FUJITSU

Disk Drive
Installation Guide

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For more information:
Fujitsu America Bulletin Board System
Telephone: (408) 944 9899

Technical Assistance Center
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Drive Specifications

MODEL	Cylinders	Heads	Sectors	Capacity
M2261SA	1658	5	53	415.1 MB (unformatted)
M2261E	1658	5	(b)	415.1 MB (unformatted)
M2263E	1658	15	(b)	778.3MB (unformatted)
M2263SA	1658	15	53	778.3 MB (unformatted)
M2266SA	1658	15	85	1,079.1 MB (formatted)
M2611SA/T	1334	2	34	45 MB (formatted)
M2612SA/ESA/T/ET	1334	4	34	90.8 MB (formatted)
M2613SA/ESA/T/ET	1334	6	34	136.6 MB (formatted)
M2614SA/ESA/T/ET	1334	8	34	182.36 MB (formatted)
M2622SA	1429	7	56-70(c)	330.1 MB (formatted)
M2623SA	1429	9	56-70(c)	425.1 MB (formatted)
M2624SA	1429	11	56-70(c)	520.1 MB (formatted)
M2624T (a)	~	~	~	~
M2616ET/ESA	1542	4	34	105 MB (formatted)

(a) To be released.

(b) Selectable 24/27/28/48/52/53/54/96 sectors.

(c) The M2624 has 4 zones with 56, 62, 66, 40 sectors/track.

The following definitions cover the following drives:
M261x-T/ET = M2611/M2612/M2613/M2614/M2616
M261x-SA/ESA =M2611/M2612/M2613/M2614/M2616
M226x-E/SA = M2261/M2263/M2266
M262x-T/SA = M2622/M2623/M2624

Hardware Installation

To install a Fujitsu disk drive a control card, cable(s), and mounting hardware will be needed. The controller card will be a SCSI or an ESDI interface, or an AT bus adapter. The SCSI controller will have a 50 pin cable, the AT controller will have a 40 pin cable, and the ESDI controller will have 34 pin and 20 pin cables. The documentation with the controller should be read and the appropriate jumpers should be set before installing the controller. Write down any initial switch or jumper settings as a reference prior to changing the configuration. Also, normal anti-static electricity handling precautions should be observed. Set the jumpers or switches on the disk drive as required and write down initial settings. Refer to the tables and diagrams for information on switch settings.

IDE DRIVES (PCAT - Interface)
Check to see if factory settings are adequate and change as necessary. Set the drives for master/ slave operation if more than one drive is connected to the system. Attach the cable(s) according to the instructions in the controller documentation being sure to observe the correct orientation of pin 1 (usually a red stripe) on the connectors. Attach power connectors as required.

ESDI DRIVES
Check to see if the factory settings are adequate. Set the Drive ID as needed. If more than one drive is being used make sure that the drives have different IDs. Set other options as needed (Sector mode, Gating, etc.).

SCSI DRIVES
Read the descriptions of the options to see if the factory settings are correct for your application. Set the device ID (this is usually set to 7 at the factory). Set other options as needed (Parity Check, Arbitration, Synchronous Data Transfer, etc.).

Software Installation

IDE DRIVES (PCAT - Interface)
DO NOT LOW LEVEL FORMAT THE M261X-T/M261X-ET DRIVE! DO NOT USE PROGRAMS LIKE SPEEDSTOR OR EARLY VERSIONS OF ONTRACK DISK MANAGER TO ACCESS CYLINDERS BEYOND CYLINDER 1024 OR TO CONFIGURE LARGE PARTITIONS.

The M261X-T/ET is equipped with a translation table that will allow access to cylinders beyond 1024. CMOS RAM in the PC system will need to be configured for the translated drive parameters. For the M261X-T/ET this will be a drive type that is 667 cylinders, 33 sectors per track, and twice the number of physical heads (Example: The M2614T has 8 heads so 16 heads would be specified as the number of heads). If the PC system BIOS has the user-configurable options, these parameters can be entered directly (check the PC system user's guide for your system for information on CMOS RAM confiiguration.

