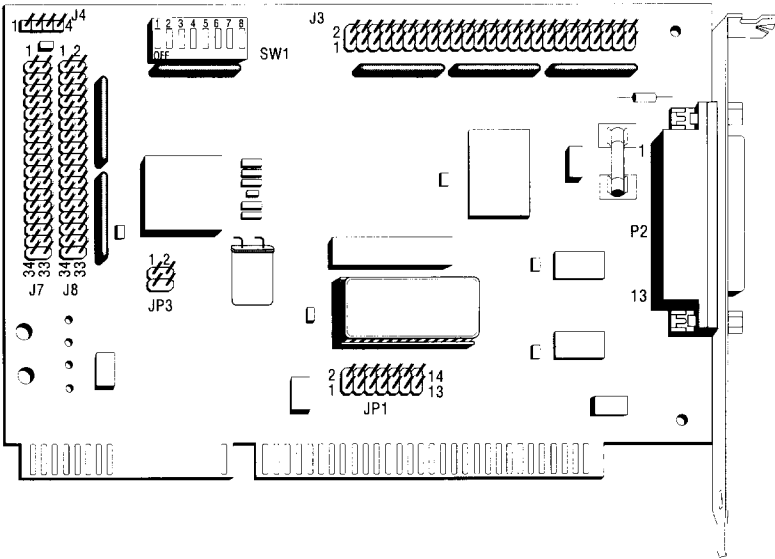


T160F SCSI Host Adapter



Hardware Installation Guide

NOTE

If you're like many users, you'll want to get started using your new equipment as soon as possible. But, before you attempt to install and use your Trantor SCSI host adapter, please read this guide. It will save you time in the long run, and make you aware of many options you might otherwise miss. Remember, you can always change your system configuration at a later time.

For technical support of this product, please see your dealer first for assistance, as he/she is most likely to understand your specific needs and equipment setup. To be eligible for any Trantor factory technical support which may be necessary, your Product Registration Card **must** be on file with us.

Please fill out and mail in your Product Registration Card within 10 days of purchase!

1.0 Introduction

This guide describes the installation and operation of the Trantor™ T160F SCSI host adapter (hereafter also referred to as "host adapter") for the IBM® AT®/80386/80486 and other compatible computer systems.

1.1 Hardware

Your Trantor SCSI (Small Computer System Interface) host adapter has been designed to provide high-performance control of virtually any SCSI device. Some of the important features include:

- Standardized SCSI interface, permitting the use of most SCSI devices.
- Both internal and external connectors, for use with SCSI devices mounted inside or outside the computer. The external connector is compatible with Apple® Macintosh® SCSI interface pinouts for ease of cabling (see below for details).
- Supports I/O-mapped data transfer at any one of 8 addresses, BIOS ROM mapping at any one of 7 addresses (plus disable) and zero-wait-state operation for high-speed performance.

1.2 Checklist

You should have received the following items in your Trantor host adapter kit:

- T160F SCSI host adapter
- Software distribution diskette(s)
- Hardware Installation Guide* (this document)
- User Guide* for the included software
- Product Registration card

If you find that anything is missing, please contact your dealer immediately.

1.3 Software Overview

The distribution diskette packaged with your host adapter contains a number of files of interest. These are fully described in the software *User Guide*, but there is one file to be aware of when installing the hardware:

READ.ME

A text file which **may** be included, containing up-to-date information since this guide was printed. It is important that you look for this file and, if it exists, read it carefully.

2.0 Hardware Installation

The Trantor T160F SCSI host adapter will fit into any available 16-bit adapter slot in your computer. If you plan to use internally-mounted SCSI devices, we recommend installing the T160F in a slot near the drive mounting location.

Before beginning installation, please read through this procedure thoroughly. Also review your computer system's manual for the procedures covering adapter installation and removal and replacement. Have the appropriate hand tools available so that you can remove your computer's cover and install the card.

