TRANTOR
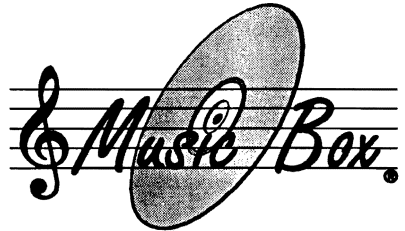
SCSI Software & Utilities

User Guide

SCSI Software & Utilities

Including Music Box CD-ROM Audio-Control Software

User Guide

NOTE

If you are like many users, you will want to get started using
your new software and equipment as soon as possible.
Section 2 of this manual gives a quick overview of the
installation process. But, before you attempt to install and
use your Trantor host adapter and/or software, please read
this manual first. 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 with the INSTALL program.

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!**

Printed in USA

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1.0 Introduction

This manual describes installation and operation of Trantor SCSI Host Adapter software for both rewriteable devices (including hard disks, magneto-optical, SyQuest, Bernoulli Box, floptical and SCSI floppy drives) and CD-ROM support.

The software described in this manual is supplied standard with Trantor host adapters and functions similarly on each. Trantor's software is designed to be ASPI-compatible and may be used with other manufacturer's ASPI-compatible hardware. Similarly, Trantor's hardware is also ASPI-compatible and allows you to interface with other manufacturers' ASPI-compatible applications.

Any references made in this User Guide to host adapter or adapter refers to Trantor's as well as any other manufacturer's SCSI host adapter that is ASPI-compatible, having the appropriate ASPI Manager. See Appendix D for an ASPI overview.

Note that for the sake of simplicity, this manual refers to the software for all devices (except CD-ROMs) as "hard disk" software, since these devices all share the same hard disk device driver and utilities.

☞ *Be sure to register your MSCDEX driver with Microsoft Corporation using the registration card packaged with your distribution software.*

☞ This manual assumes that your host adapter has been successfully installed in your computer system following the instructions in the appropriate Trantor *Hardware Installation Guide* or other manufacturer's installation documents supplied with the product. **If you have not performed this installation, please do so before attempting to install and run the software described in this document.**

1.1 Software

The software has several important feature which include:

- Simple installation and configuration, including automatic updating of your AUTOEXEC.BAT and CONFIG.SYS files.
- Support for the ASPI (Advanced SCSI Programming Interface) specification, permitting use of ASPI-compatible software. See Appendix D for more information.

- Spanning capability, which allows you to treat two or more erasable SCSI devices (either fixed or removable media) as a single large device.
- Formatting routines which automatically identify all connected devices and media, allowing partitioning and verification.
- Media format compatibility, so that you may interchangeably connect your SCSI devices to any Trantor SCSI host adapters installed in other IBM-compatible computers.
- Simple installation menus which allows you to easily call SCSI device media format routines, set spanning selections, and test your SCSI interface and devices.
- Simple, complete audio control of music CDs in your CD-ROM drive with the included *Music Box*® software.

1.2 Checklist

You should have received the following items in your software package:

- ❏ 5¼ or 3½-inch software distribution diskette
- ❏ *Hard Disk & CD-ROM Software & Utilities User Guide* (this document)
- ❏ Product Registration card
- ❏ Microsoft Registration card (for MSCDEX)

If you find that anything is missing, please contact your dealer immediately. Be sure to fill out and return your Product Registration cards to be eligible for warranty support and technical assistance.

1.3 Software Overview

The distribution diskette contains a number of files which are of interest. The following is a brief summary:

INSTALL.EXE

The main setup and installation program, which provides a "shell" to perform numerous functions, including:

- Copying all software files to your system, for hard disk and/or CD-ROM support
- Formatting SCSI device storage media (fixed and removable)
- Configuring SCSI device spanning
- Testing of all SCSI devices connected to the adapter

1.0 Introduction

Note that there are separate programs (see below) which perform some of these functions.

CDINSTAL.EXE

The CD-ROM installation routines, initially run from the main INSTALL program. Use this program to change CD-ROM operation options at a later time.

HDINSTAL.EXE

The hard disk installation routines, initially run from the main INSTALL program. Use this program to change hard disk operation options at a later time.

MAxxx.SYS

ASPI Manager files (see Appendix D) for various Trantor SCSI host adapters. Only one of these will be copied to your system during the installation process.

TSCSI.SYS

The hard disk "device driver" file which links the hardware to your computer's operating system. It must be loaded through your system's CONFIG.SYS file; INSTALL.EXE will modify your CONFIG.SYS file automatically. This driver is not needed for CD-ROM operation.

TSTATUS.EXE

A status utility which will inform you of:

- The revision level of the TSCSI.SYS driver
- How much memory is used by TSCSI.SYS
- The SCSI drives connected to your adapter and their capacities

SCSITEST.EXE

A test utility to search for all SCSI adapters and devices connected to your computer and report the results. This driver is used to confirm that your SCSI adapter and all SCSI devices are properly connected and configured.

TFORMAT.EXE

A SCSI formatting utility, used to format and partition the storage media of your SCSI drives. Works with both fixed (hard disk) and removable (cartridge or floppy) drives. Options include the ability to define more than one logical partition (drive letter) per drive, and to verify the reliability of the media after formatting. The ASPI Manager (MAxxx.SYS) must be loaded in order for TFORMAT to function.

TSPAN.EXE

Allows you to create one large logical drive (C:, D:, E:, etc.) from two or more SCSI devices by "spanning" them via software control. Note that the spanned devices must either be all fixed or all removable; spanning fixed and removable devices together is not permitted. It is possible, however, to use more than one spanned set of devices simultaneously; for instance, a spanned set of hard disks may be used along with a different spanned set of removable cartridges. The ASPI Manager (MAxxx.SYS) must be loaded in order for TSPAN to function.

TSLCDR.SYS

The CD-ROM "device driver" file which links the hardware to the operating system. It must be loaded through your system's CONFIG.SYS file; INSTALL.EXE will modify your CONFIG.SYS file automatically. This file must be loaded in addition to TSCSI.SYS if you wish to support both hard disks and CD-ROMs simultaneously.

MSCDEX.EXE

Microsoft's CD-ROM extensions to MS-DOS, licensed by Trantor. It is generally loaded from AUTOEXEC.BAT. See Section 4.1. *Be sure to register your MSCDEX driver with Microsoft Corporation using the registration card packaged with your distribution software.*

CHKCD.EXE

A utility, similar to the CHKDSK program supplied with DOS, to display status information about a CD-ROM.

TLOCK.EXE

A utility designed to prevent ejecting a disc from a CD-ROM or other removable-media drive by pushing the drive's front panel button.

TUNLOCK.EXE

A utility which is the opposite of TLOCK; it "unlocks" a CD-ROM or other removable-media drive, permitting the disc to eject by pushing the drive's front panel button.

TEJECT.EXE

When executed from the DOS command line, ejects the currently-loaded disc(s) from a CD-ROM or other removable-media drive.

READ.ME

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

Auxiliary Files

*.OVL

Overlay files used during installation only. There are several versions supplied; only one of which is used for any particular Trantor SCSI interface product.

*.INF

Text information files used during installation only. There are several versions supplied; only one of which is used for any particular Trantor SCSI interface product. Note that you <u>must not</u> modify these files in any way; if you do, the installation process will halt.

Music Box Files

Your distribution diskette has a \MUSICBOX subdirectory, containing the following files:

MUSICBOX.EXE

The standard version of *Music Box* with graphical interface designed to run from the MS-DOS command line. This version of *Music Box* may be optionally run as a memory-resident application (referred to as *Music Box TSR*). Once installed, *Music Box TSR* takes up about 18 KB of memory and provides most of the commands available in graphical interface mode. When memory resident, *Music Box TSR* uses keyboard control only and provides audio feedback to the user through the computer's speaker, thus making it usable in any screen mode, even when graphical software (except Windows) is running.

MBOXRES.EXE

A version of *Music Box* which invokes the memory-resident option, then immediately returns to the DOS command line. See Section 6.4.5.

MBOXRES.OVL

An overlay file used by the memory-resident version of *Music Box*. This file must be in either the current directory or the DOS path when the memory-resident version of *Music Box* is loaded into memory.

MBOXWIN.EXE

The Microsoft Windows version of *Music Box* for use with Windows version 3.0 or later. Includes a disc database to store disc/track titles and play-order preferences.

MBOXREAD.ME

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

OS/2 Files

Your distribution diskette has an \OS2 subdirectory, containing the following files:

OS2_READ.ME

A standard text file explaining how to install and configure your hardware for OS/2. For installation instructions, see Appendix E. Please note that OS/2 technical support is provided via fax and BBS only – see this file for details.

OS2.FAQ

OS/2 Frequently Asked Questions text file. Please read this before contacting Trantor, IBM, or your dealer for OS/2 technical support.

*.ADD

OS/2 Adapter Device Driver files. There are several versions supplied for various Trantor host adapters – see the OS2_READ.ME file for details of OS/2 support installation and operation.

*.DDP

OS/2 installation script files. See OS2_READ.ME for details.

NOTE

If you plan to install and use your Trantor SCSI adapter with OS/2, <u>please read Appendix E now!</u>

2.0 Installation Overview

This quick overview is intended to summarize the various steps involved with installation and configuration of your hardware and software. *New users should thoroughly read the remainder of this manual before proceeding with installation and configuration!*

1. Referring to your *Hardware Installation Guide* supplied with your hardware, install the SCSI host adapter in your computer system. It's important that the hardware be carefully and completely installed prior to using the software described in this manual.

2. Connect the SCSI device(s) to be used with the host adapter. The **last** (or only) SCSI device connected to the host adapter should be properly "terminated," per the device manufacturer's specifications. See your dealer for termination assistance if necessary; a terminator is often an optional accessory.

3. Power up the computer system and allow it to boot, then place the software distribution diskette in a floppy disk drive and log on to that drive.

4. If you plan to use your Trantor SCSI adapter under OS/2 2.0 or later, skip to Appendix E now for installation information. Skip steps 5 and 6. Note that only the .ADD files supplied by Trantor are applicable under OS/2 — all other drivers and utilities are not used with OS/2.

5. Install CD-ROM and/or hard disk software by typing "INSTALL" at the DOS prompt. Select the appropriate hard disk drive for software installation, then (after the installation process is complete) reboot your computer to activate the SCSI software driver(s) and utility software.

6. Run the SCSITEST program to test the installation and run the INSTALL program again, if necessary, to reconfigure system options.

3.0 Software Installation

An automatic software installation program (called INSTALL) is included on the software distribution diskette and allows you to install and configure hard disk and/or CD-ROM support software. You must install your software onto a bootable hard disk. The original distribution diskette is not copy-protected, and you are encouraged to make a backup copy of the original diskette (using DOS' DISKCOPY or any other suitable utility) to protect against loss or damage of your original software.

If there is a READ.ME text file on your Trantor distribution diskette, **please read it now** with any word processor or text editor. It may contain corrections or updates to the software or this manual. *Please see Appendix C for troubleshooting assistance with possible problems which may develop.*

3.1 Installation Steps

Prior to installing your software, the hardware installation should have been completed, following instructions contained in the *Hardware Installation Guide* or other instructions supplied with your host adapter. Make sure that you have:

❑ installed the SCSI host adapter

❑ attached the SCSI device(s) you intend to use

❑ checked that the last (or only) SCSI device is properly terminated, per manufacturer's instructions

❑ checked that the device addresses of multiple SCSI devices are unique

❑ turned on the SCSI device(s) and your computer

The automatic installation program, INSTALL, performs the following tasks:

For CD-ROM software:

• Creates a subdirectory (\TSCSI), if necessary, on the hard drive specified by you during installation

• Copies all the CD-ROM files to the new subdirectory

• Adds the lines "**DEVICE=C:\TSCSI\TSLCDR.SYS**" to your CONFIG.SYS file and "**C:\TSCSI**" to the PATH statement in your AUTOEXEC.BAT file. This assumes that you specified drive C for the installation, of course. CONFIG.SYS,

AUTOEXEC.BAT, and the PATH statement are created if they do not already exist. These statements are required for operation with a CD-ROM drive.

For Hard Disk software:

- Creates a subdirectory (\TSCSI), if necessary, on the hard drive specified by you during installation.
- Copies all the hard disk files to the new subdirectory.
- Adds the lines "`DEVICE=C:\TSCSI\TSCSI.SYS`" to your CONFIG.SYS file, and "`C:\TSCSI`" to the PATH statement in your AUTOEXEC.BAT file. This assumes that you specified drive C for the installation of course. CONFIG.SYS, AUTOEXEC.BAT, and the PATH statement are created if they do not already exist. These statements are required for operation with a hard disk.

