

USER'S GUIDE

7800 FAMILY MANAGER SET

Adaptec 7800 Family Manager Set

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▼▼▼▼ Adaptec SCSI Card 1520

for Novell NetWare, IBM OS/2, Windows 95,
Windows NT, SCO UNIX,
and SCO UnixWare

User's Guide



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▼▼▼▼ Contents

1 Introduction

Adaptec 7800 Family Host Adapters 1-2
Requirements 1-3

2 Novell NetWare Installation

Installing the Driver When Installing NetWare 2-2
 NetWare v3.1x 2-2
 NetWare v4.0 or v4.1x 2-3
Installing the Driver When NetWare is Already Installed 2-4
Loading the Driver at Server Bootup 2-5
Using the Load Command Line Options 2-6
 Bit Mask Options 2-8
 Sample Load Commands 2-8
Using NetWare and the Host Adapter 2-9
 Using Removable Media 2-9
 Using the NetWare Tape Backup 2-10
 Using a CD-ROM with NetWare 2-11
 Optimizing Performance 2-12
Troubleshooting 2-13
 Error Messages 2-13

3 IBM OS/2 Installation

Installing the Driver When Installing OS/2 3-2
 Installing OS/2 v2.1x 3-2
 Installing OS/2 Warp 3.x and 4.x 3-4
Installing the Driver When OS/2 is Already Installed 3-7
Using Command Line Options 3-8
 Universal Parameters 3-8
 Adapter ID 3-9
 Unit Parameters 3-9

Adaptec 7800 Family Manager Set

Command Line Examples 3-10
Troubleshooting 3-11
Problems and Solutions 3-11
Error Messages 3-12

4 Microsoft Windows 95 Installation

Installing the Driver When Installing Windows 95 4-2
Installing the Driver When Windows 95 is Already
Installed 4-2
Using Driver Parameters 4-4
Troubleshooting 4-5
Problems and Solutions 4-5

5 Microsoft Windows NT Installation

Installing the Driver When Installing Windows NT 5-2
Completing a Fresh Windows NT 3.5x Installation 5-2
Completing a Fresh Windows NT 4.0 Installation 5-4
Installing the Driver When Windows NT is Already
Installed 5-5
Updating Windows NT 3.5x 5-5
Updating Windows NT 4.0 5-7
Using Advanced Configurable Parameters 5-8
Using Windows NT SCSI Parameters 5-8
Using Driver-specific Parameters 5-10
Using Windows NT and the Host Adapter 5-12
Removing a Host Adapter 5-12
Swapping a Host Adapter 5-14
Troubleshooting 5-15
Problems and Solutions 5-15
Error Codes 5-15

6 SCO UNIX Installation

Installing the Driver When Installing SCO UNIX 6-2
Installing SCO UNIX 3.2 v4.2, SCO ODT 3.0, or
SCO OpenServer 3.0 6-2
Installing SCO OpenServer 5 6-4

Contents

Installing the Driver When SCO UNIX is Already Installed 6-4

Performing a System Backup 6-5

Using the Install Package 6-6

Modifying the mscsi File 6-7

Rebuilding the UNIX Kernel 6-8

Booting the New Kernel 6-8

Using SCO UNIX and the Host Adapter 6-9

Using Multiple Host Adapters 6-9

Changing the Boot Disk 6-9

Using Wide SCSI Host Adapters and Devices 6-9

Using Tunable Parameters for the alad Driver 6-10

Enabling Scatter/Gather and Tagged Queuing 6-11

Troubleshooting 6-11

Problems and Solutions 6-11

Error Messages 6-16

7 SCO UnixWare Installation

Installing the Driver When Installing SCO UnixWare 7-2

Installing the Driver When SCO UnixWare is Already Installed 7-3

Backing Up the Computer 7-4

Loading the Package 7-4

Modifying the New System File 7-5

Rebuilding the SCO UnixWare Kernel 7-6

Booting the New Kernel 7-6

Using SCO UnixWare and the Host Adapter 7-7

Using Tunable Parameters 7-7

Using Multiple Host Adapters 7-8

Removing the Driver 7-8

Troubleshooting 7-9

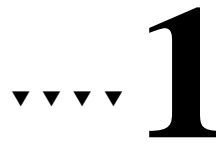
Problems and Solutions 7-9

Error Messages 7-10

Index



File Location: D:\Production\511505-00 A 7800
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Introduction

The Adaptec® SCSI Card 1520 v2.x is a set of software drivers and other files that enable your Adaptec 7800 Family host adapter to communicate with your computer. The Adaptec SCSI Card 1520 contains drivers for the following operating systems:

- Novell NetWare
- IBM OS/2
- Microsoft Windows 95
- Microsoft Windows NT
- SCO UNIX
- SCO UnixWare

The remainder of this chapter includes a table that lists all Adaptec host adapters that make up the Adaptec 7800 Family, as well as the minimum requirements needed to install the software.

The remaining chapters are organized by operating system. Each chapter provides instructions on how to install the driver at the same time you install your operating system. If your operating system is already installed, instructions on updating or installing the driver are also included. If you have problems installing and using the driver, refer to the *Troubleshooting* sections, included at the end of each chapter.

Adaptec 7800 Family Manager Set

Adaptec 7800 Family Host Adapters

The following Adaptec PCI-to-SCSI host adapters are collectively referred to as the Adaptec 7800 Family host adapters:

Host Adapter	Description
AHA-2910	PCI-to-Fast SCSI (non-bootable)
AHA-2930	PCI-to-Fast SCSI
AHA-2940	PCI-to-Fast SCSI
AHA-2940W	PCI-to-Fast and Wide SCSI
AHA-2940AU	PCI-to-Ultra SCSI
AHA-2940U	PCI-to-Ultra SCSI
AHA-2940UW	PCI-to-Wide Ultra SCSI
AHA-2944W	PCI-to-Fast and Wide Differential SCSI
AHA-2944UW	PCI-to-Wide Ultra Differential SCSI
AHA-3940	MultiChannel PCI-to-Fast SCSI
AHA-3940W	MultiChannel PCI-to-Fast and Wide SCSI
AHA-3940U	MultiChannel PCI-to-Ultra SCSI
AHA-3940UW	MultiChannel PCI-to-Wide Ultra SCSI
AHA-3940UWD	MultiChannel PCI-to-Wide Ultra SCSI with Dual External Connectors
AHA-3940AU	MultiChannel PCI-to-Ultra SCSI
AHA-3940AUW	MultiChannel PCI-to-Wide Ultra SCSI
AHA-3940AUWD	MultiChannel PCI-to-Wide Ultra SCSI with Dual External Connectors
AHA-3944UWD	MultiChannel PCI-to-Wide Ultra Differential SCSI with Dual External Connectors
AHA-3944AUWD	MultiChannel PCI-to-Wide Ultra Differential SCSI with Dual External Connectors
AHA-4944W	Quad Channel PCI-to-Fast and Wide Differential SCSI
AIC-7850	Single-chip PCI-to-Fast SCSI
AIC-7855	Single-chip PCI-to-Fast SCSI
AIC-7856	Single-chip PCI-to-Fast SCSI
AIC-7860	Single-chip PCI-to-Ultra SCSI
AIC-7870	Single-chip PCI-to-Fast and Wide SCSI
AIC-7880	Single-chip PCI-to-Wide Ultra SCSI
AIC-7895	Single-chip PCI-to-MultiChannel Wide Ultra SCSI

Introduction

Requirements

The following are the minimum and recommended requirements needed to install the Adaptec 7800 Family Manager Set:

- A PCI computer, with an installed and configured Adaptec 7800 Family host adapter(s).
- An installed primary (boot) floppy diskette drive. The drive must be able to read your operating system diskettes. A 3.5-inch (1.44 MByte) floppy diskette drive is required.
- The diskettes included with your Adaptec SCSI Card 1520.
- *Optional*—an installed and configured CD-ROM drive for installing your operating system from CD-ROM.
- The distribution software and documentation included with your operating system.
- The *User's Guide* for your host adapter.



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Page: 1-4

ECN Date: 6/97

....2

Novell NetWare Installation

This chapter explains how to install the Adaptec 7800 Family Manager Driver (*aic7870.dsk*) for Novell NetWare— NetWare v3.1x, v4.0, and v4.1x. The *aic7870.dsk* driver supports the Adaptec 7800 Family host adapters listed on page 1-2.

If you are performing a first time NetWare installation, see *Installing the Driver When Installing NetWare* on page 2-2. If NetWare is already installed in your system, see *Installing the Driver When NetWare is Already Installed* on page 2-4.

Adaptec 7800 Family Manager Set

Installing the Driver When Installing NetWare

To install the *aic7870.dsk* at the same time you install NetWare, follow the instructions below for the version of NetWare you are installing.

NetWare v3.1x

Follow these instructions only if you are installing NetWare v3.1x for the first time:

- 1 Follow the procedures in your NetWare documentation for installing a new server.
- 2 When you see the NetWare colon prompt (:), use the load command to install the driver from the 7800 Family Manager Set diskette for NetWare.

The correct syntax to load the 7800 Family driver is

```
:load [pathname]aic7870 [options]
```



Note: To load the driver automatically at server bootup, copy the driver to the server's startup directory and modify the *startup.ncf* file. See *Installing the Driver When NetWare is Already Installed* on page 2-4 and *Loading the Driver at Server Bootup* on page 2-5.

The command line options are *not* case sensitive. Placing commas between command line options is optional. See *Using the Load Command Line Options* on page 2-6 for possible values.



Note: The *aspitran.dsk* file must reside in the same path as *aic7870.dsk*, because NetWare attempts to load the file automatically.

- 3 Load the NetWare *install* program from the NetWare colon prompt (:load install). Follow the instructions in the NetWare documentation to complete the installation (e.g., creating disk partitions, system volumes, etc.) of your server.

Novell NetWare Installation

NetWare v4.0 or v4.1x

Follow these instructions only if you are installing NetWare v4.0 or v4.1x for the first time:

- 1 Begin installation of NetWare v4.0 or v4.1x on your server as instructed in your NetWare documentation.
- 2 When a screen appears that asks you to select a disk driver, press **Insert**.
- 3 Insert the Adaptec 7800 Family Manager Set diskette for NetWare into your disk drive.
- 4 Press **F3** and specify the path to the *aic7870.dsk* driver for NetWare (e.g., *a:\netware\v4_xx* on the diskette).
- 5 Select **AIC7870.DSK** and press **Enter**.
- 6 Specify the server's startup directory (usually *c:\server.40* for NetWare v4.0 or *c:\nwserver* for NetWare v4.1x) and press **Enter**.
- 7 Select **Continue the Installation** to complete the installation.



Note: To load the driver automatically at server bootup, make sure the *startup.ncf* file includes the load command line for your host adapter. See *Installing the Driver When NetWare is Already Installed* on page 2-4 and *Loading the Driver at Server Bootup* on page 2-5.

Adaptec 7800 Family Manager Set

Installing the Driver When NetWare is Already Installed

To update or install the *aic7870.dsk* driver if NetWare is already installed, follow the instructions in this section. The procedures are similar for all versions of NetWare. Procedures that are specific to a NetWare version are noted when necessary.

- 1 Make a backup copy of the old driver (if it exists) before installing the new driver.
- 2 Copy the *aic7870.dsk* driver from the 7800 Family Manager Set diskette for NetWare into the server's startup directory (e.g., *c:\nwserver*, *c:\server.40*, *c:\server.312*) on your hard disk. This overwrites any existing version of the driver in the directory.



Note: For NetWare v3.1x, the *aic7870.dsk* file is located in the *\netware\v3_1x* directory on the diskette; for NetWare v4.0 and v4.1x, the file is in *\netware\v4_xx*.

- 3 If necessary, modify the load command line in the *startup.ncf* file so that the proper path to the driver and all appropriate command line options are specified. See *Loading the Driver at Server Bootup* on page 2-5.

The correct syntax to load the 7800 Family driver is

```
load [pathname]aic7870 [options]
```

Command line options are *not* case sensitive. Placing commas between command line options is optional. See *Loading the Driver at Server Bootup* on page 2-5 for possible values.

Loading the Driver at Server Bootup

To automatically load the *aic7870.dsk* at server bootup, the *startup.ncf* file (usually located in your server's startup directory) must contain a load command line that specifies the location of the driver and any appropriate command line options (see *Using the Load Command Line Options* on page 2-6). For additional information on the *startup.ncf* file, refer to your NetWare documentation.



Note: To load the driver from your hard disk, the *aic7870.dsk* driver and *aspitran.dsk* module must be copied from the 7800 Family Manager Set diskette for NetWare to a directory on your hard disk [usually the server's startup directory (e.g., *c:\nwserver*)].

The correct syntax to load the *aic7870.dsk* driver is

```
load [pathname]aic7870 [options]
```

For example, the command line to load the driver from the *c:\nwserver* directory, with the *verbose=* option *on* is

```
load c:\nwserver\aic7870 verbose=y
```

Command line options are *not* case sensitive. Placing commas between command line options is optional. See *Using the Load Command Line Options* on page 2-6 for possible values.

To modify the *startup.ncf* file, follow these steps:



Note: You can also use your DOS text editor to modify the *startup.ncf* file.

- 1 Type **load install** at the NetWare prompt and press **Enter**.
- 2 Select the appropriate menu choice that allows you to edit the *startup.ncf* file.
- 3 Make the necessary changes. When you are done, press **Esc**.

Adaptec 7800 Family Manager Set

Using the Load Command Line Options

You can specify several command line options when the driver is loaded. The available options are described in the following table.

Option	Values	Default	Description
auto_bus_fairness=	on, off	on	Enables/disables auto SCSI bus fairness algorithm.
auto_disable_tagq=	on, off	on	Enables/disables auto disable tag queuing algorithm.
auto_flush_diskreq=	on, off	on	Enables/disables auto disk flush algorithm.
cdrom=	on, off	on	Enables/disable driver support for CD-ROM devices; on = Driver, off = ASPI.
dev_enable=	00-FFFF	FFFF	Allows you to enable the driver's registration of SCSI devices on a per target basis. By default, all targets are scanned. A bit value of 0 causes the target not to register under the operating system. These devices are still accessible via ASPI. This enable bit mask is entered in hex (see <i>Bit Mask Options</i> on page 2-8).
ext_tran=	yes, no	no	Determines translation method for a new drive in the system; yes = extended, no = standard. By default, standard translation is used unless set to extended by SCSI <i>Select</i>
fixed_disk=	on, off	on	Enables/disables support for hard disks. By default, hard disks are supported. You may want to disable hard disk support in order to load an ASPI Fixed Disk Module.
flush_diskreq=	00-FFFF	0	A bit mask to send occasionally ordered tags to specific targets. By default, no targets receive occasionally ordered tags. This bit mask is entered in hex (see <i>Bit Mask Options</i> on page 2-8).
instr=	on, off	off	Enables/disables recording of I/O statistics.
io_combine=	1-32	16	Specifies maximum number of segments in a scatter/gather list.