1. Before proceeding, **turn off and unplug** your computer, to avoid the risk of dangerous electrical shock or damage to your equipment!
2. Remove your computer system's cover. This is typically done by removing 5 or 6 screws at the rear of the system, then sliding the cover forward and off. Refer to your computer manufacturer's user manual for details if you're unsure of this procedure.
3. Check the switch and jumper settings on your card, as required. For most installations, the factory default settings should be correct, but see section 3 for setup details.
4. Choose an available expansion slot for installation of the host adapter. The card may normally be used in any available 16-bit slot. When choosing a slot, keep in mind that a SCSI cable will be run between the host adapter and any internal SCSI devices that you wish to use. Therefore, it's usually a good idea to put the host adapter in a slot nearest these devices, to make sure the cable will reach and to minimize clutter.
5. If you require the appropriate SCSI interface cable (either internal or external) to connect the host adapter to your SCSI device, contact your dealer for assistance. If you plan to use the host adapter with internally-mounted SCSI devices, connect your SCSI interface ribbon cable to the host adapter's internal connector (on the top edge of the card). Note that the cable may be hooked up one of two ways; make sure that line 1 of the cable is oriented toward the Pin 1 end of the J2 connector (Pin 1 is at the lower left corner of the T160F connector). The number "1" is silkscreened on the board adjacent to Pin 1. Normally, line 1 of the cable should have a colored stripe for easy identification.
6. Remove the blank back-cover plate at the chosen slot position and save the bracket screw (you'll need it in a moment).
Carefully insert the host adapter into the slot and align the edge connector on the card with the connector in the computer. Apply firm downward pressure on the card as you insert it into the slot, being careful to avoid bending the card or jamming it on any nearby protrusions in the chassis. Re-use the screw removed with the blank cover plate to fasten the host adapter securely into place. **Unless the edge connector on the card is properly inserted into the connector in the computer it is possible that neither the card nor the computer will work properly (and may even suffer damage). Double-check your work carefully!**
If you installed an internal-device ribbon cable for SCSI devices (Step 5), make sure that the cable does not rub against any sharp points on adjacently-mounted cards in your computer, and that it is positioned so that it will not snag your computer's top cover when it is slid back into place.
7. If you plan to connect more than one SCSI device to your adapter simultaneously, make sure that the each device's "address" (device number) is different (between 0 and 6, a bootable device must be set to address 0, 1 or 2). This is essential to prevent conflicts when the host adapter communicates with the devices. Also note, on the SCSI connector of each device, which end of the connector is the "pin 1" end. Most SCSI devices have a 50-pin connector, and it is possible to connect a cable backwards if you don't identify the correct end. The

device(s) should have a label on the circuit board near the connector, indicating either the pin-1 end or the pin-50 end; consult the device's manual if you can't identify the correct end yourself. The cable which connects the device(s) to the host adapter should have a colored stripe on one side; the stripe indicates pin 1 of the cable.

8. If you are using an externally-mounted SCSI device, connect your SCSI interface cable to the 25-pin connector at the rear of the host adapter. **Be careful to avoid connecting the SCSI cable to one of the parallel printer ports on the back of the computer. These use the same type of connector, and are easily confused. Conversely, never plug a parallel printer (or other parallel device) into a host adapter.**
9. If you are using an internally-mounted SCSI device, install it into an available drive bay per the manufacturer's instructions. Connect the power and SCSI interface cables, being careful to route both cables around any sharp edges or protrusions, and keeping the cables out of the way of the cover.
10. This completes the hardware installation of your SCSI subsystem. Once the host adapter is properly installed, replace the computer's cover and plug the computer in.
11. Proceed with software installation, hard disk partitioning/formatting (if applicable) and system checkout, following the instructions in your software User Guide.

Note: see the reverse side (section 4) for connector pinout details.

3.0 Switch & Jumper Settings

Although the default settings will work in most installations, you may find it necessary to change the factory switch and jumper settings of your T160F SCSI host adapter. These switches and jumpers set the card address, interrupt channel and other functions. See *Figure 1* for an illustration of the card configuration locations.

Note, however, that you should only change settings on the card if you **absolutely understand** what you are doing. The following information is **not** intended for, and is not written for, novice users. In some cases, changing settings on the card also necessitates changing settings in the software. In the following instructions, switch blocks and jumper blocks are mentioned; these are indicated on *Figure 1*. The default position for all switches on the T160F is OFF.