3.1.1 Running the INSTALL Program

To run the automatic installation program, place the distribution diskette (or, preferably, a copy of it) into floppy disk drive A or B, log onto the floppy drive, and enter the command "`INSTALL`." Here's an example of this sequence:

```
C>b:
B>INSTALL
```

You should now see INSTALL's Main Menu appear *(Figure 1)*. You may select any of the three options by using the <Spacebar> or <arrow> keys to move the highlight cursor. Choose either *Install Hard Disk Driver* or *Install CD-ROM Driver* to proceed.

```
╔══════════════ Install ══════════════╗
║  ┌────────────────────────────────┐  ║
║  │      Install Hard Disk Driver  │  ║
║  │      Install CDROM Driver      │  ║
║  │         Exit to DOS            │  ║
║  │                                │  ║
║  │                                │  ║
║  │ Press Enter to install softuare for hard disk. │  ║
║  └────────────────────────────────┘  ║
╚══════════════════════════════════════╝
```
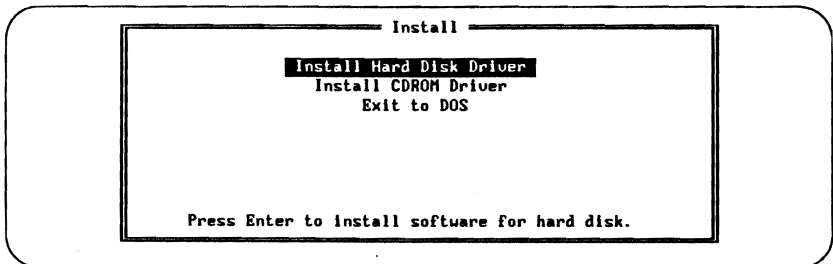
Figure 1   INSTALL Main Menu

Once you have configured and installed your software, the main INSTALL program is no longer used. You may reconfigure your CD-ROM or hard disk software at any time by running the

appropriate installation program (CDINSTAL or HDINSTAL) from the directory containing your installed CD-ROM and/or hard disk software. If you choose to install hard disk software, skip to Section 3.1.3; otherwise, continue with Section 3.1.2 for CD-ROM software installation.

3.1.2 CD-ROM Software Installation

If you selected *Install* CD-ROM *Driver*, select *Install* CD-ROM *Driver* again(at the new menu) and the CD-ROM Host Adapter Options Menu will appear as shown in *Figure 2*. Now you may specify the SCSI host adapter for which you are installing software, or let INSTALL automatically select it for you. For Trantor bus-based adapters, you also have the option of setting a host adapter interrupt setting.

```
┌─────────────── CD-ROM Driver Installation ──────────────┐
│ ┌─────────────────── Host Adapter Options ───────────────┐ │
│ │                                                        │ │
│ │          Trantor Host Adapter: [None    ]              │ │
│ │     Trantor Host Adapter Interrupt: None               │ │
│ │                                                        │ │
│ │       Automatic Search for Host Adapter                │ │
│ │              Continue Installation                     │ │
│ │                                                        │ │
│ │                                                        │ │
│ │    Press ↑ and ↓ to move highlight among items.        │ │
│ │                                                        │ │
│ │    Press → and ← to select a host adapter.             │ │
│ └────────────────────────────────────────────────────────┘ │
└──────────────────────────────────────────────────────────┘
```
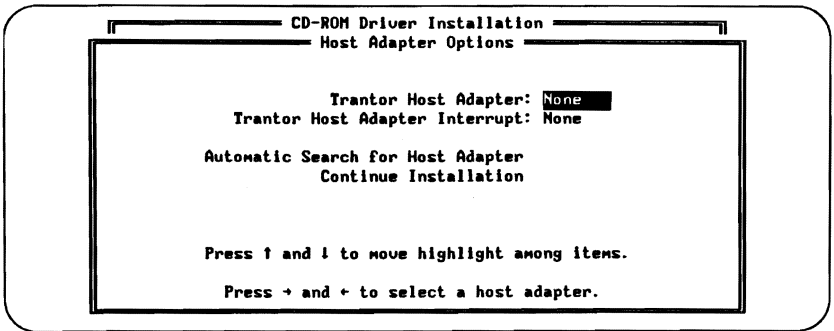
Figure 2   CD-ROM Host Adapter Options Menu

In most cases, you should move the cursor to *Automatic Search for Host Adapter* and press <Enter>. After a few seconds, INSTALL will scan the system, identify the adapter, and set the adapter settings (*Figure 3*).

```
┌─────────────── CD-ROM Driver Installation ──────────────┐
│ ┌─────────────────── Host Adapter Options ───────────────┐ │
│ │                                                        │ │
│ │          Trantor Host Adapter: T130                    │ │
│ │     Trantor Host Adapter Interrupt: None               │ │
│ │                                                        │ │
│ │       [Automatic Search for Host Adapter]              │ │
│ │              Continue Installation                     │ │
│ │                                                        │ │
│ │    Press ↑ and ↓ to move highlight among items.        │ │
│ │                                                        │ │
│ │    Press Enter to find the host adapter present.       │ │
│ └────────────────────────────────────────────────────────┘ │
└──────────────────────────────────────────────────────────┘
```
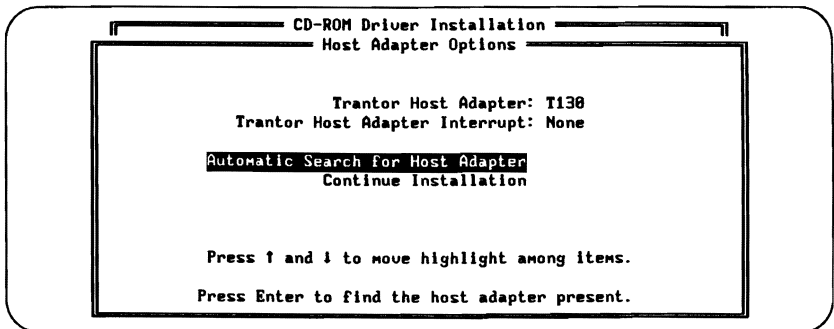
Figure 3   Host Adapter Set

The only reason you might want to set the adapter manually (with the <left-arrow> and <right-arrow> keys) is if you do not have your adapter installed and connected to a SCSI device at this time, or if you already have another adapter installed in your computer — INSTALL will only automatically identify the first adapter it finds.

Once the host adapter option has been set, move the cursor to *Continue Installation* and press <Enter>. The next CD-ROM Installation Menu will appear as shown in *Figure 4*.

```
┌──────────────── CD-ROM Driver Installation ────────────────┐
│ ══════════════════ MSCDEX Options ══════════════════ │
│                                                             │
│        CD-ROM Device Driver Name (/D): ▐TSLCD▌              │
│        First CD-ROM Drive Letter (/L): Default              │
│      Number of 2K CD-ROM Buffers (/M): 10                   │
│               EMS for MSCDEX (/E): No                       │
│            Kanji Character Set (/K): No                     │
│        Verbose Sign-on Messages (/V): No                    │
│                                                             │
│                 Proceed with Installation                   │
│                 Restore Default Settings                    │
│                    Abort Installation                       │
│                                                             │
│      Press ↑ and ↓ to move highlight among items.          │
│      You may type a new device driver name.                 │
│      (Generally, you do not need to change this field.)     │
└─────────────────────────────────────────────────────────────┘
```
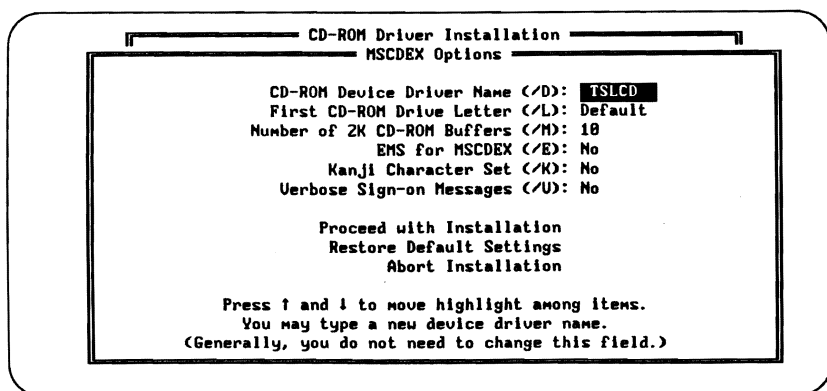
Figure 4   CD-ROM INSTALL Options

You may point to any of the menu options with the <up-arrow> and <down-arrow> keys; the help line at the bottom of the screen explains how to change each option. In most cases, accepting the default installation options is appropriate, but you may change any of these, as well as restore all the options to their default values with a menu selection.

The various options shown in *Figure 4* relate to operation of the MSCDEX extensions software for CD-ROM drives. For a full explanation of each of these options, please refer to Section 4.1, which discusses MSCDEX in detail.

Once you have set all the options, select the *Proceed with Installation* menu line and press <Enter> to continue. After prompting you for the drive letter of your boot disk (which may be a hard drive or floppy), INSTALL will present a summary Installation Options Confirmation Screen showing you exactly what will be done during installation *(Figure 5)*. Check this screen very carefully to understand what INSTALL will do; you have the option at this point of backing up to change any of the option settings by pressing <Escape>.

```
╔══════════════ CD-ROM Driver Installation ═══════════════╗
║ ─────────────── Installation Options ──────────────      ║
║ The following options have been selected for your installation: ║
║ Creating new directory C:\TSCSI.                         ║
║ Copying all the required files to C:\TSCSI\.             ║
║                                                          ║
║ Backups for CONFIG.SYS and AUTOEXEC.BAT will be stored in ║
║ CONFIG.CD and AUTOEXEC.CD respectively.                  ║
║                                                          ║
║ Adding the following to your C:\CONFIG.SYS file:         ║
║    Device=C:\TSCSI\MA348.SYS (with interrupt = Disabled) ║
║    Device=C:\TSCSI\TSLCDR.SYS  /D: TSLCD                 ║
║                                                          ║
║ Adding the following to your C:\AUTOEXEC.BAT file:       ║
║    C:\TSCSI\MSCDEX /D: TSLCD /M:10                       ║
║                                                          ║
║ Press any key to install on drive C: with the above options. ║
║ Press Esc to abort installation and return to            ║
║ CD-ROM Driver Installation menu.                         ║
╚══════════════════════════════════════════════════════════╝
```

Figure 5   Installation Options Confirmation Screen

Press any key to proceed with the installation. If you proceed, you will see a screen similar to *Figure 6* as INSTALL creates (if necessary) the \TSCSI subdirectory on your boot disk and copies the CD-ROM distribution files into it. In addition, your CONFIG.SYS and AUTOEXEC.BAT files will be modified (or created, if necessary) to load the CD-ROM software.

```
╔══════════════ CD-ROM Driver Installation ═══════════════╗
║ ─────────────── Installing Software ───────────────      ║
║ Copying b:\SCSITEST.EXE -> C:\TSCSI\SCSITEST.EXE...      ║
║ Copying b:\TEJECT.EXE -> C:\TSCSI\TEJECT.EXE...          ║
║ Copying b:\TLOCK.EXE -> C:\TSCSI\TLOCK.EXE...            ║
║ Copying b:\TSTATUS.EXE -> C:\TSCSI\TSTATUS.EXE...        ║
║ Copying b:\TUNLOCK.EXE -> C:\TSCSI\TUNLOCK.EXE...        ║
║ Copying C:\CONFIG.SYS -> C:\CONFIG.CD...                 ║
║ Copying C:\AUTOEXEC.BAT -> C:\AUTOEXEC.CD...             ║
║ Opening C:\CONFIG.SYS file...                            ║
║ Copying b:\TSLCDR.SYS -> C:\TSCSI\TSLCDR.SYS...         ║
║ Checking Lastdrive statement in config.sys...           ║
║ Adding Lastdrive=F command in config.sys...             ║
║ Closing C:\CONFIG.SYS file...                            ║
║ Checking Path=c:\tscsi in C:\AUTOEXEC.BAT...            ║
║ Amending Path= statement in C:\AUTOEXEC.BAT...          ║
║ Checking C:\TSCSI\MSCDEX command in C:\AUTOEXEC.BAT...   ║
║ Adding C:\TSCSI\MSCDEX command in C:\AUTOEXEC.BAT...     ║
║                                                          ║
║              Installation Completed.                     ║
║ Please reboot the computer for the installation to take effect. ║
║        Press any key to return to Install menu.          ║
╚══════════════════════════════════════════════════════════╝
```

Figure 6   Installation Complete Screen

Upon completion, you will be prompted to press any key to return to the INSTALL Main Menu. There you may choose to install hard disk software as well (see next section) or return to DOS. When you are finished installing the software, reboot your computer (by pressing the <Control>, <Alt>, and <Delete> keys simultaneously) to activate the software.
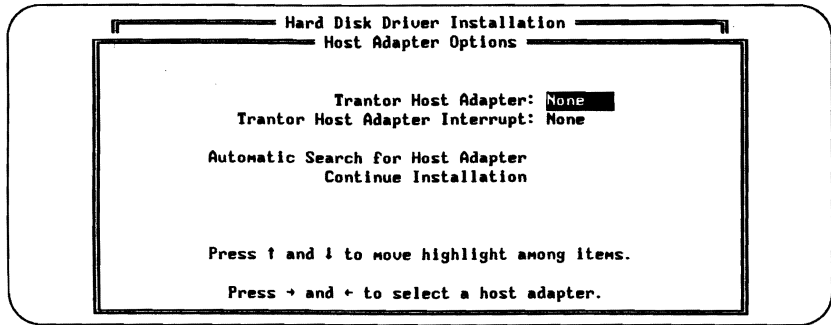
3.1.3 Hard Disk Software Installation

If you have chosen *Install Hard Disk Driver* from the main INSTALL
Menu, you will see a screen similar to *Figure 7.* You may point to the
menu options with the up/down arrow keys; pressing the <Enter> key
performs the desired action. This menu allows selection of many
options for your SCSI device, but for now we are only concerned with
the top selection: *Install Distribution Software.* (The remaining options
are discussed in Chapter 5.) Select this option and press <Enter>.

```
════════════ Hard Disk Driver Installation ════════════

              ┌──────────────────────────────────┐
              │ Install Distribution Softuare     │
              └──────────────────────────────────┘
                        SCSI Format
                     SCSI Drive Spanning
                     SCSI Hardware Test
                    Return to Install menu

            Press ↑ and ↓ to move highlight among items.
            Press Enter to install distribution software.
```

