

HSH COMPUTER

HSH's MSX SCSI INTERFACE
MSX HARD DISK
SYSTEM OPERATING MANUAL

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We didn't really want to include any of the above, but try telling that to lawyers, ours insisted.

You should note, however, that we support our products and we try to be fair, and we will continue development. So any feedback is welcome.

HSH Computer 1990

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IF YOU DON'T READ ANYTHING ELSE, AT LEAST READ THIS

The HSH MSX-Hard Disk System comes READY TO RUN, that is:

DEVICE NUMBER'S CORRECTLY SET
HARD DISK DRIVE FORMATTED
HARD DISK DRIVE PARTITIONED

... so here goes:

CAREFULLY UNPACK THE PACKAGE CONTENTS etc.

If you're using MSX-DOS 1 and an MSX Computer with built in disk drive:

SWITCH ON YOUR COMPUTER (don't BOOT DOS 1)
FORMAT A NEW DISK
MAKE A COPY OF THE "HSH HD SYSTEM DISK"
 (it's under the Interface)
 by placing the "package disk" in your disk drive and
 type "QC" and RETURN (COMPLY WITH THE PROMPT MESSAGES)
BOOT DOS 1
COPY MSXDOS.SYS & COMAND.COM onto the copy of
 the "package disk"
SWITCH OFF YOUR COMPUTER
INSERT THE HSH SCSI-INTERFACE INTO ANY SLOT
INSERT CABLE FROM HARD DISK DRIVE INTO INTERFACE CONNECTOR
CONNECT POWER TO HARD DISK DRIVE & SWITCH ON POWER
W A I T FOR 30 SECONDS
SWITCH ON YOUR COMPUTER

if all went well, then you should now be looking for an extra drive or two .. or even three. You should have the DOS prompt A>, so type in b:, or c: and press enter, try the DIR command, the Hard Disk Drive is the one which indicates something like:

```
xxxxxxxxxx           20158 Kbytes free   or  
xxxxxxxxxx           31512 KBytes Free
```

if you're using MSX-DOS 2 and an MSX Computer with built in disk drive:

INSERT THE HSH SCSI-INTERFACE INTO SLOT 2
INSERT CABLE FROM HARD DISK DRIVE INTO INTERFACE CONNECTOR
CONNECT POWER TO HARD DISK DRIVE & SWITCH ON POWER
W A I T FOR 30 SECONDS
SWITCH ON YOUR COMPUTER
TYPE DIR & ENTER wow!... so much free space.....

A: is the Hard Disk Drive, and maybe B: and C: as well...

your Floppy Disk Drives come after the hard disk.

MSX-DOS 2 has its advantages, you should have done this in 4 minutes.

A special thank you to:

nobi for his diligence and perseverance

ush, for showing me the light

other members of the MSX/SVI Club (D)

marina, for proof reading

anton, for testing

peter, for his faith

and brunny

c

0. INTRODUCTION

The HSH MSX Hard Disk System, based on high performance SCSI technology, gives the MSX System access to high capacity data storage mediums, through the HSH SCSI (Small Computer System Interface) MSX Interface.

Although you are probably eager to get started we recommend that you read through this manual, to become familiar with the terms concerning SCSI DEVICES and acquainted with the system. The SHORT amount of time required should assure LONG un-impaired use and satisfaction.

Your HSH MSX-Hard Disk System Package contains the following:

- The HSH SCSI-Cartridge
- The SCSI-Hard Disk drive
- A disk containing the installation and formatting software
- This manual

Important note for the Netherlands

There is nothing missing, ... it works ... it's the REAL THING
is your version of DOS?

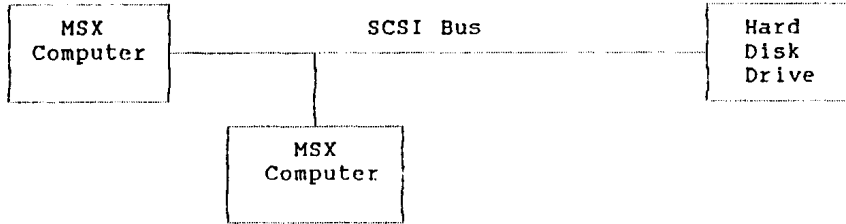
N.B. SECURE ALL WINDOWS ... a Sparrow might get in
..... the saga has ended! ???

