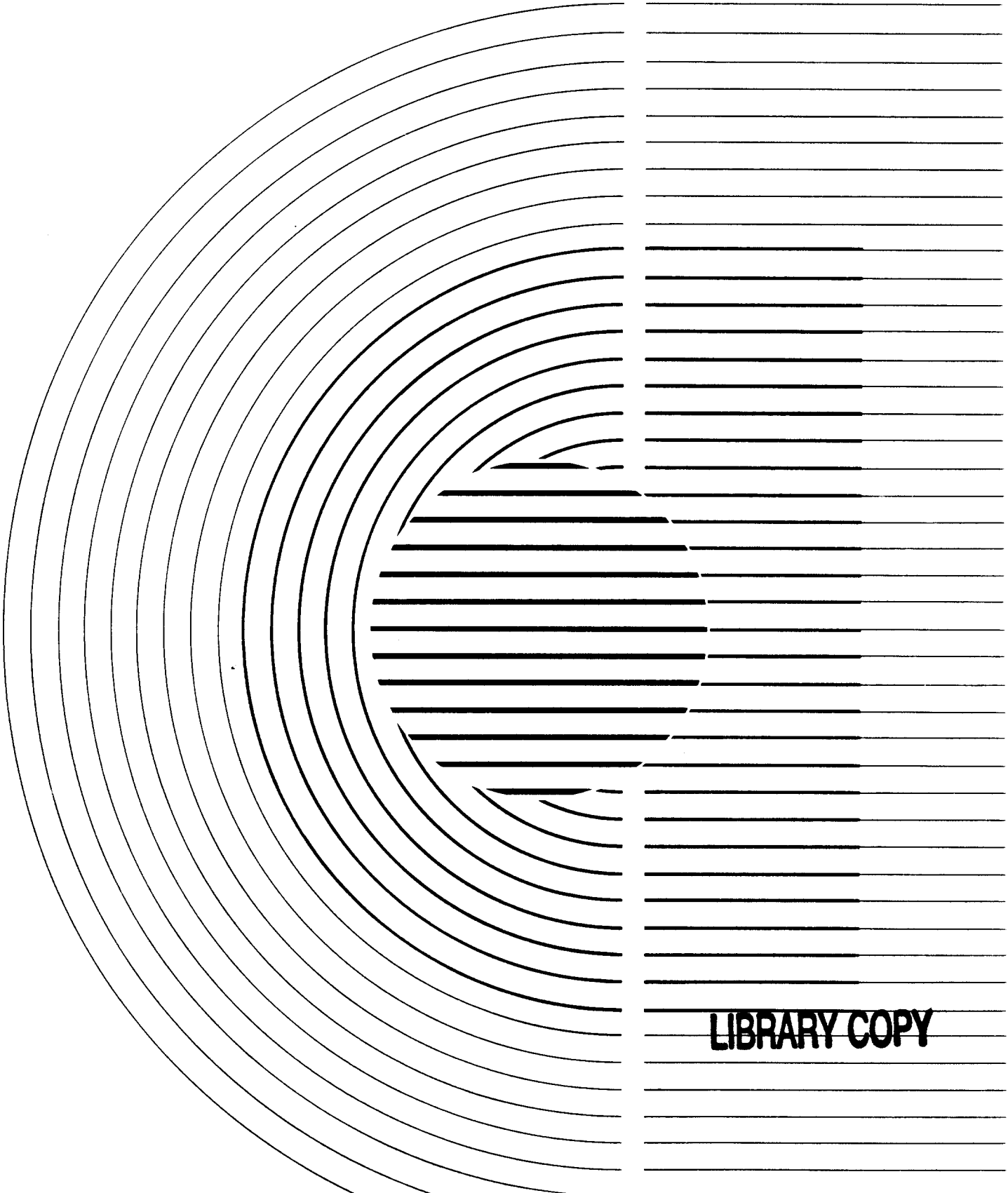




adaptec, inc.