Figure 7   Hard Disk Installation Options Menu

At this point, the Hard Disk Host Adapter Options Menu will appear
as shown in *Figure 8.*

```
══════════════ Hard Disk Driver Installation ══════════════
══════════════════ Host Adapter Options ══════════════════

                 Trantor Host Adapter: │None  │
         Trantor Host Adapter Interrupt: None

         Automatic Search for Host Adapter
                   Continue Installation



         Press ↑ and ↓ to move highlight among items.

         Press → and ← to select a host adapter.
```

Figure 8   Hard Disk Host Adapter Options Menu

At this point you have the option of explicitly specifying the adapter for
which you are installing software, or letting INSTALL automatically
select it for you. For Trantor bus-based adapters, you also have the
option of selecting a host adapter interrupt setting.
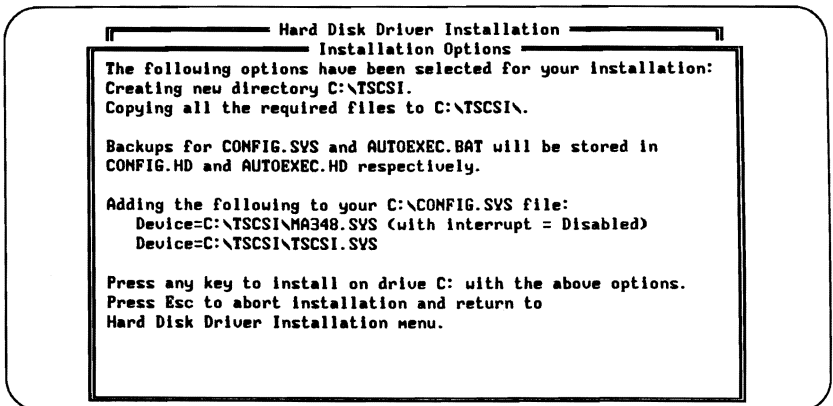
In most cases, you should move the cursor to *Automatic Search for Host
Adapter* and press <Enter>. After a few seconds, INSTALL will scan
your system, identify the adapter and set the adapter setting as shown
in *Figure 9.*

```
┌─────────────── Hard Disk Driver Installation ──────────────┐
│┌──────────────── Host Adapter Options ──────────────┐│
││                                                      ││
││          Trantor Host Adapter: T130                  ││
││      Trantor Host Adapter Interrupt: None            ││
││      ▐Automatic Search for Host Adapter▌             ││
││              Continue Installation                   ││
││                                                      ││
││                                                      ││
││      Press ↑ and ↓ to move highlight among items.    ││
││                                                      ││
││      Press Enter to find the host adapter present.   ││
│└──────────────────────────────────────────────────┘│
└────────────────────────────────────────────────────┘
```

Figure 9   Host Adapter Set

The only reason you might want to set the adapter manually (with the <left-arrow> or <right-arrow> keys) is if you do not have your adapter installed and connected to a SCSI device or if you already have another adapter installed in your computer — INSTALL will only automatically identify the first adapter it finds.
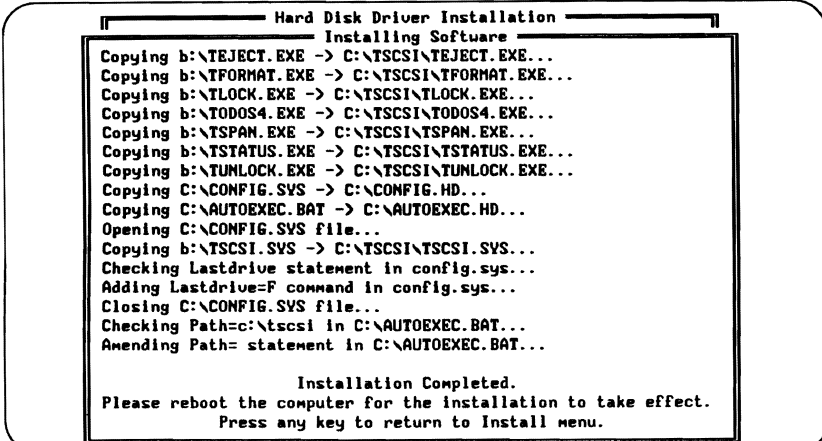
Once the host adapter option has been set, move the cursor to *Continue Installation* and press <Enter>. After prompting you for the drive letter of your boot disk (which must be a hard drive), INSTALL will present a summary Installation Options Screen showing you exactly what will be done during installation (*Figure 10*).

```
┌─────────────── Hard Disk Driver Installation ──────────────┐
│┌──────────────── Installation Options ──────────────┐│
││ The following options have been selected for your installation:│
││ Creating new directory C:\TSCSI.                     ││
││ Copying all the required files to C:\TSCSI\.         ││
││                                                      ││
││ Backups for CONFIG.SYS and AUTOEXEC.BAT will be stored in│
││ CONFIG.HD and AUTOEXEC.HD respectively.              ││
││                                                      ││
││ Adding the following to your C:\CONFIG.SYS file:     ││
││    Device=C:\TSCSI\MA348.SYS (with interrupt = Disabled)│
││    Device=C:\TSCSI\TSCSI.SYS                          ││
││                                                      ││
││ Press any key to install on drive C: with the above options.│
││ Press Esc to abort installation and return to        ││
││ Hard Disk Driver Installation menu.                  ││
│└──────────────────────────────────────────────────┘│
└────────────────────────────────────────────────────┘
```

Figure 10   Installation Options Confirmation Screen

Check this screen very carefully to understand what INSTALL will do; you have the option at this point of backing up to change any of the option settings by pressing <Escape>. Then press any key to continue.

If you proceed with installation, you will see a screen similar to *Figure 11* as INSTALL creates (if necessary) the \TSCSI subdirectory on your boot disk and copies the hard disk distribution files into it.

```
┌─────────────── Hard Disk Driver Installation ───────────────┐
│ ┌──────────────── Installing Software ─────────────────┐ │
│ │ Copying b:\TEJECT.EXE -> C:\TSCSI\TEJECT.EXE...       │ │
│ │ Copying b:\TFORMAT.EXE -> C:\TSCSI\TFORMAT.EXE...     │ │
│ │ Copying b:\TLOCK.EXE -> C:\TSCSI\TLOCK.EXE...         │ │
│ │ Copying b:\TODOS4.EXE -> C:\TSCSI\TODOS4.EXE...       │ │
│ │ Copying b:\TSPAN.EXE -> C:\TSCSI\TSPAN.EXE...         │ │
│ │ Copying b:\TSTATUS.EXE -> C:\TSCSI\TSTATUS.EXE...     │ │
│ │ Copying b:\TUNLOCK.EXE -> C:\TSCSI\TUNLOCK.EXE...     │ │
│ │ Copying C:\CONFIG.SYS -> C:\CONFIG.HD...              │ │
│ │ Copying C:\AUTOEXEC.BAT -> C:\AUTOEXEC.HD...          │ │
│ │ Opening C:\CONFIG.SYS file...                        │ │
│ │ Copying b:\TSCSI.SYS -> C:\TSCSI\TSCSI.SYS...        │ │
│ │ Checking Lastdrive statement in config.sys...        │ │
│ │ Adding Lastdrive=F command in config.sys...          │ │
│ │ Closing C:\CONFIG.SYS file...                        │ │
│ │ Checking Path=c:\tscsi in C:\AUTOEXEC.BAT...         │ │
│ │ Amending Path= statement in C:\AUTOEXEC.BAT...       │ │
│ │                                                      │ │
│ │               Installation Completed.                │ │
│ │ Please reboot the computer for the installation to take effect. │ │
│ │         Press any key to return to Install menu.     │ │
└─────────────────────────────────────────────────────────────┘
```

Figure 11   Installation Complete Screen

In addition, your CONFIG.SYS and AUTOEXEC.BAT files will be modified (or created, if necessary) to load the hard disk software. Upon completion, you will be prompted to press any key to return to the INSTALL Main Menu. There you may choose to install CD-ROM software as well (see previous Section) or return to DOS. When you are finished installing the software, reboot your computer (by pressing the <Control>, <Alt>, and <Delete> keys simultaneously) to activate the distribution software.

3.1.4 Checking the Installation

If the installation process was completed correctly, your computer should operate as before, except that the software (MAxxx.SYS, TSLCDR.SYS and/or TSCSI.SYS – all loaded via your CONFIG.SYS file) should now recognize and use the host adapter and any SCSI device(s) attached to it. *(Full DOS access to these devices may require formatting first, however. See Chapter 5 for details.)*

During bootup, you should see information appear on your screen as the software searches for and recognizes the host adapter and your SCSI device(s).

As each device is found, information about the device will be shown on screen. If MAxxx.SYS, TSLCDR.SYS, TSCSI.SYS and/or MSCDEX report any problems, check the following:

- Make sure the hardware is installed and cabled correctly (see hardware documentation).
- Make sure the SCSI software has been installed properly (Section 3.1.1 to 3.1.3). Run SCSITEST (see next Section) to make sure the system can recognize the SCSI device(s).
- Make sure your SCSI device(s) is plugged in and turned on! You would be amazed at how often people forget this simple step.

3.1.5 Testing the SCSI Hardware

If there appears to be a problem accessing the SCSI device(s) attached to your computer, or if you simply want to verify proper operation of your SCSI hardware, you can use the test software (called SCSITEST). There are two ways to run SCSITEST, either within the INSTALL menu system *(SCSI Hardware Test)*, or in a "stand-alone" mode, directly from DOS. The program's operation will be the same in either case — the choice is yours.

Starting the Test Software in Stand-Alone Mode

Invoke the test software (SCSITEST) by first logging onto the \TSCSI subdirectory or, with a floppy-drive system, by logging to a copy of the distribution software disk in drive A. For example:

```
D:\>c:
C:\>cd \TSCSI
C:\TSCSI>SCSITEST
```

After running SCSITEST, you will see the opening screen (*Figure 12,* next page).

The selection bar will be on the first option, *Test Hardware;* select this option by pressing the <Enter> key. After a moment, SCSITEST should confirm that an adapter is connected to the system.

If SCSITEST Indicates an Error

If SCSITEST reports a problem identifying an adapter, turn your computer off and recheck your installation of the host adapter. Make sure it is securely seated in your computer and that all connections to

SCSI Software & Utilities User Guide

```
╭──────────────────────────────────────────────────╮
│ ┌──────────── SCSI Test ─────────────┐            │
│ │                                     │            │
│ │  SCSI Test - SCSI Hardware Test Program         │
│ │      Revision 1.10  March 21, 1989  │            │
│ │  Copyright (C) 1988-90, Trantor Systems, Ltd.   │
│ │                                     │      ╭─    │
│ │                                     │            │
│ └─────────────────────────────────────┘            │
│          ┌──────── Main Menu ────────┐             │
│          │                           │             │
│          │     ▐Test Hardware▌       │             │
│          │      View Test Setup      │             │
│          │      Return to DOS        │             │
│          │                           │             │
│          └───────────────────────────┘             │
╰──────────────────────────────────────────────────╯
```
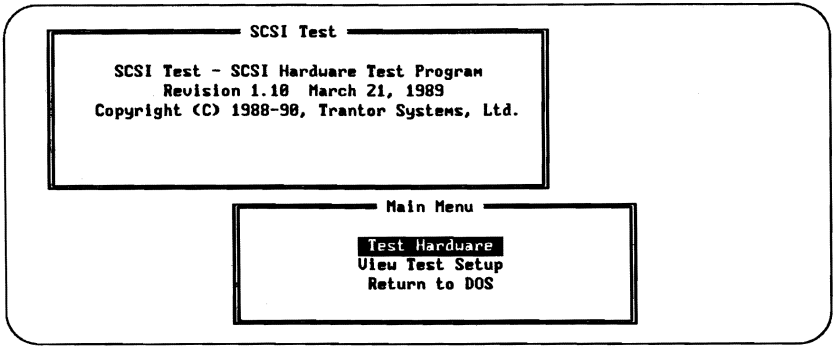
Figure 12   SCSITEST Opening Screen

the adapter are secure. After retesting the installation, if SCSITEST still shows a problem identifying the adapter, contact your dealer for assistance.

If SCSITEST Indicates a SCSI Adapter Was Found

In most cases, SCSITEST will indicate that one adapter was found, and ask for confirmation *(Figure 13)*.

```
╭──────────────────────────────────────────────────╮
│ ┌──────────── SCSI Test ─────────────┐            │
│ │                                     │            │
│ │  SCSI Test - SCSI Hardware Test Program         │
│ │      Revision 1.10  March 21, 1989  │            │
│ │  Copyright (C) 1988-90, Trantor Systems, Ltd.   │
│ │                                     │            │
│ └───────────────┬─────────────────────┘           │
│      ┌────────── Test in Progress ──────────┐      │
│      │                                       │      │
│      │     SCSI Host Adapter Test - Pass 1   │      │
│      │                                       │      │
│      │       This test scans for the presence│      │
│      │   of properly installed SCSI host adapters.  │
│      │   This test will NOT find SCSI adapters│      │
│      │          from other manufacturers.    │      │
│      │                                       │      │
│      │       1 SCSI host adapter found.       │      │
│      │                                       │      │
│      │  Is this the number of host adapters installed (y,n)? │
│      └───────────────────────────────────────┘      │
╰──────────────────────────────────────────────────╯
```

Figure 13   SCSITEST Adapter Board Count

If all seems to be working properly, confirm this by answering <y> to the question. SCSITEST will then proceed to an informational screen, telling you that a scan for SCSI devices will now take place.

18

After reading the information presented, press the <Enter> key to begin the scan ("polling") for devices. Polling begins with device 0 and proceeds through device 7. If you have more than one SCSI device connected (such as a hard disk and a removable-cartridge or CD-ROM drive), make certain that their device addresses are different (see your hardware documentation). As each device is found, SCSITEST will pause to identify the device and its address; press <Enter> to continue after making sure the information provided is correct.

