional peripheral connection known to DOS. Each is assigned, by default, to an actual physical device by means of a 'device translation' table. If a physical connection is altered, by merely changing the translation table contents, the logical to physical relationships can be altered without any change to DOS's view of the outside world. See also CON, AUX, and PRN.

Mouse	A hardware device connected to the micro for input of relative movements (of the mouse) on a flat surface, mimicked by a pointer on the screen. With suitable software this pointer can be used to choose one from a range of options, or to 'draw' on screen. See also WIMP.
MS-DOS	The version of DOS as produced by Microsoft.
Offset	The name given to a variable which indicates a point, usually in memory, with reference to a fixed base address or start-point. In DOS each segment points to a 64k block of memory, but the data within a segment is located by its offset from the start address of the segment.
Parameter	Information supplied as a variable to limit or control or direct a process. For example, in a file copy operation both the source and destination filenames are parameters.
Parallel port	A physical connection between the computer and the outside world, capable of passing eight bits of data simultaneously. That is, all eight data bits are passed through in parallel. This is the most common connection for printers.
Port	A physical or notional connection between the computer and external devices. See also Logical device.
PRN	DOS abbreviation for Printer. PRN is the logical printer device as known to DOS, by default attached to the parallel port.
Register	In microprocessors, a special data storage area capable of use for a specified range of tasks on a defined quantity of data. In the 80186 in the 512 the registers can hold two bytes, or 16 bits of data, hence the description, 16-bit processor. Internal memory addressing uses registers specifically assigned to the task of referencing the current segment and the offset. By manipulating these registers different parts of memory are addressed.

Segment   The name given to each 64 kilobytes of memory in the
                       512. A segment is the maximum unit that can be
                       addressed in 16-bits. See also Register.

Serial port   A physical connection between the computer and the
                       outside world, capable of passing only a single bit of
                       information at a time. That is, data bits are passed
                       through in serial procession. In DOS the logical devices
                       AUXIN and AUXOUT are assigned to the serial port by
                       default. This is the standard connection for
                       communications. See also Logical device.

Transient command
                       A system command function which exists only during
                       the time it is active. All transients must be loaded from
                       an external storage device when called.

Utility   A program written to carry out a defined task, often
                       not an end in itself, but as a necessary adjunct to
                       maintaining and running a computer, eg, COPY, DEL,
                       PRINT.

Vector   A pointer found at a fixed location, and known to
                       reference the address of a defined function, usually in
                       the operating system. By means of vectors programs
                       can 'legally' connect to all the various functions
                       provided in operating system software, and remain
                       compatible through version changes.

WIMP   Windows, Icons, Menus and Pointer. A graphical user
                       interface aimed, largely, at avoiding the keyboard by
                       use of a mouse, which directs a visible pointer on the
                       screen. The pointer is used to select one of the items
                       offered.

A:Software Compatibility List

The following pages contain details of software that should run on the Master 512. Total compatibilty cannot be assured due to the wide range of features offered by many of the larger packages. Some software may require a hard disc to be used correctly.

Further details on these can be obtained from Dabhand Computing Ltd. (061-766-8423), who also offer the products at a discounted price.

Title	Ver	Supplier	Comments
Ability	1.2	Migent	Except Comms & Tutor
Ability Plus		Migent	Except Comms & Tutor
Accountant	1.0	Sage	Some colour problems
Accountant Plus	1.0	Sage	Some colour problems
Auto sketch	1.0a	Auto Desk	Keyboard only
Ballyhoo		Infocom	
BBC BASIC 86	1.0	M-Tec	
Beyond Zork	1.0	Infocom	
Book Keeper	1.0	Sage	Some colour problems
Bureaucracy		Infocom	
Cardbox		Business Simulations	
Cardbox Plus		Business Simulations	
Clipper			
COMM+	2.1	Marigolis	Comms program
Dataease	2.5		
Dbase II	2.43	Ashton Tate	
Dbase III+	1.1	Ashton Tate	
Dbase IV	1.00	Ashton Tate	As far as tested
Deadline		Infocom	
Delta	4.0		
Desktop	1.0	Sage	Some colour problems
Displaywrite II			
Displaywrite III			Needs installing
Draw-it	1.0		
DR C	1.0	Digital Research	

Title	Ver	Supplier	Comments
DR FORTRAN	1.0	Digital Research	
DR PASCAL	1.0	Digital Research	
DR Personal BASIC		Digital Research	
DR RASM	1.0	Digital Research	
Easyflow			
Easywriter			
Enable			
Enchanter		Infocom	
Eureka	1.0	Borland	
Exchange	1.0	Psion	Needs installing on a PC first
Executive Filer	1.0		
Executive Speller	1.0		
Executive Writer	1.0		
Financial Contol	1.0	Sage	Some colour problems
Flight Simulator	2.12	Microsoft	Not 2.13
Fontasy	1.0		
Framework II	1.0	Ashton Tate	Except scroll lock
Freelance			
GEM Desktop		Digital Research	Supplied
GEM Diary	1.0	Digital Research	
GEM Draw	1.0	Digital Research	
GEM Graph	1.0	Digital Research	
GEM Paint		Digital Research	Supplied
GEM Wordchart	1.0	Digital Research	
GEM Wordcraft	1.0	Digital Research	
GEM Write	1.0	Digital Research	Supplied
GW BASIC	1.0	Olivetti	
HAL			
Hitch Hikers Guide		Infocom	
IBM Assistant			
Infidel		Infocom	
Integrated 7			
ITT XBASIC			
Javlin			
Javlin Plus			
Kedit			
Lattice C	1.0		
Leather Goddesses		Infocom	