ACB-5580

User's Manual



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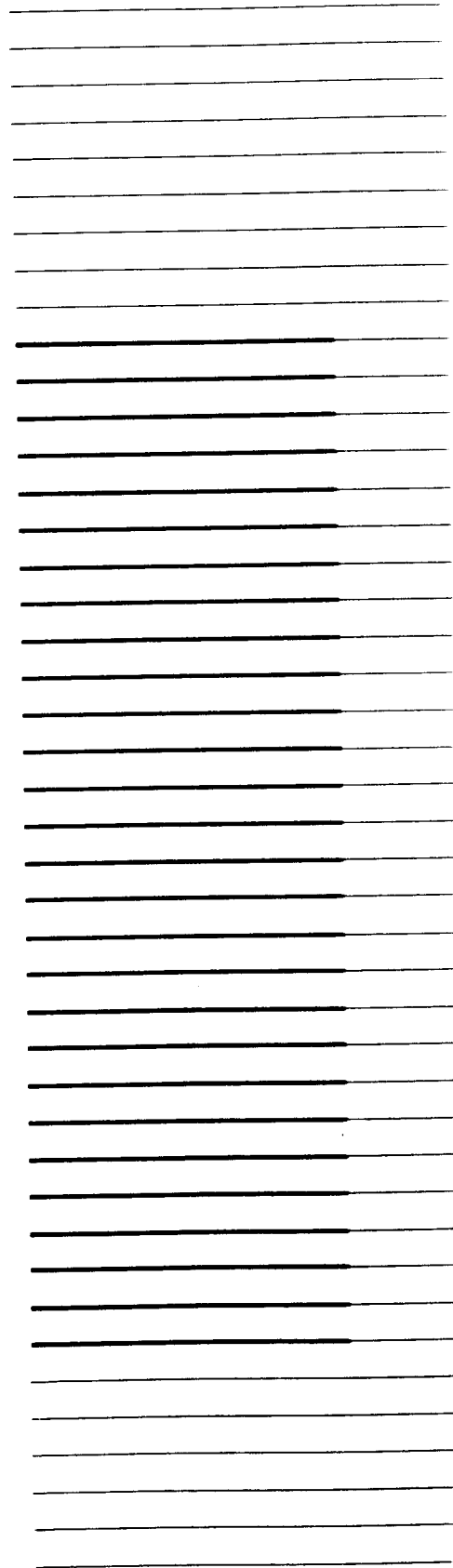
**CB-5580 Family User's Manual
CSI to SMD/ESMD Controllers**

CB-5580A
10 Mbit/s SMD Controller
With Single-Ended SCSI Drivers

CB-5580AD
10 Mbit/s SMD Controller
With Differential SCSI Drivers

CB-5585
5 Mbit/s ESMD Controller
With Single-Ended SCSI Drivers

CB-5585D
5 Mbit/s ESMD Controller
With Differential SCSI Drivers



0 INSTALLATION

The ACB-5580 is a self-contained circuit board. All logical and electronic functions required for its normal operation are contained on the circuit board. The ACB-5580 is simple to install, operate, and maintain.

1 UNPACKING

The ACB-5580 is shipped in a protective carton with shock absorbing material and static protecting material completely surrounding the card. The carton should be examined for external damage as it is opened. The cards were physically inspected when packed. Any mechanical damage to the cards should be reported to the shipper and to Adaptec as soon as possible.

CAUTION

1 circuit boards containing VLSI circuitry have some sensitivity to electrostatic discharge. The ACB-5580 is no exception. Proper handling precautions, including personnel grounding and work surface grounding, should be taken to prevent circuit stress which can cause premature circuit failure.

2 PREPARATION OF INSTALLATION AREA

The ACB-5580 is generally designed into the host system or the peripheral disk system. Proper attention should be given to the location of the ACB-5580 so the necessary ventilation, installation clearances, and cabling paths are provided.

The power output is low enough that convective ventilation will be sufficient if the air and surrounding surfaces are at a temperature of 55 degrees Celsius or less. If this requirement cannot be met by the system enclosure in its worst case environment, then the system enclosure must provide for appropriate ventilation and cooling.

Precautions should be taken to support the card mechanically. Any appropriate combination of the six mounting holes provided can be used, depending on the forces to which the system will be subjected. No conductive material should come in contact with the ACB-5580.

Installation clearances, for both the ACB-5580 and the selected power and signal cabling configuration, should be sufficient to minimize system cost, manufacturability, and maintainability.

The ACB-5580 emits a small amount of radio-frequency signals. Extremely sensitive components, such as high bandwidth sensors, should be properly shielded from the ACB-5580. Case construction is sufficient to shield the ACB-5580 as required by the FCC. If FCC compliance is required and the case leaves the box in which the ACB-5580 is installed, the case probably requires connector and cable shielding.