If No Devices Are Found

If SCSITEST cannot identify any devices connected to the adapter, it will stop and inform you of this problem. In most cases, the reason for a device not being found is one of the following:

- The device is not connected to the adapter correctly. Double-check that the cable between the adapter and the SCSI device(s) is correctly attached.
- The device is not receiving power. Check that a power cable is properly attached to the SCSI device.
- The device address is not set properly. Check that the device address is set between 0 and 7 (see your device manual for details) and, if you are using more than one SCSI device, that each device is set to a different address.
- The ASPI Manager (MAxxx.SYS) is not loaded.

After checking the above conditions, re-run SCSITEST. If SCSITEST still indicates that it cannot identify any devices, and you are sure you have double-checked everything, contact your dealer for assistance. If SCSITEST correctly detects the presence of the adapter and cannot identify any devices, the most likely remaining problem is either a bad connecting cable or a failure of the SCSI device.

Test Summary

After testing for the presence of the Host Adapter(s) and SCSI device(s), you may select *View Test Setup* from the SCSITEST Menu. This short summary screen *(Figure 14)* will indicate whether an adapter was found during the test and, if so, its address.

Normally, you will see three "failed" indications and one "ok" indication which denotes the adapter. This summary screen does not report anything about the device(s) connected to the adapter; it is designed to summarize the condition of the adapter only.

```
┌──────────────────────────────────────────────────────────────┐
│  ┌─────────────── SCSI Test ───────────────┐                  │
│  │                                          │                  │
│  │   SCSI Test - SCSI Hardware Test Program │                  │
│  │        Revision 1.20  July 24, 1990      │                  │
│  │   Copyright (C) 1988-92, Trantor Systems, Ltd.              │
│  │                                          │                  │
│  │                                          │                  │
│  └──────────────── Test Setup ─────────────────────────┐      │
│           │                                             │      │
│           │   Adapter #    Address    Status            │      │
│           │   ---------    -------    ------             │      │
│           │                                             │      │
│           │       1          0h       OK                │      │
│           │       2          1h       Failed            │      │
│           │       3          2h       Failed            │      │
│           │       4          3h       Failed            │      │
│           │                                             │      │
│           │       Press any key to continue.            │      │
│           │                                             │      │
│           └─────────────────────────────────────────────┘      │
└──────────────────────────────────────────────────────────────┘
```
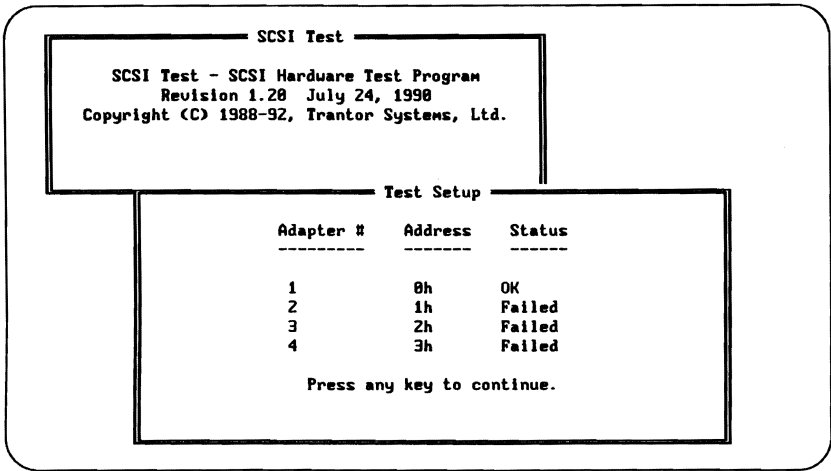
Figure 14   SCSITEST Hardware Summary

At this point, if everything seems to be working properly, you should be able to exit SCSITEST to "see" the CD-ROM and/or hard disk drive(s) by logging to them in DOS like any other disk drive. For example, if your first SCSI device has been assigned "D" as its drive letter, you should be able to type "**D:**" followed by the <Enter> key and see DOS recognize it as it would any other drive, assuming it has been properly formatted (see Chapter 5).

Assuming that the hardware and software tests indicate proper operation of your system, proceed to Chapter 4 of this manual for a summary of the CD-ROM utilities, or Chapter 5 for a summary of the hard disk utilities.

4.0 CD-ROM Software Operation

This chapter describes the function and operation of the CD-ROM software utilities. Although you might need these programs only infrequently, it is suggested that you familiarize yourself with them now, so that you will understand their capabilities when needed.

This manual does not address any of the standard DOS commands, such as DIR, DEL, COPY, etc. Your software and hardware will, in most cases, permit the use of these DOS commands with your SCSI device(s) in exactly the same way as with your other hardware (CD-ROM drives will not permit you to delete files from or copy files to the CD-ROM disk). If you are unfamiliar with these, consult your DOS documentation or dealer for assistance.

4.1 MSCDEX, the DOS CD-ROM Extensions

Your MS-DOS or PC-DOS operating system by itself does not know how to access a CD-ROM drive. There are many differences between a CD-ROM and either hard or floppy drives. For example:

- CD-ROMs are read-only media; data cannot be added to or deleted from a CD-ROM disc.
- CD-ROM drives can hold up to 680 MB of data — many DOS versions (prior to 4.x) cannot handle partitions greater than 32 MB.
- CD-ROM drives use the High Sierra or ISO 9660 file formats — DOS drives use the MS-DOS format.
- CD-ROM drives do not include a FAT (File Allocation Table).
- CD-ROM drive sector size is 2048 bytes. IBM PC/XT/AT-type floppy and hard disks typically use a sector size of 512 bytes.

Due to these differences, CHKDSK, FORMAT, and some other DOS file utilities will not work on a CD-ROM drive.

The MSCDEX program is a memory-resident extension to DOS which interfaces your operating system to your SCSI CD-ROM device driver (TSLCDR.SYS) and your CD-ROM drive.

MSCDEX is provided by Trantor under license from Microsoft. Please complete and return your Microsoft MSCDEX registration card!

After the TSLCDR.SYS device driver is successfully loaded (via your CONFIG.SYS file), MSCDEX must be executed. It is common to load it through your AUTOEXEC.BAT file. You could also run it only when you first need access to your CD-ROM drive during a work session. The installation process normally sets up your AUTOEXEC.BAT file to automatically load MSCDEX.

The format of the MSCDEX program is as follows:

```
MSCDEX [/V /K /E] /D:[DriverName]
  /L:[DriveLetter] /M:[Value]
```

Where:

/D: [DriverName] is a required parameter and gives MSCDEX the name of the device driver it will use to "talk to" the CD-ROM drive. The internal name of TSLCDR.SYS is TSLCD and should be substituted for **[DriverName]**.

/L: [DriveLetter] tells MSCDEX to assign **[DriveLetter]** as the logical device drive name to the CD-ROM. When more than one CD-ROM is present, the drive letters will be sequentially assigned starting with **[DriveLetter]**. If no **/L:** parameter is supplied, MSCDEX will assign the next available drive letter.

☞ If you will have a total of more than five logical drives on your system (drives A: - E:), you must prepare DOS to support at least the number of devices you will have, via the DOS LASTDRIVE statement. In your CONFIG.SYS file, you must insert a line like this:

```
LASTDRIVE=[DriveLetter]
```

Where:

[DriveLetter] is the alphabetic character (F through Z) that represents the last valid drive letter that DOS may use. For example:

```
LASTDRIVE=H
```

/M: [value] tells MSCDEX how much memory to allocate as sector buffers for caching CD-ROM information. The higher this value is, the better performance will be, though you will use additional RAM

memory for each buffer that is allocated. If no **/M:** parameter is supplied, MSCDEX allocates ten buffers, each of which uses 2048 bytes of RAM memory.

The **/V** option results in a verbose listing of additional information, including how much memory is used by buffers, resident data and resident code.

The **/K** option is used only when the CD-ROM media directory is written in Kanji (Japanese).

The **/E** option tells MSCDEX to use expanded (EMS) memory if your system includes it; this will conserve about 16 KB of main DOS memory. For example:

```
MSCDEX /E /D:TSLCD /L:M
```

installs MSCDEX with an internal name of "**TSLCD**," uses expanded memory, and configures the CD-ROM drive as drive M.

☞ All of the above options may be configured via the CDINSTAL program, either when first installing your CD-ROM software or later, should you decide to change the settings. See Section 3.1.2 for details of the CD-ROM installation programs.

4.2 CHKCD

Very similar to the CHKDSK utility which is supplied with DOS, CHKCD will display useful information about the capacity and contents of your CD-ROM disc. While not required for normal operation of your SCSI system, it is often useful to have available.

To run CHKCD, simply type its name, optionally followed by the drive letter of your CD-ROM and a colon. For example:

```
CHKCD M:
```

reports the results for CD-ROM drive M.

4.3 TLOCK

This program when run from the DOS command line (or within a batch file, if desired) will "lock" a CD-ROM disc or removable-media hard disk cartridge in the drive; i.e. it will inhibit operation of the front-panel Eject button. This is useful on a shared or networked

computer system where an inadvertent disc eject might disrupt operations. Some CD-ROMs, such as the NEC CDR-37, have manual-loading mechanisms; TLOCK has no effect on such drives.

Simply type TLOCK to lock all removable-media drives currently installed, or follow with the drive letter to lock one drive. For example:

TLOCK

will lock all removable-media drives, except additional units on multi-drive products (such as dual-drive Bernoulli Boxes and multi-disc CD-ROM changers). You must specify the drive letter for such devices.

TLOCK F:

will lock only drive F:, which may be any removable-media drive.

4.4 TUNLOCK

This utility reverses the action of TLOCK, i.e. it permits media to be ejected from a CD-ROM or other removable-media drive. Type TUNLOCK to unlock all installed removable-media drives, or follow with the drive letter to unlock one drive. For example:

TUNLOCK

will unlock all removable-media drives, except additional units on multi-drive products (such as dual-drive Bernoulli Boxes and multi-disc CD-ROM changers). You must specify the drive letter for such devices.

TUNLOCK G:

will unlock only drive G:, which may be any removable-media drive.

4.5 TEJECT

Just like the name says: when run, this program ejects a CD-ROM disc or removable-media hard disk cartridge from the drive (except, of course, for those drives which have a purely mechanical eject mechanism). If TLOCK has been run, TEJECT will set the drive to unlocked status prior to ejecting the disc.

Type TEJECT to eject all installed removable-media drives, or follow with the drive letter to eject just one drive. For example:

TEJECT

will eject all removable-media drives, except additional units on multi-drive products (such as dual-drive Bernoulli Boxes and multi-disc CD-ROM changers). You must specify the drive letter for such devices.

TEJECT H:

will eject only drive H:, which may be any removable-media drive.

5.0 Hard Disk Software Operation

This section describes the function and operation of each of the TSCSI hard disk software utilities in detail. Although you might need some of these programs only infrequently, it is suggested that you familiarize yourself with them now, so that you will understand their capabilities when needed.

This manual does not address any of the standard DOS commands, such as DIR, DEL, COPY, etc. Your software and hardware will, in most cases, permit the use of these DOS commands with your SCSI hard disk device(s) in exactly the same way as with your other hardware (except CD-ROM drives; see Section 4). If you are unfamiliar with these, consult your DOS documentation or dealer for assistance.

5.1 TFORMAT (Formats Storage Media)

TFORMAT is designed to format or prepare the storage media of your SCSI hard disk devices in the same manner as the FORMAT command used by DOS. It will work with any erasable SCSI device compatible with the host adapter including hard disks, SCSI floppy drives, magneto-optical, and removable-media cartridge drives (such as the Bernoulli Box). Note that the ASPI Manager (MAxxx.SYS) must be installed and loaded before TFORMAT will work; this is normally set up automatically during software installation (Chapter 3).

In all cases, the operation of TFORMAT is the same; just run TFORMAT from DOS, but do not specify a drive letter to format (as you normally would with the DOS FORMAT command). For example:

TFORMAT

TFORMAT will then "poll" your adapter and the SCSI device(s) in your system and present you the option of which device to format. For example, *Figure 15* (next page) illustrates the case of a single device (SCSI address 4) being found; a SyQuest 42-MB removable cartridge drive.

☞ If you are formatting a cartridge in a dual-drive Bernoulli Box, you **must** perform the format operation in the first (usually the left) drive.

TFORMAT asks you to confirm whether or not you wish to format this device; you must type "yes" (upper or lower case), followed by <Enter> to proceed with the formatting, as a safety precaution. Type

```
TFORMAT: Generic SCSI Format Program. Version  1.77
Copyright (C) 1988-90, Trantor Systems, Ltd.




─────────────────────────────────────────────────────────────

  Card Address: 3BCH, SCSI Device Address: 4

  Device vendor: SyQuest
  Device name:   SQ555

  Is this the drive you would like to format?
  Type 'yes' to confirm or anything else to abort:


─────────────────────────────────────────────────────────────

  Polling (328,4)    SyQuest  SQ555
```

Figure 15   Opening TFORMAT Screen

anything else to abort the formatting operation. When more than one drive is daisy-chained to the adapter, the format program will show you the SCSI address and the vendor information of the next drive and allow you to either select the drive by typing "yes" or proceed to the next one.

Care must be taken during selection of the drive to format when more than one device from the same vendor is connected to the adapter as in this case the same vendor name will be shown on the screen each time but with a different SCSI device address.

After confirming that you wish to proceed with the format, TFORMAT displays the technical characteristics of the drive and pauses to wait for a key to be pressed. After doing so, TFORMAT will then ask if you wish to do a "low-level" format.

A low-level format is a complete total erasure of the entire disk surface and usually must be done once on brand-new media. This is in contrast to a "high-level" format, which only erases the drive's subdirectory and file directory information. In most cases, a high-level format is sufficient to clear out all data from the drive and is much faster than a low-level format.