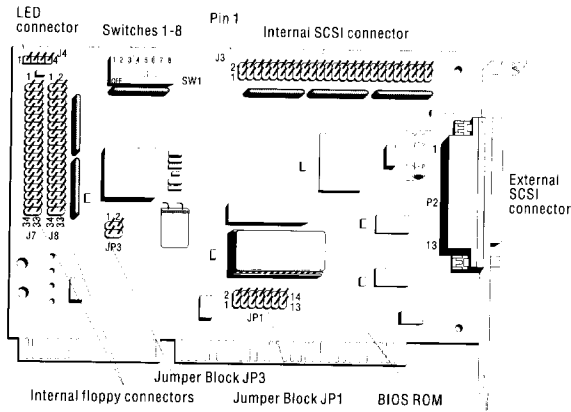


Figure 1 T160F Switch & Jumper Locations

Summary of Switch Settings

The various switches (1 - 8) are assigned as follows, and are detailed below:

SW 1	I/O address 1	4	ROM address 1
2	I/O address 2	5	ROM address 2
3	I/O address 3	6	ROM address 3
7	Reserved	8	Reserved

Card Address (SW1/SW2/SW3):

The T160F will work at one of eight I/O addresses. Switches 1, 2 and 3 select this address.

I/O Address	SW1	SW2	SW3
360h	OFF	OFF	OFF
350h	OFF	OFF	ON
340h	OFF	ON	OFF
330h	OFF	ON	ON
260h	ON	OFF	OFF
250h	ON	OFF	ON
240h	ON	ON	OFF
230h	ON	ON	ON

Note: The T160F uses a single 8 KB address range beginning at the address selected by the switches.

BIOS ROM Address (SW4/SW5/SW6):

The T160F BIOS ROM will work at one of eight addresses. Switches 4, 5 & 6 select this address.

ROM Address	SW4	SW5	SW6
None	OFF	OFF	OFF
C8000h	OFF	OFF	ON
CA000h	OFF	ON	OFF
CE000h	OFF	ON	ON
D0000h	ON	OFF	OFF
D4000h	ON	OFF	ON
D8000h	ON	ON	OFF
DC000h	ON	ON	ON

Note: The T160F's ROM uses a single 8 KB address range beginning at the address selected by the switches.

Reserved Switches:

Switches 7 and 8 are reserved and should remain in the OFF position at all times.

Jumper Block JP1:

If this jumper block is used for optional interrupt selection. The jumper included with the T160F is set for no interrupt setting. If required by other software, interrupts 3, 5, 7, 10, 12, 14 and 15 are available via jumper settings on jumper block JP1 as follows:

Interrupt	Jumper Block JP1
IRQ3	pin 1 [•] • • • • • • • • pin 13
IRQ5	pin 1 • [•] • • • • • • • • pin 13
IRQ7	pin 1 • • [•] • • • • • • • • pin 13
IRQ10	pin 1 • • • [•] • • • • • • • • pin 13
IRQ12	pin 1 • • • • [•] • • • • • • • • pin 13
IRQ14	pin 1 • • • • • [•] • • • • • • • • pin 13
IRQ15	pin 1 • • • • • • [•] • • • • • • • • pin 13
no interrupt	pin 1 [•] • • • • • • • • pin 13 (or no jumper)

Jumper Block JP4:

JP4 is used for connecting a hard disk LED activity light. Typically, this LED is present on the front panel of your computer's case; simply connect the appropriate wire from your computer to this location. The top two pins should be used if your computer has a 2-wire connector.

4.0 Floppy Drive Operation

The T160F floppy controller is a standard MS-DOS floppy disk controller that is not in any way affected by the SCSI section of the T160F Host Adapter.

Up to 4 floppy drives are supported by the T160F, using two 34-pin header connectors, J7 (drive 0 and drive 1) and J8 (drive 2 and drive 3). **Note:** The floppy drives **must** be supported in the BIOS on your computer before they will be available for use. Some versions of BIOS only support 2 floppy drives. Others, such as Phoenix 3.10 or higher, support 3 floppy drives only. Driver software which allows floppy support in addition to your BIOS is available from 3rd-party vendors.

The first 2 floppy drives are designated through your computer's SETUP program. Any additional floppy drives require the use of a device driver included with MS-DOS called DRIVER.SYS.