Title	Ver	Supplier	Comments
Lets C			
Level 2 COBOL	2.1		
Logistix	1.0	Grafox	
Lotus 123	1.0a	Lotus	Not 2.0. Latest version works
Microsoft BASIC	2.0	Microsoft	
Microsoft C		Microsoft	
Microsoft COBOL	2.1	Microsoft	
Microsoft FORTRAN		Microsoft	
Microsoft MASM		Microsoft	
Microsoft PASCAL		Microsoft	
Microtext			
MS-Chart	3.0	Microsoft	
Multimate	3.2		Except DEL key
Multiplan	2.02		
New Word 3	3.01	New Star	Files limited on DOS Plus 1.2
Norton Commander	1.00	Peter Norton	
Norton Utilities	Adv.	Peter Norton	
Paradox	2.0	Borland	Except personal programmer
PC Boss	2.06		
Payroll	1.0	Sage	Some colour problems
PC Calc			
PC File			
PC Four	1.0	Psion	
PC Outline	1.08		
PC Paint	4.0		
PC Paintbrush			
PC Planner	1.0	Sage·	Some colour problems
PC Prolog			
PC Promise	1.12		
PC Smart			
PC Storyboard	1.11		Except camera
PC Talk			
PC Tools			
PC Write	2.7		
PC Write	1.0	Sage	Some Colour Problems
Pegasus Accounts		Pegasus	
Perfect Calc			
Perfect Filer			

Title	Ver	Supplier	Comments
Personal BASIC			
Personal Editor	1.0		
Planetfall		Infocom	
Power 'C'		MIX	Requires DOS Plus.2.1. Reload COMMAND.COM first
Printmaster			
Quest			
Reflex			
Retrieve	1.0	Sage	Some colour problems
Rogue			
Sidekick	1.2	Borland	Requires DOS Plus. 2.1. Not versions above 1.50
Slidewriter+			
Smartwork			
Sorcerer		Infocom	
Stationfall		Infocom	
Storyboard			
Supercalc II		Computer Associates	
Supercalc III	2.1	Computer Associates	
Supercalc IV	1.0	Computer Associates	
Suspect		Infocom	
Suspended		Infocom	
Turbo C	1.0	Borland	Need to write your own Floating point routines
Turbo CAD	1.0	Borland	
Turbo Editor	3.0	Borland	
Turbo Graphics		Borland	
Turbo PASCAL	3.0	Borland	
Turbo PASCAL	4.0	Borland	Requires DOS Plus 2.1. Reload COMMAND.COM first
Turbo Reflex		Borland	
Twin	1.3		
Ventura Publisher	1.0		Needs DOS Plus 2.1 and PC+
Volkswriter 3	1.0	Lifetree	
Volkswriter Deluxe		Lifetree	
VP Planner	1.0		Requires loader
VU Writer			
VU Writer Scientific			

Software Compatibility List

Title	Ver	Supplier	Comments
Wishbringer		Infocom	
WordPerfect	4.2		Not version 4.0 or 4.1
Wordstar	3.x	Micro Pro	
Wordstar Prof.	4.0	Micro Pro	Requires DOS Plus 2.1
Zorland C			Problems with ZC
Zork I/II/III		Infocom	

B : DOS Plus Versions

There are three versions of DOS Plus for the Master 512: Versions 1.2, 1.2a and 2.1. There are a few differences between these versions with minor bugs ironed out in later versions. The following chart shows the command compatibility between the three versions. The DR specification of DOS Plus and MS-DOS version 3.2 are also shown for comparison.

Note that the presence of an entry for the 512 does not necessarily imply that a given function is implemented, merely that use of the command is permitted and will not, of itself, cause an error. For example, see 8087.

DOS Compatibility Chart

COMMAND	D/I	DR	DOS Plus Version 1.2	DOS Plus Version 1.2a	DOS Plus Version 2.1	MS-DOS 3.2
8087			•	•	•	•
ADDMEM			•	•	•	•
ALARM		CMD	•	•	•	•
BACKG		CMD	•	•	•	•
BACKUP	CMD	•	•	•	•	•
BREAK			•			
BYE	CMD		•	•	•	
CHKDSK	CMD	•	•	•	•	•
CLS			•			•
COLOUR	EXE		•	•	•	
COMSIZE			•	•	•	•
COPY		•	•	•	•	•
DATE		•	•	•	•	•
DEBUG						•
DEL		•	•	•	•	•
DELQ			•	•	•	•
DEVICE		CMD	•	•	•	•
DIR		•	•	•	•	•
DISK		CMD	•	•	•	•
DISKCOPY		•				•
ED		CMD	•	•	•	•
EDLIN						•