If you elect to perform a low-level format, TFORMAT will ask you to supply an "interleave" value (enter 0 to use the drive's default interleave value, unless otherwise instructed by your dealer) and to confirm that you really want to destroy all data on the device. It will then proceed with the low-level format, showing elapsed format time.

WARNING

If you have any concerns about the security of your data, you should perform a low-level format on the media. A DEL command issued from DOS, or a high-level format, is no guarantee that data is irretrievably erased. Given a moderate level of knowledge, it is possible to "unerase" data under these circumstances. A low-level format will erase data for good and should be used in sensitive circumstances. For government-classified data, even this is probably not sufficient; seek assistance if you have any doubts. This potential for unerasure is true of any DOS device, not just SCSI devices.

If you elect not to perform a low-level format, or upon completion of low-level formatting, TFORMAT will ask if you wish to do a high-level format. At this point, you will "partition" the drive (assignment of multiple drive letters to one device). For instance, with a large hard disk, you might wish to assign both a D drive and an E drive to divide up the large capacity. These are considered multiple "partitions" of a device. TFORMAT gives you the option of using one or more partitions (up to four partitions per physical device) in the high-level format routine.

If you choose to perform a high-level format, you'll see a screen similar to that in *Figure 16* (next page).

Here you have the option of setting up single or multiple partitions. In general, for floppy drives or hard/cartridge drives smaller than 32 MB, a single partition should be used for convenience. For large drives, you may create multiple partitions of any size you wish, except that *if you wish to make a drive bootable, the first partition should be no larger than 512 MB to conform with DOS 4 or later restrictions (except under DOS version 3, the first bootable partition must be no larger than 32 MB).*

```
TFORMAT: Generic SCSI Format Program. Version  1.77
Copyright (C) 1988-90, Trantor Systems, Ltd.


                          Total Partitions   1
      SCYL ECYL  BOOT  TYPE                      SCYL ECYL  BOOT  TYPE
1.    0    349   N     FAT12              2.
3.                                        4.


Options:
  S(ingle) Partition.
  T(wo) Partitons (A small one for booting and the remainder)
  C(ustom) Partitioning.
  Q(uit).
Selection -



Polling (328,4)      SyQuest  SQ555
```

Figure 16   TFORMAT High-Level Format Options

☞ In order to create a partition larger than 32 MB, your system **must** be running DOS version 3.3 or later. Earlier versions of DOS will limit you to a maximum of four partitions per physical disk drive, with each partition a maximum of 32 MB. Under DOS 3.3, the SCSI device sector size begins at 512 bytes for up to a 32-MB partition and doubles with each doubling of partition size, due to the requirements of DOS. For instance, a 64-MB partition would use 1-KB sectors, a 128-MB partition would use 2-KB sectors, etc. Therefore, if you wish to store a large number of small files, keeping each partition size (and therefore, the sector size) small would be the best arrangement. *DOS versions 4 and 5 have no such limitation; sector size is always 512 bytes.*

One of the options which will be presented for drives larger than 32 MB is "T(wo)" partitions, which on a hard disk will create a small partition for bootup, and another large partition with the rest of the drive's capacity. This offers a couple of advantages: it protects your data by keeping the bootup information in a separate partition (away from your data partition) in the event of a problem with the drive, and it allows you to have all the advantages of one very large drive (which exceeds DOS 3.x's normal capabilities) while tying up only the minimum amount of disk space necessary for booting.

Another option is a Custom partitioning, which will allow you to specify exactly how many (up to four) partitions you wish to have and how large they should be. The size is specified in "cylinders," which is a

measure of the drive's capacity. For instance, if a drive has 430 cylinders (TFORMAT tells you this information) and you wish to have two equal-sized partitions, you would specify the first partition to be from cylinders 0-215 and the second partition from 216-429 (cylinder counts start from 0). You may use any combination of cylinders you wish to define your partitions.

After you choose the type of partitioning you wish to use, TFORMAT will ask if you wish to "verify" the partitions. Verification is the process of examining each storage sector on the drive to make sure that it will reliably store data. It is a good idea, especially if the media is new, to run the verification process (which will "lock out" any bad areas), but it does take time to perform this operation. If you are just repartitioning the drive, and you are sure the media is in good shape, verification may not be necessary.

After you finish specifying your choices, TFORMAT will remind you that repartitioning will <u>destroy</u> all data on the drive. After confirming this, TFORMAT will proceed with the partitioning (and verification, if requested), informing you of its progress. After this process is complete, TFORMAT will remind you that a reboot of your computer (and possible installation of the software) may be necessary. This will complete TFORMAT's operation.

5.2 TSPAN (Span One Partition Over Several Drives)

TSPAN allows you to create a single large logical drive from two or more erasable SCSI devices by combining or "spanning" them under software control. These devices do not need to be identical, however, they must be either all fixed or all removable devices. It is possible to span, for instance, two 40 MB cartridge drives to create a single 80 MB removable 'drive.' Note that the ASPI Manager (MAxxx.SYS) must be installed and loaded before TSPAN will work; this is normally set up automatically during software installation (Chapter 3).

TSPAN uses the entire SCSI device, no matter how many partitions you have previously created on it. Partitions are eliminated and the whole drive becomes part of the newly spanned logical drive. Prior to running TSPAN, TFORMAT must be run with at least one partition defined in each drive that is going to become part of the spanned set. TSPAN can be run from the HDINSTAL menu by choosing the *SCSI Drive Spanning* option. It can also be run from DOS by typing TSPAN at the DOS command line.

For example:

TSPAN

will poll all the devices attached to your SCSI card(s) and give you a menu *(Figure 17)* of available SCSI devices listed by Drive #, SCSI address, Capacity, and drive type (fixed or removable).

```
TSPAN: Build Spanned Volume Record. Version  1.20
Copyright (C) 1988-90, Trantor Systems, Ltd.



Dru#  SCSI ADRS  Capacity   DruType   Dru#  SCSI ADRS  Capacity  DruType
 1.   3BCH,0      10.2MB  Removable    2.   3BCH,4      42.3MB  Removable



Select Dru# to combine or press return to terminate:
```
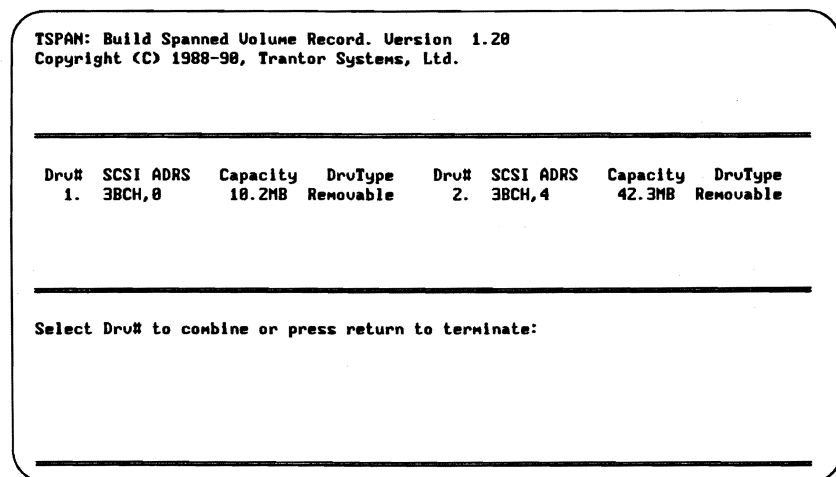
Figure 17   TSPAN List of Available Drives

Select in turn the *Drive Number* of each device you wish to span into a single partition, and press your <Enter> key to continue.

NOTE

Spanning will erase all the information on a device!

After confirming that spanning the drives will destroy all the data on them, you will have the option of doing a surface verify of your spanned drive. If you chose to verify, each sector on your drives will be evaluated and TSPAN will "lock out" any bad areas on your disk to prevent data from being written there. This will take some time, especially on large drives. This step must be done even if the drives had been verified after they were formatted with TFORMAT, just to make sure that the spanned partitions are correctly established. Therefore, to speed up the installation, skip the verify step in TFORMAT for those drives that you intend to combine in a spanned volume.

TSPAN will notify you that it is initializing the Spanned Drive, clearing the FATs (File Allocation Tables) and Directory and then either proceeding to the verify procedure or exiting the program. You must reboot your system to make the new spanned drive available.

5.3 TSTATUS (Checks Status of Your System)

If you have installed the hard disk driver, TSTATUS gives you a simple summary screen (*Figure 18*) of the version of TSCSI.SYS loaded in memory, how many bytes of memory it uses, and the drive letters and capacity of SCSI devices currently active on your system.

```
╔════════════ SCSI Status ════════════╗

        SCSI Driver Status Utility
           Version 1.51   May 2, 1989
    Copyright (C) 1988-90, Trantor Systems, Ltd.



       ╔═══════ Current Driver Status ═══════╗

        Revision 4.30 of the SCSI driver is loaded.
        The driver occupies 12896 bytes of memory.

        Drive L, Removable Media 42.3MB





               Press any key to continue.
```

Figure 18   TSTATUS Summary Screen

It is a useful utility to run anytime, but it is best to run TSTATUS immediately after installing or changing any of your hardware or software configuration settings, just to make sure that your SCSI equipment is operating as you expect.

☞ TSTATUS does not apply for CD-ROM or tape drive installations.

6.0 Music Box

This chapter describes installation and operation of Trantor's Music Box® CD audio disc control software for MS-DOS (hereafter referred to as *"Music Box"*) for operation with CD-ROM drives. *Music Box* gives your CD-ROM drive most of the features of a sophisticated CD player! It supports **any** CD-ROM drive which supports Microsoft's MSCDEX extensions to MS-DOS for CD-ROM (version 2.1 and above), supports audio functions and which has a software driver that implements audio functions.

This package includes a standard MS-DOS command-line version with graphical interface (which may optionally be run in memory-resident mode) and a Microsoft Windows 3.x version, which also incorporates a disc database feature.

6.1 Requirements

6.1.1 Hardware

Music Box is designed to operate with virtually any CD-ROM drive for IBM-compatible computers. No specific CD-ROM hardware configuration is required, but it is presumed that your CD-ROM drive is properly installed and functioning prior to installation of *Music Box*.

The MS-DOS command-line version of *Music Box* will automatically recognize and operate with the following video graphics card standards:

CGA, EGA, VGA and Hercules Monochrome Graphics

Other video card designs may work, but are not certified to do so. You **must** have a graphics card installed to use the graphical and Windows versions of *Music Box;* text-only displays are not compatible. CGA displays will run *Music Box* in relatively low resolution compared to the others. The Windows version of *Music Box* will function with any

graphic display supported by your version of Windows 3.0 or above. *Music Box* in memory-resident mode may operate properly with text-only video display systems but is not certified to do so.

6.1.2 Software

Since MS-DOS (through version 5.0, as of this writing) does not directly support CD-ROM drives, *Music Box* requires that Microsoft's CD-ROM software extensions for CD-ROMs (MSCDEX) and an audio-capable CD-ROM driver be installed. Both are supplied with your Trantor software — see Chapter 3 for installation instructions.

6.2 Music Box Installation

Prior to installation and first use of *Music Box*, you should make sure your CD-ROM software driver and hardware are completely installed and working properly (see Chapters 3 and 4 for details).

Installation of *Music Box* consists of copying the contents of the \MUSICBOX subdirectory on your software distribution diskette to your own hard disk drive. We recommend that you place the *Music Box* files in the same location as your other CD-ROM files, which is typically the \TSCSI subdirectory on your hard disk. For convenience, the location of the *Music Box* files should be in a PATH statement in your AUTOEXEC.BAT file so that *Music Box* may be loaded from any current directory on your system. See your MS-DOS documentation if you are not familiar with the PATH command.

To copy the files, first move to your desired diskette or subdirectory, then use the DOS COPY command to copy the files as follows:

COPY B:\MUSICBOX*.*   (assuming the software distribution diskette is in Drive B)

Now reboot your system; this loads the MSCDEX.EXE driver. No additional preparation is necessary as *Music Box* will automatically recognize and adapt to your video display and CD-ROM hardware.

6.3 Running Music Box

6.3.1 From the MS-DOS Command Line

Note that if you plan to use *Music Box* with Microsoft Windows, see the next section, *Running Music Box with Microsoft Windows*.

To run *Music Box* in the graphical non-resident mode, type "**MUSICBOX**" from your DOS prompt. The memory-resident option is described below, but running *Music Box* first in non-resident mode will help you to learn its functions.

When run from the command line, *Music Box* displays a brief copyright notice, then switches to graphics mode for operation (see *Figure 19*). If you are running *Music Box* with a Hercules-compatible monochrome graphics adapter, you will be asked to confirm the switch to graphics mode.
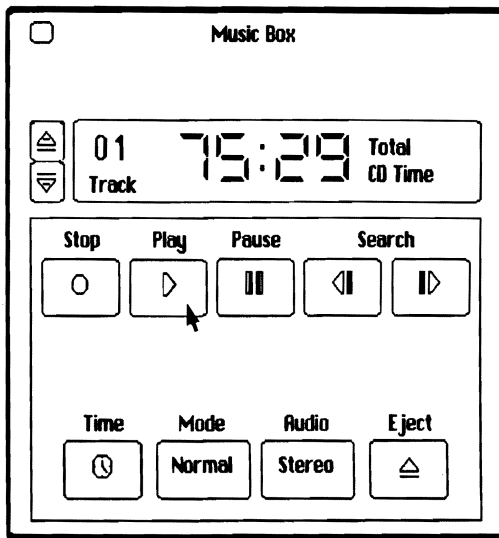
Figure 19   Music Box Command-line Graphical Interface

Now that *Music Box* is running, please skip to Section 6.4 of this manual for a full description of the commands available to you.