Novell NetWare Installation

Option	Values	Default	Description
lun_enable= ¹	00-FFFF	01	A bit mask to enable scanning for specific LUNs on all targets. The default value of 01 causes the driver to scan LUN 0 only. This enable bit mask is entered in hex (see <i>Bit Mask Options</i> on page 2-8.)
max_tags=	1-128	16	Specifies maximum number of tagged commands per device.
multlun_targets	00-FFFF	FFFF	A bit mask to enable LUNs on selected targets. By default, LUNs on all targets are enabled. This bit mask is entered in hex (see <i>Bit Mask Options</i> on page 2-8).
read_after_write	0-1	1	Specifies default verify mode; 0 = Off (No verify on writes), 1 = On (Hardware verify).
removable= ¹	on, off	on	Enables/disables support for removable media other than CD-ROMs. By default, removable media is supported. You may want to disable removable disk support in order to load an ASPI Removable Disk Module.
start_unit	0-FFFF	0	A bit mask to enable sending the Start_Unit command to specific targets. By default, the command is not sent to any target. This feature is not needed by most devices. This bit mask is entered in hex (see <i>Bit Mask Options</i> on page 2-8).
tag_disable	0-FFFF	0	A bit mask to disable tagged queuing for specific targets. By default, tagged queuing is enabled for all targets. If bit mask is set, then tagged queuing for that particular device is disabled. This bit mask is entered in hex (see <i>Bit Mask Options</i> on page 2-8).
slot=	0-xxxx ²	0	Defines a physical slot number for the host adapter. If 0 is specified, or if this option is not specified, then the driver loads for all 7800 Family host adapters.
verbose=	yes, no	no	Displays host adapter configuration information at load time.

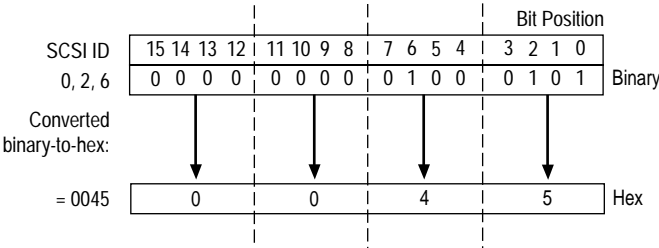
¹ Many multiple-lun and removable media devices are changers or magazines. Some of these are only supported by the *aic7870.dsk* driver through an ASPI driver provided by the hardware vendor.

² The values can vary and are dependent on the system configuration.

Adaptec 7800 Family Manager Set

Bit Mask Options

Use the example below as an aid for calculating bit mask option hex values. Each SCSI device is enabled by a 1 in its corresponding bit position. The table that follows the figure, lists the binary-to-hex conversions. Using this example, if you want to enable scanning for LUNs 0, 2, and 6 on all targets, then use the command line option of lun_enable=0045.



Binary	Hex.	Binary	Hex.
0000	0	1000	8
0001	1	1001	9
0010	2	1010	A
0011	3	1011	B
0100	4	1100	C
0101	5	1101	D
0110	6	1110	E
0111	7	1111	F

Sample Load Commands

Here is a simple load command with no option switches (if loaded from drive A):

```
load a:\network\v3_1x\aic7870
```

If an error message appears when attempting to load the driver, refer to *Troubleshooting* on page 2-13.

Here is an example of the *aic7870.dsk* driver being loaded with command line options (if loaded from drive A):

```
load a:\network\v3_1x\aic7870 verbose=y slot=22
```

Using NetWare and the Host Adapter

This section contains useful information on using NetWare and your host adapter.

Using Removable Media

The *aic7870.dsk* driver module fully supports removable-media disk drives, including magneto-optical drives. Removable media is treated as a standard SCSI hard disk, with some exceptions:

- The driver only recognizes and registers media with 512 bytes/sector.
- NetWare allows you to mount/dismount the media, and to lock/unlock the media.

NetWare's *monitor.nlm* program supports several removable media option. Follow these steps to view and configure these options:

- 1 Load *monitor.nlm* to display the various options.
- 2 Select **Disk Information**. All system disk drives appear.
- 3 Select the removable-media device. The following drive status items appear:

Menu Choice	Default Value
1. Volume Segments On Drive ¹	(select for list)
2. Read After Write Verify ¹	Hardware Level
3. Drive Light Status ¹	Not Supported
4. Driver Operating Status ¹	Active
5. Removable Drive Mount Status ²	Mounted
6. Removable Drive Lock Status ²	Not Locked

¹ Valid for both removable and nonremovable types of SCSI disk drives.

² Valid for removable media only

Mount Status

Mounting causes a drive to come online as a NetWare storage device. Dismounted drives are inactive and cannot be accessed.

Before you eject your current media, you should first *dismount* it (menu choice 5). When the media status is *dismounted*, you can eject

Adaptec 7800 Family Manager Set

the media. However, NetWare does not allow you to dismount it if the media is locked.

To insert your new media, wait for the drive to spin-up, and then select the **Drive Mount** option.

Lock Status

If your removable-media device supports the Lock/Unlock feature, you can lock the media (menu choice 6). The media must be in the *Not Locked* state before you can eject it. If the media is *Locked*, it cannot be ejected when you press the **Eject** button.

Verify

Read After Write Verify (menu choice 2) is set to *Hardware Level* by default. The option can also be set on the command line, see *Using the Load Command Line Options* on page 2-6.

The available options are defined as follows:

Read After Write Verify	
Option Setting	Function
Disabled	All writes to SCSI disk drives are with the SCSI Write command (2Ah).
Hardware Level	All writes to SCSI disk drives are with the SCSI Write and Verify command (2Eh). If not supported by the drive, behavior is the same as if Read After Write Verify is disabled. We recommend this setting for best data security.
Software Level	Not supported.

Using the NetWare Tape Backup

Included with Novell NetWare is a server-based tape backup utility called *sbackup.nlm*. This utility allows you to backup server disk drives to a server tape drive. The utility supports Adaptec host adapters.

Novell NetWare documentation contains instructions for loading the server backup software. Refer to the *NetWare Server Backup Manual* to load the *tapedai*, *tsa*, and *sbackup* modules.

Novell NetWare Installation

- 1 Once you have loaded *aic7870.dsk*, load *tapedai.dsk*, *tsaxxx.nlm* (*tsa312.nlm*, *tsa400.nlm*, *tsa410.nlm*), and *sbackup* with these options:

```
:load tapedai  
:load tsaxxx  
:load sbackup
```

The appropriate driver that interfaces *sbackup* to ASPI is loaded automatically.

If you are *duplexing* the Adaptec 7800 Family host adapter with another host adapter for NetWare drive *mirroring*, you must also load the appropriate ASPI manager (*.dsk*) for the second host adapter.

- 2 When *sbackup* is loaded, it asks for a login name. Enter the appropriate name.
- 3 If *sbackup* asks you to select the device driver, select the **HP DIBI-2 Tape Driver**, regardless of the type of SCSI tape drive being attached (e.g., even if the tape drive is manufactured by Wangtek, *do not* select the Wangtek driver).



Note: Novell also includes a driver called *adaptec.nlm*. This driver is not needed and should not be loaded. Adaptec's *aic7870.dsk* driver module takes advantage of ASPI interface features bypassed by *adaptec.nlm*.

Novell publishes a list of SCSI tape drives supported by *sbackup.nlm*.

Using a CD-ROM with NetWare

To use a CD-ROM with NetWare v3.1x, v4.0, or v4.1x, follow these instructions:

- 1 Load *aic7870.dsk* by entering the following line:
:load [pathname]aic7870
- 2 Load *aspicd.dsk* by entering the following line:
:load [pathname]aspicd

Adaptec 7800 Family Manager Set

For multiple LUN CDs, enable multiple LUN scanning with the `lun_enable` switch (e.g., `load aspicd lun_enable=FF`). The `lun_enable` switch is not needed for *aic7870.dsk*.

- 3 Load *cdrom.nlm* by entering the following line:

```
:load [pathname]cdrom.nlm
```



Note: For NetWare 4.01 and 4.02 only: You have to load *nwpa.nlm* before you can load *cdrom.nlm*.

- 4 Enter the following line at the prompt and then note the number and name of the CD:

```
:cd device list
```

- 5 Enter the number or volume name of the CD at the command line:

```
:cd mount [x] [name]
```

Optimizing Performance

The Adaptec 7800 Family SCSI Bus Master firmware increases the SCSI performance of the Adaptec 7800 Family host adapters under multitasking environments. The firmware uses a paging mechanism to handle up to 255 simultaneous SCSI commands. The sequencer can simultaneously manage up to 128 tagged, or 1nontagged, SCSI commands for each SCSI device, up to a limit of 255 SCSI commands. The firmware can queue as many commands as the operating system is able to send to the host adapter. To set this feature, enter the following command:

```
max_tags=n
```

In general, a low number of `max_tags` gives better sequential performance, and a high number a better random performance.



Note: A large number of `max_tags` can also cause starvation problems leading to deactivations with some drives.

Troubleshooting

Error Messages

The error messages listed below are the messages associated with the *aic7870.dsk* driver. Messages are listed sequentially according to the last three digits of the error code. For example, [xxxxx080], [xxxxx081], [xxxxx082], etc.



Note: When reporting problems to Customer Support, be sure to include the complete error code in your problem description.

[xxxxx080] Unable to allocate memory

This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.

[xxxxx081] Adapter software initialization failure

An error has occurred while the driver was setting up its internal data structures. Verify that your adapter is supported by this version of the driver.

[xxxxx082] Internal driver error

An error has occurred while the driver was setting up its internal data structures. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

[xxxxx083] Adapter not supported by this version of the driver

Your adapter is not supported by the driver on your system. You may have installed a new adapter and have not updated the driver on your system.

[xxxxx084] Adapter software initialization failure

An error has occurred while the driver was setting up its internal data structures. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

Adaptec 7800 Family Manager Set

[xxxxx085] Unable to allocate memory

This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.

[xxxxx087] Internal driver error

An error has occurred while the driver was setting up its internal data structures. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

[xxxxx088] Adapter software initialization failure

An error has occurred while the driver was setting up its internal data structures. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

[xxxxx089] Unable to allocate memory

This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.

[xxxxx096] Adapter hardware initialization failure - possible resource conflict

The driver has attempted to initialize the adapter hardware but failed. This might suggest that the adapter resources (e.g., IRQ) conflict with the resources of another board installed in your system.

[xxxxx099] Adapter software initialization failure

[xxxxx09a] Adapter software initialization failure

[xxxxx09b] Adapter software initialization failure

An error has occurred initializing one of the driver's internal data structures for a device connected to the adapter. This may result in problems accessing the device. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

[xxxxx0ab] Driver already loaded for this host bus adapter

The driver is already loaded for this adapter. Verify that the correct adapter is specified in your command line or startup file.

[xxxxx0ac] Driver already loaded for all host bus adapters

The driver is already loaded for all the supported adapters in this system.

Novell NetWare Installation

[xxxxx0a4] SCSI bus reset by third party hardware

Hardware such as an array enclosure may have reset the SCSI bus. This is a normal condition unless you receive additional errors.

[xxxxx0a7] Unable to allocate memory

[xxxxx0a8] Unable to allocate memory

This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.

[xxxxx0a9] Possible interrupt conflict

This indicates that the adapter IRQ conflicts with the IRQ of another board installed in your system. Check your hardware documentation for instructions on setting and changing IRQs.

[xxxxx0c9] Invalid command line parameter

A command line option for the driver is invalid. See *Using the Load Command Line Options* on page 2-6 for valid command line options.

[xxxxx0ca] Invalid command line syntax

[xxxxx0cb] Invalid command line syntax

[xxxxx0cc] Invalid command line syntax

The command line syntax for the driver is incorrect. See *Using the Load Command Line Options* on page 2-6 for entering the correct syntax.

[xxxxx07c] Unable to allocate memory

[xxxxx07d] Unable to allocate memory

[xxxxx07e] Unable to allocate memory

[xxxxx07f] Unable to allocate memory

This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.



File Location: D:\Production\511505-00 A 7800 FMS\7800-02.FM
Last Modified: June 19, 1997 9:24 pm

Adaptec 7800 Family Manager Set
Stock Number: 511505-00, Rev. A
Print Spec Number: 496814-00
Current Date: 6/19/97

Page: 2-16

ECN Date: 6/97

...3

IBM OS/2 Installation

This chapter explains how to install the Adaptec 7800 Family Manager Set Driver (*aic7870.add*) for OS/2 —OS/2 v2.1x, OS/2 Warp 3.x and 4.x. The *aic7870.add* driver supports the Adaptec 7800 Family host adapters listed on page 1-2.

If you are performing a first time OS/2 installation, see *Installing the Driver When Installing OS/2* on page 3-2. If OS/2 is already installed in your system, see *Installing the Driver When OS/2 is Already Installed* on page 3-7.

Adaptec 7800 Family Manager Set

Installing the Driver When Installing OS/2

To install the *aic7870.add* driver at the same time you install OS/2, follow the instructions below for the version of OS/2 you are installing.



Note: When installing OS/2 from a CD-ROM, be sure the CD-ROM SCSI ID is not set to 0 or 7.

Installing OS/2 v2.1x

Follow these instructions only if you are installing OS/2 v2.1x for the first time. We assume here that OS/2 is not already installed on the system. You will need to have access to a computer where you can copy DOS files from one diskette to another.



Note: To install the *aic7870.add* driver, it is necessary to copy the driver from the 7800 Family Manager Set diskette for OS/2 on to the OS/2 installation diskette #1. However, before you can copy the driver, you must first remove various files from the OS/2 installation diskette #1, as explained in step 2 below.

- 1 Go to a computer on which DOS, Windows®, or OS/2 is already installed. Use diskcopy to make backup copies of all IBM OS/2 and Adaptec-supplied diskettes. Use the backup copies as your working diskettes.
- 2 Delete some of the existing files on the backup copy of the OS/2 diskette #1 so that approximately 120 KBytes of disk space is available on the diskette. Use the following information to help you decide which files to delete:
 - If the Adaptec 7800 Family host adapter is the only Adaptec host adapter installed in your system, delete all Adaptec drivers (*aha152x.add*, *aha154x.add*, *aha164x.add*, *aha174x.add*, *aic7770.add*, and *fd16_700.add*).

IBM OS/2 Installation

- If you have an Adaptec host adapter that is not part of the 7800 Family, delete all of the Adaptec drivers not used by that particular host adapter. For example, if you have an Adaptec AHA-1540CP host adapter installed in your computer, delete all Adaptec drivers except for the *aha154x.add* driver.
 - If you have deleted the suggested Adaptec drivers above, and you still do not have approximately 120 KBytes of disk space available on the diskette, delete these files:
ibm2flpy.add, *ibm2adsk.add*, and *ibm2scsi.add*.
- 3 Copy the *os2ldr* file from the 7800 Family Manager Set diskette for OS/2 (i.e., *los2l*) onto the OS/2 installation diskette.
 - 4 Copy the *ibmint13.i13* and the *aic7870.add* files from the 7800 Family Manager Set diskette for OS/2 (i.e., *los2l*) onto the OS/2 diskette # 1.
 - 5 Add the following line to the *config.sys* file on diskette #1:

 basedev=aic7870.add
 - 6 Run the OS/2 v2.1x installation program; follow the instructions in your OS/2 documentation.
 - 7 At the end of the installation process, follow the onscreen instructions to remove the last OS/2 distribution diskette and reboot the computer.
 - 8 After the computer has restarted, OS/2 displays a welcome screen. You have the option to view online information while the OS/2 desktop is building. Allow OS/2 to finish building.



Note: Refer to the *readme.txt* file for any additional information on installing OS/2 v2.1x and the driver.

Adaptec 7800 Family Manager Set

Installing OS/2 Warp 3.x and 4.x

Follow these instructions *only* if you are installing OS/2 Warp 3.x or 4.x for the first time. The instructions are the same for these versions of OS/2, unless otherwise stated. We assume here that OS/2 is not already installed on the system. You will need to have access to a computer where you can copy DOS files from one diskette to another.



