

S-DOS

Disc Operating System

Amstrad CPC 464
Amstrad CPC 664
Amstrad CPC 6128
Amstrad 464 Plus
Amstrad 6128 Plus

from STS Software

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S-DOS is supplied on one ROM chip. This can be placed in any ROM-box, in any slot, as long as it is not in a slot higher than 6. This should not usually be a problem. (S-DOS also requires the AMSDOS ROM to be in slot 7. Again, this will not be a problem unless you have modified your computer or - for 464 owners - DDI-1.)

Before you fit the ROM chip, earth yourself. You can do this by holding a metal tap, pipe, or radiator for a few seconds. Be careful to touch the ROM's pins as little as possible: ROMs are delicate and can be broken if not handled correctly.

Make sure that your computer is switched off before you attempt to fit the ROM into the ROM-box. You will notice that one end of the ROM chip has a slight notch in it. Simply insert the ROM so that this notch corresponds with the notch on the ROM socket. If you have a ROM-box with on-off switches (details in the ROM-box manual), remember that S-DOS should be switched on!

Now switch your CPC on. You should see the following sign-on message:

```
S-DOS (c)1993 STS Software
```

If not, check that you have followed the above instructions correctly.

S-DOS was designed for users of large capacity (e.g. 3.5") drives, so that they can use these drives' full capacity. There are many programs on the market that claim to do this, but S-DOS is undoubtedly the most fully-featured and powerful. Here are some of its features:

- * **792k per disc:** each side of a 3.5" disc can hold a mammoth 396k. With a cheap side-switch (probably already fitted to your drive), you can use both sides, giving you an incredible 792k in total! You can even have up to 128 programs on each side (256 for two sides!), as compared to the usual maximum of 64.
- * **Automatic format detection:** you don't have to run a program to set up your disc drive after every reset, or when you want to change disc format - which wipes out any program in memory. With S-DOS, you don't have to do anything: it automatically works out what format disc you have placed in the drive.
- * **Compatibility with other systems:** as well as S-DOS format discs, you can read standard formats (data, CP/M and IBM), Ultraform (205k on each side of a normal 3" disc!), and MS800 format 5 (the most popular MS800 format). What's more, S-DOS format is identical to that used by ROMDOS (format D80) and 400K/S operating systems, so you can work with discs created with those utilities too!
- * **Formats recognised in both drives:** most utilities only let you use special formats in drive B. S-DOS is the only one which automatically detects them in drive A, too - ideal for ABBA switch users or people with a 3.5" drive A.
- * **Utilities mode:** a complete set of user-friendly utilities allowing you to format discs to S-DOS, Ultraform or standard formats, copy files from one disc to another (even between different formats), verify a disc (to check for errors), erase and rename files. Very easy to use and powerful too.
- * **File copier:** unlike other operating systems, S-DOS isn't daunted by files over 42k in length. Two commands are supplied to let you copy files of any length: a 396k file if you wanted!
- * **Program compatibility:** S-DOS hides itself away in unused areas of memory, and so is compatible even with programs such as Stardump and PowerPage 64: unlike ROMDOS, which causes problems by using memory around &BE00 and &BF00. A command is also included to run awkward programs (such as most games) which reset the disc system.
- * **Programmers' commands:** you can examine the header of any disc file, load a file anywhere in memory, and de-protect BASIC programs.
- * **CP/M compatibility:** under both CP/M 2.2 and CP/M Plus, formats are recognised automatically in either drive - just like under AMSDOS. The |SETCPM command configures your CP/M Plus boot disc for good, or with CP/M 2.2, simply boot using |CPM22 instead of |CPM. A far cry from the highly involved process required by some operating systems.
- * **User-friendly:** an on-screen display of commands available is always present in utilities mode, and a help-screen can be called up from BASIC, Prottext or similar.

The S-DOS utilities mode allows you to carry out useful operations on your discs. To enter utilities mode, type

```
|UTILS
```

from BASIC, Protex, or any other program that lets you enter | commands. Note that entering utilities mode clears the CPC's memory (with the exception of extra memory, such as in a 6128): this is to provide storage space for the copy mode, etc.