6.3.2 Running Music Box with Microsoft Windows

If you wish to use *Music Box* in the Microsoft Windows 3 environment, you should first install *Music Box* as a "Windows Application" in the Program Manager. See your Windows Manual for instructions on how to do this. For convenience, you may wish to load *Music Box* automatically, when Windows is loaded, by adding it to the "**RUN =**" line in WIN.INI. See your Windows Manual for information about how to do this.

To start *Music Box* in the Windows environment, simply double-click on its icon to bring up its Main Control Panel (*Figure 20*, next page).
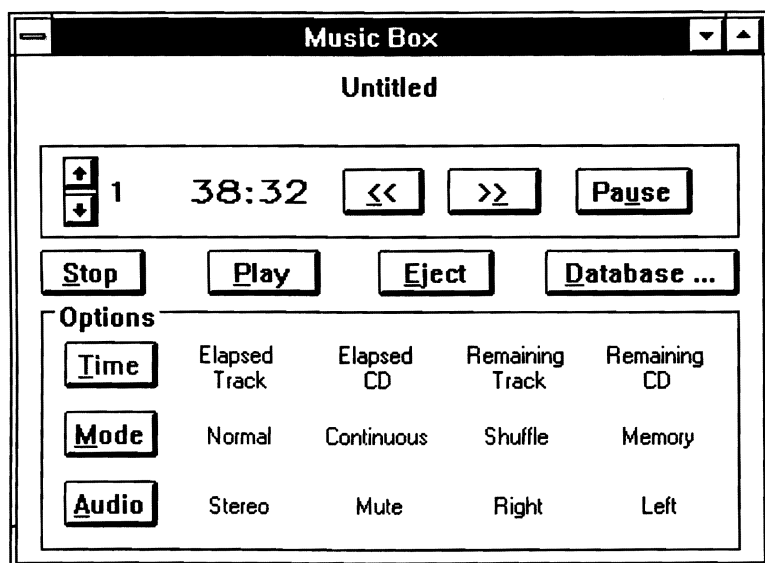
Figure 20   Windows 3 Main Control Panel

Once loaded in Windows, *Music Box* may then be run like any other Windows application, including resizing, moving, and minimizing it to an icon. If you are unfamiliar with standard Windows-application functions such as these, please see your Windows manual for a complete description. When minimized, the *Music Box* icon will display and update the current time display information. As long as you remain in the Windows environment, *Music Box* will continue to monitor and control the audio operation of your CD-ROM drive.

Please continue with Section 6.4 of this manual *(Learning Music Box)* for a full description of the commands available to you.

6.4 Learning Music Box

Once running, the graphical command-line version of *Music Box* and the Windows version operate similarly (except for the disc database feature available in the Windows 3 version only, described below in the *"Using the Windows 3 Version"* section) with some differences in their appearance. Refer to Figures 19 and 20.

If you have not loaded a disc, *Music Box* will indicate "**no CD**" in the display window and will indicate track #**OO**. If you have loaded a disc with data tracks only (no audio tracks), *Music Box* will indicate "**no CD**" in the display window and will indicate track #**O1**. In this event,

inserting a disc with audio tracks and clicking on **PLAY** will reset *Music Box* and begin play. It is not necessary to exit the program and restart.

Music Box allows you to select any track on your audio disc and play it on your audio-capable CD-ROM drive. If you have loaded a mixed-media disc which also contains digital data, non-music tracks will be skipped, and *Music Box* will begin operation at the next available audio track on the CD.

Most functions are self-explanatory and work in a fashion similar to conventional CD audio players, but there are some additional features which are explained below.

Music Box displays the total CD time when it is first activated. To the left of the time display is the Track Number indicator. For an all-audio disc, this will display Track 1 when *Music Box* is first loaded; a mixed media disc will display the number of the first audio track.

To exit *Music Box* at any time, press the <Escape> key on your keyboard or use your mouse to click on the small "Close Box" in *Music Box's* upper left corner. If the current CD is playing, it will continue to do so until the end of the disc is reached. If you exit and then reload *Music Box*, the current play information is displayed.

6.4.1 Mouse Control

If you have a mouse installed, a mouse cursor will appear (as shown in *Figure 19)* in the graphical command-line and Windows versions, permitting point-and-click interaction with *Music Box*. Operation is very simple — clicking anywhere inside the perimeter of a button will perform the desired function.

6.4.2 Keyboard Control

Whether or not you have a mouse, *Music Box* may also be controlled from the keyboard. In the function explanations which follow, the equivalent key is listed in parentheses and is usually the same as the first letter of the function.

6.4.3 Music Box Control Functions

Just to the left of the Track Number display are the Track Skip buttons. The upper button (or <up-arrow> or **U** on your keyboard) will skip forward to the beginning of the next track, the lower button

(or <down-arrow> or **D** on your keyboard) will skip backward to the beginning of the current track on the first click, then back to the beginning of previous tracks with subsequent clicks. Note that if *Music Box* is in Shuffle mode (see **MODE**, below) the Track Skip buttons will skip to a randomly-chosen track, not necessarily the next or previous track.

When you click on the **PLAY** button (**P** on the keyboard), the CD begins playing and the elapsed time of the track you are playing is displayed.

You can change the time display by clicking on the **TIME** button (**T** on the keyboard), which has a clock icon displayed on it. Each click will cycle the time display through Elapsed Track Time, Elapsed CD time, Remaining Track Time, and Remaining CD Time. You must be in the Play mode to select these alternate time displays with the **TIME** button.

Clicking on the **STOP** button (**S** on the keyboard) will cause the CD-ROM drive to stop playing and to return to the first audio track.

The **PAUSE** button (or <Spacebar>) will stop at the current play location and resume playing when either the **PAUSE** or the **PLAY** button is clicked.

The **SEARCH** buttons will move the play point quickly in either direction. (The **F** or <right-arrow> keys search forward, the **R** or <left-arrow> keys search in reverse.) If you continue to hold down the **SEARCH** button or key, the search speed will increase and larger jumps between audio segments will be made, up to a maximum of 30 seconds per jump. When the **SEARCH** button or key is released, the CD will continue in Play mode from that point.

The **MODE** button (**M** on the keyboard) allows you to select the various operating modes available as follows:

- NORMAL - the CD is played starting at track 1 and continuing to the end of the disc.
- CONTINUE - the CD will continuously play through to the end of the disc, then restart from the beginning.

- SHUFFLE - *Music Box* will randomly play all tracks on the CD before beginning the shuffle play again.
- MEMORY - *Music Box* will query the disc database for the play order designated (Windows 3.0 version only).

Note that, when running from the DOS command line, SHUFFLE and CONTINUE modes require that *Music Box* remain on screen to control CD operation. If either SHUFFLE or CONTINUE mode is selected, and *Music Box* is closed, the CD will continue sequential play from the current play location to the end of the disc. In Windows, you many resize or minimize *Music Box* without disturbing play operation.

The **AUDIO** button (**A** on the keyboard) allows you to select either Stereo, Right, or Left channel output, or you may Mute the output entirely on CD-ROM drives that support these commands. Repeated pressing of this button cycles through the various options.

The **EJECT** button (**E** on the keyboard) will stop playing the disc and eject the disc carrier on CD-ROM drives that support the Eject function.

The "Close Box" in the upper left corner (<Escape> on the keyboard) exits *Music Box* and returns you to the MS-DOS command line or Windows, depending on which version you are running. The standard Windows Close Box is used for the Windows version of *Music Box*.

6.4.4 Using the Windows 3 Version

There are a few differences between the Windows 3 version of *Music Box* and the DOS command-line graphical version.

Minimized Icon Display

If you minimize *Music Box* to an icon in Windows 3, the currently programmed play settings will continue to govern operation of the CD-ROM, and the icon itself will display and update the time display normally shown in the *Music Box* window (we do not want you to feel left out!).

Fine-Tuning the Windows 3 Version

Music Box "polls" the CD-ROM disc during play mode to update the
time and track information. By default, polling occurs every two
seconds, and on slower computers or with slow CD-ROM drives,
polling can slow down overall Windows performance.

If you discover that some programs are operating sluggishly under
Windows when *Music Box* is running, try reducing the polling rate by
adding the following to your WIN.INI file using any text editor:

```
[MUSICBOX]
PollRate=5000
```

The PollRate is expressed in milliseconds; 5000 causes polling to occur
every five seconds (instead of the default of two seconds), 10000 would
poll every ten seconds, etc.

Disc Database Operation

The **Database** button brings up an additional Windows 3-only
Music Box feature. The first time you use run the Windows 3 version,
Music Box will create empty database files on your system and inform
you of this fact. Then, from the Database Control Panel *(Figure 21)*,
you can enter CD disc names, track names, and play order.

☞ To play tracks in the sequence you have set in the Database Control
Panel, remember to select the Memory mode by pressing the **Mode**
button on the Main Control Panel.

Each CD audio disc has a unique ID that is automatically logged into
the database. Additional information such as the number and length of
each track is also encoded directly on the disc. Name information is
not, so you will have to manually enter this information into the
database (one time only) if you wish to make use of it.

To enter a CD into the database, insert the CD into your drive and
click on the **Current CD** button. If the CD is not recognized by
Music Box, it will be given a default name of *"Untitled"* (see *Figure 21*).
This name must be changed for it to be saved into the database, so type
a new name into the **Selection** box, then click on **Accept Name**.
The CD name is now saved in the database and will be recognized
whenever it is inserted and **Current CD** is clicked.
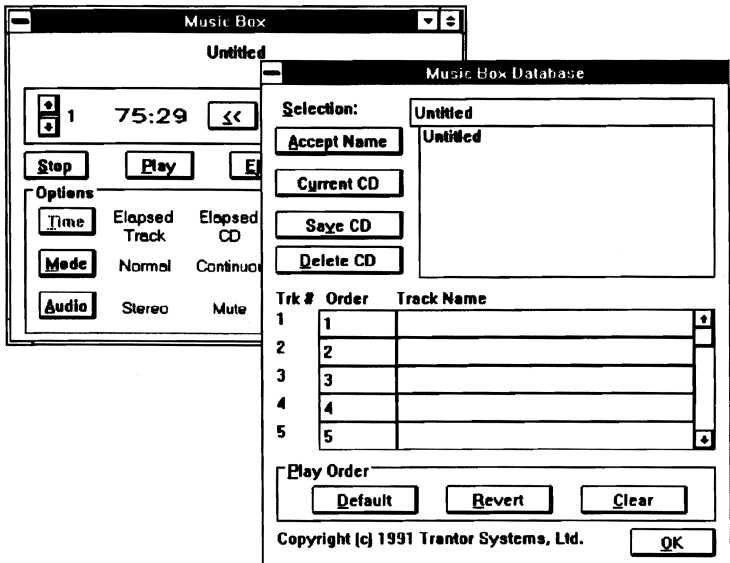
Figure 21 Windows 3 Database Control Panel

To enter track names and play order into the database, make sure the correct CD is inserted in the drive, then click on **Current CD**. The CD will be recognized and any already existing track information will be displayed. Use the scrollbar and the edit table to change or enter any track name and the play order desired.

The **Default** play order button can be used to reset the play order to sequentially play all tracks in standard order. The **Clear** play order button clears all play order fields; you may then enter a new play-order sequence for any or all tracks. For example, if you click on **Clear** then enter "1" for the third track and "2" for the first track, the Memory mode will play tracks 3 and 1 in sequence — no other tracks will play. As an added feature, you can specify playing track 3 twice for each play of track 1, by entering "1 2" for the third track (make sure a space separates the numbers) and "3" for the first track. To skip a track entirely, make sure the Order column has no entries.

Example

Figure 22 illustrates an example of track resequencing. As shown, *Music Box* will play the disc tracks in the following order:

Track #	1	2	3	4	5
Play Order	3	not played	1 & 2	5 & 6	4
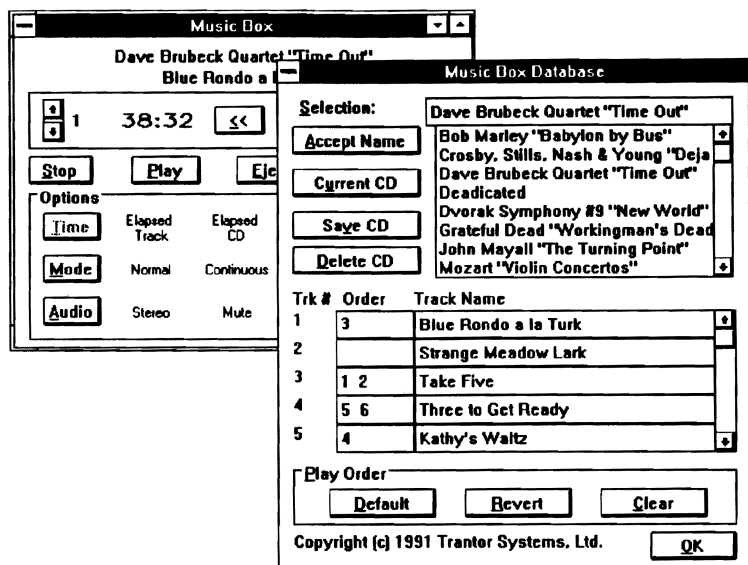
Figure 22   Database Entries, with Track Resequencing

The **Revert** button will read the last-saved play order back into the database, in case you change your mind about the current changes. When you are finished editing the track name and play order list, click on the **Save CD** button to save the track list and play sequence permanently.

