

**SPECCY-DOS VERSION V4.0**

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## SUMMARY OF SPECCY v4.0 SYNTAX

Preliminary: SPECCY is able to handle 4 drives. See the annexed technical document. To access a specific drive you must specify for each commands and directly after each "\*" the 0, 1, 2, 3 to select the desired one.

Ex:           LIST\*0   LIST\*3  
               LIST\*1  
               LIST\*2   LIST\* (select the default drive with can be 0,1,2,3)

With this the total formatted capacity is 2.6 Mbytes (4\*655 Kbytes), the user available capacity is 4\*620 Kbytes. See chapter 19 for details.

At power ON the default drive is always drive 0. This can be modified by the command ASN\* (for assign) followed by the drive number. See chapter 17 for details.

### 1) LOAD\*

LOAD\*"filename"   LOAD\*"filename"DATA b()  
 LOAD\*"filename","CODE start addr,length           LOAD\*"filename"DATA a\$()  
 LOAD\*"filename"CODE start addr  
 LOAD\*"filename"CODE                                   LOAD\*"filename"SCREEN\$

Multi drives operation:

LOAD\*"filename" = default drive selected  
 LOAD\*0"filename" = drive 0 selected                 LOAD\*1"filename" = drive 1 selected  
 LOAD\*2"filename" = drive 2 selected                 LOAD\*3"filename" = drive 3 selected

### 2) SAVE\*

SAVE\*"file"   SAVE\*"file"SCREEN\$  
 SAVE\*"file"LINE number  
 SAVE\*"file"CODE start addr,length,start addr       SAVE\*"file"DATA b()  
   (where the code must RUN)   SAVE\*"file"DATA a\$()  
 SAVE\*"file"CODE start addr, length

Multi drives operation: same as above add 0 - 1 - 2 - 3 after the keyword.

### Dual saving:

SAVE\*"filename"d  
 This record your important files twice on disc. The directory shows only one filename. Under the ATTR the letter D is mentioned after the filename to inform you.

### 3) RUN\*

RUN\*"filename"   RUN\*"filename"CODE  
 RUN\*"filename"CODE start addr.

Multi drives operation: as above i.e: RUN\*1"filename"

### 4) MERGE\*

MERGE\* "filename"

Multi drives operation: as above i.e: MERGE\*1 "filename"

### 5) LIST\*

LIST\*   list the directory on screen           (default drive )  
 LIST\*0   (drive 0)  
 LIST\*1   (drive 1)  
 LIST\*2   (drive 2)  
 LIST\*3   (drive 3)  
 LIST\* "filename"                                       search & list a particular file.

LIST\*s Gives the remaining free space of the disc.  
LIST\*2s *same for the drive no 2*  
LIST\*i List the invisible files if this attribute has been set for special files.  
LIST\*li *same for drive 1*  
LIST\*2i *same for drive 2*

N.B.: - Press 'N' to stop scrolling of the directory if desired.

**6) LLIST\***

Exactly the same functions as LIST\* but with output to the ZX or ALPHACOM printer.

**7) ERASE\***

ERASE\* "filename" ERASE\*1"filename"  
ERASE\*O"filename" ERASE\*2"filename"

**8) COPY\***

**8.1 Single drive operation:**

COPY\*"file name 1" TO copy filename 1 from source disk under the same name on the target disk using the same drive.  
COPY\*"file name 1"TO "filename 2" The copy will be renamed compared with the original.

**8.2 Multi drive operation:**

COPY\*"file" TO 1 COPY from default drive 0 to drive 1  
COPY\*0"file" TO 1 COPY from drive 0 to drive 1

example:

COPY\*3"JET" TO Drive 3 = source - Default drive = target  
COPY\*2"Mary" TO 1 Drive 2 = source - Drive 1= target

**9) LEN\***

PRINT on screen the remaining free bytes in the computer. LEN\* can also be used to reset colour attributes.

**10) FORMAT\***

FORMAT\*"diskname" gives 40 tracks, single side, double density format (default values).  
FORMAT\*"diskname"side, density, tracks  
- side s single side  
d dual side  
- density s single density  
dual density  
- track 35 (single side only) 40  
45 (single side only) 80

example:

FORMAT\*"essai"dd80 or FORMAT\*"Essai"ds40

**11) FN\***

FN\*"old name" TO"new name"  
Allows to modify a filename already on disk.  
Mufti drives operation: add the N0 of the drive as usual.