COMMAND	D/I	DR	DOS Plus Version 1.2	1.2a	2.1	MS-DOS 3.2
EDBIN		EXE			•	•
ERASE		•	•	•	•	•
ERAQ			•	•	•	•
EXIT			•	•	•	•
FIDDLOAD	COM				•	
FMG		CMD	•	•	•	
FORMAT			•			
FSET		CMD	•	•	•	•
GETFILE	CMD		•	•	•	
HDISK		CMD		•	•	•
HELP	CMD	•	•	•	•	•
INITDIR	CMD	•	•	•	•	
LABEL		CMD				•
MEMDISK	COM		•	•	•	
MKDIR			•	•	•	•
MODE		•	•	•	•	•
MOVE		EXE			•	•
NETPRINT	CMD		•	•	•	
NOTUBE		CMD		•	•	•
PATH			•	•	•	•
PCSCREEN	CMD		•	•	•	
PIP		CMD	•	•	•	•
PRINT		CMD	•	•	•	•
PROMPT			•	•	•	•
PUTFILE	CMD		•	•	•	
RENAME			•	•	•	•
RMDIR			•	•	•	•
SDIR		CMD	•	•	•	•
SET			•			
SETFMG		CMD		•		
SHOW		CMD	•	•	•	•
SKS		CMD			•	
SLICE			•	•	•	•
STAR		CMD		•	•	•
TIME			•	•	•	•
TREE	CMD	•	•	•	•	•
TYPE		•	•	•	•	•
USER			•	•	•	•
VER			•			
VERIFY			•	•	•	•
VOL			•	•	•	•

• = Command implemented, blank=not implemented

M512—M

C : GEM Write Codes

Listed below are some ..CMD control code sequences for use with Epson-compatible printers that may prove to be of interest.

Character Print Width and Line Spacing

Effect	Turn on with	Turn off with
Pica pitch	..CMD> "P"	..CMD> "M"
Elite pitch	..CMD> "M"	..CMD> "P"
Continuous Expanded	..CMD> "W1"	..CMD> "W0"
Proportional	..CMD> "p1"	..CMD> "p0"
Spacing 1/8"	..CMD> "0"	
Spacing 7/72"	..CMD> "1"	
Spacing 1/6"	..CMD> "2"	

Special Effects

Effect	Turn on with	Turn off with
Italics	..CMD> "4"	..CMD> "5"
Underlining	..CMD> "-1"	..CMD> "-0"
Reset printer	..CMD> "@"	
Emphasised	..CMD> "E"	..CMD> "F"
Doublestrike	..CMD> "G"	..CMD> "H"
Subscript	..CMD> "S1"	..CMD> "T"
Superscript	..CMD> "S0"	..CMD> "T"

D : Dial A Program

To be capable of down-loading software – shareware or public domain – you will need a modem to talk to the 'host' computer via the telephone line. Reviews of the various modems have appeared in the BBC specific magazines and these should be used to choose a suitable one should you not already have one. Alternatively you may phone Dabhand Computing on the number given in Appendix A for free advice – they can also take your order of course!

At your end, you connect the modem to your RS423 port, and to the telephone line – you must have a BT Type 600 wall socket – and connect your telephone instrument into a socket in the back of the modem. When the modem is not in use, or switched off, the voice telephone line passes straight through, and behaves normally. However, when you dial out to another modem, you can switch the modem on, and the two modems establish contact. At this point the noise on the telephone handset disappears. The two computers are now in communication. Most modern modems will actually performs the dialling and connection for you, so there is no need to use a telephone instrument.

All communications software at this point enters a mode where whatever you type is sent to the remote modem and computer, and whatever it throws back at you is displayed on your screen. (Therefore, to see yourself type, and well the remote messages, the other system must echo everything it receives.)

The bulletin boards which contain downloadable PC software almost invariably use the same communications settings, and you should set your comms software to these:

    Terminal Type : Scrolling or ASCII (not Viewdata)
    Bits : 8
    Parity : None or N
    Stop Bits : 1
    Duplex : Full
    Columns : 80

XON/XOFF : Yes
Files transfers supported : ASCII, XMODEM

Don't worry if there are not options for all these on your menu. As long as
you set the first five (and 8,N,1, Full Duplex should be default settings
anyway), then everything should work.

Baud Rates

Modems works at different speeds. The four main speeds used in this
country are:

V21	300 baud send, 300 baud receive
V22	1200 baud send, 1200 baud receive
V22bis	2400 baud send, 2400 baud receive
V23	75 baud send, 1200 baud receive.

Baud means bits-per-second. To work out the number of bytes per second,
divide the quoted figure by 10 (not eight, as there are two extra bits send
with each byte). Naturally, the faster the software, the more quickly you
will be able to download software. The snag is that V21 and V23 modems
are cheap, V22 modems cost a bit more and V22bis modems cost a lot more.
Some modems work at more than one speed, and are altered either by a
physical switch, or a software command. The newer ones simply let you
adjust your computer's RS423 speed, and alter themselves accordingly.

To check which speed to use, you must check the speeds supported by the
bulletin board (virtually always either V21 and V23 only, or V21 and V22
only, or all four), and the speeds of your modem, and in the case of using a
real PC, whether your software and modem support the use of V23, and use
the fastest available speed. Performing a software download involves an
great deal of receiving and very little sending, so V23 should be used in
preference to V21, if these are the only speeds available. PC programs are
in general much bigger than those on the BBC, and 200k files are not
uncommon. Don't worry, virtually all BBC comms software is capable of
downloading files bigger than the BBC memory, by spooling them out to
disc, but you can't avoid the fact that it takes a long time.

When connected to the bulletin board, you must use a 'file transfer
protocol' to download files. The simplest is XMODEM, which is available on
virtually all packages. There are two varieties of XMODEM (CRC and
Checksum) but don't worry – the software usually sorts out which one to

use. All you do is select 'Download' from a menu presented by the remote system, and select a file, and you will be prompted to start downloading. At this point, you invoke the XMODEM download command on your own software (at which point you will be asked for a BBC filename, as XMODEM does not automatically read the remote filename).