0.1. Some Configurations

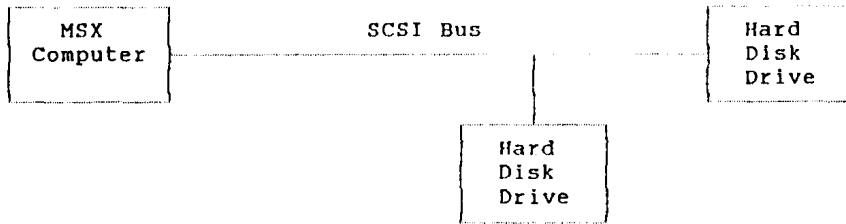
You can connect up to 8 devices to a SCSI-Bus. The following configurations are just some of the possibilities:



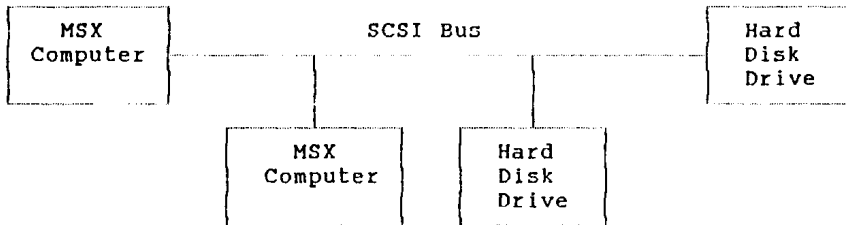
dig. 1 MSX COMPUTER AND 1 HD DRIVE



dig. 2 MSX COMPUTERS AND 1 HD DRIVE



dig. 1 MSX COMPUTER AND 2 HD DRIVES



dig. 2 MSX COMPUTERS AND 2 HD DRIVE

The maximum length of each SCSI cable should not exceed 6 meters (20 feet). This would allow you, for instance, to place a connected device away from the proximity of the computer.

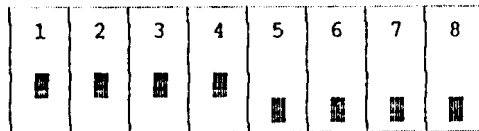
In the following chapters we will assume the basic configuration: - 1 MSX Computer and 1 Hard Disk Drive -. Having done this we will then go on to explain the necessary steps on how to install and integrate further Hard Disk Drives and computers.

1. PREPARATIONS AND INSTALLATION

If you have purchased the complete HSH MSX HARD DISK SYSTEM, you can skip this chapter and continue with chapter 2.

1.1 Preparing the interface

Open the interface cartridge by removing the 6 screws. On the COMPONENTS SIDE of the printed circuit board (pcb) you will see a row of switches marked DS-1 or S-1, which look like the following:



dig. DIP SWITCHES

The switches 1 to 3 are for setting the SCSI Device number for the interface. These 3 switches should be set to the ON position, this ensures that your MSX Computer is the highest priority device (number 7) in the system.

Switch 4 activates the PARITY CHECK. Check SCSI-Drive handbook, which you should receive with every SCSI-Drive, whether the drive you have supports parity checking. Switch 4 should be set to ON if the drive supports this, otherwise switch 4 should be set to OFF.

Switch 5 enables the VERIFY OPTION of MSX-DOS. If your SCSI-Drive supports the SCSI-Command VERIFY (&H2F), check the SCSI-Drive handbook to see whether your drive has this feature. If your drive has this feature then switch 5 should be set to ON. You can then, from MSX-DOS with the VERIFY COMMAND ON/OFF, cause the drive to verify data after it has been written to it. If your SCSI-Drive does not support the verify option, then switch 5 should be set OFF. This causes the MSX-DOS command VERIFY ON/OFF to be ignored.

Hard disk drives have an automatic error correction feature, which corrects read errors independantly. You can switch off the automatic error correction feature of your drive by setting switch 6 to the ON position. NOTE, that this is only useful for testing purposes and during normal everyday use switch 6 should be set to the OFF position.

