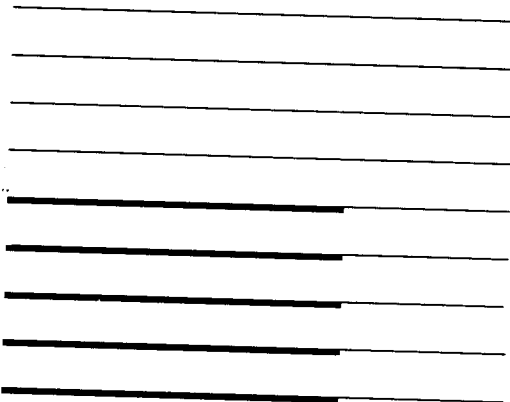


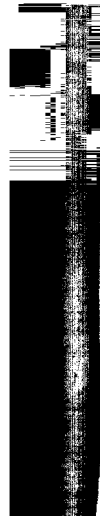
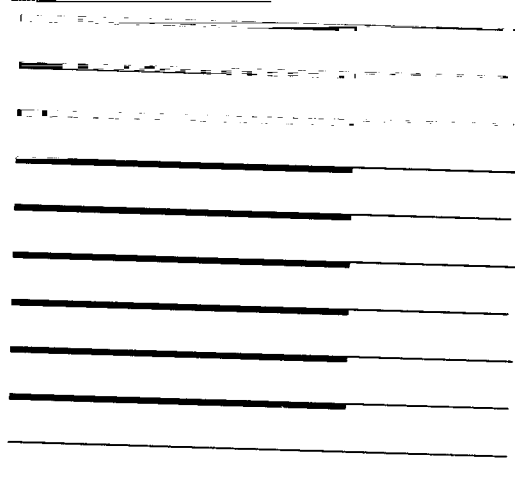
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ACB-2320/ACB-2322

User's Manual



ADAPTEC



2.1 INTRODUCTION

This section describes the steps necessary to install the ACB-232X board into the computer. First, the operating environment, unpacking procedure and board layout are described. This section also describes the integration of the drive and controller into the computer.

2.2 ENVIRONMENTAL REQUIREMENTS

The ACB-232X will perform properly over the following range of conditions:

	Operating	Storage
Temperature:	0° to 55°C (32° to 131°F)	-40° to 75°C (-8° to 167°F)
Humidity (Noncondensing):	0% to 95%	10% to 95%
Altitude (Feet):	Sea level to 10,000	Sea level to 20,000
MTBF (Hours):	20,000 at 55°C	

2.3 UNPACKING PROCEDURE

The carrier is responsible for damage incurred during shipment. In case of damage, have the carrier note the damage on both the delivery receipt and the freight bill, then notify your freight company representative so that the necessary insurance claims can be initiated.

After opening the shipping container, use the packing slip to verify receipt of the individual items listed on the slip. Retain the shipping container and packing material for possible later reuse should return of the equipment to the factory or distributor be necessary.

CAUTION: THE ACB-232X LIKE ALL ELECTRONIC EQUIPMENT, IS STATIC SENSITIVE. PLEASE TAKE THE PROPER PRECAUTIONS WHEN HANDLING THE BOARD. KEEP THE BOARD IN ITS CONDUCTIVE WRAPPING UNTIL IT IS READY TO BE CONFIGURED AND INSTALLED IN YOUR SYSTEM.

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2.6 SYSTEM REQUIREMENTS

The ACB-2322X was designed to be installed in an IBM PC AT-compatible personal computer; thus, it requires the same system resources as the IBM AT hard disk controller.