Note: To install the *aic7870.add* driver, it is necessary to copy the driver from the Adaptec 7800 Family Manager Set diskette for OS/2 on to the OS/2 installation diskette #1. However, before you can copy the driver, you must first remove various files from the OS/2 installation diskette #1, as explained in step 2 below.

- 1 Go to a computer on which DOS, Windows, or OS/2 is already installed. Use diskcopy to make backup copies of all IBM OS/2 and Adaptec-supplied diskettes. Use the backup copies as your working diskettes.
- 2 Delete some of the existing files on the backup copy of the OS/2 installation diskette #1 so that approximately 140 KBytes of disk space is available on the diskette. Use the following information to help you decide which files to delete:
 - If the Adaptec 7800 Family host adapter is the only Adaptec host adapter installed in your system, delete all Adaptec drivers (*aha152x.add*, *aha154x.add*, *aha164x.add*, *aha174x.add*, *aic7770.add*, and *fd16_700.add*).
 - If you have an Adaptec host adapter that is not part of the 7800 Family, delete all of the Adaptec drivers not used by that particular host adapter. For example, if you have an Adaptec AHA-1540CP host adapter installed in your computer, delete all Adaptec drivers except for the *aha154x.add* driver.
 - If you have deleted the suggested Adaptec drivers above, and if you do not have a Microchannel architecture system, and you still do not have approximately 120 KBytes of disk space available on the diskette, delete these files: *ibm2flpy.add*, *ibm2adsk.add*, and *ibm2scsi.add*.

IBM OS/2 Installation



Note: If you have a combination PCI/Microchannel architecture system, you need to delete third-party driver files not required.

- 3 Copy the *aic7870.add* driver from the 7800 Family Manager Set diskette for OS/2 (i.e., *los2\aic7870.add*) onto the OS/2 installation diskette #1. This overwrites any existing version of the driver included on diskette #1.
- 4 For each driver removed from the OS/2 diskette #1, remove its corresponding line in the *config.sys* file (also on OS/2 diskette #1).

For example, if you deleted all Adaptec drivers, as explained in Step 2a, above, remove the following lines from the *config.sys* file:

```
basedev=aha152x.add  
basedev=aha154x.add  
basedev=aha164x.add  
basedev=aha174x.add  
basedev=aic7770.add  
basedev=fd16_700.add
```

- 5 In the *config.sys* file on OS/2 diskette #1, add the following line:

```
set copyfromfloppy=1
```

This line must be added so that the install process copies the *aic7870.add* driver from the OS/2 diskette #1, instead of the *aic7870.add* driver included on your OS/2 CD-ROM.



Note: For OS/2 Warp 4.0 users only, add the *basedev=aic7870.add* line to the top line of the *config.sys* file on OS/2 diskette #1. This will result in two *basedev=aic7870.add* statements existing in the *config.sys* file.

- 6 Run the OS/2 installation program; follow the instructions in your OS/2 documentation until you reach the System Configuration window.

Adaptec 7800 Family Manager Set

- 7 In the System Configuration windows, click the SCSI Adapter Support icon.
- 8 Deselect any highlighted adapters (including the Adaptec 294x, 394x, AIC7870 PCI SCSI), and click **OK**. The text box for SCSI Adapter Support should say None.



Note: If these adapters are not deselected, the driver included on the CD-ROM will be copied over the driver being installed.

- 9 Follow the instructions in your OS/2 documentation to complete the installation.



Note: The update files *os2ldr* and *ibmint13.i13* included with the Adaptec 7800 Family Manager Set are not needed when installing OS/2 Warp.

After installation is complete, verify that only one basedev=aic7870.add statement exists in the *config.sys* file on your hard drive. Remove other instances if more than one is found.

Installing the Driver When OS/2 is Already Installed

To update or install the *aic7870.add* driver if OS/2 is already installed, follow the instructions below. The procedures are similar for all versions of OS/2. Procedures that are specific to an OS/2 version are noted when necessary.

- 1 If you are updating the driver, simply copy the *aic7870.add* driver from the 7800 Family Manager Set diskette for OS/2 (e.g., *los2\aic7870.add*) into the *los2* directory (for OS/2 v2.1x) or *los2\boot* directory (for OS/2 Warp 3.x or 4.x) on your hard disk. (*Make a backup copy of the older driver before doing this.*) This overwrites any existing version of the driver in the directory. Updating of the driver is complete; *do not* continue with Steps 3 through 5.

If OS/2 has been installed and does not recognize the Adaptec 7800 Family host adapter, *or* if you are adding your Adaptec 7800 Family host adapter to your OS/2 computer, you need to install the driver. To do so, continue with Step 2:

- 2 Run the *ddinstal* program by selecting the **Device Driver Install** icon from the System Setup folder or by typing *ddinstal* at the OS/2 prompt.



Note: If you are running OS/2 v2.1x, change to the directory containing *aic7870.add* and associated files and run *ddinstal* from the OS/2 prompt.



Caution: If you are running OS/2 v2.1x GA, *do not* run Device Driver Install from the System Setup folder. Instead, open a full screen OS/2 session and change to the drive with the 7800 Family Manager Set diskette for OS/2. Then type *ddinstal* and press **Enter**.

- 3 Insert the Adaptec 7800 Family Manager Set diskette for OS/2 in the appropriate disk drive and follow the prompts from *ddinstal*.

Adaptec 7800 Family Manager Set

- 4 The computer scans for the host adapter(s). If a host adapter is found, the Installing Device Drivers message appears. Another message appears when the driver is successfully installed. If no host adapters are found, an error message appears.
- 5 Reboot the computer for the changes to take effect.

Using Command Line Options

Once installed, the *aic7870.add* driver does not usually require any modifications to its configuration. In certain situations, however, you may wish to add command line options to the driver to meet your specific needs. The command line options described in this section can be used in OS/2 v2.1x and OS/2 Warp 3.x and 4.x.

The *aic7870.add* driver command line resides in the *config.sys* file. Command line options are not case sensitive, and take effect after the computer is rebooted. The command line syntax is

```
basedev=aic7870.add [Universal Parameters] [Adapter ID]  
[Unit Parameters: [SCSI Target ID]]
```



Caution: Your computer may not boot if you enter the command line options incorrectly.

Universal Parameters

/et

Embedded targets allowed. Makes the driver assume that all targets have more than one Logical Unit Number (LUN) defined.

/!et

No embedded targets allowed. Makes the driver assume that all targets have only one LUN defined. (This is the default setting.)

/v

Verbose mode. Information such as the driver name, version number, and Adaptec copyright appears if the driver loads successfully. Also displays information about all targets found in the computer.

/pcihw

PCI configuration hardware registers. Enables driver to access PCI configuration hardware registers. This switch is available for some PCI systems that run into problems when trying to access PCI con-

IBM OS/2 Installation

figuration space through PCI BIOS function calls. (This is the default setting.)

/pcihw

Disables the /pcihw switch. This parameter will cause the driver to access the PCI configuration space through PCI BIOS function calls.

/instr

Enables I/O performance monitoring. This switch allows the *aic7870.add* driver to record I/O statistics and errors. By default, this option is disabled.

/instr_errlogsz:nn

Sets the number of error log entries for recording errors (provided the /instr switch is enabled). 64 is the maximum value allowed. 32 is the default value.



Note: The /instr and /instr_errlogsz: options require additional software to retrieve the recorded statistics and error logs.

Adapter ID

/a:n

Adapter numbers are assigned based on BIOS address (starting from the lowest first) and the Device number (PCI Device number in hex as seen at the upper right hand corner of the first *SCSISelect* screen) if the BIOS is disabled. Built-in single-channel host adapters are generally assigned ID 0 (zero), as the first found adapter.

Unit Parameters

Replace the italicized letters (*x,y,z*) in the switch descriptions below with the SCSI target ID(s) of the device(s) that you want affected. The IDs may be a single ID (*x*) or a list of IDs (*x,y,z*). The IDs must be separated by commas.

/dm:x,y,z

Enables Direct Access Storage Device (DASD) manager support. Allows *os2dasd.dmd* to control the specified target(s) when they are identified as DASD devices. (This is the default setting.)

Adaptec 7800 Family Manager Set

/!dm:x,y,z

Disables DASD manager support. Prevents *os2dasd.dmd* from controlling the specified target(s).



Caution: *Do not* disable DASD manager support to the boot drive, or the computer will not be able to boot.

/!sm:x,y,z

Enables SCSI manager support for the target device(s) *x,y,z*. Allows *os2scsi.dmd* to control the specified target(s) if they are identified as non-DASD SCSI devices. All SCSI hard drives are controlled by *os2dasd.dmd*. (This is the default setting.)

/!sm:x,y,z

Disables SCSI manager support. Prevents *os2scsi.dmd* from controlling the specified target(s).

/tag:x

Specifies the maximum number of tagged commands for all target devices on the host adapter (1-16). A value of 1 disables tagged queuing. The maximum number allowed is 16. (The default is 8.)

/i

Ignores the host adapter. The driver ignores the host adapter so that another driver may control it.

/ur

Enables reporting of underruns.

/!ur

Disables reporting of underruns. (This is the default setting.)

Command Line Examples

Example 1

Suppose that you have a removable-media drive as target 3. Normally *os2dasd* allocates this device, treats it as a large floppy, and prevents you from sending any SCSI commands via another device manager. The command line below prevents *os2dasd.dmd* from accessing the target and allows *os2scsi.dmd* and *os2aspi.dmd* to share access to it:

```
basedev=aic7870.add /a:0 /!dm:3
```

IBM OS/2 Installation

Example 2

Suppose that you have a multidisk CD-ROM as target 4 on host adapter 0 and two DASD devices as targets 1 and 5 on host adapter 1. The command line below prevents *os2scsi.dmd* from accessing the CD-ROM and *os2dasd.dmd* from controlling the DASD devices. The driver searches for multiple LUNs on all devices.

```
basedev=aic7870.add /et /a:0 /lsm:4 /a:1 /ldm:1,5
```



Note: There are no switches for directly controlling *os2aspi.dmd*, the ASPI device manager.

Troubleshooting

Problems and Solutions

How do I assign an interrupt for the host adapter?

The interrupt assignment is handled via the motherboard BIOS. You may or may not be able to assign an interrupt manually. Refer to your motherboard or system documentation.

During installation, OS/2 fails to find the hard drive.

Make sure the latest driver from Adaptec has been installed. Add the `/pcihw` or `!pcihw` command option to the `basedev=aic7870.add` driver statement in the *config.sys* file.

Does extended translation need to be enabled on the host adapter in order to support drives greater than 1GByte?

Under OS/2, if you are using a FAT file system and/or switching back and forth from DOS, extended translation should be enabled. If you are using HPFS (High Performance File System), extended translation may or may not be enabled. Once the driver for the host adapter loads, the remaining hard drive space will be seen beyond 1024KBytes.

Adaptec 7800 Family Manager Set

Error Messages

The error messages listed below are the messages associated with the *aic7870.add* driver. Messages are listed sequentially according to the last three digits of the error code. For example, [xxxxx080], [xxxxx081], [xxxxx082], etc.



Note: When reporting problems to Customer Support, be sure to include the complete error code in your problem description.

[xxxxx080] Unable to allocate memory

This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.

[xxxxx081] Adapter software initialization failure

An error has occurred while the driver was setting up its internal data structures. Verify that your adapter is supported by this version of the driver.

[xxxxx082] Internal driver error

An error has occurred while the driver was setting up its internal data structures. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

[xxxxx083] Adapter not supported by this version of the driver

Your adapter is not supported by the driver on your system. You may have installed a new adapter and have not updated the driver on your system.

[xxxxx084] Adapter software initialization failure

An error has occurred while the driver was setting up its internal data structures. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

[xxxxx085] Unable to allocate memory

This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.

IBM OS/2 Installation

[xxxxx087] Internal driver error

An error has occurred while the driver was setting up its internal data structures. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

[xxxxx088] Adapter software initialization failure

An error has occurred while the driver was setting up its internal data structures. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

[xxxxx089] Unable to allocate memory

This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.

[xxxxx096] Adapter hardware initialization failure - possible resource conflict

The driver has attempted to initialize the adapter hardware but failed. This might suggest that the adapter resources (e.g., IRQ) conflict with the resources of another board installed in your system.

[xxxxx099] Adapter software initialization failure

[xxxxx09a] Adapter software initialization failure

[xxxxx09b] Adapter software initialization failure

An error has occurred initializing one of the driver's internal data structures for a device connected to the adapter. This may result in problems accessing the device. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

[xxxxx0a7] Unable to allocate memory

This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.

[xxxxx0a9] Possible interrupt conflict

This indicates that the adapter IRQ conflicts with the IRQ of another board installed in your system. Check your hardware documentation for instructions on setting and changing IRQs.

[xxxxx0c9] Invalid command line parameter

A command line option for the driver is invalid. See *Using Command Line Options* on page 3-8 for valid command line options.

Adaptec 7800 Family Manager Set

[xxxxx0ca] Invalid command line syntax

[xxxxx0cb] Invalid command line syntax

[xxxxx0cc] Invalid command line syntax

The command line syntax for the driver is incorrect. See *Using Command Line Options* on page 3-8 for entering the correct syntax.

[xxxxx07c] Unable to allocate memory

[xxxxx07d] Unable to allocate memory

[xxxxx07e] Unable to allocate memory

[xxxxx07f] Unable to allocate memory

This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.



...4

Microsoft Windows 95 Installation

This chapter explains how to install the Adaptec 7800 Family Manager Set Driver (*aic78xx.mpd*) for Windows[®] 95. The *aic78xx.mpd* driver supports the Adaptec 7800 Family host adapters listed on page 1-2.

If you are performing a first time Windows 95 installation, see *Installing the Driver When Installing Windows 95* on page 4-2. If Windows 95 is already installed in your system, see *Installing the Driver When Windows 95 is Already Installed* on page 4-2.

Adaptec 7800 Family Manager Set

Installing the Driver When Installing Windows 95

A version of the *aic78xx.mpd* driver is embedded (included) in the Windows 95 installation CD-ROM. During a normal Windows 95 installation, the 7800 Family host adapter is detected in your system and the embedded *aic78xx.mpd* driver is automatically installed. Once the Windows 95 installation is complete, you can update the *aic78xx.mpd* driver with the most recent version of the driver by following the instructions in *Installing the Driver When Windows 95 is Already Installed*, below.



Note: If Windows 95 installation cannot detect the 7800 Family host adapter installed in your computer, you must install the *aic78xx.mpd* driver manually once Windows 95 installation is complete. To determine if the *aic78xx.mpd* driver was installed, and to install the driver manually, see *Installing the Driver When Windows 95 is Already Installed*, below.

Installing the Driver When Windows 95 is Already Installed

To update or install the *aic78xx.mpd* if Windows 95 is already installed, follow these instructions:



Note: All Adaptec 7800 Family host adapters use the same *aic78xx.mpd* driver. Once the driver is updated, it is not necessary to update it again for each 7800 Family host adapter installed in your system.

- 1 Start Windows 95.
- 2 Click the **Start** button on the Windows 95 task bar, and then point to Settings.
- 3 Click **Control Panel**.
- 4 Double-click the System icon.
- 5 On the Device Manager tab, click the plus sign (+) next to the SCSI controller icon.

