

**DTC6280 ESDI HARD AND FLOPPY DISK CONTROLLER
REV. D 04/21/89**

INSTALLATION MANUAL

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JUMPER	JUMPER FUNCTION	DEFAULT	INSTALLED Y/N OPEN/CLOSED
W1	AUTO-DESELECT MODE	AUTO-DESELECT DISABLED	NO
W2 W3	FLOPPY ENABLE/DIS- ABLE JUMPERS	FLOPPY ENABLED	YES NO
SW1-1-2	HARD & FLOPPY PORT ADDRESS	PRIMARY PORT ADDRESS ENABLED	OPEN OPEN
SW1-3	BIOS MEMORY ADDRESS	C8000	OPEN
SW1-4	BIOS ENABLED SWITCH	BIOS PROM ENABLED	CLOSED

Auto-Deselect Mode Jumper – W1 (Not Installed)

This jumper is used to control the drive select light (LED). The factory settings call for the drive light to remain illuminated when power is on.

- W1 installed = Auto-Deselect enabled
- * W1 not installed = Auto-Deselect Disabled

Floppy Enable/Disable Jumpers – W2 & W3

These jumpers allow the ability to disable the floppy portion of the 6280 for use in systems that already contain a floppy controller.

- * W2 installed & W3 not installed = Floppy enable
- W2 not installed & W3 installed = Floppy disabled

Primary/Secondary Port Address Switches – (SW1-1 & 2)

I/O port addresses for the Hard & Floppy drive.

- * SW1-1 & SW1-2 Open = Primary port addresses
(1F0 to 1F7, 3F0 to 3F7)
- SW1-1 & SW1-2 Closed = Secondary port addresses
(170 to 177, 370 to 377)

BIOS Prom Address Switch – (SW1-3)

- * SW1-3 Open = C800:0000 to CC00:0000
- SW1-3 Closed = D800:0000 to DC00:0000

CMOS UPDATE & LOW LEVEL FORMAT

EXAMPLE FOR ONE ESDI DISK DRIVE

Once the controller and disk drive hardware installation is complete, the ESDI hard disk drive(s) need to be added to your system CMOS/ Setup. The hard drives(s) then require low level formatting (FORMAT). The following is a CMOS update and low level formatting example for a system utilizing 1 ESDI hard disk drive.

ADDING THE DRIVE TO CMOS

Adding the ESDI hard drive to system CMOS does not require the user to run SETUP or DIAGNOSTIC. Instead, boot into DOS and load the diskette with the DEBUG file from floppy drive "A" in the following manner.

```
User Enters:          DEBUG<cr>
System response:     -
User Enters:          g=C800:5<cr>
```

Note: If you selected the alternate BIOS address, enter g=d800:5<cr>

Note: <cr> means "enter" or "return"

System response:

```
                DATA TECHNOLOGY CORPORATION
                ESDI Hard Disk Formatting Utility V1.5A
```

This program provides drive mode selection, format, verify and defect mapping

Current drive types selected are:

Drive 1 is NONE

Drive 2 is NONE

Do you want to change the number of drives in the system? (Y/N) :

Enter "Y" <cr>; the system will respond:

Enter number of drives? (0/1/2):

Enter "1 <cr>"; the system will respond:

Do you want to make this change permanent? (Y/N):

Enter "Y <cr>" the system will update the system CMOS and ask the user to hit any key to reboot the system. At this point the system CMOS is updated and the user is required to run the debug program again for low level formatting.

LOW LEVEL FORMATTING THE DRIVE

The DTC 6280 formatting utility contains the following features:

17 SECTOR FORMAT SUPPORT

The 6280 is compatible with software that requires 17 sectors per track formatting (i.e. Novell 2.0A). Consult your operating system or software user's manual in order to determine if there is a 17 sector per track format limitation.

ESDI DRIVES WITH GREATER THAN 1024 CYLINDER SUPPORT

The 6280 overcomes the 1024 cylinder limitation imposed by DOS by activating the 60 sector remapping mode. This will allow users to utilize the entire formatted capacity of an ESDI drive without violating the 1024 maximum cylinder limitation. In this 60 sector mode the 6280 can support ESDI drives with up to 480MB of formatted capacity. Maximum Capacity = 503,316,480 bytes (16 heads x 1024 cylinders x 60 sectors x 512 bytes).