TABLE 2-1. ACB-2322X SYSTEM MEMORY MAP

I/O Ports	
Hard Disk	- Primary
	1F0, 1F1, 1F2, 1F3, 1F4, 1F5, 1F6, 1F7, 3F6, 3F7
	- Secondary
	170, 171, 172, 173, 174, 175, 176, 177, 376, 377
*Floppy Disk	- Primary
	3F0, 2F1, 3F2, 3F3, 3F4, 3FF5
	- Secondary
	370, 371, 372, 373, 374, 375
If the BIOS is enabled:	
BIOS Address	- Primary 16 Kbytes C8000H-CBFFFFH
	- Secondary 16 Kbytes CC000H-CFFFFH
Temporary Drive	
Parameters Table Interrupt locations 60H through 67H	

*ACB-2322 only

Drive Power

The IBM PC AT internal power supply does not provide sufficient current to power most hard disk drives in addition to its present load. Check with your drive vendor for an accurate estimate of its specific power requirements.

TABLE 2-2. ACB-2322 POWER REQUIREMENTS

+5V Power	1.7 Amp
-5V Power	Not Used
+12V Power	90mA
-12V Power	50mA

TABLE 2-3. ACB-2320 POWER REQUIREMENTS

+5V Power	1.1 Amp
-5V Power	Not Used
+12V Power	Not Used
-12V Power	Not Used

CAUTION: THE VALUES FOR THE POWER REQUIREMENTS WERE DETERMINED BY ACTUAL MEASUREMENTS IN AN IBM PC AT WHILE THE CONTROLLER WAS READING A HARD DISK. IF THESE VALUES ARE TO BE USED TO DESIGN THE CONTROLLER INTO A SPECIFIC APPLICATION, AT LEAST 20% SHOULD BE ADDED TO THESE LISTED VALUES AS A SAFETY MARGIN.

Section Two

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TABLE 2-4. ACB-2322 CONTROLLER JUMPER DEFINITIONS (Continued)

Note: Jumper positions and pin numbers are defined from bottom, where applicable per Figure 2-1. An asterisk (*) denotes jumpers that are installed for a standard configuration.

J13	Serial Monitor Output
J14	Manufacturing Test Points
J15	Manufacturing Test Points
J16	Not Used
J17	Not Used
J18	Controller's system interrupt selection *Pins 1 and 2 jumpered for IRQ14 Pins 2 and 3 jumpered for IRQ15 Pins 3 and 4 DO NOT USE
J19	Floppy Disk DMA Acknowledgment *Pins 1 and 2 jumpered for signal selection Pins 2 and 3 jumpered for DACK2
J20	Floppy Disk Interrupt Request signal selection *Pins 1 and 2 jumpered for IRQ6 Pins 2 and 3 jumpered for IRQ10
J21	Floppy Disk DMA Request signal selection Pins 1 and 2 jumpered for DREQ3 *Pins 2 and 3 jumpered for DREQ2

TABLE 2-5. ACB-2320 CONTROLLER JUMPER DEFINITIONS

Note: Jumper positions and pin numbers are defined from left to right, or top to bottom, where applicable per Figure 2-1. An asterisk (*) denotes jumpers that are installed for a standard configuration.

J11	Hard disk data cable (20-pin), First drive (Drive 1)
J12	Hard disk data cable (20-pin), Second drive (Drive 2)
J13	Hard disk control cable (34-pin), Both drives (Drive 2)
J14	Drive activity LED - Pins 1,4 are +5 Volts Signal Ground Pins 2,3 are
J15	BOARD CONFIGURATION JUMPERS Position 1 Hard Disk Port Address Not installed: primary address 1F0 - 1F7 address Installed: secondary address 170-177
J16	Position 2 Not Used
J17	Position 3 Bus Wait State Not installed: Enable Installed: Disabled
J18	Position 4 Not Used
J19	Position 5 Not Used
J10	Position 6 Serial Monitor Mode Not installed: Disabled Installed: Enabled (200 board)
J11	Position 7 Manufacturing Test Points
J12	Serial Monitor Output
J13	Manufacturing Test Points
	Not Used
	Not Used
	Not Used
	Controller's system interrupt selection *Pins 1 and 2 jumpered for IRQ14 Pins 2 and 3 jumpered for IRQ15 Pins 3 and 4 DO NOT USE
	Adaptec ACB-BIOS address selection *Position 1 and 2 Jumpered for BIOS address C8000 - CBFFF address Position 2 and 3 Jumpered for BIOS address CC000 - CFFFF address
	No jumper ACB-BIOS disabled ACB-BIOS Disabled

Note: Install only one jumper on J13. No jumper should be installed.

select the address (drive address 1-4) to which the drive will respond. This is accomplished either by setting both drives to be the second lowest address and using a twisted 34-pin cable, or by setting the drive address to the lowest two addresses and using a flat cable.