SWITCHES 7 AND 8 ARE RESERVED FOR FUTURE HSH SYSTEM EXPANSIONS.
These switches should remain in the OFF position!

You should check now that the TERMINATION RESISTOR PACK, directly behind the connector for the SCSI-Cable, is present. Assuming that all the above steps have been completed, you can now close the interface housing, not forgetting to reseal the 6 screws.

1.2 Preparing the hard disk drive

Set the SCSI-Device number of the drive to 0 (see drive handbook) and activate the parity check feature, if present (see drive handbook). Ensure that the TERMINATION RESISTOR PACK of the drive is in place (see drive handbook). You can then go on to the next step.

1.3 Installing the hard disk drive

Connect the drive to the interface with a SCSI-Cable. Place the interface into one of the cartridge slots of your MSX Computer. Having ensured that all the connections have been made properly, switch on the drive power supply.

WAIT FOR 30 SECONDS

During these 30 seconds the drive goes through a self test procedure (you might find that your drive only requires 5 seconds, but you won't know until it has been switched on). When the drive has completed its self test, switch on the power to your computer and boot MSX-DOS as normal.

Since the drive has not yet been installed, you cannot access it. (If you have MSX-DOS 2 installed, the drive will most probably be registered as drive A: by the system; but attempting to access the drive will result in an UNFORMATTED DISK ERROR).

Remove your MSX-DOS disk and insert the HSH HD-System Disk into your floppy disk drive. DON'T RESET YOUR COMPUTER!

=====

Type FDISK and press RETURN (or ENTER on some MSX Computers).

The program will display the type of Hard Disk Drive connected and show a menu with a list of options, similar to the following:

SEAGATE ST296N

Unit 0-0

FDISK 1.06 main menu (C) usch 01/1990

Key	Action
F	Format disk (drive parameters, defect list, low level formatter)
P	Modify partition table
I	Initialize partitions (logical formatter)
T	Perform controller and disk drive self test
S	Stop drive (park read/write heads)
Q	Quit to MSX-DOS

dig. FDISK MAINMENU

Three further steps are all you need to complete the installation of the drive:

- FORMATTING
- PARTITIONING
- INITIALISATION

1.3.1 Formatting the hard disk drive

To format the hard disk drive choose the "F" option from the main menu. The hard disk drive contained in your HSH MSX Hard Disk System is already formatted, so you can skip this point. You need only re-format the drive, if for some reason the data has become illegible (if, for example, during transport it has been subjected to a strong magnetic field).

Having pressed the "F" key to choose the [F]ormat option the following menu is displayed:

SEAGATE ST296N

Unit 0-0

FDISK low level format menu (C) usch 01/1990

Page	Parameters
1	Error recovery
2	Disconnect
3	Drive format
4	Drive geometry
N	Next menu (defect list and formatting)
Q	Quit to main menu

dig. LOW LEVEL FORMAT MENU 1

From here you can activate some drive parameters. These are dependant upon the actual drive (see drive manual or specifications as to whether your drive supports the relevant features).

NOTE: MSX-DOS can only manage data formats of 512 Bytes per sector. If you are offered a selection of sector sizes, then be sure to choose the correct one of 512 Bytes/Sector.

Choosing the "N" option from Format Menu 1 will display the next menu:

SEAGATE ST296N		Unit 0-0
FDISK 1.06 low level format menu (C) usch 01/1990		
Key	Action	
0	No defect list	
1	Enter complete defect list, BFI format	
2	Enter partial defect list, BFI format	
3	Enter complete defect list, physical sector format	
4	Enter partial defect list, physical sector format	
5	Enter complete defect list, logical block format	
6	Enter partial defect list, logical block format	
F	Format disk - kill any existing data	
P	Previous menu (drive parameters)	

dig. LOW LEVEL FORMAT MENU 2

Nearly all Hard Disk Drives available today do not have a 100% error free magnetic film (coating). It is for this reason that with most Hard Disk Drives you also receive a quality control document (test protocol printout), which gives a list of faulty sectors. During formatting these can be made to appear invisible, so that drive functions are not impaired. Check the test protocol to see in which format the defect list has been documented, these are; BFI (Bytes from Index), Physical Sector Format or Logical Block Format. Then choose the appropriate format from the menu (1, 3 or 5), then type in the defects in ascending order.

