TORCH
COMPUTERS

User Guide

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The aims of this guide

This User Guide has been written to provide all the information necessary to operate any of the range of TORCH professional microcomputers or UNICORN upgrade packs.

It provides a complete description of the standard TORCH operating system and its interaction with the computer's keyboard, screen and discs, etc.

It assumes that you have a working TORCH system, set up by using the Installation Guide supplied.

Firmware versions

This User Guide describes the operation of a TORCH system fitted with versions of the firmware as listed below (or "greater").

You can check the version numbers of your firmware by typing, at the command line, **HELP** (for CCCP details) and ***HELP** (for MCP, NFS and OS details).

CCCP	v1.00
MCP	v1.00
NFS	v3.35K or v3.6
OS	v1.20

How to use this guide - the reading sequence

Whether or not you are an experienced microcomputer user, the reading sequence set out below will help you to start getting "hands-on" experience in the shortest possible time.

How to start-up your TORCH is the first section to read, followed by **Getting the feel of the keyboard** - although anyone familiar with a typewriter will be able to skip some of these keyboard details.

What the screen tells you is a basic introduction to the way the system operates through the keyboard and the screen.

Discs are used to organise, store and retrieve all data and - if you are not already experienced in such techniques - you should read the section on the **The Disc System** before starting to handle any of your discs.

Each disc stores data in files which must have unique filenames and the section **Files and Filenames** explains how these are made up and how they work.

To start using your TORCH productively, you need to know what commands are immediately available (type HELP or H to display a full list) - the **Commands** section helps explain what each one will do.

Other sections - which can be read as and when required - describe the complete TORCH range, the use of **Utility programs** and the **TORCHNET** local area network.

Further details of the **CPN disc structure** and how **printers** can be used with your TORCH are contained in the **Appendices** together with the **TORCHLIGHT** glossary which explains many of the terms used in this Guide.

More detailed information on the operation and programming of TORCH systems is contained in the **Programmers' Guide.**

SECTION GUIDE

SECTION 1

Getting to know your TORCH computer

How to start-up your TORCH

Once all the installation instructions have been carried out you may choose between two methods of starting up your TORCH system.

Using the first method - **Manual start-up** - your TORCH will immediately be at the "command line prompt", ready to accept commands from the keyboard.

Using the second method - **Automatic start-up** - your TORCH will first search for a special file, read it and then carry out the instructions that it contains.

Please Note

If you are using your TORCH system for the first time you should only use the **Manual start-up** method when you first switch on.

You should then skip straight to **Getting the feel of the keyboard** for more information on operating the computer.

Manual start-up

To carry out a **Manual** start-up you will need to press **[CAPS LOCK]** (on the BBC keyboard) or **[ALT]** or **[CAPITALS]** (on TORCH keyboards) and - at the same time - switch on the power to your machine.

THIS KEY MUST BE HELD DOWN

- until you see the "command line prompt" appear on the screen.

It looks like this:

99:0A>

- with your own station number in place of the 99.

Or - if your TORCH is not fitted with Econet - like this:

NoNet:0A>

Note: After a manual start-up some of the function keys on your keyboard will be automatically assigned values. These are:

```
KEY 0  "QUIT"
KEY 1  "HELP"
KEY 2  "NO"
KEY 3  "YES"
KEY 9  "BEGIN"
```

Automatic start-up

You should only use this method once you have read the rest of the Guide and are familiar with your TORCH and its commands.

For this method of starting up you need to have ready the **Standard Utilities** disc, supplied with your TORCH system. This disc contains an example of the special file AUTOBOOT.SUB which is used as a source of commands during the Automatic start-up procedure.

Please Note

If you have a hard disc machine and you are switching it on for the first time you MUST use the manual method previously described.

You must then copy all files from both your **Standard Utilities** and **Hard Disc Utilities** discs on to the first hard disc surface (see the COPY command).

The drive letter of the first hard disc surface is given in the command line prompt immediately after a manual start-up.

Now switch on the main power to your TORCH system - **AND THEN** - if not a hard disc machine - load the **Standard Utilities** disc into floppy disc drive A.

Your TORCH will then automatically "enter" function key 9 which is set on power-up to run the special BEGIN command. This command picks up the AUTOBOOT.SUB file and act on the commands it contains. A description of the commands within the example file on your **Standard Utilities** disc is given overleaf.

If you wish to change the commands run on power up you may edit this file or create a new one with the same name. See **Appendix A - How to create a Submit file** for details.

If your TORCH cannot find the special file where it expects, it will give you a disc error message and try again after a suitable period (see also **Restarting on disc errors** overleaf).

Automatic start-up on TORCHNET stations

If your TORCH system does not have a hard disc but is attached to TORCHNET it will look for the special start-up file on another (hard disc) station. This allows you to automatically start-up on a workstation that has no disc drives. See the **TORCHNET Manager's Guide** for further details.

Re-starting on disc errors

If your TORCH detects a disc error it will output an error message (see **The Disc System** for a list of the common ones) and then repeat the start-up sequence used when you first switched on.

For example if you use the manual start-up method it will give the command line prompt even without the [CAPS] key held down.

If you initially used the **automatic start-up** method then it will normally repeat the sequence described under that heading. However if you change the contents of function key 9 before the disc error occurs (see the **KEY** command) it will run the new command or submit file instead.

A description of the different **Restart Levels** is given in **Appendix E.**

Description of the example AUTOBOOT.SUB file

The AUTOBOOT.SUB file on your **Standard Utilities** disc contains a number of different examples of the use of **Commands** and **Utilities** - see appropriate sections for full details.

It first sets up the values of the function keys (using the KEY command) and then displays the TORCH logo and sets the screen colours. The SOFTKEYS utility is then run to confirm the contents of the function keys. These are:

```
KEY 0  "Q"
KEY 1  "H|M"
KEY 2  "COPY"
KEY 3  "TYPE"
KEY 4  "DIR"
KEY 5  "A:"
KEY 6  "B:"
KEY 7  "{LPS}|M"
KEY 8  ";This key is used by EXEC"
KEY 9  "XA|M"
```

Finally it uses the EXEC utility to call the DATETIME utility - both of which are full described in the **Commands** section. EXEC must be used to call DATETIME as the latter requires keyboard input.

Note that a call to XA (Executives' Aid) has been set in function key 9. This means you can run this program just by pressing [F9]. In addition it will automatically be re-run after any form of reset except power-on or [CTRL] reset (e.g. after a disc error).

If you wish to go straight into Executive's Aid on power up you can change the final EXEC call to run XA instead of DATETIME.

Getting the feel of the keyboard

Keyboard equivalents

The TORCH system will operate with three different types of keyboards: the "white" TORCH keyboard, the "black" TORCH keyboard, and the BBC Micro. The illustrations overleaf identify each type and help to explain the basic differences in key layout.

This section is aimed at first-time users of the "white" TORCH keyboard. The most important differences between all three keyboards are set out in the **Keyboard Summary** at the end. BBC Micro users may also like to refer to their own USER GUIDE.

Using a keyboard to operate a computer is no more difficult than using a push-button telephone. You don't have to be a "touch" typist - or even to have ever used a typewriter seriously before.

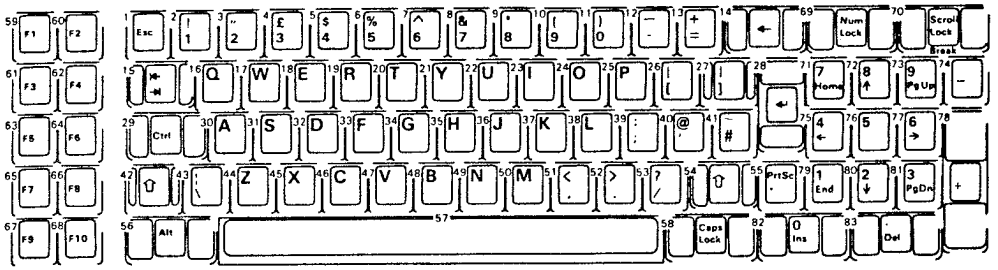
The next section, **What the screen tells you**, explains more about the meaning of what actually appears on the screen when you press the keys. The purpose of this section is to "introduce" the keyboard itself and help you gain confidence by getting the "feel" of using it.

Don't be afraid to experiment as you read through these explanations. The screen will "print" or "reflect" whatever you do and - once you've got to know the keyboard better - you can easily change what is displayed at any time.

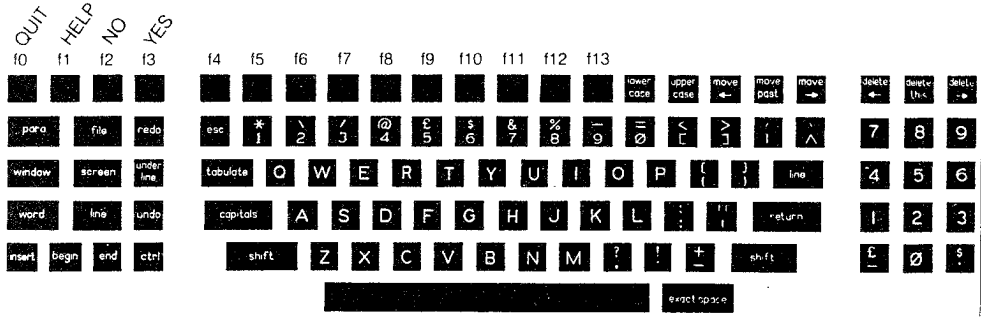
All computer keyboards are based on a conventional typewriter layout with a number of extra keys to provide the special functions not available on a typewriter.

Some of these extra keys carry out different functions at different times and - although this may sound confusing at first - you can be sure that "which does what and when" will either be obvious or carefully explained to you at the time.

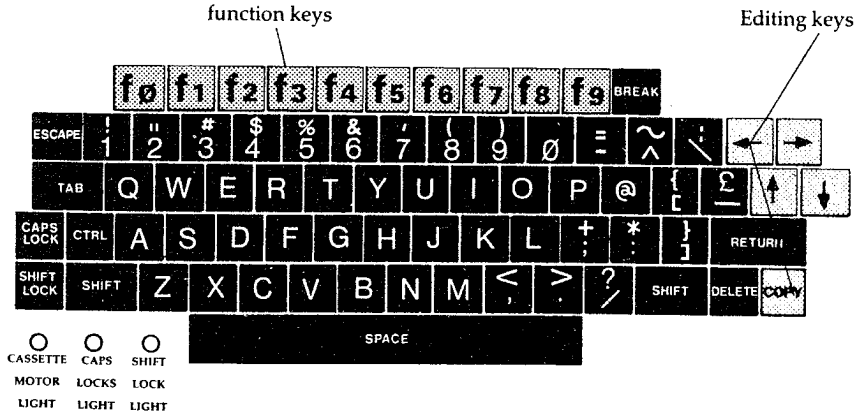
"White" TORCH keyboard illustration.



"Black" TORCH keyboard illustration.



BBC Micro keyboard illustration.



Differences between TORCH and typewriter keyboards

Newcomers to microcomputers may like to note a few of the more basic differences between a conventional typewriter keyboard and a microcomputer's (apart from the fact that whatever you type appears on the computer's screen):

"Auto-repeat"

After a momentary delay, TORCH keys will "auto-repeat" - that is, the character produced by the key will go on reproducing itself automatically on the screen for as long as the key is held down.

"Type-ahead" memory

The TORCH keyboard is capable of "remembering" what has been typed into it if the computer happens to be very busy doing something else at the time. This means that you may sometimes notice a slight delay before whatever you have typed appears on the screen - but it will not be "lost".

Additional keys

The other noticeable differences between the standard "QWERTY" layout of the letters on the TORCH keyboard and a conventional typewriter are the special keys described below.

[Caps lock]

This key switches the keyboard from typing all upper-case letters to all lower-case and vice versa (in computer jargon this is known as a "toggle" - see the **glossary** if you need a further explanation of this or any other puzzling term). It does not affect other keys such as the "number" keys. You will notice that this key always "lights up" when it is locked on.

(Broad UP arrow)

This **[Shift]** key behaves just like a typewriter's **shift** key - when used in conjunction with other keys it produces individual capital letters (in the usual typewriter style) and the symbols such as "@", "&", or "+" which are engraved on the top half of the keys. (Try to type all the symbols on your keyboard to familiarise yourself with this function).

"Upper and lower case" typing

You will find that your TORCH is very tolerant and accepts any mixture of upper or lower case characters as legitimate commands, programs or filenames (see later sections for details)

e.g. CoMmAnDS = cOmMaNds.

torch.DOC = TORCH.doc

(DOWN and LEFT arrow)

This key (referred to as the **[return]** key) replaces the mechanical typewriter's "carriage return" function and is one of the most important keys on the TORCH keyboard.

Using [return] to "enter" instructions

The **[return]** key is used to "enter" instructions - such as **Commands** - into the computer. It is a "signal" that you have completed a particular entry and that the computer should "action" it.

Please note that throughout the rest of this Guide, the use of the **[return]** key will be assumed after each complete instruction.

[.]
[Del]

or

[<--]

(LEFT arrow)

Either of the two keys shown above will delete the previous character on the screen before the point marked by the cursor.

The operation of both these **[Del]** keys will become clearer once you have tried them out.

```
[-->]
[<--]
```

(two opposing arrows)

This **[Tab]** key acts in a similar way to the "Tabulate" key on a coventional typewriter. It will move the cursor (the flashing indicator) to pre-set points across the screen, depending on which program is running. For some programs it will "tab" the cursor backwards when used in conjunction with the **[shift]** key.

[Num]
[Lock]

This key (with an indicator light to show when it is locked on) affects the set of special number keys set out beneath it:

```
[7    ] [8  ^] [9    ]
[Home ] [   |] [Pg Up]

[4    ] [5   ] [6    ]
[   <-] [    ] [   ->]

[1    ] [2  |] [3    ]
[End  ] [   v] [Pg Dn]

[0   ]       [.   ]
[Ins ]       [Del ]
```

When locked on, **[Num Lock]** turns the keys illustrated above into a "number entry pad". This duplicates the number and decimal point keys on the main keyboard but may be found easier to use during prolonged sessions of financial or statistical work.

When not locked on, these keys are used for "editing" and other special functions as indicated by the engravings on the lower part of the keys. Exactly how they works depends on whether you are at the command line or running an application package (see overleaf).

[CTRL]

One of the most important keys on the keyboard is the **[CTRL]** (CONTROL) key which can operate like the **[shift]** key to change the meaning of other keys on the keyboard. Its effect may also vary according to the program being run at the time. Application program documentation will explain its specialised uses. When used to modify a character it is often written as the symbol ^ placed immediately before the character:

e.g. **^A** means hold down the **[CTRL]** and then press **A**.

[Esc]

This **[escape]** key is normally used to stop or "abort" a program but it may have other effects which will be explained when appropriate.

[Scroll]
[Lock]

This key (known as the **[ACTION]** key) has special effects in certain TORCH programs. It is usually used as a special "enter" key to complete a page of information in places where **[return]** is used to "enter" a single line. See **Executive's Aid** for a description of how it is used.

The "editing" keys

The four special keys marked with directional arrows on the numeric key pad are the cursor control keys. Together with the **[COPY]** key (the "blank" key in the centre of the cursor keys) they form a set of keys often referred to as the "editing" keys.

They are normally used within programs to move a cursor or some form of marker to any position on the screen.

They can also be used to move the cursor away from the command line prompt. The new character marked by the cursor can then be copied to the command line with the **[COPY]** key. The **[COPY]** key can be pressed once to copy a single character, or held down to copy the whole - or part of - a line.

The use of the editing keys at the "command line" is further explained in the section on **What the screen tells you.**

Function keys

The "block" of 10 keys on the left-hand side of the keyboard - engraved **[F1]** to **[F10]** - are the function or "soft" keys.

They can be set (by the KEY command) and each can be used to "enter" a pre-defined string with a single key-stroke. They can also be set by individual application programs

As explained in the section **How to "start-up" your TORCH** the operating system will pre-program many of the function keys when your TORCH is switched on.

For example, pressing **[F1]** will produce **HELP** which in turn displays a list of built-in commands if you happen to be "stuck".

Note that the **[F10]** function key is set by the command **KEY 0.**

Summary table of equivalent keys

"White" TORCH keyboard	"Black" TORCH keyboard	BBC Micro
Re-set button	Re-set button	[BREAK]
[Esc]	[esc]	[ESCAPE]
[CTRL]	[CTRL]	[CTRL]
[Caps lock]	[capitals]	[CAPS LOCK]
broad "up" arrow	[shift]	[SHIFT]
"down & left" arrow	[return]	[RETURN]
two opposing arrows	[tabulate]	[TAB]
arrow pointing left	[delete] [<--]	[CTRL]+[H]
[.] [del]	[delete] [this]	[DELETE]
"up" arrow	[upper case]	"up" arrow
"down" arrow	[lower case]	"down" arrow
[<--]	[move] [<--]	[<--]
[-->]	[move] [-->]	[-->]
"blank" key	[move past]	[COPY]
[SCROLL LOCK]	[exact space]	[CTRL]-[X](^X)

What the screen tells you

Once properly set up, your TORCH system will produce what is known as a "command line prompt" on the screen, which looks something like this:

99:0A>

- with your own station number in the place of the 99.

If your station is not fitted with an Econet interface the prompt will look like this:

NoNet:0A>

A short flashing line - known as the cursor - will appear directly beneath the point of the >. Anything typed in at the keyboard will appear on the screen at the point marked by the cursor.

As its name implies, the most important role of the command line is its ability to accept and act immediately upon commands - each of which is fully described in the **Commands** section.

The command line prompt only appears when TORCH is under the control of the CPN operating system (see the next section) and a different sort of prompt will appear whenever an application program - or a different operating system - is being run.

What the PROMPT tells you

Apart from indicating that you are at the command line (see above) and that CPN is in control, the prompt reflects the "current" state of two other important "settings": **The current disc drive** and **The current user number**. What each of these means is explained on the following pages.

The current disc drive

The current disc drive (also referred to as the "default" or "logged" drive) is always indicated on the screen by the character which appears **IMMEDIATELY BEFORE** the "prompt arrow" -

e.g. the A in **99:0A>**

The current disc drive is the one which will be read from - or written to - by the system if no drive is specified.

When first switched on (or re-set) the system will automatically set-up the current disc drive.

For all floppy disc systems, this will be drive A. In the case of hard disc systems, the current drive on power up will be the first surface of the hard disc - either drive B or drive C.

How to change the current disc drive

An alternative disc drive can be specified at any time by typing:

<d>: [return]

- where <d> is the letter of the drive which you need.

It may be any letter between A and P (but see ATTACH command).

The prompt will then change to indicate the specified drive -

e.g. With a prompt of

99:0A>

- typing **B: [return]** results in the prompt becoming

99:0B>

The current drive may also be changed from within an application program.

The current user number

The other important "setting" which appears in the command line prompt is the user number. It will always be found **IMMEDIATELY BEFORE** the disc drive designation -

e.g.**0** in **99:0A>**

- and can be any number between 0 and 31.

It indicates which one of the 32 possible "user areas" the system will look in, or write to, when a filename is given without a user number.

User numbers permit up to 31 different users to share the same disc to store or retrieve files - without any user being "aware" of another users' files. User area 0 is used as a common area and is shared by all other users (see note below).

Alternatively, a single user could allocate a different user number to each group or type of files and be sure that they would always be separate.

How to change the current user number

When first switched on (the default state) the user number will be set to 0. It can be changed at any time with the USER command.

To change the user number, type -

USER <number> [return]

- where <number> is between 0 and 31.

e.g. With a prompt of

99:0A>

- typing **USER 21 [return]** would produce the prompt

99:21A>

You could now gain access to all files which have been stored on this "user area" of a disc.

Note

If the system cannot find a specified file on the current user number (as indicated in the prompt), it will "look" for it on user number 0. This is a useful feature and frequently-used programs should be stored in User Area 0 so that they are always available for use no matter what your current user number may be.

Editing facilities at the command line

To make it easier to make corrections when typing in a command, as soon as one of the cursor keys is pressed (see **Getting the feel of the keyboard**), the computer enters a special "editing mode" which produces two cursors.

The small flashing cursor can be moved around with the cursor control keys to 'mark' any character already displayed on the screen.

This and any following characters can then be copied with the **[COPY]** key to the position on the prompt indicated by the larger - or "write" - cursor.

Thus any command line entry may be corrected by a combination of re-typing and copying, using the cursor keys, **[Del]** or **[COPY]** keys as required.

Once correct, the **[return]** key can be pressed to "enter" the new line, whereupon the "write" cursor will disappear from the screen.

Extra command line editing

TORCH also provides a number of extra editing functions which may be helpful to more experienced users. They are listed and explained in **Appendix D.**

What to read next

Now that you know what facilities are available from the keyboard and what the initial screen display means, please read the sections on **Files and Filenames** and **Commands** for further details of the way your TORCH operates. You should also make sure that you know how to handle discs by reading the **The Disc System** section.

SECTION 2

The TORCH Operating System

Introduction to CPN - the TORCH operating system

The TORCH firmware installed in both UNICORN and TORCH systems results in a powerful and very flexible data processing system.

At its heart is a sophisticated operating system - based on CPN (Control Program Nucleus) - which enables you to run a wide range of CP/M-compatible applications programs and languages. It also handles all your data storage requirements - using the BBC Microprocessor to control your peripherals.

Because the operating system is provided in ROM (Read Only Memory) - instead of on disc - it is always ready for use as soon as you switch on and retains more disc storage space for other purposes.

UNICORN and TORCH professional computers are fully compatible - opening the door to further developments, such as building up a fully-communicating Local Area Network under TORCHNET and multi-user UNIX systems.

More details of CPN

The operating system consists of three separate firmware modules. When you first switch on, CPN (Control Program Nucleus), together with CCCP (Cambridge Console Command Program), are loaded into RAM (Random Access Memory) on the Z80/68000 board - while MCP (Master Control Program) is activated on the BBC board.

CCCP checks the instructions entered on the keyboard (or from SUBMIT files) and - as appropriate - carries them out or passes them on to CPN. If you have requested a program, this will be loaded into memory and run, overwriting CCCP in the process. When the program finishes, CCCP will be re-loaded ready for your next command.

All input/output requests, whether from CCCP or your program (e.g. a disc read instruction), are passed to CPN which, in turn, sends them to MCP via the communications port between the two processors (the Tube).

MCP runs on the BBC Micro's 6502 processor (at the same time as the program in the Z80) and continues to control all the peripheral devices including the disc drives, keyboard, and screen, under CPN instructions. It also handles all TORCHNET communications.

One of the biggest advantages of this technique is that only a comparatively small proportion of the available RAM is taken up by CPN - leaving the remainder available for use in running your own programs.

The Disc System

Data and programs used in TORCH systems are stored on either floppy discs or a combination of floppy and hard discs.

These first sections contain basic information on the care and handling of FLOPPY DISCS while the later sections describe HARD DISCS.

A more detailed explanation of how data is stored on both floppy and hard discs is contained in **Appendix B - CPN Disc Structure.**

Handling floppy discs

Floppy discs are constructed from thin plastic treated with a magnetic compound. Great care should be taken when handling floppy discs because they can easily be damaged.