The procedure in detail, including setting up a modem, will be given in the manuals which accompany your modem and terminal software. The computer magazines are full of advertisements for modems and terminal software. With modems, the autodial type are preferable, although these are a little more expensive than manual dial. Communications software products such as 'Hearsay' from Beebugsoft, 'Modem Master' from BBC Soft, and 'CommSoft' from SoftMachinery will perform all the tasks described above. These three are specifically mentioned as they also support autodialling modems, allowing you to select a bulletin board from a list of them, and connect with a couple of keystrokes. Note that Viewdata-only software is not suitable for downloading PC programs from bulletin boards, nor are the very simple terminal programs sometimes published in magazines, as many of these do not support XMODEM protocols.

The telephone costs of using a bulletin board are exactly the same as those for making voice calls. It therefore makes sense to use local boards if possible, and to call outside peak hours. You will however find that some boards are constantly engaged from the dot of 6pm, whereas they are available during the day. This is normally the only cost (other than the purchase of modem and software). Note however, that some of the more professionally run boards also charge a small annual subscription, which has to be paid before you can get full access to all the features. The full shareware library is often, naturally, one of the subscriber-only features of these boards.

Archived Files

You will often find that downloadable PC software is supplied in a single file with an extension .ARC. This means that to save download time, the files have been reduced in size using a compression algorithm (a program which encodes the file, with the coded version being shorter), and at the same time, the opportunity has been taken to join all the files needed to run the program into one big file.

The first time you download software, you should look for a file called ARC.COM, or PKXARC.COM, or ARCE.COM or something similar, and download this. Then download the file you want – the one with the .ARC extension – and afterwards, when you have disconnected from the bulletin board, decompress the program. If you run the ARC program without any parameters, ie, just type ARC, and press RETURN it will give instructions on how to use it. The normal method is to simply append the filename of the .ARC file, with an 'extract' parameter. So if you had downloaded a file called GAME.ARC, you would type:

```
A>ARC -X GAME
```

and all the GAME files would be created. You could then delete the original .ARC file. Obviously, you only need to download the ARC file once. The ARCE variant is a shorter program which only decompresses – it doesn't compress, verify etc. This program doesn't need the –X parameter, so you would type:

```
A>ARCE GAME
```

Etiquette

When you call a bulletin board, remember that the person operating it (the system operator or 'sysop' for short) is usually running the service as a hobby, without reward, and it is considered polite to contribute as well as taking. Bulletin boards contain messaging sections, where you can ask and answer questions, and also have 'upload' sections, where people can leave programs that they have written, or shareware/public domain programs they have acquired, for the benefit of others. One of the major complaints that sysops have is that the majority of their callers just log on (connect), download every bit of software in sight, and log off (disconnect) without so much as a thank you message.

There follows a small list of bulletin boards, with telephone numbers. These were correct at the time of writing, but as this is essentially an amateur movement, boards close and open all the time, so keep up-to-date by checking computer magazines etc.

Bulletin Boards

These boards are, as far as is known, 24 hours boards, which definitely run at V21 and V22 speeds, and in most cases, V22bis and V23 as well.

Direct Line	01-841 1847
MIX	0272 583816
PD Sig	0895 420164
Brown Bag Board	01-404 0897

E : The DOS Plus Transients

The following shows the contents of the DOS system disc as supplied in release 2.1 of DOS Plus. You should note that, if you are using an earlier issue, your own disc will not contain all the files shown here, and will in addition show one or two extras, most notably the File Manager, FMG.CMD. This has been withdrawn by Digital Research and is no longer supplied. A copy taken from release 1.2 appears to function on 2.1, but users should note that this is not a recommended practice, as filemanager is known to be unreliable, hence its withdrawal.

If you are using an earlier release of DOS Plus than 2.1 and wish to obtain the upgrade, see Appendix A for details.

The file data is shown exactly as catalogued, with inserted column headings for clarity, and brief comments on the purpose or use of the file, to give help if you are deciding which might need to be copied to your working floppy discs or memory disc. By adding up the file sizes shown (remembering to round up to the correct size for your disc format) you will be able to see in advance the amount of space which will be required. In practice it is just as easy to copy the required files to an empty disc and issue a 'DIR' command, if the system is available at the time.

DISC 1 is the DOS Plus systems disc, required initially to boot the system prior to making your own working copy. You should immediately make a working copy and use this copy in all future operations, retaining the original safely in case of disaster.

This disc contains all the transient commands and utilities required by the 512 in running DOS Plus. You may find it useful to copy selected utilities to your applications discs, or to ensure their availability by means of the memory disc, and setting the appropriate path.

Filename.Ext	Size	Date	Time	Description
COMMAND.COM	26888	6-01-87	14:28	The transient which decodes all command input. It's more or less invisible, but can be overwritten by applications. In this case, if not present when the application terminates DOS Plus will report:- "Can't find COMMAND.COM". Replace the systems disc and press RETURN.
DISK.CMD	16512	15-07-87	11:58	This is the disc copy, format and verify utility. You should use this instead of COPY, if you want to copy the \SYS files to make another bootable disc.
BACKG.CMD	14720	6-01-87	14:28	The utility used to run programs in the background, stop them, or to show the memory used by background routines.
BACKUP.CMD	12416	6-01-87	14:28	Another copy utility, but used to backup hard discs as well as floppies.
CHKDSK.CMD	11776	6-01-87	14:28	The disk check and repair utility. It has numerous options, including reporting only, or attempting to fix corrupted file allocation and free space tables.
DEVICE.CMD	11392	6-01-87	14:28	The utility used to (re) assign physical to logical peripheral device relationships.
STAR.CMD	12800	28-08-86	12:25	Allows the entry of native BBC * commands (eg FX calls) which are passed across the tube for immediate execution.
BYE.CMD	2560	28-08-86	12:26	The command to park the heads on a hard disc. Always use this if you are physically moving a hard disc drive or damage may result.
ED.CMD	9728	6-01-87	14:28	The ASCII text file editor.