The ACB-5580, and all other partially shielded electronic devices, are sensitive to high-power, high-frequency, electric or magnetic sources. The ACB-5580 should be protected from these sources while it is operating. In particular, unswitched power supplies should be physically isolated from sensitive electronic boards and their interconnecting cables. Electronic noise sources, such as welding machines and radio transmitters, should be similarly isolated from electronic systems. Connector shielding may be required in some environments. Cable shield ground points are provided to allow flexibility in the design of grounding systems.

An appropriate power source must be provided. Care should be taken to prevent ground loops and other power disturbances.

Proper programming support must be provided to generate the required command sequences. Additional program support should be provided to manage the SCSI protocols. Use of the advanced performance-oriented functions will require a more powerful host adapter that supports disconnect/reconnect and arbitration. Use of the advanced command functions requires expanded error support. The system software should make error information available at a system-level to facilitate program debug and to assist in system level failure isolation. Adaptec's host adapters will provide the required SCSI services, but must receive the commands to be executed from appropriate system software.

3.3 INSTALLATION

The following steps are required for installation of the ACB-5580 into a system properly designed to accept it. They are separate from any other testing and installation procedures required by other products of the system, but can often be done in conjunction with these other installation steps.

1) Inspect the ACB-5580 for obvious physical damage before installing.

2) Install proper jumpers (see Section 3.4) to enable the desired ACB-5580 functions and to define the address of the ACB-5580 on the SCSI Bus.

3) Install the ACB-5580 with appropriate mounting hardware.

- 4) Make the required cable connections to the ACB-5580. The cable connections are:

J9 - Power cable
J8 - SCSI cable
J2, J3, J4, J5 - SMD/ESMD data cables (radial connections as required)
J1 - SMD control cable.
G1, DC1, DC2 - Ground cables if required.

5) Install SMD/ESMD drives according to the manufacturer's directions. The drives must have appropriate drive select addresses and sector sizes set. The last SMD drive on the control cable's daisy chain must be terminated.

6) Turn on the system and perform any power on test procedures required by the system.

7) Format the attached drives. (See Section 3.7.)

Note: In a production environment, the drives may be optionally formatted by a dedicated ACB-5580 manufacturing workstation before installation. All parameters are stored on the drive by the formatting procedure. Further formatting or parameter specification is not required after installation. The ACB-5580 will autoconfigure from the drive parameters at power-on time.

8) Perform appropriate system test and verification procedures. Errors related to drive operation, ACB-5580 operation, SCSI operation, and certain installation errors will be indicated through the normal SCSI error presentation mechanism.

3.1 TERMINATOR INSTALLATION

3.1.1 SMD/ESMD CABLE A TERMINATION

The SMD Cable A must be terminated by the manufacturer's specified terminator at the drive farthest from the ACB-5580 controller. The ACB-5580 is always installed at one end of the cable, so the specified SMD/ESMD terminators are permanently installed.

3.1.2 SCSI CABLE TERMINATION (ACB-5580A AND ACB-5585 ONLY)

The single-ended driver/receiver SCSI cable must be terminated at the extreme ends. The first SCSI device and the last SCSI device must be terminated. To facilitate this termination process, the ACB-5580 Family has removable DIP terminators at IC locations 9D and 9G. These should be removed for all controllers except the first and last on the SCSI cable. At the user's convenience, all terminators may be removed and the SCSI bus terminated with termination blocks which are plugged in-line with the cables.

The ACB-5580A terminators are powered from the controller supply. By removing the 0-ohm resistor in CR4 ('LOCAL PWR') and reinstalling it at R15 ('SCSI PWR'), the terminator power can be optionally provided from the SCSI TERM POWER, pin 20 of the SCSI cable.

3.3.1.3 SCSI CABLE TERMINATION (ACB-5580AD AND ACB-5585D)

The differential SCSI cable must be terminated at the ends. The first SCSI device and the last SCSI device must be terminated. To facilitate this termination process, the ACB-5580D has removable DIP terminators at IC locations 10C, 10F. These should be removed for all controllers that are the first nor the last SCSI device on the SCSI cable. For the user's convenience, all terminators may be removed and the bus terminated with terminator blocks which are plugged into the bus with the cables.

The ACB-5580D terminators are powered from the controller supply. By removing the 0-ohm resistor in CR4 ('LOCAL PWR') and reinstalling it at R15 ('SCSI PWR'), the terminator power can be optionally provided from the SCSI TERM POWER, pins 20 and 21 of the SCSI cable.