The following points are important:

1. Check that you are using the floppy disc media recommended for TORCH disc drives. If in doubt, consult your TORCH supplier.

2. Always store floppy discs in their protective envelopes when not in use.

3. Avoid bending the discs.

4. Don't touch exposed areas of discs.

5. Don't expose discs to extreme temperatures or magnetic fields.

6. Avoid getting smoke or other contaminants on the surfaces of discs.

7. Don't switch the mains power to disc drives on or off without first removing the discs.

How to load a floppy disc

Insert a disc into a floppy disc drive as follows:

First carefully grip the protruding edge of the disc and remove it from its protective sleeve.

Make sure that you are holding the disc on the edge nearest the label and with the label facing upwards and the "notch" on the left.

Now push the disc gently but firmly into the drive until it "clicks" home.

Secure the disc in the drive by pushing the front button until it "latches". The disc is now properly centred and clamped by the drive.

How to unload a floppy disc

After use, unload the disc by pushing the front button once more to release the latch and the drive clamp.

Grip the disc's label edge again between finger and thumb and pull it out of the drive. Replace the disc in its cardboard envelope and dustproof file box.

Curing "mechanical" disc reading errors

Although comparatively robust and reliable, disc drives can occasionally give rise to a screen message indicating a "reading" error caused by a temporary mis-alignment of the disc in the drive. When this happens it is often worthwhile repeating the unloading and loading stages (described above) carefully - especially if the disc is new and/or of different manufacture to those normally supplied.

Formatting floppy discs

Before data can be stored on a disc by the operating system, the disc has to be "formatted". This process prepares the disc to receive data and, in doing so, DESTROYS any existing stored information.

This means that the disc to be formatted should be either brand new or carefully checked to ensure that the information it already contains is not needed again.

WARNING

Make sure that you check the "layout" and designations of your floppy disc drives BEFORE attempting to format a disc - especially if you have used the ATTACH and DETACH commands to reassign the logical assignments. Failure to do this could result in the wrong disc being formatted. It is suggested that you format discs in the same drive each time - to reduce the chance of making a mistake (e.g. Drive A:, normally the left or top floppy disc drive on twin disc machines).

Having confirmed your drive designations, type:

FORMAT <drive>

- where **<drive>** is the chosen drive letter.

The screen will then display this message:

Are you sure you want to format this drive?

Only after you have entered Y(es) will the operating system start the formatting process - during which it checks continuously for errors and displays error messages where necessary (see **Floppy disc errors**).

Entering N(o) or Q(uit) will abort the command.

When successfully completed, the formatting process will have prepared your disc for use by the CPN operating system.

Duplicating floppy discs

The DUPLICATE command may be used to copy the entire contents of one disc to another (see description in **Commands** section).

It may also be used to format the destination disc before the duplication process takes place. For this reason, the screen displays precise instructions once you have typed:

DUP

The screen will then look like this:

Place source disc in drive B
and destination disc in drive A

Are you sure you want to duplicate this disc?

When you press Y(es) the program will go on to present another screen choice. If you press N(o) or Q(uit) the command will abort.

The screen will then display this message:

Are you sure you want to format this drive?

As with the FORMAT command you must check that the right disc is in the destination drive before answering this question.

Entering Y(es) means that the command will first format the destination drive and then duplicate the contents of the source drive on to the destintion drive.

Entering N(o) means that the command will only duplicate the contents of the source disc drive on to the destination disc drive - without first formatting the destination disc. Entering Q(uit) aborts the command.

While this process is being carried out, the system checks continuously for errors and may display an error message (see **floppy disc errors**). If such a message is displayed, first try taking the destination disc out of the drive and putting it back in again - it may just have been badly aligned (see **Handling floppy discs**). Then try repeating the DUP procedure.

Note
DUP cannot be used to copy information to or from a hard disc.

Making backup copies of floppy discs

It is important to get into the habit of making "security" or "back-up" copies of all working discs and, where necessary, to take the additional precaution of **Write Protecting** them (see below).

These precautions are necessary because it is always possible to accidentally overwrite a disc containing important data, or to lose or damage a disc - in which case the data cannot be recovered.

There is also the possibility of losing valuable information as the result of a power failure or other interruption in a working session.

In addition for security reasons valuable "source" discs - such as the ones containing your **Utility Programs** should never be used. They should be copied as soon as you receive them, and then "write-protected". Use the copies for normal work.

Write protecting a floppy disc

To prevent the possibility of a floppy disc having the wrong data written over it, or all its data being accidentally wiped off, a square of special foil-backed adhesive paper should be placed over the small "cut-out" in the protective cover of each disc - known as the **Write protect notch**. The adhesive patches are normally supplied with boxes of blank discs.

To ensure that you never completely "lose" any of your files always have THREE copies of each working disc:

The current working copy - disc No.1
The latest backup copy - disc No.2
The previous backup copy - disc No.3

At the end of each working session, copy the contents of the **current working copy** to the **previous backup copy**. In this instance disc 3 then becomes the **current working copy**, disc 1 becomes the **latest backup copy** and disc 2 becomes the **previous backup copy**. Use the same procedure to backup at the end of each working session. If this is carried out correctly each disc will "rotate" through the sequence, i.e. **current - latest backup - previous backup**.

In this way the backups are "checked" by being used the next day and the third disc acts as a reserve should anything have happened to the other 2 discs during the backup.

Floppy disc errors

When reading or writing to or from a floppy disc your TORCH system continuously checks the data for errors. When an error is found it will retry the operation up to five times.

All these re-reading and re-writing operations are invisible to the user until after the fifth attempt has failed. The number of retries before an error message is given may be changed by using the MCPVARS utility.

If the error still occurs, a message such as the one below will be printed on the screen:

Logical Disc A sector 02F7 error 0E

This tells the user which disc has failed, the sector address, and the error code. Sector addresses are described in **Appendix B** while the more common floppy disc error codes are described below together with the best action to take when they occur.

Error Code	Description and Action to be taken
02	**Disc access timeout** - the disc could not be accessed by the disc drive within the 18 second timeout period - either because the disc is not "clamped" in the drive or there is no disc in it! ACTION - check that there is a disc in the drive and that the disc drive is closed.
0C or 0E	**Checksum error when reading the disc** - either of these error codes will be given if the information on the disc has become corrupt. ACTION - COPY any readable files you need on to another disc and then either reformat the disc or discard it (but see below).
18	**Incorrectly formatted (or non formatted) disc.** - besides meaning a bad or non-formatted disc this error also occurs if the disc is not centred in the drive. ACTION - first try removing and re-inserting the disc. If the error persists (re)format the disc.

If the error code is replaced by **Disc is read only** then the disc has its write protect notch covered. If you really want to write to the disc remove the write protect sticker.

Note

Disc errors will cause the TORCH operating system to "reboot" which in turn causes the character string held in function key 9 to be automatically entered (as used for the Autostart facility on power on/reset). So normally the AUTOBOOT.SUB file will be rerun after any disc error. However if you use the KEY commmand to change the contents of function key 9 you can run a different command (or submit file) or just stop any special action by "clearing" the function key.

Data Corruption

Data corruption may occur on discs if a program is terminated in abnormal circumstances. For example due to an error occurring in a program while it is running, or a power cut, or if you switch off the machine or reset it in any way other than when the command line prompt is displayed.

If data corruption has occurred it may be possible to recover the data with the aid of the utilities MAPDISC & POKEDISC.

Hard Discs

Current TORCH hard disc systems have a storage capacity of up to 20 Mbyte, initially split into a number of 4 Mbyte surfaces. However the VARDISC utility program may be used to create surfaces of many different sizes.

On power up the first floppy disc drive is drive A and the second floppy disc drive (if fitted) is drive B. The surfaces on the hard disc are then assigned sequentially after the last floppy disc drive.

For example a TORCH system with a single floppy disc drive and 20 Mbyte hard disc would initially be set up with 5 hard disc surfaces B, C, D, E & F.

In most cases the surface of the hard disc behaves as a large floppy disc. All commands (except DUPLICATE and FORMAT), file structures, and directory structures are identical in operation to those on floppy disc - with the added advantage of access speeds which can be up to six times faster.

(Differences in the structure of hard discs are explained in **Appendix B - CPN Disc Structure.**)

Formatting hard discs

Your hard disc is formatted during production testing at the TORCH factory and **DOES NOT** need formatting in the same way as floppy discs.

However a special maintenance program called FROMAT is provided to re-format and verify surfaces on a hard disc. However GREAT CARE should be taken when using it.

Making backup copies of a hard disc

Backups should be made at regular intervals or whenever you feel it is necessary.

The best method of backing up a hard disc is to COPY all files to another hard disc of the same capacity via TORCHNET.

If this is not possible the utilities BACKUP and RESTORE are provided for backing up a hard disc surface on to floppy discs. Alternatively you can use the archive option of the COPY command to copy groups of files on separate user areas to individual floppy discs (but see following note).

Using a hard disc to backup floppy discs

For systems with a single floppy disc drive and a hard disc, backing up a floppy disc can be carried out quickly as follows:

a) First copy the contents of the floppy disc on to an empty user area on the hard disc.

   e.g. **COPY A: TO C:[9]**

b) Place the backup floppy disc in the drive and copy back the contents of the hard disc's user area. The files can then be deleted from the hard disc's user area.

File maintenance on hard discs

Hard disc access times are fastest when files occupy contiguous (adjacent) sectors on a disc - reducing the head movements to a minimum.

After long periods of use, some files on a hard disc may become fragmented and the time taken to access them may get noticeably longer, justifying a file re-organisation.

This can be achieved by first copying all files from a single surface onto another blank hard disc surface - or on to floppy discs.

The original files may then be deleted from the fragmented surface and the copied files "returned". The operating system will allocate contiguous sectors to the files as they are copied back.

This operation should only be necessary if a serious degradation in performance has occurred. The fragmentation can be observed using the MAPDISC utility program.

Note - if a file or set of files occupy more than 358K, then not all of this data can be transferred to one floppy disc. The utility programs SPLIT and JOIN are designed to cope with this situation. To find out the size of the files on a surface use the L option of the DIRECTORY command.

Hard disc errors

Hard discs are generally much more reliable than floppy discs and errors are unlikely to occur. Even if they do a regular backup system (see above) will protect you from major loss of data.

If a hard disc error does arise it will be indicated in the same way as **floppy disc errors.** If an error message is given try the operation which gave rise to it a few more times before contacting your supplier for advice.

Files and Filenames

How filenames are made up

When a piece of text or data is to be taken from the computer's working memory and saved on disc, it is put in a "file" on the disc (see **Appendix B** for more details).

The file needs a unique "filename" so that the computer can identify it at a later date and retrieve its contents.

Filenames consist of two parts, separated by a "." (fullstop):

main body of filename . **extension**
(1 to 8 characters) . (0 to 3 characters)

where a character is defined as:

a letter from A to Z,

a digit from 0 to 9,

or / @ # $ & % + `(pound sign) | { } ~ ! " '

The first part of the filename is mandatory - but the "dot" (fullstop) is only required if the optional extension is used.

The extension is particularly useful in differentiating between groups or types of files. Files containing text only are often indicated by the ".TXT" or the ".DOC" (document) extension. This means that they can be displayed on the screen with, for example, the TYPE command. Files containing programs are normally indicated by the extension ".COM", while files which contain a set of commands which will be executed as if they were typed in at the keyboard are usually indicated by the extension ".SUB" (see **Appendix A** the section on **How to prepare a SUBMIT file** for a full explanation). Files containing data in the form of graphics to be used with the VIEW command are indicated by the ".PIC" extension.

You may also come across other standard TORCH extensions including

.$$$	temporary or incorrectly-saved file
.ASM	an assembly language program
.BAK	a backup file
.DAT	data file
.LET	file containing letter(s)
.MSG	TORCHMAIL message file
.PHN	Telephone or Telex number file
.SUM	TORCHMAIL summary file

Personal Filing Systems

A simple personal filing system can be devised using these rules for filenames - for example all your tax records could be easily identified by a series of filenames such as TAXMAN81.DOC, TAXMAN82.DOC, TAXMAN83.DOC. A series of bar charts to help display and analyse these tax facts and figures could be indicated by filenames such as TAXMAN81.PIC, TAXMAN82.PIC, and so on. Other relevant information which might be needed at some time as reference material could be indicated by a filename such as TAXINFO.REF.

The FILENAME rules are designed to be very flexible but any inventions which do not immediately conform will be rejected by the system with a message such as:

Illegal Filename - 'MY.TAXINFO'

If you have specified a "legal" filename and the system fails to find the file, the message will read:

File not found - 'TAXINFO.REF'

First check that you have the right disc (see DIR command) and user number.

Examples of filenames

```
DOCUMENT.DOC
DISC.MUS
DRF/MB
DEMO-1
Z.X
LETTER.001
MALCOLM.
```

Note

In the first example, DOCUMENT is the main body of the filename, and .DOC is the extension.

If the dot and extension are omitted, the TORCH operating system (or the program being run at the time) may add or assume one - such as .COM or .SUB. This will be described further under the description of each command or utility program.

Using ambiguous filenames

One of the most useful techniques provided with certain commands (such as DIRECTORY and COPY) is the ability to use "ambiguous filenames". This technique enables files to be identified and grouped in various ways without the necessity to specify each one precisely.

It makes use of two special characters called "wildcards". These are

? and *

The **?** can take the place of any single character in any position in a filename. It is then possible to search for and find all the filenames which match the rest of the characters in the filename and substitute the correct replacement for **?**.

Example

SYS.?? means a file called SYS with any extension of up to 2 characters (but not SYS.COM).

In general the * character, placed in any position, can represent any number of characters.

Examples

***.COM** means all files with a .COM extension.
B*.* means all files beginning with B.

When more than one "*" appears in the same "section" of a filename, successive "*"s are treated as single "?"s.

i.e. **B***.***** is the same as **B*??.*??**

Handling files

The CPN operating system provides many built-in 'commands' that allow you to handle your files easily. If - for example - you need to find out the names of the files already stored on a disc, the DIRECTORY command will provide a list. The INPUT command can be used to create a new file, while the TYPE command will allow you to read the text as it scrolls up the screen. Details of these and other operations which can be carried out with individual files are given in the **Commands** section.

Commands

The TORCH CPN operating system provides a standard set of commands that allow you to carry out most of the basic functions that you will need in every day "housekeeping" of your TORCH computer. It allows you to control your screen and files and, if available, to send files to a printer or a device on a network.

The HELP screen

The whole range of "built-in" TORCH commands can be displayed on your screen by pressing the appropriate function key (if you have your function keys pre-programmed) or by typing HELP (or just H) - which produces a screen display such as this:

The following built-in commands are available in Torch CCCP (v1.00)

drive:	- change default drive.
ATTACH	drive TO station drive [options].
B, BACKGROUND	colour - name or number.
BASIC	enter BBC Basic.
C, COMMAND	filename arguments.
COPY	filename [options] TO filename [options].
DEL, DELETE	filename.
DETACH	drive.
DIR, DIRECTORY	list of filenames [options]
DUP, DUPLICATE	- copy an entire disc.
FORBID	station drive [options]
F, FOREGROUND	colour - name or number.
FORMAT	drive.
INPUT	filename.
KEY	number text.
MODE	number.
N,NOTIFY	station message.
NETOPT	number.
PERMIT	station drive [options].
PRINT	filename.
PROTECT	filename [options].
REN, RENAME	filename AS filename.
SAVE	number filename.
TIME	- display.
TYPE	filename.
USER	user-number (0-31).
VDU	list of numbers.
VIEW	filename - containing graphics.

Each of these commands - except FORBID, NOTIFY, NETOPT and PERMIT which are described in the **TORCHNET** section - are described in the following pages.

How commands are described

The commands are described in alphabetical order under the following standard format:

NAME(N)

- the actual command characters which are to be typed into the keyboard (with, where appropriate, the abbreviated version inside brackets). **EITHER** the full command **OR** the abbreviated version (without brackets) can be used. The command will be followed by a simple description of what it does.

Syntax

- defines how to initiate a command, what parameters are needed and how to arrange them. The use of the **[return]** key to "enter" each command is assumed throughout this section - as it is in the rest of the Guide.

Description

- provides a more detailed explanation of the effect of the command.

Examples

- give illustrations of the command in use.

Warnings/Restrictions

- add any other information which may be helpful in practice.

Set out below is a list of the command parameters - characters or strings of characters - which are necessary to define the command.

Parameter	Description
<filename>	any string of between 1 and 8 characters (with optional drive and extension). See **Files and Filenames** section for full list of acceptable characters.
/ambiguous\ \filename /	filename containing ambiguous characters. See **Files and Filenames** for more details. It should be noted that a "precise" filename can always be used in places where the ambiguous version is acceptable (i.e. it is a sub-set). Specifying just a drive (i.e. the whole disc) has the same effect as if it were followed by "*.*" (e.g. **B:** means **B:*.***).
<code>	A code representing a number from a table or list.
<ld>	"logical" drive - the identity given to a disc drive by the use of the ATTACH command (a letter between A and P).
<pd>	"physical" drive - the identity of of the actual disc drive (a letter between A and Z).
<N>	An integer (a range may be given).
{ }	Anything enclosed in "braces" or "curly brackets" is optional.
.....	Means the parameter is repeatable.

ATTACH

Sets up disc drive attachments.

Syntax

ATTACH <ld> **TO** <pd> {[options]}

Description

This command is used to set up a "logical" disc drive by ATTACHing to a specific "physical" disc drive.

Once set up the logical drive may be used in the same way as the station's standard logical drives.

Each logical drive designation must be within the range A to P and the physical drive must be between A and Z (see VARDISC). In addition the physical drive requested for the ATTACH must not already have a conflicting ATTACH to any other station (see **TORCHNET**).

The CPN operating system automatically ATTACH(es) to its own physical drives on "power up" for read/write [W] access but this can be re-arranged or downgraded at any time by using the ATTACH command.

The ATTACH command can be cancelled by the DETACH command.

Options - in descending order of precedence

W will allow access for both "write" and "read" to the specified drive. Only one station at a time can be ATTACHed to a drive for read/write access.

R will allow "read only" access to the drive.

This option will be chosen "automatically" - if no other option is specified in the command.

D will allow "Dynamic read" access to the drive - even if another station is already "writing" to it.

B will allow the "Best" possible read access to the drive in the circumstances - "read only" [R], if possible, but "Dynamic read" [D], if not.

The [B] option tries to secure the "read only" option [R] first. If it fails - because another station has already succeeded in ATTACHing for "write" [W] (see above) - it will then try a "Dynamic read" [D] option.

Downgrading

The Options above are set out in their order of precedence and - once a link has been established - it is possible to "downgrade" it by using another ATTACH command with a "lower precedence " Option (see examples below). It is not possible to "upgrade" to a higher access level in a similar way.

Examples

ATTACH K TO B [D]

- attaches your logical drive K to physical drive B for a "Dynamic read" and will do so even if another station is "writing to" this drive at the time.

ATTACH C TO A [W]

- gives both read and write access to the disc in drive A.

ATTACH C TO A [D]

- would downgrade the link to "Dynamic read" access.

BACKGROUND (B)

Changes the background colour of the screen.

Syntax

BACKGROUND <name> or **BACKGROUND** <code>
B <name> or **B** <code>

- where <name> is the name of any of the non-flashing colours and <code> is one of the numbers chosen from the list below (flashing or non-flashing).

Description

The BACKGROUND colour of the screen can be chosen from the following range by using the appropriate <name> of a non-flashing colour - or the <code> of either a flashing or non-flashing colour:

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

If the screen becomes a blank when you change the background colour, you have probably set the same background and foreground colours (see under the F command).

Examples

BACKGROUND YELLOW

or

B 3

Either of these two commands would set the background colour to yellow.

B 10

This would set the colour of the background to green and magenta, flashing alternately.

BASIC(*BASIC)

Switches to BBC BASIC.

Syntax

BASIC or ***BASIC**

Description

BASIC (or *BASIC) can be used to switch the system to the BBC BASIC interpreter for use in tasks which do not take up too much memory - such as calculations. To get back to CPN, use the *MCP command.

For a more prolonged or intensive use of BBC BASIC where a large proportion or all of the available memory is required - such as running a large program - press B and [break] together to de-activate MCP completely, and then [break] again (without the B) to reactivate any "sideways ROMs" on the BBC board.

It should be noted that if you have a BBC Micro fitted with filing systems other than DFS or NFS, there may not be enough "room" for BASIC unless the system is run in MODE 3,4,5,6, and 7.

If you intend to use BBC BASIC and a disc to run programs press B and [break] followed by [break] (again) followed by *DISC. To return to CPN you will need to use [CTRL] and [break]. **Appendix C** provides more details of the Acorn DFS system.

Warning

Do not attempt to use DFS - or any other ROM - while MCP is active.

Example

BASIC

This will allow you to use the BBC BASIC interpreter for simple calculations or other tasks which do not require much memory (see above).

Note

Pressing the reset button on TORCH has the same effect as pressing [break] on the BBC Micro.

COMMAND(C)

Treats contents of a file as a series of commands.

Syntax

COMMAND <filename> <list of arguments>

or

C <filename> <list of arguments>

Description

COMMAND (or C) is used to cause the contents of a file to be treated by the CPN operating system as a series of commands. Comprehensive facilities are available for the substitution of arguments when the command is obeyed.

The default extension is .SUB and a description of how to make up a file which can be executed by this command is contained in the section on **How to create a SUBMIT FILE.**

Examples

COMMAND A:SUBMIT.TXT

This would use the file SUBMIT.TXT from the disc in drive A as a series of commands.

C TEST

The operating system would add the extension .SUB to the file TEST and then use the file TEST.SUB as a series of commands. The computer would assume that the file is stored on the current disc drive.

COPY

Copies files on to discs.

Syntax

COPY <parameter> **TO** <parameter>

- where **<parameter>** can be EITHER **/ambiguous** **\filename /** **{[options]}**

OR **[options]**

Description

COPY is used to copy a file (or a group of files) on to another disc or to make another copy of a file, or files, on the same disc. In the latter case, the new files must have a different filename or be in a different user area (see USER command) or the system will report "Cannot create file - failed" because this filename already exists (but see [D] option, below).

The COPY command is particularly useful for making backup copies of single files - or groups of files - rather than all the files on a disc.

Another feature is its ability to copy a group of files using ambiguous filenames. This facility makes use of the characters '*' and '?' (see **Files and Filenames**).

Options

A - "archive" copy - this option will allow the COPY command to select only those files which have been marked as "touched" (i.e. edited or altered in any way since it was last "archived") for copying to another disc or user number. Note that a new file is a "touched" file and would be copied with any other "touched" files (see PROTECT for how to alter an "archived" file to a touched file).

D - deletes any files on the destination disc or user number which have the same filename as the source file - which is then copied in the normal way.

<N> - the user number (between 0 and 31). The default is the current user number.

Q - offers a Y(es)/N(o)/Q(uit) choice before each file is copied by the use of the ambiguous filename or drive specification technique (see above).

Examples

COPY AL*.* TO B:[3]

This command will copy all files beginning with AL on the current disc to the disc in drive B, user number 3.