Filename.Ext	Size	Date Time	Description
PUTFILE.CMD	12672	15-01-87 14:51	Reads DOS files, writes DFS or ADFS format files.
FIDDLOAD.COM	3968	6-01-87 14:28	Allows installable device drivers.
GETFILE.CMD	12672	15-01-87 14:51	Reads DFS or ADFS files, writes DOS format files.
FSET.CMD	8960	6-01-87 14:28	Sets file access permissions.
INITDIR.CMD	35840	6-01-87 14:28	Initiates date/time stamping. Applies to CP/M discs.
MODE.COM	8064	6-01-87 14:28	A subset of DEVICE. See above.
PIP.CMD	9600	6-01-87 14:28	Peripheral Interchange Program. CP/M's data transfer program.
PRINT.CMD	15104	6-01-87 14:28	The background print utility.
SDIR.CMD	11904	6-01-87 14:28	Shows directory, displays various levels of file information.
SHOW.CMD	8064	6-01-87 14:28	Shows disc volume information.
SKS.CMD	1664	6-01-87 14:28	Utility to allow Borland's Sidekick to be run. SKS must be run before Sidekick is loaded.
TREE.CMD	6784	6-01-87 14:28	Shows the structure of directories.
NOTUBE.CMD	4224	28-08-86 12:29	A DOS command which issues a *CONFIGURE NOTUBE from DOS.
HDBOOT.SYS	3584	28-08-86 13:21	A system file for booting DOS from a hard disc.
HDISK.CMD	18688	28-08-86 13:21	The hard disc control command.
PCSCREEN.EXE	3072	28-08-86 12:33	Selects an IBM screen mode and translates it to a BBC mode change.
COLOUR.EXE	3584	28-08-86 12:36	Changes the colours used on screen.
ALARM.CMD	11264	28-08-86 12:36	The alarm utility.
MEMDISK.COM	2732	5-05-87 20:22	Sets up a RAM disc of a specified size. It can't be run twice.
NETPRINT.CMD	10112	28-08-86 12:37	Sends output to a network printer.
EDBIN.EXE	7168	16-01-87 16:08	Binary file editor.

Filename.Ext	Size	Date	Time	Description
MOVE.EXE	21510	25-01-87	19:14	File transfer between (most) BBC filing systems. (Not necessarily involving DOS.)
HDINSTAL.BAT	512	26-05-86	16:12	The batch file to install a hard disc partition for DOS Plus.
HDINSTL1.BAT	896	26-05-86	16:12	As above.
HELP.HLP	50560	28-08-86	14:43	The help text used by HELP.CMD.
ISSUE.BAT	2048	15-07-87	14:27	This batch file displays the DOS issue number (3) on screen.
HELP.CMD	7424	26-05-86	15:42	Displays systems help.
LABEL.CMD	6272	28-07-87	1:56	Allows user labelling of discs.

E : Programs Disc

To accompany this book, a disc of programs has been prepared, which provide useful utilities for the 512 user. Included on the disc are:

File Viewer   A program to view text files on screen, allowing you to scroll up and down the file. Great for reading documentation and README files, and much more convenient than the standard TYPE.

Dump   A program to view any DOS file in hex and ASCII in a layout similar to *DUMP on the Master, but again with the ability to scroll up and down the file.

APrint   A print handler, originally designed for use with the Ability integrated software package, but which will work with any program, Aprint takes a spooled text file (ie, Print to Disc), and outputs to the printer, ensuring that formfeeds are sent at the end of each page. This is primarily for printers (including laser printers) with sheet feed mechanisms, which need an actual formfeed character at the end of each page.

Menu   A user-definable menu system, which allows you to create your own custom menus, to start software packages off with a single keypress. The names of the files to be run, and the menu descriptions, are saved in a text file on disc, and can easily be altered, using any text editor (including ED) to your own descriptions. DOS operations can also be performed from the menu.

and many other useful programs. A separate manual is provided.

The Master 512 Dabhand User Guide Programs Disc costs £7.95 inclusive of VAT, postage and packing, and is available from Dabs Press, at the address given on page 2. Credit card holders can order by telephone on 061-766 8423.

G: Dabhand Guides Guide

The following Dabhand Guides and software packs are published or planned for 1989. Publication dates and contents are subject to change. All quoted prices are inclusive of 15% VAT in the UK (on software, books are zero-rated), and postage and packing (abroad add £2 or £12 airmail). Foreign customers should multiply software prices by 0.87 to exclude VAT and add postage charges as appropriate. All are available from your local dealer or bookshop or in case of difficulty direct from Dabs Press.

Please note: All future publications are in an advanced state of preparation. Content lists serve as a guide, but we reserve the right to alter and adapt them without notification. If you would like more information about Dabs Press, books and software, then drop us a line at 5 Victoria Lane, Whitefield, Manchester, M25 6AL, or phone 061-766-8423) and we'll send our latest catalogue.

Master 512 Technical Guide

Robin Burton
ISBN:1-870336-80-1. Price: £14.95. Available: June 1989. 250 pages approx

For those who want to delve even further into the secrets of the Master 512 co-processor, the companion volume, to the *Master 512 User Guide* is essential reading.

