If you require further information or other technical support, please contact your authorized dealer.

F.C.C. CERTIFICATION

This equipment generates and uses radio frequency and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in *Subpart J of Part 15 of FCC Rules*, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"*How to Identify and Resolve Radio-TV Interference Problems*." This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

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WARRANTY

Adaptec, Inc., products are warranted against defects in material and workmanship for a period of one year.

CHANGES

The material in this guide is for information only and is subject to change without notice. Adaptec reserves the right to make changes in the product design without reservation and without notification to its users.

Adaptec, Inc., Milpitas, California 510006-00/TJH/SI 3/88

AHA-1020 Installation Guide

S, DRIVES, AND CONTROLLERS
'PORTED BY THE AHA-1020

Adaptec AHA-1020 host adapter board has
n successfully tested in several personal com-
ers including, but not limited to the following:

3M PC™

C XT™

C AT™

3M Personal System/2™ Model 25

3M Personal System/2, Model 30

Compaq™ Portable[1]

ompaq Deskpro[1]

ompaq 286 Portable[1]

Compaq 286 Deskpro[1]

AT&T PC 6300[2]

eading Edge

es:

Compaq format utility requires 17 sectors/track and thus will not function with the AHA-1020. To format, use the IBM PC-DOS or Microsoft MS-DOS™ format utility.

Requires AT&T motherboard ROMS version 1.21. With Revision 1.36, the switch number 3 on the switch block 1 (located on the motherboard closest to the back of the unit) must be in the "off" position.

Compaq is a registered trademark of Compaq Computer Corporation

PC, XT, PC AT and IBM Personal System/2 are trademarks of International Business Machines Corp. IBM is a registered trademark of International Business Machines Corp.

MS-DOS is a registered trademark of Microsoft Corporation

The Adaptec AHA-1020 host adapter board has been successfully tested with drives from the companies listed below. *Contact the drive vendor to verify current models and revision levels supporting SCSI.*

Vendor	Telephone Number
Conner Peripheral	408-433-3340
CDC	612-931-8025
Fujitsu	408-946-8777
Lapine	408-262-7077
Maxtor	408-942-1700
Micropolis	818-709-3300
Microscience	415-961-2212
MiniScribe	303-678-2122
Priam	408-346-4600
Quantum	408-432-1102
Ricoh	408-424-6700
Rodime	408-725-0222
Seagate	408-438-6550
Syquest	415-490-7511
Toshiba	408-727-3939

Some drives format to greater than 64 MB and require a partitioning I/O driver to get the full capacity. Such a driver is available from Ontrack Computer Systems, (612) 941-4504.

The Adaptec AHA-1020 host adapter board has been successfully tested with these SCSI disk controller boards.

Vendor	Model	Description
Adaptec	ACB-4000A	ST412/506 with MFM to SCSI
Adaptec	ACB-4070	ST412/506 with RLL to SCSI
Adaptec	ACB-4525	ESDI to SCSI
Adaptec	ACB-5500	ST412/506 with MFM to Full SCSI

HARDWARE AND SOFTWARE REQUIREMENTS

The AHA-1020 can be installed in any IBM PC, PC XT, PC AT, PS/2 Models 25 & 30* or equivalent IBM-compatible computer. The successful installation of the Adaptec AHA-1020 to an embedded SCSI disk drive, requires the following hardware and software.

Hardware

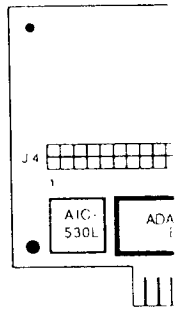
1. IBM PC, PC XT, PC AT, or Personal System/2, Model 25 or 30* or equivalent IBM-compatible computer with:
   a. One floppy diskette drive
   b. One available system expansion slot
   c. Room for one 5¼" or 3½" Winchester (hard) disk drive
2. One 5¼" or 3½" Winchester disk drive(s) supporting the industry-standard common command set (CCS) SCSI interface.
3. External power supply or power booster to support the power required by the SCSI disk drive. If using an PC XT or a very low power drive in the IBM PC, this is not required.
4. 50-pin flat ribbon cable to connect the drive to the host adapter.

* *THE AHA-1020 must be the only controller operating a hard disk in the IBM PS/2 Models 25 and 30.*

Software

1. PC XT, PC AT DOS version 2.0, or newer revisions.
2. (Optional) A customer-supplied loadable device driver is needed for three to eight logical units or for systems using more than 64 MB of total disk capacity.

AHA-1020 B



INTEGRATIO

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AHA-1020 BOARD LAYOUT

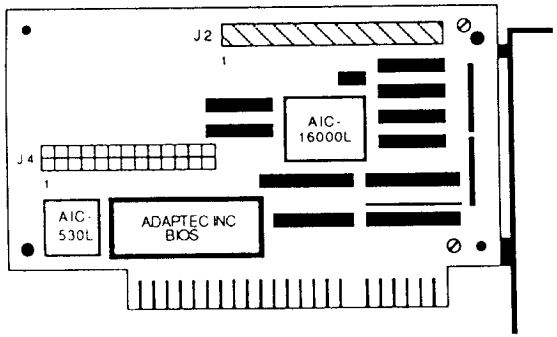

Figure 1

INTEGRATION INTO THE SYSTEM

To install the Adaptec board into your system, you must first configure the drive, check the host adapter jumpers and connect the drive cable properly. This section describes all the necessary steps needed to successfully install this hardware.

