Cadaptec

TECHNICAL TRAINING SEMINAR

Rev. 2.6a

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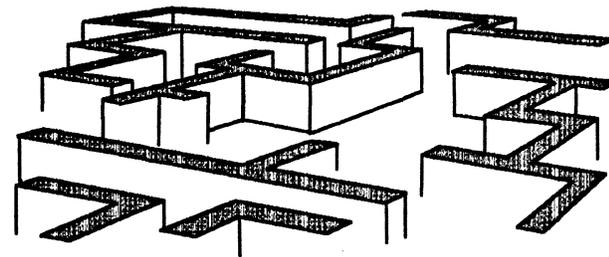# TECHNICAL TRAINING SEMINAR

Rev. 2.6a

Seminar Agenda

● **Section A: Welcome to Adaptec Training**

◆ General Introductions

◆ Course Overview

● **Section B: Adaptec Support Systems**

◆ Customer Hotline

◆ Interactive Fax

◆ Technical support FAX number

◆ Bulletin Board System

◆ Disti Hotline

◆ Literature Hotline

◆ Software Hotline

Seminar Agenda (cont.)

● **Section C: SCSI Review**

  ◆ **SCSI Basics**

  ◆ **SCSI Features**

● **Section D: Board Level Products**

  ◆ **AHA-1540C/1542C ISA-to-SCSI bus master host adapter**

  ◆ **AHA-1640 Microchannel-to-SCSI bus master host adapter**

  ◆ **AHA-1740A/1742A/1744 EISA-to-SCSI bus master host adapter**

  ◆ **SCSI Connections host adapters, including**

    ▲ **AHA-1510/1520/1522**

    ▲ **Trantor products**

Seminar Agenda (cont.)

- **Section E: Adaptec Software**
  - ASW-EZSCSI DOS/Windows software w/AHA ASPI Managers
  - SCSI Works DOS/Windows software w/Connections line ASPI Managers
  - ASW-1220/1420 IBM OS/2 v1.3 drivers
  - ASW-1240, ASW-1440 Novell NetWare drivers
  - ASW-1250, ASW-1450 SCO Unix drivers

- **Section F: Third Party/Operating System support**

Technical Training Information

- **Organized into sections**
- **Information of a more technical nature is indicated by a symbol**

Section B: Adaptec Support Systems

- **Adaptec's Telephone Technical Support**
  - ◆ End User oriented
  - ◆ Tiered structure with escalation
  - ◆ M-Th 6:00a-5:00p PST, F 6:00a-3:00p PST
  - ◆ Tel: 800-959-7274--*Call Early!*

- **Adaptec's Interactive Fax Service**
  - ◆ Inbound and Outbound Service
  - ◆ Outbound for documents, Tel: 408-957-7150
  - ◆ Inbound for problem descriptions
  - ◆ Inbound No.: 408-945-6776

- **Distributor (Disti) Line**
  - ◆ Special faster-access line for **You** only
  - ◆ Special unit assigned to deal with your calls
 - ◆ Distributor access code _____
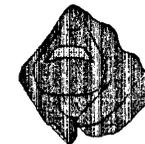
● Literature Hotline

- ◆ **It's all free!**
- ◆ **Tel: 800-934-2766**
- ◆ **Hours: M-F, 5:00a-6:00p PST**
- ◆ **See separate list for available publications**
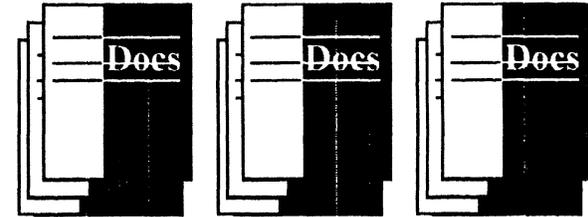
● Software Hotline

- ● **Hours: M-F, 5:00a-6:00p PST**
- ● **Tel: 800-442-7274**
- ● **Current version software and upgrades (including Adaptec EZ-SCSI, ASW-1240/1440, >gig EPROM upgrades for the 154xB/174xA, ASW-UPGRADE, ASPI Developer's Kit)**
- ● **Refunds, exchanges and credits**
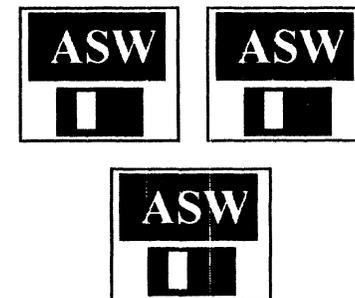
Trantor Technical Support

- 510-770-1400, option 1

- Primarily end user calls

- Trantor BBS   510-656-5159 (up to 14,400 bps)

- Compuserve Forum in CD-ROM Vendors (June 1993)

- National Videotext Forum (June 1993)

- Informal support on GEnie and America Online

Telephone Numbers Summary
Adaptec

Adaptec Main Number	**(408) 945-8600 or**
	(800) 869-8883
Adaptec Technical Support	**(800) 959-7274 (SCSI) or**
	(408) 945-2550
Adaptec Interactive FAX	**(408) 957-7150**
Adaptec Tech. Support FAX	**(408) 945-6776**
Adaptec BBS	**(408) 945-7727**
Adaptec Literature Number	**(800) 934-2766**
Adaptec Software Number	**(800) 442-7274 (SCSI) or**
	(818) 365-6264

Trantor

|	
Trantor Technical Support	**(510) 770-1400 option 1**
Trantor Main Number	**(510) 770-1400**
Trantor BBS	**(510) 656-5159**

Adaptec Technical Support
*B*ulletin *B*oard *S*ervice (BBS)

- **General Description**
- **Quick Help hot keys**
- **File Libraries**
- **Email feature**
- **Special Interest Group feature (SIGs)**
- **BBS File Listing**
- **Software: *The Major BBS* by Galacticomm**

Technical Description

- **The phone number is (408) 945-7727**
- **The settings are:**
  - ◆ **1200, 2400, or 9600 baud**
  - ◆ **8 data bits**
  - ◆ **1 stop bit**
  - ◆ **no parity**
- **There are 12 lines available**
- **The BBS operates 23 hours a day, 7 days a week**
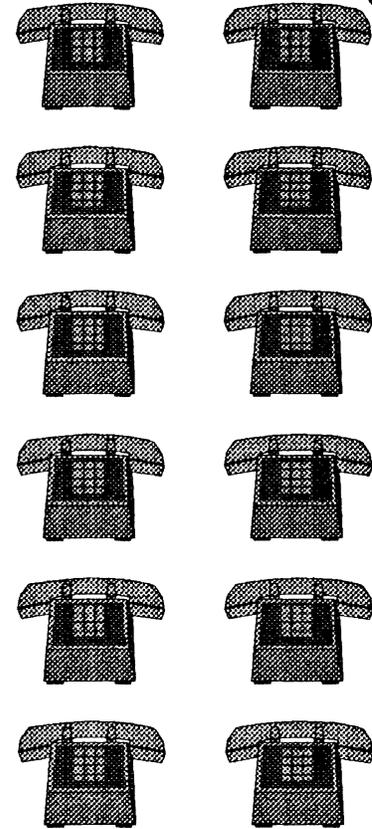
File Libraries

- **There are currently 12 different File Libraries**
- **Files are downloaded from here**

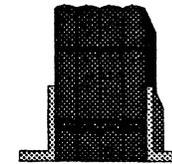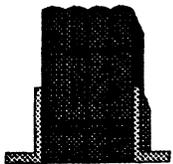| Main	EISASCSI	Novell	SCSIkit
Adaptec	Fmtutils	Obsolete SCSIlib	
ASPI	Misc	OS2	Upgrade

Electronic Mail

- Customers can get technical support
- Customers can communicate with each other
- Convenient method of selectively transmitting files

BBS File Listing

o Complete file listing distributed the first week of every month

o Updated listing distributed the third week of every month

o List can be "broadcast" faxed

Special Interest Groups
(SIGs)

- **This is an open forum where customers can discuss issues**

- **Available SIGs include:**

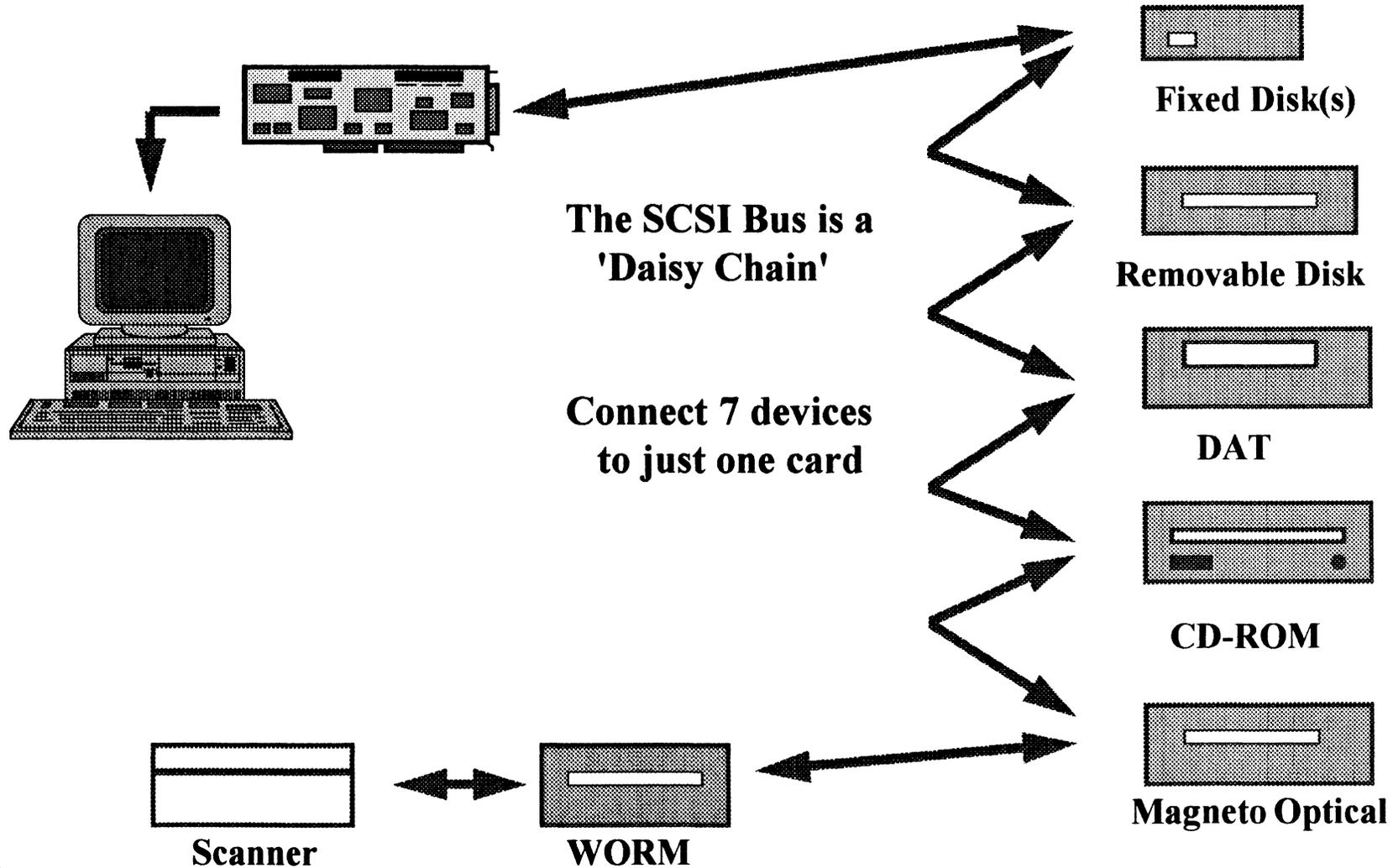| Hello	DOS	WINNT
Novell	Hardware	ASPIDEV
OS2	UNIX	

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Section C:

SCSI Overview

What is "SCSI?"
Why is SCSI so popular?

"SCSI" stands for "Small Computer Systems Interface" and is pronounced *scuzzy*

SCSI is a fast, intelligent, multitasking I/O <u>bus</u> that can connect many different types of peripherals using only one host adapter

With one SCSI bus
connect up to seven devices

Fixed Disk(s)

The SCSI Bus is a
'Daisy Chain'

Removable Disk

Connect 7 devices
to just one card

DAT

CD-ROM

Magneto Optical

Scanner

WORM

Applications are driving the development of new SCSI Peripherals

Types of SCSI Peripherals available today:

- **Fixed Disks:** Many types, capacities, and sizes.

- **Removable Magnetic Disks:** IOMega, Syquest, etc.

- **Removable Optical Disks:** Erasable (MO) or Write Once (WORM)

- New **high capacity floppies** (e.g. Floptical)

- **Tape:** QIC, DAT (4 mm 1.3 GB, or 8 mm 2.3 GB)

- **CD-ROM:** Data, audio, multi-media, Photo CD, XA

- **Printers**

- **Scanners**

- New technologies that are yet to appear

Progress of SCSI Spec

- **SCSI (SCSI-1)**
  - X3.131-1986 is the ANSI spec number for SCSI-1

- **CCS (Common Command Set) Rev 4B**
  - Disk drive manufacturers defined subset
    of standard SCSI commands for disk drives

- **SCSI-2**
  - Refined but compatible with SCSI-1,   Includes CCS

  - New performance *options* ("Wide" and "Fast" SCSI)

  - Added new device models and their command sets

  - X3T9.2/86-109 Rev 10h (SCSI-2) is now Final

- **SCSI-3 is well under way**
  - 16 bit Wide SCSI on a single 68 pin connector

  - New physical interface for serial or fiber optics

1 - 2 - 3

SCSI-2 Features

SCSI-2 added some options. A given device may not implement all the options, but it is still SCSI-2!

- Wide SCSI Option: 1, 2, or 4 bytes wide. Need two connectors (A/B) or (P/Q). A=50, B=68, P=68, Q=68 conductors
- New High Density connector alternative.*
- Fast SCSI Option. Transfer speeds up to 10 MTransfers/sec.*
- New 'Active Terminator.'*
- Command Queuing (let disk optimize order of I/O requests).*
- Tagged Queuing (let target optimize order of I/O requests).*
- Extended Contingent Allegiance (provides for error recovery).
- Intelligent Caching on the target.
- Asynchronous Event Notification.

*This option is implemented on the AHA-1740A/42A/44.

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So what is SCSI-3?

## SCSI-3 is still under development and will add even more features...

o **8 or 16 Bit Data Path on one single 68 pin connector (P).**

o **32 bit Data Path 'Option' using two 68 pin connectors (P/Q).**

o **32 bit Data Path on one 110 pin connector (L).**

o **More than 8 controllers on a SCSI bus.**

o **Longer cable lengths.**

o **Fairness (ensure that lower priority SCSI devices get to use the bus).**

o **More (enhanced) command sets (DAT, File Server).**

o **Alternate physical layers (Fiber Optic Option / Packetization).**

o **Autoconfiguration (Dynamic Address Allocation)**

o **Auto Sense.**

Host Adapter Features

- **Disconnect / Reconnect**

- **Synchronous vs. Asynchronous**

- **Scatter / Gather on Reads / Writes**

- **Queued I/O Requests**
  - ◆ **Command Queuing**
  - ◆ **Tagged Queuing**

- **Zero Latency Reads**
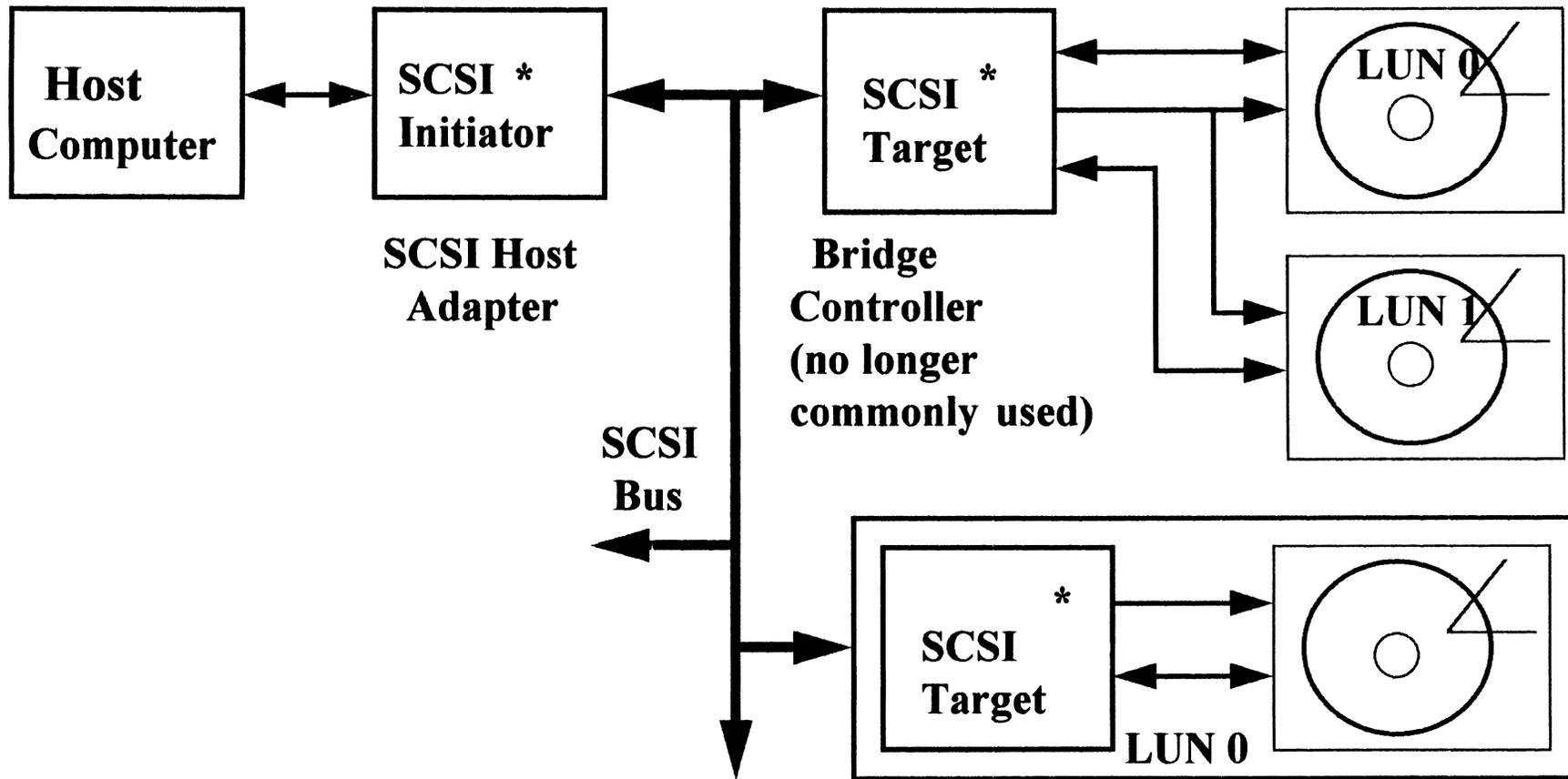
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SCSI: Digging Deeper...
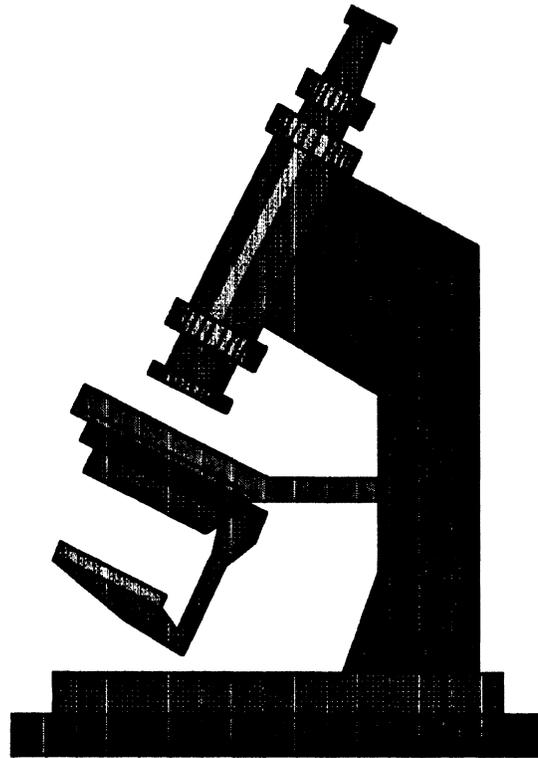
SCSI Bus Address / Luns

1 SCSI Bus can support up to eight (8) SCSI controllers.

1 Each controller can be an INITIATOR or TARGET.

1 Each controller can control up to eight (8)
   Logical Units.

1 An embedded SCSI drive is a target SCSI controller
   with only one Logical Unit (the HDA).

CONCLUSIONS:

1 SCSI can support up to 64 devices max (bridge
   controllers are required).

1 A total of one host adapter and seven
   embedded drives is more common.

SCSI Bus Example

Host Computer ↔ **SCSI * Initiator**

SCSI Host Adapter

SCSI * Target

Bridge Controller (no longer commonly used)

LUN 0

LUN 1

SCSI Bus

SCSI * Target

LUN 0

Embedded SCSI Disk Drive
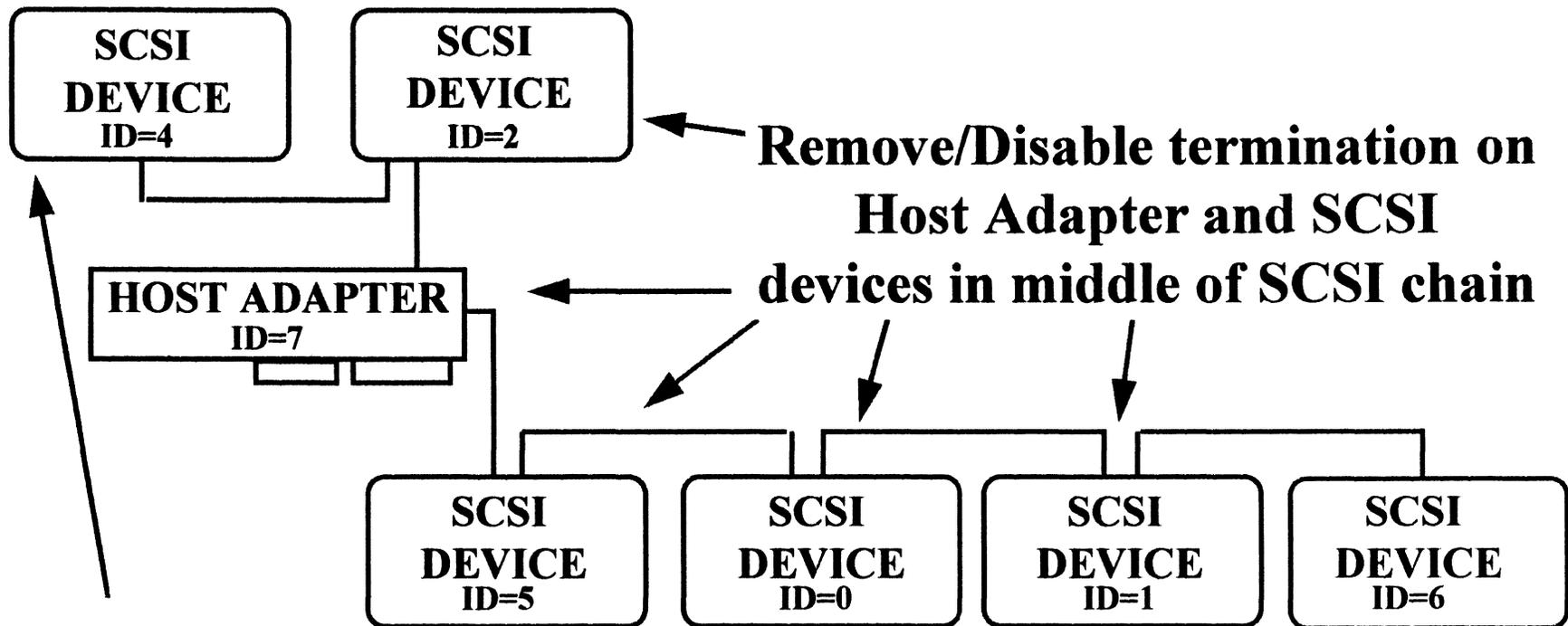
* SCSI Controllers

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SCSI Bus Termination

● On any SCSI Bus, *ONLY* two terminator (sets) should be enabled (*independent* of the device SCSI ID).