The screen will clear, and a copyright message will appear at the top. The main part of the screen will be blank. The following is displayed at the bottom:

```
Source:      0A:  A: S-DOS  Files:  0 (0k) Source Destination Copy Log
Destination: 0B:  B: S-DOS  Tagged:  0 (0k) Format Verify  Erase Rename
1..... 2..... 3..... 4.....
```

Each of the four sections will be explained in turn.

Section 1

This indicates the current source and destination drives, and the user area set on each one. The source drive is the one which most operations are carried out. The destination drive is the one which files are copied to. For example, to copy from drive A, user area 0, to drive B, user area 5, you would look for

```
Source:      0A:
Destination: 5B:
```

Section 2

S-DOS provides compatibility with the MS800 operating system. Due to the strange way in which MS800 works, it is impossible to automatically detect MS800 format discs: they would usually be interpreted as data format discs.

To get around this, S-DOS allows you to notify the computer whether either of the drives will contain MS800 format discs rather than S-DOS format discs. All other formats (such as data and Ultraform) will still be automatically recognised, of course. A display in this section of

```
A: S-DOS
B: MS800
```

would indicate that you will be using MS800 format, rather than S-DOS format, in drive B. Of course, if you want to use S-DOS format discs again, you can change this setting.

For those who intend to use this facility, the MS800 format supported is "MS800 format 5" (128 directory entries, 10 sectors per track, 80 tracks). This is the most common MS800 format.

Section 3:

The first line ("Files:") displays the number of files on the current source disc, and the space they take up. You can select ("tag") as many files on the disc as you like: the number of tagged files, and the space they take up, are displayed on the second line ("Tagged:"). If you were using a disc with 5 files, totalling 132k, but had not tagged any, this display would be as follows:

```
Files:    5 (132k)
Tagged:   0 (0k)
```

Section 4:

This is the message window. Usually, it displays the options available to you, but it may also contain error messages, progress displays, prompts, etc.

The main screen:

This is used to display the list of files on the current disc (or, more accurately, in the selected user area of the disc in the source drive). To begin with, this will be blank, until you "log" a disc (see below).

Before you can do anything to a disc (except format or verify it), it needs to be "logged". This consists of telling the CPC that you have inserted a new disc.

To do this, insert a disc into the source drive (A to begin with), and press "L" for Log (or ENTER/RETURN). A list of files on this disc (in the selected user area, of course), together with the size of each one, will be displayed. An arrow will appear to the right of the first file.

You must always log a disc after it has been inserted into the source drive (there is no need to do this if you are changing a disc in the destination drive). Whenever a disc is logged, the number of files on it and their total size is displayed at the bottom of the screen.

The arrow can be moved from file to file using the cursor keys (the arrow keys to the right of your keyboard). It is used to "tag" files: that is, mark them for copying, erasing, or renaming. To tag a file, move the arrow to its right, and press COPY. The file will be inverted (indicating tagging), and the display at the bottom of the screen (showing the number of tagged files, and their total size) will change.

To untag a file, simply move the arrow to its right and press COPY again. All files will be untagged when a disc is logged.

Note that the maximum number of files that can be shown on the screen is 64. To overcome this, you can move files to a different user area, so that they will only be shown when that area is selected.

The following operations are available by pressing their initial letter while in utilities mode (for example, "C" to copy):

Source**Destination**

The message window will clear and this will be displayed:

```
Drive  User  Format
      ENTER to quit
```

Press D to change the source or destination (depending on which option you selected!) drive, which can be either A or B. This is displayed in section 1.

Press U to change the user area, which can be from 0 to 15. Each press increases it by one. Trying to increase past 15 resets it to 0. This is displayed in section 1.

Press F to change the format of this drive. Usually it is S-DOS format, but if you want to use MS800 format, this must be changed. Of course, the drive of which you change the format depends on what you have selected using the "D" key! This is displayed in section 2.

Press ENTER to exit from this mode. If you were altering the source drive, then the disc will be re-logged. Note that a disc must be present in whichever drive you had selected when you leave this option.

Copy

This copies the tagged files from the source drive user area to the destination drive and user area. Files should not be more than 42k: if they are, then you can use the |COPYAB and |COPYBA commands (details elsewhere in this manual).