Over time, you will probably enter a number of disc titles into the database. These will appear in the name-list box, with a scrollbar if necessary, to accommodate a large number of discs *(Figure 22)*. CDs other than the current one in the drive may be edited by clicking on the desired CD in the name-list box. The **Delete CD** button will delete the selected CD from the disc database. If the CD being deleted is the selected CD then the reserved name *"Untitled"* will be created for that CD. The name of a CD may changed by selecting the desired CD, typing a new name and clicking on the **Accept Name** button.

When you are finished editing the database, close the database control panel by clicking on OK or using the Close Box provided in the upper left corner.

6.4.5 Running Music Box in Memory-Resident Mode

You may choose to load the DOS version of *Music Box* as a *Terminate and Stay Resident* application (referred to as *"Music Box TSR"*). When memory-resident, *Music Box TSR* occupies about 18 KB of memory, and once loaded, may be invoked at any time, even while running other applications (except Windows).

NOTE

Music Box TSR should not be used if you run Microsoft Windows, as Windows inhibits the keystrokes necessary to operate *Music Box TSR*. Use MBOXWIN instead.

There are two ways to load *Music Box TSR:* either directly into memory from the MS-DOS command line, or while simultaneously invoking the standard graphical interface.

- If you choose to load *Music Box TSR* at the same time you invoke the graphical interface, simply type **MUSICBOX** with one of the command-line switch options shown below.

- If, however, you wish to load *Music Box TSR* directly into memory, type **MBOXRES**, optionally adding one of the command-line switches shown below. Loading *Music Box TSR* in this manner returns you directly to the DOS command line, and is particularly useful for loading *Music Box TSR* from a batch file, such as AUTOEXEC.BAT.

☞ Note that MBOXRES.OVL, included on your *Music Box* diskette, must be available either in the current directory, or via the PATH command of MS-DOS, for *Music Box TSR* to load properly.

The command line switch options for *Music Box TSR* are as follows (note that either upper or lowercase characters will work):

/R to make *Music Box* memory-resident. The "hotkey" is the key combination which, when pressed, suspends your current application and invokes *Music Box TSR*. <Control> + <Left-shift> + <Tab> is the default hotkey. Note that all three keys must be pressed simultaneously. This switch is the default when MBOXRES is executed.

/Rx to change the resident version's hotkey combination from the default of <Control> + <Left-shift> + <Tab>, where "**x**" is the keyboard character desired (allowed characters are A-Z and 0-9). The chosen character is always used with <Control> + <Left-shift>.

For example:

MUSICBOX /R

invokes *Music Box* in memory-resident mode, with the default <Control> + <Left-shift> + <Tab> hotkey, then presents the graphical interface. When you exit the graphical mode, *Music Box TSR* remains in memory.

MUSICBOX /RM

invokes *Music Box* in memory-resident mode, with the hotkey set to <Control> + <Left-shift> + M, then presents the graphical interface. When you exit the graphical mode, *Music Box TSR* remains in memory.

MBOXRES /R

invokes *Music Box* in memory-resident mode, with the default <Control> + <Left-shift> + <Tab> hotkey, then immediately returns you to the MS-DOS command line prompt. This is equivalent to typing **MBOXRES** by itself, as the **/R** switch is assumed.

MBOXRES /R5

invokes *Music Box* in memory-resident mode, with the hotkey set to <Control> + <Left-shift> + 5, then immediately returns you to the MS-DOS command line prompt.

Note that if you wish to change the hotkey combination after *Music Box TSR* has been loaded, you must first completely unload *Music Box TSR* (with the <Control> + X command), then reload it with your new hotkey selection. If you attempt to load *Music Box TSR* with a different hotkey when *Music Box TSR* is already loaded, the new loading attempt will be ignored.

6.4.6 Music Box TSR Commands and Audio Interface

In memory-resident mode, *Music Box TSR* uses audio feedback, rather than a screen display, to convey information (that is why you do not get any pretty screen illustrations in this section). This method allows

Music Box TSR to operate with virtually any non-Windows application you may be running, including programs that run in graphics mode, and greatly reduces the amount of memory needed to remain resident.

When the hotkey combination is pressed, *Music Box TSR* responds with a series of descending tones to inform you that it is in operation. Until you exit back to your application (with the <Escape> key), *Music Box TSR* will either execute CD-ROM audio commands or respond with a low error tone if an inappropriate key is struck. When a keystroke command is entered, *Music Box TSR* acknowledges it with a tone.

When running, *Music Box TSR* uses the same keyboard commands as those which are allowed in the non-resident graphical mode:

P	begin or resume play
S	stop playing and return to track 1
<Spacebar>	pause or restart play
U or <Up-arrow>	skip to next track
D or <Down-arrow>	skip to beginning of the current or previous track
F or <Right-arrow>	search in the forward direction
R or <Left-arrow>	search in the reverse direction
E	stop play and eject the CD disc
M	cycle through the various Mode options
A	cycle through the various Audio options

Note that the Time command is not functional in TSR mode, as there is no information display.

There are also two special keystrokes for use with *Music Box TSR*:

<Escape>	to exit *Music Box TSR* back to your application
<Control> + X	unloads *Music Box TSR* from memory (see below)

6.4.7 Unloading Music Box TSR

To unload the memory-resident version of *Music Box* from memory, press <Control> + X (i.e. hold down the <Control> key while pressing X) while you are at the MS-DOS command line level and *Music Box TSR* is running. Note that *Music Box TSR* must be the **last** memory-resident application loaded into memory in order to unload it, to avoid disturbing the operation of other memory-resident programs. Otherwise, *Music Box TSR* will be disabled but will still occupy memory space. An attempt to unload *Music Box TSR* from within another application will be ignored.

6.4.8 Reloading Music Box TSR

If *Music Box TSR* has been removed from memory or disabled via the
<Control> + X keystroke (see above), you may reload it at any time. If
disabled, reloading will re-enable *Music Box TSR*, otherwise the
reloading will place *Music Box TSR* back in memory. Reloading will
never cause more than one copy of *Music Box TSR* to be in memory at
any time.

Appendix A System Requirements

Memory Requirements

Drivers

The ASPI Manager, MAxxx.SYS, requires about 7 KB of system memory, once loaded. TSCSI.SYS uses about 11 KB of system memory. In addition, at least 512 bytes of buffer space is required. TSLCDR.SYS uses about 10 KB of system memory. In most cases, both Trantor drivers should be able to be "loaded high" on 386 and 386SX computers using memory managers such as *QEMM* from Quarterdeck and *386Max* from Qualitas.

DOS Extensions

MSCDEX typically requires about 20 KB of system memory, depending on how many buffers are allocated. It is also possible for MSCDEX to be "loaded high."

Operating System

The software requires MS-/PC-DOS 3.0 or above. DOS 3.3 or above is required to format and use partitions larger than 32 MB.

BIOS

A 100% IBM-compatible BIOS is required. Operation with some incompatible BIOSs may be possible but is not guaranteed.

Music Box Requirements

Memory

Music Box needs about 128 KB of system memory to run in non-resident graphical mode. The memory-resident option requires about 18 KB of memory when loaded.

Hardware Requirements

Any CD-ROM drive which supports the MSCDEX CD-ROM extensions to DOS and which has audio-play capabilities.

Software Requirements

MSCDEX, version 2.1 or above, and a CD-ROM software driver which implements the appropriate audio-mode commands. These are included with your distribution software.

The Windows version of *Music Box* requires Windows version 3.0 or later.

Appendix B Device Driver Options

This Appendix describes command-line options (commonly called "switches") for various files. Normally, the defaults for these switches (as set during installation) will work fine; these options are available primarily for fine-tuning and troubleshooting. We recommend that you do not change the default settings unless it is necessary and only if you clearly understand what you are doing.

How to Identify Software Versions

Occasionally, for technical support or other reasons, you may need to determine the version number of our software drivers. The version is shown on screen as the software loads, but you may also find it by using the TYPE command from your DOS command line. This applies to the .SYS driver files, and is performed as follows (using the CD-ROM driver as an example):

TYPE TSLCDR.SYS

Driver Updates

If you use a modem, you may get software updates and technical support our drivers via our tech-support BBS. See Appendix C for more information.

Driver Command Line Switches

Shown in the format **/Xn**, where **X** is the command line switch, and **n** is the option passed to it.

ASPI Manager (MAxxx.SYS)

/In   Sets the interrupt channel; for example, **3**, **5**, or **7**. Be sure to set the jumpers on the adapter to match the interrupt channel.

/Mn   Mode configuration switch.

	Mode	Bidirectional Sense
0	Full Handshake	Auto-determine (default)
1	Blind	Auto-determine
2	Full Handshake	Force unidirectional
3	Blind	Force unidirectional

/Wn	Pause (warning) mode
0	Pause for a key to be pressed if no SCSI device is detected (default)
1	Pause for a key to be pressed if SCSI device is detected
3	Do not pause at all; useful if you often boot with no SCSI devices connected

TSLCDR.SYS and TSCSI.SYS (ASPI versions)

/R	Reset. This will send a RESET command to the SCSI bus before the driver loads.
/Un	Restrict maximum number of Logical Units (LUNs) available. Useful when a device, such as a Pioneer CD-ROM changer, has multiple logical units that are not all being used. This allows you to select, for instance, only the first three LUNs and ignore the others.
/Wn	Pause (warning) mode
0	Pause for a key to be pressed if no SCSI device is detected (default)
1	Pause for a key to be pressed if SCSI device is detected
3	Do not pause at all; useful if you often boot with no SCSI devices connected.

TSCSI.SYS (ASPI version)

/An	Allocates a particular maximum sector size under DOS 3.x Used with removable media. The default is to recognize standard 32 MB or smaller partitions. Larger partitions can be allocated as follows, where the number "n" indicates the sector size in Kilobytes (KB):
1	32 MB–64 MB partitions
2	64 MB–128 MB partitions
4	128 MB–256 MB partitions
8	256 MB–512 MB partitions
16	512 MB–1 GB partitions
/Kn	Reserves drives to prevent "phantom" drives. When booting from a non-Trantor SCSI adapter, both the ROM and the Trantor software driver manage the SCSI device, creating a "phantom" drive. This feature forces the ASPI driver to ignore devices managed by the ROM. "n" indicates the number of drives the driver should ignore.

TSLCDR.SYS (ASPI version)

/D:driver_name   Specifies internal driver name for CD-ROM driver in CONFIG.SYS. This must match the name in the MSCDEX command line in AUTOEXEC.BAT.

/Pn	Allow Prefetch and/or Seek
0	Seek and Prefetch are disabled (default)
1	Allows Prefetch
2	Allows Seek
3	Allows both Seek and Prefetch

OS/2 .ADD Drivers

/O   Enables an optical drive to emulate a hard disk drive. Useful in situations where IBM's OPTICAL.SYS file is not available.

/T   Enables IBM CD-ROM emulation mode so non-IBM or Toshiba CD-ROM drives will operate with IBM's CDROM.SYS driver in data mode only. Audio commands are passed without translation, and will only work with IBM or Toshiba CD-ROM drives.

/Un   Restrict maximum number of Logical Units (LUNs) available. Useful when a device, such as a Pioneer CD-ROM changer, has multiple logical units that are not all being used. This allows you to select, for instance, only the first three LUNs and ignore the others. Default is seven LUNs in the August, 1992 driver.

TFORMAT

/S60   Formats SCSI drives for compatibility with original T128/T228 Boot ROM release 1.x. If a SCSI drive connected to a T128 or T228 will not boot with a version 1.x ROM because it is not in the ROM tables, this option should fix it.

Appendix C Troubleshooting Notes

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 on-line. The telephone number is 510-656-5159, 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 and no parity.

☞ Note that the Parallel-to-SCSI adapter requires termination power from the SCSI device(s) to operate, and the SCSI device chain should be properly terminated.

Common Error Messages and Remedies

During bootup, the driver recognizes the adapter and the SCSI device(s), then stops with a "No SCSI Functions in Use" message.

- The software driver is looking for a different device.

  For example, you may have the CD-ROM driver loaded, but you are trying to work with a hard disk drive, or vice versa. Each Trantor software driver recognizes the existence of all SCSI devices attached to the SCSI chain, but will only work with the device it is written to communicate with. Install the correct driver, or remove an unwanted driver from your CONFIG.SYS file with a text editor program.

Notes

- MS-DOS (or PC-DOS) 3.0 or higher is required (3.3 or higher to format and use partitions larger than 32 MB). Older laptops with DOS 2.x in ROM will have to be booted and operated with DOS 3 on floppy disk, unless the ROM version of DOS is upgraded.

- For erasable devices, such as hard disks and SyQuest or Bernoulli cartridges, you **must** use the TFORMAT program supplied with your software to perform both low-level and high-level media formatting and partitioning. The standard DOS FORMAT program is not compatible with SCSI devices.

Music Box Troubleshooting

The Windows version of Music Box doesn't recognize my CD-ROM drive.

First, make sure that your CD-ROM drive is properly installed and configured, and that MSCDEX has been loaded. If the CD-ROM is installed and operating properly, you should be able to use the MS-DOS DIR command with the CD-ROM drive when a data disc is loaded.

If you believe your CD-ROM drive is installed properly, try running the command-line version of *Music Box* by typing **MUSICBOX**. If this version operates properly, your CD-ROM drive installation is operating correctly.

Make sure you are not attempting to use the standard DOS version of *Music Box* (MUSICBOX.EXE) from within the Windows environment. To operate properly with Windows, you **must** use the Windows-only version (MBOXWIN).

If you are running Windows 3.0, the following statement from the Windows 3.0 README.TXT file may apply:

If you are using CD-ROM Extensions, include the following entry in the [386Enh] section of your SYSTEM.INI file:

DEVICE=LANMAN10.386

You also need to activate the drive by sending it a command before you start Windows. For example, type the following at the DOS prompt and then start Windows:

DIR X:

where x is the drive letter for the CD ROM drive.