● Question of what device supplies terminator power.

  ◆ Adjusting this could solve a connection problem

● Terminators need to be removed (or disabled) from host adapter when both internal & external connections are used.

SCSI Bus Termination

- **Only two SCSI devices may be terminated per SCSI Bus**
- **Each SCSI device must have a unique SCSI ID**

SCSI DEVICE ID=4	SCSI DEVICE ID=2

Remove/Disable termination on Host Adapter and SCSI devices in middle of SCSI chain

HOST ADAPTER ID=7

SCSI DEVICE ID=5	SCSI DEVICE ID=0	SCSI DEVICE ID=1	SCSI DEVICE ID=6

Termination Installed/Enabled for devices on end of the SCSI chain

Recommended SCSI Bus IDs
(many other configurations are possible)

SCSI ID

Host Adapter BIOS

Software Mgr./Mod. required

0	←————————————→ **Boot Drive Only**
1	←————→ **1st and 2nd HDD**
2	←————→ **3rd HDD**
3	
4	←————→ **CDROM Drive**
5	
6	←————→ **Tape Drive, MO Drive**
7	←————→ **Host Adapter**

Disconnect/Reconnect

WITHOUT DISCONNECT

Host Adapter

Initiator must hold until Target 0
has completed the process

Target 0

WITH DISCONNECT

Initiator can have Target 0 reconnect
later when data is ready. This
will free Init to connect to Target 1
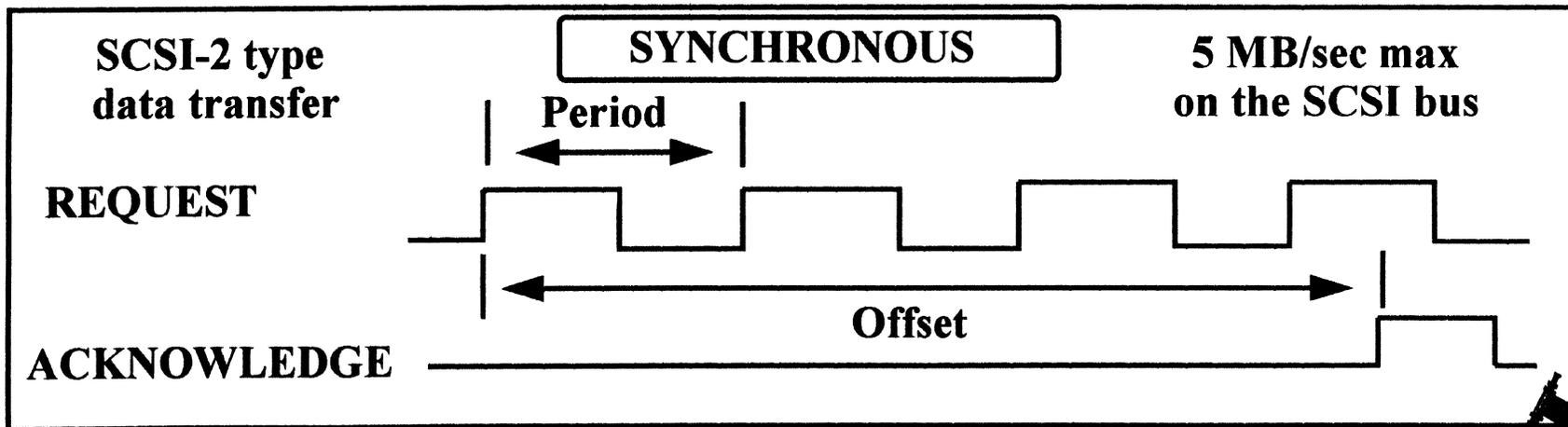
Target 1
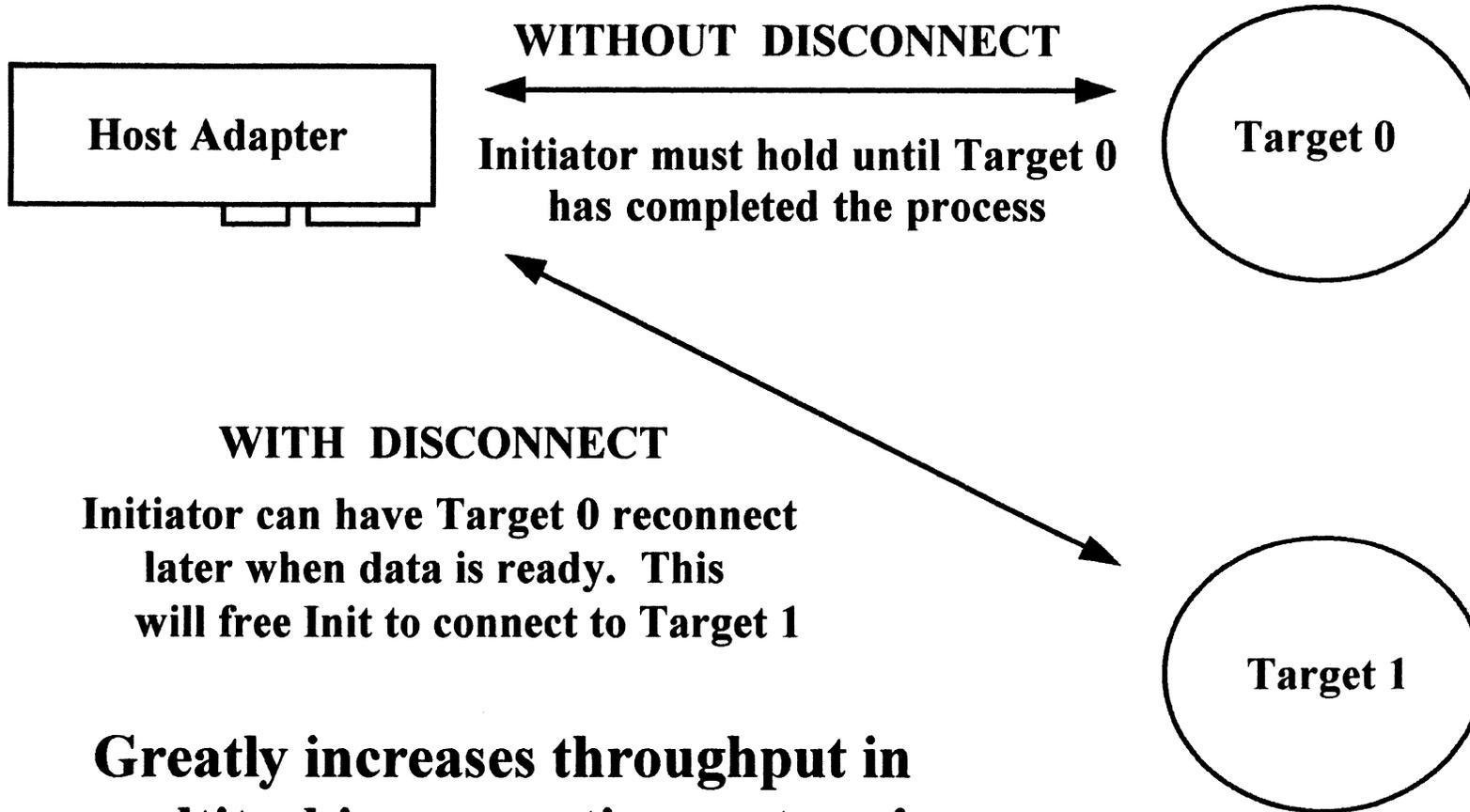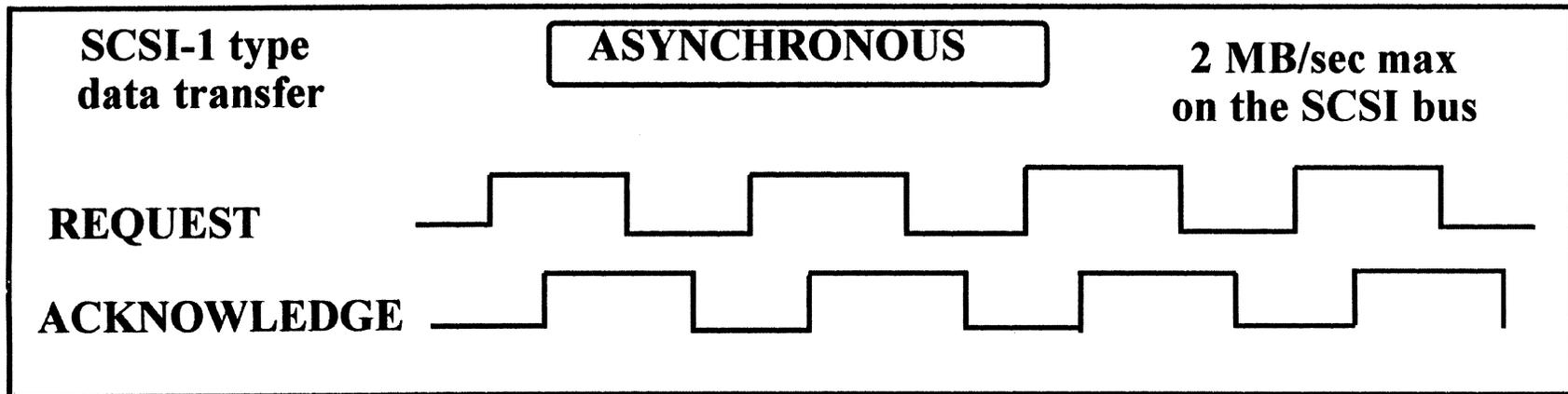
Greatly increases throughput in
multitasking operating systems!

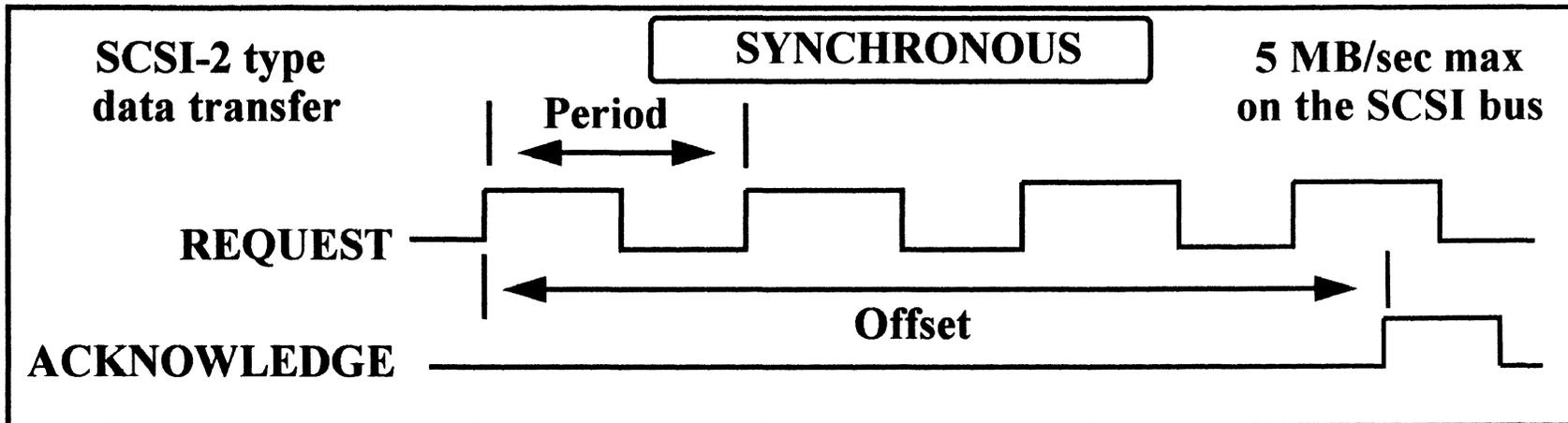# Adaptec's SCSI Host Adapter Features

Synchronous and Asynchronous

SCSI-1 type data transfer

ASYNCHRONOUS

2 MB/sec max on the SCSI bus

REQUEST

ACKNOWLEDGE

SCSI-2 type data transfer

SYNCHRONOUS

5 MB/sec max on the SCSI bus

Period

REQUEST

Offset

ACKNOWLEDGE

Adaptec's SCSI Host Adapter Features
Standard Synchronous and FAST Synchronous

SCSI-2 type
data transfer

SYNCHRONOUS

5 MB/sec max
on the SCSI bus

Period

REQUEST

Offset

ACKNOWLEDGE

SCSI-2 option to
increase performance

Period

FAST SYNCHRONOUS

10 MB/sec max
on the SCSI bus

REQUEST

Offset*

ACKNOWLEDGE
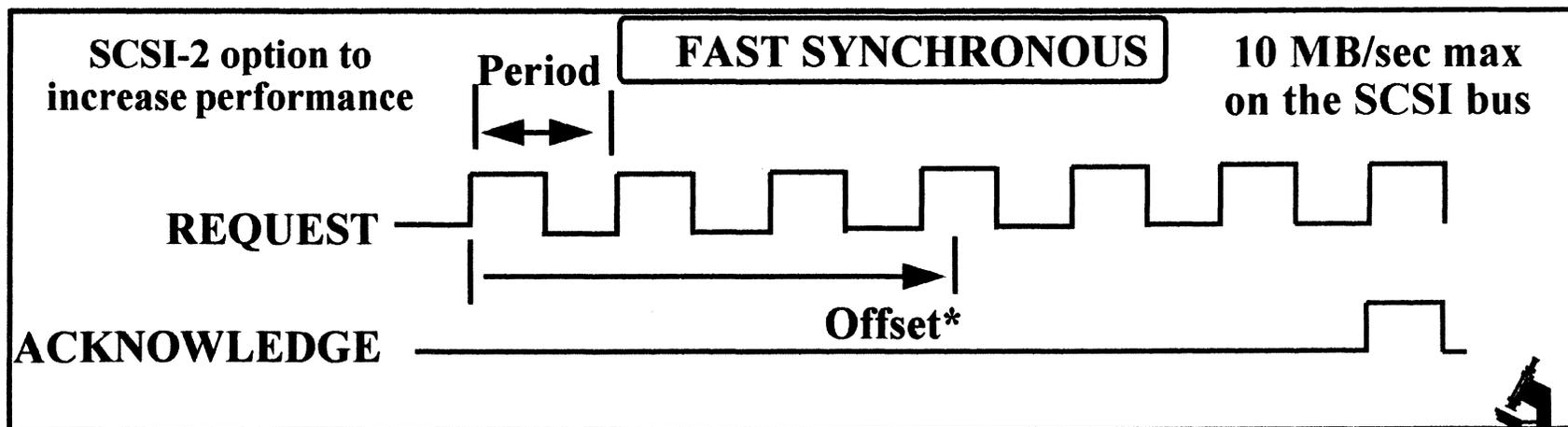
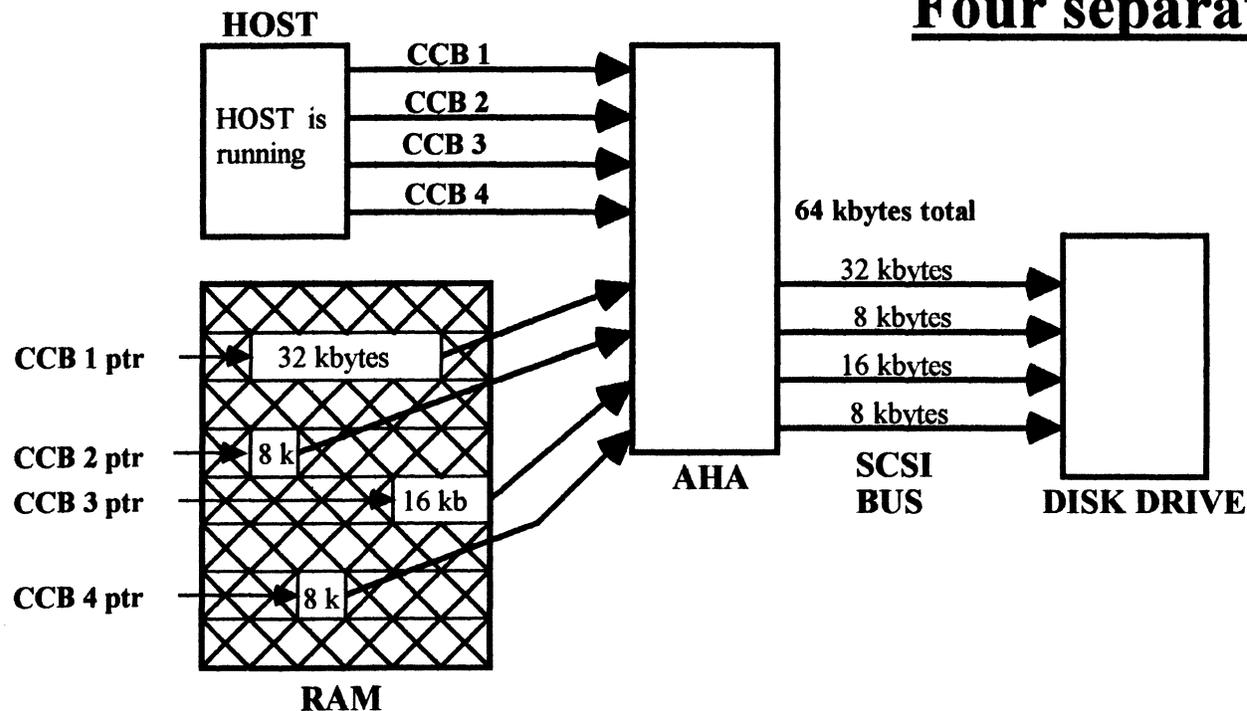**Cutting the period in half doubles the synchronous transfer rate!**
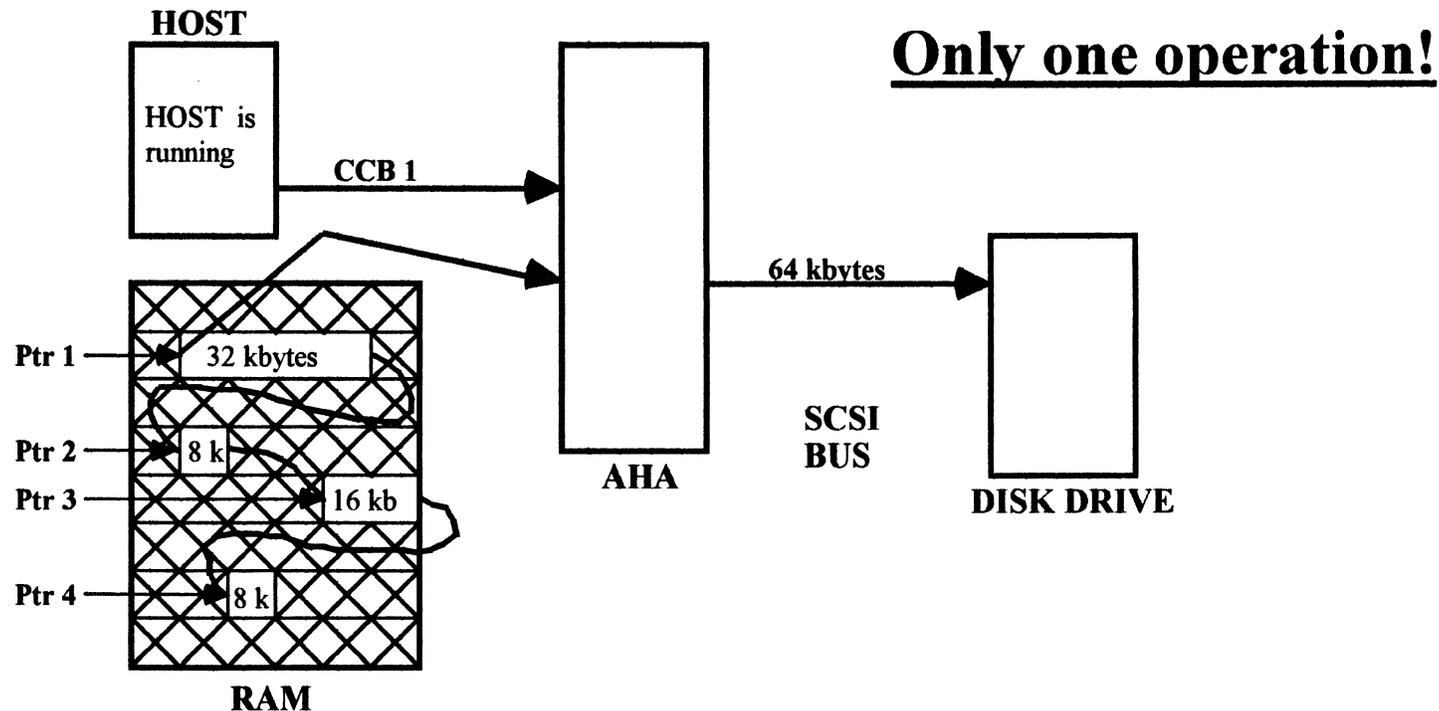*** Actual default offset is 7 bytes.**