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If user configuration is not available, use a drive type that is the closest to but does not exceed the parameters shown. The remainder of the drive capacity will be lost. **Note:** Ontrack Disk Manager 4.31 and above may be used to get the full capacity on the drive when the user configurable bios is not used. DOS 4.01 will allow configuration of larger than 32 MByte partitions. Boot DOS from a floppy. Load FDISK and follow the instructions in your DOS manual for partitioning the drive. Under DOS 3.3 the drive will need to be partitioned into several 32 MByte or less drives. **High level format the drive.** Load format from the DOS disk. Format a bootable "C:" drive using the " /s" option. This option will produce a bootable C: drive. The remaining partitions will not need to be formatted with the "/s" option. The drive may now be used normally. If two drives are installed, both drives need to have partitions defined. This is done by partitioning drive 0 and then selecting and partitioning drive 1. Use FDISK to do this as described above. Refer to DOS manual for other FDISK options.

ESDI DRIVES

Due to the vast array of computer types, controllers, device configurations, and software utilities in use, it is impossible to give specific instructions for each computer type in which the drive may be installed. There is no generic installation description that would apply in all cases. The following presents basic principles for installing a disk drive into a PC using the PC DOS operating system.

First define the hard drive type in one of two ways. (1) The system BIOS may support a CMOS RAM setup mode that allows the user to change the drive type number to the same parameter as the drive to be installed. Repeat for each drive to be installed. or (2) If the system BIOS does not support the above method, then select "Type 1". This value is used by most ESDI controllers to define the drive characteristics that are passed to the host system by an intelligent on-board BIOS. With DOS 3.3 or lower, the maximum drive capacity is 32 Mbytes. Therefore, multiple drive partitions of 32 Mbytes or less must be created. Definition of larger partition size requires either DOS 4.01 or a third-party software package such as Disk Manager from Ontrack Systems, SpeedStor from Storage Dimensions, or VFeature from Golden Bow Systems. Software installation on the drive involves low-level formatting, partitioning, and high-level formatting. Do the following steps:

(1) Boot DOS, and then run the DEBUG program. At the DEBUG prompt ("-"), type g=c800:5 to access the BIOS-level formatter (The manufacturer of the controller may specify a different segment and offset location to access the low-level formatter. Refer to the controller documentation for this information.)

(2) To initialize the drive, use the low-level formatter for option selection. Define all options applicable to your specific installation, such as Defect Management (Sector Sparing or Sector Flagging) and Cylinder Translation or Cylinder Truncation.

(3) Boot the system again, and run the software to create the partitions required by your configuration. (This software is either the FDISK program in DOS or one of the third-party software packages mentioned above.) Then boot the system again to save the partitions.

(4) To perform high-level (or DOS-level) formatting of the partitions, use the DOS FORMAT program or follow the onscreen instructions for a third-party software package. If using the FORMAT program, enter it at the A: prompt as follows:

FORMAT d:/s

where d is the drive letter (typically C) assigned by DOS to the hard drive. The /s flag automatically copies the system files required to make a bootable hard drive. The drive may now be used normally.

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SCSI DRIVES

Since the SCSI drives are formatted with a specific (default) data format for each model (part number) when shipped from the factory, these drives may not need to be low-level formatted (initialized) when installed in a system. The same factors regarding specific installation instructions that apply to the ESDI drives also apply to the SCSI drives. The following presents basic principles for installing the M2261/63/66SA, M261x-SA/ESA, and M262xSA drives into a PC using the PC DOS operating system. First define the drive type as zero (0) or "Not Installed" in the CMOS setup. Low-level formatting of the drives can be skipped in most cases. If the low-level formatting needs to be done then follow the same procedure for step (1) and step (2) for low-level formatting of ESDI Drives as detailed above. Step (3) and step (4) of the ESDI Drive procedure can be used for partitioning and high-level (DOS level) formatting of the SCSI drives. After this has been done the drive may now be used normally.

AT Drive Setting

		M261XT/ET		
Note: Drive may have dip switches or jumpers		Jumpers	Dip Switches	
1 Drive System		CNH1 8-9	SW2-3 OFF	(*)
2 Drive System		CNH1 7-8	SW2-3 ON	
Master/Slave	Master	CNH2 4-5	SW2-1 ON -2 OFF	(*)
	Slave	CNH2 1-2	SW2-1 OFF -2 ON	
ECC Bytes	4 Bytes	CNH2 7-8	SW2-6 ON	
	7 Bytes	CNH2 8-9	SW2-6 OFF	(*)
Write Protect	Enabled	CNH3 1-2	SW2-4 ON	
	Disabled	CNH3 2-3	SW2-4 OFF	(*)
IO Channel Ready	IOCHRDY output to pin 27	CNH1 4-5	SW2-5 ON	
	Pin 27 reserved	CNH1 5-6	SW2-5 OFF	(*)
Slave present mode (Both drives used)		n/a	SW1-3 ON -4 OFF	
Active mode (daisy-chained connection)		n/a	SW1-3 OFF -4 ON	(*)
Exchange IRQ14 and RSVD	Pin 29 = IRQ14, pin 31 = reserved	CNH1 10-11	SW1-1 OFF -2 ON	
	Pin 29 = reserved, pin 31 IRQ14	CNH1 11-12	SW1-1 ON -2 OFF	(*)