Microsoft Windows 95 Installation



Note: If Windows 95 cannot determine the type of host adapter installed in your computer, a yellow question mark labelled *Other devices* appears instead of the SCSI controller icon. To continue, click the plus sign (+) next to the question mark; a yellow question mark labelled *PCI SCSI Bus Controller* then appears.

- 6 Double-click the 7800 Family host adapter you wish to update, or if a yellow question mark labelled *PCI SCSI Bus Controller* is displayed, double-click the question mark.
- 7 On the Driver tab, click **Change Driver**. If you are prompted to select the hardware type, select **SCSI Controller**.



Note: If an Update Driver button appears instead of a Change Driver button, click the Update Driver button. An installation wizard will guide you through the remainder of the driver installation. See the readme file on the 7800 Family Manager Set diskette for Windows 95 for additional information.

- 8 Insert the 7800 Family Manager Set diskette for Windows 95 into drive A.
- 9 Click the **Have Disk** button and enter a:\win95 as the path.
- 10 Click **OK**.
- 11 Select the 7800 Family host adapter, and click **OK**.
- 12 Click **OK**. The driver is copied and scanned.
- 13 You must restart your computer for the changes to take effect. Click **Yes** to restart your computer. Click **No** to return to the system properties window.

Adaptec 7800 Family Manager Set

Using Driver Parameters

Once installed, the *aic78xx.mpd* driver does not usually require any modification to its configuration. In certain situation, however, you may wish to add parameters to the driver to meet your specific needs. Valid parameters are



Note: The following parameters are case-sensitive and must be entered exactly as shown. When entering multiple parameters, each parameter must be separated by a space.

- **/INSTRUMENTATION**—enables recording of I/O statistics and errors. If this option is not specified, instrumentation defaults to disabled. To retrieve the recorded statistics and error logs, you will need an application that supports this feature.
- **/INSTR_ERRLOG_Z = *nnn***—sets the maximum number of error log entries, if **/INSTRUMENTATION** is enabled. If a number is not specified, the maximum number of error log entries defaults to 32.

To enter driver parameters, follow these steps:

- 1 Click the **Start** button on the Windows 95 task bar, and then point to **Settings**.
- 2 Click **Control Panel**.
- 3 Double-click the **System** icon.
- 4 On the **Device Manager** tab, click the plus sign (+) next to the **SCSI controller** icon.
- 5 Double-click on the 7800 Family host adapter you want to configure.
- 6 Click on the **Settings** tab and enter the parameters in the **Adapter Settings** text box; the available parameters are listed above. When entering multiple parameters, each parameter must be separated by a space.

Troubleshooting

Problems and Solutions

What is a miniport driver, and how do I make sure that the miniport driver for my host adapter is installed correctly?

Miniport drivers are 32-bit protected mode device drivers used by Windows 95 to control host adapters and devices. Windows 95 includes a set of miniport drivers for various SCSI host adapters.

If your 7800 Family host adapter is already installed, the adapter's miniport driver is automatically installed and configured during Windows 95 installation. Follow the instructions listed in *Installing the Driver When Windows 95 is Already Installed* on page 4-2 to ensure that the miniport driver is updated.

To make sure the driver is installed correctly in systems running Windows 95, open the Control Panel, double-click on **System**, and click the **Device Manager** tab. Then double-click the **SCSI Controllers** icon; you should see the model name of the SCSI host adapter(s) installed in your system.

What if there is no SCSI Controllers icon under Device Manager, or the model name of the host adapter does not appear under Device Manager?

If the SCSI Controllers icon or your host adapter's model name do not appear in the Device Manager, follow these steps:

- 1 Open Control Panel and double-click the **Add New Hardware** icon. Let Windows search for the host adapter by selecting **Yes** on the second screen of the Add New Hardware Wizard.
- 2 If Windows does not detect the adapter, run the Add New Hardware Wizard again. This time, select **No** on the second screen of the wizard, then select **SCSI Controllers** on the next screen.
- 3 Insert the 7800 Family Manager Set diskette for Windows 95 into your floppy drive.
- 4 Select the model of your 7800 Family host adapter, and then click the **Have Disk** button.
- 5 Enter a:\win95 or b:\win95 as the location to copy the file from.
- 6 Click **OK**. The driver is copied and your system is updated.
- 7 You must restart your computer for the changes to take effect.

Adaptec 7800 Family Manager Set

What if a yellow exclamation mark or a red X appears in Device Manager in front of my host adapter.

This means there is some kind of resource problem. First, see if the names of any host adapters appear that are not actually installed in your computer. If so, select the name and click **Remove**.

If a red X appears in front of your host adapter name, remove all the host adapter references under SCSI Controllers and run Add New Hardware, as described in the previous question/answer.

If a yellow exclamation point appears in front of your host adapter name, the resources that the driver uses probably do not match the resources used by the hardware. Double-click the host adapter name, then click on the **Resource** tab. Deselect the Use Automatic Settings box and edit the resources (Interrupt Request, Direct Memory Access, etc.) so they match those used by the host adapter. If the problem still remains, there is probably a hardware resource conflict between the host adapter and other hardware in your computer. You can fix this by changing the hardware resource settings. (See your hardware documentation.)

What do I need to do if I change or upgrade my host adapter?

- 1 Open the Control Panel, double-click on **System**, and click the **Device Manager** tab.
- 2 Double-click the **SCSI Controllers** icon, select the name of the old host adapter, and click **Remove**.
- 3 Turn OFF the computer and physically remove the currently installed host adapter.
- 4 Install the new host adapter according to the instructions in the hardware documentation.
- 5 Turn the computer ON. If the new host adapter supports Plug and Play, Windows will install and configure it automatically. Otherwise, run Add New Hardware to make sure the new driver is loaded.

Microsoft Windows 95 Installation

If I am running under Windows 95, do I need lines for the Adaptec real mode ASPI drivers and *mscdex* in my *config.sys* and *autoexec.bat* files?

Usually, you do *not* need to use these Real mode ASPI drivers, because the new Windows miniport drivers support most SCSI host adapters and SCSI devices. However, you need to load the drivers (including *mscdex*, if you have a CD-ROM drive) if any of the following is true:

- You are running in MS-DOS mode and need to access your CD-ROM drive.
- You are using a scanner or another SCSI device with *config.sys*- or *autoexec.bat*-based drivers, such as Hewlett Packard *sjiix.sys*.
- You have an older model SCSI-1 CD-ROM drive that Windows 95 does not support.
- You are using a CD-Recorder drive (however, some newer models of CD-Recorder drives can use the embedded Windows miniport drivers).

My CD-ROM drive doesn't work properly under Windows 95.

Some older models of SCSI CD-ROM drives are not compatible with the embedded Windows 95 CD-ROM driver. You can add support for the CD-ROM drive by doing the following:

- 1 Make sure your ASPI Real mode drivers (including *aspicd.sys*, *aspi8dos.sys*, and *mscdex.exe*) are loaded and running from your *config.sys* and *autoexec.bat* files.
- 2 Find the file named *cdtsd.vxd* in the *\windows\system\iosubsys* directory and rename it *cdtsd.sav*.

My CD-ROM drive shows up as more than one icon under My Computer.

The mapping between *mscdex*, which runs in Real mode, and the Windows 95 CD-ROM driver does not match. You can correct this in one of two ways:

- Comment out the line that loads *mscdex.exe* in the *autoexec.bat* file.
- Change the /L switch on the line that loads *mscdex.exe* in the *autoexec.bat* file so it assigns the CD-ROM drive the next highest logical drive letter after the hard disk drives.



File Location: D:\Production\511505-00 A 7800 FMS\7800-04.FM
Last Modified: June 19, 1997 9:27 pm

Adaptec 7800 Family Manager Set
Stock Number: 511505-00, Rev. A
Print Spec Number: 496814-00
Current Date: 6/19/97

Page: 4-8

ECN Date: 6/97

...5

Microsoft Windows NT Installation

This chapter explains how to install the Adaptec 7800 Family Manager Set Driver (*aic78xx.sys*) for Windows NT[™]—Windows NT 3.5x and 4.0. The driver (*aic78xx.sys*) supports the Adaptec 7800 Family host adapters listed on page 1-2.

If you are performing a first time Windows NT installation, see *Installing the Driver When Installing Windows NT* on page 5-2. If Windows NT is already installed in your system, see *Installing the Driver When Windows NT is Already Installed* on page 5-5.

Adaptec 7800 Family Manager Set

Installing the Driver When Installing Windows NT

A version of the *aic78xx.sys* driver is embedded (included) in the Windows NT 3.5x and 4.0 installation disks (or CD-ROM). During a normal Windows NT installation, the 7800 Family host adapter is detected in your system and the embedded *aic78xx.sys* driver is automatically installed.

We recommend first installing the embedded driver by completing a normal Windows NT installation. Once the Windows NT installation is complete, you can update the *aic78xx.sys* driver by following the instructions in *Installing the Driver When Windows NT is Already Installed* on page 5-5.

If you are booting from a 7800 Family host adapter and you are unable to install the embedded *aic78xx.sys* driver by performing a Windows NT installation, then follow the instructions below for completing a *fresh* Windows NT installation.

Completing a Fresh Windows NT 3.5x Installation

To complete a *fresh* Windows NT installation, and to install the *aic78xx.sys* driver from the 7800 Family Manager Set diskette for Windows NT, follow these steps:



Note: You may install Windows NT from a floppy drive or from a CD-ROM drive; whichever you choose, make sure the hardware installation is completed prior to following these steps.

- 1 If you choose to install Windows NT from a floppy drive, locate the Windows NT Setup Disk 1 for Floppy Installation.
If you are installing from a CD-ROM drive, locate the Windows NT Setup Disk 1 for CD-ROM Installation.
- 2 Insert the diskette into drive A (not drive B) and turn ON your computer. When prompted, insert Windows NT Disk 2.
- 3 From the Welcome to Setup Screen, press **Enter** to set up Windows NT.

Microsoft Windows NT Installation

- 4 When prompted, select **Custom** setup.



Note: If you select **Express** setup, the embedded *aic78xx.sys* driver included with Windows NT will be loaded and not the most recent version of driver available from the 7800 Family Manager Set diskette for Windows NT.

- 5 Press **S** to skip mass storage device detection. This allows you to manually select the driver for your host adapter.
- 6 Since mass storage device detection was skipped in the previous step, Windows NT Setup displays none in the list of recognized devices. Press **S** to configure additional SCSI adapters.
- 7 From the list of additional SCSI adapters, expand the list, select **Other**, and press **Enter**. (Requires disk provided by a hardware manufacturer).
- 8 Insert the Adaptec 7800 Family Manager Set diskette for Windows NT into drive A and press **Enter**.
- 9 The screen displays the adapter drivers supported on the diskette. For Windows NT 3.5x, the Adaptec AHA-294x/AHA-394x/AHA-4944 or AIC-78xx PCI SCSI Controller (NT 3.5x) driver is highlighted by default; press **Enter**.
- 10 If you want to add other host adapters that are not a part of the 7800 Family, do so at this time by repeating Step 7 for each additional adapter and inserting the appropriate disk provided by the hardware manufacturer. The Adaptec 7800 Family host adapters use the same driver; it is not necessary to install the *aic78xx.sys* driver again.
- 11 Press **Enter** to continue with the Windows NT operating system setup. Follow the instructions given onscreen and in the Windows NT installation documentation.

Adaptec 7800 Family Manager Set

Completing a Fresh Windows NT 4.0 Installation

To complete a *fresh* Windows NT 4.0 installation, and to install the *aic78xx.sys* driver from the 7800 Family Manager Set diskette for Windows NT, follow these steps:



Note: You may install Windows NT from a floppy drive or from a CD-ROM drive; whichever you choose, make sure the hardware installation is completed prior to following these steps.

- 1 Start your system with the Windows NT Boot Diskette in the floppy drive.
- 2 When prompted, insert diskette #2 in your floppy drive. After a few moments you will see a blue screen. To setup Windows NT now, press **Enter**.
- 3 Press **S** to skip auto-detection of your SCSI host adapter.
- 4 Press **S** again to specify an additional device.
- 5 Press **Enter** to select Others; insert the 7800 Family Manager Set diskette for Windows NT in your floppy drive.
- 6 Select the Adaptec AHA-294x/AHA-394x/AHA-4944 or AIC-78xx PCI SCSI Controller (NT 4.0) and press **Enter**.
- 7 If you want to add other host adapters that are not part of the 7800 Family, do so at this time by pressing **S** and repeating Step 5 for each additional adapter and inserting the appropriate disk provided by the hardware manufacturer. The Adaptec 7800 Family host adapters use the same driver; it is not necessary to install the *aic78xx.sys* driver again.
- 8 Press **Enter** to continue with the Windows NT operating system setup. Follow the onscreen instructions and in the Windows NT documentation to complete the installation.

Microsoft Windows NT Installation

Installing the Driver When Windows NT is Already Installed

To update or install the *aic78xx.sys* driver if Windows NT is already installed, follow the instructions below for the version of Windows NT you are installing.

Updating Windows NT 3.5x

- 1 Start the Windows NT Setup program. (Its icon is usually found in the Main program group.) There is a brief pause while Windows NT Setup scans your hardware configuration.
- 2 Select the **Options** pull-down menu and then select **Add/Remove SCSI Adapters**. The SCSI Adapter *setup* program displays a list of all host adapters currently installed.
- 3 Click the **Add** button to add another host adapter type to the list. A list of additional SCSI adapters appears.
- 4 Expand the list of additional SCSI adapters; select **Other** and press **Enter**. (Requires disk provided by the hardware manufacturer.)
- 5 Insert the Adaptec 7800 Family Manager Set diskette for Windows NT into drive A; enter one of the following paths to the installation files and then click **OK**.

a:\winnt\3_5)

The screen displays the adapter drivers supported on the diskette; the Adaptec AHA-294x/AHA-394x/AHA-4944 or AIC-78xx PCI SCSI Controller (NT 3.5x) driver is highlighted by default.

- 6 Click **OK**. The driver is added to the list of SCSI adapters.
- 7 Select the driver from the list of SCSI adapters and click **Install**.

At this point, Windows NT Setup checks to see if the specified driver (in this example, *aic78xx.sys*) has already been copied to the system disk.

Adaptec 7800 Family Manager Set

- 8** If the following message appears, click **New** to replace the existing driver and skip to Step 10.

The driver(s) for this SCSI Adapter are already on the system. Do you want to use the currently installed driver(s) or install new one(s).

If the following message appears, continue with Step 9.

Please enter the full path to the Windows NT SCSI Adapter files.

- 9** Change the path to the a:\winnt\3_5 directory, then click **Continue**.

The device driver is copied to your system disk and the Windows NT configuration is updated so that the new device driver loads when Windows NT reboots.

- 10** When the installation is complete, Windows NT Setup again displays a list of currently installed host adapter types. Verify that the new host adapter appears on the list. The text string should look similar to Adaptec AHA-294x/AHA-394x/AHA-4944 or AIC-78xx PCI SCSI Controller (NT 3.5x)
- 11** Add other types of host adapters if necessary (see Step 4 on page 5-5), or click **Close** to exit the SCSI adapters portion of Windows NT Setup, and then close the program.
- 12** When you see this message, click **OK** to exit:
- The changes you have made will not take effect until the computer is restarted
- If this message *does not* appear, no changes have been made to the Windows NT system configuration.
- 13** Restart your computer and Windows NT. It is possible that some drive letter assignments may change from the previous configuration.