For example, to add a third 1.44 MB floppy drive to your computer, you must add the following statement to your CONFIG.SYS file (must all be on one line):

```
device=driver.sys /d:2 /f:7 /t:80 /s:18 /h:2 /c
```

The full syntax for DRIVER.SYS is listed in your MS-DOS manual. For your convenience, it is as follows (must all be on one line):

```
DEVICE=[d:] [path] DRIVER.SYS /D:ddd[/T:ttt] [/S:ss] [/H:hh] [/C] [/N] [/F:f]
```

/D:ddd = physical drive number (diskette 0-127, fixed 128-255); 0 is A:; 2 must be external; first physical hard disk must be 128

/T:ttt = tracks per side (1-999, default is 80)

/S:ss = sectors per track (1-99, default is 9)

/H:hh = number of heads/sides (1-99, default is 2)

/C = changeline support required on AT and later only

/N = nonremovable block device (hard disk)

/F:f = form factor (0=160-360 KB; 1=1.2 MB; 2=720 KB; 7=1.44 MB)

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5.0 SCSI Connector Pinouts

This section documents both the SCSI interface connectors on the T160F host adapter as well as typical connectors found on SCSI devices such as hard disk and CD-ROM drives. Your host adapter has been designed with ease of connection in mind, therefore the internal SCSI connector requires only a standard ribbon cable, and the external connector is completely compatible with that used on Apple's Macintosh line of computers. Any commonly-available Macintosh cable designed to interface to external SCSI devices will work with your Trantor host adapter.

But, for those who are making their own cable assembly or who need the connector details for other reasons, the following provides the necessary information. Figure 2 illustrates the pin arrangement of the host adapter's external DB-25F connector.

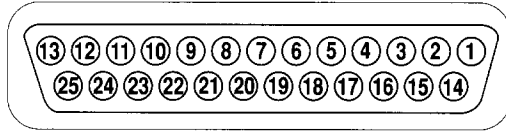


Figure 2 T160F External Connector Pinouts

Internal SCSI devices (as well as the internal connector of your Trantor host adapter) commonly use a 50-pin header connector (*SCSI specification Alternative 1*), consisting of two rows of 25 male contacts with adjacent contacts 2.54 mm (0.1 in) apart, as shown in Figure 3.

A typical single-ended shielded SCSI device 50-pin connector (*SCSI specification Alternative 2*) is shown in Figure 4; this connector is most often used with an external SCSI device.

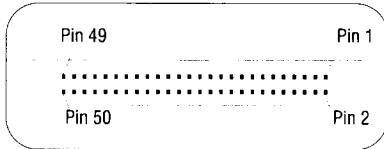


Figure 3 Internal Connector

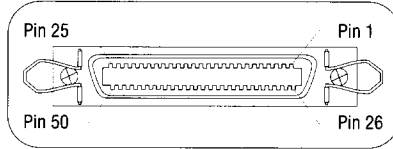


Figure 4 Device Connector

Table 1 lists the pin assignments for each connector type. Definitions of the various signals may be found in any SCSI design reference book. The SCSI interface is fully defined in **ANSI X3.131-1986**; this document is available from Global Engineering Documents, 2805 McGraw Ave, Irvine, CA 92713-9539 USA, telephone (714) 261-1455.

Pin		Function	Pin			
Alt. 1 (Fig. 3)	Alt. 2 (Fig. 4)		External (Fig. 2)	Alt. 1 (Fig. 3)	Alt. 2 (Fig. 4)	
1	1	Gnd	-DB0	8	2	26
3	2	Gnd	-DB1	21	4	27
5	3	Gnd	-DB2	22	6	28
7	4	Gnd	-DB3	10	8	29
9	5	Gnd	-DB4	23	10	30
11	6	Gnd	-DB5	11	12	31
13	7	Gnd	-DB6	12	14	32
15	8	Gnd	-DB7	13	16	33
17	9	Gnd	DBP	20	18	34
19	10	Gnd	Gnd	7	20	35
21	11	Gnd	Gnd	9	22	36
23	12	Gnd	Gnd	14	24	37
25	13	Open	Tempwvr	25	26	38
27	14	Gnd	Gnd	16	28	39
29	15	Gnd	Gnd	18	30	40
31	16	Gnd	-ATN	17	32	41
33	17	Gnd	Gnd	24	34	42
35	18	Gnd	-BSY	6	36	43
37	19	Gnd	-ACK	5	38	44
39	20	Gnd	-RST	4	40	45
41	21	Gnd	-MSG	2	42	46
43	22	Gnd	-SEL	19	44	47
45	23	Gnd	-C/D	15	46	48
47	24	Gnd	-REQ	1	48	49
49	25	Gnd	-I/O	3	50	50

Table 1 SCSI Connector Pin Assignments

WARRANTY, SERVICE, SUPPORT

If you have technical questions not answered by this guide, contact your dealer first. If your dealer is unable to answer your questions, you may contact Trantor directly.