A. Twisted 34-Pin Cable

The typical AT 34-pin cable has three connectors. Between the first (middle) drive connector (for drive D) and the second drive connector (for drive C) wires 25 through 29 are twisted, thus inverting the drive selection wires. This type of twisted cable allows both drives to have their drive selection switches (or jumpers) to be the same. Both drives must be set to the SECOND lowest drive address. The controller will see the two drives to be drive 1 and drive 2, depending on the position of the connector that is used.

B. Flat 34-Pin Cable

In some cases a 34-pin flat (non-twisted) cable is used. This cable does not invert the drive selection wires but relies on the drive addresses to be unique for each drive. Now drive 1 must have its drive selection switches (or jumpers) set to be the lowest drive address (typically 1). Drive 2 must have its selection switches (or jumpers) set to be the second lowest drive address (typically 2). The controller will see the two drives to be drive 1 and drive 2, independent of the position on the connector that is used.

Before the drives can be cabled to the controller, the drive cable terminator must be properly set. The terminator is used to reduce signal "ringing" in the cables. The terminator, as its name implies, must be at the end of each cable in order to have the controller and drive communicate properly. The controller has a termination terminator built into it. 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 located on the drive PCB. The last physical drive in

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Section Two

Step 2 Hard Disk Cabling, Drive Selection and Termination

The drive changeable parameters that must be set are the drive selection switches (or jumpers) and the drive termination. The drive selection switches and cabling

Now select the proper drive addresses and remove or install the required terminators for your system.

Step 3 (ACB-2322 Only) Floppy Disk Cabling, Drive Selection and Termination

The typical AT 34-pin floppy disk cable has three connectors. Between the first (middle) drive connector (for drive B) and the second drive connector (for drive A) wires 10 through 16 are twisted, thus inverting the drive selection wires. This type of twisted cable allows both drives to have their drive selection switches (or jumpers) to be the same. Both drives must be set to the SECOND lowest drive address (typically 1 since floppy drives are addressed as 0-3). The controller will see the two drives to be drive 0 and drive 1, depending on the position of the connector that is used.

Termination of the floppy disk drives is the same as the hard disk drives in step 2.

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Hardware Installation

the chain must always have its terminator installed. When two drives are connected to the same controller, only the last one in the daisy chain is terminated. The other drive must have the terminator resistor removed.