Microsoft Windows NT Installation

Updating Windows NT 4.0

- 1 Start Windows NT.
- 2 Click the **Start** button on the Windows NT task bar, and then point to Settings.
- 3 Click the **Control Panel**.
- 4 Double-click the **SCSI Adapters** icon.
- 5 Click the **Drivers** tab, and then click the **Add** button.
- 6 In the Install Driver window, click the **Have Disk** button.
- 7 Insert the 7800 Family Manager Set diskette for Windows NT into drive A; enter the following path to the installation files and then click **OK**.

a:\winnt\4_0

The Adaptec AHA-294x/AHA-394x/AHA-4944 or AIC-78xx PCI SCSI Controller (NT 4.0) is highlighted by default.
- 8 In the Install Driver window, Click **OK**.
- 9 Click the **New** button when asked if you want to use the currently installed driver(s) or install new one(s).
- 10 Type a:\winnt\4_0 again, and click **Continue**. The driver is now installed.
- 11 You must restart your computer for the changes to take effect. Click **Yes** to restart your computer.

Adaptec 7800 Family Manager Set

Using Advanced Configurable Parameters

Advanced users may use software parameters to alter the configuration of the Windows NT device drivers supplied by Adaptec. All Windows NT configuration information is stored in a data structure called the Registry. You can edit this information through a tool called the Registry Editor.



Caution: Do not edit your registry unless it is absolutely necessary. If there is an error in your registry, your computer may become nonfunctional.

Using Windows NT SCSI Parameters

Follow the instructions below to enter the registry values that affect how the Windows NT SCSI manager interprets the generic configuration information of SCSI device drivers. All SCSI host adapters installed in your system are affected by the values you enter here. Valid values are



Note: The following value keys are case-sensitive and must be entered exactly as shown.

- **DisableTaggedQueuing**—A nonzero value indicates that the SCSI host adapter disables tagged queueing for SCSI devices. The data type for this value is REG_SZ.
- **DisableSynchronousTransfers**—A nonzero value indicates that the SCSI host adapter is not to initiate synchronous negotiations (but it may still accept negotiations initiated by a SCSI target). The data type for this value is REG_SZ.
- **DisableDisconnects**—A nonzero value indicates that targets are not permitted to disconnect during the execution of a SCSI command. The data type for this value is REG_DWORD.
- **MaximumLogicalUnit**—This can limit the scan for connected devices on the SCSI bus. Valid values are 1 to 8. If 1 is specified, the Windows NT SCSI manager assumes that no SCSI targets support LUNs other than 0. Otherwise, LUNs from 0 to 8 are scanned during system initialization. The data type for this value is REG_DWORD.

Microsoft Windows NT Installation

To enter Windows NT parameters, follow these steps:

- 1 Select **Run** from the File menu (Windows NT 3.5x), or **Run** from the Start button (Windows NT 4.0).
- 2 Type regedt32 and press **Enter**.
- 3 Open the registry list to the following location:

\HKEY_LOCAL_MACHINE\System\CurrentControlSet\
Services\aic78xx\Parameters\Device

If the \Parameters\Device keys already exist, skip to step 8 below to begin entering values. If the keys do not yet exist, you will need to create them by continuing with step 4.

- 4 Click on the aic78xx key.
- 5 Select **Add Key** from the Edit menu; Type Parameters in the Key Name edit box. Leave the Class edit box blank.
- 6 Click on the Parameters key.
- 7 Select **Add Key** from the Edit menu; Type Device in the Key Name edit box. Leave the Class edit box blank.

To specify a certain host adapter, append Device with the number of the host adapter. For example, type Device0 for the first host adapter, Device1 for the second, etc. If you omit the host adapter number, the configuration information applies to all 7800 Family host adapters.

- 8 Click on the Device key.
- 9 Select **Add Value** from the Edit menu. In the Value Name edit box, enter one of the valid parameter values. Make sure to enter the appropriate Data Type for the value. To enter additional values, repeat steps 8-9.



Note: Changes made with the Registry Editor do not take effect until you shut down and then restart your system.

Adaptec 7800 Family Manager Set

Using Driver-specific Parameters

To use the Registry Editor to enter *aic78xx.sys* driver-specific parameters that affect the configuration information for Adaptec SCSI PCI device drivers, follow the instructions below. Valid parameters are



Note: The following parameters are case-sensitive and must be entered exactly as shown. When entering multiple parameters, each parameter must be separated by a space.

- **/INSTRUMENTATION**—enables recording of I/O statistics and errors. If this option is not specified, instrumentation defaults to disabled. The data type for this value is REG_SZ.
- **/INSTR_ERRLOG_Z = *nnn***—sets the maximum number of error log entries, if /INSTRUMENTATION is enabled. If a number is not specified, the maximum number of error log entries defaults to 32. Valid values are 0-128. The data type for this value is REG_SZ.
- **/MAXIMUMSGLIST = *nnn***—specifies the maximum number of scatter-gather elements. If a number is not specified, the maximum number of scatter-gather elements defaults to 17. Valid values are 1-255. The data type for this value is REG_SZ.
- **/MAXTAGS = *nnn***—specifies the tagged command queue depth. If a number is not specified, the tagged queue depth defaults to 128. Valid values are 1-255. The data type for this value is REG_SZ.

Microsoft Windows NT Installation

To enter driver-specific parameters, follow these steps:

- 1 Select **Run** from the File menu (Windows NT 3.5x), or **Run** from the Start button (Windows NT 4.0).
- 2 Type regedt32 and press **Enter**.
- 3 Open the registry list to the following location:

`\HKEY_LOCAL_MACHINE\System\CurrentControlSet\
Services\aic78xx\Parameters\Device\DriverParameters`

If the `\Parameters\Device\DriverParameters` keys already exist, skip to step 10 below to begin entering parameters. If the keys do not yet exist, you will need to create them by continuing with step 4.

- 4 Click on the aic78xx key.
- 5 Select **Add Key** from the Edit menu; Type Parameters in the Key Name edit box. Leave the Class edit box blank.
- 6 Click on the Parameters key.
- 7 Select **Add Key** from the Edit menu; Type Device in the Key Name edit box. Leave the Class edit box blank.

To specify a certain host adapter, append Device with the number of the host adapter. For example, type Device0 for the first host adapter, Device1 for the second, etc. If you omit the host adapter number, the configuration information applies to all 7800 Family host adapters.

- 8 Click on the Device key.
- 9 Select **Add Value** from the Edit menu; type DriverParameters in the Key Name edit box. Enter REG_SZ as the Data Type and press **Enter**.
- 10 A String Editor text box appears. Enter valid parameters in the text box. When entering multiple parameters, each parameter must be separated by a space.



Note: Changes made with the Registry Editor do not take effect until you shut down and then restart your system.

Adaptec 7800 Family Manager Set

Using Windows NT and the Host Adapter

This section contains useful information on using Windows NT and your host adapter.

Removing a Host Adapter

Removing a host adapter can be as simple as physically removing it from the slot when your computer is shut down. Windows NT boots and functions properly in this configuration, but a warning message is generated every time you boot Windows NT.



Caution: If you have removed a host adapter but still have other host adapters of the same type installed in your computer, *do not* use Windows NT Setup to remove the device driver.

To eliminate the warning message, you must update the Windows NT software configuration, as described below:

Removing a Host Adapter in Windows NT 3.5x

- 1 Start the Windows NT Setup program. There is a brief pause while Windows NT Setup scans your hardware configuration.
- 2 Select the **Options** pull-down menu and then select **Add/Remove SCSI Adapters**. The SCSI Adapter *setup* program displays a list of all host adapters currently installed.
- 3 Select the host adapter you want to remove and click the **Remove** button. When the Windows NT Setup program asks you for confirmation, click **OK**.

Because SCSI device drivers are loaded during system bootup and because they may be needed to load Windows NT itself, a screen may appear warning you that Windows NT may not start if you remove the SCSI adapter.

- 4 If you are sure you are removing the correct host adapter type, click **OK**.
- 5 Return to Step 3 if you want to remove driver support for other types of host adapters, or click **Close** to exit the SCSI adapters portion of Windows NT Setup.

Microsoft Windows NT Installation

- 6 Close the Windows NT Setup program. When the following message appears, click **OK** to exit:

The changes you have made will not take effect until the computer is restarted.

If this message *does not* appear, no changes have been made to the Windows NT system configuration.

- 7 Restart the computer.



Note: Windows NT Setup does not delete the device driver from your system disk; it only updates Windows NT software configuration information so that the device driver is no longer loaded during system bootup.

Removing a Host Adapter in Windows NT 4.0

- 1 From the Control Panel, double-click the **SCSI Adapters** icon.
- 2 Click the **Drivers** tab.
- 3 Select the driver you are planning on removing. The driver appears as one of the following:
Adaptec AHA-294X/AHA-394x/AHA-4944 or AIC-78xx PCI SCSI Controller (NT 4.0)
or
Adaptec AHA-294x/AHA-394x or AIC-78xx PCI SCSI Controller
- 4 Click the **Remove** button.
- 5 If you are sure you are removing the correct host adapter type, click **Yes**.
- 6 Restart the computer.



Note: Windows NT Setup does not delete the device driver from your system disk; it only updates Windows NT software configuration information so that the device driver is no longer loaded during system bootup.

Adaptec 7800 Family Manager Set

Swapping a Host Adapter

Swapping a 7800 Family host adapter for a non-7800 Family host adapter is similar to the procedure for adding a host adapter. The important distinction is that you make all software configuration changes while Windows NT is running and before you make the hardware changes.

To swap adapters, follow these steps:

- 1 Install the driver for the 7800 Family host adapter by following the steps in *Installing the Driver When Windows NT is Already Installed* on page 5-5.

It is not essential to remove the device driver for the host adapter you are replacing. Windows NT dynamically detects the absence or presence of host adapter hardware, and no problems should arise if you leave the existing device driver installed. You may remove the device driver later, after you have successfully rebooted Windows NT. However, if you leave the driver installed, the system alerts you with an error message of the extra device driver every time you boot. See *Removing a Host Adapter* on page 5-12.

- 2 Once the new device driver is installed, shut down Windows NT and replace the existing host adapter with the 7800 Family host adapter.
- 3 Restart your computer and Windows NT. It is possible that some drive letter assignments may change from the previous configuration.

Microsoft Windows NT Installation

Troubleshooting

Problems and Solutions

I made changes to the host adapter configuration and Windows NT no longer boots! The boot manager for Windows NT contains recovery logic to allow you to return to the last known good configuration. If you have changed your host adapter configuration and Windows NT no longer boots, follow these steps to recover:

- 1 Undo any hardware changes you have made to the computer since it was last operational.
- 2 Reboot the computer. Watch the display carefully during bootup. If the following message appears, press the **Spacebar** and follow the instructions on the screen to continue booting with the last known good configuration:

Press spacebar NOW to invoke the Last Known Good menu
- 3 Once your computer is operational again, check all of the hardware and software configuration changes you want to make. Look specifically for conflicts with parts of the existing system configuration that are not being changed.

Error Codes

Error codes generated by the *aic78xx.sys* driver can be viewed by opening the Windows NT Event Viewer error logs.

To view events generated by the *aic78xx.sys* driver, follow these steps:

- 1 Double-click the **Event Viewer** icon in the Administrative Tools program group.

Error codes generated by the *aic78xx.sys* driver show up as Event ID 11. Error codes generated by the SCSI Port show up as Event ID 9.
- 2 To view event details, select **System** from the Log menu. Double-click the *aic78xx.sys* driver event that has an Event ID of 11. (There may be none or multiple *aic78xx.sys* driver events.)

The top portion of the Event Detail dialog box displays information such as the time that the event was generated, the

Adaptec 7800 Family Manager Set

computer on which the event occurred (in case of remote monitoring) and the description of the event. The Data section of the Event Details dialog box displays the error codes generated.

3 Click the **Words** radio button.

In the Data section of the dialog box, the entry in the second row and second column (to the right of the 0010: entry) lists the error code generated by the *aic78xx.sys* driver. The common error codes for the driver are described below.



Note: The entry in the third row of the last column identifies the SCSI ID of the device originating the error.

aic78xx.sys Error Codes

The following error codes are listed sequentially according to the last three digits of the code. For example, [xxxxx010], [xxxxx011], [xxxxx012], etc.



Note: When reporting problems to Customer Support, be sure to include the complete error code in your problem description.

[xxxxx004]

[xxxxx005]

[xxxxx006]

Command completed with error. A request issued to a target device completed with indication that there is an error. In most cases, the error is recovered and normal operations continues.

[xxxxx010]

Error issuing command. An error has occurred while the driver was setting up its internal data structures.

[xxxxx011]

Error issuing command. The requested command is not supported by this driver.

Microsoft Windows NT Installation

[xxxxx012]

Error issuing command. The driver does not recognize the target device.

[xxxxx021]

Device protocol error. An unexpected event occurred during data transfer between the adapter and target device. Normally, this indicates a faulty or non-compliant target device.

[xxxxx022]

Adapter or target device protocol error. The adapter or target device has broken the communication protocol. A badly behaving device could be cause this message to appear. Normally this is not a serious problem. If you get this message frequently over a short period of time, it could indicate that the device or system is malfunctioning. Unplug or power down unused devices to see if the problem persists.

[xxxxx023]

Target device parity error. The driver has detected a parity error by the target device.

[xxxxx024]

Data overrun or underrun. The adapter was given more or less data than the expected amount of data.

[xxxxx031]

Target device queue full. The target device internal buffer is full.

[xxxxx032]

Target device busy. The target device reports a busy status. Another program may already be using this device.

[xxxxx050]

Host adapter failure. Your host adapter may not be properly installed or is defective. Try re-seating the adapter in the PCI slot, or try installing it a different PCI slot.

[xxxxx081]

Adapter initialization failure. An error has occurred while the driver was setting up its internal data structures. Verify that your adapter is supported by this version of the driver.

Adaptec 7800 Family Manager Set

[xxxxx089]

Unable to allocate memory. This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.

[xxxxx096]

Adapter hardware initialization failure—possible resource conflict. The driver has attempted to initialize the adapter hardware but failed. This might suggest that the adapter resources (e.g., IRQ) conflict with another board installed in your system.

[xxxxx097]

Unable to allocate memory. This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.

[xxxxx0af]

Unable to de-allocate memory that was allocated for a target device. Normally, this is not a serious problem, unless you get this message frequently over a short period of time. The memory can be reclaimed by rebooting the system.

[xxxxx0ce]

Scatter Gather Limit exceeded. An I/O request packet from the system contained a Scatter Gather element list that contained more elements than are supported by the miniport. Scatter Gather is a list of data segments that define the entire data transfer. Scatter Gather is a means to improve total data throughput. This error might be caused by a component external to the miniport driver, such as the operating system or an ASPI application.

[xxxxxd4]

Adapter hardware failure - adapter reset. The host adapter hardware failed and the miniport has to reset the hardware.

Microsoft Windows NT Installation

[xxxxx0d6]

Internal driver error. An error has occurred while the driver was setting up its internal data structures. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.



File Location: D:\Production\511505-00 A 7800 FMS\7800-05.FM
Last Modified: June 19, 1997 9:28 pm

Adaptec 7800 Family Manager Set
Stock Number: 511505-00, Rev. A
Print Spec Number: 496814-00
Current Date: 6/19/97

Page: 5-20

ECN Date: 6/97

...6

SCO UNIX Installation

This chapter explains how to install the Adaptec 7800 Family Manager Set Driver (*alad* or *alad325*) for SCO UNIX—SCO UNIX 3.2v4.2, SCO OpenDesktop 3.0 (ODT 3.0), SCO OpenServer 3.0, and SCO OpenServer 5.