TRANTOR PRODUCTS LIMITED WARRANTY

Trantor Systems Limited (hereafter Trantor) warrants this hardware product to be free from defects in material and workmanship under the following terms.

WARRANTY TERM

Labor is warranted for (1) One Year from the date of the first consumer purchase. Parts are warranted for (1) One Year from the date of the first consumer purchase. Magnetic media on which the software is supplied is warranted for (90) Ninety Days from the date of the first consumer purchase. Note that only the media itself is warranted, not the software; please refer to the License Agreement on the software package.

WHO IS PROTECTED

This warranty may be enforced only by the first consumer purchaser.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as specified below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Trantor or an Authorized Distributor or which is not purchased from an authorized Trantor dealer. If you are uncertain as to whether a dealer is authorized please contact Trantor.
2. Any product on which the serial number (if applicable) has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
 - a. Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature, commercial or industrial use, unauthorized product modification, or failure to follow instructions supplied with the product.
 - b. Repair or attempted repair by anyone not authorized by Trantor.
 - c. Any shipment of the product; warrants must be presented to the dealer.
 - d. Removal or installation of the product.
 - e. Any other cause which does not relate to a product defect.

4. Cartons, carrying cases, batteries, external cabinets, or any accessories used in conjunction with the product.

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay all labor and material expenses for covered items, but we will not pay for the following:

1. Removal or installation.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls and software installation and configuration. These costs are the responsibility of the Trantor dealer from whom the product was purchased.
3. Shipping charges to or from Trantor.

HOW YOU CAN GET WARRANTY SERVICE

1. Call Technical Support to verify the product is not functioning properly at (510) 226-SCSI.
2. Call us for a Return Merchandise Authorization (RMA) at (510) 770-1400.
3. Ship product prepaid, with RMA number clearly marked on the outside of the package to Trantor Systems Limited, 5415 Bandall Place, Fremont, CA 94538-3151 USA.
4. Whenever warranty service is required, the original dated sales slip (or a copy) must be presented as proof of warranty coverage and should be included in any shipment of the product. Please also include in any mailing, your name, address, and a description of the problem(s).

TECHNICAL SUPPORT BBS

Trantor Systems maintains a Technical Support Bulletin Board System at our Fremont offices for use by our registered customers with modems. You are welcome to contact us via the BBS with questions and suggestions, and share these with other users. Update notifications, new product announcements and technical tips will be available online. The telephone number is 510-658-5159, and the BBS is available 24 hours per day. When you call, set your modem and communications software to 8 data bits, 1 stop bit, no parity, and V.32 bis operation.

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Please refer to the separate Trantor Software License and Warranty which came with your Trantor distribution diskette.

FCC NOTICE

Your Trantor SCSI host adapter is covered by FCC rules for a Class B computing device.

The following information is provided for the information and guidance of the user. Use shielded cables to attach only peripherals (computer input/output devices, terminals, printers etc.) certified to comply with the Class B limits to your computer.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. FCC regulations, Part 15 prescribed by the Federal Communications Commission (FCC) specify that we provide the following information:

WARNING

This equipment generates and uses radio frequency energy and, if not installed and used properly, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the

limits for a Class B computing device in accordance with FCC regulations. It is the responsibility of the user to take the necessary precautions to provide a reasonable protection against such interference by a reasonable installation. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television reception, (which you can determine by turning the equipment OFF and ON), the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that the computer and receiver are on different branch circuits.

If necessary, consult the dealer or an experienced radio/television technician for additional suggestions. You may find the booklet **How to Identify and Resolve Radio-TV Interference Problems** helpful. This booklet has been prepared by the FCC and is available from the U.S. Government Printing Office, Washington, D.C. 20402; Stock # 004-000-00345-4.