**12) DEF FN\***

DEF FN\*"new disk name"  
Allows to rename a disc.

**13) AT\***

Attribute for disc:  
AT\* set the write protect for the disc. A "W" will be visible in the directory.  
Enter 1 to set  
Enter 0 to reset the function.

**14) ATTR\***

ATTR\*"filename"

Attribute for a file, set the write protect and the *invisible* attributes for a specific file. A "W" and/or a "I" will be visible in the directory. Enter 1 to set, enter 0 to reset the function.

**15) USR\***

USR\*"filename"

Allows a file to be auto-booted at cold start. (1 per disk)

The auto-boot file appear at the end of the directory.

USR\* reset the function.

**16) MOVE\***

This command may be used for backup purpose. When you need an exact copy of a whole disk this command can be used instead of the COPY\*.

MOVE\* 0 TO 1

Will backup the whole disk from drive 0 to 1.

MOVE\* 0 TO 0

The same but using a single drive. In that case the computer will tell when you need to exchange the disk. Precautions has been taken to avoid mismatch between target and source disk.

N.B. - You cannot use the default drive specification in this command.

MOVE\* TO 1

This syntax is not allowed.

- You must have at least 10 Kbytes free workspace in the computer to perform the MOVE\*.

- If you have a large BASIC program when using the MOVE\* command, it will not be destroyed, but the function will take several turns (loading and saving) to be performed. Especially if you work with a single drive. In consequence it is highly advisable to keep the SPECTRUM free from BASIC programs.

- ONE IMPORTANT RESTRICTION : The MOVE\* must be used with similar formatted disks. If you attempt to use it with different format you will get the ERROR code 37 = INEQUAL FORMAT @ MOVE\*.

- You can only use the MOVE\* from disk that contain no errors.

- A utility software is available to allow the COPY\* function with question (Y/N). This supports any kind of formatted disks.

**17) ASN\***

This command allows to alter the default drive.

ASN\* ASN\*0 ASN\*1 ASN\*2 ASN\*3

A reset or a NEW restore the default drive. As soon a drive has been selected all the functions without drive assignment will refer to that assigned drive. This allows to RUN on any drive you wish, multi-files programs without altering the several files linked together.

**18) STEP\***

This function refers to the specification of the disc drive connected to the SPECCY. The hardware allows the use of any kind of drives that are compatible with the so-called "SHUGART standard". The specification for the speed of the R/W head between tracks can be different. Generally old drive specification has a step rate of max. 30 msec, new one 6 msec or even lower.

STEP*	Stepping rate: 6 msec	STEP*2	Stepping rate: 20 msec
STEP*0	Stepping rate: 6 msec	STEP*3	Stepping rate: 30 msec
STEP*1	Stepping rate:12 msec		

The STEP\* command works on the default drive which is assigned with the ASN\* function. It can be set for each of the four drives independently from the others. This allows you to use any type of drive.

If you once set the stepping rate, it will not be influenced by a NEW, but will by a PRINT USR 0, or a microprocessor RESET. The default value at power ON is 6 msec for all the four drives.

## **19) ERROR REPORT MESSAGES**

1	LOST DATA (FDC)
2	CRC ERROR (FDC) (CHECK SUM ERROR ON DATA RECORD OR HEADER)
3	RECORD NOT FOUND
4	DRIVE NOT READY
5	DISK WRITE PROTECTED
6	FILE ALREADY EXIST
7	SEEK ERROR
8	FILE TYPE ERROR
9	INSUFFICIENT DISK SPACE
10	INSUFFICIENT RAM SPACE
11	DIRECTORY FULL (60 FILES MAXIMUM)
12	NO SUCH FILE
13	CODE LONGER THAN SPECIFIED
14	NO PROGRAM OR CODE
15	UNRECOGNIZED REC. FORMAT
16	NON-SPECCY DISK