This is how the screen might look:

Source File		Destination File	
A:ALTEXT	.DOC	B:ALTEXT	.DOC
A:ALLOW	.SUB	B:ALLOW	.SUB
A:AL23	.COM	B:AL23	.COM
A:AL	.DAT	B:AL	.DAT

COPY SYS.COM TO SYS1.COM

The above command would copy the contents of the file SYS.COM to form the file SYS1.COM.

DELETE (DEL)

Deletes files from discs.

Syntax

```
            /ambiguous\
DELETE \filename / {[U]}
```

or

```
        /ambiguous\
DEL \filename / {[U]}
```

Description

DELETE (DEL) will remove one file - or a group of files in sequence - from a specified disc. Before each file is deleted, the screen will prompt like this:

Do you want to delete A:TYPETHIS.DOC?

Typing Y will then delete that particular file. Typing N will cancel the DELETE command for that particular file but, if you have specified a group of files, offer your next choice for action. Typing Q will immediately quit the command, ignoring any remaining files.

Option

Available with the DELETE command is the U option. If this option is specified, then the file(s) will be deleted "unconditionally" - that is you will not be given another chance to change your mind as each file is presented for action.

Examples

DEL A:SYS.MAN

This will cause the command to ask you if you wish to delete the file SYS.MAN from the disc in drive A. If you answer Y, the file will be deleted - otherwise the file will not be deleted.

DEL AL*.* [U]

This will automatically delete all the files whose first two letters are AL from the disc in the current disc drive.

Note

The DELETE command will only work on files with the current user number.

DETACH

Countermands ATTACH - breaks existing attachments between a station's logical and physical disc drives.

Syntax

DETACH <ld>

Description

This command is used to cancel the ATTACH command and release the link between a logical drive and a physical drive.

Example

DETACH K

DETACH(es) logical drive K from the physical drive to which it was ATTACHed.

DIRECTORY (DIR)

Produces a directory of files on a disc.

Syntax

```
                { /ambiguous\ }
     DIRECTORY  { \filenames/ } {[options]} . . . . . .
or
          { /ambiguous\ }
     DIR  { \filenames/ } {[options]} . . . . . .
```

Description

The DIRECTORY command (abbreviated to DIR) is used to display the filenames stored on a particular disc. An alternative to using an ambiguous filename when all the files on a particular disc need to be listed is to use DIR <d:> if the directory of a disc other than the current one is needed. Otherwise, to obtain a directory of the current disc (i.e. the disc drive showing in the prompt) just type DIR.

Note:
"System" files will not appear in a DIRECTORY - see the PROTECT command.

Options

A - will list "archived" files only (see COPY command).

L - will display the length of the specified file.

<N> - user number (between 0-31). This option will display all the files on the disc with the user number specified (rather than the current user).

P - will display the level of protection which each file has been given.

S - will display the space left on the disc.

T - will list "touched" files only (see COPY command).

Note

Any number of the above options may be enclosed within one set of square brackets. More experienced users may also combine parameters to "interrogate" a number of drives, ambiguous filenames, and options with one command. Only the simplest examples are given here.

Examples

DIRECTORY B:

The above example would list all the files on the current user number on the disc in drive B.

DIR *.COM [LP4]

This would list all the files in user area 4 on the disc in the current drive with the extension .COM. The L option would produce the length in Kilobytes of each file and the P option would produce a protection status report (see PROTECT command).

DUPLICATE (DUP)

Copies the contents of one floppy disc to another.

Syntax

DUPLICATE {FULL}

or

DUP {F}

Description

DUPLICATE (or DUP) produces the following screen prompt:

Place source disc in drive B
and destination disc in drive A

Are you sure you want to duplicate this disc?

Check your drive designations carefully - especially if you are a network station (see ATTACH command and **TORCHNET** section).

If you press N(o) or Q(uit), the program will abort. If you press Y(es) the program will go on to ask:

Are your sure you want to Format this disc?

As in the FORMAT command you must check that the right disc is in the destination drive before answering this question and proceeeding.

Entering N(o) means that the program will only duplicate the contents of the source disc on to the destination disc - without first formatting the destination disc.

Entering Q(uit) aborts the program.

Entering Y(es) means that the program will first format the destination disc and then duplicate the contents of the source disc on to the destination disc.

While formatting is taking place, the system checks for errors and reports any found (see **The Disc System**).

Option

If the FULL option is used, the whole of each disc will be duplicated without regard for which sectors are being used. This is useful for duplicating discs which may not use the TORCH CPN file structure - such as Acorn DFS or UNIX.

Examples

DUP

This will first ask if you are sure about the positions of the discs and drives and then ask you if you want to format the destination disc. Depending on your answers, it may format the disc in drive A and then copy the contents of the disc in drive B to the disc in drive A.

DUP FULL

Depending on your choices, this form of the command will format the disc in drive A and then copy the whole of the contents of the disc in drive B to the disc in drive A (see Option, above).

Warning

Do not attempt to use DUP if you have a hard disc machine with a single floppy disc drive **UNLESS** you first DETACH B and ATTACH it to another floppy disc drive.

FOREGROUND (F)

Changes the foreground colour of the screen.

Syntax

FOREGROUND<name> or **FOREGROUND**<code>
F <name> or **F**<code>

Description

FOREGROUND (or F) is used to change the foreground colour of the screen. Typing the <name> of any of the "non-flashing" colours after FOREGROUND - or the <code> of either the flashing or the non-flashing colours given in the option table below - will execute this command.

Options

The choice of colours is as follows:

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

Examples

F 7 or **FOREGROUND WHITE**

- would set the foreground colour to white (this is set as the default colour).

F 11

This would set the colour of the foreground to yellow and blue, flashing alternately

Note
If, when you change the colour, the screen becomes a blank, you have probably set the foreground and background to the same colour (see BACKGROUND command).

FORMAT

Sets up the tracks and sectors on a floppy disc.

Syntax

FORMAT <drive>

- where **<drive>** is the drive to be formatted.

Description

The FORMAT command is used to set up the necessary tracks and sectors on a floppy disc before files may be stored on it (see **Appendix B** on **CPN Disc Structure** for more details). All new discs **MUST** be formatted before use.

Warning

Re-formatting a disc which has been in use will destroy all existing data on that disc.

Example

FORMAT A

This will result in a screen message such as this one:

Are you sure you want to format this drive?

Only after you have answered this question with Y(es) will the formatting process begin. Typing N(o) or Q(uit) will abort the program.

Note

FORMAT **cannot** be used to format hard discs (see **The Disc System** for more details).

*FX

Special functions.

Syntax

***FX** <N>{,<N>}{,<N>}....

- where **N** is between 0 and 255

Description

The *FX command has a number of special uses which are described in more detail in the **Programmers' Guide.** It should be noted that not all the *FX commands described in the BBC User Guide have the same effect under the TORCH operating system.

Examples

The most regularly-used *FX command sets up the TORCH for printing:

***FX 5,2**

- selects a serial printer output.

***FX 5,1**

- selects a parallel printer output.

HELP(H)

Displays list of built-in commands.

Syntax

HELP

or

H

Description

The HELP command is used to display a list of the "built-in" commands and their options (see full display at the beginning of this command section).

Note:

Function key F1 is set on power up to run the help command.

Example

HELP

This will displaythe HELP list of commands on the screen.

INPUT

Allows the input of text into a file.

Syntax

INPUT <filename>

Description

INPUT is used to store a text file on a disc. First type INPUT followed by a filename. The actual text may then be typed in using the editing function keys (described in Appendix D) as required. Once all the text has been entered, close the file by enter a new line with just ^Z om it ([CTRL]-Z followed by [return]). The data you have typed in will now be saved in the file you specified.

Example

```
INPUT A:EXAMPLE.DOC
This document is to show
how to enter a three line
text file
^Z
```

If you entered everything in the above example (each line followed by [return]) you would create a three line file called EXAMPLE.DOC which would be stored on the disc in drive A.

KEY (*KEY)

Programs the function keys.

Syntax

KEY <N> {<string of characters>}

or

***KEY** <N> {<string of characters>}

- where **<N>** is a number in the range 0 to 9

Description

KEY (or *KEY) can be used to program any of the function keys. Up to 58 characters can be stored in each key.

KEY can be used to store frequently-used information such as a company's name and address. To use the command, enter KEY followed by the key number and the string of characters you wish to program into the key which may be enclosed within double quotation marks. To include control characters in the string, you should use the "|" (bar) key. For example, "|M" stores the [return] function while "|I" means the TAB key.

Examples

An illustration of how the function keys may be set up is contained in the AUTOBOOT.SUB file on the standard utilities disc (explained in **How to start-up your TORCH**).

Note

The current setting of the function keys always be displayed by using the SOFTKEYS utility.

*MCP (or *CPN)

Switches back to TORCH operating system from BBC BASIC.

Syntax

***MCP** or ***CPN**

Description

The *MCP (or *CPN) command returns control to the TORCH operating system from BBC BASIC after the use of the BASIC command (the command line prompt will re-appear - see **What the screen tells you**). It may also be used when running MCP to re-set the system.

Example

***MCP**

This would re-enter the TORCH operating system or return control to TORCH from BBC BASIC.

Note

This command cannot be used if B + [break] has been used to enter BBC BASIC (see BASIC command) - [CTRL] +[break] must be used.

MODE

Changes the screen format.

Syntax

MODE <N>

Description

The MODE command allows you to change the format of the screen. This means that you can increase or decrease the character size.

Options

There are eight optional modes available:

0	80*32 text (or graphics).
1	40*32 text (or graphics).
2	20*32 text (or graphics).
3	80*25 text.
4	40*32 text (or graphics).
5	20*32 text (or graphics).
6	40*25 text.
7	40*25 Teletext display.

(80*32 means 80 columns by 32 lines).

The Teletext display (mode 7), is compatible with the mode used for the British Telecom PRESTEL system.

When first switched on, the screen appears in mode 0 and once a MODE command has been issued it will stay in this mode of operation until

a) A new MODE command is given.
b) An application program changes the screen mode.
c) The [break] key is pressed.

Note
Changing the mode clears the screen and selects a white foreground on a black background.

Examples

MODE 0

This is the default mode which produces 32 rows of characters and 80 columns.

MODE 7

This prepares your TORCH for Teletext display.

PRINT

Prints out files from disc to printer.

Syntax

PRINT <filename>

Description

The PRINT command is used to print out information from files stored on disc on to a printer which may be attached to your computer via the parallel or serial ports.

The type of printer output must be set up before this command can be used. A parallel printer will require *FX5,1 while a serial printer connected to the RS423 socket will require *FX5,2. **Appendix F** and the BBC User Guide will provide more information on the use of printers.

It is possible to set up the PRINT instructions as part of the "auto-boot" procedure - see **How to start-up your TORCH** section.

To halt the printing process, press the [escape] key. The system will ask you if you wish to stop the printing (Y) or carry on (N - or any other key).

Examples

PRINT TYPETHIS.DOC

This would send the file TYPETHIS.DOC from the disc in the current disc drive to the currently-selected printer port.

PRINT B:REPORT

This would send the file REPORT from the disc in drive B to the printer.

Note

It is always worthwhile checking that the printer is fully operational and loaded with paper before using PRINT.

PROTECT

Protects files.

Syntax

PROTECT {/ambiguous\} {\filename /} {[options]}

Description

The PROTECT command may be used to protect a specified file - or a group of files - in various ways depending on the options selected from the following table. If no option is specified then the command will display the current protection for the files).

Options

A	File becomes "archived" (see COPY).
R	File becomes read only.
S	File is made invisible to the DIR command. This option is usually chosen for UTILITY programs, or frequently-used applications programs , such as Perfect Writer. They can be stored ready for use but will not appear in a DIR directory.
T	File becomes "touched"(see COPY).
U	This option cancels the "S" option - see above.
W	File becomes read/write - cancels "R" option.

Example

PROTECT TORCHTEL.COM [R]

The command above will make the file TORCHTEL.COM "read only". This means that it cannot be deleted or modified until another PROTECT command has been used.

PROTECT B:*.COM [S]

This makes all files on drive B with extension .COM (program files) into system files, which means in effect that they do not appear on the directory, but may still be used.

RENAME(REN)

Renames a file or files.

Syntax

```
          /ambiguous\    /ambiguous\
RENAME \filename / AS \filename /
```

or

```
        /ambiguous\    /ambiguous\
REN \filename / AS \filename /
```

Description

RENAME (or REN) may be used to rename a single file by specifying both the old and the new filenames. It may also be used to rename a group of files by using the ambiguous characters "*" and "?" (See **Files and Filenames**). This may be useful if you want to regroup information or put outdated information into "storage" and reuse the filenames.

Examples

```
REN SUPER.MAN AS SUPERWO.MAN
```

This will rename the file SUPER.MAN on the current disc drive as SUPERWO.MAN.

```
REN AL*.* AS RA*.*
```

This will rename all files with AL as the first two letters to RA with the first two letters e.g.

Old Filename	New Filename
AL.DOC	RA.DOC
ALSYS.MAN	RASYS.MAN

SAVE

Saves data on to disc.

Syntax

```
SAVE <N> <filename>
```

- where **N** is between 0 and 255.

Description

This is a specialised command - normally only used by programmers - used to save data stored in the TPA (Transient Program Area). It will save the data starting from the memory address 0100 (hex) in pages of 256 bytes. The number specified in the SAVE command line is the number of pages to be saved.

Examples

```
SAVE 16 DATA.COM
```

This will save the first 16 pages (4K) of memory, from 0100(hex) to 10FF(hex) - into the file DATA.COM on the current disc. Note that if an extension is not specified in the command, the default extension added by the system is ".COM".

```
SAVE 64 A:PROGRAM.COM
```

This will save the first 64 pages (16K) of the TPA into the file PROGRAM.COM on the disc in drive A.

TIME

Displays time.

Syntax

TIME

Description

The TIME command is used to read the time - which is re-set to 00:00:00 each time the system is switched on.

It is displayed in this format:

The time is 06:25:30

To set the correct time, use the DATETIME utility.

Example

TIME

This would display the elapsed time since your machine was switched on if DATETIME had not been used, or the current time if it had.

TYPE

Displays the contents of a file on the screen.

Syntax

TYPE filename

Description

The TYPE command displays the contents of a file on the screen. If it is a long file, pressing the [escape] key as a "toggle" (see **Glossary**) will interrupt and re-start the display as it scrolls up the screen.

Examples

TYPE REPORT.DOC

This will display the contents of the file REPORT.DOC (which is stored on the current disc drive).

TYPE A:FILE.BAK

This will display the contents of the file FILE.BAK (which is stored on the disc in drive A).

USER(U)

Sets the user number.

Syntax

USER <N>

or

U <N>

- where **<N>** is in the range 0 to 31

Description

This command may be used to change the current user number. The current user number is always displayed immediately before the current drive letter in the command line prompt, e.g. the "0" in the "0A>" which appears on power up, or reset.

The user number in the prompt indicates which of the 32 separate "user areas" is being used. It enables up to 31 different users to store or retrieve files without interfering with each other's work (but note that user number 0 provides "common" access - see below).

Alternatively, a single user may decide to allocate a different user number for each type or group of files and keep them separate but easily accessible in this way.

Normally when a file is not found on the current user number then the operating system will "look" for specified files on user number 0. This action can be utilised by storing regularly-used ".COM" UTILITY files on user number 0 where the system can always find them - although they will not appear on a DIRECTORY when any other user number is specified (see DIR command).

Example

USER 5

This will set the current user number to 5 in the prompt. It allows access to the files stored in user area 0 as well as user area 5.

VDU

Sends control characters to the screen display.

Syntax

VDU <N> {,<N>} {,<N>}.....{<N>}

Description

The VDU command is used to send control codes to the screen driver - the part of the operating system software which is used to print and draw on the screen.

There are many functions available with this command which are listed in full in both the BBC User Guide and the **TORCH Programmers' Guide.** The TORCH command is similar to the BBC command except that eight "nulls" are always sent at the end.

Examples

VDU 65

This sends the character with the ASCII value 65 to the screen (i.e prints the letter A).

VDU 7

This produces a short "beep" on the speaker.

VDU 12

This command would clear the current text area and position the cursor in the top left hand corner of the text area.

VDU 2,1,66,3

This command would cause the following actions: the printer is "enabled", the character "B" is sent to the printer, and the printer is then "disabled".

VIEW

Displays a picture file on the screen.

Syntax

VIEW <filename>

Description

The VIEW command is used to display a picture file on the screen. It takes a file of VDU control functions, and outputs them to the screen driver which displays them on the screen.

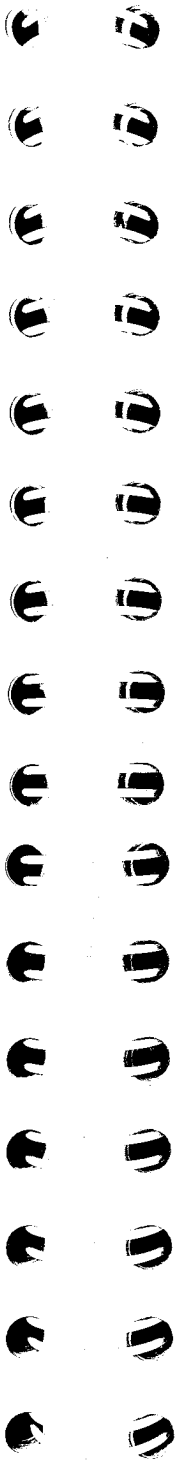
To stop the display of a file, press the [escape] key. Files displayed by the VIEW command usually have the extension .PIC and if no extension is given, the operating system will assume it.

Some picture files terminate with the VDU code 21 (disable screen) so that commands can be issued without corrupting the display. VDU 6 reverses the effect of VDU 21.

Example

VIEW MAP

This will display the contents of the file MAP.PIC on the screen.



SECTION 3

Executive's Aid

Executive's Aid

Executive's Aid is a menu system that provides a flexible and user friendly interface with other software packages, commands etc., while still allowing use of the network facilities. Once configured to suits your own needs it can be used to initiate most of your every day tasks without the need to get involved with the intricacies of the Operating System.

It consists of a 'shell' program that displays any one of up to 64 different menus. Each menu is configurable to provide a maximum of 10 options. An option - selected by simply entering the option number - can either call another menu or else call a program, Submit file or command.

Each menu and option can be given its own title, description and help text in order to provide you with enough information before you confirm the selection. Each menu can also have its own password to prevent unauthorised access from any other menu.

Parameters and/or initial keyboard input can be set up for any program or command option, thus removing the need for keyboard input when the program is selected. However it is possible to input or change the parameters if necessary.

In addition to the normal station identifier, disc and user number, the time and date are displayed on each menu. Also small 'Icons' are shown during disc accesses and whenever a message has been received.

Background Menu

A background menu is available for the sending and receiving of messages over TORCHNET. It may be 'called up' from within any program as well as from any menu.

Initialisation

The menus and their options are set up by a separate initialisation mode which is protected by a password to prevent unauthorised modification of the system. Special commands are available within this mode to insert and delete both menu and program options as well as edit them.

Customisation

A separate program is also provided that allows the colours, main title, printer type and installation password to be modified. The installation password must be entered before the program can be run.

Starting Executive's Aid

Executive's Aid consists of a 'suite' of four files which are supplied on your **Standard Utilities** disc. These are:

XA.COM
XACONFIG.DAT
XACONFIG.NUL
XASETUP.COM

The first file is the Executive's Aid program. The second contains an example set of menus, commands and help text so that you can try out the basic functions of Executive's Aid without having to configure it first. It should also be used as a guide on how to layout menus and commands when you configure your own Executive's Aid system.

The third file is an 'empty' configuration file. It allows you to configure your own system from scratch although you can edit the example file.

The fourth file is the program that allows you to change the basic parameters of Executive's Aid, such as the main titles and screen colours of the menus.

To use Executive's Aid the first two files need to be present on your current disc drive. This means that you must either have a copy of the **Standard Utilities** disc in drive A or, if you have a hard disc machine, that the disc has been copied to your first hard disc surface. You can check that they are present by entering **DIR XA*.*** on the command line.

Once you are sure that the files are present just type **XA** to load Executive's Aid and display the main menu.

Keyboard Differences

Executive's Aid will run on all TORCH systems with either of the TORCH professional keyboards or the BBC micro. Since the engraving of some of the keys used by Executive's Aid differ between these keyboards the following 'Universal' names will be used when describing the key:

Name	White keyboard	Black keyboard	BBC
[ACTION]	[Scroll lock]	[exact space]	^X
[INSTALL]	(f9)	[F9]	^F
[QUIT]	(f0)	[f10]	

The Main Menu

The first menu (referred to as the main menu) is normally used to gain access to subsequent, more specialised menus. That is it acts as the starting point for a complete root structure of other menus. On the example system all 10 options of the main menu will take the user to other menus. However any of the 10 options could equally be used to call a program or run a system command.

The Menus

Each Menu is divided into a number of panels.

The top panel gives TORCH's name, the name and version number of the program and two titles, one in large characters and one in normal text. Both of these titles may be changed, for details see **Customisation.**

The next panel is used to display a variety of useful system information. On the left of this panel are the TORCHNET station number, currently logged disc drive and user number. On the far right are the date and time as stored in the computer.

The small picture of a TORCH computer to the right of the station number is called an "icon". Other icons are also displayed when relevant. For example a picture of a floppy disc is shown during disc accesses - even to hard discs ! - and a letter icon is shown when an unread message exists.

The line underneath this panel initially displays a copyright message. However it is replaced by "**Message for you from** xxx" whenever a message is received, as well as the letter icon. "xxx" is the number of the network station sending the message. Pressing **[f2]** will display the message and remove the letter icon. Pressing it again will commiserate "**There are no messages for you**".

The main left hand panel will show the menu number, the title of the menu and a list of the available options, numbered from 0 up to 9 down the left side.

The right hand side of the screen initially gives information about how to make a choice or get more information. However if you press the **[HELP]** key - **[f1]** - it will overwrite this panel with the help information for either the current menu or, if an option is selected, the current option (see next section).

Selecting an option

The simplest way to select an option is to press the numeric key corresponding with the number displayed in front of the option's name. The choice will be displayed in inverse video - that is it will be boxed in with the background and foreground colours reversed. If present, a short message about the option will appear at the bottom of the screen.

The selected option may be changed for another, by either pressing a different numeric key, or by using the cursor control keys to move the selection box up or down. Pressing the **[ESC]** key at this point will simply "clear" the selected option.

When none of the options are selected the **[RETURN]** key may be used to choose the menu's "default" option. If the menu has just been displayed the default choice will be option 0. However if a choice was made and then "cleared" (by using the **[ESC]** key) the default will be that choice.

Any other key will not be accepted and a message to that effect will be displayed on the screen.

Confirming an option

To confirm the option press the **[RETURN]** key. The disc access icon will be displayed while the menu or program requested is loaded from disc.

Calling another menu

If the option requested was a call to another menu then the new menu will be written to the screen. The new menu will have a different number and title to the previous one - as well as different options - but the top of the menu should be the same.

Calling a program

If the option requested was a call to a program, submit file or system command the screen will clear. If no parameters are required then the program will be run, or the command (or submit file) passed to the operating system. The screen display will then depend on the program or command requested.