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Without Scatter/Gather

EXAMPLE: 64 KByte Write to disk. Largest contiguous 'free' physical memory is less than 64 KBytes.
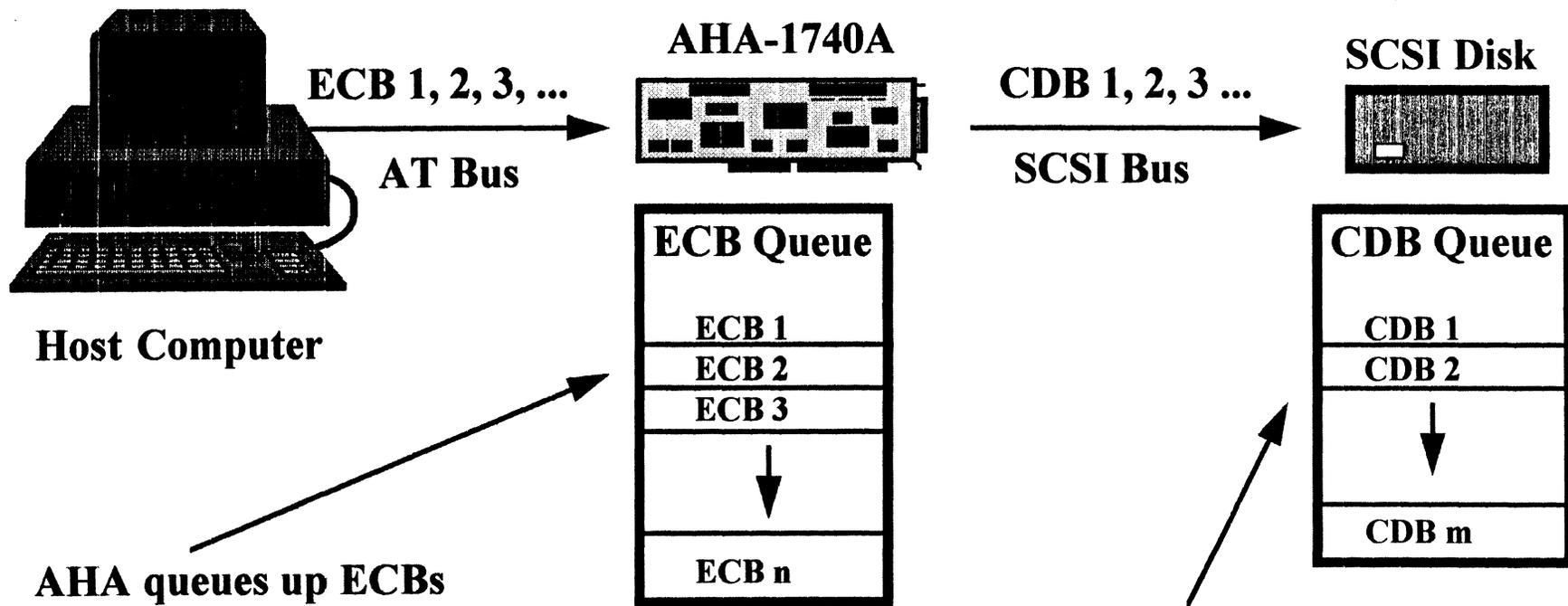
Four separate operations!

HOST

HOST is running	CCB 1
	CCB 2
	CCB 3
	CCB 4

64 kbytes total

CCB 1 ptr → 32 kbytes

CCB 2 ptr → 8 k

CCB 3 ptr → 16 kb

CCB 4 ptr → 8 k

RAM

AHA

SCSI
BUS

32 kbytes

8 kbytes

16 kbytes

8 kbytes

DISK DRIVE

<u>With</u> Scatter/Gather

EXAMPLE: 64 KByte Write to disk. Largest contiguous 'free' physical memory is less than 64 KBytes.

HOST

HOST is running

CCB 1

<u>Only one operation!</u>

64 kbytes

Ptr 1 —— 32 kbytes

Ptr 2 —— 8 k

Ptr 3 —— 16 kb

Ptr 4 —— 8 k

RAM

AHA

SCSI BUS

DISK DRIVE

Queued I/O Requests

on the SCSI Host Adapter *(Command Queuing)*
and on the disk drive *(Tagged Queuing)*

AHA-1740A

SCSI Disk

ECB 1, 2, 3, ...

CDB 1, 2, 3 ...

AT Bus

SCSI Bus

Host Computer

ECB Queue
ECB 1
ECB 2
ECB 3
↓
ECB n

CDB Queue
CDB 1
CDB 2
↓
CDB m

**AHA queues up ECBs
as they come from Host.
Overhead to begin execution
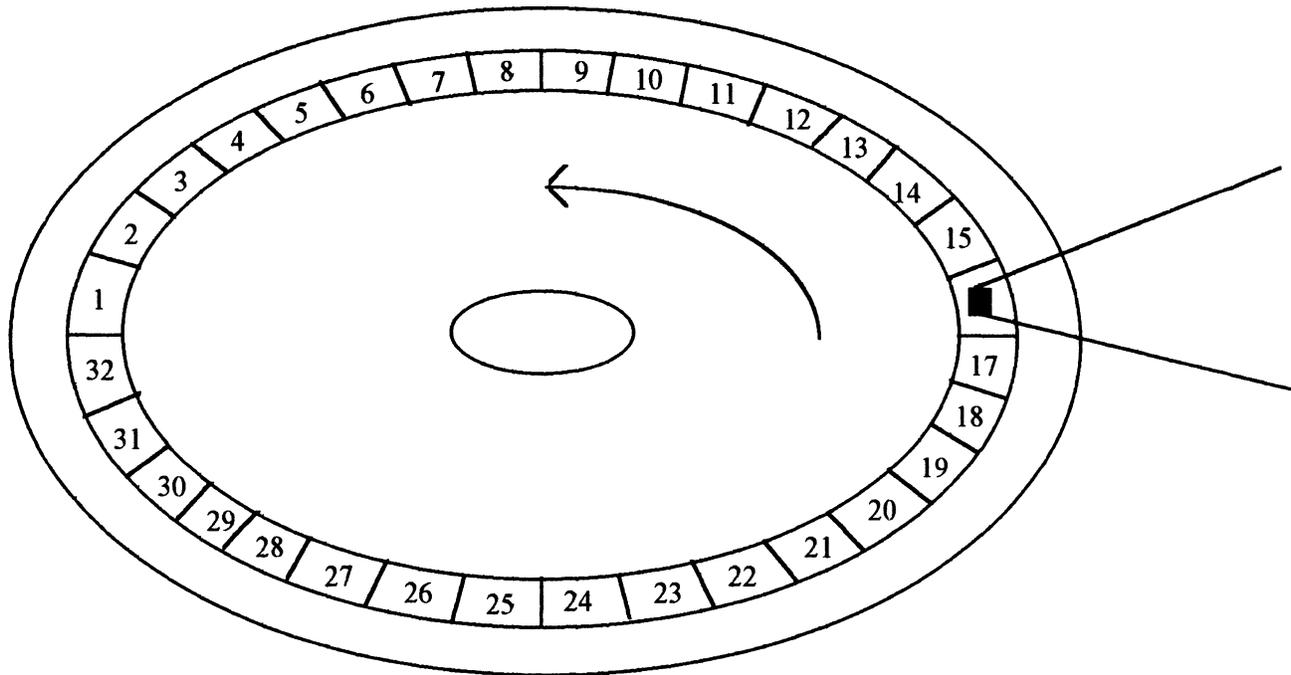of next ECB is greatly reduced.**

**Disk queues Tagged CDBs
from AHA-1740A and executes
them in optimum order.**

Zero Latency Read
minimizes rotational latency

It takes 16.67 msec to rotate the platter around one time.
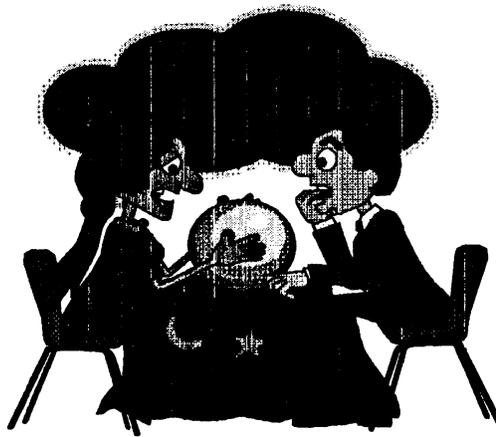

Without ZLR You Lose 8.33 msec on a full track read.
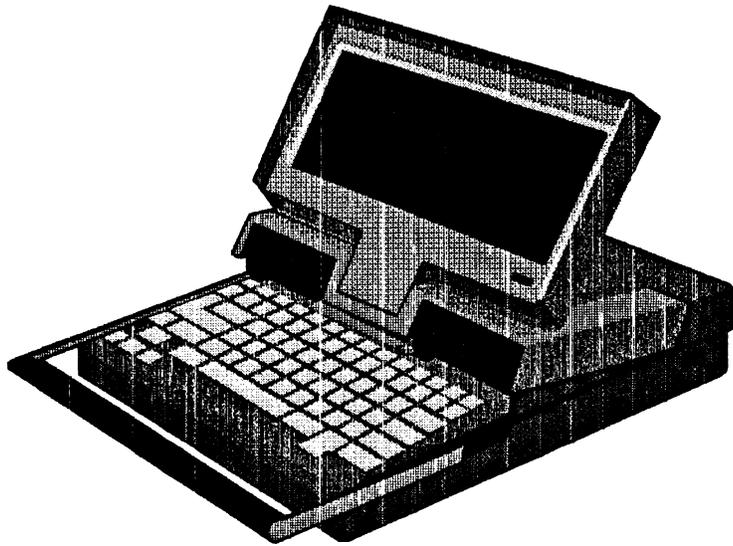
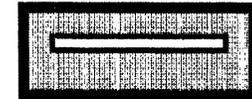**With ZLR you start reading data immediately.**

Section D: Board Level Products

Adaptec Provides
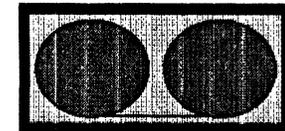# SCSI I/O Solutions for
Low Cost Systems ...

AHA-1510

CD-ROM

Mini-SCSI

Tape
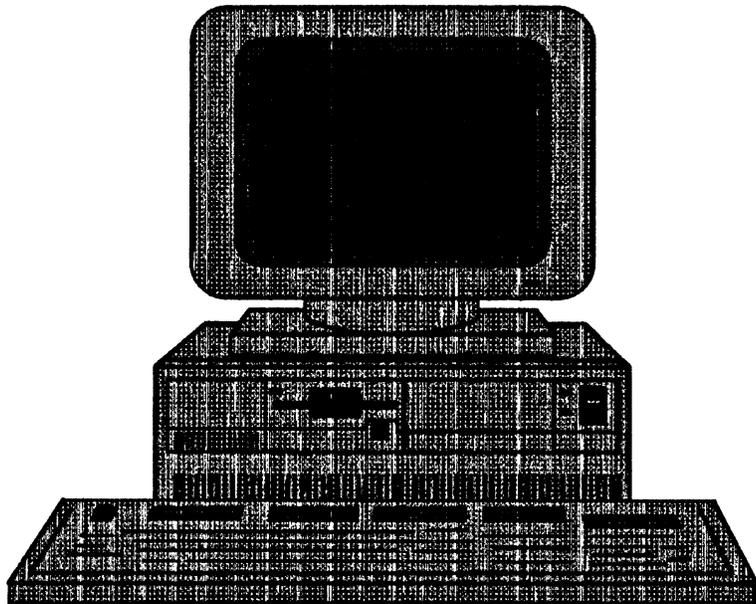
Notebook or Laptop

... **High Performance Systems**

Fixed Disks

Disk Array

QIC or DAT tape

AHA-1740A
AHA-1744

CD-ROM

**EISA System used as
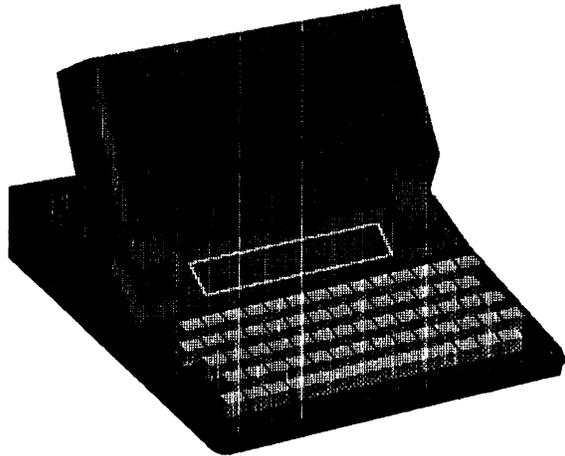Unix/Xenix, CAD Workstation,
or NetWare File Server**
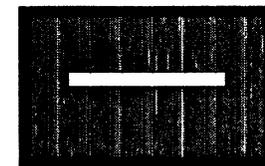
Magneto Optical

... and everything in between

Laptop -- AHA-1510, 1520, 1522
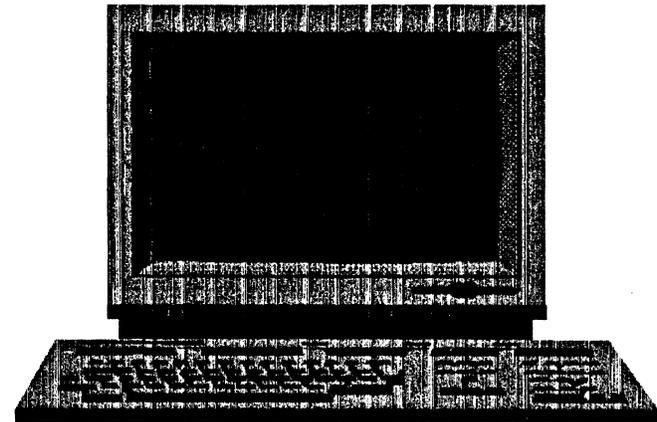
**Various AT (ISA) machines
AHA-1540, 1542**

PS/2
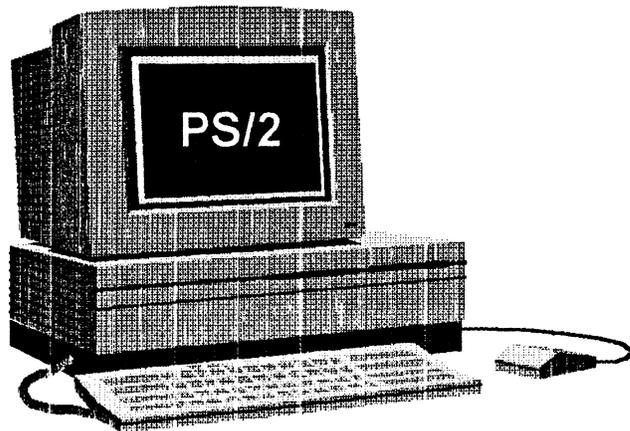
Microchannel -- AHA-1640
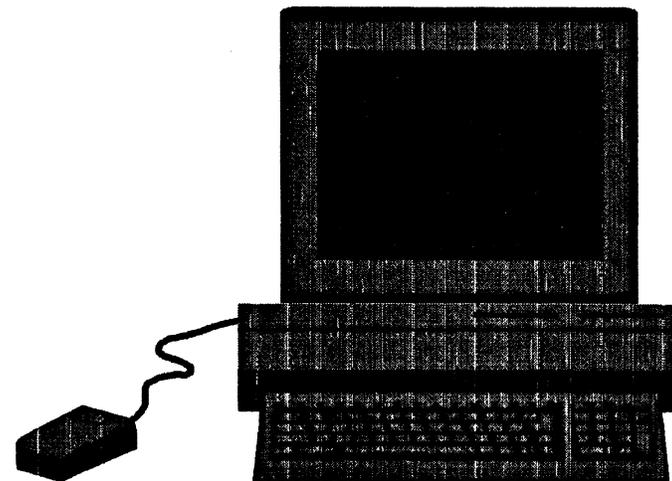
Adaptec High Performance
SCSI Host Adapters

<u>High Performance EISA-to-SCSI Host Adapters:</u>

- **AHA-1740A**   **Bus Master EISA-to-Fast SCSI Host Adapter**
- **AHA-1742A**   **Bus Master EISA-to-Fast SCSI Host Adapter with floppy**
- **AHA-1744**   **Bus Master EISA-to-Fast SCSI Host Adapter (Differential SCSI)**

<u>High Performance AT-to-SCSI Host Adapters:</u>

- **AHA-1540C**   **Bus Master AT-to-SCSI Host Adapter**
- **AHA-1542C**   **Bus Master AT-to-SCSI Host Adapter with floppy**

<u>High Performance Microchannel-to-SCSI Host Adapters:</u>

- **AHA-1640**   **Bus master Microchannel-to-SCSI Host Adapter**

Adaptec Connections SCSI Host Adapters

16 bit ISA-to-SCSI Host Adapters:

- **AHA-1510**   AT-to-SCSI Host Adapter 'chip-on-a-board'(AIC-6260 based)
- **AHA-1520**   AT-to-SCSI Host Adapter with BIOS   (AIC-6260 based)
- **AHA-1522**   AT-to-SCSI H/A with BIOS + floppy   (AIC-6260 based)

16 bit Microchannel-to-SCSI Host Adapters:

- **T228**   Microchannel-to-SCSI non-Busmastering Host Adapter

Parallel-to-SCSI Host Adapters:

- **T348**   MiniSCSI Plus for standard parallel ports
- **T358**   MiniSCSI EPP for Enhanced Parallel Ports (EPP)

PCMCIA-to-SCSI Host Adapters:

- **T460**   PCMCIA-to-SCSI Host Adapter

Complete SCSI Kit Solutions

◆ **The MultiMedia Connection**

   Complete AHA-1510 AT-SCSI HA Kit for CDROM, *et. al.* Applications

◆ **The SCSI Direction**

   Complete AHA-1522 AT-SCSI HA Kit

◆ **The SCSI Direction Plus**

   SCSI Direction plus Corel SCSI S/W for General SCSI Device Support

◆ **The SCSI Master**

   Complete AHA-1542C AT-SCSI High-Performance HA Kit

◆ **The SCSI Master Plus**

   SCSI Master plus Corel Applications Module

◆ **The SCSI Channel**

   Complete AHA-1640 Micro Channel - SCSI HA Kit

◆ **The EISA SCSI Master**

   Complete AHA-1742A EISA-Fast SCSI High Performance HA Kit

◆ **The Floptical Connection**

   Complete AHA-1522FS AT-SCSI HA Kit for Floptical Drives
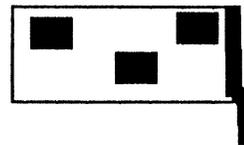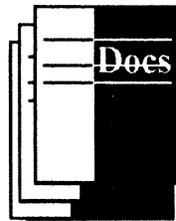
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All of the kits contain...