The *alad* driver (or package) is used with SCO UNIX 3.2v4.2 based products (SCO UNIX 3.2v4.2, SCO ODT 3.0, or SCO OpenServer 3.0). The *alad325* driver (or package) is used with SCO OpenServer 5. Both drivers support the Adaptec 7800 Family host adapters listed on page 1-2.

If you are performing a first time SCO UNIX installation, see *Installing the Driver When Installing SCO UNIX* on page 6-2 to begin driver installation. If SCO UNIX is already installed in your system, see *Installing the Driver When SCO UNIX is Already Installed* on page 6-4.



Note: If you are installing SCO UNIX products with a SCSI tape drive, set the tape drive to SCSI ID 2; if you are installing with a CD-ROM, set the CD-ROM drive to SCSI ID 5 as recommended by SCO.

Adaptec 7800 Family Manager Set

Installing the Driver When Installing SCO UNIX

To install the *alad* or *alad325* driver at the same time you install SCO UNIX, follow the instructions below for the version of SCO UNIX you are installing.

Installing SCO UNIX 3.2 v4.2, SCO ODT 3.0, or SCO OpenServer 3.0

Follow these instructions only if you are installing SCO UNIX 3.2v4.2, SCO ODT 3.0, or SCO OpenServer 3.0 for the first time. The instructions for installing the driver are the same for these SCO products.



Note: Remember that UNIX commands are *case sensitive*. Enter the commands exactly as shown in the instructions.

- 1 Insert the SCO UNIX N1 (Boot) floppy diskette into the primary floppy drive and turn ON the computer.
- 2 When you see these prompts

```
SCO UNIX System V/386
Boot
:
```

type link and press **Enter**.



Note: Do not use the link command to install the driver for SCO OpenServer 5. See *Installing SCO OpenServer 5* on page 6-4.

- 3 Type *alad* as the package you want linked to the system and press **Enter**.
- 4 Insert the requested volume (7800 Family Manager Set diskette for SCO UNIX) in the floppy drive and press **Enter**. Prompts similar to the following appear until the driver is completely loaded:

SCO UNIX Installation

```
alad.alad>Loading module fd(52)/alad/driver/alad/Driver.o
.text .....
:
:
alad: Driver "alad" successfully loaded.
```

- 5 When prompted to insert the SCO UNIX N2 (Filesystem) diskette, remove the 7800 Family Manager Set diskette for SCO UNIX from the floppy drive, and then insert the SCO UNIX N2 (Filesystem) diskette and press **Enter**.
- 6 Follow the procedures in your SCO UNIX documentation for completing the installation until you have reached and completed the Password procedure.



Note: For SCO UNIX 3.2v4.2 only. When the run-time installation is complete, make sure you select the **Install Additional Software** option. This ensures that the *Link Kit* is installed and available for later driver integration.

- 7 After completing the Password procedure, a message similar to the following appears:

```
The BTLD packages will now be added to the Link Kit.
The following packages are on this disk.
NAME  DESCRIPTION
alad   Adaptec 7800 Family Driver for SCO UNIX 3.2v4.2/dxx
alad325 Adaptec 7800 Family Driver for SCO OpenServer 5/dxx

Please enter the names of the packages you
wish to install or q to quit:___
[default: alad]
```

- 8 Type `alad` and press **Enter**. The *alad* driver for your 7800 Family host adapter has been relinked to the SCO UNIX kernel.

Installation is complete!

Adaptec 7800 Family Manager Set

Installing SCO OpenServer 5

A version of the *alad325* driver is embedded (included) in the SCO OpenServer 5 installation diskettes (or CD-ROM). Follow the procedures in your SCO OpenServer 5 documentation to perform the initial installation (regular non-BTLD installation) of the embedded *alad325* driver. If you then wish to update the embedded *alad325* driver to the version of the *alad325* driver provided with the 7800 Family Manager Set, follow the instructions in *Installing the Driver When SCO UNIX is Already Installed* on page 6-4.



Note: Do not use the link command to install the driver.

If you are unable to install the embedded *alad325* driver during the initial installation of SCO OpenServer 5, see *Troubleshooting* on page 6-11.

Installing the Driver When SCO UNIX is Already Installed

To update or install the *alad/alad325* driver if SCO UNIX is already installed, follow the instructions in this section. The procedures are similar for all versions of SCO UNIX. Procedures that are specific to a SCO version are noted when necessary.



Caution: Improper or corrupt driver updates might *destroy* your existing UNIX file system. Back up all important files before proceeding.

Installing or updating the driver involves the following tasks, which must be completed in the order presented:

- *Performing a System Backup*—Backs up the old UNIX kernel and any other important files.
- *Using the Install Package*—Uses *installpkg* to load the driver.
- *Modifying the mscsi File*—Changes the primary host adapter to a 7800 Family host adapter, if necessary.

SCO UNIX Installation

- *Rebuilding the UNIX Kernel*—Rebuilds the kernel to reflect the new changes.
- *Booting the New Kernel*—Reboots the computer with the new kernel.



Note: To update/install the driver, you must first enter the Single User Mode (System Maintenance Mode). Refer to the SCO UNIX documentation for instructions on how to use the `init(m)` or `shutdown(m)` command to bring the system to System Maintenance Mode.

Performing a System Backup

If you have not already done so, back up all important files on the computer by following these steps:



Note: To back up the whole system, refer to your SCO UNIX documentation.

- 1 Login as root.
- 2 *For SCO 3.2v4.2 based UNIX:* To back up the current kernel configuration, type the following and press **Enter**:

```
cp /unix /unix.orig
```

For SCO OpenServer 5: To back up the current kernel configuration, type the following and press **Enter** after each line:

```
umount /stand  
mount /dev/boot /stand  
cp /stand/unix /stand/unix.orig
```



Note: If you ever need to bootup from the pre-update kernel, load the *unix.orig* backup kernel at the UNIX Boot: prompt. To do this, type `unix.orig` and press **Enter**.

Adaptec 7800 Family Manager Set

- 3 This step is optional. For extra security, you may back up the *mdevice* file and the *sdevice.d* directory. To perform this backup, type the following and press **Enter**:

```
copy -rom /etc/conf /etc/conf.bak
```

Using the Install Package

To load the driver using *installpkg*, follow these steps:

- 1 At the UNIX system prompt, type *installpkg* and press **Enter**. The screen then displays these messages:

```
Confirm
Please insert the floppy disk
:
:
Strike ENTER when ready
or ESC to stop.
```

- 2 Insert the 7800 Family Manager Set diskette for SCO UNIX and press **Enter**. The screen then displays these messages:

Installation is in progress — do not remove the floppy disk.

The following packages are on this disk:

NAME	DESCRIPTION
alad	Adaptec 7800 Family Driver for SCO UNIX 3.2v4.2/dxx
alad325	Adaptec 7800 Family Driver for SCO OpenServer 5/dxx

Please enter the names of the packages you wish to install, or q to quit:

- 3 At this point, type *alad* (or *alad325* for SCO OpenServer 5) and press **Enter**. The screen then displays this message and various installation status prompts:

```
Installing alad
```

When the driver is done loading, the following appears:

```
Installed alad
#
```

The *alad*/*alad325* driver has now been loaded into the *Link Kit* for kernel addition.

Modifying the mscsi File

If necessary, to change your primary host adapter to a 7800 Family host adapter, follow these steps:

- 1 Enter this command:

```
cd /etc/conf/cf.d
```

- 2 Enter this command to copy the file:

```
cp mscsi mscsi.org
```

- 3 Use a text editor to edit this file. Enter the following command if using the vi editor:

```
vi mscsi
```

- 4 Search for all entries with the host adapter number 0 (zero). The host adapter number is the third column in each entry. For example:

Host Adapter Prefix	SCSI Device Type	Host Adapter Number	Target ID	Logical Unit Number	Bus ¹
xx	Stp	0	2	0	0
xx	Sdsk	0	0	0	0
xx	Srom	0	5	0	0

¹ This field applies to SCO OpenServer 5 only.

- 5 Modify the *mscsi* file according to your hardware setup:

- If you are booting from a 7800 Family host adapter, make sure the host adapter prefix for the host adapter number 0 is *alad*.
- If you are not booting from a 7800 Family host adapter, make sure the host adapter prefix for the host adapter number 0 is the appropriate prefix for each device on your primary Adaptec host adapter. See the table below:

Host Adapter Prefix	Type of Driver	Primary Adaptec Host Adapter
ad	embedded	AHA-1540/1640 family
eiad	embedded	AHA-1740 family
spad	embedded	AIC-6260 family
arad	BTLD	AIC-7770 family
smad	BTLD	AIC-6260/6360 family

Adaptec 7800 Family Manager Set

- 6 Save the file and exit the text editor.

Rebuilding the UNIX Kernel

To rebuild the UNIX kernel with the new changes, follow these steps:

- 1 Type the following at the # prompt and press **Enter** after each line:

```
cd /etc/conf/cf.d  
./link_unix
```

Status messages appear.

- 2 When the kernel has been built, shut down the system by typing **haltsys** and pressing **Enter**.
- 3 Turn OFF the system power when you are prompted to do so.

The UNIX kernel has been prepared for 7800 Family host adapter operation.

Booting the New Kernel

To reboot the computer with the new kernel, follow these steps:

- 1 Follow the onscreen instructions to reboot your system, usually by pressing **Enter**.
- 2 Check the host adapter BIOS messages to verify that all your installed SCSI devices are listed.

If some or all of your installed SCSI devices do not appear at this time, your SCSI cables may be loose, or the SCSI device setup may not be complete. If so, go back and correct any problem before proceeding.

- 3 Wait for UNIX to complete bootup with the new kernel.

Refer to *Troubleshooting* on page 6-11 if the system crashes or if panic (UNIX error) messages are displayed during bootup.

The *alad/alad325* driver for your 7800 Family host adapter should now be ready for use.

Using SCO UNIX and the Host Adapter

This section contains useful information on using SCO UNIX and your host adapter.

Using Multiple Host Adapters

If you are adding an additional 7800 Family host adapter to a system with a 7800 Family host adapter already installed, follow the instructions in the SCO UNIX documentation for adding devices using the `mkdev` command. When the system asks for the host adapter prefix, type `alad` and press **Enter**.

Changing the Boot Disk

If you are changing the boot device from a non-SCSI hard disk to a SCSI hard disk attached to an Adaptec 7800 Family host adapter, you must reinstall SCO UNIX.

If you are already booting from a SCSI hard disk and wish to boot from a SCSI hard disk attached to an Adaptec 7800 Family host adapter, you may elect to either reinstall SCO UNIX with the new driver (see *Installing the Driver When Installing SCO UNIX* on page 6-2), or update SCO UNIX with the new driver (see *Installing the Driver When SCO UNIX is Already Installed* on page 6-4).

Using Wide SCSI Host Adapters and Devices

SCO UNIX 3.2v4.2, SCO ODT 3.0, and SCO OpenServer 3.0 support SCSI IDs 0 to 7; SCSI IDs greater than 7 are not recognized. If your 7800 Family host adapter is a Wide SCSI adapter, only 7 SCSI devices (SCSI ID 0 to 6, with the host adapter set at SCSI ID 7) can be attached and supported.

SCO OpenServer 5 supports SCSI IDs 0 to 15. If your 7800 Family host adapter is a Wide SCSI adapter, up to 15 SCSI devices can be attached and supported.

Adaptec 7800 Family Manager Set

Using Tunable Parameters for the *alad* Driver

For SCO UNIX, some parameters are defined in the following file:

```
/etc/conf/pack.d/alad/space.c
```

These parameters can be tuned for the *alad/alad325* driver. After modifying the *space.c* file, you must rebuild the kernel for the new parameters to take effect. The following section describes how to set the tunable parameters.

Setting Parameters

If the *space.c* file has not been modified, all the parameters are set according to the *SCSISelect* utility for your 7800 Family host adapter. However, you can override the parameters by modifying the *space.c* file. Changing the parameters is self-explanatory in the *space.c* file. Examples are provided in the following sections.

If you want to change the configured values, the first number indicates whether the default should be changed. If it is set to 0 (zero), the parameter is set to the default. If it is set to 1, the second number is used to override the default. For example:

```
char variable = {1,22};
```

The first number is 1 which overrides the default variable with the value 22.

Examples

- *alad_parity[SCSI_NALAD]*—specifies whether the host adapter checks parity on incoming SCSI data. If the second number is set to 0, parity checking is enabled. If it is set to 1, parity checking is disabled.
- *alad_parity[SCSI_NALAD]*—in this example you want the host adapter *not* to check parity on incoming SCSI data; define parameters as

```
alad_parity[SCSI_NALAD] = {1,0};
```


SCO UNIX Installation

Enabling Scatter/Gather and Tagged Queuing

The *alad*/*alad325* driver supports scatter/gather and tagged queuing; however, the *Sdsk* (SCSI disk module) driver controls whether these features are enabled or disabled. Look for the *Sdsk* driver controls in the *space.c* file. It is located at

`/etc/conf/pack.d/Sdsk/space.c`

Troubleshooting

Problems and Solutions

I cannot install the embedded *alad325* driver during the initial installation of SCO OpenServer 5.

If you are unable to install the embedded *alad325* driver during the initial installation of SCO OpenServer 5 only, try completing the following steps:

- 1 Insert the SCO UNIX Boot floppy diskette into the primary floppy drive and turn ON the computer.
- 2 When you see these prompts

```
SCO OpenServer (TM) Release 5
Boot
:
```

type `ahslink` and press **Enter**.



Note: Do not use the `link` command to install the driver.

- 3 Type *alad325* as the package you want linked to the system and press **Enter**.

Adaptec 7800 Family Manager Set

- 4 Insert the requested volume (i.e., the 7800 Family Manager Set diskette for SCO UNIX) in the floppy drive and press **Enter**. Several messages appear including a message similar to

Table "io_init" contains (at 21) another routine named "aladinit."

Please enter

Which (0-40) to replace ('?' to list),
'a' to add "aladinit" at the end [default]/
'n' to do nothing
or 'q' to quit:

- 5 Enter the corresponding number for "aladinit." In the above example, the number 21 appears in the Table "io_init" contains (at 21) another routine named "aladinit" message, and is the number that should be entered. If you are unsure of which number to use, enter a "?" to list possible values; use the number that is listed next to "aladinit." Once you enter the number, prompts similar to the following appear until the driver is completely loaded:

```
alad.alad:Loading module fd(52)/alad/driver/alad/Driver.o
.text .....
:
:
alad325: Driver "alad" successfully loaded.
```

- 6 Insert the Boot floppy diskette and press **Enter**.

Follow the procedures in your SCO UNIX documentation for completing the installation.

In SCO OpenServer 5, my system hangs after I have installed the driver and rebooted the system.

You may have to install the SCO OpenServer 5 keyboard patch (available from the SCO Web site or BBS) at the same time you install the *alad325* driver. To install the keyboard patch at the same time you install SCO OpenServer 5 and the *alad325* driver, type the following instead of the *ahslink* command described above:

```
defbootstr ahslink = "kbp alad325"
```

Follow the onscreen instructions to insert the SCO keyboard patch diskette (kbp) and the 7800 Family Manager Set diskette for SCO UNIX when instructed.

SCO UNIX Installation

I have problems using my SCSI devices.