If a program with optional parameters is requested Executive's Aid will ask for the parameters before it runs the program. The options panel will be replaced by two lines delimited by square brackets. If the program has default parameter(s) they will be displayed in the first line. You may now either delete the parameter(s), modify them with the editing keys (use the default parameters as a guide) or leave them untouched. If in doubt leave them alone. Once the parameters are correct the program can be executed by pressing the **[ACTION]** key.

Returning from a program

When a program (or command) is completed the message

press any key to return to Executive's Aid

will be displayed on the screen. This allows you to read any information generated by the program, for example the output from a request for a directory listing. Once you follow the instruction the Executive's Aid menu from which the program was selected will be re-displayed.

Returning to the previous menu

It is possible to return to the previous menu by pressing **[ESC]** on the current menu instead of choosing a valid option. This re-enters the menu from which the current menu was called. Pressing **[ESC]** from the main menu will, after confirmation has been given, exit Executive's Aid and display the command line prompt.

Background Menu

From any point in Executive's Aid, or from a program being run from within Executive's Aid, it is possible to access a "background menu" that allows you to send and receive TORCHNET messages. This is especially useful if you receive a "call" while in the middle of word processing a file and want to reply or a send a message without leaving the program.

To call up the background menu press the **[CTRL]** and **]** keys simultaneously:

The background menu contains two options:

1 - Send a message
2 - Read a message

Pressing **[1]** results in requests for a network station number and a message. Pressing **[2]** displays any messages which may be waiting. To return from the background menu press **[ESC]** or **[QUIT]**.

If **[1]** was pressed by mistake then **[ESC]** will cancel the choice.

Customisation

Customisation is one of the two methods of adapting Executive's Aid to your requirements. With the program XASETUP.COM it is possible to:

a) change the screen colours
b) alter details of an attached printer
c) change the header messages.

Starting to Customise

The program can be run in two ways. Firstly from the command line - after ensuring that a copy of the **Standard Utilities** disc is in the current disc drive. Then type **XASETUP** on the command line.

Alternatively it can be called from within Executive's Aid. If you are using the example configuration file supplied with the system disc - from the main menu choose the **Initialisation menu** (option 1) and then choose option 2 - **Tailor Exec Aid.** The message at the bottom of the screen will say **the password is SECRET!** which is true.

First of all a password must be entered in answer to the prompt

Please type the install password : [ ]

As mentioned before the password is **SECRET.** If an incorrect password is entered the program will exit with a message to that effect. If the password is correct then there is an opportunity to change it, but make sure that you remember the new password.

Once the password formalities have been finished the Customisation menu is displayed. This shows the four options that are available together with instructions how to leave the program.

Pressing the **[HELP]** key - **[f1]** - will display further information about the options.

To choose any of the four options just press the appropriate key.

Once any of the options is displayed you may:

- exit at any time by pressing the **[ESC]** or **[QUIT]** keys
- use the **[HELP]** key to display more information
- use the cursor keys and **[return]** to position the cursor
- modify the current values
- and the **[ACTION]** key to confirm the values displayed.

Details on each option are given overleaf.

Changing colour [C]

A list of the possible colours is shown together with the currently selected foreground (text) colour. To choose a new foreground colour simply enter **[Y]** or **[y]** in the relevant box and ensure that all the other boxes are either blank or contain **[N]** or **[n]**.

If **[ACTION]** is pressed when more than one colour has been specified, or if no colour is requested, an error message will appear on the screen. A single colour must be selected before you can continue. This selection process is then repeated for the background colour.

Once both options have been set the screen will change according to the colours selected. If it goes blank then you have set both the foreground and background colours the same!

Printer details [P]

Three mutually exclusive options are presented and one of them must be chosen in the same way as the colours. It is also possible to set the "printer ignore character". This is the character which, if received by the printer, will be ignored. The default is 0.

If a serial printer is selected then another value needs to be chosen. This is the "baud rate" and is related to the speed of communication between your computer and printer. See **Appendix F - Printers** for more details.

The Titles [T]

The two titles are those on the Executive's Aid menus. They are displayed within boxes that indicate their maximum possible lengths. Just type the new titles required - the Short title will automatically be displayed in larger characters on the Executive's Aid menus.

Changing all options

If you wish to change all the values together just press **[return]** when the menu is displayed and each of the other 3 options will be displayed in turn.

Leaving XASETUP

If you press **[S]**, XASETUP will save any changes which have been made and then exit. If you do not want to save any of the changes use the **[Q]** option. If the latter option is used and changes have been made, a warning will be printed and the choice must be confirmed.

Configuring Executive's Aid

The most complicated part of Executive's Aid is the configuration of the menus and options to suit your requirements. This is known as **Installation**. Once in installation mode it is possible to add modify or delete the menus, their options and the associated messages and help text.

To enter installation mode press **[INSTALL]** - **[f9]** while on any Executive's Aid display. The same password as that used by the customisation program is required - it is initially set to **SECRET**. If the wrong password is entered then an error message is given and the display restored.

If the correct password is given then the screen display will change from its original colour to red and white and the "short title" will become **INSTALLATION**. When in installation mode it is possible to move around the menus as before, but commands may not be executed. Any attempt to do so will result in an error message at the bottom of the screen.

Various function keys can now be used to provide the install functions. These are:

[f3] - Add Option or Menu
[f4] - Delete Option or Menu
[f5] - Edit Option or Menu
[f6] - Edit menu password
[f7] - Edit help text
[f8] - Exit help text
[f9] - Exit installation mode

When adding or editing various fields of information will be displayed. In most cases the following standard functions apply:

- exit at any time by pressing the **[ESC]** or **[QUIT]** keys
- use the cursor keys and [return] to position the cursor
- modify the current values by just overtyping
- use the **[ACTION]** key to confirm the values displayed

Editing an existing Menu

To edit an existing menu first display the menu and then press [f5] with no option specified. This will display the current menu name and allow it to be changed.

You cannot edit the order of the options on a menu, you can only add or delete options (see below).

Editing an existing Option

To edit an option, first specify - but do not confirm - the option number and then press [f5].

The following information will be displayed:

Text: - name of the option
Description: - appears when the option is selected
Type: - MENU or PROGRAM

If a **MENU** is specified then once **[ACTION]** has been pressed a new prompt appears - **create new menu?**. If the reply is Yes then a new menu is created and the editing completed.

If the reply to "**create a new menu?**" is No then the existing menu link is shown. For option 8 on the main menu of the example this is initially "1" and that is why the main menu is redisplayed when option 8 is chosen.

It is possible to change this number to the number of any existing menu. If a non-existant menu is given then an error message is displayed and a different number must be given. If a single digit is to be entered the **[ACTION]** key should be pressed, if a two digit number is specified then editing will be terminated once the second digit is entered.

If a **PROGRAM** is specified pressing **[ACTION]** will display details of the program or command for editing:

Enter command The name of the program or command that is to be executed. There is no need to add .COM.

Parameter Additional information which is appended to the program when it is run. If "**allow parameter to be changed?**" is set to "**Y**" then you are given a chance to edit or delete the parameter before the program is run. Leaving it blank will cause the program to be executed without any parameters.

Keyboard buffer This will be entered in response to a prompt within a program once it has started.

Adding a new Option

To add an option to a menu first of all ensure that the menu is not full and then press [f3]. There must be less than ten options already on the menu - trying to add an option to a full menu will not be allowed.

Adding a new option is similar to editing an option except that the fields displayed are initially empty. When completed the option will be given the next available number on the menu.

Adding a new Menu

A new menu may be created when editing an existing option or while creating a new option (see above).

Deleting an Option

To delete an option simply select the option - but don't confirm it - and then press **[f4]**. Confirmation is requested before the option is deleted. If an option is deleted all the other options on the menu are moved up so that consecutive numbers will be retained.

Note that you should always make sure that you delete a menu before deleting all links to it - if it is no longer required. Once the links are deleted the menu is 'lost' but it is still in the configuration file and takes up one of the 64 menu allocations. You can use this fact to 'hide' menus and then quickly restore them.

Deleting a Menu

To delete a menu simply display the menu and press **[f4]**. Confirmation is requested before the menu is deleted.

If a menu is deleted options may still try to call it. For example if menu 2 is deleted and then option 0 of the main menu executed, the system will try and display the non-existant menu. In this case an error message will be displayed and the option should be edited to link it to an existing menu, or a new menu 2 created.

The Help text

The text displayed when **[HELP]** is pressed can also be modified. To edit simply press **[f7]** - any text already present will be displayed. It is possible to type directly over the text. Note that there is no word wrap or justification procedure.

To end the editing session press **[f8]** to save the changes or **[ESC]** to abandon them. To delete text simply overtype it with spaces.

Passwords

It is possible to protect each menu with a password. If a menu is protected it will not immediately be displayed when chosen. Instead a prompt for the password will be given. If the correct password is given the calling menu will then be displayed.

To set the password simply press **[f6]** when in the desired menu. To cancel the password simply press **[ESC]** instead of entering text when asked to set the password.

Leaving Installation mode

To finish installation and save the changes that have been made press the **[INSTALL]** key - **[f9]** - again. Any changes will be noted and the "new" version of Executive's Aid will now be activated. If an attempt is made to leave Executive's Aid (pressing **[ESC]** from the main menu) while in install mode a message that "any changes made will be lost" is displayed and confirmation requested.

SECTION 4

Utility Programs

Utility Programs

Your TORCH system is supplied with two floppy discs containing special "housekeeping" programs - called Utilities - which are designed to help you to get the best out of your TORCH system.

A list of the Utility Programs supplied on each disc is given overleaf, followed by a more detailed description of what each one does and how to use it later in the section.

Looking after your Utility discs

To avoid any accidental loss or corruption of your **Utility** discs it is important to make at least one copy of each disc and to use the copies for every day work (see **The Disc System** section for details).

How the Utility Programs are described

The description of each Utility Program appears in this format:

NAME

- the name of the program together with a simple description - and the version number.

Syntax

- defines how to call the program together with any parameters required and how to arrange them. Optional parameters are enclosed in curly brackets.

Description

- provides a more detailed explanation of the effect of the program and how to use it.

The following programs are provided with your TORCH system:

* **BACKUP** - backs up a hard disc surface onto floppy discs
* **BACKDATE** - displays the 'label' on BACKUP floppy discs
  COPIER - copies 40 track to 80 track floppy discs
  DATETIME - displays and sets the date and time
  EXEC - enables programs to be run in SUBMIT files
* **FIND** - locates file or range of files on disc/user area
* **FROMAT** - formats and verifys hard discs
* **JOIN** - recreates a SPLIT file
* **LS** - lists filenames alphabetically
  MAPDISC - corrects disc allocation map discrepancies
  MCPVARS - displays and modifies MCP variables
  POKEDISC - displays and modifies disc sectors
* **RECALL** - restores single files from BACKUP floppy discs
* **RESTORE** - restores a hard disc surface from BACKUP floppy discs
  RWACORN - converts between CPN and DFS file formats
* **SHIP** - position hard disc heads ready for shipping
  SOFTKEYS - displays current contents of function keys
* **SPLIT** - split a large file into smaller files
* **TITLE** - lists title information for each user number
  TORCHBUG - displays and modifies programs
* **VARDISC** - divides hard discs into user-defined surfaces

Utility programs marked with a "*" are supplied on the **Hard Disc Utilities** disc and, except for FIND, LS and TITLE, must only be used on machines fitted with a hard disc.

The other utilities are provided on the **Standard Utilities** disc and can be used on any TORCH system.

BACKUP (v3.00)

Backs up a hard disc surface onto floppy discs.

Syntax

BACKUP

Description

BACKUP creates an archive copy of any hard disc surface on upto 11 floppy discs. It can archive both CPN surfaces and other special or physical surfaces (e.g. a UNIX filesystem). If the surface to be archived is a CPN surface, only the allocated sectors will be copied.

BACKUP first asks for the following archive information:

a) the hard disc surface to be archived
b) the date (in the form dd/mm/yy)
c) a title (for the hard disc contents) of upto 40 chrs

of which only the title is optional.

Once entered BACKUP will re-display the information and ask for confirmation. If not confirmed as correct it will ask for all information to be re-entered. When confirmed BACKUP will prompt for the space-bar to be pressed (once a formatted floppy disc is inserted in drive A) before starting the backup.

Note that BACKUP puts its own 'label' on each disc. This contains the archive information entered, a special BACKUP number, and the sequence number of the disc within this BACKUP. The BACKUP number is held on each hard disc surface and incremented at the end of a successful BACKUP.

After writing to each disc, BACKUP will ask for the disc to be removed, list the information to be written on its label, and request another disc (if necessary). For example, when the first disc has been written, a message of the form:

Remove floppy disc and label:
DISC F BACKUP No. 10 SEQUENCE No. 1

is displayed. Note that the archive information on any BACKUP disc may be checked later by using the BACKDATE utility.

Once the last disc has been written BACKUP will exit.

Errors

BACKUP makes various checks to ensure that no floppy disc from the current or previous backup is overwritten. The following error messages are displayed when appropriate:

Unable to access drive '_'

Not a hard disc drive

Invalid date/format

Unable to access floppy disc drive A

This floppy has already been used - try another

This floppy was used for the last BACKUP - try another

BACKUP will re-prompt after any of the above errors.

If a hard disc error occurs, BACKUP will give an error message but continue with the archive.

Notes and Restrictions

The RESTORE utility must be used to recover the hard disc information stored via BACKUP. Both these utilities may operate on remote hard discs over TORCHNET.

Since BACKUP only 'saves' allocated sectors it is suggested that MAPDISC is run first to check for (and correct) any used but unallocated sectors.

Once discs have been used by BACKUP they cannot be used as CPN discs unless reformatted.

The first time a physical surface is archived its BACKUP number may not be 1.

BACKDATE (v3.00)

Displays the "label" on BACKUP floppy discs.

Syntax

BACKDATE

Description

BACKDATE displays the header information (the 'label') of a floppy disc written by BACKUP as part of of a hard disc surface archive. It will also display the file directory if the disc is the first BACKUP disc of a CPN surface.

BACKDATE first requests for the space bar to be pressed once the floppy disc has been inserted into drive A. It then examines the header and displays:

a) the type of BACKUP (CPN or PHYSICAL).
b) the surface that was archived by BACKUP.
c) the BACKUP number.
d) the sequence number of the disc.
e) the BACKUP date.
f) the BACKUP title.

If the disc is the first BACKUP disc of a CPN surface, the program also asks if a directory listing is required. A Y(ES) response causes the name of all the available files, and their user numbers, to be listed in 2 columns.

After displaying all the information required, BACKDATE finishes with a prompt for another disc. If no further discs require checking then the [esc] key quits the program.

Errors

A number of self-explanatory error messages may be generated by BACKDATE. These are:

Unable to access drive A
Not a BACKUP disc in drive A

COPIER

(v2.04)

Copies the contents of a 40 track disc to an 80 track disc.

Syntax

COPIER

Description

COPIER copies the total contents of a 40 track disc to an 80 track disc using 80 track disc drives. The source disc can be either an ACORN or a TORCH format but the destination disc will always be created in the same format as the source. COPIER can also be used to create an exact duplicate of a 40 or 80 track disc.

When run COPIER will display the default set of copy parameters and a menu of options. The options allow the parameters to be modified to suit the type of copying required before it starts, and also allows the destination disc to be formatted and/or verified during the copying process.

C sets the copy for a single side or both sides.

S sets the source disc surface as A or B (if both sides to be copied) or as 0 or 1 or 2 or 3 (if a single side).

D sets the destination disc surface as A or B (if both sides to be copied) or as 0 or 1 or 2 or 3 (if a single side).

F sets/clears the format flag. If set the destination disc is formatted before the disc is copied.

V sets/clears the verify flag. If set the data is verified after being copied to the destination disc.

T sets the discs format to ACORN or TORCH.

Z sets the source disc as 40 or 80 track.

X sets the destination disc as 40 or 80 track.

B begins copying.

Q exits the program.

The default set of parameters will copy the first side of a 40 track ACORN disc in drive A to the first side of an 80 track disc in drive B.

Once the copy parameters have been set, the B option should be used to begin copying. COPIER will then display a confirmation prompt:

Insert discs and Press Any Key
to continue

When this prompt appears it is possible to press the escape key to return to the main menu.

Notes and Restrictions

You may encounter reliability problems when writing to 40 track discs using 80-track disc drives.

If requested, COPIER will attempt to copy an 80 track disc to a 40 track disc. The first 40 tracks will be copied successfully but attempts to copy the remaining tracks will continue unsuccessfully until the program is aborted.

If you Quit COPIER it will reboot the system.

DATETIME (v1.01)

Displays and sets the date and time.

Syntax

DATETIME

Description

This utility program will display and set the date and time. After loading, the program will first display a message such as:

The time is 14:42:36 on Mon 25-Sep-89

Do you wish to change this ?(y/n):

If you choose y(es) and intend to change the time and/or date (the name of day of the week and the month are computed automatically), type the correct numbers into the boxes which are presented like this on the screen :

Year [88]
Month [09]
Day [25]

Hours [14]
Minutes [42]
Seconds [36]

Note that the hours are calculated on the 24-hour system and that [return] or the cursor controls may be used to "skip" downwards to the next box (the cursor can also be skipped back up through the "Seconds - Minutes - Hours" boxes but NOT the "Day - Month - Year" boxes).

When you have completed the changes, the screen will ask you to confirm:

Set time to 14:42:36 on Sun 25-Sep-88? (y/n):

Note that - in this case - the corrected year has given rise to a changed day of the week. Typing y will set this date and time and the next time you type

DATETIME

- the computer will present you with up-dated information.

The boxes will not accept invalid times or dates.

EXEC (v0.21)

Enables a program to be run as part of a SUBMIT file.

Syntax

EXEC <characters>

Description

The EXEC utility enables a program requiring "keyboard response" to be run as part of a SUBMIT file (see **Appendix A** on **How to prepare Submit Files**).

The characters which follow EXEC can be stored - using the function key format (see KEY command, and below) - on any specified (and currently unused) function key.

If a particular key is not specified the character string will be directed to key 8 with an "overflow" into key 7. The maximum for this default condition is 120 characters.

When the operating system arrives at the EXEC program it reads the EXEC characters from the keyboard buffer and then runs the specified program.

Example

If a file such as AUTOBOOT.SUB is set up (see **How to start-up** section) it may be used to define the use of some of the function keys and to run the DATETIME utility program automatically (see the details under that heading).

By including

EXEC|xDATETIME|m

- as part of the Submit File, the correct date and time can be set from the keyboard at the end of the submit program.

Restrictions

Only one EXEC program should be included in any SUB file or sequence of such files.

The EXEC string has a limit of 58 characters for each key - see KEY command for further details.

While particular keys are being used by EXEC they cannot be used for other purposes.

FIND (v0.46)

Finds the location of a file (or range of files).

Syntax

FIND {drivelist:}{filename}

drivelist - any number of disc surfaces in the range A - P, in any order. If specified the last drive must be followed by a ':'. The default is the current disc drive.

filename - any specific or ambiguous filename (i.e. containing * and ?). The default is 'all files'.

Description

For each drive specified, FIND lists all occurrences of the filename (or range of matching filenames) together with additional information associated with each file as follows:

R/O - Read only file (Default is read/write)
Sys - System file (Default is User file)
[??] - User Number (Default is User [0])
????k - file size

the first two attributes are set by CPN's PROTECT option. Where appropriate the filenames are listed in 2 columns in alphabetical/User Number order. The lists are also produced in alphabetical drive sequence.

Examples

FIND

- this will list, in alphabetical order, every file on the current disc surface together with its User Number and size.

FIND BCD:*.COM

- this will list every file with a .COM extension that is stored on disc surfaces B, C and D.

FIND PM:A*.??

- this will list every file on disc surfaces M and P whose filename starts with A and has a 1 or 2 character extension.

FROMAT (v1.00)

Formats and verifies an entire hard disc (or initialises individual surfaces).

Syntax

FROMAT {datafile}

datafile - name of a file containing the parameters relating to the disc's physical dimensions

Description

FROMAT's main use is to format all the surfaces of a new hard disc and 'remove' any bad tracks before it leaves the factory. However it can also be used to check for and 'remove' any further tracks which may become corrupt, initialise the main directory on an individual disc surface or rewrite its disc (system) parameters.

WARNING - because of the 'ease' with which it erases large numbers of files FROMAT should be used with extreme caution. If in doubt, don't use it!

If called in conjunction with a valid datafile FROMAT will pick up the default system parameters from the file and immediately display the menu of options (see below). Datafiles for each of the hard discs supported by TORCH are given on the Hard Disc Utilities disc and are described in the file FROMAT.DOC.

If called without a datafile (or the datafile is not found or is invalid) FROMAT will first display a title page describing the type of hard disc to which it defaults. (If this is not correct press [escape] to return to the command line.) It then prompt for the hard disc's size when formatted (normally 10 or 20 Mbyte) and the number of floppy disc drives on the computer (1 or 2). These are then used in conjunction with the values built into FROMAT to create a set of default system parameters. Once these have been entered a menu will be displayed with the following options:

F Format (and verify) the entire disc.

V Verify the entire disc.

I Initialise individual surface directories.

W Write the system parameters to disc.

S Set the system parameters.

P Enable/disable output to a printer.

Q Quit.

F - formats the entire disc and then verifies it. In addition all directories are initialised and the system parameters are written to disc (i.e. options V, I & W). This process takes approximately 15 minutes on a 20Mbyte disc. FROMAT will request confirmation before starting to format the disc; a response other than Y (or YES) will cause a return to the menu.

V - verifies every track on the disc and flags any bad tracks as unusable. The address of any bad tracks will be printed if the printer has been enabled (option P). All data within a bad track will be 'lost'. This option may be used to clear some hard disc errors without having to reformat the entire disc.

I - initialises the main directory on a given disc surface (i.e. the directories for all User Areas). This allows the surface to be cleared of files without having to erase individual files or format the whole disc. FROMAT will first prompt for the surface of the directory to be initialised and then clear all entries in that directory. It will also write the system parameters to the same disc surface (i.e. option W).

Also use this option to reset a physical (e.g. UNIX) surface so that it can be re-used by CPN.

W - writes the system parameters to a single disc surface. FROMAT prompts for the surface to be modified. The default parameters are used unless the have been changed by the S option. The system parameters only need to be rewritten if they have become corrupted (e.g. if a 'Parm error' is given).

S - modifies the system parameters as used by the F,I and W options. The parameters are:

a) Sector size (256 or 512)
b) Interleave factor (1 to 31)
c) Number of Cylinders
c) Number of Heads
d) Reduced Write Cylinder
e) Precompensation Cylinder
f) ECC Data Burst Length

Once entered these parameters will be used in preference to the default system parameters. However they are not stored and will need to be reset each time FROMAT is restarted.

WARNING - The default system parameters are the only parameters which should be written to your hard disc unless the disc has been replaced. The S option should only be used by qualified TORCH suppliers with access to the disc's specification.

P - enables/disables output of error messages to a printer. This is especially useful when verifying (or formatting) a hard disc as it provides a perminent record of any bad tracks. Note that the printer must be set up correctly using the relevant *fx commands.

Q - return control to CPN.