- **Complete Hardware and Software Installation Documentation (user's manual and installation guide)**
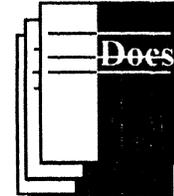
- **Internal SCSI Flat Ribbon Cable**
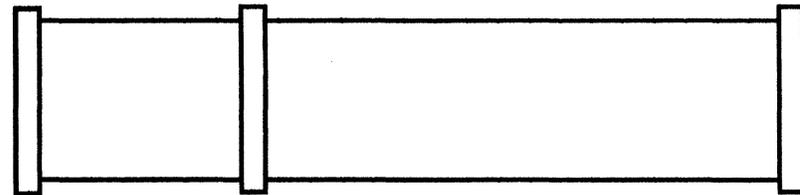
- **Alternative Bracket (except the SCSI Channel)**

- **Software**

The "SCSI Direction"

- **Adaptec AHA-1522 AT-to-SCSI Host Adapter**

- **Adaptec ASW-EZSCSI, which includes ASPI2DOS.SYS and CD-ROM support**

- **Adaptec ASW-1400 ASPI Novell NetWare Manager for NetWare 286 v2.15, 386 v3.1, and v3.11, and IBM OS/2 v1.1 and v1.3**
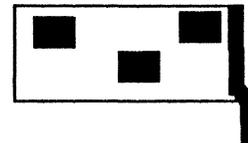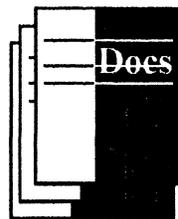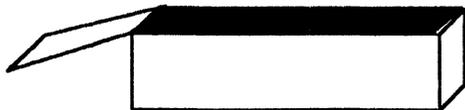
The "SCSI Direction Plus"

- Adaptec AHA-1522 AT-to-SCSI Host Adapter

- Adaptec ASW-1400, which includes DOS, OS/2 and NetWare support

- ASW-500 v1.1, equivalent to Corel SCSI v1.01c
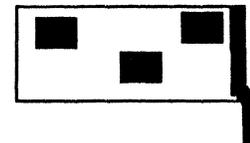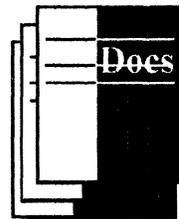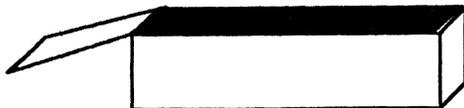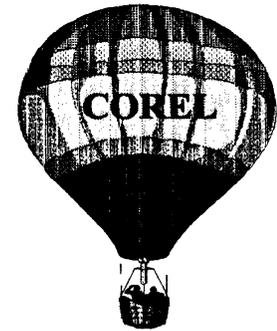
The "SCSI Master"

- **Adaptec AHA-1542C AT-to-SCSI Host Adapter**

- **Adaptec ASW-EZSCSI, which includes ASPI4DOS.SYS and CD-ROM support**

- **Adaptec ASW-1420 ASPI OS/2 1.3 Manager for IBM OS/2 v1.3**

- **Adaptec ASW-1440 ASPI Novell NetWare Manager for NetWare 286 v2.15 and v2.2, and 386 v3.0, v3.1, and v3.11**
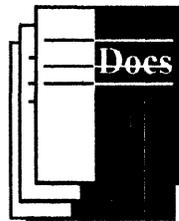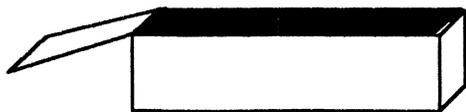
The "SCSI Master Plus"

● **Adaptec AHA-1542C AT-to-SCSI Host Adapter**

● **Adaptec ASW-1400, which includes DOS, OS/2 and NetWare support**

● **ASW-500 v1.1, equivalent to Corel SCSI v1.01c**
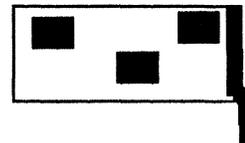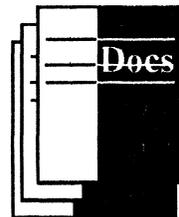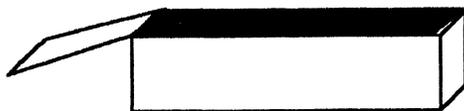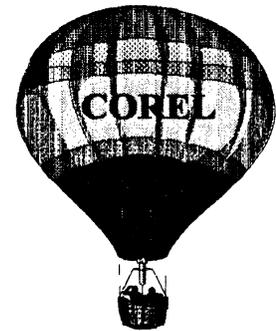
The "SCSI Channel"

- **Adaptec AHA-1640 Microchannel-to-SCSI Host Adapter**

- **Adaptec ASW-EZSCSI, which includes ASPI4DOS.SYS and CD-ROM support**

- **Adaptec ASW-1440 ASPI Novell NetWare Manager for NetWare 286 v2.15 and v2.2, and 386 v3.0, v3.1, and v3.11**
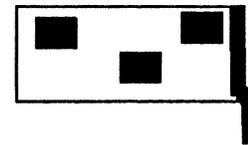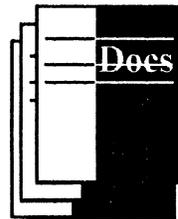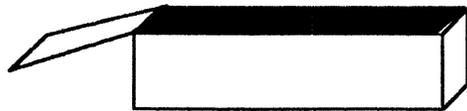
The "EISA SCSI Master"

- Adaptec AHA-1742A EISA-to-SCSI Host Adapter

- Adaptec AHA-C174 Configuration and Download Utilities

- Adaptec ASW-EZSCSI, which includes ASPI4DOS.SYS and CD-ROM support

- Adaptec ASW-1420 ASPI OS/2 1.3 Manager for OS/2 v1.3

- Adaptec ASW-1440 ASPI Novell NetWare Manager for NetWare 286 v2.15 and v2.2, and 386 v3.0, v3.1, and v3.11

- Adaptec ASW-1450 SCO Unix Manager for SCO Unix 3.2.2
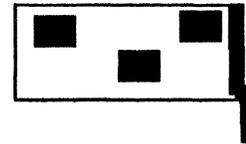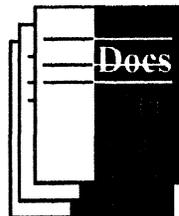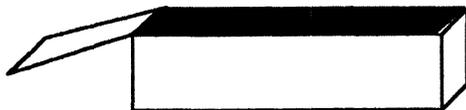
The "Multimedia Connection"

- Adaptec AHA-1510 AT-to-SCSI Host Adapter

- Adaptec ASW-EZSCSI, which includes ASPI2DOS.SYS and CD-ROM support
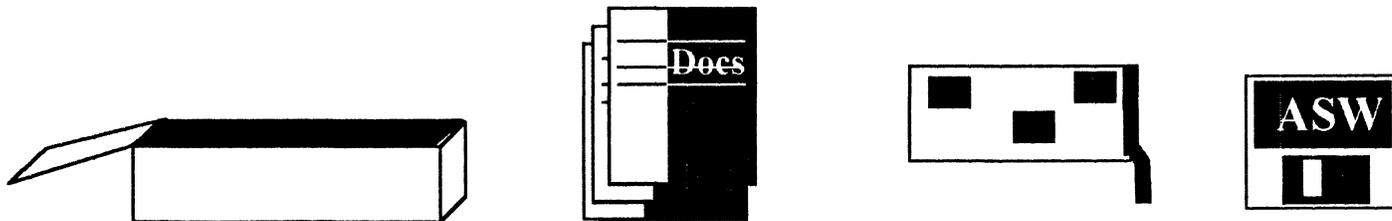
Introducing ....

ADAPTEC

Connections

Trantor-brand product offering:
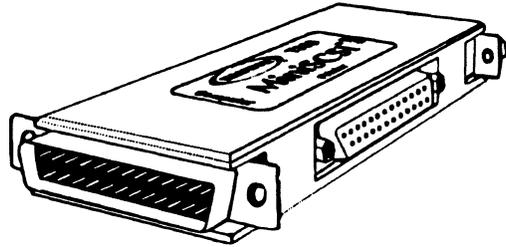
SCSIworks!™

◆ **Comprehensive software package**

◆ **ISA and MCA SCSI adapters**

◆ **Parallel-to-SCSI adapters**
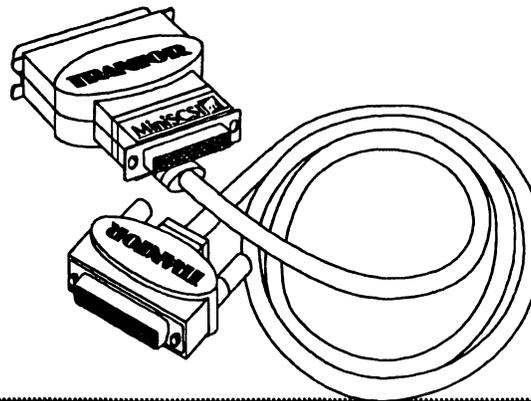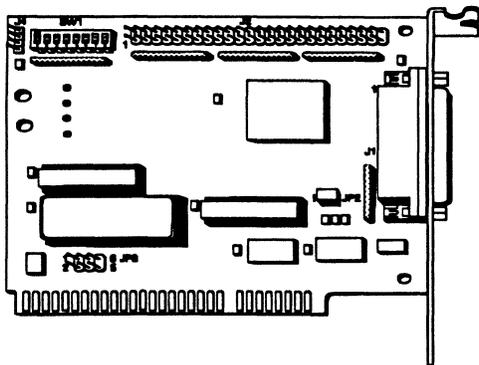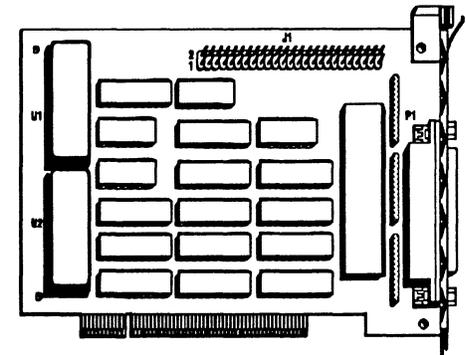
adaptec

ADAPTEC
Connections

AHA-1510   16 bit ISA Adapter
AHA-1520/1522 16 bit ISA Adapter with BIOS

T338 MiniSCSI - parallel to SCSI host
adapter

T348 MiniSCSI Plus bidectional parallel port to SCSI
T358 MiniSCSI EPP
T130 8 bit ISA Adapter with BIOS
T260 Micro Channel 16 Bit
T460 SlimSCSI 16 bit PCMCIA SCSI

T338 MiniSCSI

- Original Design - Unidirectional operation

- Passes printer through when T338 is powered

- Up to seven SCSI devices can be connected

- Requires SCSI Termination Power

- Requires standard 25 to 50 pin Macintosh compatible cable

- Reads in nybble mode, writes byte-wide

  - Read is approx 75K/sec, Write is approx 150K/sec

MiniSCSI

ADAPTEC
Connections

T338 MiniSCSI

Connect this up to the
parallel port on your
computer

25 pin to 50 pin
cable goes here
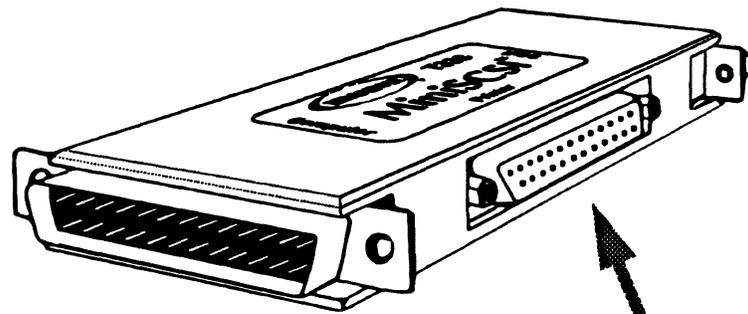
Printer pass through
goes here

adaptec

SCSIworks! ASPI Bundle

comes with the every Trantor product, and includes...

- **ASPI Managers, OS/2, Windows NT, and Novell NLM for Trantor SCSI adapters**

- **CD-ROM**

- **Hard Disk, Magneto-Optical**

- **Removable (SyQuest, Bernoulli, Floptical)**

- **HP ScanJet scanner driver**

- **Tape Mate II and Music Box applications**

- **MediaVision Pro Audio Spectrum / Sigma Designs WinStorm ASPI**

T338 MiniSCSI
Installation

1. Connect the T338 to an available parallel port. If there is a printer already attached, connect that to the printer bypass on the side of the T338.

2. Connect the SCSI cable, DB25 to 50 pin SCSI from the T338 to the SCSI peripheral. The T338 is always terminated. The other end of the cable must be terminated.

T338 MiniSCSI
Troubleshooting

1.   The printer bypass will only work if the SCSI peripheral is powered up.

2.   The SCSI peripheral must be supplying terminator power, since the T338 does not provide terminator power.

Gladaptec

Relative Performance of Parallel host adapters

	Uni-directional Parallel Port	Bi-directional Parallel Port	Enhanced Parallel Port
T338 MiniSCSI	75 KB/sec Read 150 KB/sec Write	75 KB/sec Read 150 KB/sec Write	75 KB/sec Read 150 KB/sec Write
T348 MiniSCSI Plus	75 KB/sec Read 150 KB/sec Write	240 KB/sec Read 240 KB/sec Write	240 KB/sec Read 240 KB/sec Write
T358 MiniSCSI EPP	75 KB/sec Read 150 KB/sec Write	240 KB/sec Read 240 KB/sec Write	800 KB/sec Read 800 KB/sec Write

ADAPTEC
Connections

AHA-1510   16 bit ISA Adapter

AHA-1520/1522 16 bit ISA Adapter with BIOS

T338 MiniSCSI - parallel to SCSI host adapter

T348 MiniSCSI Plus bidectional parallel port to SCSI

T358 MiniSCSI EPP

T130 8 bit ISA Adapter with BIOS

T260 Micro Channel 16 Bit

T460 SlimSCSI 16 bit PCMCIA SCSI

T348 MiniSCSI Plus

- Bidirectional operation - Improved performance

- Uses Trantor P3C ASIC for parallel port interface

- Passes printer through when T348 is powered

- Requires SCSI Termination Power

- Attached cable plugs into parallel port - Modern styling

- Takes advantage of bidirectional parallel ports

    - Reads and writes approx 240K/sec

MiniSCSI
Plus

ADAPTEC
Connections

adaptec

T348 Mini SCSI Plus

Printer pass through goes here

Standard 50 pin centronics connector ➤

Says Mini SCSI Plus to distinguish from the Mini SCSI EPP

Connect this up to the parallel port on your computer
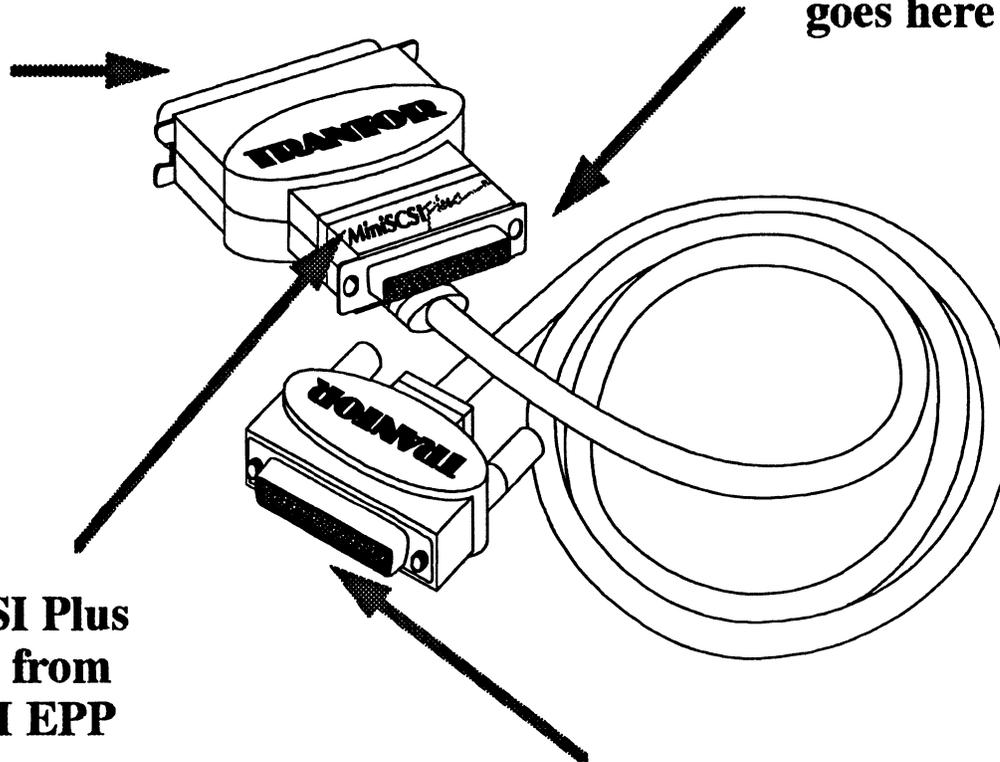
SCSIworks! ASPI Bundle

comes with the every Trantor product, and includes...

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- CD-ROM

- Hard Disk, Magneto-Optical

- Removable (SyQuest, Bernoulli, Floptical)

- HP ScanJet scanner driver

- Tape Mate II and Music Box applications

- MediaVision Pro Audio Spectrum / Sigma Designs WinStorm ASPI

T348 MiniSCSI Plus
Installation

1. Connect the T348 to an available parallel port. If there is a printer already attached, connect that to the printer bypass on the side of the T348.

2. Connect the SCSI cable, DB25 to 50 pin SCSI from the T348 to the SCSI peripheral. The T348 is always terminated. The other end of the SCSI bus must be terminated.

T348 MiniSCSI Plus Troubleshooting

1. The printer bypass will only work if the SCSI peripheral is powered up.

2. The SCSI peripheral must be supplying terminator power, since the T348 does not provide terminator power.

Relative Performance of Parallel host adapters

	Uni-directional Parallel Port	Bi-directional Parallel Port	Enhanced Parallel Port
T338 MiniSCSI	75 KB/sec Read 150 KB/sec Write	75 KB/sec Read 150 KB/sec Write	75 KB/sec Read 150 KB/sec Write
T348 MiniSCSI Plus	75 KB/sec Read 150 KB/sec Write	240 KB/sec Read 240 KB/sec Write	240 KB/sec Read 240 KB/sec Write
T358 MiniSCSI EPP	75 KB/sec Read 150 KB/sec Write	240 KB/sec Read 240 KB/sec Write	800 KB/sec Read 800 KB/sec Write

ADAPTEC
Connections

AHA-1510   16 bit ISA Adapter
AHA-1520/1522 16 bit ISA Adapter with BIOS
T338 MiniSCSI - parallel to SCSI host adapter
T348 MiniSCSI Plus bidectional parallel port to SCSI

T358 MiniSCSI EPP

T130 8 bit ISA Adapter with BIOS
T260 Micro Channel 16 Bit
*T460 SlimSCSI 16 bit PCMCIA SCSI*

T358 MiniSCSI EPP

- Performance equivalent to 8 bit SCSI adapter

- Styling and features similar to T348

- Takes advantage of Enhanced Parallel Port architecture

    - Reads and writes approx 800K/sec

    - Uses Intel 82360 chipset found in many notebook computers

- Backward compatible with uni and bidirectional parallel ports at reduced speeds

MiniSCSI
Plus EPP

ADAPTEC
Connections

T358 Mini SCSI EPP

Printer pass through goes here

Standard 50 pin centronics connector

Says Mini SCSI EPP to distinguish from the Mini SCSI Plus

Connect this up to the parallel port on your computer
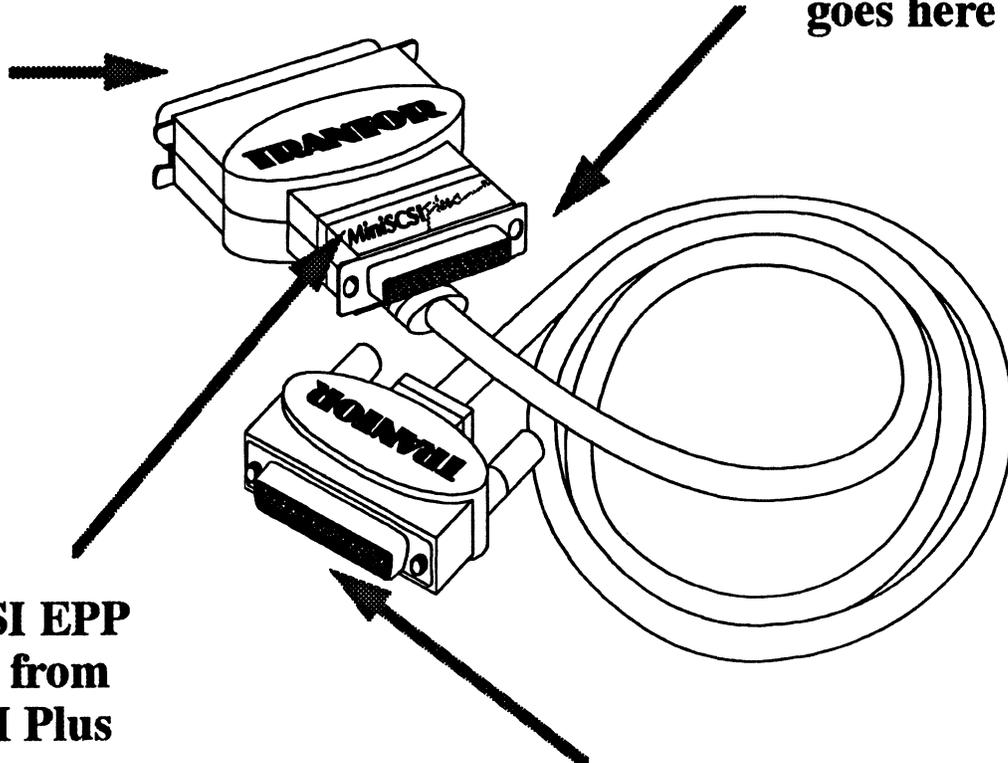
SCSIworks!   ASPI Bundle

comes with the every Trantor product, and includes...

- ASPI Managers, OS/2, Windows NT, and Novell NLM for Trantor SCSI adapters

- CD-ROM

- Hard Disk, Magneto-Optical

- Removable (SyQuest, Bernoulli, Floptical)

- HP ScanJet scanner driver

- Tape Mate II and Music Box applications

- MediaVision Pro Audio Spectrum / Sigma Designs WinStorm ASPI

T358 MiniSCSI Plus
Installation

1. Connect the T358 to an available parallel port. If there is a printer already attached, connect that to the printer bypass on the side of the T358.

2. Connect the SCSI cable, DB25 to 50 pin SCSI from the T358 to the SCSI peripheral. The T358 is always terminated. The other end of the SCSI bus must be terminated.