SURFACE VERIFICATION

The 6280 can perform a surface verification of the ESDI drive and will compile a list of defective locations. In addition, the 6280 will automatically map out these defects during low level format.

SOFT SECTOR FORMAT SUPPORT

The 6280 supports drives with a soft-sectored format and will calculate the optimum number of sectors per track in this soft-sectored mode. During the low level format routine, the 6280 will perform a sector per track calculation that maximizes capacity and provides this number as the default setting for the user to enter. It is recommended that the user enter the 6280 default setting for soft sectors per track. The normal number of sectors per track in the soft-sectored mode is from 32 to 36. (DO NOT ENTER 17 OR 60.)

SECTOR SPARING

The 6280 supports sector sparing and allows the user either one or no spare sectors per track. If the user is formatting a hard-sectored 36 sector per track ESDI drive and chooses sector sparing, then the ESDI drive will be formatted with 35 sectors per track. Sector sparing is useful for maintaining formatted capacity in ESDI drives with a large amount of media defects (50 to 100+). Sector sparing is not recommended for ESDI drives with few defects.

UPDATE OF THE ESDI DRIVE DEFECT CYLINDER

The 6280 allows users to append, delete, modify, view, and save the defect list that is stored in the ESDI drive. Any saved changes are automatically stored in the drive defect cylinder(s) and will be mapped out during low level format. All defects are displayed as Cylinder/Head/Byte-offset/ Bit length.

- APPEND - add additional defects.
- DELETE - delete a defect already entered.
- MODIFY - change a defect already entered.
- VIEW - view defect table.
- SAVE - store all changes into the defect cylinder.

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ENTRY OF MEDIA DEFECTS FROM DRIVE TABLE

The defect table printed on the outside of the ESDI drive should be identical to the list stored within the drive defect cylinders. However, if this is not the case, new defects are discovered, or the defect cylinder cannot be accessed, this utility will allow the user to enter these defects. The defects will then be mapped out during low level format.

ENTRY OF INTERLEAVE FACTOR (DEFAULT = 1)

The 6280 allows for a programmable interleave factor ranging from 1 to 9. Maximum system performance can be achieved when utilizing a 1:1 interleave factor. The 1:1 interleave performance is maintained for up to 36 physical sectors per track for most ESDI drives.

ENTRY OF HEAD SKEW FACTOR (DEFAULT = 0)

The 6280 allows for a programmable head skew factor. Head skew is defined by the amount of offset of the first logical sector from index for each physical head. Optimum head skew maximizes system performance by allowing the ESDI drive to perform head switching without losing a revolution. Choosing the default setting "0" if you do not know the optimum head skew.

PROTECTION OF LAST (N-1) OR (N-1 & N-8) DEFECT TABLE CYLINDERS

The 6280 allows for protection of one or both ESDI drive defect table cylinders. By protecting the last cylinder (N-1) only, the (n-8) cylinder can be formatted for increased capacity.

LOW LEVEL FORMATTING EXAMPLE FOR ONE ESDI DRIVE

To low level format the ESDI hard drive requires the user to run DEBUG again. Boot into DOS and load the diskette with the DEBUG file from floppy drive "A" in the following manner:

```
User Enters:      DEBUG<cr>
System response:  -
User Enters:      g=c800:5<cr>
```

NOTE: If you selected the alternate BIOS address, enter g=c800:5<cr>

System response:

```
DATA TECHNOLOGY CORPORATION
ESDI Hard Disk Formatting Utility V1.5A
```

This program provides drive mode selection, format, verify and defect mapping

```
Drive 1 is (HARD SECTORED, NATIVE MODE, 2 RESERVED CYL.)
CYL:___HEAD:___PRECOMP:___L-ZONE:___SECTOR/TRK:___
```

Drive 2 is NONE

```
Do you want to change drive mode? (Y/N):
If all the drive information is correct ENTER "N <cr>" .
```

NOTE: Only enter "Y <cr>" if the following situations apply.