The [escape] key may be used to abort the current option and return to the menu.

Notes and Restrictions

1) No range checking on many input fields.

2) [escape] does not abort the current option in all cases.

JOIN (v1.20)

Re-creates a file from the pieces generated by SPLIT.

Syntax

JOIN fname {drive {w}}

fname is the file to be re-created, specified in the form {d:}filename. The default drive is the current disc surface.

drive is the (optional) source disc surface (A-P). The default is the surface specified for the file to be re-created.

w When this optional flag is present JOIN will wait after re-joining each piece. In order to set this flag the source disc must also be specified.

A 'Usage' prompt listing the syntax required will be displayed if JOIN is run without any parameters.

Description

JOIN re-creates a single file from a number of smaller files (pieces). It should only be used to join files generated by SPLIT since it does not remove end-of-file markers and thus cannot be used to merge separate text files. The pieces may either be present on a single hard disc surface or on a number of floppy discs.

JOIN re-creates the original file by searching the given source for the pieces with identical primary names and with extensions .1, .2, .3 etc. The requested file is opened and each piece is added to it in extension number order until the next piece in the sequence cannot be found. At this point JOIN closes the file and exits. Note that the file-name of each piece is displayed as it is added to the file.

When the pieces are stored on more than one floppy disc the wait flag must be used to allow the user to change the discs when necessary. The discs should be labelled clearly with the extensions of the first and last pieces on the disc as well as the name of the original file. The next disc should be inserted when its first extension number is the next in sequence to the last filename displayed.

Examples

```
JOIN PHONE.LST
```

- this will re-create a phone list from the pieces on the same (default) disc.

```
JOIN F:DATABASE.FLS A W
```

- this will re-create a database from a set of backup floppies inserted (in sequence) into drive A.

Error Message

Failed to open any part file 'filespec'

Notes and Restrictions

1) User numbers cannot be added to the filespec. The pieces are searched for in the current User Area of the specified disc, and if not there, then in User Area 0. The file is always re-created in the current User Area on the destination disc.

2) JOIN takes approximately 15 minutes to rejoin each 380K piece from a floppy disc.

LS (v0.02)

Lists filenames alphabetically (inc User TITLE & number of files).

Syntax

LS {drivelist:}{filename}{[userno]}

drivelist - any number of disc surfaces in the range A - P, in any order. If specified the last drive letter must be followed by a ':'. The default is the current disc drive.

filename - any specific or ambiguous filename (i.e. containing * and ?). The default is 'all files'.

userno - any user number in the range 0 - 31. The default is the current user number.

Description

LS will display the names of files on a specific user number and specific disc surface. The names are listed in alphabetical order across 5 columns. In addition the title of the User Directory (as stored in TITLE.LS) and the number of files within it are displayed above the filenames.

Examples

LS

- this will list all files in the current user number of the current drive.

LS B:[4]

- this will list all user 4 files on drive B.

LS A:*.COM[3]

- this will list all user 3 .COM files on drive A.

LS AB:*.*

- this will list all files on the current user number of drives A and B.

MAPDISC (v4.20)

Finds and corrects discrepancies in a disc's allocation map.

Syntax

MAPDISC

Description

Each surface of a TORCH formatted disc contains an allocation 'map' indicating which sectors of the disc have been allocated to files and which are free (unallocated). This map is used and maintained by the CPN operating system when creating, copying or deleting files.

MAPDISC is used to display the allocation map of a disc and compare this map with the sectors that are actually used within the file structure. Inconsistencies in the map are then higlighted and the corrections written back to disc.

When MAPDISC is run it will first ask for the drive to be scanned. At this point it will only accept a letter of an assigned disc drive (in the range A to P) or the Q(uit) key. Pressing Q(uit) will just cause MAPDISC to exit. A valid disc drive causes the allocation map to be read into memory and displayed on the screen together with a short menu of options.

The Allocation Map (see Appendix B - CPN Disc Structure)

The allocation map is shown as a matrix of boxes (cells), each of which represents a sector of the disc. Unallocated sectors are shown 'empty' (a grey box around the yellow background) while allocated sectors are shown 'full' (completely grey).

For floppy discs each column of the matrix represents a cylinder of the disc. The cylinders are numbered from 1 to 79 (cylinder 0 holds the directory and allocation map and is not shown). Each cylinder is divided to represent the two sides of the disc (side 0 and side 1) and the sectors on each side of a cylinder are numbered from 0 to 9. Thus the address of any sector may be read from the display in the form Cylinder:Side:Sectornumber (c:s:e) and used to uniquely reference that sector. For example the last sector on a floppy disc has a sector address of 79:1:9.

For hard disc drives each column of the matrix represents a track (numbered from 2 to 1023) with 16 sectors per track ('numbered' 0 to F). In this case the address of a sector is read in the form Track:Sectornumber (t:e). For example the last sector on a hard disc drive is 1023:F.

The only options available on the short menu are:

F - Full check of directory
N - Next disc
Q - Quit

Option F uses the disc's directory structure to create another map of the sectors that are actually used to store file information. It then compares this with the disc's allocation map and displays the status of each sector together with a full menu of options.

The Sector Status Map

The symbols shown on the sector status map are interpreted as follows:

An 'empty' cell - an unallocated and unused sector.

A 'full' cell - an allocated sector that contains data.

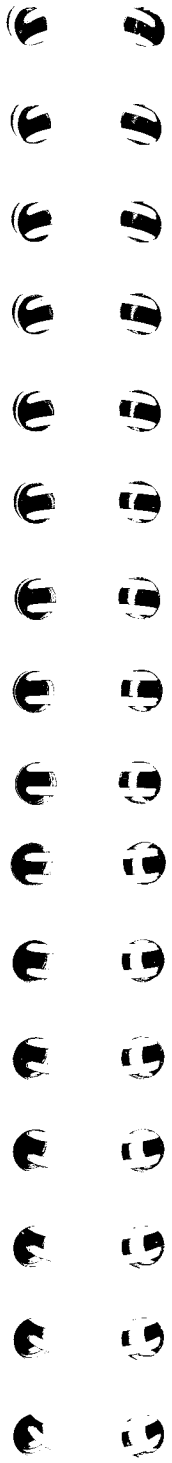
A cell with a vertical line - an allocated sector that contains an L2 block.

A cell with a horizontal line - an allocated sector that contains an L3 block.

A cell containing a 'X' - an allocated but unused sector (garbage).

A cell containing a 'u' - an unallocated but used sector.

A cell with a grey dot - an allocated sector used by more than one file (multiple allocated).



The options available on the full menu are as follows:

A displays all types of sectors.

G displays only allocated but unused sectors. (garbage)

U displays only unallocated sectors.

M displays only multiple allocated sectors.

2 displays only L2 blocks.

3 displays only L3 blocks.

H displays information about the next file, i.e:

a) the filename
b) its user number
c) its directory entry number (0 to 255)

and highlights all the sectors used by the file by displaying them in blue instead of grey. The 'next' file is taken to be the first file in the directory if the H (or R) option has not yet been used.

R displays information about the previous file. The 'previous' file is taken to be the last file in the directory if the R (or H) option has not yet been used.

T 'tidies' the sector status map by setting all allocated but unused sectors to be unallocated, and all un-allocated but used sectors to be allocated. In this way it stops unallocated but used sectors from being used by a different file and enables garbage sectors to be re-used. When complete the message "Tidied" is displayed on the screen. Note: once 'tidied' the W option must be used to update the allocation map on the disc to match the sector status map.

P 'protects' all unused sectors on the sector status map from being used, by setting them as allocated (i.e garbage). In this way it stops the operating system from overwriting any sectors until 'bad' (e.g. multiple allocated) sectors have been sorted out. When complete the message "Protected" is displayed on the screen. Note: once 'protected' the W option must be used to update the allocation map on the disc to match the sector status map.

W updates the allocation map to match the sector status map and writes it back to disc (only necessary after the T or P options).

N requests another disc to be scanned.

Q quits the program.

Additional options when using a Hard Disc Drive

For hard disc drives only part of the map is displayed at any one time. Other parts of the map may be viewed by scrolling left and right with the following keys:

[< ({ scroll the map to the left.

] >) } scroll the map to the right.

When the map reaches the first (or last) track the left (or right) scroll function will be disabled and it will disappear from the menu.

Since less than a twelfth of a hard disc drive can be displayed at a time it is difficult to manually scan it for 'bad' sectors. The S ('scrunch') option overcomes this by producing a single display that contains the most significant sectors of the entire status map. This is done by compressing the status map horizontally so that each cell displays the "most important" sector (with the same sector number) out of a group of consecutive tracks. The order used in determining the "most important" sector is:

Multiple allocated sector in the current file.

Unallocated sector in the current file.

Multiple allocated sector.

Unallocated but used sector.

L2 Block in the current file.

L3 Block in the current file.

Data sector in the current file.

Allocated but unused sector (Garbage).

L2 Block.

L3 Block.

Data sector.

Unallocated and unused sector.

The track number of the first track in each group is given above each column of cells.

Examples

Use MAPDISC to check (and correct) the consistency of your disc, especially:

a) just before any type of backup.
b) after an inconsistent disc error message.
c) if a commonly used program or utility suddenly crashes or acts as if it were a different program.
d) immediately after a full reset if not done while at the command line prompt.

Notes and Restrictions

MAPDISC displays various messages in the top lefthand corner of the screen while it is carrying out an option. These are **Working** while it is accessing a disc and **Drawing Map** while it is rewriting the screen.

If MAPDISC is in the middle of drawing a map, and a key is pressed which is a valid option, then MAPDISC will break off from drawing the map and execute the option selected. In this manner a particular file may be rapidly highlighted without waiting for the map to be drawn for each of the intermediate files.

MCPVARS (v1.00)

Displays and modifies MCP variables.

Syntax

MCPVARS {varno {value}}

- where **varno** is the variable's identity number (0 to 22)

and **value** is the required new value (0 to 255)

Description

Typing **MCPVARS** - without adding the optional **varno** and **value** - will display on the screen a list of the existing settings of the variables within the MCP operating system.

Typing **MCPVARS** - with the **varno** - will display an explanatory message with the current setting of the chosen variable.

Typing **MCPVARS** - with the **varno** and a new value for **value** - will change this value and confirm it by displaying the new setting in an explanatory message.

Further details of the effect of changing variables are given in the **Programmer's Guide**.

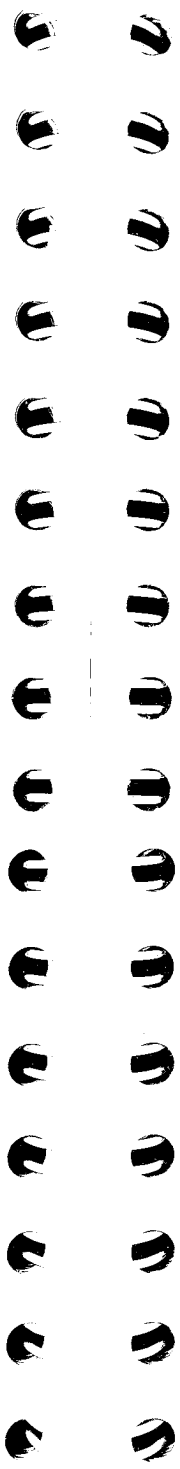
Examples

MCPVARS 5

- would display the number of times the operating system retries reading and/or writing to a disc when disc errors occur.

MCPVARS 13 24

- would set the character actually printed out when a pound sign (ASCII 96) is sent to the printer to be the $ (dollar) sign - whose ASCII equivalent is 24.



POKEDISC (v4.12)

Displays and modifies individual sectors of a disc drive.

Syntax

POKEDISC

Description

POKEDISC provides facilities to scan a disc and change the contents of its sectors directly, without using the normal file structure (see **Appendix B** for details).

When run POKEDISC will display the following:

a) program title and version number
b) disc drive letter and sector address
c) sector information shown in one of 4 modes
d) menu of options

Initially the sector information displayed will be for:

a) the specified disc drive.
b) the first sector of the drive (in directory mode).

Selecting another disc drive

Two options are available for changing the disc drive:

A switches to drive A:

B switches to drive B: (if only A & B available)
prompts for the required drive (if other drives exist)

POKEDISC will only switch to an attached drive.

The menu of Options

The menu lists all the available options in 3 parts.

COPY displays the next part of the menu.

[f1] displays a screen of HELP information.

[f0] quits a particular option or the program.

Sector display modes

Each sector may be displayed in any one of 4 different display modes which are easily set by using the following options:

D directory mode - displays the sector as a set of 16 directory entries, with each entry split into the following fields:

```
Type       - L2, L3 'Unused' or 'No more'.
Address    - sector address (of L2 or L3 block).
Limit      - the highest record number used.
User       - user number.
Filename   - 11 characters (with an implied '.').
                White filename = User file
                Red filename   = System file
Attributes -    R = Read only file
                W = Write and Read file
```

H hexadecimal mode - displays the sector as 256 pairs of hexadecimal characters.

K character mode - displays the sector information as ASCII characters. If a byte is not displayable then a hexadecimal code is shown instead. For instance, a carriage return is displayed as '0D'. A yellow character or code indicates that the most significant bit of the character is set. A space with the most significant bit set is represented by the symbol of a square bracket on its side in yellow.

M mixed mode - displays one eighth of the sector (32 bytes) in 3 different modes. The 32 bytes being displayed are treated as 16 2-byte words. Each word is displayed as

```
16 bits
4 hex digits        (= H mode)
2 characters        (= K mode)
```

Note: because of the way the 6502 handles words, the least significant byte holds the first character.

Moving the cursor (& Byte Addresses)

The cursor may be moved to any byte of the sector information by using the cursor control keys. In addition:

[Line](^L)moves the cursor to the start of the current line.

[return] moves the cursor to the start of the next line.

Each byte within a sector may be uniquely identified by its 2 'digit' hexadecimal address (in the range 00 to FF). The address of the first byte of each row is given in the left most column of the sector information.

G goes to a specific byte in the current sector. When selected POKEDISC prompts for the address of the byte. As soon as a valid address is keyed the cursor will move to the appropriate byte (or the character or symbol representing the byte). For example GFF will position the cursor onto the last byte.

Scrolling sector information

In mixed mode only part of the sector information is displayed. In this case the addresses of the first and last byte displayed is given in the top right hand corner of the screen. To allow the rest of the sector to be viewed 2 options are provided that move (scroll) the display 'window' a line at a time within the current sector.

W scrolls upwards (to the start of the sector)

Z scrolls downwards (to the end of the sector)

Holding either key down repeats the scrolling until the sector boundary is reached. The address of the first and last bytes are modified as the scrolling occurs.

The 4 cursor control keys will also scroll in the same way as W or Z when the cursor reaches the top or bottom of the 'window'.

The G option will automatically move the display 'window' to the appropriate part of the sector information if necessary.

Sector addresses

Sector addresses are entered and displayed in one of two forms depending on the type of disc being scanned.

Floppy discs have sector addresses with the format (c:s:e) where:

c:	is the cylinder number	(0 to 79)
s:	is the side	(0 or 1)
e:	is the sector number	(0 to 9)

e.g. the last sector on a floppy disc is 79:1:9.

Hard discs have sector addresses with the format (t:e) where:

t:	is the track number	(0 to 1023)
e:	is the sector number	(0 to F(hex))

e.g. the last sector on a hard disc drive is 1023:F.

T switches between the 2 forms of sector address for all occurrences on the display, including the menu.

Sector addresses entered by the user are always validated according to the disc type and the current address format.

Selecting another sector

A number of keys may be used to move (or jump) between sectors:

0 - moves to the start of the directory (sector 0:0:0)
1 - moves to the start of the 2nd part of the directory (sector 0:1:0)
5 - moves to the end of the directory (sector 0:1:5)
6 - moves to the start of the allocation map (sector 0:1:6)
9 - moves to end of the first part of the directory (sector 0:0:9)
S - moves to the other side of the disc (=track+/-1)
C - moves to the next cylinder (=track+2)
R - moves to the previous cylinder (=track-2)
X - moves to the next sector
E - moves to the previous sector
P - moves to the previously displayed sector
J - jumps to any sector (see details below)

The **E** and **X** keys move to a different cylinder or track if necessary.

With the Jump option POKEDISC requests a valid sector address in the current format. Note that the **: ; - . ,** **[space]** or **[return]** keys can all be used to move to the next part of the address and initiate the jump once a valid address has been keyed. In addition [delete] can be used to correct an address and [escape] used to abandon the jump.

Each 'new' sector is displayed in the currently selected display mode, except that a move into the directory switches to Directory mode and a move out of the directory sector switches to the last mode manually selected.

[redo](^R) saves the address of the current sector in one of the soft function key buffers. POKEDISC will ask for a function key to be pressed but only function keys f4 to f10 will be accepted. (Use the Q(uit) key to abort this option.) Once the address has been saved a return can be made to this sector at any time simply by pressing the appropriate function key.

Modifying sector information

To modify sector information it is first necessary to display the sector to be modified (in the most appropriate display mode) and then enter edit mode.

[begin] (^B) enters EDIT mode

Once in edit mode it is not possible to change the current display mode, or move from the current sector. The cursor control, **[CTRL]** **L** and **[return]** keys can still be used to move the cursor to the information to be edited but the G(oto) option is not available.

In Character mode (inc Mixed)

To enter a character that is not on the keyboard first press the **[escape]** key followed by its 2 'digit' hex code.

The " key, and the ' key may be used to set and clear, respectively, the most significant bit of a byte.

In Directory mode

Valid characters for the type field are:

3 - L3 block
2 - L2 block
1 - L1 block (not used)
* - Reserved disc (if used in first directory entry)
N - No more
D - Deleted (see details below)

Valid characters for the attributes of a file are:

R - Read only file
W - Write and read file
S - System file
U - User file

Completing a sector edit

Once all editing of a sector is complete a return must be made to display mode.

[end] (^E) ends EDIT mode.

Once out of edit mode the modified information must either be written to disc or else overwritten (lost) by using one of the following options:

[undo] (^U) rereads the current sector from disc. Any editing that has taken place will be lost.

[insert] (^N) writes the displayed information back to disc. POKEDISC will first ask

Output sector to disc?

Only the Y(es) and N(o) keys are valid at this point, with the obvious results.

Note that once the currently displayed sector has been modified in any way, any option that displays a different sector will automatically invoke the INSERT option first.

Moving information between sectors

Complete sectors of information can be easily moved around the disc by using the following 2 options:

[window] (^T) saves the contents of the current sector in a special buffer.

[screen] (^S) copies the contents of the buffer into the current sector on display. The sector must then be updated on disc by INSERTing it, either specifically or when moving to another sector.

Examples

Use POKEDISC to:

a) Investigate and repair a corrupt file.

b) Patch a program file without having to re-compile.

Notes and Restrictions

When using POKEDISC the typeahead facility is suppressed. That is it will only "remember" the first letter that is typed while carrying out the current option.

RECALL (v3.00)

Restores single CPN files from BACKUP floppy discs.

Syntax

RECALL

Description

RECALL recovers individual files that have been previously archived from a CPN hard disc surface using BACKUP. A file recovered in this way is always placed on the currently assigned disc drive and user area. It will overwrite any existing file with the same filename.

RECALL first prompts the user to load the first of the BACKUP floppy discs. It then displays the disc's BACKUP 'label' and asks for confirmation before proceeding.

It will then ask if a directory listing is required and - if requested - display a list of all the BACKUP files.

Next RECALL prompts for the name of the file to be recovered together with its user number. Once a valid file has been specified, RECALL will display the details of the BACKUP disc required, if not the current disc. For example the second BACKUP disc will be requested by a message of the form:

```
Insert floppy disc in drive A labelled:
Disc D  BACKUP No. 10  Sequence No. 2
```

This will be repeated for all the discs which contain part of the requested file. Note that files which were fragmented on the original CPN surface may need the same disc to be read more than once.

Errors

RECALL makes various checks to ensure the integrity of the file being recovered. The following error messages are displayed when appropriate:

```
Unable to access drive '_'
Not a BACKUP disc in drive A
Not a CPN BACKUP disc
Not FIRST BACKUP disc
Incorrect BACKUP drive name
Incorrect BACKUP number
Incorrect sequence number
File "filespec" not found on this BACKUP
Disc full - use another disc
```

Notes and Restrictions

The currently assigned disc drive must not be drive A: for obvious reasons!

RESTORE (v3.00)

Restores a hard disc surface from BACKUP floppy discs.

Syntax

RESTORE

Description

RESTORE recovers a hard disc surface that has been previously archived using BACKUP. If the surface was in CPN format, the program will only copy the allocated sectors.

It is possible to reload any CPN surface onto another surface of equivalent or larger size. It is also possible to restore physical (e.g. UNIX) surfaces onto any surface of identical size (except the first surface of a hard disc).

RESTORE first asks for the surface to be restored and prompts the user to load the first of the BACKUP floppy discs. It then displays the disc's BACKUP 'label' and asks for confirmation of the restore before proceeding.

After the first disc has been read, RESTORE will display the details of each of any additional BACKUP discs required. For example a second disc will be requested by a message of the form:

```
Insert floppy disc in drive A labelled:
Disc D  BACKUP No. 10  Sequence No. 2
```

When the last BACKUP disc has been read RESTORE will exit.

Errors

RESTORE makes various checks to ensure the integrity of the surface being recovered. The following error messages are displayed when appropriate:

```
Unable to access drive '_'
Not a hard disc drive
Unable to RESTORE Physical to FIRST hard surface
Unable to access floppy disc drive A
Not a BACKUP disc in drive A
Not FIRST BACKUP disc
Incorrect BACKUP drive name
Incorrect BACKUP number
Incorrect sequence number
```

RESTORE will re-prompt after any of the above errors.

Notes and Restrictions

It is not possible to recover single files with RESTORE.

When recovering a physical backup, RESTORE assumes that the BACKUP discs have the same capacity as the hard disc surface it is restoring. When not equal it will request non-existent BACKUP discs or give 'Disc Full' messages.

If you use RESTORE to transfer a backup of a hard disc surface on to a different physical hard disc (e.g. if your hard disc has been replaced) it will copy the backup disc's parameters on to the RESTOREd disc. If the hard discs are different "types" you must immediately run FROMAT (from floppy disc) and use the write parameter (W) option to write the correct parameters to each RESTOREd surface.

RWACORN (v1.00)

Converts between Acorn DFS and CPN file formats.

Syntax

RWACORN

Description

This program converts Acorn DFS files into the equivalent CPN format - and vice versa. Both source and destination discs must be 80-track and - **BEFORE using RWACORN** - any files stored on 40-track discs must be copied on to 80 track discs, using the COPIER program.

The program first asks for the floppy disc drive (A-P) into which you have loaded the DFS disc.

The next question is whether you will be using the "top" or the "bottom" of that drive. You should answer T(op) if the surface you need to copy from or to is DFS drive 0 or 1 - and B(ottom) if the required surface is DFS drive 2 or 3 (see **Appendix C** on **BBC BASIC DFS** for further explanation).

The answer to the next screen question determines whether you will be copying T(o) or F(rom) the DFS disc.

If you choose to copy T(o) the DFS disc you will first be asked for the CPN filename and then the DFS filename.