Note that if you try a DIR command on an audio-only CD disc, your system may respond improperly. If this happens, use a disc with at least one data track.

When Music Box is running, Windows operation seems sluggish.

This is probably due to the polling rate of the *Music Box* time and track information display. See Section 6.4.4 for details of how to change the polling rate.

Appendix D Introduction to ASPI

What is ASPI?

ASPI (Advanced SCSI Programming Interface) is a software interface standard originally proposed by Adaptec (Milpitas, CA). ASPI entered the public domain when Adaptec presented it to the SCSI CAM Committee (SCSI Common Access Method Committee) as a model for a public interface standard. Your Trantor SCSI host adapter supports ASPI.

The idea behind ASPI is to create a "black box" software interface - one which allows programmers to create software without having to know anything about the details of the SCSI interface hardware used in your computer system. With ASPI, it's possible to write programs that can be used with any SCSI-based device used on a computer system that supports ASPI. While things are not always 100% perfect in all cases, ASPI greatly reduces potential compatibility problems for you, the user. And, of course, ASPI also reduces the need for detailed technical support by us. For both reasons, Trantor Systems fully endorses and supports widespread use of the ASPI standard.

How Does ASPI Work?

Essentially, there are two parts to an ASPI implementation, the ASPI "Manager," a device driver supplied by the hardware manufacturer, and the ASPI software application. Applications range from the ASPI-compatible CD-ROM and hard disk drivers supplied by Trantor to our *Tape Mate II* tape backup, scanner control applications from other companies or any other type of software designed to work with SCSI devices.

It is important to note that without an ASPI Manager, ASPI compatibility is not possible. It's the Manager that creates the standard ASPI compatibility layer between the SCSI host adapter hardware and the ASPI-compatible application. The Manager is very hardware-specific, and is almost always supplied by the manufacturer of your SCSI host adapter. Trantor has supplied an ASPI Manager in this package; you can identify it by its filename of MAxxx.SYS, where the "xxx" indicates the host adapter model number. During the software installation process, our Manager and the appropriate CD-ROM or

hard disk drivers are copied to your computer by the INSTALL program and are loaded through your CONFIG.SYS file during bootup.

Referring to *Figure 23*, you can see that the ASPI CD-ROM and hard disk drivers actually work through the ASPI Manager to perform their functions. Also, DOS applications which access your SCSI devices work through both the drivers and the Manager. ASPI applications (such as tape backup software) usually access the ASPI Manager directly.
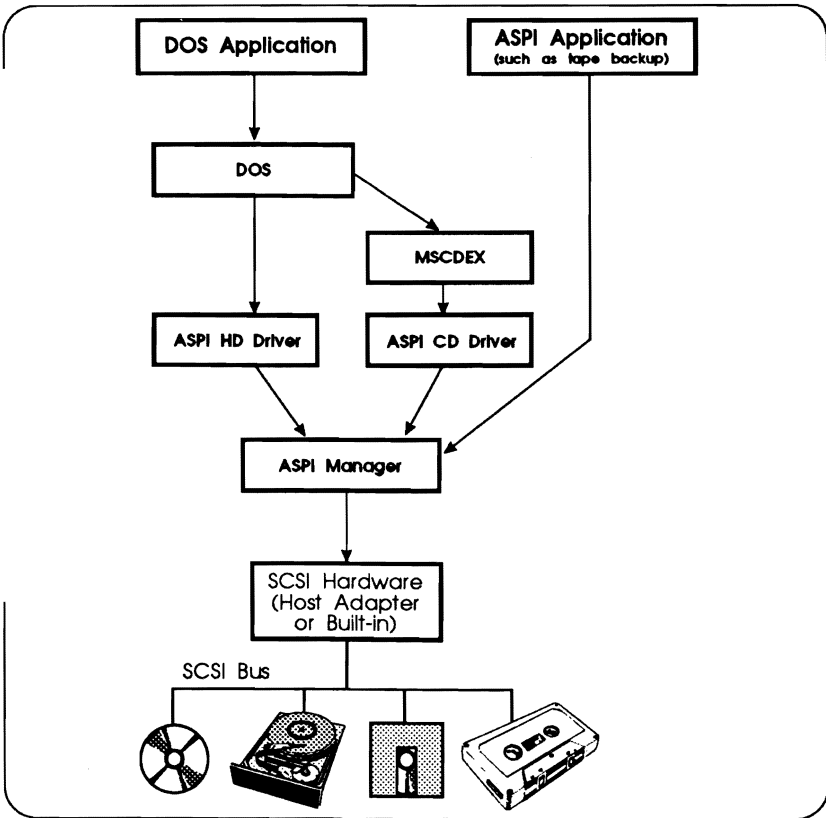
Figure 23   ASPI Block Diagram

From the standpoint of your ASPI-compatible software, all SCSI host adapters and devices connected to your system work the same way. The secret is the ASPI Manager; it translates ASPI commands to those necessary for the specific hardware for which it was created.

SCSI software, interface and device compatibility has traditionally been a source of concern and confusion for many users. ASPI compatibility goes a long way toward alleviating these problems, and as a result is beginning to be widely adopted by many manufacturers. As an early supporter of ASPI, Trantor strongly encourages this trend.

So, What Does All This Mean to Me?

For most users, it's not important to understand the details of how ASPI works. An ASPI-compatible SCSI host adapter installation functions much like a hardware-specific installation. You only need to realize that if you use software designed to work with ASPI, it should operate without problems on Trantor's ASPI-compatible SCSI host adapters, as well as those from other ASPI-compatible manufacturers. For more information about ASPI, please contact us through our technical support BBS (see Appendix C).

NOTE

The information in this chapter describes Trantor's implementation of ASPI, a SCSI access model originally proposed by Adaptec to the SCSI CAM Committee.

Trantor's implementation is based on Adaptec's ASPI Revision 1.1 (dated May 30, 1989) and MS-DOS Access Method Revision 2.5 (dated October 2, 1989). However, Trantor's implementation is a superset of Adaptec's original specification, most notably adding SCSI target functions.

We believe the information contained herein to be accurate, but shall incur no liability for the use or misuse of this information. We reserve the right to modify the contents of this chapter without obligation to notify any individual or organization of such modification.

The original ASPI documents were copyrighted by Adaptec, Inc. These documents are now in the public domain.

Appendix E   OS/2 Software Installation

This Appendix documents the drivers supplied by Trantor called Adapter Device Drivers (.ADD) which are supported by Trantor SCSI adapters. These drivers provide an interface between the Trantor SCSI hardware and the OS/2 version 2.0 or above operating system. Support for different SCSI devices is not done by Trantor, but by IBM with their OS/2 high-level drivers. Therefore, other Trantor device drivers and utilities function under DOS only, not OS/2.

In order to use a Trantor SCSI adapter with OS/2, you must first install the OS/2 SCSI support, the DASD support for hard disk drives and the CD-ROM support for CD-ROM drives. These drivers are included with OS/2, but were probably not installed when you first set up OS/2 on your computer. DOS support is usually automatically installed in the \OS2\MDOS directory, so you will see the virtual device drivers in that directory (VCDROM.SYS, etc). Do not delete these files if you want to use DOS as well.

To install the IBM-supplied CD-ROM support drivers on a running OS/2 system, you need to click on the *System Setup* icon in the OS/2 SYSTEM folder. Click on the *Selective Install* icon and select OK from the first screen.

A second screen of options will appear. For CD-ROM select the first option, CD-ROM Device Support and then click on the *More* button associated with this choice. Check both the CD-ROM IFS and IBM CD-ROM Device Drivers check boxes and then OK, and proceed with the installation.

`IFS=c:\os2\cdfs.ifs`   This is the CD-ROM file system.

`BASEDEV=c:\os2dasd.dmd`   This is the hard disk driver.

`DEVICE=c:\os2\cdrom.sys`   This is the CD-ROM driver.

`BASEDEV=c:\os2\os2scsi.dmd`   This is the SCSI driver.

`BASEDEV=c:\os2\TxxxSCSI.ADD /T`   This is the Trantor driver.

Every device connected to the Trantor SCSI adapter must have, in addition to the Trantor .ADD, the IBM SCSI driver (OS2SCSI.DMD), the File System driver (CDFS.SYS for CD-ROM, HPFS.IFS for HPFS partitions, etc.), and the media support driver

(OS2DASD.DMD for Hard Disks, CDROM.SYS for CD-ROM
drives, etc.). If any of these three levels is missing, your installation will
not work!

The order of the files usually does not matter, but if you are having
trouble, put the files in the order shown above, with the IFS files at the
beginning of your CONFIG.SYS and the rest of the files at the end of
the CONFIG.SYS. We have found this always works for us!

CD-ROM Drive Support

The Trantor OS/2 .ADD driver has a command line switch
documented in the README.DOC file that comes with the
TxxxSCSI.ADD driver. If you add the /T command line option to our
.ADD, all CD-ROM drives then look to the IBM CD-ROM.SYS
driver as though they were an IBM drive. This will allow data reads on
all CD-ROM drives, but will not support audio commands. A special
version of CDROM.SYS from IBM would be needed to support audio
commands.

IBM has indicated that they will be supplying a new version of
CDROM.SYS in the future that supports more CD-ROM drive
models directly.

Removable Media Drives (Magneto-Optical, SyQuest, Bernoulli, etc.)

IBM treats removable media drives as though they are a very large
floppy. This means you cannot interchange removable media between
DOS and OS/2.

To format a removable media drive for OS/2, you first have to do a low
level format under MS-DOS with the TFORMAT utility. Select a
single partition. . . the IBM driver can not handle multiple partitions
on removable media.

Boot up your OS/2 system with this formatted cartridge in the drive.
From the OS/2 SYSTEM folder, select the *Drives* icon and double click
on it. Select the removable media drive (which will show up with a
floppy icon) and click the center button. Select *Format Disk* and use
any available capacity. . . 2.88 MB will work just fine. The removable
media drive will be formatted to its correct capacity with an OS/2
partition.

You can now use the drive cartridge under OS/2. It will not be readable by an MS-DOS system.

Setting Up a Hard Drive for OS/2 Use

If you have an existing hard disk drive on your Trantor SCSI controller set up as a single partition under MS-DOS 4.01 or 5.0, you should be able to install it under OS/2 with no special requirements other than those discussed here earlier.

If you have a disk partitioned under DOS 3.3 larger than 32 MB, you will need to re-format your disk under DOS 4.01 or later for OS/2, since partition sizes over 32 MB are non-standard.

WARNING

All your data will be lost if you format your disk drive unless you back it up first!

To format your hard disk drive, you must run the DOS-based TFORMAT program supplied with the Trantor SCSI adapter. There is no OS/2 version of this program, but it will run from a DOS box or VDM on your OS/2 system.

In order to make the Trantor SCSI adapter a primary OS/2 boot drive, you must have an optional BIOS ROM package from Trantor called a T2ROM. T128 and T228 cards are not shipped with this ROM package. . . they use a different version of the Boot ROM. The T2ROM for the T128 may be ordered from the Trantor sales office. T130B and later cards come standard with the T2ROM BIOS ROM installed. The T2ROM is also supported with the IBM generic INT13 driver that is included with OS/2 and can be installed in your OS/2 system.

NOTE

Support for Trantor's OS/2 drivers is available from the Trantor BBS at 510-656-5159, or by FAX at 510-770-9910. There is no support available by telephone on this product due to the complexity of the CONFIG.SYS. Please FAX your questions, a copy of the errors you see, and a copy of your CONFIG.SYS to Trantor OS/2 Technical Support, or leave this information as a message on the Trantor BBS.

OS/2 Error Messages

The System cannot find the file "C:\OS2\SYSTEM\COUNTRY.SYS" specified in the COUNTRY command. The System is stopped.

- This error usually happens if the OS2DASD.DMD driver is not installed in the CONFIG.SYS. Make sure you have BASEDEV=OS2DASD.DMD in the CONFIG.SYS right after the BASEDEV=IBM1FLPY.ADD statement. If you installed the SCSI support on the OS/2 Installation, you should not get this message.

- This can also happen if you install OS/2 on a second partition of your C: drive and add a second SCSI hard drive for OS/2. OS/2, like MS-DOS, always mounts primary partitions on hard drives before extended partitions. OS/2 will assign a second drive a drive letter D: and the second partition on the original C: drive will become E: rather than the D: it was without the second drive attached. OS/2 cannot load files from the D: drive, since it is now re-assigned as E:. Since OS/2 always tries to load COUNTRY.SYS, it errors out at this point. You can change the drive that the OS/2 files are loading from to fix this problem.

SYS1718: The System cannot find the file "... "

The file indicated has not been installed. Most commonly happens when CD-ROM files are not copied to the System subdirectory. Use the OS/2 Selective Install program to install your CD-ROM support files.

SYS1201: The device driver "C:\OS2\CDROM.SYS" specified in the DEVICE command on line... was not installed. Line is ignored.

The .ADD driver for the SCSI adapter did not load. Either there is not SCSI device attached, the SCSI adapter is not installed, or there is a hardware conflict with the SCSI adapter. Check under DOS with SCSITEST to see if the SCSI device is identified.

SYS1201: The device driver "TxxxSCSI.ADD" specified in the BASEDEV=command on line... was not installed. Line is ignored.

The .ADD driver for the SCSI adapter did not load. If you are using a Parallel-to-SCSI adapter, make sure the SCSI device is plugged in and powered up correctly. Check your installation under DOS and with SCSITEST to see if the SCSI device is

identified correctly. With a bus-based adapter and an internal drive, check that the ribbon cable is not on backwards and that the SCSI adapter is actually installed in the computer.

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