Files are copied one-by-one. The name of the file being copied is displayed in the message window. If the source and destination drives are the same (for example, you are copying from one disc in drive A to another), then you will be prompted to insert the correct disc whenever necessary. Press a key when you have done this.

The maximum length of file which can be copied is 43k (or, in the case of ASCII files, 41k). If you want to copy longer files, two commands are provided for use from BASIC (see the section "S-DOS commands").

Log

This option (which can also be selected by pressing ENTER) is explained above.

Format

This lets you format a disc in the source drive. Formatting wipes out all the data on the disc, and as such is a dangerous process. It must be done to every new disc you buy.

Pressing D selects data format. This is the standard format for 3" discs, and gives you 178k free space (with 64 directory entries).

Pressing V selects vendor format. This can be used by the CP/M 2.2 operating system, and gives you 169k free space (with 64 directory entries).

Pressing U selects Ultra format. This squeezes the most out of 3" discs, and gives you 205k free space (with 64 directory entries). The original program (Ultraform) to support this format was published in Amstrad Action, and is a popular public domain utility.

Pressing S selects S-DOS format. This is the recommended format for 3.5" discs, and gives you 396k free space (with 128 directory entries). It is very important that you do not format to S-DOS format in a 3" drive: if you attempt to, it is possible (although unlikely) that you could damage the drive.

Pressing ENTER quits the format mode. It is not possible to format to MS800 format.

After selecting the format you want to use, you will be asked for confirmation: press "Y" if you are sure, or "N" if you are not. Formatting will then begin.

Each disc is divided into a number of tracks: 80 in the case of an S-DOS format disc, 41 for Ultra format, and 40 for data or vendor format. Each track must be formatted individually. A progress report is displayed in the message window.

As the computer fills up tracks starting from the beginning, S-DOS formats from the very last track backwards. This is so that, if you realise that you don't actually want to wipe the data on the disc, you can reset the computer early on in the process and cause minimal damage. The directory information for each disc (without which the disc is unusable) is held in the first few tracks, and as such is the last thing to be wiped by the format operation: most formatters wipe this first, making the disc unrecoverable immediately!

Verify

This checks that the disc in the source drive has no faults. If any are detected, then their location (track and sector) is displayed on the screen.

If you encounter a faulty disc, then try to copy as much data as possible from it onto another disc. Then reformat the disc until no faults show up: if the faults continue, throw the disc out.

Erase

This wipes all the tagged files from the disc.

Rename

This lets you change the name of the tagged files. You should enter the new name for each file in the message window, pressing ENTER after each one.

This can also be used to move a file from one user area to another. For example, say that you wanted to move the file DEMO.BIN to user area 7. You would enter the following when prompted for the new name:

7:DEMO.BIN

Leaving utilities mode

Press ESC. The computer will be reset.

S-DOS allows you to use a number of new commands, from BASIC, Prottext, or any other program that allows you to enter commands prefixed with a bar (the | symbol). For some commands, the syntax is different on the CPC 464 (supplied with BASIC 1.0) to all other CPCs (664, 6128) and Plus machines (464 Plus, 6128 Plus) - which use BASIC 1.1.

The following new commands are available:

|CAT

Syntax: |CAT,0/1

This command catalogues drive A (if you supply the parameter 0) or drive B (parameter 1). However, it does not change the current drive, and so is useful if you want to see the contents of a disc in the other drive.

|COPYAB

Syntax (BASIC 1.0) : a\$="filename": |COPYAB,@a\$
Syntax (BASIC 1.1) : |COPYAB,"filename"
Syntax (alternative): |COPYAB

These copies the specified file, which can be of any length, from drive A to drive B. Copying is slow but effective.