If you choose to copy F(rom) you will first be asked for the DFS filename and then the CPN filename to be copied to.

In both cases the CPN drive designation should precede the CPN filename. If you do not specify a drive name when copying to a CPN file, the current drive (displayed in the command line prompt) will be assumed. If the drive name you choose is the DFS drive, the program will ask you to try again.

Warning

If the drives are not properly specified , it is possible to corrupt your discs. If the program finds what it "thinks" is an incorrect disc type it will ask you to check and confirm before continuing.

As soon as a file has been successfully copied from one format to the other - with a screen message explaining what is happening - the program will ask for the next filename to be copied (see below for [escape] sequence).

If the DFS file you are transferring is a text file, leave a space and then type the letter 'T' after the CPN filename.

e.g. **B:LETTER.TXT T** is a text file.

(BBC basic programs should be converted to text format before using RWACORN, and so require this option. See note below on text files).

There is no need to specify the DFS drive, since this has already been decided, but you may specify a DFS directory - the default is "$" (see Appendix C for further details).

e.g. **A.DFSFILE** is a file in directory 'A.'

DFSTEXT is a file in the default directory '$'

If the disc or its directory are full, an appropriate message will be displayed and the transfer aborted. You may then change the disc and try again.

If a file with the same name already exists, you will be asked whether you wish to replace it. If you answer Y(es), the transfer will go ahead, deleting the existing file. Otherwise the transfer will be aborted and you can try again with a different name or a different disc.

[escape] will halt the program at any time and you will then be offered the choice of quitting with Y(es) or continuing the copying with N(o). The program will always "tidy up" before it stops copying and not leave any partially copied files on the disc.

Note:

DFS text files "mark" the end of line in a different way to CPN format files. The program does not alter this, because there may be many good reasons for keeping these different "styles". However the result may confuse some word processors. The usual CPN end of line is marked by a "carriage return" character <cr> followed by a "line feed" character <lf>. Some DFS files have these the other way round, or may have one of them missing altogether. If it is necessary to correct this, your word processor manual should provide information on exchanges and special characters.

SHIP (v2.00)

'Parks' the heads of a hard disc for shipment.

Syntax

SHIP

Description

SHIP minimises the risk of damage to the read/write heads of a hard disc, and the possible loss of data, during shipment. It will first try to put the heads in the 'park' position (available on some types of hard disc). If such parking is not available it places the heads in the best position to prevent them damaging information on the disc (especially the disc directories and allocation maps).

SHIP runs on machines with or without TORCHNET facilities, but will only access hard discs physically connected to the machine i.e. not just ATTACHed. It interfaces with all types of hard disc controller and recognises the following types of disc :-

BASF	**20 Mbytes**
RODIME	**10 or 20 Mbytes**
VERTEX	**50 Mbytes**

SHIP will first display the type of hard disc and then, after identifying the best location, it will position the heads and display:

Heads parked - Turn off power and pack for shipment.

- before returning to the command line. Power to the machine should then be turned off immediately, so that the heads will remain in that position during shipment.

Errors

If SHIP does not recognise the disc type it displays:**UNKNOWN**
If no hard disc surfaces are physically connected to the machine, SHIP will terminate after displaying the message:

SHIP will only park heads of HARD disc drives - stopping

If SHIP encounters any problems (such as an unknown type of disc) it will terminate after displaying:

Unable to park hard disc heads - consult service engineer

and, if the machine has TORCHNET facilities, it will add:

Note: all drives detached - Press <CTRL> and RESET

SOFTKEYS (v0.13)

Displays current contents of user-definable function keys.

Syntax

SOFTKEYS

Description

SOFTKEYS may be used to check on the current contents of the user-definable (soft) function keys. These may have been set up individually by the user (see KEY command), or automatically during the "start-up" procedure (see **How to start-up your TORCH**).

Example

If the automatic method of start-up has been chosen, the following keys will be set up - and reported on the screen like this:

```
KEY 0  "Q"
KEY 1  "H|M"
KEY 2  "COPY "
KEY 3  "TYPE "
KEY 4  "DIR "
KEY 5  "A:"
KEY 6  "B:"
KEY 7  "[LPS]|M"
KEY 8  ";This key is used by EXEC"
KEY 9  "XA|M"
KEY 10 "MODE 0|M"
```

If you chose the manual method of start-up, and then typed:

SOFTKEYS

- the screen message would be:

```
Key 0  "QUIT|M"
Key 1  "HELP|M"
Key 2  "NO|M"
Key 3  "YES|M"
Key 9  "|XBEGIN|M"
```


SPLIT (v1.20)

Splits a large file into a number of smaller files.

Syntax

SPLIT psize fspec {drive {w}}

psize is the size in Kbytes of the pieces (files) to be created. This argument is mandatory and must be an integer between 1 and 380.

fspec is the file to be split, specified in the form {d:}filename. The default drive is the current disc surface.

drive is the (optional) destination surface (A-P). The default is the drive containing the file.

w When this optional flag is present SPLIT will wait after creating each piece. In order to set this flag the destination surface must also be specified.

A 'Usage' prompt listing the syntax required will be displayed if SPLIT is run without any parameters.

Description

SPLIT takes any large file and splits it into a maximum of 200 smaller files (pieces). Its main use is to backup a hard disc file on to floppy discs. For this reason the maximum size of pieces that can be created is 380 Kbytes. The pieces may be either created on the original (hard) disc and transferred to floppy disc later, or created directly on to a floppy disc.

When creating files directly onto floppy disc the wait flag must be used if the file to be split is larger than 380K (which is normally the case). Using the wait flag causes SPLIT to stop after the creation of each piece and wait for the RETURN key to be pressed. Before doing this the user should change to another formatted disc if the next piece will overflow the current disc, otherwise SPLIT will abort with a 'Disc Full' error message (in order to calculate this point easily only blank formatted discs should be used when splitting files).

The filenames of the pieces created by SPLIT are allocated primary names identical to that of the original file but with unique file extensions in the sequence .1, .2, .3 etc. The name of each piece is displayed on the screen as it is being created. Any existing files with identical filenames are overwritten.

WARNING: The pieces should not be renamed as the extension sequence is used by JOIN when re-creating the original file. In addition make sure that all floppy discs containing split files are labelled with the original filename plus the first and last extension numbers (e.g. ADDRESS.LST [.1 to .5]).

Examples

SPLIT 50 PHONE.LST

this will create two 50K files (PHONE.1 & PHONE.2) plus a 45K file (PHONE.3) on the same disc as PHONE.LST, assuming the latter is 145K long.

SPLIT 380 F:DATABASE.FLS A W

this will take a database file on surface F: and split it into a number of 380k files which it will store on a series of floppy discs inserted into drive A.

Error Messages

a) Unable to open file to be split 'filespec'.
b) Invalid size given for pieces.
c) Illegal disc name given.
d) Write failed whilst writing to 'filespec'.

Notes and Restrictions

1) User Numbers cannot be added to the filespec. The file is searched for in the current User Area of the specified disc, and if not there then in User Area 0. The pieces are always created in the current User Area on the destination disc.

2) SPLIT takes appx 15 minutes to create each 380k file on a floppy disc.

3) SPLIT may also be used to reduce the size of files transmitted over noisy communication lines (e.g. when using TORCHMAIL), thereby minimising retries and hence transmission costs.

TITLE (v0.03)

Stores and lists title information for individual user numbers.

Syntax

TITLE [drive][userno]...

drive - any disc surface (in the range A - Z). The default is the current drive.

userno - any user number (in the range 0 - 31). The default is the current user number.

Note: All non-alphanumeric characters are ignored and may therefore be used as parameter separators.

Description

TITLE is used to both enter individual user titles and to list the titles in user number order. TITLE must initially be called with one or more user numbers in order for it to create the file TITLE.LS on user number [0] of the current drive. It uses this file to store all user titles entered on this and future occasions.

Each disc drive specified causes the titles for that drive to be listed in user number order. An error message will be given if the file TITLE.LS cannot be found on user number [0] of the specified drive.

Each user number will cause a prompt for a title for that user on the last drive specified. At this point a string of up to 64 characters may be entered. Just pressing the [return] key without entering a title will remove any existing title for that user number while [CTRL] C will abort the program and return control to CPN.

Examples

TITLE 1 2 3

- this will create the file TITLE.LS on the current drive if not already created, and prompt for title descriptions of user numbers 1, 2 and 3.

TITLE

- this will list the user titles on the current drive.

TITLE c,1,2,c d,1,2,d

- this will list the titles for drive C, prompt for new user titles 1 and 2, and then display the modified list once entered. This will then be repeated for drive D.

Error Messages

a) User number must be in the range 0-31

b) No title file found on disc '_' - use TITLE n

Notes and Restrictions

1) TITLE just exits if drive not in range A - P.

2) Currently assigned disc may be changed after error (b).

TORCHBUG (v0.02)

A monitor and debugging aid.

Syntax

TORCHBUG {filename}

Description

TORCHBUG is a simple "debugger" program capable of loading files (either object code or Intel Hex), modifying and testing the code, and then saving the resulting program.

When run, TORCHBUG loads and automatically locates itself at the top of the free store. If a filename is also typed in at the command line as a parameter then that file will be loaded at 0100(hex) - but not executed. TORCHBUG will then display a menu of options and the TORCHBUG prompt **TBUG>**.

Options

(f1) HELP - pressing this key will reveal some information about what options are available from the part of the program in use. It usually leaves the user in the same mode as if no key had been pressed, but an exception to this is "Modify" mode where the program will return to the **TBUG>** prompt if HELP is requested.

(f0) QUIT - pressing this key will quit TORCHBUG and return to the CPN prompt. A re-set or "cold boot" is performed (see Appendix E for details of restart levels), removing TORCHBUG from the system and preventing the SAVE option being used (see below).

G Go - this option allows the user to execute a program from any memory location. The address to "go" from should be entered as a hexadecimal number terminated by a [return].

I Load Intel hex file - the name of a hex file should be entered in the format given below. Errors detected in the standard hex format will stop the loading and display an error message. The file will be displayed as it loads.

L Load "COM" file - this option will ask for a filename and then the first location in memory from which the program should be loaded. Note that no checks are made to prevent overwriting of the CPN etc.

M Modify memory - this option allows the dumping and modifying of blocks of memory. The first address will be prompted for as in G above. Memory is displayed in blocks of 16 bytes in hex format followed by the 16 characters made up from those numbers with the MSB set to zero and non-printing characters displayed as '.'. To change memory locations copy the new values on to the cursor line and press [return]. If fewer than 16 hex numbers are entered then only the first few bytes of that block may be modified. The line will then be displayed again and may be further modified. If a "dot" (.) is entered on the line then the program will return to the TBUG prompt. To display the next 16 bytes of memory, simply press [return] without modifying anything. Holding [return] down will allow large areas of memory to be displayed.

Warning

Any entries other than those specified above (or HELP) will cause the current line of memory to be cleared to 0.

R Register display and modify - this option first asks for the name of a register. Registers AF, BC, DE, HL, IX, IY, SP, and PC, may be modified by this option and - except for IX, IY - the first letter is sufficient to identify the register. Upper or lower case may be used. If register name X is entered, the main register set and the alternative register set will be exchanged in the register buffer. Pressing [return] on its own will display the current value of all registers in the register buffer.

S Save file - this option allows areas of memory to be saved to disc. The user is prompted for filename and also for the first and last addresses to be saved. This means that programs need not be saved from location 0.

All filenames entered when using TORCHBUG (except the optional one on the command line) have the following format. Optional drive name A or B followed by ":", up to 8 characters, then an optional "." and a 3-character extension. If the extension is omitted it always defaults to '.COM'. The filename is taken to be "as entered" and does not substitute "uppercasing". This last point allows access to any files consisting of printing characters only.

All hexadecimal numbers except those used by the Modify option are of the following format: any number of characters consisting only of 0-9 and A-F or a-f, terminated by any other character. Numbers entered to modify a block of memory must contain exactly 2 digits.

Example

One of the most important uses of TORCHBUG is to allow customisation of programs such as WordStar for the Torch computer.

Assuming that the required "patches" are in the Intel Hex file WSPAT.HEX and you also possess WSCUSTOM.COM, to produce a copy of WordStar for the Torch, the following procedure should be used:

Install WordStar without selecting any terminal but installing whichever printer driver is appropriate to your own installation. Assuming that the disc in drive A now contains the files mentioned above, together with TORCHBUG.COM and a WordStar file (here called WS.COM) - enter the following:

TORCHBUG WS.COM

The **TBUG>** prompt should appear.

WordStar is now in memory and the patch file can be loaded by pressing I. The prompt 'Filename:' will appear and WSPAT.HEX should be entered. N.B. If no extension is given then the file type will default to '.COM'. The hex file will load and be linked automatically into the existing program. The next stage is to save the patched version of WordStar by pressing S and then a new filename such as WS1.COM to save the patched WordStar. The start address should be given as 0100 and the end address as 3f00. The name under which WordStar is saved should not already exist on the disc as TORCHBUG will never delete an existing file.

VARDISC (v1.00)

Partitions a hard disc into surfaces of differing sizes.

Syntax

VARDISC

Description

VARDISC varies the size and number of hard disc surfaces (physical drives). It is normally used to alter the "standard" hard disc configuration set up by FROMAT during the manufacturing process.

Each hard disc surface can be "set" to any whole number of Megabytes between 1 and 16 instead of the standard 4 Mbytes.

Creating 1 to 3 Mbyte surfaces causes additional surfaces to be created on the same disc. This permits better segregation of information and may also allow additional files to be stored, since the directory of a 4 Mbyte surface often reaches full capacity long before the surface itself.

Note, however, that unlike UNIX the CPN operating system cannot address information beyond the 4 Mbyte boundary of each surface. VARDISC sets surfaces greater than 4 Mbyte as 'Restricted' and therefore unavailable to CPN. Since the first surface of a hard disc must be available to CPN it will not set it larger than 4 Mbytes.

5 to 16 Mbyte surfaces may be necessary when storing a large database in a single file under UNIX.

VARDISC may be used AT ANY TIME and can therefore be used to delete all existing files on a hard disc. For this reason it should be used with extreme caution and not kept on the hard disc.

Start Up

VARDISC first checks the hardware and firmware to see if it is appropriate (see Restrictions) and if not it reports "no hard disc connected" or "incorrect firmware" before returning to the command line.

If VARDISC discovers that it is dealing with anything other than a completely blank formatted disc it will report this and ask you if you wish to continue (and so lose all existing information stored on that hard disc).

Pressing [return] at this stage will quit the program but typing DESTROY CONTENTS will allow the program to proceed. If "destruction" is confirmed - or if the disc appears to be completely blank - the main display will be revealed.

Main Display

The main display is divided into a number of different "regions" of information. The size of the hard disc (and the number of floppy discs) is given at the top right-hand side of the screen. The left-hand side of the screen displays the disc's existing partitioning - displayed in both numbers of Mbytes and in coloured bar chart form (one square per Mbyte). The text window on the right hand side of the screen is used to display the currently available options. However this is overwritten by further Help information (when requested) or further information about the error messages given when an invalid surface size is entered. The main error messages are displayed on the prompt line at the bottom of the screen which normally provides information on what to do next.

Selecting New Surface Sizes

Initially the OPTIONS presented in the window are:

<F1> - displays Help information.

<esc> - immediately exits from the program.

<E> - allows editing of the surface sizes.

As soon as the <E> Option is chosen, the cursor will move to the size field of the first hard disc surface and a set of editing ACTIONS will be presented in the window:

<Number> [return] - specifies the size of a surface.

<Cursor Keys> - changes the surface being edited.

<P> - puts partitions on to disc.

<F1> - asks for help.

<esc> - returns to the Option menu.

Each time [return] is pressed, the number entered is checked against the restrictions outlined below and - if valid - the display is updated accordingly. The total amount of storage space on the disc is constant and the program will automatically add to, or taking space from, surfaces below the cursor position.

Errors

Errors are given when the size entered:

- on the first hard disc surface was greater than 4 Mbytes.
- on any surface was 0 Mbytes or greater than 16 Mbytes.
- required more disc space than was available.
- released disc space which could not be redistributed.

When an error is detected a bleep will sound and an error message displayed together with additional text in the window. The window will also include an invitation to display further information (if any) or Continue. This will reset the message line and the text window to its previous form and clear the input which caused the error.

Partitioning

Press P to partition the hard disc once the surface sizes have been edited. Confirmation will be requested - press "Y" if you are ready to partition the hard disc and any other key if not.

Pressing Y causes the hard disc to be divided into the separate partitions (disc 'drives') requested. For each disc drive the information written will be a blank directory and an appropriately filled allocation map. As each drive is "set up" the appropriate drive letter on the screen will be changed to inverse video.

Once the directory and allocation maps have been sucessfully written for all drives, the disc parameters are written to each of the drives with the appropriate checksum.

As soon as the partitioning is complete VARDISC will display an appropriate message requesting a key to be pressed. Pressing any key causes the machine to be re-started so that the operating system will "recognise" the new surface sizes.

SECTION 5

TORCHNET - local area network

Introduction to TORCHNET

The TORCHNET local area network allows individual computer systems to communicate with each other - first of all through simple screen messages, which can be announced with an audible "CALL". But its most important uses are in the sending, receiving and sharing of network information and peripheral equipment such as printers and data storage devices.

TORCHNET has been designed to be simple and friendly to use - the important points to bear in mind while you are learning how to use it are not to be too impatient, at first, either with yourself or the TORCHNET system !

The best way to get to know all about TORCHNET commands is to try out each example as you read through - heeding the **Warnings** where necessary.

Some of the more common messages which TORCHNET may use to tell you what is happening on the network are given at the end of this section. A more detailed description of all Errors and Error messages is given in the **Programmer's Guide** which also contains further technical information.

When first switched on your system will display a prompt such as:

99:0A>

The most important part of this prompt is the station identifier number - in this case 99. Each station is allocated a number between 1 and 254 to identify it to other stations. Your network supervisor organises this allocation.

The "0" in the prompt refers to the current user number while the "A" refers to the current disc drive (see **What the screen tells you** for further explanation).

TORCHNET introduces itself

TORCHNET is very friendly - it will actually speak to you to let you know when a message has been sent to you from another station.

Just to demonstrate this - and to help you get used to the way it works - it will even let you send a message to yourself!

Type in:

NOTIFY (your own station number) **Welcome to TORCHNET!**[return]

Soon after you press [return] you should hear the word "CALL"(if you have a speech "chip") - or a "beep" - and the screen will look like this:

*****From 99 Welcome to TORCHNET!**

- with, of course, your own station number in place of "99".

Note

To avoid unnecessary repetition, the instruction to press **[return]** after each entry will be assumed throughout the rest of this section - as it is in the rest of this **User Guide.**

How to send a message on TORCHNET

If you know someone else's station identifier number you could start by sending them a message, or get them to send you one, by using this command:

NOTIFY (station number) message

Just type the text in at the keyboard exactly as shown above and keep the message as short as possible (this is for a very good reason - explained in the full description of the NOTIFY command).

If for any reason your message is not successfully received by the other station, don't panic! TORCHNET will display a message explaining what has happened.

A description of the more common replies and what they mean is given in **TORCHNET Errors.**

Using TORCHNET seriously

The real power of TORCHNET is its ability to transfer data between stations using a special set of built-in TORCHNET commands.

The most important TORCHNET command is ATTACH which allows the station using it to gain access to the disc drives of other stations on the network.

Many of the other commands are also important - especially DETACH (see **Warning**) - and it is a good idea to read quickly through this whole TORCHNET command section before venturing on to the network.

If you are not already experienced in using disc systems, please read **The Disc System** section before going any further. It is essential to know all about disc drives before using TORCHNET seriously.

Warning

Once a link has been set up between two stations with the **ATTACH** command, it must only be broken by the use of the **DETACH** command - see below for further details of the use of these commands.

DO NOT try to end the link by resetting or switching off either station as this could lead to data corruption, or upset other TORCHNET users.

TORCHNET Commands

This section contains a detailed description (in alphabetical order) of the commands which are available with TORCHNET.

Each TORCHNET command will be set out in the following format:

NAME
- the actual characters to be typed into the keyboard followed by a simple description of what the command does.

Syntax
- explains how to initiate the command, what parameters may be needed and how to arrange them.

Description
- provides a more detailed explanation of the effect of the command.

Options
- provides details of options.

Examples/Warnings/Restrictions
- any other information which may be helpful in practice

Set out below are the TORCHNET command parameters used in this section.

Parameter	*Description*
<statid>	**STAT**ion **ID**entifier - the number on your machine which must be unique and between 1 and 254.
<ld>	"logical" drive - the identity given by one station on a network to the disc drive(s) at another station to which it has become ATTACHed (a character between A and P).
<pd>	"physical" drive - the identity of a network station's own existing disc drive(s) (a character between A and Z).
{}	Anything within these "curly brackets" is optional.

ATTACH

Sets up links between TORCHNET station disc drives.

Syntax

ATTACH <ld> **TO** {<statid>} <pd> {[options]}

Description

This command is used to set up a "logical" disc drive (ld) by ATTACHing to a specific "physical" disc drive (pd) at another - or the same - station. The corresponding PERMIT command is usually required (see PERMIT command in this section and **Privileged Stations** under FORBID command).

Once set up, each logical drive may be used in the same way as the station's own (physical) drives (see **The Disc System** and **Commands** sections).

Each logical drive designation must be within the range A to Z and the physical drive to which it is linked must not already have a conflicting ATTACH to any other station.

If the statid is omitted, the system will attempt to attach to the station's own drive.

The ATTACH command can be cancelled by the DETACH command.

Options - in descending order of precedence

W will allow access for both "read" and "write" to the specified drive. Only one station at a time can be ATTACHed to a drive for "read/write" access. This is normally referred to as just "write" access.

R will allow "read only" access to the drive.

This option will be chosen "automatically" - if no other option is specified in the command.

D will allow "Dynamic read" access to the drive - even if another station already has "write" access to it.

"Dynamic read" means that the station making the ATTACH command is aware that - because another station may have ATTACHed for (and be in the process of) writing to the drive - the information being read could be altered or incomplete.

B will allow the "Best" possible read access to the drive in the circumstances - "read only" if possible, but "Dynamic read" if not.

The "Best" option tries to secure "read only" access first. If it fails - because another station has already succeeded in ATTACHing for "write" access - it will allow "Dynamic read" instead.

Downgrading

The Options above are set out in their order of precedence and - once a link has been established - it is possible to "downgrade" it by using another ATTACH command with a "lower precedence " option (see examples below). It is not possible to "upgrade" to a higher access level in a similar way.

Examples

ATTACH K TO 45 B [D]

- attaches your logical drive K to physical drive B at station 45 for a "Dynamic read" and will do so even if another station is writing to this drive at station 45.

ATTACH C TO 112 A [W]

This would give "read and write" access to the disc in drive A at station 112. This is assuming - as with all such ATTACH commands - that the appropriate PERMIT has been given and that no other station is writing to this drive (including the station itself - because each station is ATTACHed automatically for "write" access to its own drives on power up).

ATTACH C TO 112 A [D]

- would "downgrade" the link to "Dynamic read" access.

DETACH

Countermands ATTACH - breaks existing link between TORCHNET station disc drives.