During bootup, check to see if the BIOS messages for your primary 7800 Family host adapter lists all installed SCSI devices. If some or all devices do not appear, check the following (also check your host adapter's *User's Guide* for additional troubleshooting information):

- Are all SCSI devices powered?
- Are all SCSI bus cables and power cables properly connected?
- Do the host adapter and all devices on the SCSI bus have unique SCSI IDs?
- Are all devices on the SCSI bus terminated properly?
- Do you have an older SCSI peripheral installed? Some older SCSI peripherals, especially CD-ROM drives, do not properly respond to synchronous negotiation. As a result, these peripherals may lock or reset the SCSI bus. To solve this problem, turn off synchronous negotiation for this device ID through the *SCSISelect* utility for the host adapter. See the host adapter's *User's Guide*.

My computer does not recognize my host adapter.

During bootup, check to see if the BIOS messages for your primary 7800 Family host adapter appears. If it does not appear, the host adapter may not be properly configured; check the following:

- The 7800 Family host adapter supports level-triggered interrupts and can share the same interrupt with another 7800 Family host adapter or PCI hardware that also supports level-triggered interrupts. Check your host adapter's *User's Guide* and your computer documentation for details in configuring IRQs and other parameters in the system CMOS setup.
- The Boot host adapters should be installed into the lowest PCI Device number. The Device number is determined by the slot number on the PCI bus.

To find out the Device number of your 7800 Family host adapter(s), run the *SCSISelect* utility (by pressing a key combination displayed onscreen at bootup). Look on the first screen of *SCSISelect* in the upper right hand corner for Bus:Device xx:xxh (given in hex).

Adaptec 7800 Family Manager Set

If the Device number is high, power OFF the computer, move the 7800 Family host adapter to a PCI slot at the other end of the motherboard, and rerun *SCSISelect* to see if the number is lower.

The host adapter LED lights during activity. This light helps to determine which adapter *SCSISelect* displays information for. Refer to your system documentation for further details on determining the PCI slot number and slot number order in the system.

I am having problems booting the computer from a SCSI drive.

- Make sure your host adapter is installed and configured correctly, as described in your host adapter's *User's Guide*. Here are some of the things you should check:



Note: If both SCSI and non-SCSI (e.g., IDE) disk drives are installed, then the non-SCSI disk drive is always the boot device.

- Be sure the Drives setting (in your computer's CMOS setup program) that corresponds to the SCSI boot drive is set to **None** or **No Drives Installed**, as is required for SCSI hard disk drives. (See your computer's documentation.)
- Be sure the Host Adapter BIOS setting in the *SCSISelect* utility is enabled.
- Be sure the Extended BIOS Translation feature in the *SCSISelect* utility is enabled. The host adapter BIOS automatically selects the correct translation method as needed.
- Examine the SCO UNIX *mscsi* file to make sure the correct host adapter and device are specified as the *boot entry*. The boot entry is the first all zero entry in the *mscsi* file (see *Modifying the mscsi File* on page 6-7 for additional information)

For SCO 3.2v4.2 based UNIX, the boot entry looks like this:

```
alad      Sdsk      0      0      0
```

SCO UNIX Installation

For SCO OpenServer 5, the boot entry looks like this:

```
alad325 Sdk 0 0 0 0
```



Note: Each field is separated by a tab (do not use the spacebar to separate fields).

The meaning of each field is as follows:

Host Adapter Prefix	SCSI Device Type	Host Adapter Number	Target ID	Logical Unit Number	Bus ¹
alad	Sdk	0	0	0	0

¹ This field applies to SCO OpenServer 5 only.

- **Host Adapter Prefix**—Identifies the name of the host adapter driver. If you are booting from a 7800 Family host adapter, the Host Adapter Prefix must be *alad*.
- **SCSI Device Type**—Identifies the type of SCSI device. For example, Sdk indicates that the device is a hard disk; Srom indicates a CD-ROM drive; and Stp indicates a tape drive.
- **Host Adapter Number**—Identifies the SCSI host adapter that the SCSI device is attached to. For example, the first 7800 Family host adapter is 0, the second 7800 Family host adapter is 1.
- **Target ID**—Identifies the SCSI ID of the SCSI device.
- **Logical Unit Number**—Identifies the Logical Unit Number (LUN) of the SCSI device. This field is usually 0.
- **Bus**—Identifies the SCSI bus that the SCSI device is attached to. For most single channel devices such as the AHA-2940/2940W, the bus number is 0.

If you need to edit the *mcsdi* file, use the vi editor. You must build a new kernel in order for any changes to take effect (see *Rebuilding the UNIX Kernel* on page 6-8).

Adaptec 7800 Family Manager Set

- If you are booting from a 7800 Family host adapter and are using ISA/EISA-based host adapters as secondary devices, you must disable the BIOS on all ISA/EISA-based host adapters.

If you are booting from ISA/EISA-based host adapters and are using a 7800 Family host adapter as a secondary device, see your ISA/EISA-based host adapter documentation to ensure the host adapter is at the lowest BIOS base address. ISA/EISA-based host adapters boot before the 7800 Family host adapters.

My computer crashes or displays panic messages during the bootup procedure.

You may have to boot from the backup kernel created earlier. To boot from the backup kernel, follow these steps:

- 1 Reboot the system.
- 2 At the Booting UNIX System... prompt, type `unix.orig` and press **Enter**.

Your system should now boot from the backup kernel you created prior to the driver update.

Error Messages

The error messages listed below are the messages associated with the *alad/alad325* driver. Messages are listed sequentially according to the last three digits of the error code. For example, [xxxxx020], [xxxxx021], [xxxxx022], etc.



Note: When reporting problems to Customer Support, be sure to include the complete error code in your problem description.

[xxxxx020] Adapter or target device not responding or not connected

The target device did not respond to the adapter. If the device is present, refer to your host adapter's user's guide for troubleshooting information. If the device is no longer connected to the system, ignore this error.

SCO UNIX Installation

[xxxxx022] Adapter or target device protocol error

The adapter or target device has broken the communication protocol. A badly behaving device could be cause this message to appear. Normally this is not a serious problem. If you get this message frequently over a short period of time, it could indicate that the device or system is malfunctioning. Unplug or power down unused devices to see if the problem persists.

[xxxxx030] Target device busy

[xxxxx032] Target device busy

The target device reports a busy status. Another program might already be using this device.

[xxxxx09D] Unexpected interrupt

The Adaptec driver received an interrupt from the system that does not correspond to any adapter supported by the driver. This could be caused by another host adapter from a different vendor, such as a video card or a network card. The problem can also be caused by malfunctioning hardware.

[xxxxx0a3] Adapter diagnostic failure - possible resource conflict

The driver failed the internal software or hardware diagnostic. Refer to your host adapter's user's guide for troubleshooting information.

[xxxxx0ca] Cannot initialize device

The system, host adapter, or target device is busy or is not responding. The target device could not be initialized.

[xxxxx0cb] Unable to allocate memory. Decrease alad_instr_buffersz in space.c

The driver has requested a larger buffer size than the available RAM. Either increase the amount of RAM in the system, or decrease the user option alad_instr_buffersz in the */etc/conf/pack.d/alad/space.c* file.

[xxxxx0cc] CONFLICT: Disconnection must be enabled in order for tag-queueing to work

Use the SCSISelect utility of your host adapter to enable Disconnection for each device reporting this message. Alternatively, disable tagged queuing in */etc/conf/pack.d/alad/space.c* file by setting alad_do_tagged = 0. If tagged queuing is disabled, performance may be negatively affected.



File Location: D:\Production\511505-00 A 7800 FMS\7800-06.FM
Last Modified: June 19, 1997 9:30 pm

Adaptec 7800 Family Manager Set
Stock Number: 511505-00, Rev. A
Print Spec Number: 496814-00
Current Date: 6/19/97

Page: 6-18
ECN Date: 6/97



SCO UnixWare Installation

This chapter explains how to install the Adaptec 7800 Family Managers Set Driver (*ads/20* or *ads/*) for SCO UnixWare—SCO UnixWare 2.0x and SCO UnixWare 2.1.

The *ads/20* driver (or package) is used with SCO UnixWare 2.0x. The *ads/* driver (or package) is used with SCO UnixWare 2.1. Both drivers support the Adaptec 7800 Family host adapters listed on page 1-2.

If you are performing a first time SCO UnixWare installation, see *Installing the Driver When Installing SCO UnixWare* on page 7-2 to begin driver installation. If SCO UnixWare is already installed in your system, see *Installing the Driver When SCO UnixWare is Already Installed* on page 7-3.

Adaptec 7800 Family Manager Set

Installing the Driver When Installing SCO UnixWare

To install the *ads120/ads1* driver at the same time you install SCO UnixWare, follow the instructions below. The procedures are the same for SCO UnixWare 2.0x and 2.1.

- 1 Insert the Install diskette of the SCO UnixWare package into the floppy boot drive. Reboot your computer.

Wait for the first SCO UnixWare installation screen and prompt to appear, then follow the onscreen instructions.
- 2 When prompted to either Install Host Bus Adapter Drivers or Continue Installation, first remove the Install diskette, then select **Install Host Bus Adapter Driver** and press **Enter**.
- 3 Insert the 7800 Family Manager Set diskette for UnixWare 2.x into the primary floppy drive and press **Enter** (you cannot load drivers from a secondary floppy drive).

As the driver loads, a message identifying the installed host adapter briefly appears on screen. The installation process determines which device drivers on the diskettes are needed.
- 4 If you have additional HBA diskettes, insert the next HBA diskette, select **Install Another HBA Diskette**, and press **Enter**.

If all of your HBA diskettes have been installed, remove the last HBA diskette, select **Continue Installation**, and press **Enter**.
- 5 If necessary, enter the DCU (Device Configuration Utility) to view/change the SCO UnixWare device driver configuration data.
- 6 Follow the onscreen instructions to continue with installation. Refer to the SCO UnixWare documentation and onscreen help files for help in choosing options.



Note: If your installation fails, *do not* attempt to use the update installation pkgadd procedure to fix the installation. Follow the instructions in the SCO UnixWare documentation and in this document to retry the installation.

Installing the Driver When SCO UnixWare is Already Installed

To update or install the *ads/20/ads/* driver if SCO UnixWare is already installed, follow the instructions in this section. The procedures are similar for SCO UnixWare 2.0x and 2.1. Procedures that are specific to a SCO UnixWare version are noted when necessary.



Caution: Improper or corrupt driver updates might *destroy* your existing SCO UnixWare file system. Back up all important files before proceeding. Consult your SCO UnixWare documentation for proper backup procedures.

Installing or updating the driver involves the following tasks, which must be completed in the order presented:

- *Backing Up the Computer*—Backs up the old SCO UnixWare kernel and any other important files.
- *Loading the Package*—Uses *pkgadd* to load the 7800 Family driver package.
- *Modifying the New System File*—For computers booting from a device connected to a 7800 Family host adapter, modifies the new driver that was loaded in the previous procedure. Loading the driver causes the driver to become a permanent part of the new boot kernel on rebuild.
- *Rebuilding the SCO UnixWare Kernel*—Rebuilds the kernel with the new driver.
- *Booting the New Kernel*—Reboots the computer with the new kernel.



Note: Remember that SCO UnixWare commands are *case sensitive*. Enter the commands exactly as shown here.

Adaptec 7800 Family Manager Set

Backing Up the Computer

If you have not already done so, back up all important files on the computer. See your SCO UnixWare documentation for proper SCO UnixWare file system backup procedures.

- 1 Login as root at the UnixWare # system prompt.
- 2 To back up the old SCO UnixWare kernel, type the following and press **Enter**:

```
cp /stand/unix /stand/unix.work
```

- 3 To back up the old configuration file, type the following and press **Enter**:

For SCO UnixWare 2.0x:

```
cp /etc/conf/sdevice.d/adsl20 /save/adsl20
```

For SCO UnixWare 2.1:

```
cp /etc/conf/sdevice.d/adsl /save/adsl
```

Loading the Package

To load the driver, follow these steps:

- 1 At the system prompt, type the following and press **Enter**:

```
pkgadd -d diskette1
```

Follow the instructions onscreen to insert the IHV HBA diskette (or 7800 Family Manager Set diskette for UnixWare 2.x) into the floppy boot drive.

- 2 Select the *adsl20/adsl* package from the onscreen menu and press **Enter**. The package is loaded into your SCO UnixWare operating system.
- 3 When the package has loaded, you may be prompted to install the diskette again.

Do not reinsert the IHV HBA diskette (or Adaptec 7800 Family Manager Set diskette for UnixWare 2.x). Instead, type q (quit) and press **Enter**.

- 4 Type mail and press **Enter**. The mail messages tell you if the installation was successful.

SCO UnixWare Installation

If a mail message informs you that the installation has failed, turn to *Troubleshooting* on page 7-9.

- 5 Type `pkginfo` and press **Enter**.
- 6 Verify that the `adsl20/adsl` driver is now listed. The `adsl20/adsl` driver appears among the other installed packages.

If the `adsl20/adsl` driver does not appear in the `pkginfo` listing, turn to *Troubleshooting* on page 7-9.

The listing should be similar to

```
system  adsl  Adaptec AIC-7870 PCI SCSI IHV HBA
```

Modifying the New System File

If your computer *is not to boot* from the host adapter SCSI bus, and you wish to leave the driver as a loadable module, skip to *Rebuilding the SCO UnixWare Kernel* on page 7-6.

If your computer *is to boot* from a device connected to a 7800 Family host adapter, follow these steps to modify the new driver system file that was loaded in the previous section.

- 1 Back up the `adsl20/adsl` SCO UnixWare configuration file. To do this, type the following and press **Enter** after each line:

For SCO UnixWare 2.0x:

```
cd /etc/conf/sdevice.d  
cp adsl20 /save/adsl20.org
```

For SCO UnixWare 2.1:

```
cd /etc/conf/sdevice.d  
cp adsl /save/adsl.org
```

- 2 To restore the configuration file, type the following and press **Enter**:

For SCO UnixWare 2.0x:

```
cp /save/adsl20 /etc/conf/sdevice.d/adsl20
```

For SCO UnixWare 2.1:

```
cp /save/adsl /etc/conf/sdevice.d/adsl
```

Adaptec 7800 Family Manager Set

- 3 Display the contents of the *adsl20/adsl* file by typing the following and pressing **Enter**:

For SCO UnixWare 2.0x:

```
cat adsl20
```

For SCO UnixWare 2.1:

```
cat adsl
```

Verify that the line \$static is present immediately below the line \$version 2.

Rebuilding the SCO UnixWare Kernel

To rebuild the UnixWare kernel with the new changes, follow these steps:

- 1 Type the following at the # prompt and press **Enter** after each line:

```
cd /etc/conf/bin  
./ldbuild -B
```

Status messages appear.

- 2 When the kernel has been built, type the following and press **Enter** after each line (0 in -g0 is zero, not the letter O):

```
cd /etc/conf/cf.d  
cp unix /stand/unix  
cd /  
shutdown -g0
```

- 3 Type y and press **Enter** when the computer asks if you really want to shut down. System Is Down should appear on the screen.

The SCO UnixWare kernel is now ready for host adapter operation.

Booting the New Kernel

To reboot the computer with the new kernel, follow these steps:

- 1 Follow the onscreen instructions (usually by pressing **Enter**) to reboot your computer.
- 2 Check the bootup messages to verify that all your installed SCSI devices are listed.

SCO UnixWare Installation

If some or all of your installed SCSI devices do not appear at this time, your SCSI cables may be loose, or the SCSI device setup may not be complete. If so, go back and correct any problems before proceeding.