If no faulty sectors are listed on the test protocol printout, this does not mean that the drive is error free, but rather, that the built-in controller is already aware of any faults. In this case choose option "0" (No defect list) from the menu.

Option "F" starts the formatting procedure, which will ask you to input an INTERLEAVE-FACTOR. Through skillfully choosing the best value (trial and error) you can optimise on the read write performance of the drive. With all due respect, however, a high performance SCSI-Drive (capable of data transfer rates in and above 100 Mega Bytes per second) will not be too greatly impressed by the 3.7 MHz clock of a Z80-CPU. Optimisation will therefor be minimal, and as a rule an INTERLEAVE-FACTOR of 2 is sufficient.

After the above, proceed by entering "P" (Previous Menu) and from there "Q" which brings you back to the Main Menu.

1.3.2 Partitioning

MSX-DOS can only manage and organise datamediums having 512 Bytes per Sector. Since 65536 is the largest number possible attainable in 16 Bit format, hence, $65536 \times 512 = 33554432$ or 32 MB, the maximum drive capacity, of each drive.

To utilise higher capacity drives and still manage and organise the data in excess of 32 MB, drives exceeding this capacity have to be divided into managable units (partitioned). Each partition can have a maximum capacity of 32 MB. MSX-DOS regards each partition as a seperate drive, even though all these drives are present on the same Hard Disk Drive.

Choosing "P" from the menu will display the PARTITIONING MENU:

SEAGATE ST296N		Total capacity		80.982 MBytes		Unit 0-0	
		In use		80.982 MBytes			
Partition table							
Number	Type	Att	MBytes	Sectors	Dir	FAT	Cluster KB/Clust
1	MSX-DOS	P	4.000	1- 8192	112	12	4080 1.00
2	MSX-DOS	-	9.974	8193- 28618	254	1	318 32.00
3	MSX-DOS	-	31.896	28619- 93941	254	12	4080 8.00
4	MSX-DOS	P	15.000	93942-124661	112	12	3836 4.00
5	MSX-DOS	-	20.112	124662-165850	64	8	2573 8.00
6	unused						
W	Write new partition table to disk						
S	Save partition table as a disk file						
L	Load partition table from a disk file						
Q	Quit to main menu (discard modifications)						

dig. PARTITIONING MENU

With the HSH Hard Disk Formatting Software, you can install up to 6 partitions on each Hard Disk Drive (this gives a maximum capacity of 192 MB per Hard Disk Drive). Installing more partitions would be impractical, since each partition is regarded by MSX-DOS as a separate drive and MSX-DOS supports a maximum of 8 drives, 1 or 2 of which is/are the Floppy Disk Drive(s) already present in the system. If, under HSH's MSX-DOS 2, you use the RAM-Disk H:, you should limit the number of partitions to a maximum of 5.

Choose a partition (1 to 6). Then choose from the following partition attributes:

- (D) Delete The partition will be deleted.
Does not apply to first time installation.
- (M) MSX-DOS The partition is initialised for MSX-DOS
- (P) Protected Same as (M) except that the partitions are
WRITE PROTECTED
- (R) Reserved This reserves space on the drive that
cannot be accessed from MSX-DOS.
- (N) Network A designated partition is reserved for
another MSX Computer linked into the network
system.

Next the partition size has to be allocated in MBytes. Ensure that the sum of all the partitions does not exceed the maximum drive capacity (displayed at the top of the screen).

The menu also displays the following information:

- The sectors used by the partition
- The number of directory entries
- The size of the FAT (File Allocation Table)
- The number of clusters
- The number of KBytes per cluster

Next the number of DIRECTORY ENTRIES for the partition is allocated. The maximum number (available under MSX-DOS) is 254.

And finally the number of SECTORS per FAT is allocated. Note, a larger number (maximum is 12) results in a more precise partition, i.e. less disk space is wasted, if you intend to have a large number of small files.

SECTORS/FAT limitations under MSX-DOS 1.