If you do not supply a filename as a parameter, you will be requested to enter one. Only one file may be copied at once.

|COPYBA

Syntax (BASIC 1.0) : a\$="filename": |COPYBA,@a\$
Syntax (BASIC 1.1) : |COPYBA,"filename"
Syntax (alternative): |COPYBA

As above, but to copy from drive B to drive A.

|CPM22

Syntax: |CPM22

This enters CP/M as the command |CPM would normally do. |CPM22 is intended for booting CP/M 2.2 only: it sets up automatic format detection, so that you can use all the extended formats (except MS800 format) under CP/M. (See the section "Using CP/M" for more details.)

|MS800

Syntax: |MS800

This instructs the CPC to expect MS800 format 5 discs in drive B, rather than S-DOS ones. This command accesses the disc. All other formats (except S-DOS) will still be recognised in drive B.

|MS800A

Syntax: |MS800A

As |MS800, but for drive A.

|RUN

Syntax (BASIC 1.0) : a\$="filename": |RUN,@a\$

Syntax (BASIC 1.1) : |RUN,"filename"

Syntax (alternative): |RUN

Some programs - notably those with a machine code loader file - will not RUN from a disc in any format except normal system, data or IBM. This command gives them a much higher chance of working.

You should turn all ROMs (except S-DOS) off before using this command. If you attempt to |RUN a BASIC file, S-DOS will warn you. You should then RUN the program by the normal means (i.e. RUN"filename").

If you do not supply a filename, S-DOS will ask you to input one.

|SDOS

Syntax: |SDOS

This reverses the effect of the |MS800 command, and tells S-DOS to expect S-DOS format (rather than MS800 format 5) discs in drive B from now on. Of course, all other formats (e.g. data and Ultra) will still be recognised - the only one which won't is MS800.

|SDOSA

Syntax: |SDOSA

As above, but for drive A.

|SETCPM

Syntax: |SETCPM

This should be used on a CP/M Plus boot disc. It alters the CP/M Plus code, contained in the file C10CPM3.EMS, to detect all the extended formats (except MS800) in both drives. (See the section "Using CP/M").

|SHEADER

Syntax (BASIC 1.0) : a\$="filename": |SHEADER,@a\$
Syntax (BASIC 1.1) : |SHEADER,"filename"
Syntax (alternative): |SHEADER

This displays the header information (filetype, start address, length, and execution address) for a file. If you do not supply a filename, you will be asked to input one.

|SHELP

Syntax: |SHELP

This displays a help-screen, with a list of all S-DOS commands.

|SLOAD

Syntax (BASIC 1.0) : a\$="filename": |SLOAD,@a\$
Syntax (BASIC 1.1) : |SLOAD,"filename"
Syntax (alternative): |SLOAD

This loads the specified file into any address in memory. You will be asked for the address to load it to: pressing ENTER selects its usual start address. If you do not supply a filename, you will be asked to input one.

|SPLOAD

Syntax (BASIC 1.0) : a\$="filename": |SPLOAD,@a\$
Syntax (BASIC 1.1) : |SPLOAD,"filename"
Syntax (alternative): |SPLOAD

This command loads a protected BASIC program and de-protects it, so that it can be edited, resaved, listed etc. If you do not supply a filename, S-DOS will prompt you to enter one.

|TYPE

Syntax (BASIC 1.0) : a\$="filename": |TYPE,@a\$
Syntax (BASIC 1.1) : |TYPE,"filename"
Syntax (alternative): |TYPE

This displays a text file on the screen. You can pause it by pressing any key, and restart by pressing a key again. When paused, ESC aborts displaying the file. If you do not supply a filename, you will be asked to input one.

|UTILS

This command enters utilities mode (detailed earlier).

Under CP/M, S-DOS automatically recognises the extended formats (S-DOS and Ultraform) in both drives. This works no matter what program you are in.

CP/M 2.2 (64k machines): insert your normal CP/M 2.2 boot disc, and type |CPM22 instead of |CPM to load. CP/M 2.2 will load with automatic format detection. Remember that CP/M 2.2 demands that a system format disc is in drive A at certain points.

CP/M Plus (128k machines): take your usual CP/M Plus boot disc (not the master copy), and type |SETCPM. Wait a short while. The C10CPM3.EMS file, which contains all of the CP/M Plus code, will be configured for automatic format detection. You only need to do this once: from then on, you can boot into CP/M Plus by inserting that disc and typing |CPM as usual.

Notes

A new command (|CPM22) has been used for CP/M 2.2, instead of simply patching the original command, for this reason: a patched version would be incompatible with some other programs (e.g. CP/M Plus and many disc games) which load using the |CPM command. So, type |CPM22 to enter CP/M 2.2, and |CPM in all other cases.