Written by Robin Burton with the full co-operation of Acorn computers this tome not only details the Master 512 at software and hardware levels but also includes several hardware projects including memory expansion and the addition of a 12MHz processor.

The proposed contents of the Master 512 Technical Guide are outlined below.

- Introduction
- The Hardware
- The Host, Facilities
- The 80186 processor

- The RAM , The ROMs , The Tube
- DOS Disc Systems
- 6502 System Software
- Acorn MOS, Tube Protocols
- 80186 System Software
- DOS Plus 2.1, ROM BIOS Emulation, The XIOS
- 6502 OS Calls
- The 80186 Monitor
- Error Handling
- Applications Compatibility
- PIP – Advanced Use
- ED – Advanced Use
- MOVE File Transfer Utility
- Program Types
- EDBIN
- Hard Discs — Partitions, Building
- Z80 Emulator
- Advanced Command Use
- SKS, FIDDLOAD, CHKDSK, PATH, DEVICE
- Hardware Projects
- 512k Memory Expansion, 12Mhz Processor
- 512 Circuit Diagram

The Master 512 Technical Guide takes up where this User Guide ends, and expands on the information, examples and ideas contained in this volume to provide all the information needed by the Master 512 user who wants to get the very best from his or her system.

Note: This book is an advanced state of preparation and while Dabs Press will try to ensure that the above details are correct, the publishers and author reserve the right to change them without prior notification.

Master 512 Shareware Collections

Volume One, Available Now. Price £29.95
Volume Two, Available April 1989. Price £29.95
Volume Three Available May 1989. Price £29.95
Further volumes planned for later in 1989.

The subject of Shareware is discussed in Chapter 17 of this Dabhand Guide. Dabs Press are planning to release three volumes of Shareware

discs which will contain a wide and variety selection of Master 512 programs that been tested on the standard Master 512, ie, without the Solidisk expansion, and found to work correctly.

Any minor problems found are noted in the accompanying manual. This is not, however, a guarantee. Some of these programs could have little nooks and crannies which may lie undiscovered for years, that contain some obscure system call which DOS Plus doesn't support. Also, the software itself may have leaks in it at certain points. All we can say is that we've run everything on these discs through each major function, and everything seemed to work as expected. Programs which require a printer were tested with an Epson-compatible Star NL10 printer with IBM interface cartridge.

The discs in the Shareware Collections are not copy-protected. The software may be used on IBM PCs and compatibles once transferred to a compatible disc format. Each Shareware collection is accompanied by a manual which gives brief details of the software and explains how to print the documentation for each program which is presented in the form of a text file on disc.

Volume One

Volume One of the Master 512 Shareware Collection comprises five 800k Volume (non-bootable Acorn format) discs.

The software is grouped into categories for each disc, these are:

Disc 1	Wordprocessors
Disc 2	Business Software
Disc 3	Games
Disc 4	Printer Utilities
Disc 5	Miscellaneous

Disc 1. Wordprocessing

The major program on Disc 1 is a full-function word processor contains an amazing 'word anticipate' feature, which guesses the word you intend to use while you are typing. A box of suggested words appears, and you type a number or ';' corresponding to the word in the list. This is extremely useful if you have trouble finding keys on the keyboard. For touch typists the feature can be turned off. The program also has a spelling checker and many advanced word processing features.

SpellChecker is a stand-alone spelling checker, which reads ASCII files, and reports spelling mistakes. When an error is spotted, the whole line is displayed so that you can see the context.

Justify is, in fact, a print utility that could not be contained on Disc 4, which will fully justify an ASCII text file to the printer. The justification actually includes inter-letter spacing. Standard 80-column text mode should be used on the Master 512.

Style Checker is a stand-alone style checker, a program which reports how 'readable' your text is. The program works normally in 80-column mode.

Word Processing for Kids: A delightful program is a simple text editor for young children, with just six commands in a pictorial interface. On-line help is available at any time by pressing F1. The program works in 40-column colour and can edit with very large characters as well.

Disc 2. Business Programs

The major program on Disc 2 is a 'clone' of the world-famous spreadsheet Lotus 1-2-3. It has graphics, macros, the lot! Any book on learning 1-2-3 should suffice as a tutorial for this program. Even the graphics work well on a Master 512! There are lots of sample worksheets.

FloDraw is a program allows you to design flowcharts and other graphic layouts on a large 16x16 screen sheet, (previewed in miniature with f2), which can then be printed out graphically to the Epson printer. A demo file is included to show how easy the program is to use. This program works exceptionally smoothly on the Master 512, with no flickering at all.

Disc 3. Games

The games disc includes nine interesting games which are detailed briefly below.

Bridge	This is a full-function contract bridge playing game.
Burger	You have to catch the bits of the hamburger in order to win. It is almost impossible to beat the machine.
Checkers	This is a full-colour board game, not draughts, but something much more interesting.
Entrap	This is a text Othello (also called Reversi). The squares are entered by typing co-ordinates.

PC Chess | This is a nice colour chess game, with quite a few options, controlled from the function keys. Moves are entered in letter-number notation, and an autoplay mode is included.

Sopwith | Enjoy the thrills and spills of the old biplanes, as you loop the loop, dodge the mountains, and generally behave in a rather antisocial manner to the buildings below!

Wombat | This is a big, interesting text adventure game.

Mono Chess | This is a simpler chess game, although the graphics are nicer!

3-D OXO | This is a text-based version of the famous computer game 3D Noughts and Crosses, or as the Americans say, Tic-Tac-Toe.