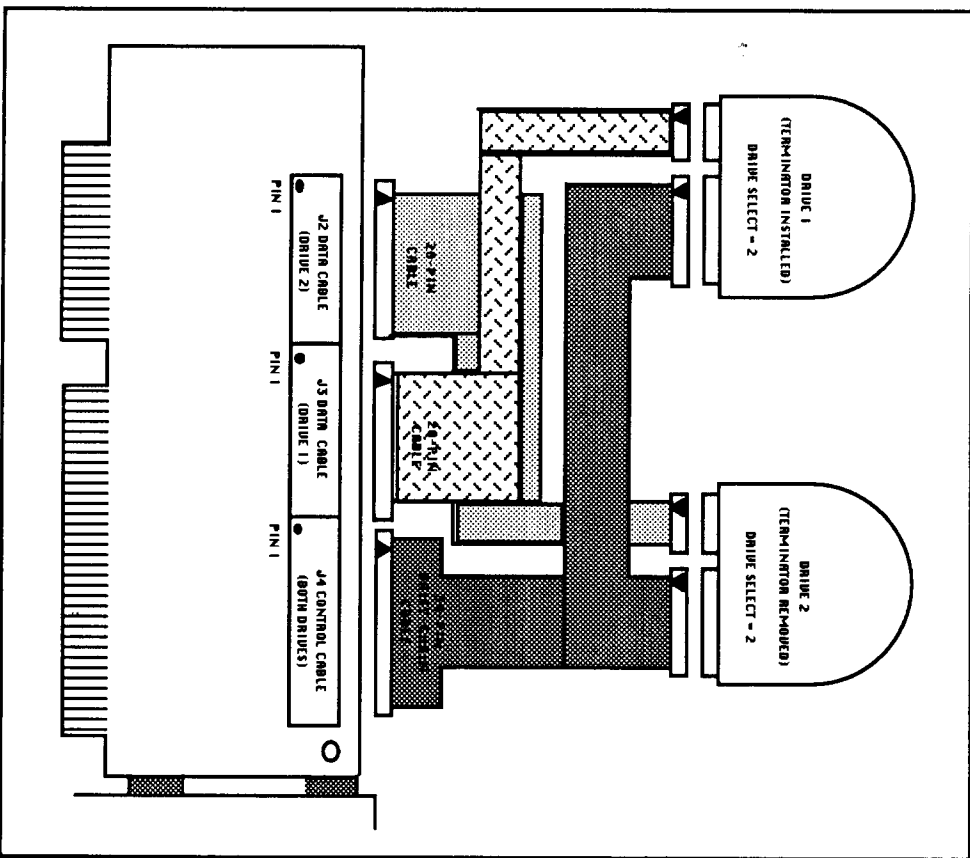


FIGURE 2-3. ACB-2322 CONTROLLER AND DRIVE CABLING-TWISTED CABLE (HARD DISK CABLES)

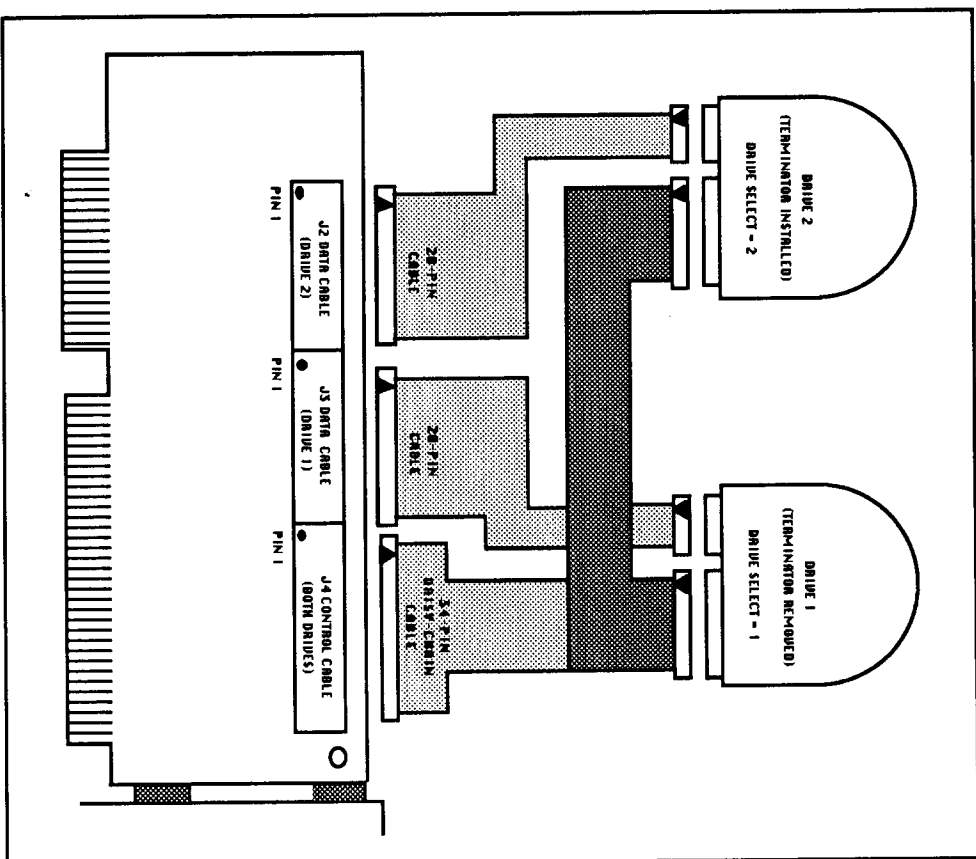


FIGURE 2-4. ACB-2322 CONTROLLER AND DRIVE CABLING-FLAT CABLE (HARD DISK CABLES)