T358 MiniSCSI Plus Troubleshooting

1. The printer bypass will only work if the SCSI peripheral is powered up.

2. The SCSI peripheral must be supplying terminator power, since the T358 does not provide terminator power.

Relative Performance of Parallel host adapters

	Uni-directional Parallel Port	Bi-directional Parallel Port	Enhanced Parallel Port
T338 MiniSCSI	75 KB/sec Read 150 KB/sec Write	75 KB/sec Read 150 KB/sec Write	75 KB/sec Read 150 KB/sec Write
T348 MiniSCSI Plus	75 KB/sec Read 150 KB/sec Write	240 KB/sec Read 240 KB/sec Write	240 KB/sec Read 240 KB/sec Write
T358 MiniSCSI EPP	75 KB/sec Read 150 KB/sec Write	240 KB/sec Read 240 KB/sec Write	800 KB/sec Read 800 KB/sec Write

ADAPTEC
Connections

AHA-1510   16 bit ISA Adapter

AHA-1520/1522 16 bit ISA Adapter with BIOS

T338 MiniSCSI - parallel to SCSI host adapter

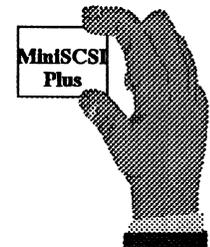*T348 MiniSCSI Plus bidectional parallel port to SCSI*

T358 MiniSCSI EPP

T130 8 bit ISA Adapter with BIOS

T260 Micro Channel 16 Bit

T460 SlimSCSI 16 bit PCMCIA SCSI

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adaptec   *Technical Training Seminar*

T130 8 bit ISA Adapter

- 1 M/sec data transfer rate

- NCR 53C400 based SCSI controller

- BIOS ROM included

- Internal 50 pin SCSI connector

- External DB25 SCSI connector (Macintosh compatible pinout)

- 4 selectable addresses

- 4 cards supported simultaneously

ADAPTEC
Connections

adaptec

T130 8 bit ISA Adapter

Jumper settings silkscreened here for convenience

Terminators should be removed if both internal and external connectors are used

On board BIOS controls booting and support for up to two hard drives without drivers
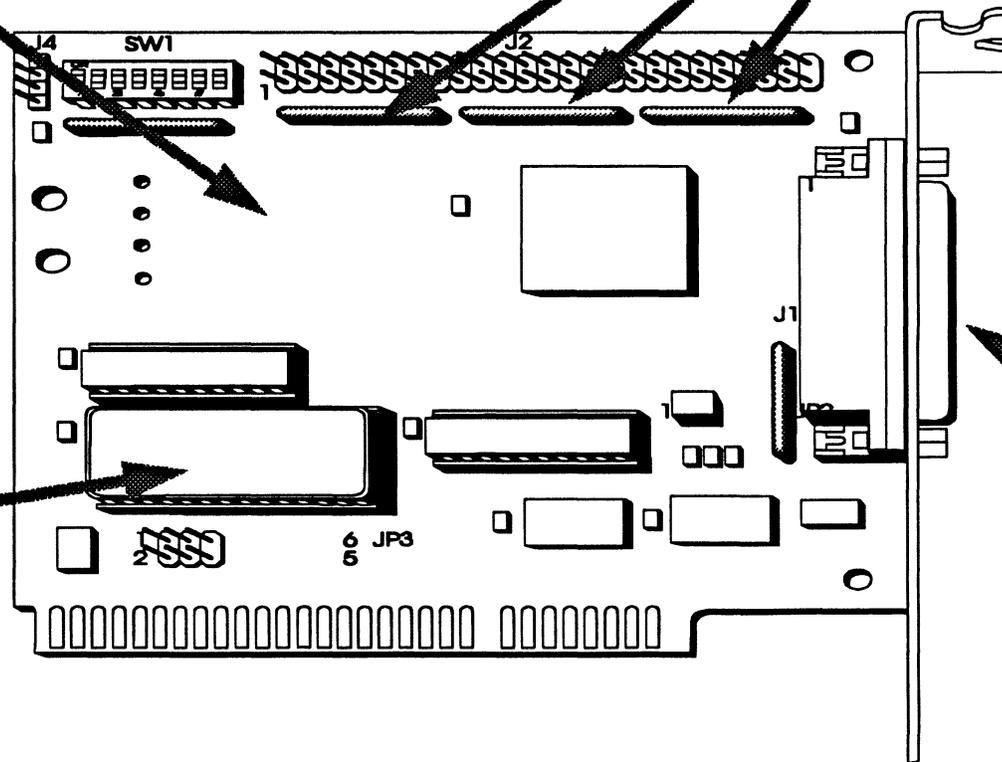
DB 25 connector for ease of connection to external devices

SCSIworks! ASPI Bundle

comes with the every Trantor product, and includes...

- ASPI Managers, OS/2, Windows NT, and Novell NLM for Trantor SCSI adapters

- CD-ROM

- Hard Disk, Magneto-Optical

- Removable (SyQuest, Bernoulli, Floptical)

- HP ScanJet scanner driver

- Tape Mate II and Music Box applications

- MediaVision Pro Audio Spectrum / Sigma Designs WinStorm ASPI

T130 8 bit ISA Adapter Installation

1. The T130 has the following I/O settings:

Port Address: *350h, 340h, 250h, 240h
ROM BIOS address: *Disabled, CA000h, CE000h, DA000h, DE000h
                                    (8Ks in size)
Interrupt (IRQ):   *no interrupt, IRQ3, IRQ5, IRQ7

Make sure that the settings don't conflict with anything else in the system.

2. If booting from the SCSI hard disk is desired, enable the BIOS.

3. Install the jumper at JP2 in order to increase performance in an AT or EISA system.

ADAPTEC
Connections

AHA-1510   16 bit ISA Adapter

AHA-1520/1522 16 bit ISA Adapter with BIOS

T338 MiniSCSI - parallel to SCSI host adapter

T348 MiniSCSI Plus bidectional parallel port to SCSI

T358 MiniSCSI EPP

T130 8 bit ISA Adapter with BIOS

T260 Micro Channel 16 Bit

T460 SlimSCSI 16 bit PCMCIA SCSI

T260 Micro Channel 16 Bit

- **16 bit MCA Host Adapter**

- **Very small, fits short slot of IBM Model 70 Portable**

- **2.0 MB/sec**

- **BIOS onboard, internal and external (25-pin) connectors**

  - **Internal: 50-pin inline, unshrouded**

  - **External: DB25F, Macintosh pinout-compatible**

- **Low Cost Micro Channel alternative**

SCSIworks! ASPI Bundle

comes with the every Trantor product, and includes...

- ASPI Managers, OS/2, Windows NT, and Novell NLM for Trantor SCSI adapters

- CD-ROM

- Hard Disk, Magneto-Optical

- Removable (SyQuest, Bernoulli, Floptical)

- HP ScanJet scanner driver

- Tape Mate II and Music Box applications

- MediaVision Pro Audio Spectrum / Sigma Designs WinStorm ASPI

ADAPTEC
Connections

AHA-1510   16 bit ISA Adapter
AHA-1520/1522 16 bit ISA Adapter with BIOS
T338 MiniSCSI - parallel to SCSI host adapter
T348 MiniSCSI Plus bidectional parallel port to SCSI
T358 MiniSCSI EPP
T130 8 bit ISA Adapter with BIOS
T260 Micro Channel 16 Bit

T460 SlimSCSI 16 bit PCMCIA SCSI

T460 Slim SCSI-PCMCIA

- ## T460 SlimSCSI 16 bit SCSI

  - ### Uses Trantor T101 ASIC for SCSI interface

  - ### 2M/sec data transfer rate

  - ### PCMCIA Type 2 case

  - ### Included cable is reversible for connection ease

  - ### Supports Intel 82365SL PCMCIA chipset

  - ### Computers from AST, Compaq, DELL, Grid, IBM, NEC, Zenith support PCMCIA

AHA-1510/1520/1522

The Connectivity Product Line

ISA to SCSI

Host Adapters
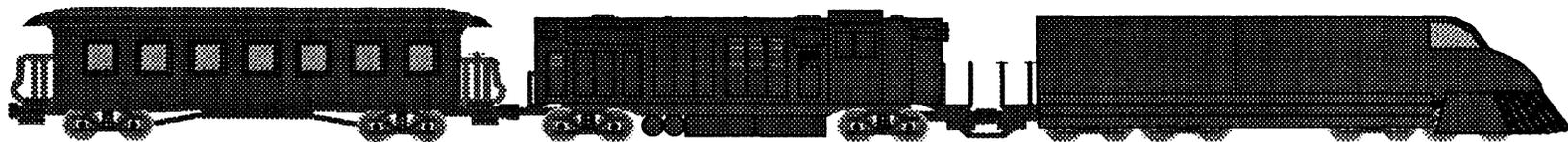
AHA-1510 / 1520 / 1522
Boards based on the AIC-6260

● **AHA-1510**   AIC-6260 on a board with:
- SCSI internal and external connectors
- SCSI Terminators (provides Term. Power)

● **AHA-1520**   AHA-1510 plus:
- BIOS EPROM and BIOS address decode logic -
Jumpers for configuration settings, buffers

● **AHA-1522**   AHA-1520 plus:
- Floppy Controller

AHA-1510 / 1520 / 1522
Boards based on the AIC-6260

All three boards:

- use the same Printed Circuit Board

- are supported by the same ASPI software for DOS/Windows and NetWare

- have embedded S/W support in Unix and OS/2

AHA-1510 / 1520 / 1522
Boards based on the AIC-6260

All three boards have these features:

- 5 MBytes/sec Synchronous data transfer rate on SCSI Bus

- SCSI protocol auto-sequencer based on mature AIC-6250 design

- 16 bit Programmed I/O transfer on ISA bus

- Internal Stack (No need to use system RAM to save parameters)

- 128 byte data FIFO to handle asynchronous SCSI vs ISA data transfer

- Multitasking support with Multi-threading - Up to 8 I/O threads

Max data transfer is limited by SCSI drive or by host ISA bus PIO rate. AIC-6260 is not a bottle neck. Newer systems can PIO at 4 MBytes/sec.

ADAPTEC
Connections

AHA-1510 - 16 bit ISA-to-SCSI single user host adapter

AHA-1520/1522

T338 MiniSCSI

T348 MiniSCSI Plus

T358 MiniSCSI EPP

T130 8 bit ISA Adapter

T260 Micro Channel 16 Bit

T460 SlimSCSI 16 bit PCMCIA SCSI

AHA-1510
Features and Benefits

- **16 bit Programmed I/O transfer on ISA bus**
- **SCSI-2 device: compatible with both SCSI-1 and SCSI-2 devices**
- **Supports synchronous (5 MB/sec) and asynchronous (2 MB/sec) devices simultaneously**
- **Compatible with a wide variety of SCSI peripherals (see compatibility list in Volume 1)**
- **Easy to configure: most parameters set with command line switches, not jumpers**

AHA-1510 Block Diagram

INTERNAL SCSI HEADER

AIC-6260AL

I2 I1 I0 I9 AL

EXTERNAL CONNECTOR
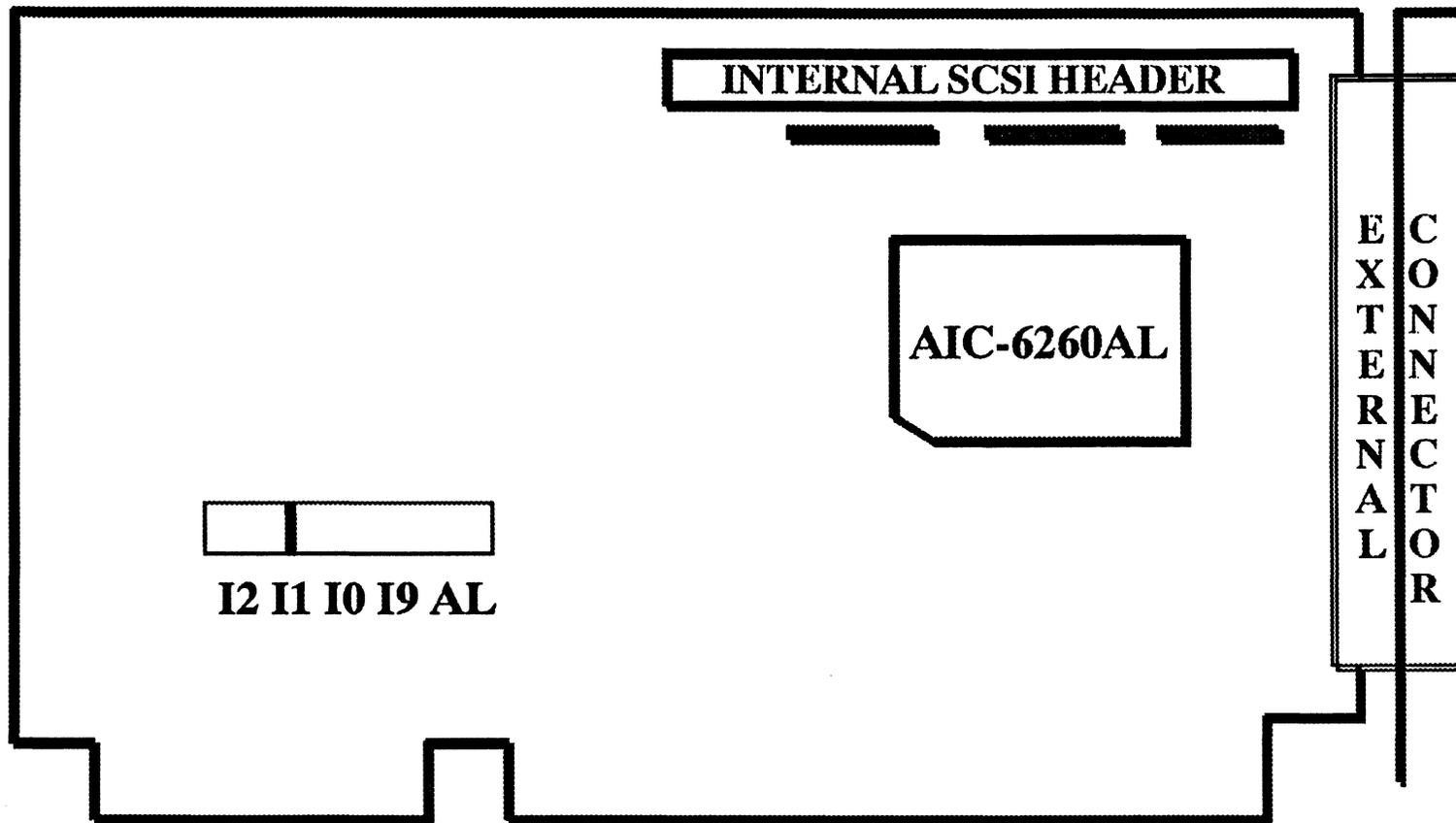
AHA-1510 Installation

1. Install the AHA-1510 into any ISA or EISA slot.
2. Connect the internal and/or external devices, then check the SCSI termination (described in detail under the 'Common Installation Issues' section of this document.

Jumper Hints:

The Interrupt (IRQ) and Port Address must be set with jumpers. If changed from the defaults (IRQ 11 and Port 340-35Fh), then switches must be added to the device driver. e.g. `DEVICE=ASPI2DOS.SYS /Z /Q12` must be used if the host adapter is jumpered to I2, IRQ 12.

I0=IRQ 10, I1=IRQ 11 (default), I2=IRQ 12, I9=IRQ 9
AL jumper installed = port 340-35Fh, not installed = port 140-15Fh

AHA-1510 Troubleshooting

- **Disable synchronous negotiations**

DEVICE=ASPI2DOS.SYS /U-

Some CD-ROM and other older SCSI devices do not support synchronous negotiation, and will not work if synchronous is enabled.

AHA-1510
DOS Software Installation

● **Install ASW-EZSCSI software**

● **Reboot**

● **Optional ASPI2DOS.SYS command line options:**

   ◆ **Entering /Z option is equivalent to:**

      ▲ **/C-**   **Enables disconnection**

      ▲ **/TP**   **Transfer mode is PIO (Programmed Input/Output)**

      ▲ **/Y**   **Parity enabled**

      ▲ **/U**   **Enable synchronous negotiation**

      ▲ **/A0**   **DMA is set to 0**

      ▲ **/H7**   **SCSI ID is set to 7**

      ▲ **/Q11**   **Interrupt Channel is set to 11**

      ▲ **/D**   **Detailed messages**

AHA-1510 Jumper Configuration

J9
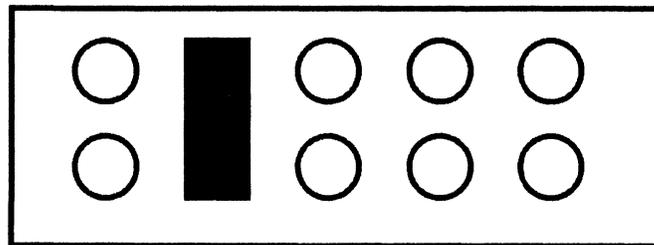
AL jumper removed = port 340-35Fh*
AL jumper installed = port 140-15Fh

I2 I1 I0 I9 AL

Primary/Secondary Port Address

IRQ 9

IRQ 10

IRQ 11*

IRQ 12
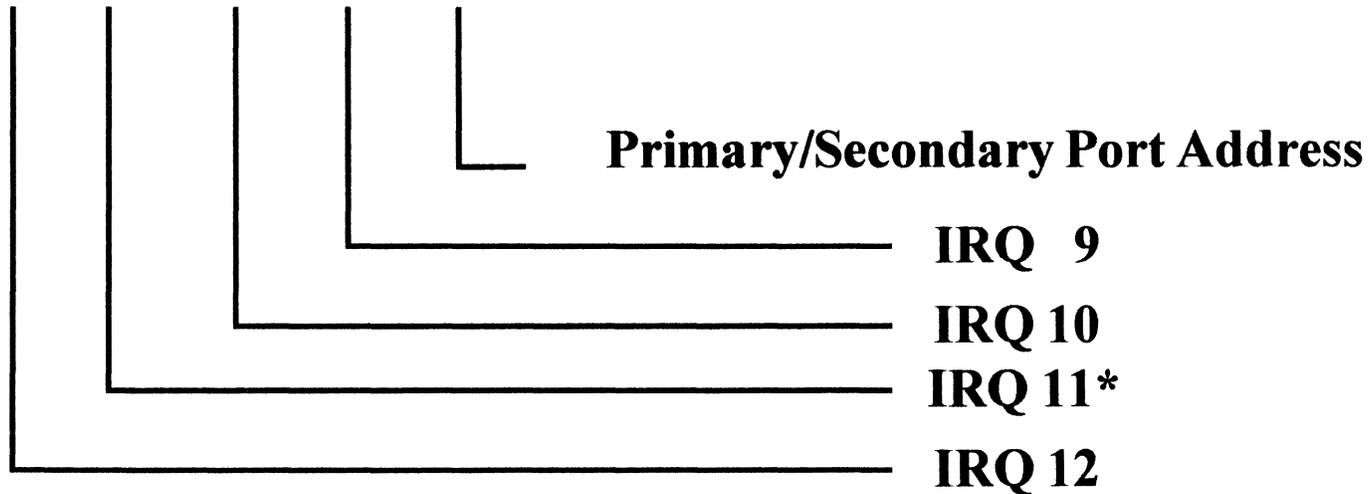
* = default

AHA-1510 Hints

- **Internal connector is 50 pin flat ribbon cable**

- **External connector is 50 pin low density Centronix-type**

- **Maximum of two 1510's can be installed**

- **AHA-1510 cannot be used to boot**

- **Other drives should be set at addresses 2-6**

- **/Z command line option defaults all settings on the ASPI2DOS.SYS device driver**

ADAPTEC
Connections

AHA-1510

AHA-1520/1522-16 bit ISA-to-SCSI single user host adapter with BIOS (floppy support on the AHA-1522)

T338 MiniSCSI

T348 MiniSCSI Plus

T358 MiniSCSI EPP

T130 8 bit ISA Adapter

T260 Micro Channel 16 Bit

T460 SlimSCSI 16 bit PCMCIA SCSI

AHA-1520/1522
Features and Benefits

- 16 bit Programmed I/O transfer on ISA bus
- SCSI-2 device: compatible with both SCSI-1 and SCSI-2 devices
- Supports synchronous (5 MB/sec) and asynchronous (2 MB/sec) devices simultaneously
- On board BIOS supports booting, and control of up to 2 hard disk drives under DOS without drivers.
- Compatible with a wide variety of SCSI peripherals (see compatibility list in Volume 1)
- Easy to configure: most parameters set with command line switches, not jumpers

AHA-1522 Block Diagram

FLOPPY HEADER

INTERNAL SCSI HEADER

FDC J5 [   ] J6

AIC-6260AL

J7 [   ] J9

BIOS

J8

EXTERNAL CONNECTOR
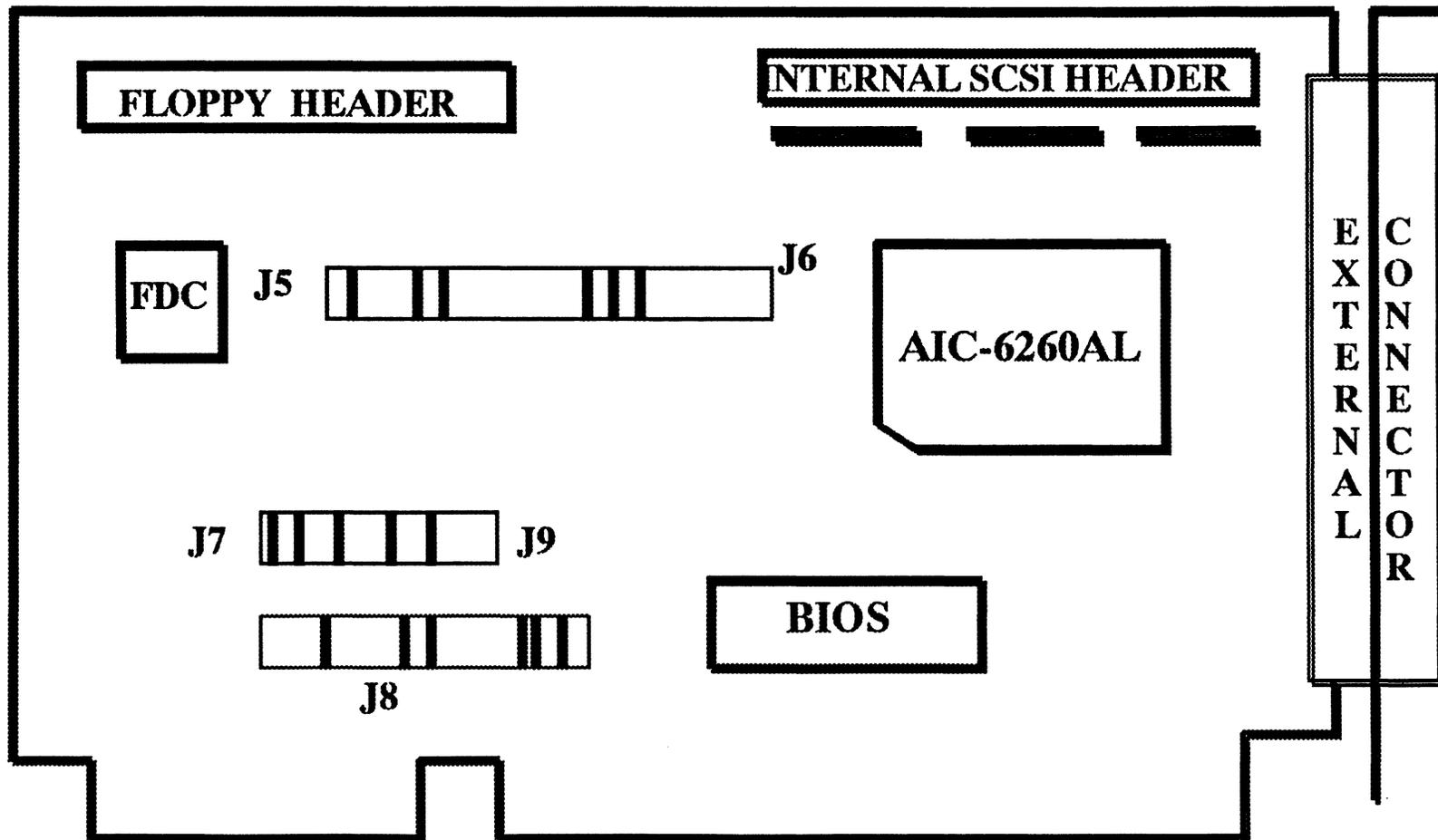
AHA-1520/1522 Installation

1. Install the AHA-1520/1522 into any ISA or EISA slot.
2. Connect the internal and/or external devices, then check the SCSI termination (described in detail under the 'Common Installation Issues' section of this document.