MS800 format 5, due to the layout of the format, is not automatically detected. However, it is possible to use this format (without auto-detection) in a format almost identical to using standard MS800. Enter |SDOS before entering CP/M, and then boot as usual. You can then select drive B: and type MS800 (for MS800.COM) as per usual with MS800.

When the |SETCPM command is executed, the contents of the extra 64k are wiped. This should not be a problem.

The new formats provided under S-DOS are as follows:

S-DOS format: for 3.5" and 5.25" discs only. This gives you 396k per side of a disc, with 128 directory entries.

Ultra format: this gives you 203k on any disc (even 3" ones), with 64 directory entries.

MS800 format 5: for 3.5" and 5.25" discs only. This, like S-DOS format, gives you 396k for each side of the disc and 128 directory entries. In addition, boot files are included on the disc, so that if you do not have a compatible disc operating system, these (when executed) will set up the computer to this format.

In addition, standard data, CP/M (system and vendor) and IBM formats are supported.

The parameters (eXtended Parameter Block) for each format are:

	S-DOS	MS800	Ultra	data	CP/M	IBM
records per track.....	40	40	40	36	36	32
block shift.....	4	4	3	3	3	3
block mask.....	15	15	7	7	7	7
extent mask.....	0	0	0	0	0	0
number of blocks -1....	199	199	204	179	170	155
directory entries -1...	127	127	63	63	63	63
directory blocks.....	&C0	&C0	&C0	&C0	&C0	&C0
size of checksum vector	16	16	16	16	16	16
reserved tracks.....	0	1	0	0	2	1
first sector number....	&71	&71	&10	&C1	&41	&01
sectors per track.....	10	10	10	9	9	9
gap length (read/write)	9	9	32	42	42	42
gap length (format)....	16	16	50	82	82	80
filler byte.....	&E5	&E5	&E5	&E5	&E5	&E5
log2 sector size -7....	2	2	2	2	2	2
sector size / 128.....	4	4	4	4	4	4

A consequence of S-DOS and MS800 formats giving such a large amount of space on each disc is that block size, which is usually 1k, becomes 2k under these formats.

What this means in English is that files will always take up a multiple of 2k. So, if you save a 15k file, it will be shown as 16k on the disc, a 1k file becomes 2k, and so on. Of course, a 2k file would remain as 2k, a 38k one as 38k, etc. Please note that this does not actually alter the file in any way - it's still the same length. The disc system just allocates it a bit more space on the disc, and as you have 396k on each side of the disc to play around with anyway, this shouldn't be a problem!

400K/S: again, S-DOS format is identical to that of the SD Microsystems operating system, 400K/S. This means that your discs are interchangeable.

MS800: S-DOS can detect MS800 format 5 automatically, as long as you tell it that you want to use this format rather than S-DOS format (by issuing the |MS800 command). Due to the large amount of storage provided, this is by far and away the most popular MS800 format. It should therefore be easy to read friends' MS800 discs.

RAMDOS: unlike its big brother, RAMDOS does not provide the D80 format, so discs are not interchangeable between the two.

ROMDOS: S-DOS format is identical to ROMDOS D80 format. Friends with ROMDOS, then, can read your S-DOS format discs easily. Note, however, that if they do not have a side switch with their drive (the major distributor of ROMDOS, Siren Software, does not fit such a switch), they will only be able to read one side of any discs you send them.

RODOS: RODOS is compatible with nothing on earth (such as humans and 99% of CPC software). Apparently, it is quite popular on Mars, where it hosts a late-night chat show on MBS (Martian Broadcasting System).

Ultraform (Amstrad Action type-in): S-DOS supports this format, which gives you 203k per side of a 3" disc. Unlike the original, it also detects the format automatically, so you do not need to use RSX commands when you want to change disc format.

Xexor: when S-DOS is installed at the same time as the replacement Xexor ROM in slot 7, Xexor extended formats are not available. However, Xexor's side-switching capabilities are still effective.

If you have friends with other disc operating systems, perhaps they would like to replace them with S-DOS: a discount of £2 off the standard price is available to anyone who sends STS Software their old ROM-based operating system!