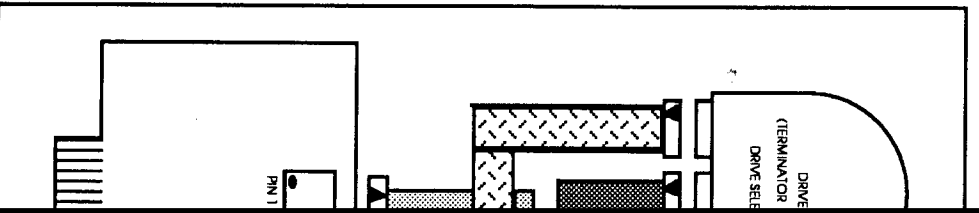


FIGURE 2-5. ACB CABLE

Section Two

20 feet (6 meters)

Step 4 Mounting the Drives and Controller

Now that the drives and controller are installed in the system.

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The controller has four cable connectors. The suggested connector plugs and maximum

TABLE 2-6. ACB-2322 CONTROLLER

Connector	Signals	Controller in the PC AT
J1	Control/Data	When configured, they can be connected and used to control both drives.
J2	Data	Used to connect to drive 1.
J3	Data	Used to connect to drive 2.
J4	Control	Used to connect to drive 1.

FLAT RIBBON CONNECTOR DEFINITIONS

Connector	Recommended Cable	Maximum Length
J1	3M Part #3414 34-pin flat ribbon cable.	20 feet (6 meters)
J3	3M Part #3421 34-pin flat ribbon cable. Connected to both floppy drives 0 and 1.	20 feet (6 meters)
J2	3M Part #3421 34-pin flat ribbon cable. Connected to ESDI drive 2.	20 feet (6 meters)
J4	3M Part #3414 34-pin flat ribbon cable. Connected to ESDI drive 1.	20 feet (6 meters)

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FLAT RIBBON CONNECTOR DEFINITIONS

Connector	Recommended Cable	Maximum Length
J1	3M Part #3414 34-pin flat ribbon cable. Connected to both ESDI drives 1 and 2.	20 feet (6 meters)
J2	3M Part #3421 34-pin flat ribbon cable. Connected to both ESDI drives 1 and 2.	20 feet (6 meters)
J3	3M Part #3421 34-pin flat ribbon cable. Connected to both ESDI drives 1 and 2.	20 feet (6 meters)
J4	3M Part #3414 34-pin flat ribbon cable. Connected to both ESDI drives 1 and 2.	20 feet (6 meters)

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The controller has three cable connectors: J1, J2, and J3. Their function, suggested connector plugs and maximum cable length are described in Table 2-7.

TABLE 2-7. ACB-2320 CONTROLLER CONNECTOR DEFINITIONS

Connector	Signals	Cable
J1	Data	20-pin flat ribbon cable. Connected to drive 1.
J2	Data	20-pin flat ribbon cable. Connected to drive 2.
J3	Control	34-pin flat ribbon cable. Connected to both drives 1 and 2.

Connector	Recommended Plug	Maximum Length
J1	3M Part #3421	20 feet (6 meters)
J2	3M Part #3421	20 feet (6 meters)
J3	3M Part #3414	20 feet (6 meters)

Attach the cables to the controller, making sure that the pin 1 indicator on the cable goes to pin 1 on the controller.

Now the controller must be installed into a 16-bit slot on the PC AT motherboard. Next, mount the drive(s) in any available drive bay in the AT. Consult your PC AT owner's manual for details of performing the installation of options into the motherboard expansion slots and for instructions on mounting a hard disk and floppy disk in the system.