(*) Factory default setting.

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SCSI Jumper Definitions

		M2261/63/66SA	M261x-SA	M261x-ESA	M262x-SA
[See table1 for more time monitoring settings]		CN3 (7-8)	~	~	~
SCSI time monitoring, (Reselection, ACK response)	Time Monitoring disabled, Time Monitoring enable	Open Short (*)	~ ~	~ ~	~ ~
		CN3 (5-6)	~	~	~
Read-Ahead Caching	Disabled Enabled	Open Short (*)	~ ~	~ ~	~ ~
		CN3 (1-2)	CNH4	Dip Switch	CNH1 (5-6)
Diagnostic Switch	Diagnostics executed Diagnostics stop	Open Short (*)	1-2 2-3 (*)	SW-3 On SW-3 Off (*)	Open (*) Short
		CNH2 (1-2)	~	~	CNH1 (3-4)
SCSI Level	SCSI-2 SCSI-1/CCS	Short (*) Open	~ ~	~ ~	Open Short (*)
		CNH2 (3-4)	~	~	~
Message Mode	SAVE DATA POINTER is issued for disconnecttion after data transfer. SAVE DATA POINTER is not issued for disconnection after data transfer.	Short (*) . Open	~ . ~	~ . ~	~ . ~
		CNH2 (5-6)	~	~	~
Error report at Mode Select parameter rounding	Check Condition status not posted Check Condition status (Recovered Error) is posted	Short (*) Open	~ ~	~ ~	~ ~
		CNH2 (7-8)	~	~	CNH1 (1-2)
PER Default mode	0 1	Short (*) Open	~ ~	~ ~	Short (*) Open
		CNH2 (9-10)	CNH3	Dip Switch	CNH1 (19-20)
Motor Start Mode	Started when power is turned on. Started with the START/STOP UNIT command.	Short (*) Open	4-5 (*) 5-6	SW-2 On (*) SW-2 Off	Short (*) Open
		CNH2 (11-12)	CNH1	CNH1	CNH1 (13-14)
SCSI Bus Parity	Parity Check is executed. No Parity Check is executed.	Short (*) Open	1-2 (*) 2-3	1-2 (*) 2-3	Short (*) Open
		CNH2 (13-14)	~	~	~
Synchronous mode transfer request	0.96 to 4.8 MB/second 0.96 to 2.67 MB/second	Short (*) Open	~ ~	~ ~	~ ~
		CNH2 (15-16)	CNH1	CNH1	CNH1 (15-16)
Synchronous mode data transfer request	Enabled Disabled	Short (*) Open	4-5 (*) 5-6	4-5 (*) 5-6	Short (*) Open
		~	CNH3	Dip Switch	CNH7 (7-8)
Write Protect	Enabled Disabled	~ ~	1-2 2-3 (*)	On Off (*)	Open Short (*)
		CNH1 (1-2)	~	~	CNH1 (17-18)
LED Display	Lights when the drive is active. Lights when the drive is ready.	Short (*) Open	~ ~	~ ~	Short (*) Open
			~	~	CNH1 (9-10)
Retry count of RESELECTION phase	10 Unlimited	[See Table 1]	~ ~	~ ~	Open Short (*)
		CNH1(11-12)	~	~	CNH1(7-8)
Drive response under the UNIT ATTENTION condition	For a command other that REQUEST SENSE, INQUIRY, or PRIORITY RESERVE the drive responds with the CHECK CONDITION status. All received commands are executed normally.	Short (*) . . Open	~ . . ~	~ . . ~	Short (*) . . Open

(*) Factory default setting

Table 1

SCSI Time Monitoring				
CNH1		**Setting Contents**		
13-14	15-16	ACK signal wait monitoring time	SELECTION monitoring time and number of retries	
Short	Short	Unlimited	250 ms, 128 retries	(*)
Short	Open	30-60 seconds	250 ms, 10 retries	
Open	Short	30-60 seconds	250 ms, unlimited retries	
Open	Open	1-2 seconds	1 ms, 10 retries	

(*) Factory default settings.