Syntax

DETACH <ld>

Description

This command is used to cancel the ATTACH command and release the link between a logical drive and a physical drive.

Example

DETACH K

DETACHes logical drive K from the physical drive to which it was ATTACHed.

FORBID

Prevents other stations gaining access to disc drives - countermanded by PERMIT.

Syntax

FORBID {<statid>} <pd> {[options]}

Description

The FORBID command is used to prevent other users of the network ATTACHing to the (physical) disc drives on your TORCH (but see **Privileged Stations**, below).

FORBID does not break existing ATTACHments (see DETACH command).

It is possible to FORBID a station from accessing a drive by specifying a statid. If no statid is specified the FORBID applies to all stations.

Options

The following options are available with this command (see ATTACH command for further description of Options):

W FORBIDs "read and write" access but does not affect any previously-granted "read only" access.

Existing "read and write" permission will be downgraded to "read only".

R FORBIDs all types of ATTACHes - and is the default option.

The FORBID command must be countermanded by the PERMIT command to restore access to the drives.

Examples

FORBID A

FORBIDs everyone the possibility of ATTACHing for any access to your (physical) drive A.

FORBID 69 A

FORBIDs station 69 the possibility of ATTACHing for any access to your (physical) drive A. A PERMIT A followed by this command would give every station except 69 permission to ATTACH.

FORBID A [W]

FORBIDs everyone the possibility of ATTACHing to physical drive A for "read and write" access. Existing "read only" PERMITs will not be affected but any "read and write" PERMITs will be relegated to "read only".

Privileged Stations

Although it is normally necessary for permission to be given before one station can gain access to the drives of another - there are exceptions.

All stations with station identifier number 200 - and above - are "privileged stations".

A privileged station does not need PERMITs to ATTACH to another station's drives and cannot be FORBIDden access to them.

Privileged stations are used to help manage the network and NETPRINT needs this facility to be able to operate efficiently (see the separate **Network Manager's Guide** for details).

NETOPT

Controls the acceptance and announcement of incoming messages (see NOTIFY command).

Syntax

NETOPT <n>

- where n is one of the Options given below.

Description

This command enables a station to choose how to accept and announce messages sent to it by other stations using the NOTIFY command. The assumption is made that the "speech chip" is fitted to the station and that it will be able to produce a "Call" (see NOTIFY command).

Options

0	Announce no messages.
1	Announce all messages with "Call".
3	Announce messages with "Call" only if not at the command line.
5	Announce all messages with a beep.
7	Announce messages with a beep only if not at the command line.
128	Reject all messages.

The default settings are 1 for machines fitted with a speech chip and five for those without.

Examples

NETOPT 128

- will cause your station to reject all subsequent messages.

NETOPT 5

- changes the "CALL" - which announces the arrival of a message - to a beep.

NOTIFY(N)

Used to send messages between stations.

Syntax

NOTIFY <statid> message

or

N <statid> message

Description

This command allows one station to send a simple screen-displayed message to another station over the network.

The arrival of a message at the receiving station can be announced immediately with an audible "CALL" - or one of the other options available (see NETOPT command).

If the receiving station is "busy" running a program, the message will be stored for display later (but only one message at a time can be stored at each station).

Example

If station 99 typed this into the keyboard:

NOTIFY 66 Hello

then

***** From 99 - Hello**

- would appear on the screen at station 66 - if that station has decided to accept the message.

PERMIT

Allows a remote TORCHNET station to ATTACH to your disc drive.

Syntax

PERMIT [statid] <pd> [[option]]

Description

This command must be used before the corresponding ATTACH command can be issued by a remote station.

If no statid is specified, everybody on the network will be allowed access - this is known as a "PERMIT ALL" command.

Any PERMIT command can be countermanded by an appropriate FORBID command.

Options

W allows "read and write", "read only", and "Dynamic read" access.

R allows "read only" and "Dynamic read" access.

This option will be chosen automatically if the W option is not specified in the command.

Examples

PERMIT B

- gives every station permission to ATTACH to your (physical) drive B for "read only" access. A station which already has "read and write" permission will retain it.

PERMIT 69 A

- gives station 69 permission to ATTACH to your (physical) drive A for "read only" and "dynamic read" access.

PERMIT 69 A [W]

gives station 69 permission to ATTACH to (physical) drive A for "read and write" access. This takes precedence over earlier "read only" PERMITs (see order of preference under ATTACH command).

TORCHNET Errors

The philosophy behind TORCHNET is that you should never be left to puzzle needlessly if what you expect to happen hasn't.

That's why there's a comprehensive system of screen replies which try to tell you what went wrong and help you to put it right.

Command Line Messages

The most frequent messages are of the form:

Network Error n

- where n is the code of the error which has occurred.

Errors are divided into three categories - the first (errors 40 to 68) are all "failure in transmission" errors:

Error code	Cause of error
40 or 64	Means that a station is jamming the network. The network supervisor should be informed as soon as possible and the station isolated.
41 or 65	Indicates one of the following problems: **Collision** - Two stations attempted to broadcast at the same time. **CRC (Cyclic Redundancy Check) error** - The CRC has revealed that the transmission was garbled. The station responsible for the error will NOT be the one displaying the error message, but the station with which it tried to communicate. This is probably a hardware fault - the station causing the error should be serviced. **Bad Acknowledgement** - An acknowledgement was received from the wrong station. Either station involved could be at fault. If error 65 occurs consistently it is most likely to be a CRC error.
42 or 66	The station addressed was not listening. This may be because that station is busy or not on the network.
43 or 67	Indicates that the network is not "up and running". This could be because the station is not connected to the network or because the network itself is at fault. After checking that your station is properly connected to the network you should inform the network supervisor if this error persists.

44 or 68	This is an internal operating system error. The computer should be reset. This error may indicate a hardware fault (such as a RAM failure) and should be reported.

Errors in the second category (128 to 136) are dependent on the current state of ATTACHments.

Error code	Cause of error
128	The ATTACH requested is not possible because the drive is already in use for writing. The "Dynamic read" option will allow you to read from the drive. Note that this error will only occur if you have permission to access the drive.
129	The ATTACH requested is not possible because the drive is already in use for reading. The [R] option may allow you to read from the drive but [D] is more certain. Note that this error will only occur if you have permission to access the drive.
130	You do not have permission to access the drive requested.
131	You do not have permission to write to the drive requested.
132	The logical drive specified is already in use.
134	Occurring after an ATTACH it means that you tried to upgrade your status (see the section on precedence). If the error occurs after a PERMIT or FORBID then it means that the list kept internally by the operating system is too large and only a FORBID ALL will be accepted.
136	Is very unlikely to occur. It means that there are 254 drives ATTACHed for read to a physical drive and that no more requests for ATTACH [R] to that drive will be accepted until another station DETACHes.

The third category of errors (192 to 224) could occur at any time:

Error code	Cause of error
192	Illegal statid - an unrecognised station number was used. Station numbers must be within the range 1-254.
208	Illegal option field - the wrong option was specified. Consult the appropriate description.
224	The physical drive you have specified does not exist.

The following errors are caused by entering a command with incorrect syntax and give rise to these explanatory screen messages:

Bad Station - abandoned

The operating system did not recognise a valid station number.

Illegal drive - abandoned

The operating system did not recognise a "legal" drive.

Separator not 'TO'

This error occurs when the operating system does not find a 'TO' in, for example, an ATTACH command.

The following errors may occur after a NOTIFY command:

Message truncated

This is a warning that your message was too long and was cut to the maximum allowable length before being sent.

Message not accepted

The receiving station is not accepting messages. This may be because a message is already stored or because NETOPT 128 has been used.

SECTION 6

Appendices

Appendix A - How to prepare Submit files

As explained in the introductory sections of this Guide the TORCH operating system is capable of executing one or more commands stored in a file as if they had been entered at the keyboard. Files containing a list of commands are called SUBMIT files and are normally given a .SUB file extension.

This facility can be exploited to carry out many routine tasks in a simple and "fool-proof" way without having to remember and key in long command sequences.

Example

To display the HELP menu in your favourite screen colours first prepare a file named X.SUB that contains the following commands. Use a wordprocessor such as Perfect Writer to key in the commands, or more simply still, use the INPUT command.

```
F YELLOW
B BLUE
HELP
```

Store this file on your normal working disc (user area 0).

You may then use it at any time by just typing:

```
X
```

- since the operating system assumes both the "C" (for COMMAND) and the ".SUB" extension - unless a file X.COM exists in which case type:

```
C X
```

Comments

Comments may be place in a submit file by putting a ";" at the beginning of the line(s) containing the comment. These lines will be displayed when the submit file is run but ignored by the operating system.

Using arguments with a submit file

In many cases it is difficult to create a submit file for a certain task because some of the command parameters are unknown at the time. In addition you may have produced many submit files which are very similar except for a few parameters that vary.

Whenever such "unknowns" or "variables" are required in a SUBMIT file you can simply use the substitution symbol **$** followed by a number between 1 and 9 in their place.

e.g.

BACKGROUND $1 instead of **BACKGROUND BLUE**

Also if $0 is found in a submit file it will be replaced by the name of the file and $$ will be replaced by a single $.

To "run" such a SUBMIT file its filename must be followed by the necessary arguments - separated from the filename and each other by spaces. When entered the arguments are allocated the argument numbers 1-9 in sequence and then substituted in the SUBMIT file where appropriate.

e.g.

X YELLOW BLUE

Special characters may be inserted into an argument using **"\"** (backslash) and one of three valid codes:

\n	newline (moves to new line)
\s	space (inserts a space into the argument)
\0	null argument (allows an argument to be omitted without effecting further arguments).

Example

SHOW BLUE \0 MARK\sCOOK

- the space between "MARK" and "COOK" must be produced by "\s" because the conventional space is used as a separator between arguments.

How to create an "automatic" backup submit file

One of the most useful applications of the submit file technique is in the creation of your own backup routine (see **The Disc System** for full explanation of backup techniques).

If the disc on to which you are going to copy the updated files is always placed in drive A, while the current working disc is in drive B, you may create a submit file, called BACKUP.SUB in the following way:

; Backing up	remark which appears on the screen as a reminder of what is happening.
COPY B:$1.DOC TO A:[AD	copies all "new" versions of documents with the "$1".DOC filename from drive B to drive A.
VDU 7	sounds a "beep" when complete.

To "run" this submit file just type BACKUP followed by the name of the .DOC file you want to backup. Alternatively, the ambiguous character "*" could be used instead of a filename and this would carry out a similar operation on all files with the ".DOC" extension that had been modified since the last backup (see the **COPY** command and **Files and Filenames**).

To give more flexibility to this submit file you can use additional substitutions for the disc drives and the filename extension.

Appendix B - CPN Disc Structure

How data is stored on discs

Data is stored on both floppy and hard discs in concentric TRACKS, segmented into SECTORS of 256 bytes - each of which can store two CPN RECORDS of 128 bytes.

Data is written to - and read from - these RECORDS by read/write heads which move in precisely-synchronised horizontal "steps" across the spinning disc(s) to locate the required track(s).

Although there are some mechanical differences between the operation of floppy and hard discs the CPN operating system's file structure has been designed to make the most efficient use of both media.

It is faster to write - and read - sequences of data to tracks which are "vertically" adjacent for each step of the heads, rather than to move to horizontally adjacent tracks on the same side of a disc.

This is why - in the case of a floppy disc - a sequence of data making up a file may be stored on alternate upper and lower surface tracks and - in the case of a hard disc - in "vertically sequenced" tracks.

Each "vertical pair" of tracks - the upper track always an even number and the lower an odd number - can be referred to as a CYLINDER.

The alternate numbering of the CYLINDER tracks mean that a complete TRACK reference system - adding 0 for upper SIDE and 1 for the lower SIDE - is also possible and the relationship is set out formally below.

The SIDES, CYLINDERS, TRACKS, and SECTORS are all numbered for ease of reference. On the current floppy discs:

a cylinder number (c) is between 00 (outer) & 79 (inner).

a side number (s) is either 0 (upper) or 1 (lower).

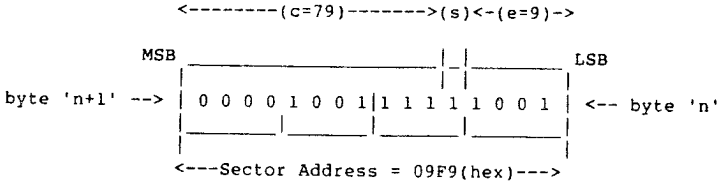
a track number (t) is between 000 and 159
(where t = c * 2 + s)

a sector number (e) is between 0 and 9 for each track.

Each sector on the disc has a unique address which is normally given in the form cylinder:side:sector number (c:s:e) although in some cases only the track and sector number (t:e) are used. For example, the last sector on a floppy disc has a sector address of 79:1:9 (or 159:9).

A sector address is stored in two adjacent bytes and can be given in a hexadecimal form (see fig 1). Note that the sector address in this form is not the same as an absolute sector offset. Sector numbers only go up to 9 and therefore some intermediate addresses are invalid. Thus the last sector has an address of 09F9(hex).

Fig 1



Where two adjacent bytes are used to store one word - such as the sector address - the least significant bit (LSB) of byte n also becomes the LSB of the address, while the most significant bit (MSB) of byte n + 1 also becomes the MSB of the word.

System Tracks

The sectors of the first cylinder (0) are reserved for special information which includes the Directory, the Allocation Map and System Information.

The Directory

The Directory occupies sectors 0:0:0 - 0:0:9 and 0:1:0 - 0:1:5 and consists of 256 entries (each of 16 bytes). New files are inserted in the first invalid entry in the directory, which is either the first entry containing a deleted file or else the first unused entry.

File searches through the directory are carried out sequentially but only until the first unused entry is found (or the end of the directory is reached). Deleted entries are skipped. Note that all entries in the directory are initialised as unused when the disc is formatted. Unused entries are marked as 'No more' when displayed by POKEDISC (since the first such entry defines the effective end of the directory).

Each directory entry is constructed as follows:

Bytes	Bits		
00-01	00-13	Address of L2/3 Block	) 0000=End of directory
00-01	14	0	)
00-01	15	0=L3 1=L2	) FFFF=Deleted entry) (see note below)
02-03	all	Highest record number in the file	
04	all	User number of file	
05-12	0-6	Filename (main part)	
05-08	7	User set attributes	
09-12	7	Reserved	
13-15	0-6	Filename extension	
13	7	0=r/w file 1=r/o file	)) see
14	7	0=user file 1=sys file	) PROTECT
15	7	0=touched 1=archived	) Command)

L2 and L3 blocks are described under **CPN file structure**.

Deleted Files

Under MCP v1.00 onwards, when a file is deleted, bytes 0 and 1 are copied to bytes 14 and 15 before their value is set to FFFF. This allows the file to be easily re-instated by POKEDISC as long as its data sectors have not been overwritten.

Special Discs

If byte 01 of the first Directory entry has a value in the range 40 to 7F(hex) the disc is a special "Reserved disc" which does not conform to CPN standards (e.g. a UNIX disc). In this case bytes 05 to 15 normally hold the disc identification but the data structure of the rest of the disc will depend on the program which created it.

Special discs will be displayed as an L* entry on POKEDISC.

The Allocation Map

The Allocation Map occupies sectors 0:1:6 - 7 on a floppy disc and sectors 0:1:6 - E on a hard disc, divided into 256 or 1024 words (of 16 bits).

System Information

The two System Information sectors are used by the operating system, and should not be altered. On a floppy disc they are 0:1:8 - 9 and on a hard disc they are 0:1:E - F.

CPN file structure

A CPN file consists of a number of records, numbered from 0 upwards. Each record is 128 bytes long and thus occupies only half a sector. However, the two records in a sector always form a pair of records in the same file.

CPN uses a "tree" structure to link together the records that form a file. The first 16 bits of a directory entry point to either an L2 or an L3 "link" block.

For small files the directory will normally point to a single L3 block. An L3 block contains a list of sector addresses, each address being a pointer to a sector that contains 2 records of file data. The sector addresses are listed in the order needed to reconstruct the file.

However this structure only allows files of up to 32 Kbytes to be created. For larger files an additional level of linking is required. In this case the directory entry points to an L2 block. An L2 block has a similar format to an L3 block but instead of holding a list of data sector addresses it holds a list of L3 block addresses (in file order).

The CPN operating system will automatically create L2 and L3 blocks as necessary when creating or modifying a file. It may store a file anywhere on the disc, except cylinder 0.

The L2 Block

Each L2 block is divided into 128 words of 16 bits. Word number 'n' contains either the sector address of the L3 block referring to records 256n to 256n + 255, or 0 if none of these records have been written to.

The L3 Block

Each L3 block is also divided into 128 words of 16 bits. Here, word number 'n' refers to records 2n and 2n+1 as follows:

```
bits 00-13     sector address holding records 2n and 2n+1
bit 14         'record used' flag: record 2n
bit 15           "      "     " : record 2n+1
               (0=record unused - never written to)
               (1=record used   - written to)
```

If all bits of the word are zero then both records are unused.

Data Sectors

Record '2n' occupies the first half of the data sector (bytes 0 to 127) and record '2n+1' occupies the second half (bytes 128 to 255), in the obvious way.
Note: The CPN filestructure is identical for Hard Discs although the sector addresses can go upto 3FFF (1023:F).

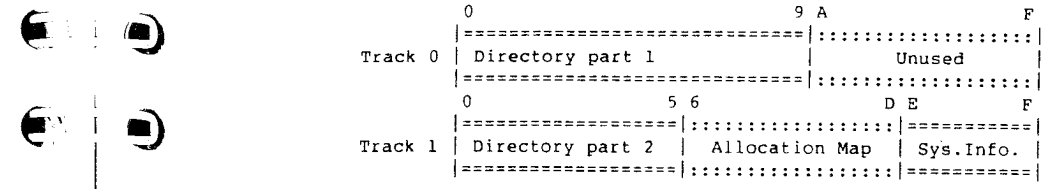
Differences between floppy and hard discs

Although the CPN operating system hides the differences between floppy and hard discs from the user the following are worth noting (especially if you use MAPDISC to check your discs):

a) Each hard disc track contains 16 sectors (labelled 0 to F) while each floppy disc contains only 10 sectors (labelled 0 to 9).

b) There are 1024 tracks on each of the five 4Mbyte surfaces which make up a 20Mbyte hard disc, while each side of a floppy disc contains only 80 tracks.

c) The Directory, Allocation Map and System Information on a hard disc are assigned to the following sectors:



Note that for compatibility reasons the directory resides in exactly the same sectors as for floppy discs, despite the extra sectors available on track 0.

Appendix C - BBC BASIC Disc Filing System

How to use The Disc System with BBC BASIC

Your TORCH or UNICORN floppy disc drives can be used to store and retrieve programs written while the machine is in the BBC BASIC mode.

To do this you will need to use the Acorn DFS (Disc Filing System). This will have been installed as part of the upgrade of your BBC Micro to a UNICORN system. If you have a TORCH professional computer, the DFS ROM may be fitted as an optional extra - please contact your supplier for details.

You must first enter the BBC BASIC mode by pressing the "B" and [break] keys down together and then making sure that you release the [break] key first, so that when the system boots it will respond to the "B" key. On a TORCH professional machine the reset button replaces the [break] key on the BBC micro.

You may then **EITHER** press [break] once more on its own, **OR** [shift] and [break] together. The latter technique may be used to start up a routine from a disc which has already been prepared with the *OPT 4 command (see the section on OPT).

You may also have to follow the BBC User Guide's instructions on how to change from tape storage to disc by typing (in BASIC mode):

***DISC** or ***DISK**

Once the the DFS system is activated, any BASIC program using "LOAD" or "SAVE" will now use the Acorn DFS file format on disc.

Although the formatting process itself is compatible (you may use the CPN FORMAT command to format your DFS discs) once formatted, the DFS system stores and retrieves information in a different way.

Therefore the two TYPES of discs (TORCH CPN and ACORN DFS) should be carefully labelled and you should never attempt to mix data from both systems on the same disc.

However the TORCH utility RWACORN is available to "convert" from one system to the other where necessary (see **Utility Programs**) and the DUP command with the FULL option (see **Commands**) can be used to make exact backup copies of Acorn DFS discs, using the TORCH CPN system.

Filenames, drives and directories

DFS uses filenames which can be up to seven characters long and consist of any letters or digits. However, the following characters have special meanings which will be explained later:

£ * . :

The filename is stored in a "catalogue" with its sector number (see **Appendix B - CPN disc structure** which the DFS system uses to find it again.

DFS file specification - <fsp>

The full specification for a file stored on a DFS disc consists of the following:

{:drive-number.directory.}filename

- which will be abbreviated when specifying the Syntax of a DFS command in the following way:

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

- where the "curly brackets" enclose optional parameters.
This conforms with the style used in the Acorn DFS User Guide.

Example

:1.A.BACKUP

The colon is an optional way to start the specification of a DFS filename and the drive number (see below) is then separated from the directory character by a fullstop which, in turn, is separated from the filename itself by another fullstop.

DFS drive numbers - <drv>

After the colon(:), the DFS system requires a drive number which must be between 0 and 3.

These drive numbers can be equated with the TORCH disc system by thinking of the "upper" side of the floppy disc in drive A as the DFS drive number 0. The "lower" side of drive A in the TORCH disc system then becomes the DFS drive number 2.

In a similar way, the upper side of the floppy disc in drive B becomes the DFS drive number 1 and its lower side becomes DFS drive number 3.

DFS directories - <dir>

The directory is an optional character which can be used to divide the catalogue into separate sections and can be thought of as the equivalent of the user number in CPN (see **DFS Defaults**).

Example

:1.$.BACKUP is not the same file as **:1.`.BACKUP**

DFS Defaults

When working with a TORCH floppy disc system the Acorn DFS system will choose drive number 0 - the upper surface of drive A - as the "default" or current disc when started up. The DFS Directory parameter is also "set" to $ - in the same way that the CPN user number will be 0.

"Ambiguous" file specifications" - <afsp>

In the same way that certain ambiguous characters can be used in the TORCH CPN system (see **Files and Filenames**), Acorn DFS allows the use of "*" and "£" as "wildcards".

"*" stands for any number of characters, while "£" stands for a single ambiguous character (equivalent to "?" in CPN).

Examples

***INFO :0.£.BACKUP**

- would display information about files with the filename BACKUP contained in any directory on drive 0.

INFO :0.$.W

- would display information on all files beginning with W on drive 0 in directory $.

Using the "Auto-start" facility

In the same way that the TORCH CPN system calls the AUTOBOOT.SUB file on power up (see **Appendix A**), DFS provides the !BOOT (known as "pling BOOT") file facility. This enables a file to be executed as soon as your BBC micro is "booted" by [shift] and [break] (re-set on a TORCH machine):

A file such as:

:0.$.!BOOT

- will be treated in one of the four ways set by the OPTION command *OPT 4

Option 0: ignores !BOOT

Option 1: *LOAD's !BOOT into memory

Option 2: *RUN's !BOOT as a machine code program - not a BASIC program

Option 3: *EXEC's !BOOT

The DFS commands OPT and *EXEC are explained in more detail under their own headings.