Jumper Hints:

The Interrupt (IRQ) and Port Address must be set with jumpers. If changed from the defaults (IRQ 11 and Port 340-35Fh), then switches must be added to the device driver. e.g. `DEVICE=ASPI2DOS.SYS /Q12` must be used if the host adapter is jumpered to I2, IRQ 12.

AHA-1520/1522 Troubleshooting

- **Disable synchronous negotiation**
  Remove the jumper at J5, position 5 (silkscreened SN for sync. negotiation)
  Some CD-ROM and other older SCSI devices do not support synchronous negotiation, and will not work if synchronous is enabled.

SCSIworks! ASPI Bundle

comes with the every Trantor product, and includes...

- **ASPI Managers, OS/2, Windows NT, and Novell NLM for Trantor SCSI adapters**

- **CD-ROM**

- **Hard Disk, Magneto-Optical**

- **Removable (SyQuest, Bernoulli, Floptical)**

- **HP ScanJet scanner driver**

- **Tape Mate II and Music Box applications**

- **MediaVision Pro Audio Spectrum / Sigma Designs WinStorm ASPI**

AHA-1540C Fourth Generation ISA- SCSI Host Adapter

The Best Just Got Better!

The AHA-1540C - You Asked For it !

Software compatible
with the popular
AHA-1542B

Easily Accessible
Dip Switches

Active termination
controlled from
the keyboard

10 MHz processor
cuts SCSI
overhead
and boosts
performance
up to 25%

SCSI*Select*™
configuration utility
eliminates jumpers

Microcode design
optimizes
performance

Boot from any Device
and *Start Unit* commands
support disk arrays

Virtual DMA Services
support conserves
low memory
under Windows

AHA-1540C Configuration Utility
Easy and Flexible
SCSISelect ™

Once in the system, does not need to be moved for configuration changes

No jumpers. Configure board with software

Pop-up Window screens for setting options

Help screens

Find out Firmware & BIOS Revs via software

Default options are reset with a keystroke

The AHA-1540C/1542C Highlights

- ● **Fully software compatible with AHA-1540B/1542B**
- ● **SCSI made Easy**
  - ✓ Menu software configuration utility
  - ✓ Much less likely to have to open your machine for changes
- ● **New features**
  - ✓ DOS/Windows support for disks over 1 GByte
  - ✓ VDS in the BIOS
  - ✓ Disk array support
  - ✓ Active termination
- ● **Highest performance**

BIOS
EPROM

ⓒadaptec
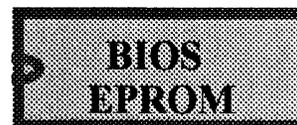
Lean AHA-1540C Design Reduces Overhead, Boosts Performance

Kbytes/sec

Test Parameters

- Tdrive 2.6 Reading
- DMA speed = 6.7 MB/s
- Everex 486/33
- AMI BIOS
- Quantum LP240S
- VGA Video
- 16 MByte RAM

Block size in Kbytes

◆ AHA-1540C ■ AHA-1540B
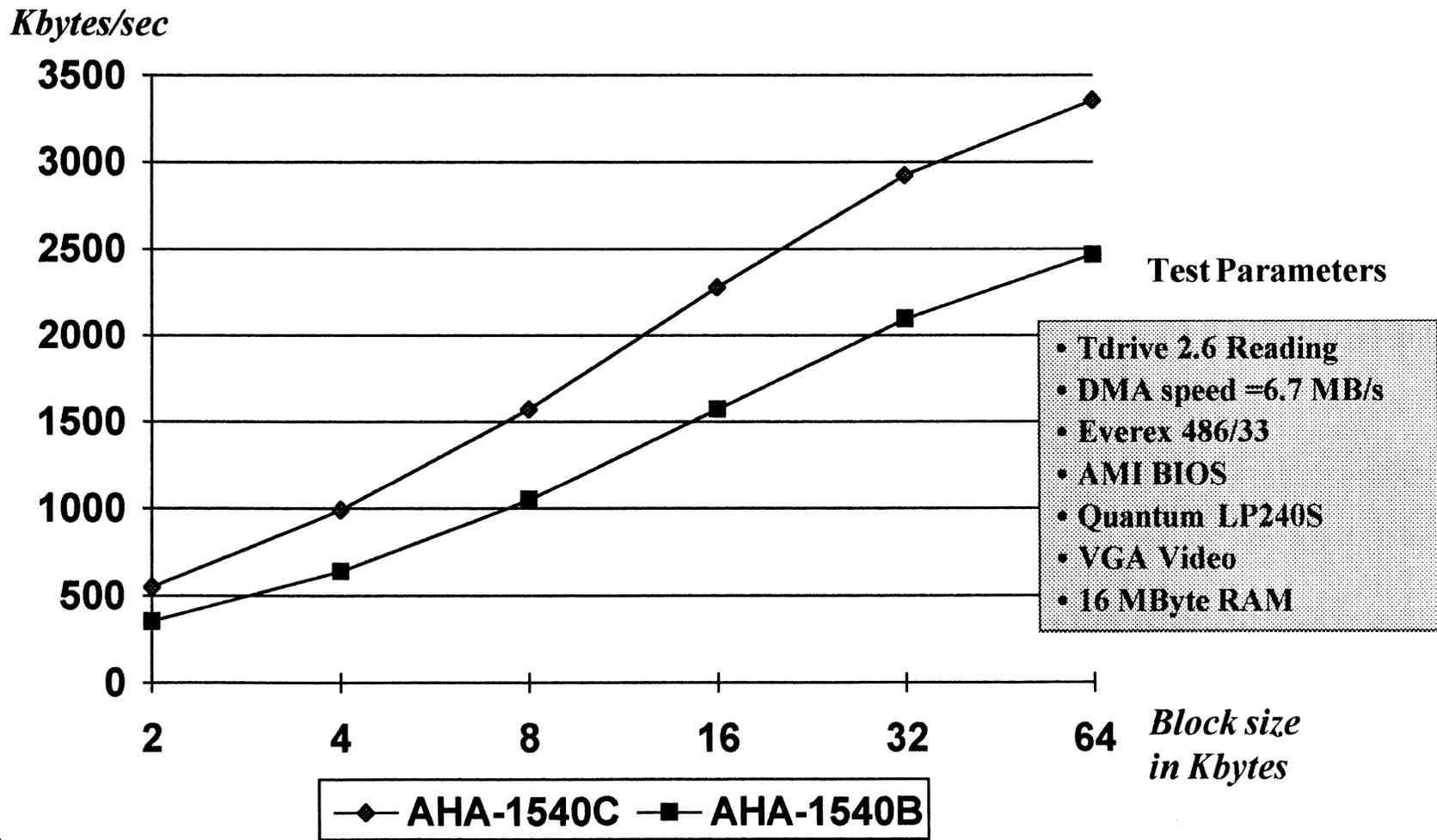
ISA System Bottlenecks Level the Playing Field for Everyone

Kbytes/sec
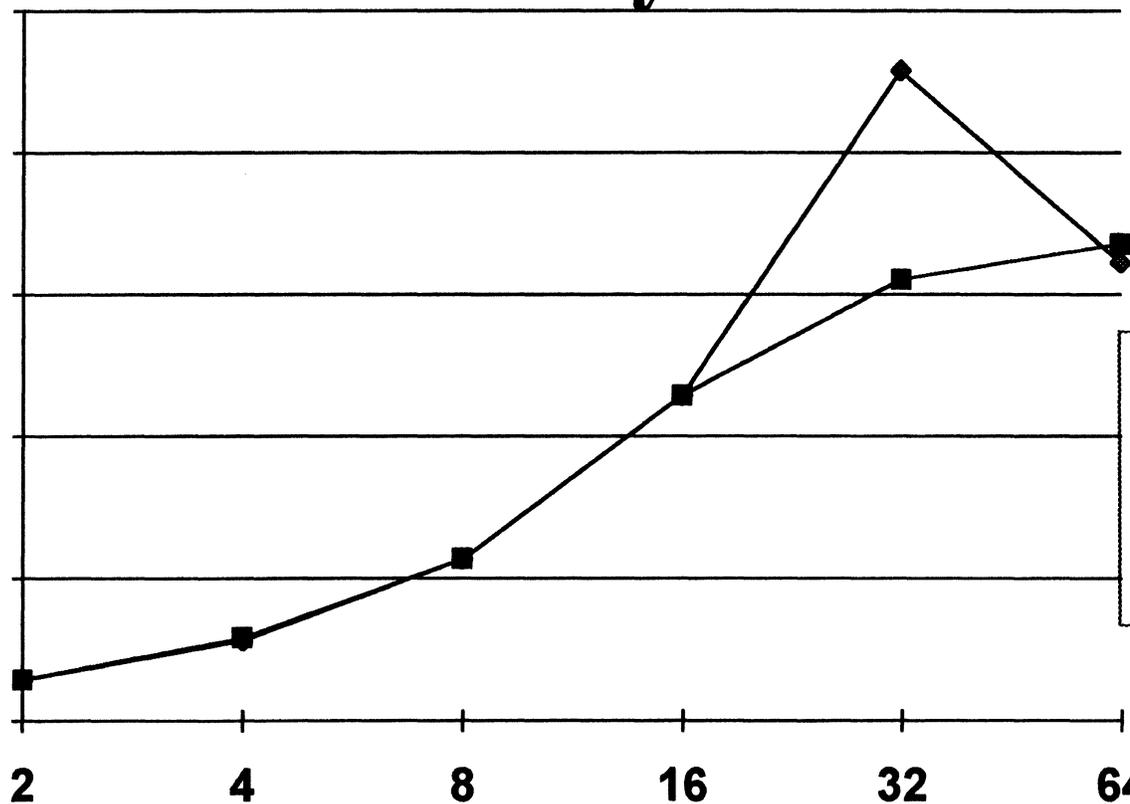
Test Parameters

- Tdrive 2.6 Writing
- DMA speed =6.7 Mbytes/sec
- Everex 486/33
- AMI BIOS
- Quantum LP240S
- VGA Video
- 16 Mbyte RAM

Block size in Kbytes

AHA-1540C   AHA-1540B

AHA-1540C/1542C
Digging Deeper...
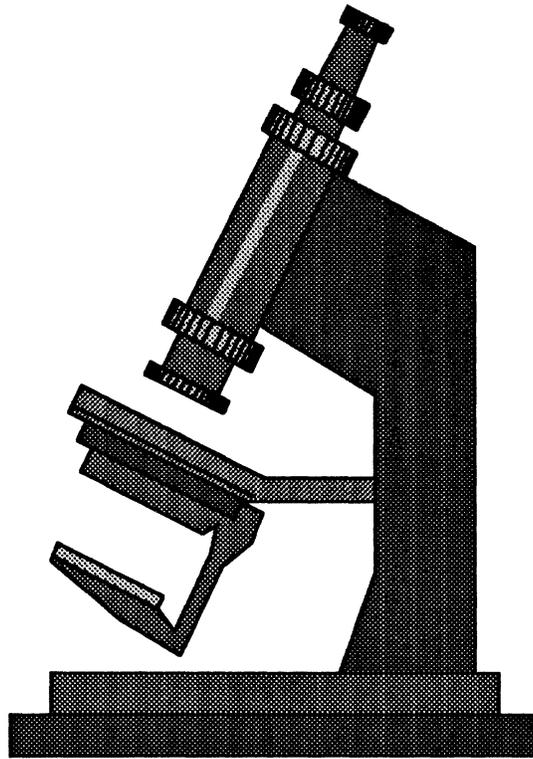
AHA-1540/42C Installation

1. Insert the AHA-1540/42C into an available slot.

2. Check the hardware settings of all I/O cards in the system to insure that they do not conflict with the hardware settings of the host adapter [IRQ, DMA channel, I/O port, BIOS address, and floppy (AHA-1542C only)] The hardware settings are set via switches and/or the SCSI-Select utility.

3. Run the host adapter diagnostics test from the SCSI-Select utiliity to insure bus mastering is supported at the selected rate.

4. The AHA-1540/42C is now installed. Run the appropriate partitioning program. (e.g. FDISK, AFDISK, etc.)

AHA-1540/42C Options
settable by switches

BIOS Address: ***DC000h, D8000h, D4000h,**
                                                    D0000h, CC000h, C8000h, disabled

I/O Port Address: ***330h, 334h, 230h, 234h, 130h, 134h**

Floppy Controller: ***Enable, Disable**

**Host Adapter
Termination:**   ***Software Controlled, Always Enabled**

AHA-1540/42C Options settable by the SCSI-Select Utility

Interrupt Channel:	*11, 12, 14, 15, 10, 9
DMA Channel:	*5, 7, 6, 0
SCSI Address (ID):	*7, 6, 5, 4, 3, 2, 1, 0
SCSI Parity Checking:	*Enabled, Disabled
DMA Transfer Rate:	*5.0, 5.7, 6.7, 8.0, 3.3
Host Adapter Termination:	*Enabled, Disabled
* SCSI Device Configuration	Press <Enter>
* Advanced Configuration Options	Press <Enter>

dadaptec

AHA-1540/42C
nice advantages over the
AHA-1540B/1542B

AHA-1540/42B	AHA-1540/42C
1. Boot from port 330h only	Boot from any port address
2. Boot from SCSI ID 0 only	Boot from any SCSI ID
3. VDS support provided by ASPI4DOS driver. ASPI4DOS can't be loaded "high"	VDS support built into the HA BIOS. ASPI4DOS can be loaded "high"
4. Terminators must be removed to disable termination	Termination can be controlled with software
5. BIOS upgrade required for >gig	>gig support built in
6. Additional drivers req. to support more than 2 drives under DOS	Up to 7 drives can be supported under MS-DOS 5 without more software

AHA - 1640

Microchannel to SCSI Host Adapter
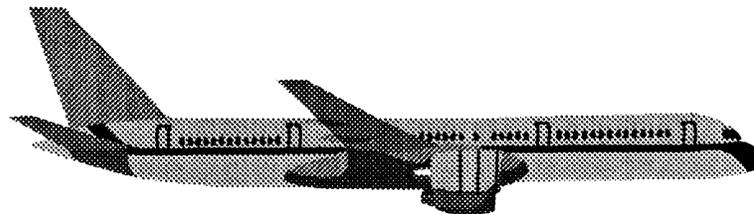
AHA-1640 Features

- **On-board 64/32 translations scheme & two drive support without software**

- **Async. to 3MB/sec, Sync. to 5MB/sec**

- **8MB/sec, 16-bit host transfers**

- **Disconnect/Reconnect support**

- **Scatter-Gather support**

- **Major O/S support**

- **SCSI-1 and SCSI-2 support**

AHA-1640
Block Diagram
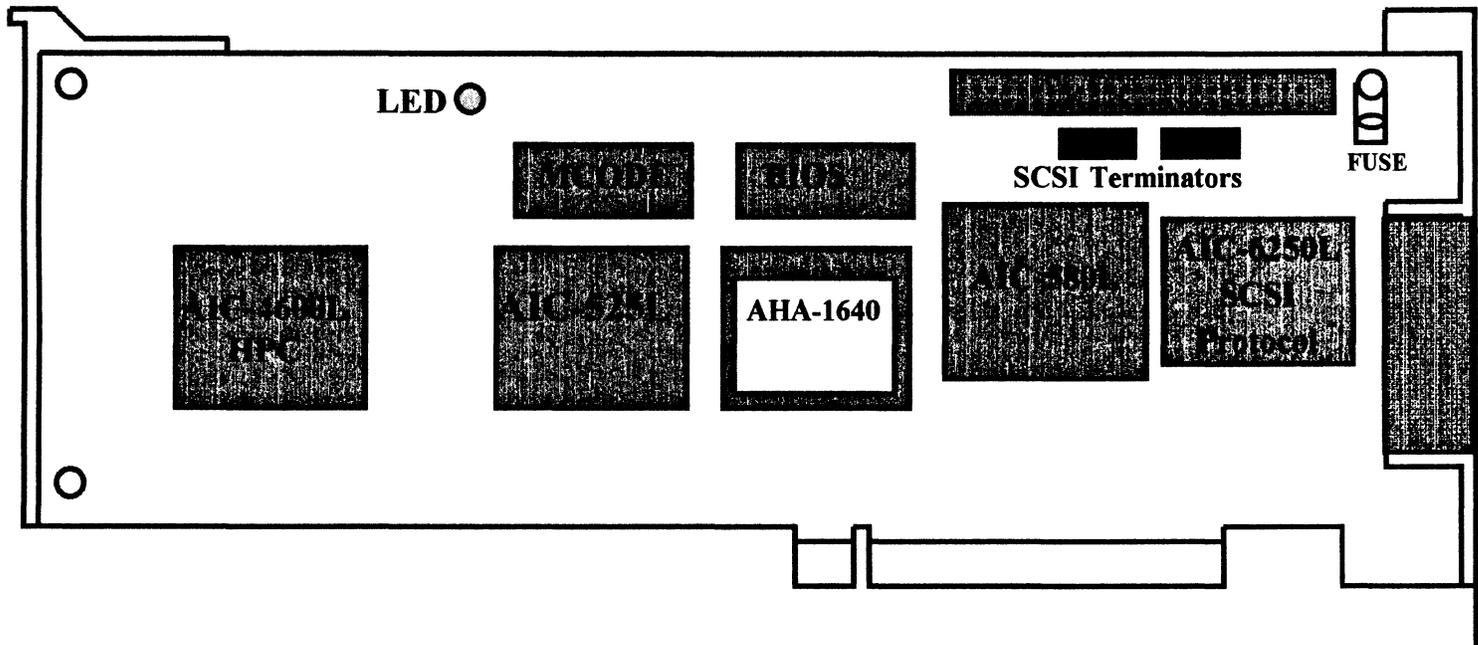
adaptec

AHA-1640 Installation

1. Copy the Adapter Descriptor File (ADF) to the System Reference Diskette.   The AHA-1640 ADF file is called @0F1F.ADF.

2. Insert the AHA-1640 into an available slot.

3. Boot the system to the reference diskette of the PS/2 model 50, 60, 70, 80 or compatible.

4. Run automatic configuration. The system will automatically reboot.

5. The AHA-1640 is now installed. If some of the options need to be changed, boot to the reference diskette and go to the "Change Configuration" menu.

AHA-1640 Options

BIOS Address:	*DC000h, D8000h, D4000h, D0000h, CC000h, C8000h
I/O Port Address:	*330h, 334h, 234h, 134h, 230h, 130h
Arbitration Level:	*5, 6, 7, 4, 3, 1, 0
Interrupt Channel:	*11, 15, 14, 12, 10, 9
SCSI Address (ID):	*7, 6, 5, 4, 3, 2, 1, 0
Sync. Xfer Started by AHA-1640:	*Yes, No
SCSI Parity Checking:	*On, Off
Fairness:	*On, Off

AHA-1640 hints

1. Booting is only possible from port 130h, 230h, or 330h .

2. There is a format utility, but not a bus master DMA test, in the BIOS.

3. The system LED will only flash if the DOS ASPI Manager v2.1 or newer is loaded.

4. A maximum of 6 AHA-1640s can be installed per system.

5. The external connector is a 50 pin high density connector.

6. There is no power connector available on this adapter. Hard disk drives can be mounted externally in desktop systems such as the IBM PS/2 models 55 and 70.