## **20) ERROR CODE MESSAGES**

30 =	ATTEMPT TO WRITE SOFT WRITE PROTECTED DISK
31 =	ATTEMPT TO WRITE SOFT WRITE PROTECTED FILE
32 =	DISK COPY PROTECTED
33 =	FILE COPY PROTECTED
34 =	ATTEMPT TO ERASE AUTOBOOT FILE
35 =	ATTEMPT TO RENAME AUTOBOOT FILE
36 =	ATTEMPT TO RESET AUTOBOOT ATTRIBUT OF A DISK HAVING NO AUTOBOOT FILE
37 =	INEQUAL FORMAT @ MOVE*
50 =	IMPROPER SYSTEM CALL
51 =	IMPROPER SYSTEM CALL
52 =	IMPROPER SYSTEM CALL
53 =	IMPROPER SYSTEM CALL
70 =	DISK READ UNDERRUN
71 =	DISK WRITE UNDERRUN
72 =	DISK READ OVERRUN
71 =	DISK WRITE OVERRUN

## 21) CAPACITY

CONF. NO TRACK	D	FORMATTED CAPACITY [sect/256]	FORMATTED CAPACITY [KBytes]	USER AVAIL. CAPACITY [sect/256]	USER AVAIL. CAPACITY [KBytes]	DIR. %	TIME sec.
1*35	S	350	90	330	82	5.7	40
	D	560	143.4	528	132	5.7	40
1*40	S	400	102.4	380	95	5	45
	D	640	163.8	608	152	5	45
1*45	S	315	80.7	301	75	4.4	50
	D	585	149.8	559	140	4.4	50
1*80	S	800	204.8	770	192	3.7	90
	D	1280	327.7	1232	308	3.7	90
2*40	S	800	204.8	770	193	3.7	85
	D	1280	327.7	1232	308	3.7	85
2*80	S	1600	409.6	1550	385	3.1	170
	D	2560	655.4	2480	620	3.1	170

N.B.:

- 35 and 45 tracks can only be formatted in single side.
- TIME is the average time necessary for formatting the disk with no defective sectors using 5 1/4 inches drive.

This time can vary according the specification of the drive or when no erroneous sectors are found. SPECCY takes into account those bad sectors. If too many errors occur the disk will be rejected. In this case try a lower disk density or single sided format.

- The directory will show the remaining user capacity of the disk. The directory takes between 2 and 5 tracks in relation with the type of format used.

## 22) TECHNICAL DESCRIPTION

The SPECCY-DOS organizes the disk as follows:

### 22.1) NUMBER OF TRACKS:

SPECCY supports 35 - 40 - 45 - 80 tracks. Each of them are divided in sectors of a total length of 256 bytes.

### 22.2) RECORDING DENSITY:

- Two possibilities can be used: single or double.
- Double doesn't mean that you can save twice the capacity of a single density recording.
- In single density each track are divided in 10 sectors. (10\*256 bytes/track).
- In double density these sectors are increased up to 16. (16\*256 = 4096 bytes/track).
- The data transfer speed is the following:

125 Kbits/sec. - single density  
250 Kbits/sec. - dual density

This allows to calculate easily the average formatting capacity you can obtain with the system.

ex.: with a drive of 40 tracks single sided

We obtain for

single density:  $40 \cdot 10 \cdot 256 = 102,40$  Kbytes

dual density :  $40 \cdot 16 \cdot 256 = 163,84$  Kbytes

### 22.3) DIRECTORY TRACK

- The calculated capacity as here above is not fully accessible by user. In SPECCY the reserved tracks for the DIRECTORY varies from 2 up to 5 depending of the disk format.

These are used for the management and location of the programs that are stored on the disk. When a file is saved an automatic directory entry is made along with the file name given to it. This entry contains the track

number and sectors where the computer can find the file, and the number of sectors it has to read when loading back.

This is done by moving the R/W head across tracks.

- On single side the head reads only the underside, when in dual side both side are used alternatively up and down for each tracks.

#### **22.4) TRACK WIDTH**

- In the past the pitch of track was for 40 and 80 tracks drives different. The 80 laydown the tracks on the same area than the 40 one drive. That means that the width for 80 system is exactly 50% of the 40 one.

- New slim line disk drives can use 40 or 80 tracks by changing the step rate of the stepper motor. The width of the tracks are the same. This is convenient to READ 40 tracks disk on a 80 system.