The DFS "Library" directory

The "default" file setting of :0.$ can be used to store any files or !BOOT utility programs required to run as soon as the system is booted with the [break] key.

There are many similarities between this facility and the COMMAND/SUBMIT structure of CPN and many users will want to set up their own personal "housekeeping" system of this type.

For example, typing

*(Utility name)

- will cause the DFS filing system to assume that you want to

***RUN**(Utility name)

and the program will be searched for in the Library default(:0.$) or the current drive/directory if this has been changed (see *LIB, DFS command).

DFS Commands

The most frequently-used DFS commands are described in this section in alphabetical order. A complete list and more detailed descriptions of the use of each one is contained in the Acorn DFS User Guide.

Each DFS command described on the following pages is in the same format as the CPN commands, that is:

(NAME)

- the actual characters to be typed into the keyboard followed by a simple description of its affect.

Syntax

- defines any parameters and options and how to arrange them.

Description

- provides a more detailed explanation of the effect of the command, gives some examples and adds any other information which may be helpful in practice.

The following DFS command parameters will be used in the Syntax format:

<fsp>	file specification
<afsp>	ambiguous file specification.
<dir>	directory
<drv>	drive

*ACCESS (L)

Sets or cancels file protection.

Syntax

***ACCESS <afsp> L**

***ACCESS <afsp>**

Description

This DFS command - used with the "L" option - prevents a file from being deleted or over-written (as with the CPN PROTECT command).

It is cancelled by using it again - without the "L" option.

If a protected file is loaded, it cannot be SAVE'd unless the name is changed.

Examples

***ACCESS BACKUP L**

- would "lock" the file BACKUP.

***ACCESS BACKUP**

- unlocks it again so that it can be written to or deleted.

---

*BUILD

Opens a text file.

Syntax

***BUILD <fsp>**

Description

This DFS command will create a file and then automatically number each line as it is entered. Apart from this line numbering facility, the *BUILD command is similar in operation to the CPN INPUT command.

Mainly used for setting up EXEC files (see that heading) and the !BOOT file technique.
Typing [escape] on a line by itself will close the file.

Example

***BUILD !BOOT**

- means that every line will itself act as a command once the program is loaded.

*CAT

Displays catalogue of contents of disc.

Syntax

*CAT <drv>

Description

This DFS command displays the contents of the specified drive - or the default drive if <drv> is omitted. It is the equivalent DFS command to the CPN DIRECTORY command.

The display is in the form of drive number, title of disc, the currently-set auto-start option (*OPT command) and the "current" library and directory. The files will then be displayed in alphabetical order reading across the two columns with details of any *ACCESS options (L) which may have been chosen.

---

*COMPACT

"Tidies" disc by moving free space to end.

Syntax

*COMPACT <drv>

Description

This DFS command moves all current files to the "start" of the disc - leaving any space at the "end". Deleting files may leave fragmented space on a disc which can then be "tidied" by this command which may create enough space for a number of new files to be added.

Example

*COMPACT 0

- would produce a display of the files on drive 0 as they are "tidied".

Warning

*COMPACT needs to use memory to re-organise files and will overwrite any other contents. Programs or data in memory should be SAVEd before using this command.

---

*COPY

Copies files.

Syntax

*COPY <source drv> <destination drv> <afsp>

Description

This DFS command can be used to make backup copies of files and - if the ambiguous filename facility is used - of a category of files.

Files can be copied to another disc - or to the same disc with a new filename.

Example

COPY 0 1 £.W

- would copy all files beginning with "W" in any directory on drive 0 to drive 1.

Warning

*COPY uses memory to sort out the files it needs and will overwrite any other contents. Programs or data in memory should be SAVE'd before using this command.

---

*DELETE

Removes an "unlocked" file from a disc.

Syntax

*DELETE <fsp>

Description

Removes a single specified file from the catalogue of a disc. The space occupied by the file becomes available for other information. DELETEd files cannot be recovered.

If the disc is write-protected the following message will be displayed on the screen:

Disc write protected

*DESTROY

Used with *ENABLE to delete a group of specified files.

Syntax

```
*DESTROY <afsp>
```

Description

This DFS command uses the ambiguous file specification to delete groups of specified files. A list of the files to be deleted is displayed with a single (Y/N) confirmation choice for the whole group. Because it is irreversible, this command can only be used after *ENABLE.

Example

```
*ENABLE
*DESTROY *.B*
```

- would produce a display such as:

```
A.BACKUP
$.BUDGETS

Delete (Y/N)?
```

Typing Y would allow the command to complete its task.

---

*DIR

Changes the current directory.

Syntax

```
*DIR <letter>
```

Description

This DFS command allows a file to be SAVEd in a specified directory - rather than the "default" directory "$" - or gives access to the files in the specified directory.

Example

```
*DIR A
```

- would set the current directory to A and any files using *SAVE or subject to a SAVE instruction in a BASIC program will be in directory A.

*DRIVE

Changes the current drive.

Syntax

```
*DRIVE <dr>
```

Description

This DFS command specifies the current drive to work to - until changed by a subsequent similar instruction.

Example

```
*DRIVE 1
```

- would set the current drive to 1 and

```
*CAT
```

- would produce the catalogue of drive 1.

```
*CAT 0
```

- would produce a catalogue of drive 0 - but the current drive would still be drive 1.

---

*DUMP

Produces a hexadecimal listing of a file on the screen.

Syntax

```
*DUMP <fsp>
```

Description

This DFS command can be used - with the page mode turned on ([CTRL] N) - and will then present the information so that it can be easily examined page-by-page. [CTRL] O will turn the page mode off again.

Example

```
*DUMP GRAPH
```

- would produce a hexadecimal listing of the file called GRAPH.

*ENABLE

Allows irreversible command *DESTROY to be used.

Syntax

***ENABLE**

Description

This DFS command protects a group of files from being destroyed without careful thought - it must be used immediately before *DESTROY.

---

*EXEC

Treats the contents of a file as a set of commands.

Syntax

***EXEC <fsp>**

Description

This DFS command can be used to set up a file of frequently-used commands which will be EXECuted as if they had been typed into the keyboard.

An EXEC file is opened and set up by the *BUILD command.

Example

***EXEC START**

- would take the contents of the BEGIN file (which could contain similar routines to those described in the CPN AUTOBOOT file) and execute them.

In association with the auto-start facilities described in the introduction to this section and the *OPT 4 and !BOOT file techniques, a BASIC program could be loaded and run automatically after the [shift] [break] start-up.

*INFO

Displays information about a file or group of files.

Syntax

***INFO <afsp>**

Description

This is an alternative to the *CAT command but provides more detailed information about a file or group of files. The information is displayed in the following order across the screen:

Directory	Filename	Access	Load Address	Execution Address	Length in bytes	Start sector

Example

***INFO A.HELLO**

- would display something like:

A.	HELLO	L	001900	00801F	00003B	003

---

*LIB

Sets the library to the specified drive and directory.

Syntax

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

Description

This DFS command is used to set up the "library" in terms of drive and directory so that the system always searches this particular combination for a specified file. This means that utility programs stored in the library are always ready for use.

Example

***LIB :1.A**

- after searching the current directory this would set the library to drive 1 directory A. Following this, typing something like:

***<filename>**

- would search directory A on drive 1 for the named file and would then treat it as if the following command had been typed in:

***RUN :*.A.<filename>**

*LIST

Displays a text file on the screen with line numbers.

Syntax

***LIST <fsp>**

Description

This DFS command will display the contents of a text file line by line with each line numbered (similar to CPN TYPE command).

Example

***LIST DOCUMENT**

---

*OPT 4

Changes the start-up option of a disc.

Syntax

***OPT 4,(n)**

Where **n** takes one of the following options:

0 does nothing
1 will *LOAD the file !BOOT
2 will *RUN the file !BOOT
3 will *EXEC the file !BOOT

Description

This DFS command changes the auto-start option of the disc in the currently-selected drive. Each of the four options set out above will be initiated by [shift] [break] with the file in directory $ on drive 0.

It is essential to include a comma between the command and (n).

Example

***OPT 4,1**

*RENAME

Renames a file.

Syntax

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

Description

Changes a file name and moves it to another directory if required.

Example

***RENAME ALPHA BETA**

---

*TITLE

Changes the title of a disc.

Syntax

***TITLE <disc name>**

Description

Changes the title of the disc in the current drive to the first twelve characters after the command. It fills in with "nulls" if there are less than twelve characters. Any characters are allowed.

Example

***TITLE UNICORNBASIC**

- would put the title UNICORNBASIC on the current disc.

Quotation marks ("") can be used to include spaces within a word.

*TYPE

Displays the contents of a file on the screen.

Syntax

***TYPE <fsp>**

Description

Displays a text file on the screen without line numbers (see *LIST command). Page mode can be selected by [CTRL] N and turned off again with [CTRL] O.

---

*WIPE

Deletes a group of files individually.

Syntax

***WIPE <afsp>**

Description

This DFS command asks for confirmation before deleting each file from a group chosen be the ambiguous file specification.

Example

WIPE *.W

- would delete all files on the current drive beginning with W.

Appendix D - Extra command line editing functions

The TORCH CPN operating system provides a number of extra editing functions which you may use when entering commands (their use will be easier to understand if you try them out now - while reading the explanations).

[CTRL] is represented in the following list by "^" and where this appears immediately before a character, it means that the [CTRL] key should be held down while the character itself is pressed.

^X - deletes everything just typed in (from memory as well as from the screen).

^U - produces a "£" (known as "hash") and moves the cursor to the next line. Everything typed in before the hash will be removed from the computer's memory but left on the screen. You can then copy parts of it to the new line by using the cursor and <COPY> keys).

^E - moves the cursor to the next line without "entering" the existing line (as using [return] would do).

^R - moves the cursor to a new line and re-types the original line on the screen - leaving a hash sign at the end of the original line to indicate what has happened.

^C - when used as the first character on the line immediately after the prompt, it causes the computer to be re-set (see Appendix E).

^P - "Toggles" the printer output. When set 'ON' everything appearing on the screen will be sent (echoed) to the printer. The printer must first be correctly set-up and selected (see Appendix F).

Appendix E - RESTART LEVELS

A number of different restart levels are available on TORCH systems. These vary in severity from the operating system restarting whenever a program finishes, to a reset of everything when the computer is switched on. The different restart levels, when they occur and what they do are described below in their order of severity.

Program Exit

When a program is started the Command Processor (CCCP) loads the program into memory, overwriting itself in the process. Thus whenever a program exits normally, CCCP is copied back into memory from ROM and restarted. This is known as a 'Z80 warmboot'.

Control C (^C) - Command Processor Restart or Program Abort

If a **Control C** is entered as the first character on a CCCP command line (by pressing the CTRL and C keys together) then MCP will reset the Z80 processor whilst still continuing its I/O functions. In this way network messages etc will not be lost. This is known as a "Z80 coldboot".

If a program uses a CPN call (call 10) to get its keyboard input, a **^C** entered as the first character will also have the same affect. However the majority of programs do not use this facility directly and will either simply abort and return control to the command line (as with a normal program exit) or else just ignore the **^C**.

Operating System Restart

There are five ways in which the total Operating System can be restarted:

a) when the user presses the CTRL/shift/esc keys together (a hard-wired option)
b) after MCP has generated a Disc Error
c) after MCP has generated a Network Error
d) after a user program error
e) by typing *CPN or *MCP on the command line

After any of these all current I/O operations be aborted and MCP restarted. MCP will then restart the Z80.

6502 Restart

If the Reset button on the back of a TORCH computer is pressed (or the 'Break' key on the BBC micro) then the 6502 processor is restarted which in turn restarts MCP and hence CCCP. However MCP variables (e.g. the softkeys, baudrates, drive attaches, etc) are not affected.

6502 Re-initialise

If the Reset button is pressed while the CTRL key is depressed (or Control and Break on the BBC) then the 6502 processor is restarted after the BBC RAM (i.e. the MCP variables) have been reset to their default values.

Power Off/On

Switching the power to the machine off and then on again has a very similar effect to CTRL & Reset except that a few extra processes (such as additional testing) are carried out. However this method of restarting is not recommended since power switching of the monitor and hard disc drives should always be kept to a minimum.

Notes:

a) All restarts that reset the Z80 (Nos 2 and above) cause the current disc drive and user number to be reset to their default values.

b) All restarts that reset the 6502 (Nos 4, 5 & 6) load the contents of softkey 9 into the keyboard buffer before restarting the Z80 (and hence CCCP). This will be blank for restarts 5 & 6 (see below) but for restart 4 it means that anything set in key 10 will be entered automatically.

c) Since restarts 5 or 6 cause the MCP variables to be reset to their default values any changes to the logical disc attaches, soft key settings, etc will be 'lost'.

Appendix F - Printers

The BBC Micro computer and the TORCH professional range of computers provide connections for both parallel and serial printers. If you are using a BBC micro as part of a UNICORN system please refer to the BBC User Guide for details of how to connect a printer.

Connecting a printer to your TORCH Computer

Your printer manual will specify whether it is a parallel or serial type of printer. The only restriction in connecting either type of printer to a TORCH computer is that a parallel printer must be sited within a few feet of the computer to avoid the possibility of data corruption.

Once you have determined the type of printer you must connect it to the correct interface on your TORCH with the correct connecting cable - the supplier of your TORCH or printer should be able to provide you with the appropriate one.

If you experience difficulty in obtaining the correct cable you can make up your own using the information in your printer manual together with the list of pin connections on the appropriate TORCH interface (see below).

Serial (RS423) Interface

The serial interface on a TORCH is made through the 25 way female D type connector on the rear panel labelled "RS423". It conforms to the RS423 standard, which is compatible with the RS232C interface on many other systems but has a higher line driving capability.

The pin connections are:

PIN NO.	SIGNAL NAME	FUNCTION	INPUT/OUTPUT
2	TXD	Transit Data	output
3	RXD	Received Data	input
4	CTS	Clear to Send	input
5	RTS	Request to Send	output
7	GND	Signal Ground	-----

The default format of the data sent (as set on power up) is:

1 Start bit - 8 Data bits - 1 Stop bit.

"Mark" is -5 volts and "Space" is +5 volts.

The Parallel (Centronics) Interface

The parallel interface on a TORCH is made through a 25 way male D-type connector on the rear panel labelled "parallel printer" or just "printer". This interface conforms to the Centronics standard used on most parallel printers. A length of ribbon cable should be used to connect your TORCH to the printer.

The pin connections are:

PIN No.	SIGNAL NAME	FUNCTION
1	STB	strobe
2	D0	data
3	D1	data
4	D2	data
5	D3	data
6	D4	data
7	D5	data
8	D6	data
9	D7	data
10	ACK	acknowledge
11-13	-	no connection
14-25	GND	signal ground

Selecting the printer

When first switched on - or after reset - your TORCH system always assumes that no printer is connected unless one of the following commands is entered:

To use the parallel (Centronics) port to output to a printer, type:

***FX 5,1**

To use the serial (RS423) port to output to a printer, type:

***FX 5,2**

The baud rate for the serial printer (bits transmitted per second) can be selected by using the following commands:

***FX 7,x** (sets up the "receive" baud rate)
***FX 8,x** (sets up the "transmit" baud rate)

- where **"x"** should be replaced by one of the following values depending on the baud rate of your printer:

1 = 75 baud	**5 = 2400 baud**
2 = 150	**6 = 4800**
3 = 300	**7 = 9600**
4 = 1200	**8 = 19200**

Baud rates do not need to be selected for parallel printers.

How to print a file

Once the correct printer has been selected all you need to do to print a file is use the PRINT command with the file specification as a parameter.

Example

PRINT B:TYPETHIS.DOC

- will print out the contents of the file "TYPETHIS.DOC" from the disc in Drive B. Further details of PRINT are given in the **Commands** section.

Printer fault finding

If the printer has worked before with your TORCH system but fails to print:

a) check that the printer is loaded with paper, connected to the mains supply, switched on and selected "on-line".

b) check that the connecting cable is plugged in securely at both ends.

c) check that the correct configuration commands have been given to your TORCH system for the type and speed of the printer.

If you have set up your TORCH system with a printer for the first time always test it with a simple PRINT command (see example above) rather than using a program such a Perfect Writer. If it will not print correctly carry out the following checks in addition to those given above:

d) check that the wiring of the connecting cable is correct (see relevant section above).

e) check that any configuration switches on the printer have been set up to match the output from your TORCH system. Especially check the baud rate settings if the printer prints "rubbish", and line feed settings if the printer only prints on a single line or double spaces lines.

Appendix G - "TORCHLIGHT"

A glossary of some of the more common computer "jargon" as well as some expressions which are specific to TORCH products.

application program
: a **program** which carries out a specific user function (e.g. financial planning). Application programs may be specially written for users or provided as a standard software package.

bit
: a single piece of binary information which can only be either 1 or 0 (also sometimes referred to by terms such as on/off, true/false, high/low). Bits are grouped into **bytes** which can also be grouped in **words.**

boot
: derived from the phrase "to pull yourself up by your own bootstraps" it describes a computer's ability to load a routine (such as the operating system) into memory on power up or reset.

byte
: a group of 8 bits of information. The capacity of storage media is usually quoted in either thousands of bytes (Kbytes) or millions of bytes (Mbytes). Note that these are not the normal decimal values but are binary 'round numbers' which are close equivalents. Thus K = 1024 and M = 1,048,576.

character
: a screen-displayed letter, digit or special symbol, represented by a **byte** of memory within the computer. There can be up to 256 different characters because there are 256 different ways of arranging the 8 bits which make up a byte. TORCH computers use the industry-standard ASCII character set.

command
: a keyed-in instruction which can be understood and immediately acted upon by the **operating system.** The precise effect of commands varies between different operating systems but in general their main use is to allow the user to access information stored on disc (e.g. a directory listing of filenames). In addition, a command is always provided to pass control from the operating system to an **application program.**

command line prompt
a **prompt** which indicates that the operating system is ready to receive a typed-in **command**. On a TORCH system it looks something like this:

99:0A>

compiler a special **program** which converts a set of instructions from a form which can be written by a programmer - the **source code** - into a form which can be read by the **processor** - the **object code**.

cursor a special screen character that indicates where the next character typed in at the keyboard will appear on the screen. The form of the cursor may vary depending on the current program. When on the command line the cursor takes the form of a flashing line. A different "editing" cursor appears when the cursor control and [COPY] keys are being used.

data information which can be processed by a **program**. **Note:** a program may itself be data to a **compiler**.

disc(disk) the primary medium on which information (both data and programs) is stored. TORCH currently uses both **floppy discs** and **hard discs**. Both types have their surfaces covered with a thin layer of magnetic material which holds the information in a binary form.

disc drive(1) from a hardware point of view a disc drive is a device that is used to read information from, and write information to, a disc. A read/write head is provided for each physical surface of the disc. The drive rotates the disc at a constant speed and moves the read/write heads in and out across the disc surfaces in order to access any part of the disc. The heads store information on the disc by magnetising or demagnetising small pieces of the disc's surface; each piece representing a bit. The bits are read by detecting their magnetic influence as they rotate past the drive heads.

disc drive(2) as defined within the operating system a disc drive is 'seen' to be the disc that the disc drive contains. The **current** disc drive is the one being referenced via the corresponding drive letter in the **command line prompt** or specified in a command or program. In the case of floppy discs there is a one-to-one relationship between the actual drive and the disc. However since a hard disc contains many times the capacity of a floppy disc it is convenient to partition it into several different disc drives (e.g. B,C,D,E,F:). Thus the operating system treats the hard disc as if it were a number of large floppy discs (see **surface**).

extension the optional "second half" of a **filename** which follows the "."(dot). It allows **files** to be grouped, and can be used to indicate the nature of the contents of the file.

file a logical 'block' of information that has been placed on a storage medium (e.g. **disc**). Files are used to store both **programs** and **data**.

filename a means of referring to a **file**. The filenames of all files on a TORCH disc are stored together in a directory together with a pointer to the file. Each filename, when combined with its **disc drive** letter and **user number**, forms a unique reference to its file. e.g. A:FILENAME.EXT[1]

firmware a term which describes software held in **ROM**.

floppy a flexible **disc** with its own protective jacket which can be moved between **drives** and stores information.

hard disc a number of separate rigid **discs** joined together on a common spindle. Also called a Winchester disc, it is fixed in its own disc drive and cannot be removed. It provides a much greater degree of both data capacity and reliability than floppy discs.

hardware a term used to describe all the physical parts of a computer.

interrupt a pause in executing a program during which control is transferred to the operating system.

memory any solid state device which stores information. The **processor** can access information in its memory much faster than information stored on any other media.

network a number of computers and/or **peripherals** linked together so that their resources can be shared.

object code any program in a form that can be understood by the **processor.**

operating system - a 'supervisor' program which creates and maintains a file structure on the discs and also controls the input/output (I/O) requests to the other peripherals. It contains a command interpreter to understand the commands entered by the computer user, plus a set of I/O routines that provide a standard interface with other programs. Whenever a computer is switched on the operating system is automatically loaded into memory and used by the processor as its initial program. It will then wait for commands from the user. If requested it will load another program (into a different part of memory) and pass control to it. However, the operating system will then 'wait' in the background to carry out the I/O requests from the program and to retake control when this program finishes.

peripheral usually refers to a device that is physically separate from the basic computer (e.g. a printer). However when describing a computer it is often used to cover all devices that are linked to the processor, whether inside the same box or not. Thus a disc drive can be a peripheral even when inside the main processor box.

ports general term for the interfaces between **peripherals** - such as printers - and the computer.

processor the solid state device which acts as the brains of the computer. It operates in a way defined by the current **program.**

program a set of logically ordered instructions which tell the processor how to perform a task or series of tasks.

prompt a string of characters on the screen that provides information to the user and indicates that the **processor** is awaiting input from the keyboard.

RAM Random Access Memory (also known as read/write memory). This memory is used to hold programs and data. All data is lost when power is switched off.

ROM Read Only Memory. Memory which cannot be altered by the **processor.** Information stored in ROM is fixed and not lost when power is switched off.

software a term that encompasses all the various types of **programs - applications, utilities, compilers,** etc.

surface when referring to a disc its meaning is the same as **disc drive** i.e. a **floppy disc** or part of a **hard disc.** Note that hard disc surfaces as seen by the operating system do not correspond with the physically separate surfaces of the disc.

source code program written in an easily understood way but needing to be compiled into an **object code** before it can be understood by the **processor** (see **compiler**).

text **data** that can be read when displayed on the screen or printed.

toggle the switching of a device or indicator between two alternative states (e.g. first state is "on", the second is "off", the third is "on", etc.).

user area a term that describes all files on a single disc **surface** that have the same **user number.**

user number a number between 0 and 31 which is given to each CPN file. It allows files to be grouped together and different users to share the same disc without mixing their files.

utility a **program** which performs some kind of general purpose "housekeeping" or administrative function for the computer user - usually improving the efficiency or maintaining the system in some way. For example the MAPDISC utility provided with your TORCH computer will allow you to see the structure of your discs.

word a group of **bytes** which is handled as a single unit by the **processor.** Words are of different lengths for different processors and purposes. For example, the Z80 uses two-byte words while the 68000 uses both two-byte and four-byte words (the latter are often referred to as "long words").