Helpful Utilities in the Host Adapter BIOS EPROM

From DEBUG:

BIOS SEGMENT:6 BIOS Format Utility
(e.g. G=DC00:6)
- Verify installed SCSI drives
- Verify SCSI drive IDs
- Verify SCSI Cable
- SCSI FORMAT UNIT command
- SCSI VERIFY

SCSI Format Utility

AT/SCSI Fixed Disk Format Utility
Copyright Adaptec, Inc. 1989 Version 3.08

```
OPTIONS:                                              SELECTED DRIVE:
--------                                              ---------------


(1) Display Installed SCSI Devices                        Target 0
(2) Select Next Installed SCSI Device
(3) Format Drive                                          LUN 0
(4) Verify Drive
(5) Quit


---------------------------------------------------------------------



Target            LUN                  Vendor ID          Product ID
------            ---                  ---------          ----------


  0                0                   CONNER             CP3100-100mb-3.5
  1                0                   Syquest            SQ555
  2                0                   Maxoptics          Tahiti
  5                0                   IOMEGA             BETA 44
```

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AHA - 1740/42A

EISA to SCSI
Host Adapter
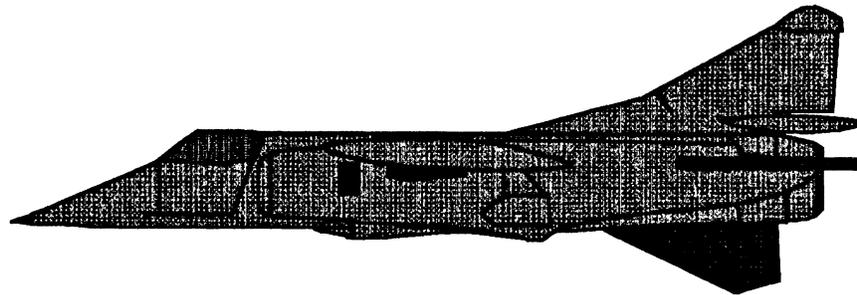
AHA-1740/42A Features

- **On-Board 64 Head BIOS for boot capability and up to two drive support without drivers**
- **Supports Async. up to 3MB/sec, standard Sync. up to 5MB/sec, and Fast Sync up to 10MB/sec**
- **32-bit host transfers at 33 MB/sec**
- **Standard and Enhanced modes**
- **Downloadable firmware for easy upgrades (ADL.EXE) (AHA-1740 only)**
- **Disconnect/Reconnect support**
- **Scatter-Gather support**
- **SCSI Tagged Queuing support**
- **SCSI-1 and SCSI-2 compatible**

AHA-1740/42A Operating Modes

Standard Mode
(ISA compatible mode)

Enhanced Mode
(enhanced mailbox Interface)

32-bit host transfers at 33 MB/sec	32-bit host transfers at 33 MB/sec
Addresses up to 16 MBytes of motherboard RAM	Addresses up to 4 GigaBytes of motherboard RAM
1540B series mailbox structure compatible with 1540 software)	High performance mailbox structure (low SCSI overhead)
Supports SCSI devices up to 5 MB/sec.	Supports FAST SCSI devices up to 10 MB/sec.
Boot from SCSI ID 0	Boot from any SCSI ID

AHA-1740/42A Installation

1. Copy the EISA Configuration file (CFG) to the Configuration Diskette. The overlay file ADP0000.OVL (or ADP0000.OVR) and .CFG file is required:

   AHA-1740 -----> !ADP0000.CFG

   AHA-1740A ---> !ADP0001.CFG

   AHA-1742A ---> !ADP0002.CFG

   AHA-1744 -----> !ADP0400.CFG

2. Insert the AHA-1740A into an available slot.
3. Boot to DOS and run the configuration utility.
4. The AHA-1740A will be auto-added. The mode of the host adapter can be changed, as well as several configurable options.
5. The AHA-1740A is now installed. Save the changes and reboot for the changes to take effect.

AHA-1740/42A Options Standard Mode

```
Adaptec 32-bit EISA SCSI Host Adapter
Mass Storage device

  Host Adapter Interface Mode...........IRQ 11, Standard Mode

  Standard Mode Resource Selection
   I/O Port Definition..................Port 330h
   DMA Channel Definition...............DMA Channel 5

  Host Adapter SCSI ID..................Device Id 7

  SCSI Bus Reset at Power-on............Enable SCSI bus reset

  Host Adapter BIOS.............Enabled @ Base Address CC000H

  Advanced Enhanced Mode BIOS Options
    Extended BIOS Translation...........Disabled
    Support for more than 2 Drives......Disabled
    Immediate Return on Seeks...........Enabled


  SCSI Device Configuration.............Press <Enter> to set SCSI
                                        Configuration Options
```

AHA-1740/42A Options
Standard Mode:
Device Configuration

Global Host Adapter SCSI Configuration Options

Enable Parity Checking   yes
Initiate Synch negotiation   yes
Enable Disconnection   yes

Ok <ESC>

These options are for all SCSI devices attached to the host adapter.
The BIOS must be enabled for these changes to take effect.

AHA-1740/42A Options
Standard Mode: Hints

1. The AHA-1740 in standard mode is compatible with AHA-1540 family software.

DOS:	ASPI4DOS.SYS
OS/2 v1.3:	SCSI01.SYS, ASPI4OS2.SYS, or AHA154X.BID
OS/2 v2.0:	AHA154X.ADD
NetWare:	ASWNOVL.DSK (286) or AHA1540.DSK (386)
UNIX/XENIX:	Embedded support in popular versions

2. Although parameters like Host DMA transfer speed and bus on/off time can be changed via software, this is for compatibility reasons only and does not actually affect the host adapter performance.

3. Four AHA-1740s maximum can be placed into an EISA machine in standard mode (limiting factor is available DMA channels: 0, 5, 6, 7)

AHA-1740/42A Options: Enhanced Mode

```
Adaptec 32-bit EISA SCSI Host Adapter
Mass Storage device


  Host Adapter Interface Mode...........Enhanced Mode


  Standard Mode Resource Selection
   I/O Port Definition..................Disabled (Enhanced Mode)
   DMA Channel Definition Resource......Disabled (Enhanced Mode)


  Host Adapter SCSI ID..................Device Id 7


  SCSI Bus Reset at Power-on............Enable SCSI bus reset


  Host Adapter BIOS.....................Enabled @ Base Address CC000H


  Advanced Enhanced Mode BIOS Options
   Extended BIOS Translation............Disabled
   Support for more than 2 Drives.......Disabled
   Immediate Return on Seeks............Enabled


  SCSI Device Configuration.............Press <Enter> to set SCSI
                                        Configuration Options
```

AHA-1740/42A Options Enhanced Mode: Configuration Options

Configuration Settings for SCSI Devices

SCSI Device ID	#0	#1	#2	#3	#4	#5	#6	#7
Error if Device Not Found	no	no	no	no	no	no	no	no
BIOS Support Option	HD	HD	HD	HD	HD	HD	HD	HD
Send Start Command	no	no	no	no	no	no	no	no
Enable Parity Check	yes	yes	yes	yes	yes	yes	yes	yes
Initiate Synch Negotiation	yes	yes	yes	yes	yes	yes	yes	yes
Enable Disconnection	yes	yes	yes	yes	yes	yes	yes	yes
Maximum Synch Xfer Rate (MBs per second)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Ok <ESC>

AHA-1740/42A Options Enhanced Mode: Configuration Options

"Error if Device Not Found"

If the BIOS support Option is enabled for this SCSI ID, then the BIOS will expect to find the appropriate SCSI device (HD or FR). If the device is not found, the BIOS will display an error message.

"BIOS Support Option"

Possible values are HD (hard disk) or FR (removable disk). If selected, the BIOS will look for a device at that SCSI ID. This allows booting at IDs other than 0. Up to sevem devices maximum can be installed per system by the BIOS.

AHA-1740/42A Options Enhanced Mode: Configuration Options

"Send Start Command"

If 'yes' is selected, the AHA-1740 will send the START UNIT SCSI command to the selected SCSI ID. The disk drive must be configured (via jumpers or mode select) to wait for a START UNIT command if delayed spin up is desired.

"Enable Parity Check"

This allows parity checking to be enabled or disabled on a per device basis.

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AHA-1740/42A Options Enhanced Mode: Configuration Options

"Initiate Synch Negotiation"

This allows synchronous negotiation to be enabled or disabled on a per target basis. If 'no' is selected, the host adapter will still transfer data via synchronous transfers if the SCSI peripherals begins the synchronous negotiation.

"Enable Disconnection"

This allows or disallows SCSI devices to disconnect from the SCSI bus on a per target basis. In single target systems, disabling disconnect may result in improved system performance due to decreased SCSI overhead.

AHA-1740/42A Options Enhanced Mode: Configuration Options

"Maximum Synch Xfer Rate"

This determines the maximum value that the host adapter will use for synchronous negotiation. The offset used is always 8. The word 'maximum' is used because if the target cannot run synchronous at the selected rate, it can negotiate with the host adapter for a slower synchronous transfer rate.

Possible values are 3.3, 4.0, 5.0, 6.7, and 10.0 MB/sec.

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AHA-1740/42A Options Enhanced Mode: Hints

1. Up to twelve AHA-1740As can be installed per system in enhanced mode. No DMA channels or I/O port addresses are used. Interrupt channels are still used, and by default interrupt 11 is used. Type CNTL-R (change resources) while highlighting 'Host Adapter Mode' to change the IRQ used (only valid with CF.EXE, the EISA configuration utility by MCS.)

2. Multiple AHA-1740A BIOS can be enabled per system (unlike the AHA-1540 series host adapters). The BIOS must be enabled for any changes made in the EISA configuration utility to take effect.

Adaptec Download Utility
ADL.EXE

- Used to download the AHA-1740 microcode
  STANDARD.HEX and ENHANCED.HEX

- Used to determine version of the microcode

- Used to low level format SCSI disk drives (or
  use SCSIFMT.EXE, which works on all Adaptec
  host adapters)

Common Installation Issues

- ● **Cables**
  - ◆ **Line up pin one throughout**
- ● **Slots**
  - ◆ **If wrong response, change slots**
- ● **Board insertion**
  - ◆ **Board may be skewed in slot**
- ● **Improper termination**
  - ◆ **Only two terminations per bus!**
- ● **Conflicting Port ID**
  - ◆ **Change jumper: AL to (140h) option**
- ● **No ASPI software**
  - ◆ **Install ASW-EZSCSI which sets up proper device statements in config.sys**

Section G: Software

- **ASW-EZSCSI** — DOS/WIN Combination Product including:DOS ASPI managers for all host adapters, CD-ROM support, and user friendly install utility

- **SCSI Works** — ASPI software, including support for removable, CD-ROM, Photo CD, tape, and HP scanners. Also includes the ASPI managers for the 'Connections' product line

- **ASW-500** — Corel Applications (*Corel SCSI!)* v 1.01C

- **ASW-1220/1420** — ASPI IBM OS/2 1.3 LADDR Drivers

- **ASW-1240** — ASPI Novell NetWare Manager with Disk Module

- **ASW-1440** — ASPI Novell NetWare Manager w/ Disk Module for BM Cards

- **ASW-1250** — SCO Unix Manager

- **ASW-1450** — SCO Unix Enhanced Mode Manager for BM Cards

- **ASW-UPGRADE** — Adaptec's Upgrade program

- **Embedded support** — Wide variety of Operating Systems and software

Adaptec EZ-SCSI v1.0

- **User friendly installation utility**
- **ASPI Dos Managers (ASPI2DOS, ASPI4DOS, ASPIEDOS)**
- **Disk driver module (ASPIDISK.SYS)**
- **Hard disk partitioning utility (AFDISK.EXE)**
- **CD-ROM modules (ASPICD.SYS)**
- **CD-PLAY utility**
- **Windows SHOWSCSI utility**
- **SCSI Format utility**
- **For the following products:**
  - ◆ **AHA-1510/1520/1522/1540C/1542C/1640/1740A/1742A/1744**
  - ◆ **AIC-6260**

Adaptec EZ-SCSI v2.0

- **Enhancements**

    - ** CD-XA Multi-session Photo CD support **

    - SCSI-2 support for CD-ROM drives

    - Memory usage reduced by over 50%

    - CD-Play program for Windows

    - Windows Photo CD Application

    - Adaptec SCSI Windows Program Group

    - Implementation of IBM "Floppy" MO format

    - ASPIDISK support of either partitioned or "floppy" style media

    - AFDISK allows user to choose media format
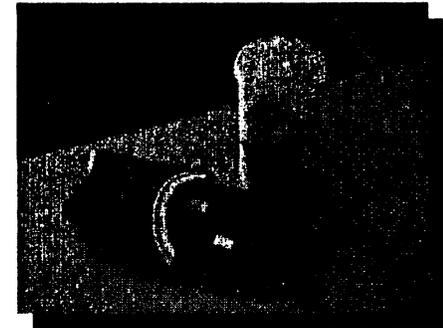
Application Support DOS/Windows

Adaptec EZ-SCSI 2.0

ASPI Support	Yes
ASPI Managers	All Products
CD-ROM Support	Yes
Photo-CD Single Session	Yes
Photo-CD Multi-Session	Yes
CD-Player	DOS/Windows
Photo CD Application	Yes
Tape Support	With Additional S/W
MO Support	Limited
Worm Support	With Additional S/W
Scanner Support	With Additional S/W
Utilities	ShowSCSI
Format Utility	Yes
User Friendly Install	Yes

Photo-CD Support

- ## SCSI-2 Compliant Drives

- ## Specific Drives

  - Chinon CDS-435, 535

  - Hitachi CDR-3750

  - NEC CDR-38, 55, 74, 74-I, 84, 84-I

  - Panasonic CR-532, 533

  - Pioneer DRM-600, 604

  - Sony CDU-561

  - Texel DM-3024, 5024

  - Toshiba 3301, 3401
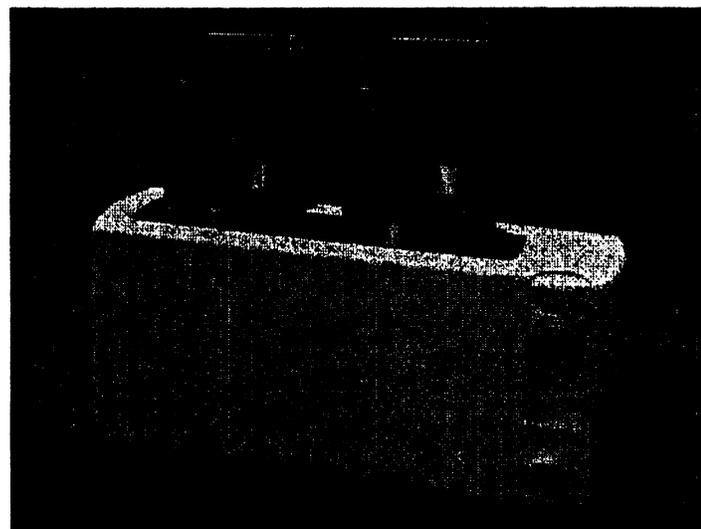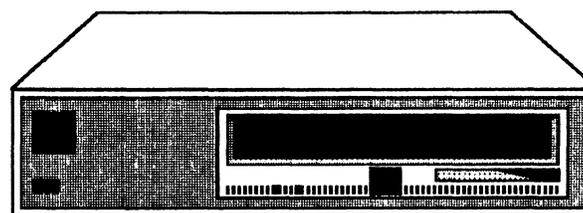
ASW-EZSCSI Hints

1. ASPIDISK.SYS and AFDISK are used to partition a SCSI disk drive that is not installed under the host adapter BIOS. A drive will not be installed under the host adapter BIOS if:

- The host adapter BIOS is disabled
- Two hard disk drives are already installed
- The SCSI ID is something other than 0 or 1
     (Does not apply with AHA-1540C or AHA-1740 Series.)

2. ASW-EZSCSI supports multiple host adapters.
```
device=aspi2dos.sys
device=aspi4dos.sys /p334
          or
 device=aspi4dos.sys /p330 /p334
```

Sample CONFIG.SYS:

```
DEVICE=ASPI4DOS.SYS /D
```
In general, this should be the first line in the CONFIG.SYS

```
DEVICE=ASPIDISK.SYS /D
```
This ASPI Module should be loaded after the ASPI Manager

```
DEVICE=SMARTDRV.EXE
```
Caching device drivers should be loaded after ASPI4DOS.SYS

```
buffers=20
```
Things like buffers and files can be before or after the ASPI Mgr.

```
files=20
lastdrive=1
```
This line is required when using the CD-ROM driver

ASPICD.SYS or ASW-EZSCSI
ASPI CD-ROM driver for DOS

- ASPI CD-ROM device driver module for DOS.

- To install the Hitachi, Sony, Toshiba, NEC, Denon, Chinon, LMSI, Panasonic, Texel and DEC CD-ROM devices on Adaptec SCSI host adapters.

- The DOS ASPI Manager must be installed in the CONFIG.SYS.

ASW-EZSCSI   Sample Boot Screen

```
AHA-154X/1640 ASPI Manager for DOS
Version 3.2
Copyright 1993 Adaptec, Inc.


        SCSI ID 0 - LUN 0:      QUANTUM     P40S 940-40-94xx
        SCSI ID 1 - LUN 0:      QUANTUM     P40S 940-40-94xx
        SCSI ID 2 - LUN 0:      Syquest     SQ555
        SCSI ID 4 - LUN 0:      CONNER      CP3040-4mb-3.5


        I/O Port Address:          330
        Interrupt Level:           11
        DMA Channel:               5
        Host Adapter SCSI ID:      7


        Debug Status:              2


        Int 13H active for drive C: and D:


Int 13H routed through ASPI manager
ASPI4DOS.SYS Installation Successful
```

SCSIworks! ASPI Bundle

- CD-ROM

- Hard Disk, Magneto-Optical

- Removable (SyQuest, Bernoulli, Floptical)

- HP ScanJet scanner driver

- Tape Mate II and Music Box applications

- ASPI Managers, OS/2, Windows NT, and Novell NLM for Trantor SCSI adapters

- MediaVision Pro Audio Spectrum / Sigma Designs WinStorm ASPI

SCSIworks! CD-ROM Driver

- **Single, self-configuring driver supports any combination of drives**

- **Most SCSI CD-ROM drives supported**

- **Support for Apple CD-ROM drives on PC**

- **Kodak Photo CD compatible**

- **MSCDEX included**

SCSIworks! Hard Disk Driver

- **Supports fixed SCSI drives and removable media**

- **SyQuest and Bernoulli native formats used**

- **Insite and Iomega Floptical support (not bootable)**

- **512 byte sector Magneto-Optical media support**

- **3.5" MO drives can be IBM 'floppy' format or standard hard disk partitioning**

- **Teac SCSI floppy support**

SCSIworks! HP ScanJet Driver

- **HP ScanJet Plus**

- **HP ScanJet IIp**

- **HP ScanJet IIc color**

- **Emulates HP driver interface for compatibility with existing applications**

SCSIworks! Tape Mate II

- **Licensed from FortuNet**

- **Supports DAT, 8mm, cassette, and QIC drives**

- **No Novell bindery support in bundled version**

- **Upgrades to full Nsure products available to SCSIworks! customers at a discount directly from Trantor**

SCSIworks! Music Box

- **Control software for audio CD discs**

- **Gives full control over audio functions**

- **DOS, TSR and Windows database version included**

SCSIworks!

- OS/2 .ADD drivers

- Windows NT drivers

- Novell ASPI NLM for T130, T160/T260 and T358

- ASPI2DOS also included for 6260 based cards

ASW-500 Software

Corel ASPI Application Modules with Software modified for use with Adaptec Products

ASW-500 supports the following types of peripherals from leading components manufactures:

- ◆ CDROM drives
- ◆ Rewritable drives
- ◆ DAT drives
- ◆ WORM drives
- ◆ Jukeboxes
- ◆ Multifunction drives
- ◆ Removable drives
- ◆ Floptical drives
- ◆ Tape drives
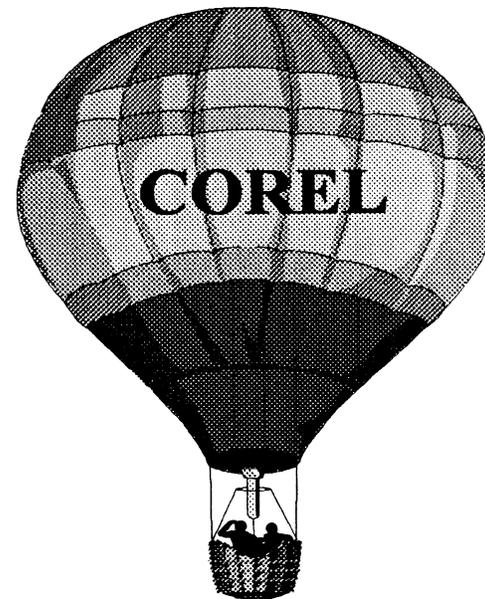
ASW-500 Hints

1. The ASW-500 (and Corel SCSI!) must be used with ASPI managers (provided in the Adaptec EZ-SCSI and SCSI Works! packages).

2. Only OS/2 v2.0 or newer is supported.
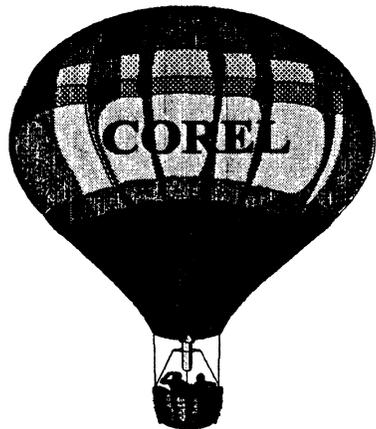
ASW-1240 and ASW-1440
Novell NetWare support for Adaptec
Host Adapters

- **ASW-1240 supports the AHA-1510/1520/1522 and AIC-6260 (non-bus master adapters)**

- **ASW-1440 supports the AHA-154xC/1640/174xA (bus master adapters)**

- **Supports NetWare 286 and 386 v3.0, v3.1, and v3.11--all the drivers are Novell certified!**

- **Available in some kits and through the 800 number for software**

Novell Certified

ASW-1440 Notes

- ASPI Manager (ASWNOVL.DSK) for NetWare 286
  v2.15 and NetWare 286 v2.2
  for the AHA-1540/42/1640/1740 host adapters.