1. You plan to use DOS and an ESDI drive with more than 1024 cylinders.
2. You plan to use an operating system that requires a 17 sector per track format (i.e. Novell NetWare 2.0A)
3. You plan to reserve only the last defect table cylinder (N-1) and change the default setting of 2 RESERVED CYL.

If you enter "Y <cr>" the following message will appear:

```
Drive 1 is (HARD SECTORED, NATIVE MODE, 2 RESERVED CYL.)
CYL:___HEAD:___PRECOMP___CTRL:___L-ZONE:___SECTOR/TRK:___
```

0 = Native mode, 1 = 17 Sector Mode, 2 = 60 Sector Mode (Default = 0):

Enter "1" only if you are planning to use an operating system that requires 17 sector per track formatting (i.e.: Novell 2.0A). Consult your operating system user's manual.

Enter "2" only if the ESDI drive(s) has more than 1024 cylinders and the operating system is DOS. The number of cylinders can be determined from the drive spec or by reading the above message that lists CYL:____. This mapping mode is used to overcome the 1024 maximum cylinder limitation imposed by DOS. Some operating system software such as UNIX and XENIX may not have this 1024 cylinder limitation.

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Enter "0" (default) in all cases except the two mentioned above (17 sectors per track or drives with more than 1024 cylinders).

(Manufacturer's Defect Table Cylinder.)

Enter 1 = to reserve cylinder N-1.

Enter 2 = to reserve cylinder N-1 and N-9.

Enter number of reserved cylinders (1 or 2, default = 2):.

Enter 1 or 2 (Default is 2).

Entering 2 will reserve the defect table cylinder (N-1) and the backup defect table cylinder (N-8).

Entering 1 will reserve only the primary defect table cylinder (N-1). The backup defect table cylinder (N-8) will be erased during low level format.

Do you want to change the number of drives in the system? (Y/N):

Enter "N <cr>"

Select drive to format or verify (1st drive=1, 2nd drive=2, or "Q" for quit):

Enter "1 <cr>" and the drive parameters will be displayed

Do you want to format (low level) this drive? (Y/N) :

Enter "Y <cr>"

NOTE: If you enter "N <cr>", the system response will be:

Do you want to verify this drive? (Y/N):

If you enter "Y <cr>" to the verify question, a low level surface verification will be performed and all defects discovered will be displayed on the screen.

All data in drive 1 WILL BE ERASED. Are you sure? (Y/N) :

Enter "Y <cr>"; at this point the parameters of the drive will be displayed. If the drive is in the soft sector mode the following question will appear:

Enter number of sectors per track (default = ____)

The default is determined by the particular soft sectored disk drive used.

Do you want to have sector sparing? (Y/N):

ENTER "N <cr>". If you enter "Y <cr>" the drive will be formatted with 1 spare sector per track.

Do you want to perform defect mapping? (Y/N) :

ENTER "Y <cr>"; Only enter "N <cr>" if you do not want the defect table to be automatically read from the drive and mapped out during low level formatting.

Do you want to update the defect table? (Y/N) :

ENTER "N <cr>"; Only enter "Y <cr>" if you want to make modifications to the disk drive defect list cylinders.

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Do you want to enter defect list? (Y/N):

ENTER "N <cr>". Only enter "Y <cr>" if you want to manually enter defects that will be mapped out, but not stored permanently in the disk drive defect cylinders.

Enter interleave factor (1-9, default=1)

ENTER "1 <cr>"

Enter head skew factor (0-35, default=0)

ENTER "0 <cr>"

All data in drive 1 WILL BE ERASED. Are you sure? (Y/N)

ENTER "Y <cr>"

This is your last chance. Are you sure? (Y/N)

ENTER "Y <cr>"

The system will perform a low level format on the drive. After the low level format is complete, a verify pass will be performed. When the verify is complete, the system will respond:

FORMAT COMPLETE

VERIFICATION COMPLETED

TOTAL NUMBER OF TRACKS ASSIGNED BAD:_____

Exit this program and proceed to FDISK and FORMAT

Exit this program? (Y/N)....:

ENTER "Y <cr>"; after entering "Y <cr>" the system will exit from the format utility and issue an A> prompt.