- But don't try to format disk on 40 tracks using 80 switchable drive. If you do this disk the intertracks will also be read at the same time giving trouble. See annex 3

#### **22.5) SETTING UP THE DRIVE**

The drive need to be controlled before use for the following parameters

a) Drive select (DS0 to DS3)

b) Loading resistors (which terminate the flat cable)

c) Eventually Head select (HS) or Head motor ON (HM)

- It is difficult to describe here all the drives available on the market, but for the point a) this choice is generally made for old drives with jumpers to be sold or soldered on the PCB (print circuit board). For new drives this selection is made by DIP switches or removeable jumpers on a pin connector.

- In any case these are generally near the flat cable coming from the DOS In single drive system position the "switch" line to DS0 (drive select 0). For multi drive system refer to the drawing hereunder but make the selection of DS according to the final position you will give to the drive in the system. Near the connector you may also see a special hybrid lookalike integrated circuit. Generally the color is white, blue or black. The tickness is greater than the other IC's and it is in a socket. This is the resistors network which terminate the flat cable. In multi drive operation ONLY one may remain in the system on the drive which is at the end of the flat cable. The other ones must be removed from their sockets.

- A certain category of new drives has the possibility to control the R/W head this permits to place it in contact with the disk by the control of different signal:

HS for head select, the head is only pressed to the surface of the disk when the drive is selected.

HM for head motor on, the head(s) are pressed when the gives the instruction. In multi drive configuration all l are switched together

The choice of the commutation is a question of philosophy with HS the disk itself is less stressed, but the system is a little bit slower than HM. If you own such a drive place the DIP switch ON according to your personal choice, but one of them must be ON.

In any case of difficulties refer always to your drive leaflet.

### **23) HOW TO INSTALL SPECCY**

The OUTPUT connector described here after, both SPECCY-DOS and disk drive has the same. If the drive is different control if you own a 'SHUGGART' standard one if the connector is different made the. Connections according to the function each line must realize.

Figures 1 to 33 are grounded.

2	HEAD LOAD
4	
6	DS3 or DRIVE-SELECT 3
8	INDEX
10	DS0 or DRIVE SELECT 0
12	DS1 or DRIVE SELECT 1
14	DS2 or DRIVE SELECT2
16	MOTOR ON
18	DIRECTION
20	STEP
22	WRITE DATA
24	WRITE GATE
26	TRACK 00
28	WRITE PROTECT
30	READ DATA
32	SIDE SELECT
33	-

To interconnect SPECCY and the DOS a flat or twisted flat cable of 34 wires, and the appropriate connectors are necessary. Generally these standard connectors are available at electronics spare part distributors. Such wellknown firm like: BERG, CANON etc.. can supply it easily.

They are also easy to mount on the cable by pressing both parts together with the help of a vice.

When mounting the connectors take care of the right position of the connectors to avoid to twist the cable to obtain the final right connection.

To achieve that localisate pin 1 of the drive and the interface when the drives and the interface material are in the right working position. See annex 1

An inversion of the connectors cannot destroy the DOS nor drives, nor the SPECTRUM. It will only result of the LED of the drive will remain ON.

POWER SUPPLY: The drives must be powered by:      + 12 V stabilised            1A  
  + 5 V stabilised                1A

ANNEX2 shows a principle diagram how to build such power supply.

ANNEX3 track width.

ANNEX4 shows how to build a 4 drives configuration.

## **24) STARTING UP**

With all the connections realized:

a) Insert SPECCY-DOS ALONE into the rear edge connector of the SPECTRUM.

Switch ON check if the prompt: SPECCY - DOS v4.0 appears.

b) If OK switch the SPECTRUM OFF. Connect the flat cable to SPECCY and DRIVE(S).

Switch the drive power supply ON.

Switch the SPECTRUM ON.

The motor(s) of drive(s) must turn for a few second and stop LED will indicate this motor on.

IF ONE OF THE DRIVE(S) LED REMAINS ON inverse one of the connectors. If everything is allright

(SPECCY prompt) you are ready to start with BASIC or DRIVE commands.

c) Introduce a disk and FORMAT it by using: FORMAT\* "NAME"ss40

Press ENTER to answer to the prompt if the disk is not a new one and wait. At the END of formatting you will see an empty directory giving the disk capacity and number of blocks (sectors). In our example 380 blocks/95 Kbytes.