- ASPI Manager and SCSI Disk Driver for:

  NetWare 386 v3.0 :ASW1440.DSK
  NetWare 386 v3.1 :AHA1540.DSK, AHA1640.DSK or AHA1740.DSK
  NetWare 386 v3.11 :AHA1540.DSK, AHA1640.DSK or AHA1740.DSK

These drivers are fully certified and support all the available features of
NetWare. (e.g. disk duplexing, disk mirroring, removable media)

The driver supports up to four host adapters for an AT (Max. of
28 drives) and up to six for a PS/2 (Max. of 42 drives).

ASW-1440 Sample Screen

```
:load aha1540 port=330 verbose=y speed=0
Loading module AHA1540.DSK
  Auto-loading Module ASPITRAN.DSK


AHA-154x/1640 ASPI Manager & SCSI Disk Driver For NetWare 386 v3.1
Version 2.0
Copyright 1990 Adaptec, Inc.


      Registered Device(s)
      ------------------------------------------------------------
      SCSI ID 0 - LUN 0:          CONNER CP3100 - 100 MB
      SCSI ID 1 - LUN 0:          QUANTUM P105S 910-10-94X

      Port Address:               330
      Interrupt Level:            11
      DMA Channel:                5
      Host Adapter SCSI ID:       7

      AT Bus Master Speed:        5.0 MBytes/second
      Bus On Time (usec):         11
      Bus Off Time (usec):        4
      Optimization Mode:          2
```

ASW-1440 Hints

1. To set the host adapter to the most compatible (and slowest) data transfer speed of 3.3 MBytes/sec, load the driver with the "speed=FF" command line option (NetWare 386 only)

   `:load aha1540.dsk speed=FF` or `:load aha1540 speed=FF`

2. The AHA-1540/1542/1640 only supports up to 16 Megabytes of RAM installed in the system (NetWare 286 and NetWare 386 v3.0 and v3.1). If more memory than that is installed, the following command should be typed before the host adapter driver is loaded (in *startup.ncf*):

   `:set Auto Register Memory Above 16 Megabytes = OFF`

   You may have to incease the reserved buffers:

   `:set Reserved Buffers Below 16 Meg=32`

More ASW-1440 hints

1. The ASW-1440 v. 3.3 supports above 16 Megabytes of RAM installed in the
   system under NetWare 386 v3.11 by using the REGISTER MEMORY
   command under Novell.

   ```
   A.  Use REGISTER MEMORY only with actual memory
       installed in the file server


   B.  Don't use this command with "shadowed" RAM
       because this memory will probably be mapped
       to some lower memory that is already in use
       by the operating system.


   C.  Use the "Above16=y" switch on Adaptec's ASPI driver
           :load AHA1540 Above16=y
   ```

   NOTE: The AHA-1740/1742 in Enhanced mode can directly access
   up to 4 GBytes. This option is not needed and should
   not be used.

More ASW-1440 hints

REGISTER MEMORY

NOTE: (Use the "Above16=Y" switch prior to loading, refer to the ASW-1440 v 3.3 manual)

EXAMPLE:

To add 4MB of memory above 16MB, type

```
REGISTER MEMORY 1000000 400000 (Enter)
```

To have the memory registered automatically when the server boots, add the following line to the AUTOEXEC.NCF file:

```
REGISTER MEMORY 1000000 400000
```

Add the line just after the lines for the file server name and the IPX internal network number.

ASW-1240 Notes

- ASPI Manager (PRI1520.DSK) for NetWare 286 v2.15
  for the AHA-1520/1522 host adapters.

- ASPI Manager and SCSI Disk Driver for:

  NetWare 386 v3.0 :no driver available
  NetWare 386 v3.1 :AHA1520.DSK
  NetWare 386 v3.11 :AHA1520.DSK (patched with DSKPATCH.EXE)

These drivers are fully certified and support all the available features of
NetWare (e.g. disk duplexing, disk mirroring, removable media)

The driver supports up to two host adapters for an AT (Max. of
14 drives).

ASW-1240 Sample Screen

```
:load aha1520 port=340 verbose=y
Loading module AHA1520.DSK
  Auto-loading Module ASPITRAN.DSK


AHA-152x/AIC-6260 ASPI Manager & SCSI Disk Driver For NetWare 386
Version 1.1
Copyright 1990 Adaptec, Inc.


        Registered Device(s)
        ------------------------------------------------------------
        SCSI ID 0 - LUN 0:          CONNER CP3100 - 100 MB
        SCSI ID 1 - LUN 0:          QUANTUM P105S 910-10-94X

        I/O Port Address:           340-363
        Interrupt Level:            11
        DMA Channel:                0
        Host Adapter SCSI ID:       7

        Initiate Sync Mode:         Enabled
        Parity Checking:            Enabled
        SCSI Disconnection:         Enabled
```

ASW-1240 Hints

1. The AHA-1520/1522 supports up to 16 Megabytes of RAM installed in the system for NetWare 286 and up to 4 Gigabytes of RAM installed for NetWare 386.

2. A NetWare 386 v3.0 driver is not supplied, since Novell provides free upgrades from NetWare 386 v3.0 to NetWare 386 v3.1.

3. NetWare 386 v3.1 and newer support the mounting and dismounting of removable media (the ASW-1240 fully supports these features).

ASW-1250 and ASW-1450
SCO UNIX support for Adaptec
Host Adapters

- ASW-1250 supports the AHA-1510/1520/1522 and AIC-6260 (non-bus master adapters)

- ASW-1450 supports the AHA-154xC/1640/174xA (bus master adapters)

- Designed to support SCO UNIX v3.2.2, an older version of SCO UNIX

- SCO UNIX v3.2.4 includes the ASW-1250/1450; thus the ASW-1250/1450 is not needed and must not but used!

ASW-1450 Hints

1. If the user accidentally installs the ASW-1450 with SCO UNIX v3.2.4 or newer, the system will not run properly. Correction instructions are available here.

2. SCO UNIX v3.2.2 will support the AHA-154xC, 1640, and 174xA (standard mode). Installing the ASW-1450 provides AHA-174xA enhanced mode support, as well as improved device driver support for the AHA-154xC and 1640 for maximum performance.

Operating System Support

DOS 5.0/6.0	ASW-EZSCSI
NetWare 3.11	ASW-1240/1440
NetWare 4.0	Embedded
OS/2 2.1	Embedded
Windows NT	Embedded
SCO UNIX 3.2.4	Embedded
USL UNIX SVR 4.2	Embedded
UnixWare 1.0	Embedded
Solaris 2.1	Embedded
Interactive 3.0	Embedded
Vines 4.X, 5.X	Embedded

Third Party Solutions

Data Backup Solutions:

Central Point Software	Beaverton, OR	(503) 690-8090
Cheyenne Software	Rosalyn, NY	(516) 484-5110
Conner Software Division	Lake Mary, FL	(407) 262-8000
Corel Corporation	Ottawa, Ontario, Canada	(613) 728-8200
Emeritus Technologies, Inc.	Fresno, CA	(209) 292-8888
Fortunet, Inc.	Salt Lake City, UT	(801) 467-6887
Gazelle Systems	Provo, UT	(801) 377-1288
HI-COMP America	Fort Collins, CO	(303) 224-9700
Interface Data	Woburn, MA	(617) 938-6333
Legato Systems, Inc.	Palo Alto, CA	(415) 329-7880
Longshine Electronics Corporation	Taipei, Taiwan, R.O.C.	(886) 2-363-4958
Maynard Electronics	Lake Mary, FL	(407) 263-3500
Novastor	Westlake Village, CA	(818) 707-9900
Palindrome Corporation	Naperville, IL	(708) 505-3300
PCX	San Diego, CA	(619) 259-9797
Systems Enhancement Corporation	Chesterfield, MO	(314) 532-2855
Sytron Corporation	Westboro, MA	(508) 898-0100
Tallgrass Technologies	Lenexa, KS	(913) 492-6002
Vitek Danmark	Hvalsoe, Denmark	(45) 42-39-25-61

Third Party Solutions

Fault Tolerance/Performance Solutions

Software

1776, Inc.	Los Angeles, CA	(310) 215-1776
Chantal Systems	San Diego, CA	(619) 621-2810
Integra Technologies, Inc.	Santa Clara, CA	(408) 980-1371
Media Integration	Soquel, CA	(408) 475-9400
Unitrol Data Protection Systems, Inc.	Vancouver, BC	(604) 681-3611
Veritas Software	Santa Clara, CA	(408) 727-1222

Hardware

1776, Inc.	Los Angeles, CA	(310) 215-1776
Digi-Data	Jessup, MD	(301) 498-0200
Legacy Storage Systems, Inc.	Hopkinton, MA	(508) 435-4700
Media Integration	Soquel, CA	(408) 475-9400
Pacific Micro Data, Inc.	Tustin, CA	(714) 838-8900

Third Party Solutions

Imaging Solutions

Apple Computer, Inc..	Cupertino, CA	(408) 996-1010
Binary Image Pty Ltd..	Australia	61-3-563-8699
Cirrus Technology, Inc..	Frederick, MD	(301) 698-1900
Courtland Group, Inc..	Columbia, MD	(410) 730-7668
Danmar Systems, Inc..	Miami, FL	(305) 388-4671
Image-In, Inc..	Minneapolis, MN	(612) 888-3633
Interlinear Technology..	Alameda, CA	(510) 748-6850
Laser Today International...	Mountain View, CA	(415) 961-3015

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Third Party Solutions

Multimedia Solutions

Adaptec, Inc..Milpitas, CA   (408) 945-8600
Corel Corporation...Ottawa, Ontario   (613) 728-8200
Optical Media International...........................Los Gatos, CA   (408) 376-3511

Multiuser/Networking Solutions

CBIS, Inc..Norcross, GA   (404) 446-1332
Meridian Data, Inc.......................................Scotts Valley, CA   (408) 438-3100
Online Computer Systems, Inc......................Germantown, MD   (301) 428-3700

Third Party Solutions

Peripheral Utilities

Adaptec, Inc.	Milpitas, CA	(408) 945-8600
Corel Corporation	Ottawa, Ontario	(613) 728-8200
Micro Design International, Inc.	Winter Park, FL	(407) 677-8333
Optical Software Solutions, Inc.	Lafayette, CA	(510) 256-1066
Optisys, Inc.	Phoenix, AZ	(602) 997-9699
Pegasus Disk Technologies	Walnut Creek, CA	(510) 938-5340
XYXIS	Eden Prairie, MN	(612) 949-2388

Operating Systems

CBIS, Inc.	Norcross, GA	(404) 446-1332
IBM Corporation	Boca Raton, FL	(407) 982-6408
Mark Williams Company	Northbrook, IL	(708) 291-6700
Microsoft Corporation	Redmond, WA	(206) 882-8080
Novell, Inc.	Provo, UT	(800) NETWARE
Sunsoft, Inc.	Mountain View, CA	(415) 336-3201
The Santa Cruz Operation, Inc.	Santa Cruz, CA	(408) 425-7222
Univel	San Jose, CA	(408) 729-2300

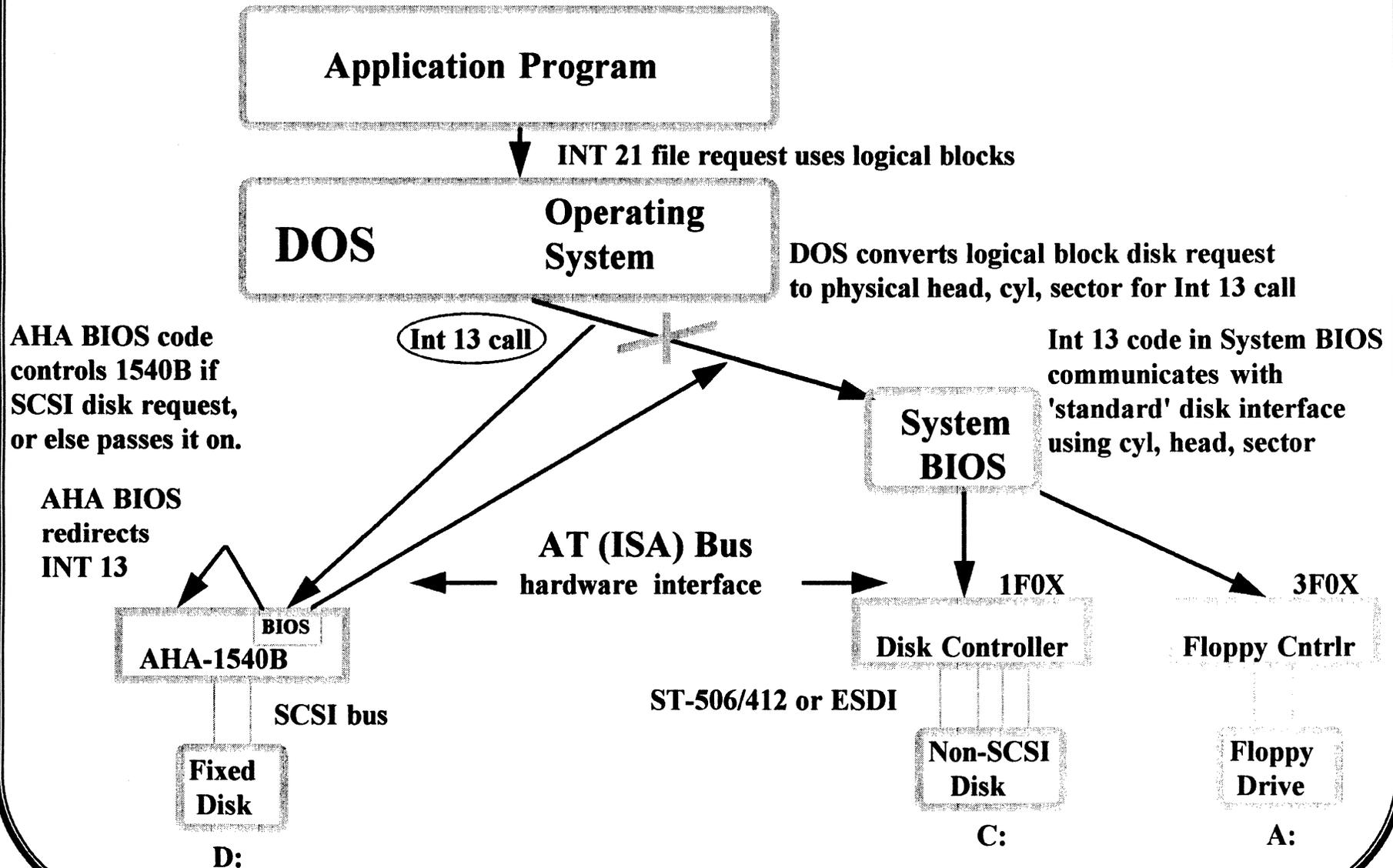# Support of disk drives over 1 GByte in capacity

Today we enjoy 100% Interchange among all our Host Adapters

Since our original 1540 which used 16/32 translation,   all of our Host Adapters use 64/32 translation (unless set otherwise).

That means: All fixed and/or removable disks can be 'moved' between any of our host adapters and be readable/usable in exactly the same format.

Why Is Translation Necessary?

Application Program

↓ **INT 21 file request uses logical blocks**

DOS **Operating System**

DOS converts logical block disk request to physical head, cyl, sector for Int 13 call

AHA BIOS code controls 1540B if SCSI disk request, or else passes it on.

Int 13 call

Int 13 code in System BIOS communicates with 'standard' disk interface using cyl, head, sector

System BIOS

AHA BIOS redirects INT 13

AT (ISA) Bus hardware interface

1F0X 3F0X

BIOS

AHA-1540B **Disk Controller** **Floppy Cntrlr**

SCSI bus **ST-506/412 or ESDI**

Fixed Disk **Non-SCSI Disk** **Floppy Drive**

D: C: A:

Our 64/32 Translation

- The translation we use across all our products today is 64 heads and 32 sectors per cylinder

- Not related to the disk's actual physical geometry

  ◆ We picked it because -- The math is easy. It's as good as any and has served us well

- 1 Megabyte on each 'cylinder'

  [64 heads x 32 sectors x 512 bytes/sector]

- Maximum # cylinders in DOS Int 13 call is 1024 !
  So ... 64/32 yields max capacity of 1 GByte (If disk exceeds 1 GByte, works fine, but only 1 GByte is accessible.)

64 $\underline{\text{tracks}}$ x 32 $\underline{\text{sectors}}$ x 512 $\underline{\text{bytes}}$ x 1024 $\underline{\text{cylinders}}$ = 1 G $\underline{\text{byte}}$
  cylinder   tracks   sector   disk   disk

E.T. -- our new <u>Extended Translation</u>

- **Our Extended Translation uses 255 heads and 63 sectors**
  Why?

- **Wanted to pick one alternative scheme to handle**
  the highest capacity possible

- **Maximum sectors possible is 63**

- **Maximum heads possible is 256. We chose 255**
  Reduced max by 1 to avoid possible NetWare
  incompatibility.

- **ET allows access up to 8 G Bytes**

255 <u>tracks</u> x 63 <u>sectors</u> x 512 <u>bytes</u> x 1024 <u>cylinders</u> = 7.84 G <u>bytes</u>
   cylinder   tracks   sector   disk

                                            or,   8.42 G <u>bytes</u> with
                                                1K=1000 bytes

DOS

- DOS' Int 13 is the reason for the 1 GByte limit.

- Int 13 calls access disk via cyl, head, sector. With 64/32, this limits access to 1 GByte.

- If disk is greater than 1 GByte capacity, and if it will be used for DOS/Windows only, then --to access all of the disk ET must be enabled.

- If a disk has 64/32 partition(s) on it, and, if the disk is over 1 GByte, then --enabling ET can cause total loss of data. User is warned at boot time.

- Future versions of DOS may no longer require a 'physical geometry' translation for SCSI drives.   Even then, to support our current S/W and older DOS versions, the need for translation will last.

NetWare

- NetWare 386 uses 64/32 and supports disks over 1 GByte.
- NetWare tips:

  1) Do not enable ET for NetWare

  2) NetWare drivers <u>do not need ET to access large disks</u>

  3) NetWare drivers <u>do not support ET</u>. It is not clear if they ever will.

  4) NetWare 386 has no cyl limit; thus, <u>no 1 GByte limit</u>. A NetWare partition table max'es out at 1022 cylinders; Cyl # is not used. NetWare goes by total # of sectors field to determine partition size.

NetWare

More NetWare tips:

5)   No need to coexist with large DOS partition.
     NetWare 3.11 server disk requires only a small DOS
     partition.

6)   Support of disks over 1 GByte in NetWare 2.2 is not
     supported. Most users of large disks install NetWare
     386, not NetWare 286

7)   Do not enable ET for NetWare

Especially remember tips 1 and 7!

Unix

- **Unix uses 64/32 translation and supports HDDs over 1 Gigabyte**

- **Unix Tips:**

  - **Do not enable ET for large disks** (*the drivers are embedded within the Unix kernel itself*)

  - **Current SCO and ISC Unix versions support:**

    - ▲ **All Adaptec's AHAs**

    - ▲ **6, 10 byte SCSI commands**

    - ▲ **HDDs over 1 Gigabyte**

  - **Remember: ET go home to Unix!**

Ⓒladaptec

SCO Unix

- **SCO support:**

- **<u>SCO 3.2 v 4 supports disks over 1 GByte.</u> Supports 10 byte SCSI commands; no cyl limit.**

- **SCO Unix 3.2 v 2.0 is limited to 1 GByte disks. Only uses 6-byte SCSI READ, WRITE commands**

  - ◆ **Download patch from SCO BBS "EFS" for > 1Gig support and 10-byte SCSI command support.**

- **All versions use 64/32 translation. No plans or need to add ET.**

SunSoft/ISC Unix

● <u>ISC v 3.0 supports disks over 1 GByte.</u>

◆ Upgrade from 2.2.1 is essentially free.

◆ ECU problem with 1742A (Enhanced mode).　　Fix
avail from SunSoft/ISC. Included in 3.0.1.

● ISC Unix v 2.2.1 supports 10 byte SCSI commands,
but it has bugs. So, only disks under 1 GByte are
supported.

● Solaris (Sun's SVR4) will support disks over 1 GByte
(Intel platform).

● All versions use 64/32 translation. No plans or need
to add ET.

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OS/2 v2.0

- OS/2 is NOT currently limited to 1 Gig. HDDs.

- OS/2 does support ET.

- OS/2 supports both FAT (DOS) and HPFS partitions.

- FAT partitions have same limitation as DOS. Must use ET to access over 1 GByte.

- Boot partition must be 1024 cylinders or less.

More OS/2 Tips

- HPFS partitions have no cyl limit, can exceed 1 GByte. Disk must be HPFS only in non-boot partition.

- OS/2 2.0 needs to be updated to support ET for FAT partitions over 1 GByte since sharing of FAT and HPFS is common.

- Current versions of OS/2:

  - ◆ OS/2 v2.0:
    - ▲ AHA-1542B/GIG & AHA-1742A (Enh.) support > 1GiG; need updated driver from BBS "NEWxxxx.ZIP"

  - ◆ OS/2 v1.3:
    - ▲ All OS/2 v1.3 support LADDR but may not include it.   May need ASW-1420/1220.
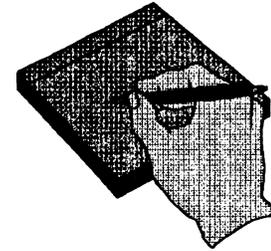   - ▲ Some user can get full use of >1 Gig HDDs with multiple partitions, but still limited to 1024 cyl/partition

Summary by OS

- **DOS:** Need ET for disks over 1 GByte. ASPIDISK v3.1 needed for non-BIOS controlled disks.

- **NetWare:** Do not need ET! Do not use ET!

- **Unix:** Do not need ET! Do not use ET!

- **OS/2:** ET supported today in v2.0. HPFS does not need ET, but needed for FAT. Need /GIG version for ISA and ET enabled for EISA cards.

● Evaluation Forms

   ◆ **Fill out completely, as time permits**

● Section K: Certificates