DRIVE SELECTION AND TERMINATION

The drive changeable parameters are the drive selection switches (or jumpers) and the drive termination. These parameters allow a drive to be selected as drive 0, 1, 2 or 3. This is accomplished by changing the drive address selection switches or jumpers. **Parity *must be* disabled on the drive.**

Before the drives can be cabled to the host adapter, the drive cable terminator must be properly set. The terminator, as its name implies, must be at the end of the cable in order to have the host adapter and drive communicate properly. The host adapter has a permanent terminator built in. The disk drives, since they can be connected in a daisy chain configuration, have a removable terminator. This is usually a 16-pin DIP resistor package. The last physical drive in the chain must have its terminator installed.

HOST ADAPTER JUMPER DEFINITION AT J4

Before beginning, verify that the following jumper configuration is set up as shown below at connector J4. Five jumpers are installed at pins 1-2,13-14, 17-18, 21-22 and 25-26.

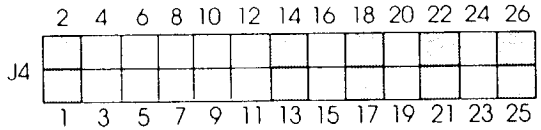

Figure 2

There should be no other jumpers present on the host adapter.

DRIVE AND CONTROLLER CABLING

The host adapter has one cable connector, J2. J2 can connect up to one SCSI disk drive, and six other SCSI devices with a daisy chain cable.

The connector location and pin orientation for the AHA-1020 connector is shown in Figure 1. The location of pin 1 can be read off the host adapter board.

AHA-1020 PRIMARY FORMATTER

At this point, the disk must be formatted with a primary format. Primary formatting is not supported by DOS; however, it is supported by the AHA-1020 BIOS through "DEBUG." Unlike other host adapters, th AHA-1020 needs no extra software to perform the primary format. The primary format defines adress fields and data fields on each track of the disk. Aft this is completed, bad blocks can be flagged and directory created by a DOS "FORMAT" command.

To use the primary formatter, perform the following steps:

1. Boot DOS 2.0 or newer revisions from the DOS SU PLEMENTAL PROGRAMS diskette.
2. Type "DEBUG," the computer will respond with a "-".

NOTE:
Underlined characters are user inputs, <RET> mean return key and parentheses mean comments.

A>DEBUG<RET>
(DEBUG prompt)

3. Type the following sequence:

-G=CA00:CCC<RET>

ADAPTEC AHA-1020 FORMAT PROGRAM
Please enter all numbers in DECIMAL

Enter sector interleave (4 to 9):n<RET>

4-to-1 is the optimum interleave factor for the IBM PC/XT. Experimentation with different interleave factors is the best way of determining the optimum interleaving factor for your application.

The CCS jumper is installed on the AHA-1020. CCS drive is assumed, no defect information is needed

Are you sure you want to format the drive? (Y/N

An 'N' will return to the beginning of the format program. When 'Y' is selected, the following will be shown:

Formatting Drive...

The drive is now being formatted.

Format Completed...
Run this program again (Y/N)? Y or N

Now the primary format is complete, answer 'N' to return to the DOS >A prompt and continue.

TABLE 3
BIOS ERROR CODES

Code	Error
01	Bad Command Passed to Disk I/O
02	Address Mark Not Found
04	Requested Sector Not Found
05	Reset Failed
07	Drive Parameter Activity Failed
09	Attempt to DMA Across 64K Boundary
0B	Bad Track Flag Detected
10	Bad ECC on Disk Read
11	ECC Corrected Data Error
20	Controller Failure
40	Seek Operation Failed
80	Attached/Failed to Respond
BB	Undefined Error Occurred
FF	Sense Operation Failed

PARTITION AND FORMAT DESCRIPTION

Logical drive C: is always the first logical unit on drive 0. Logical drive D: is the second logical unit, which could be on drive 0, if large disk partitioning is used.

The disk must now be partitioned for DOS and the format verified.

1. Insert a copy of DOS that contains "FDISK" and "FORMAT" in floppy drive A.
2. Type FDISK and Select option 1: Create a DOS partition (See Chapter 4 of DOS Manual). If needed, repeat FDISK for drive D using option 5.
3. Reboot the system.
4. When complete, type FORMAT C:/S. If needed, repeat for drive D, using FORMAT D:.

This will create a DOS directory, verify the primary format and flag any bad (defective) sectors. Since the Adaptec defect handling scheme was used, there will be no bad sectors. From this point on, you can boot from the hard disk, copy files and operate your software applications.

You are up and running!

ADAPTEC AHA-1020
TROUBLESHOOTING CHECKLIST

- ❑ Probable problems: 1701 error; power-on failure; primary format failures, DOS failures.
- ❑ Check jumpers on the disk drive, be sure that the parity jumper is removed.
- ❑ Check jumpers on H/A with Figure 2.
- ❑ Check cable at J2. Be sure that pin 1 on the host adapter is connected to pin 1 of the drive.
- ❑ Check that the terminator on the drive is properly set.
- ❑ Check that the power supply can support the added current required by the drive. Be sure the +5V and +12V voltages are correct. Verify power requirements with the drive vendor.