Under MSX-DOS 1, all the FAT's for each drive connected to an MSX Computer are stored in MAIN RAM and use 512 Bytes of RAM for every FAT-Sector. Therefore the larger the FAT's, the larger the RAM area used and hence, less RAM is available for programs. In extreme cases (6 partitions a. 12 sectors 36.86 KB), more than half the standard RAM would be reserved, i.e. the RAM available would be extremely limited. The limitations do not occur if you have an HSH RE-512 MM RAM Expansion (this is the only 100%, MSX compatible 512 KB RAM Expansion). If you do not have the HSH RE-512 MM RAM Expansion, then under MSX-DOS 1 you should limit the number of SECTORS/FAT to 3 or 4.

Using the system in conjunction with HSH's MSX-DOS 2 there are no limitations. MSX-DOS 2 does not store all the FAT's of all the drives connected to the system in main RAM continuously, it only reads the required FAT into memory when necessary from a particular drive. However, reading from disk does require a minute amount of time, so that accessing partitions with large FAT's is not quite as fast as accessing partitions with small FAT's. In the above example, partition 2 has only a single FAT sector; this partition can therefore be accessed very quickly, making it ideal, for instance, as a temporary file area (See the TEMP Environment Item in the HSH Book: MSX-DOS 2 Operating System Manual, available from HSH).

The menu option "W" will write the FAT to the disk. Option "S" writes the FAT to a file, which can be loaded again with the "L" option. This is useful, if at some future date you require the hard disk drive to be reformatted, which would destroy all data including the partition attributes etc.. By saving this information to a floppy disk file it can be used to create partitions on new or formatted drives quickly.

Option "Q" returns you to the Main Menu.

1.3.3 Initialising partitions

After the drive has been partitioned, these partitions have to be INITIALISED. This is done through the "I" option from the menu.

The partitions menu will again be displayed on your screen. Type in the number of the partition that you want to initialise. You are then prompted for a volume name which can be ignored, if given, it will be used by MSX-DOS 2, for instance, during the DIR commands' operation to display it as the title of the directory listing.

Repeat the above steps for all the installed partitions. When this has been done all the Hard Disk Preparations are completed.

1.3.4 Further options of FDISK

From the FDISK Main Menu there are 2 further options:

- (T) Perform controller and disk drive self test
- (S) Stop drive (park read/write heads)

The "T" option starts the same automatic self-test as when you power up the drive.

The "S" option parks the drives' read/write heads. In so far as your drive does not AUTO-PARK (see drive specifications), you should always use the "S" option before switching of the Hard Disk Drive.

Note: After having parked the read/write heads, you should switch off the drive power supply before exiting FDISK with the "Q" option, otherwise the read/write heads will leave the park position! This could result in damage to the Hard Disk Drive!

2. USING THE DRIVE FOR THE FIRST TIME AFTER INSTALLATION

If you have completed the above installation procedures or have purchased the HSH MSX Hard Disk System, which is supplied READY TO RUN, then you have now reached the stage where the drive is ready to use.

2.1 Using the drive with MSX-DOS 1

If you have reached this stage after initialisation, with the computer and drive still switched on, then switch everything off, remove the HSH SCSI Cartridge, and boot up your computer with MSX-DOS 1 as usual.

Make a BACKUP copy of the HSH disk supplied with the MSX Hard Disk System. Use the special software supplied on the disk (QC) to do this.

Onto the disk you have just 'made' copy the 2 files MSXDOS.SYS and COMMAND.COM from your MSX-DOS 1 System Disk onto it. This disk is now your BOOT-DISK for the Hard Disk System. Remove the disk and switch off your computer.

If you have an MSX Computer with an external floppy disk drive, connect this drive to the cartridge slot 2 (or B on some MSX Computers) and insert the HSH Interface into cartridge slot 1 (or A on some MSX Computers). If your MSX Computer has a built in floppy disk drive, then insert the HSH Interface into either of the cartridge slots.

Now you can switch on the power of the Hard Disk Drive, wait for 20-30 seconds and then switch on your computer booting MSX-DOS 1 from the BOOT-DISK you have just made. Your floppy disk drives should now be A: or/and B:, and the Hard Disk Drive should be C:, D:, etc. (dependant on the number of partitions installed). These can be accessed in the normal manner.