## **COMPATIBILITY WITH INTERFACE 1 INTERFACE**

I can be directly compatible with the SPECCY - DOS a possibility exists to transfer files from interface 1 to SPECCY and the reverse. To achieve the perfect compatibility between modules the IF1 has to be first modified, because his BUS output connector doesn't correspond to the SPECTRUM output. Otherwise the SPECCY has to be connected before the IF1 with is not mechanically acceptable.

If IF1 is not modified any ERROR messages will cause a crash of the program with is also unconvenient.

### **MODIFICATION OF IF1**

The purpose of this modification is to make the original ROMCS (B25) line of the SPECTRUM accessible at the extension connector of the IF1. For this the A4 line is chosen with is unused by the SPECTRUM. The modification means connecting these two lines to each other within the IF1.

First open the IF1, at the bottom side, above the edge connector you will see a soldering pad (2\*28 soldering pads).

Now sold an isolated wire between B25 and A4 as illustrated in the drawing hereunder.

### **IMPORTANT NOTICE:**

If you use a SPECTRUM in with the A4 line is used for some purpose due to your OWN modification, DO NOT CONNECT THE SPECCY-DOS interface, before to contact us.

The basic rules of this compatibility are as follows:

\* For DOS operation the IF1 does not need to be disable.

\* For any IF1 operation the SPECCY-DOS must be disable.



After the power on the DOS is enabled. You can use the DOS commands. If you want to issue on IF1 command, the DOS must be disabled ONLY for those IF1 commands the syntax of wich are perfectly correct in the DOS as well.

For example: LOAD\*"b" to LOAD\*"b";l wich is incorrect for the DOS, the IF1 will execute the command even the DOS is enabled. This also applies for the case you EDIT a program, and you want to enter an IF1 command into a BASIC line. If the DOS is in disabled state, and you want to issue a DOS command or you want to enter a DOS command into a BASIC line, the DOS is to be enabled first.

This is done by:

POKE 15169,0	ENABLE- DOS (DOS ON)
POKE 15169,64	DISABLE DOS (DOS OFF)

EXAMPLE: POKE 15169,64:LOAD..... :POKE 15169,0:SAVE\*1"FILE"  
load from micro-drive

This loads a program from micro-drive, then save it in SPECCY-DOS.

**COMPATIBILITY**

Due to the fact that SPECCY don't use I/O allmost of the interface will work with him.

All norm of joystick included KEMPSTON with IN 31.

All printer interface.

**MAGIC2.x**

- At any point of a program a complete backup of the SPECTRUM, memory can be loaded to the disk in one long file.
- On your interface a touch or mechanical control is provided.
- To made a complete backup first LOAD into the computer the toolkit software called MAGIC2.x
- Press ENTER.
- Made a choice as requested by the MENU.  
S = save L = load \$ = save screen C = create loader I = instruction E = end
- Select I to read instructions.
- The program can be used with TAPE - MICRODRIVE - SPECCY DISK as loading source.
- When finishing, PUT A DISK IN THE ASSIGNED DRIVE.
- Press the button on your interface, the drive will start and the complete memory program is SAVED onto your disk. When finish the, computer RESET completely.

TO RELOAD the saved program two possibilities occurs:

- a) If you have create a loader simply LOAD it. Ex.: LOAD\*"test"
- b) Or reload the program MAGIC2.x press L and answer the prompts.

Note: If you want to load a SCREEN\$ before, this has to be loaded before to call the loader explain here above.

**TOOLKIT SOFTWARE AVAILABLE**

- COPY4 file copy utility - Replace the MOVE\* when using different disk formatting.  
All the file can be copied or copy is perform after answering question (Y/N).
- ORG4 file copy as above but with reorganisation of the sequence of the files,  
according to your entry choice.
- UTIL4 utility program wich allows you to select in one go the following:  
ATTRIBUT - ERASE - RENAME
- COPY4 TF copy from TAPE to DISK (file of 41 Kb Max.),
- MENU4 menu program when autobooted in your disk will automatically display the BASIC loader  
(if CAPITAL LETTERS are used) only before to take care of attribute status.
- MAGIC2.x, Program to be loaded in the SPECTRUM before to made a complete save of the memory onto  
disk. It also allows to reload this long block into the SPECTRUM and run it.
- INTS 4.0 replace the software of INTERFACE III (EVESHAM MICRO CENTER) when reading the  
conversion tape, it will transfer automatically the files on the SPECCY disk.
- COPY4 FT Copy from disk to-tape.