SCSI ID

SCSI ID	M2261/63/66SA			M261XSA/ESA			M2624SA		
	CN3/CN9			CNH2			CNH7		
	9-10	11-12	13-14	See Diagram			5-6	3-4	1-2
0	OPEN	OPEN	OPEN	8-9	5-6	2-3	OPEN	OPEN	OPEN
1	OPEN	OPEN	SHORT	8-9	5-6	1-2	OPEN	OPEN	SHORT
2	OPEN	SHORT	OPEN	8-9	4-5	2-3	OPEN	SHORT	OPEN
3	OPEN	SHORT	SHORT	8-9	4-5	1-2	OPEN	SHORT	SHORT
4	SHORT	OPEN	OPEN	7-8	5-6	2-3	SHORT	OPEN	OPEN
5	SHORT	OPEN	SHORT	7-8	5-6	1-2	SHORT	OPEN	SHORT
6	SHORT	SHORT	OPEN	7-8	4-5	2-3	SHORT	SHORT	OPEN
7	SHORT	SHORT	SHORT	7-8	4-5	1-2	SHORT	SHORT	SHORT

SCSI Terminator Power

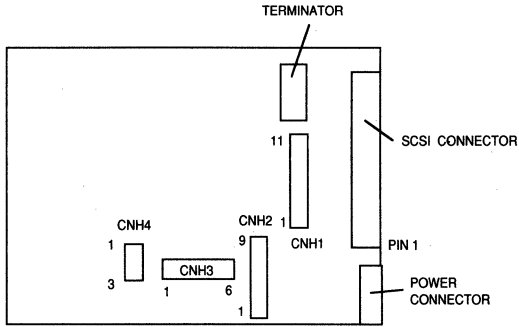|	M2261/63/66SA		M261XSA/ESA		M2624SA	
	CNH4		CNH1		CNH1	
Power Supply to terminator circuit on drive	1-2	3-4	7-8	10-11	23-24	21-22
Power supplied from disk drive and TERMPWR pin (*)	Short	Short	Short	Short	Short	Short
Power supplied from disk drive only (TERMPWR pin not used)	Open	Short	Open	Short	Open	Short '.
Power supplied from TERMPWR pin only	Short	Open	Short	Open	Short	Open

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M2261/63E Drive Setting

Sector Setting		CNH7		
Sector/Track	Bytes/Sector	7-8	9-10	11-12
24	1304	OPEN	OPEN	OPEN
27	1159	OPEN	OPEN	SHORT
28	1117	OPEN	SHORT	OPEN
48	652	OPEN	SHORT	SHORT
51	613	SHORT	OPEN	OPEN
53	590	SHORT	OPEN	SHORT
54	579	SHORT	SHORT	OPEN
96	326	SHORT	SHORT	SHORT	(*)

Sector Mode Setting	CNH7 13-14	
Drive Hard Sector (Sector)	OPEN	(*)
Controller Soft Sector (Address Mark Found)	SHORT	

Power-on Reset Condition	CNH7 15-16	
ATTENTION signal and bit 8 of status byte are set at READY STATE at power-on.	OPEN	
ATTENTION signal and bit 8 of status byte are not set at READY STATE Just after power-on.	SHORT	(*)

Motor start control from interface	CNH7 1-2	
Yes	OPEN	
No	SHORT	(*)

READY LED Lighting Condition	CNH5 15-16	
Drive Select signal not gated	OPEN	
Drive Select signal gated	SHORT	

Thermal Offtrack Compensation	CNH3 15-16	
Enabled	OPEN	(*)
Disabled	SHORT	

Spindle "Sync. In" Signal	CNH2 15-16	
Disabled	OPEN	(*)
Enabled	SHORT	

Output Signal gated or not gated	CNH6 15-16	
No gate (radial)	SHORT	(*)
Gate (daisy-chained)	OPEN	

(*) Factory Settings

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M2261/63E Drive Select Address