Disc 4. Printer Programs

This disc contains a number of very useful programs that allow the printer to be expertly controlled from the DOS Plus prompt. Included is an editor which provides downloadable fonts for an Epson FX-80 printer or compatible. An LQ font is provided by a program that takes a text files and prints it out using a high quality font.

Other programs include a short utility which will send codes to the printer directly from DOS, ie, if you type FXPR4 EJECT RESET ELITE it will formfeed up to the next sheet, reset the printer, and put it in Elite mode. Sidewriter prints text files out sideways on an Epson-compatible printer.

Disc 5. Miscellaneous

This disc contains a number of useful programs which will appeal to a wide range of Master 512 users.

Casio | This is an on-screen digital watch.

Finger Paint | This is an excellent monochrome 640x200 CGA drawing program, with many features controlled by function keys and ALT-function keys.

NewSweep | This is a file handling utility, famous in its CP/M incarnation, and now implemented for DOS. Block renaming, deleting, moving, archiving and so on are all possible with the file tagging system.

M512—N

PC-Art	A nice four-colour CGA art program driven by function keys.
PC-Outline	PC-Outline is an 'outline processor', a word processor which allows you to group ideas into 'levels'.
World Map	This interesting program displays a map of the world in several orientations. Areas can be selected by latitude and longitude, or by city name, and there is a pointer system to move around the globe and to zoom in on a particular area.
VSI	The Visual System Information provides a visual indication of the system configuration.
What Am I?	A program to give system information.
PC-Golf	This is a golf game which uses text graphics, but is nevertheless quite realistic, offering a range of courses, and the usual choice of woods and irons.

Shareware: A Dabhand Guide by Wm. Gallagher

Available third quarter 1989. 250pp approx. Book : £14.95

This book investigates and explains the whole concept of PC shareware — where you can get it from, how much it costs, and reviews many popular packages. A must for anyone interested in shareware! The book is applicable to anyone using a IBM PC or compatible, including the Master 512 system.

Master 512 Products

Dabs Press can supply a wide range of Master 512-compatible PC software, and also are working on Master 512-specific products such as a mouse driver, Print Screen utility etc. Contact Dabs for further details.

Other Books for your Master

Master Operating System: A Dabhand Guide by David Atherton
ISBN 1-870336-01-1. Available now. 272 pages. Book : £12.95; 5.25in disc £7.95; 3.5in disc £9.95. Book and disc together, £17.95 (£19.95 with 3.5in)

The Master owners bible. Acclaimed reference guide for programmers and users of the BBC B+ and Master Series micros. Contains a wealth of information on the operating system, including all the * commands, OSBYTE and OSWORD calls, the Tube, filing systems and the differences between the various BBC micros. David Somers in A&B Computing (Nov 87) said it's *'invaluable'* – we agree!

C: A Dabhand Guide by Mark Burgess
ISBN: 1-870336-16-X. Available now. Book, £14.95. 512 pages
Book and disc £21.95 (Disc for BBC or PC – please state)

This massive 512 page book provides a comprehensive tutorial in C – fast becoming the *de facto* language for all micros. This book is ideal for the beginner and starts from first principles. It includes specific sections on the Master and PC. The draft ANSI standard (superset of K&R) is covered. So whether you are running C on the Master or on the 512 itself you have the perfect tutor. As the reviewer in PCW said: *"I only wish this book had been available when I was learning C."*

VIEW: A Dabhand Guide by Bruce Smith
ISBN 1-870336-00-3. Publication : Available now. 248 pages
Book: £12.95. Disc: DFS 5.25in, £7.95 ADFS 3.5in, £9.95
Book and disc together, £17.95 (ADFS £19.95)

This top selling guide to VIEW, now in its second edition, has received rave reviews and is an absolute must for all VIEW users. This is what they said:

John Allen speaking on Radio London: *'It's very good...'*

Mike Williams, Beebug magazine June 1987: *'...much more to offer the competent VIEW user...practical and down-to-earth...for those who want a complete, thorough and readable guide to VIEW then Bruce Smith is your man.'*

Bill Penfold, Acorn User September 1987: *'This is the first computer book I've read in bed for pleasure rather than to cure insomnia.'*

ViewSheet and Viewstore: A Dabhand Guide by Graham Bell
ISBN 1-870336-04-6. Available now. 352 pages
Book: £12.95. Disc: DFS 5.25in, £7.95; ADFS 3.5in, £9.95
Book and disc together, £17.95 (ADFS £19.95)

A complete tutorial and reference guide for the Acornsoft ViewSheet spreadsheet and the ViewStore database manager, specifically written to

appeal both to the beginner and to the more knowledgeable user. Also covers ViewPlot and OverView. The accompanying disc contains many example templates and utility programs.

"This guide is the sort of invaluable reference tool that all serious users of the View business suite need" Electron User June '88. *"The practical examples are far better than those in the official Acorn manual"* IT Education/Network User Sep. 1988 . *"You certainly feel that the manual has been put together by someone who has explored the facility thoroughly."* Oldham Evening Chronicle.

Bumper Assembler Bundle by Bruce Smith
Publication : Available Now. Two books, two discs and booklet, just £9.95

Five part package providing a complete tutorial in 6502 and 65C02 machine code at a third of their normal price. Two books, two discs, and booklet for Master series. Full details on request. Available only while stocks last!

Mini Office II: A Dabhand Guide by Bruce Smith and Robin Burton
ISBN: 1 870336-55-0. Available now. 256 pages. Price £9.95. Programs Disc £7.95 (£9.95 3.5"). Disc and book £14.95 (£16.95 3.5")

A complete guide to this award winning software covering every aspect of using this powerful software package . All modules covered including Wordprocessor, Spreadsheet, Database, Label Printer, Graphics and Comms. Full of practical advice and packed with examples. Programs disc contains a text spooler, sideways spreadsheet printer, and much more.