## **REMARKS**

SOMES LOCATIONS OF THE SPECTRUM ROM CAN NOT BE USED:

1292H Entry point for prompt and AUTOBOOT.

1B41H Second entry point.

3B41H wich hold the density of disk used.

Normally these positions cannot be accessed by the computer directly. Any actions will give a crash of the system. If a commercial software crashes during the game, deselecting the SPECCY ROM after loading from disk will generally solve the problem. The deselection if done by desabling DOS (POKE 15169,64). This can be included in the basic loader

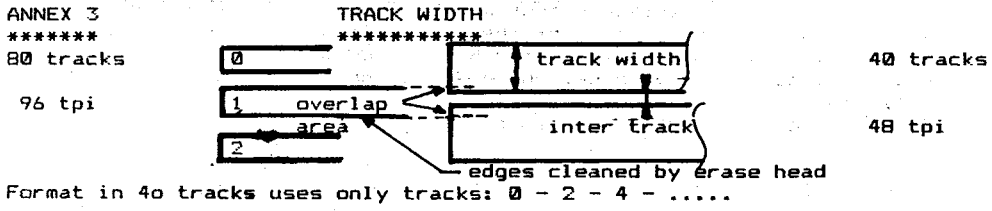
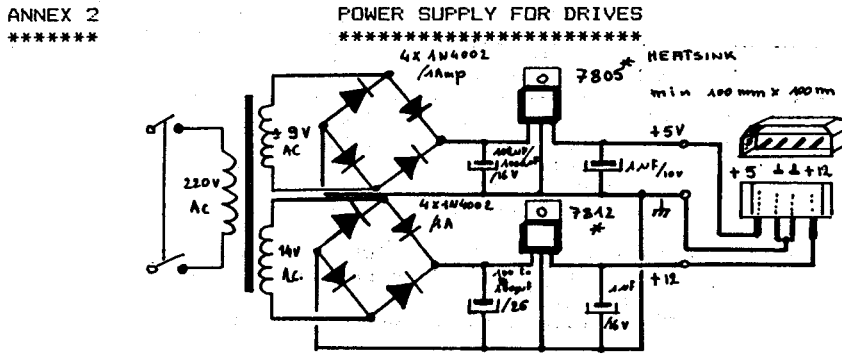
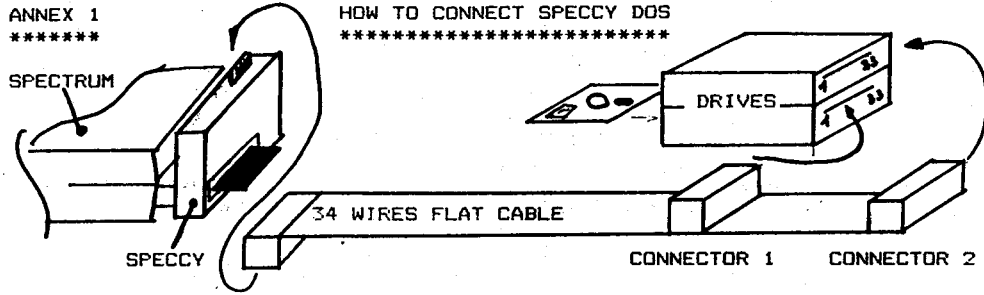
Your SPECCY-DOS is equipped with a disk controller integrated circuit, wich allows a STEP RATE of 30,20,12,6ms. So when purchasing disk drives check, if your choice is in accordance with that specification. If you don't respect it, seek errors will occurs.

A different software on EPROM is available v4.0+, includes, a special write routine, wich checks after writing the content of what you save on the disk. This slowdown a little bit the write routine, but take care of your software if a CRC occurs.

The command MOVE\* is the most affected by this control. Ex.: For a disk dd80 the backup will take 12 minutes instead of 4 with the v4.0 version. For some applications this can be very helpfull. Only the write routine is affected by this verify. The speed remain the same for all the others functions.

It can be available on request.

ANNEX



Format in 40 tracks uses only tracks: 0 - 2 - 4 - .....