Drive Number	CNH6						
	1-2	3-4	5-6	7-8	9-10	11-12	13-14
1	SHORT	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN
2	OPEN	SHORT	OPEN	OPEN	OPEN	OPEN	OPEN
3	OPEN	OPEN	SHORT	OPEN	OPEN	OPEN	OPEN
4	OPEN	OPEN	OPEN	SHORT	OPEN	OPEN	OPEN
5	OPEN	OPEN	OPEN	OPEN	SHORT	OPEN	OPEN
6	OPEN	OPEN	OPEN	OPEN	OPEN	SHORT	OPEN
7	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	SHORT

TERMINATOR

SCSI CONNECTOR

11

CNH4   CNH2 1

1   9   CNH1   PIN 1

CNH3

3   1   6   POWER
                                  CONNECTOR
                      1

M2611SA/12SA/13SA/14SA

TERMINATOR

SCSI CONNECTOR

CNH1

24   23

PIN 1

2   8
CNH7   POWER
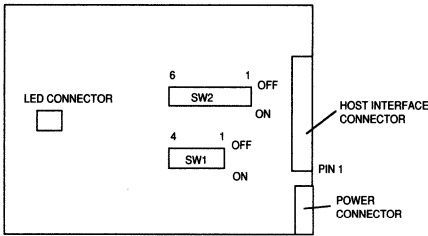1   7   CONNECTOR
                      2   1

M2622/23/24SA

8
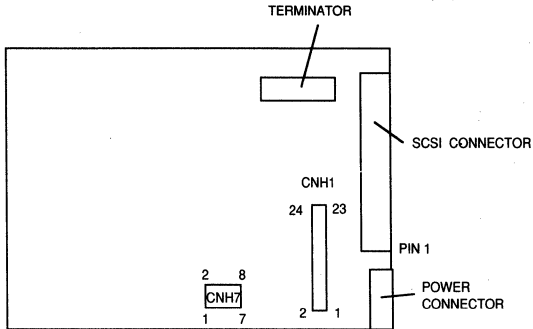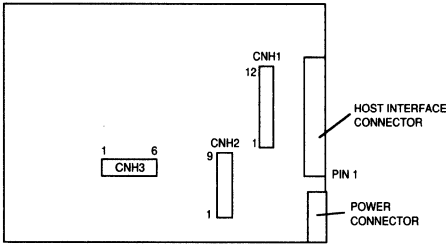
M2611T/12T/13T/14T
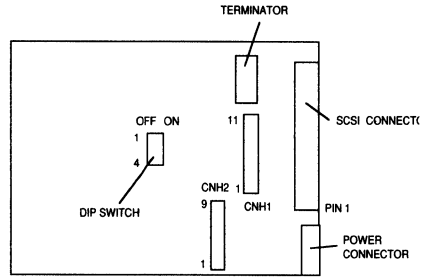
M2611ESA/12ESA/13ESA/14ESA/16ESA

M2611ET/12ET/13ET/14ET/16ET
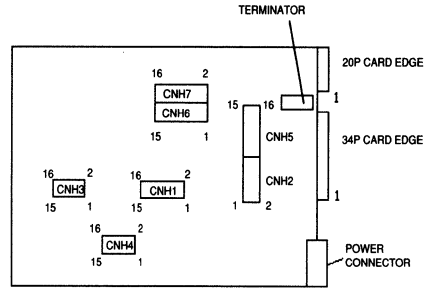
M2261/63E

M2261/63/66SA

9
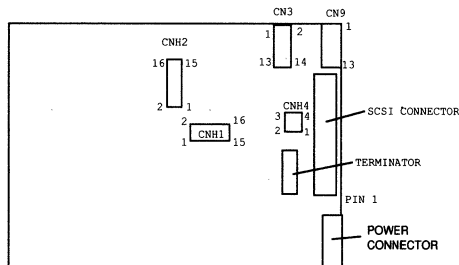
Model Number	Description	Part Number
M2266S/H	Technical Handbook	FS810125-01
M2261/62/63-S/H	Technical Handbook	FS810118-01
M2261/62/63-E	Technical Handbook	FS810117-01
M261x-SA	Technical Handbook	FS810119-01
M261x-T/ET	Technical HandBook	FS810120-01
M2246-9-E/SA M2261-63E/SA	Instalaltion Guide	FS810124-01
M2247E	Technical Handbook	FS810127-01
M262x-SA	Technical Handbook	CG003418-001

• For copies of the installation guide or Technical Handbooks please contact your distributor or sales representative. Otherwise please call Precission Images at 1-800-524-8338.