BBC and Master Software Packs

MOS Plus by David Spencer
Available Now! ROM, £12.95; disc for Sideways RAM, £7.95 (3.5in, £9.95)

For the Master 128. Provides ADFS *FORMAT, *VERIFY , *BACKUP, *CATALL and *EXALL in ROM and new * commands such as *FIND – which finds a file anywhere on an ADFS disc. A complete alarm system is present using the Master 128 alarm facility, as is an AMX Mouse driver.

'MOS Plus is an excellent product', Dave Somers, March 1988, Beebug.

HyperDriver by Robin Burton

Software pack disc and ROM, £29.95. (£31.95 3.5"). Sideways RAM version, only £24.95 (3.5" £26.95).

HyperDriver is the ultimate printer ROM. And if you have a printer, then this will be the most significant purchase you can make. It's absurdly easy to use and provides you with many of the facilities missing from your current software including: on-screen preview, CRT graphics, NLQ font and user-definable macros to name but a few. No matter what you use your printer for, wordprocessing, spreadsheets, databases, programming you will have in excess of 80 * commands available for instant use from within applications such as VIEW, InterWord and so on.

The HyperDriver pack contains a 16k EPROM, and a Sideways RAM image on disc.A full and comprehensive 100-page manual and reference card complete this value for money package.

'The thought that's gone into the way HyperDriver is used with wordprocessors and a million over good design features make the value of this ROM stand out...an ingenious blessing.' Geoff Bains, March 1988, Beebug.

FingerPrint by David Spencer
Available Now! Disc & manual, DFS version, £9.95; ADFS version, £11.95

A unique single-step machine code tracing program allowing you to step through any machine code program. FingerPrint will even trace code situated in Sideways RAM/ROM – learn how BASIC works! *"It is simple to use and there is little it doesn't provide for the machine code programmer"*. Tubelink.

SideWriter by Mike Ginns
Available Now. 5.25in DFS disc, £7.95; 3.5in ADFS disc, £9.95;

For Sideways RAM owners this is a pop-up notepad which can be used from within any application. Notes taken in SideWriter can be saved to disc, transferred to a wordprocessor, or printed out.

Other Books from Dabs Press

Archimedes Assembly Language: A Dabhand Guide By Mike Ginns
ISBN: 1-870336-48-8. Available now 1988. 368 pages
Price: £14.95. 3.5in disc, £9.95. Book and disc together, £21.95

Archimedes Operating System: A Dabhand Guide
By Alex and Nick van Someren
ISBN: 1-870336-48-8. Available now. 320 pages.
Price: £14.95. 3.5in disc, £9.95. Book and disc together, £21.95

BASIC V: A MiniGuide By Mike Williams
Available Second quarter 1989. 120 pages approx. Price: £9.95.

AmigaDOS: A Dabhand Guide by Mark Burgess
ISBN 1-870336-47-X. Publication : July 1989. 300 pp approx. Price: £14.95
Covers Workbench 1.2 and the new 1.3.

**WordStar 1512: A Dabhand Guide – Including WordStar Express
by Bruce Smith**
ISBN 1-870336-17-8. Suitable for the Master 512. Available now. 240 pages.
Price £14.95.

SuperCalc 3.1/3.2: A Dabhand Guide by A A Berk
ISBN 1-870336-65-8. Suitable for the Master 512. Available now. 240 pages.
Price £14.95.

PCW 9512: A Dabhand Guide by John Atherton
ISBN 1-870336-50-X. Publication: Second quarter 1989. 300 pages approx

Z88: A Dabhand Guide
Publication: Second quarter. 300 pages approx.

Z88 PipeDream: A Dabhand Guide
ISBN 1-870336-61-5. Publication: Second quarter. 300 pages approx.

PostScript: A Dabhand Guide by Paul Martin
ISBN 1-870336-54-2. Publication: Third quarter. 300 pages approx.

Ability Plus: A Dabhand Guide by Geoff Cox
ISBN 1-870336-51-8 . Publication: Second quarter. 300 pages approx.

If you have an idea for a computer book, or if you are an established technical author, and you would like to write for us, we would like to hear from you. An initial submission should ideally include a one page synopsis of the proposed book. We publish books for any microcomputer system with a large user base in the UK and Europe.

We also publish computer software. Submissions are welcome for the Commodore Amiga, IBM PC, BBC Micro, and Acorn Archimedes.

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Notes

A Dabhand Guide

At last, a comprehensive reference guide for all users of the Master 512, Acorn's PC-compatible add-on for the Master 128 and BBC Micros.

Highly practical in approach, the book provides detailed information on all DOS Plus commands, and explains how they differ from MS-DOS. It shows 'step-by-step' how to install and run PC applications on the Master 512, including useful techniques such as the creation of batch files.

In addition, the use and operation of the utilities provided with the machine are explained, many of which are previously undocumented.

Features of the book include:

- Summary of DOS Plus commands and reserved words
- Transient utility programs
- Differences between DOS Plus and MS-DOS
- How to check if PC software will run
- The Master 512 disc set
- Use of hard discs

Chris Snee is a consultant in the field of computers and mechanical engineering. His considerable expertise with the BBC Micro and PCs has been derived from writing practical applications and troubleshooting. His previous book, *Mastering the Disc Drive* received much acclaim.

£9.95