We recommend that you copy the 2 files MSXDOS.SYS and COMMAND.COM onto the the first partition of the Hard Disk Drive and then delete these 2 files from the BOOT-DISK. MSX-DOS will then start up automatically from the Hard Disk Drive.

NOTE: You should, however, ALWAYS have the BOOT-DISK present in drive A: when powering up your computer, or when returning to MSX-DOS via the BASIC command CALL SYSTEM (_SYSTEM) from MSX-BASIC.

In case you are unable to access all the partitions of the Hard Disk Drive, that were installed using FDISK, then the most likely cause is that the FAT's for each partition exceed the memory limits of your computer. This results in only those partitions whose FAT's can be loaded into memory without conflict, being accessible.

To gain access to all the installed partitions you should start again at the Hard Disk Installation procedure 1.3.2.

2.2 Using the drive under MSX-DOS 2

IMPORTANT NOTE: The HSH MSX Hard Disk System will ONLY function with LEGAL MSX-DOS 2 VERSIONS !!!

Legal versions are: HSH versions, 2.20 & 2.20 rel. 2.22
ASCII versions, 2.20 & higher

Place the MSX-DOS 2 Cartridge in SLOT 1 (A on some MSX Computers), place the HSH Interface Cartridge in SLOT 2 (B on some MSX Computers). Start MSX-DOS 2 as usual.

NOTE, DO NOT USE THE DISK SUPPLIED WITH THE INTERFACE !!!

The disk supplied with the interface is ONLY for use with MSX-DOS 1.

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

The Hard Disk Drive can now be accessed as A:, B: and so forth (dependant on the number of partitions installed), the Floppy Disk Drives present in the system will come after the Hard disk Drive partitions.

For example, if your Hard Disk Drive has 4 partitions, these will be A:, B:, C: and D:, and the first floppy drive would be E:.

You can now copy your MSX-DOS 2 SYSTEM DISK onto the Hard Disk Drive (using, for example, XCOPY/S). When you next switch on your system, MSX-DOS 2 will be BOOTed from the Hard Disk. Using this method dispenses with the necessity for any BOOT DISK.

3. OTHER FUNCTIONS

3.1. Write Protected Partitions

Since the actual formatting of the Hard Disk Drive is carried out with the supplied software, the MSX-DOS command `FORMAT` or the Disk-BASIC command `CALL FORMAT` are used to either `WRITE PROTECT` or `WRITE ENABLE` individual partitions (see 1.3.2.).

When logged into the Hard disk drive the prompts issued by the system are as follows:

```
A> FORMAT
1 - Write protect partition
2 - Write enable partition
```

Enter a "1" to `WRITE PROTECT` a partition, or "2" to `WRITE ENABLE` the partition.

NOTE, when running MSX-DOS 2: IGNORE THE TWO SYSTEM MESSAGES:

```
                "All data on drive X: will be destroyed"
AND             "Not a DOS disk"
```

3.2. Changing the default drive under Disk-BASIC

For Disk-BASIC versions below version 2.1, a special command

```
CALL CHDRV("d:")
```

has been incorporated enabling the system default drive to be changed. Where "d:" is the name of the new default drive.

4. EXPANDING THE SYSTEM

As previously mentioned in the introduction, the SCSI-Bus allows up to 8 SCSI-Devices to be connected to it. Each device is allocated a DEVICE NUMBER, in the range of 0 to 7, which can be set by either DIP switches or jumpers.

The present bus configuration consists of: the MSX Computer with the device number "7", and the HSH MSX Hard Disk Drive with the device number "0".

NOTE: Although not essential, we recommend that each new HARD DISK connected to the NETWORK should be allocated ASCENDING DEVICE NUMBERS (1,2 etc.), and each new COMPUTER connected to the NETWORK should be allocated DESCENDING DEVICE NUMBERS (6,5 etc.).

IMPORTANT NOTE !

It is important that only the two devices at each end of SCSI-Bus cable have their RESISTOR TERMINATION PACK installed. All other devices connected to the SCSI-Bus should have their resistor termination pack REMOVED! Otherwise serious damage could occur.