- 3 Wait for SCO UnixWare to complete bootup with the new kernel.

Refer to *Troubleshooting* on page 7-9 if the computer crashes or if panic (SCO UnixWare error) messages appear during bootup.

The updated driver for SCO UnixWare should now be ready to use.

Using SCO UnixWare and the Host Adapter

This section contains useful information on using SCO UnixWare and your host adapter.

Using Tunable Parameters

For SCO UnixWare, some parameters are defined in the following files:

```
/etc/conf/pack.d/adsI/space.c
```

These parameters can be tuned for the *adsI20/adsI* driver. Please refer to the comments in the appropriate *space.c* file for a description of these parameters. After modifying the *space.c* file, you must rebuild the kernel then reboot the system for the new parameters to take effect. To rebuild the kernel, type the following, and press **Enter** after each line:

```
/etc/conf/bin/idbuild -B  
cp /etc/conf/cf.d/unix /stand/unix
```



Note: The *adsI20/adsI* driver supports tagged queuing and reinitialization.

Adaptec 7800 Family Manager Set

Using Multiple Host Adapters

When using multiple host adapters, consider the following:

- The host adapter and computer must be configured for multiple host adapters as explained in the host adapter's *User's Guide*.
- To boot from the 7800 Family host adapter, make sure the host adapter is installed in the lowest PCI slot number. See your host adapter's *User's Guide*.
- SCO UnixWare 2.x supports auto-configuration. When adding multiple host adapters to an existing SCO UnixWare 2.x system, simply install the board and reboot; the system automatically reconfigures and rebuilds the kernel. If you want to choose a host adapter to boot from, simply disable the BIOS on all other host adapters.

Removing the Driver

If you no longer need the *adsl20/adsl* driver, you can use the following procedure to remove it completely:

- 1 Back up all important computer files.
- 2 At the UnixWare root prompt, type the following:

For SCO UnixWare 2.0x:

```
/etc/conf/bin/idinstall -d adsl20
```

The following files will be deleted:

```
/etc/conf/mdevice.d/adsl20  
/etc/conf/pack.d/adsl/Driver.o  
/etc/conf/pack.d/adsl/space.c  
/etc/conf/pack.d/adsl/disk.cfg  
/etc/conf/sdevice.d/adsl20
```

For SCO UnixWare 2.1:

```
/etc/conf/bin/idinstall -d adsl
```


SCO UnixWare Installation

The following files will be deleted:

```
/etc/conf/mdevice.d/adsl  
/etc/conf/pack.d/adsl/Driver.o  
/etc/conf/pack.d/adsl/space.c  
/etc/conf/pack.d/adsl/disk.cfg  
/etc/conf/sdevice.d/adsl
```

- 3 Then, rebuild the kernel (0 in -g0 is zero, not the letter O):

```
/etc/conf/bin/idbuild -B -K  
cp /etc/conf/cf.d/unix /unix  
cd /  
shutdown -g0
```

- 4 Reconfigure your computer for your alternate or replacement drive controller, and reboot the computer.

Troubleshooting

Problems and Solutions

My computer crashes or displays panic messages during the bootup procedure!

You may have to boot from the backup kernel created earlier, and then perform the driver update procedure again.

To boot from the old kernel, follow these steps:

- 1 Reboot the computer.
- 2 At the Booting UNIX System... prompt or loading UnixWare graphics, press the **Spacebar**.
- 3 From the [boot]# prompt, first type KERNEL=old kernel (e.g., KERNEL=unix.work) and press **Enter**. Then, type go and press **Enter**. Your computer should now boot from the backup kernel created earlier in *Installing the Driver When SCO UnixWare is Already Installed* on page 7-3.

To repeat the driver update procedure, follow these steps:

- 1 Follow the instructions in *Removing the Driver* on page 7-8 to delete the driver from your computer.
- 2 Perform the driver update procedure again. See *Installing the Driver When SCO UnixWare is Already Installed* on page 7-3.

Adaptec 7800 Family Manager Set

Error Messages

The error messages listed below are the messages associated with the *adsl20/adsl* driver. Messages are listed sequentially according to the last three digits of the error code. For example, [xxxxx020], [xxxxx021], [xxxxx022], etc.



Note: When reporting problems to Customer Support, be sure to include the complete error code in your problem description.

[xxxxx003] Command completed with error
[xxxxx004] Command completed with error
[xxxxx005] Command completed with error
[xxxxx006] Command completed with error
[xxxxx007] Command completed with error
[xxxxx008] Command completed with error
[xxxxx009] Command completed with error

A request issued to a target device completed with indication that there is an error. In most cases, the error is recovered and normal operation continues.

[xxxxx010] Error issuing command

An error has occurred while the driver was setting up its internal data structures. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

[xxxxx011] Error issuing command

The requested command is not supported by this driver.

[xxxxx012] Error issuing command

The driver does not recognize the target device.

[xxxxx013] Error issuing command

[xxxxx014] Error issuing command

An error has occurred while the driver was setting up its internal data structures. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

SCO UnixWare Installation

[xxxxx015] Error issuing command

An error has occurred with the driver. Try installing the most up-to-date version of the driver available from the Adaptec Web site or BBS.

[xxxxx020] Adapter or target device not responding or not connected

The target device did not respond to the adapter. If the device is present, refer to your host adapter's user's guide for troubleshooting information. If the device is no longer connected to the system, ignore this error.

[xxxxx021] Target device protocol error

An unexpected event occurred during data transfer between the adapter and target device. Normally, this indicates a faulty or non-compliant target device.

[xxxxx022] Adapter or target device protocol error

The adapter or target device has broken the communication protocol. A badly behaving device could be cause this message to appear. Normally this is not a serious problem. If you get this message frequently over a short period of time, it could indicate that the device or system is malfunctioning. Unplug or power down unused devices to see if the problem persists.

[xxxxx023] Target device parity error

The driver has detected a parity error by the target device. Try decreasing the transfer rate or disable the Ultra SCSI speed in *SCSISelect*. Also, make sure you are using good-quality SCSI cables.

[xxxxx024] Data overrun or underrun

The adapter was given more or less data than was expected.

[xxxxx030] Target Device busy

The target device reports a busy status. Another program might already be using this device.

[xxxxx031] Target device queue full

The target device internal buffer is full.

[xxxxx032] Target device busy

The target device reports a busy status. Another program may already be using this device.

Adaptec 7800 Family Manager Set

[xxxxx041] Command aborted

[xxxxx042] Command aborted

[xxxxx043] Command aborted

[xxxxx044] Command aborted

[xxxxx045] Command aborted

An internal condition caused the driver to abort the command. In most cases, the command is retried and is recovered, and normal operation continues.

[xxxxx046] Target device did not respond to abort sequence

The target device did not abort the command requested by the driver. Some devices do not support the abort command properly. Normally, this indicates a faulty or non-compliant target device.

[xxxxx047] Command aborted

An internal condition caused the driver to abort the command. In most cases, the command is retried and is recovered, and normal operation continues.

[xxxxx048] Unable to abort command

An error occurred while aborting a command. Possibly, the command has already completed and there is nothing to abort.

[xxxxx049] Command abort in progress

This indicates an abort command has been issued. This is a normal operating condition.

[xxxxx051] Target device did not respond to reset sequence

The target device did not reset correctly as requested by the driver. Normally, this indicates a faulty or non-compliant target device.

[xxxxx081] Adapter Initialization Failure

An error has occurred while the driver was setting up its internal data structures. Verify that your adapter is supported by this version of the driver.

[xxxxx083] Adapter not supported by this version of the driver

Your adapter is not supported by the driver on your system. You may have installed a new adapter and have not updated the driver on your system.

SCO UnixWare Installation

[xxxxx096] Adapter hardware initialization failure - possible resource conflict

The driver has attempted to initialize the adapter hardware but failed. This might suggest that the adapter resources (e.g., IRQ) conflict with another board installed in your system.

[xxxxx097] Unable to allocate memory

This indicates that there may be a problem with the amount of memory installed in your system. Verify that your system has at least the minimum amount of memory required by your operating system.

[xxxxx098] Exceeded maximum number of host bus adapters

The driver has detected more host bus adapters than is supported by this version of the driver or operating system.

[xxxxx0a4] SCSI bus reset by third party

Hardware such as an array enclosure may have reset the SCSI bus. This is a normal condition unless you receive additional errors.

[xxxxx0a5] SCSI bus reset by host adapter

The host adapter may have reset the SCSI bus. This is a normal condition unless you receive additional errors.

[xxxxx0cf] System configuration error

The driver encountered an error with your hardware. Refer to your host adapter's user's guide for troubleshooting information.

[xxxxx0d0] Command timeout

The target device is either busy, not ready, malfunctioning, or is not present. Refer to your host adapter's user's guide for troubleshooting information.

[xxxxx0d7] Target device scan failed

The driver encountered an error scanning the target device. Refer to your host adapter's user's guide for troubleshooting information.



File Location: D:\Production\511505-00 A 7800 FMS\7800-07.FM
Last Modified: June 19, 1997 9:31 pm

Adaptec 7800 Family Manager Set
Stock Number: 511505-00, Rev. A
Print Spec Number: 496814-00
Current Date: 6/19/97

Page: 7-14

ECN Date: 6/97

▼▼▼▼ Index

A

Adapter ID 3-9
ahslink command 6-11

B

Backing up the computer 7-4
Backup 2-10
Bit mask options 2-6, 2-8
Booting
 from SCO UNIX 6-14
 from UnixWare 7-5
Bus 6-13

C

CD-ROM 2-11, 4-7
Command line options 2-2, 2-4, 2-5,
 2-6, 3-8
Command syntax 6-2, 7-3
config.sys file 3-3, 3-8
Configuration information 2-7

D

DASD 3-9, 3-11
DCU 7-2
Desktop 3-3
Device configuration utility 7-2
Device manager 4-5
Device number 3-9, 6-13
Direct Access Storage Device
 see DASD

E

Embedded targets 3-8
Error messages
 NetWare 2-13
 OS/2 3-12
 SCO UNIX 6-16
 UnixWare 7-10
 Windows NT 5-15
Extended translation 3-11

H

Hard disks 2-6
Hardware registers 3-8
Host adapters
 7800 Family 1-2

I

Installation
 OS/2 driver 3-2-3-8
 SCO UNIX driver 6-1-6-8
 UnixWare driver 7-2-7-7
 Windows 95 driver 4-2-4-3
 Windows NT driver 5-2-5-7
Instrumentation 3-9, 4-4
 Windows 95 4-4
Interrupts 3-11, 6-13
IRQ 3-11, 6-13

K

Kernel
 SCO UNIX 6-4, 6-6, 6-8, 6-16
 UnixWare 7-3, 7-6
Keyboard patch 6-12

Index-1

Adaptec 7800 Family Manager Set

L

Load command 2-2, 2-4, 2-5, 2-8
Lock status 2-10
Logicial unit number
 see LUN
LUN 2-7, 3-8, 5-8

M

max_tags 2-12
Miniport driver 4-5
Mount status 2-9
Multiple host adapters 7-8

N

NetWare
 adaptec.nlm 2-11
 aic7870.dsk 2-1, 2-2, 2-3, 2-4, 2-5,
 2-8, 2-13
 aspitran.dsk 2-2
 backup 2-10
 bit mask options 2-6
 CD-ROM support 2-6, 2-11
 command line options 2-2, 2-4,
 2-5, 2-6
 error messages 2-13
 installing the driver 2-2-2-4
 load command 2-2, 2-4, 2-5, 2-8
 max_tags 2-12
 monitor.nlm 2-9
 optimizing performance 2-12
 removable media 2-9
 server bootstrap 2-5
 startup.ncf 2-2, 2-3
 tag queuing 2-6
 troubleshooting 2-13
 tsa.nlm 2-11
 using a CD-ROM 2-11

O

Optimizing performance 2-12
OS/2
 adapter ID 3-9
 aic7870.add 3-1, 3-2, 3-3, 3-5, 3-7,
 3-12
 basedev 3-3, 3-10, 3-11
 command line options 3-8
 command syntax 3-8
 DASD 3-9
 ddinstal 3-7
 desktop 3-3
 driver default settings 3-8
 driver installation 3-2-3-8
 error messages 3-12
 ibmint13.i13 3-3
 os2ldr 3-3
 parameters 3-8, 3-9
 PCI configuration 3-8
 troubleshooting 3-11-3-13

P

Parameters 3-8
 OS/2 3-8
 SCO UNIX 6-10
 UnixWare 7-7
 Windows 95 4-4
 Windows NT 5-8, 5-10
PCI configuration 3-8
PCI configuration hardware
 registers 3-8
pkgadd 7-2, 7-4
pkginfo 7-5

R

Registry editor 5-8
Removable media 2-7, 2-9, 3-10
Requirements 1-3

Index-2

Index

S

Scatter/gather 2-6, 6-11
SCO UNIX 6-11
 alad 6-1, 6-2, 6-3, 6-6, 6-11, 6-12
 alad325 6-1, 6-3, 6-6, 6-11
 changing the boot disk 6-9
 command syntax 6-2
 driver installation 6-1-6-8
 error messages 6-16
 filesystem diskette 6-3
 installing with a CD-ROM 6-1
 installpkg(adm) 6-4
 kernel 6-4, 6-6, 6-8, 6-16
 keyboard patch 6-12
 link 6-2, 6-11
 mscsi file 6-7, 6-14
 multiple host adapters 6-9
 parameters 6-10
 password 6-3
 requested volume 6-2, 6-12
 Sdsk 6-11
 shutdown 6-8
 space.c 6-10
 troubleshooting 6-11-6-17
 tunable parameters 6-10-6-11
 using Wide SCSI adapters and
 devices 6-9
SCSI ID 6-9
SCSI manager support 3-10
SCSISelect 3-9, 6-13
sdevice 7-5
startup.ncf 2-2, 2-3
System requirements 1-3

T

Tagged commands 2-7, 3-10
Tagged queuing 2-7, 5-8, 6-11
Troubleshooting
 NetWare 2-13-2-14
 OS/2 3-11-3-13

SCO UNIX 6-11-6-17
UnixWare 7-9-7-13
Windows 95 4-5-4-7
Windows NT 5-15-5-18

Tunable parameters 7-7

U

Underruns 3-10
Unit parameters 3-9
UnixWare
 adsl 7-1, 7-3
 adsl20 7-1
 backing up 7-4
 booting 7-5
 command syntax 7-3
 DCU 7-2
 Device configuration utility 7-2
 driver installation 7-2-7-7
 error messages 7-10
 kernel 7-3, 7-6
 multiple host adapters 7-8
 pkgadd 7-2, 7-4
 pkginfo 7-5
 removing the driver 7-8
 sdevice 7-5
 troubleshooting 7-9-7-13
 tunable parameters 7-7

V

Verbose mode 3-8
Verify 2-7, 2-10

W

Wide SCSI 6-9
Windows 95
 aic78xx.mpd 4-1, 4-2
 device manager 4-5
 driver installation 4-2-4-3
 instrumentation 4-4
 miniport driver 4-5

Index-3

Adaptec 7800 Family Manager Set

parameters 4-4

troubleshooting 4-5-4-7

Windows NT

advanced configurable

parameters 5-8

aic78xx.sys 5-1, 5-2, 5-5

driver installation 5-2-5-7

error codes 5-15

parameters 5-8, 5-10

problems and solutions 5-15

registry editor 5-8

removing a host adapter 5-12

removing the driver 5-12

swapping a host adapter 5-14

troubleshooting 5-15-5-18



Index-4