We will proceed assuming that the two devices connected to the SCSI-Bus will remain at each end of the Bus and that additional devices will be connected between these two.

4.1. Connecting more MSX Computers

Firstly open the HSH Interface Cartridge (as described elsewhere in the manual) and REMOVE the resistor termination pack (put this away in a safe place for possible future use), see diagram. Next, allocate an un-used device number, with DIP switches 1 to 3:

Switch			Number (Address)
1	2	3	
ON	ON	ON	7
OFF	ON	ON	6
ON	OFF	ON	5
OFF	OFF	ON	4
ON	ON	OFF	3
OFF	ON	OFF	2
ON	OFF	OFF	1

The functions of DIP switches 4 to 8 have been described elsewhere in this manual.

To avoid "DATA GARBAGE" the newly installed, 2nd Computer, can at this stage only access the existing Hard Disk Drive to READ data or/and files. To enable any "new" computer in the SCSI-NETWORK to have READ/WRITE access, one or more NETWORK PARTITIONS have to be allocated. To do this start the program FDISK, and chose the option "Partition Menu". Select a partition and choose "N" as the partition type then enter the DEVICE NUMBER of the new device (in this case the, "new", second computer). Write the new partition table to disk with the "W" option, then RESET all the computers connected to the network by pressing RESET.

This newly defined partition is now specific to the new computer. In principal any computer connected to the SCSI-Network can access all the information in all the partitions of the Hard Disk drive(s), but only write to their specific (reserved) partition(s).

4.2. Connecting more Hard Disk Drives

Firstly remove the "resistor termination pack" from the new drive, then allocate an un-used device number (address) to the drive, see your drive manual for how to do this.

Connect the new Hard Disk Drive into the system and switch on the whole system, not forgetting the new drive. Start the FDISK program as follows:

```
A> FDISK #
```

where "#" is the DEVICE NUMBER that has been allocated to the new drive (e.g. FDISK 1).

Note that 6 PARTITIONS are the maximum number that can be active at any time (see details els-where in manual). If, for examlc, the first Hard Disk drive in the system has 4 partitions, then only 2 partitions will be available on the new drive. If more partitions are installed then only the first two will accessible.

After the new drive has been installed, RESET the whole system.

4.3. Important Notes on MSX SCSI LAN (Local Area Network)

- ALL DEVICES connected to the SCSI-Bus should ALWAYS be SWITCHED ON, even if not all are required. Devices connected to the SCSI-Bus which are not switched on can impair the other devices and cause these to malfunction. It is advisable to use a multi-socket switched power outlet to which all the SCSI-Devices can be connected, and then be switched ON and OFF simultaneously, (i.e. ALL the COMPUTERS, DRIVES etc. should always be switched ON and switching the system on and off should be carried out by means of the switched power outlets).

- NEVER RESET or switch of the power to ANY DEVICE while the network is in use.

- Computers running under MSX-DOS 1 can occasionally, when accessing a Hard Disk, produce an error message "Disk error". This is quite normal, and has probably been caused by another computers BUS-RESET, simply type in "R" to the prompt message to retry the disk operation. Computers running HSH's MSX-DOS 2 (or ASCII's) will not normally respond in this manner, since under MSX-DOS 2 a Bus-Reset is handled internally by the operating system and therefore these access error messages should not be issued.

- The SCSI-Cartridges' LED is active (ON) for all SCSI-Bus activities, and does not simply indicate that the device to which it is connected is active.

- RESUME: ENSURE THAT only THE DEVICES AT EACH END OF THE scsi-NETWORK HAVE THEIR "resistor termination packs" INSTALLED

THAT EACH DEVICE HAS A "unique" DEVICE NUMBER

THAT ALL DEVICES CONNECTED TO THE NETWORK ARE SWITCHED ON

THAT no SINGLE DEVICE IS reset OR switched off WHILE THE NETWORK IS IN OPERATION

THAT WHEN USING MSX-DOS 2, IT IS A legal VERSION, IN slot 1 AND THE hsh scsi-interface IS IN slot 2

Adherence to these few simple rules will enable you to take full advantage of the sophisticated HSH SCSI-Range of products, and ensure trouble free functioning.

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