3.3.2 DIFFERENTIAL PROTECTION CIRCUITS

In an ACB-5580D bus-inadequacy system, the DIFFSENS pin (SCSI pin 21) grounded will automatically protect the controller by disabling SCSI drivers.

3.4 CONFIGURING THE ACB-5580

The ACB-5580 has a number of options that must be selected by the installation of hardware jumpers located at positions 1 through 4. The function of each jumper pair is shown in Table 3-1. The jumper header is designed to accommodate jumpers of the following types: the jumper pairs may be either

PARITY ENABLE

Installation of the PAR jumper will cause the ACB-5580 to generate SCSI data parity on bus in data and SCSI bus out (data into the ACB-5580). This jumper should only be installed if all SCSI devices on the bus with the ACB-5580 generate SCSI data parity. If not, the ACB-5580 will always generate parity on bus in data.

Reserved

the ACB-5580. The installation of the controller jumper is shown in Figure 3-1. The jumper pairs are shown together.

3.4.1 PAR

The installation of the PAR jumper will cause the ACB-5580 to generate SCSI data parity on bus in data and SCSI bus out (data into the ACB-5580). This jumper should only be installed if all SCSI devices on the bus with the ACB-5580 generate SCSI data parity. If not, the ACB-5580 will always generate parity on bus in data.

3.4.2 Y

3.4.3 REMOTE

The SMD interface provides a Channel-Ready function which is normally controlled by the ACB-5580. Control of Channel Ready can be modified by installing the jumper at RMT to allow a system-level override of the Channel Ready through the Channel Ready Remote pin of J6. This is described in section 5.7.

3.4.4 3,2,1,0 Reserved

3.4.5 EXTENDED SENSE

When Jumper SS is installed, the four-byte Adaptec sense information may be presented. When removed, SCSI extended sense information is presented. See the Request Sense Command for details.

3.4.6 DMA Reserved

3.4.7 DIAGNOSTIC MODE

The installation of the DG jumper will cause the ACB-5580 to continuously repeat a diagnostic self-test. See Appendix B for details of this self-test.

3.4.8 HARD RESET

The SCSI allows for both a hard SCSI reset and a soft SCSI reset option. The implementation is described in detail in the SCSI specification. When the HR jumper is installed, the hard reset option will be executed by the ACB-5580. When the HR jumper is not installed, the soft reset option will be executed. In general, the soft reset option is used by multihost systems with host adapters that support the special protocols required. The hard reset option is used by simple systems where multihost interference is not a problem.

3.4.9 SCSI BUS ADDRESS

The installation of jumpers A1, A2, and A4 set the SCSI bus address for the ACB-5580. SCSI devices can have an address of zero to seven. No two devices on the same bus can have the same address. The installed jumper provides a 1 state of the appropriate binary weight. For example, installation of a jumper at the A4 and A2 positions and no jumper at the A1 position generates a SCSI bus device address of '6.' The address takes effect only at power-on time.

TABLE 3-1: CONFIGURATION JUMPERS

J7		
o	o	PAR
o	o	Y
o	o	RMT
o	o	3
o	o	2
o	o	1
o	o	0
o	o	SS
o	o	DMA
o	o	DG
o	o	HR
o	o	A4 (SCSI ADDRESS 2 ²)
o	o	A2 (SCSI ADDRESS 2 ¹)
o	o	A1 (SCSI ADDRESS 2 ⁰)

3.5 POWERING-ON THE ACB-5580

Once the ACB-5580 is properly configured, the controller is powered on. When power is supplied to the system, the controller will enter a power-up mode and wait for a maximum of 40 seconds for the drive to become ready. During the 40-second sequence, the controller performs a self-test and begins initialization for the drives to become ready. If the host issues a command requiring access to a drive before it has become ready, the command will be queued until the drive becomes ready or the timer expires.

If the drive has not come ready within 40 seconds, the controller will be executed and present a Drive Not Ready (04h) error. If the drive comes ready, the initialization process will be executed and the command will then be executed normally.

If the host does not allow disconnection, the controller will not be fetched. Inquiry commands will be processed normally. Other commands will return a No Sense indication. All other commands return Busy status.

If the drive does not come ready within 40 seconds after the controller is powered on, the controller will not perform automatic initialization if and when the drive becomes ready. Reinitialization will be attempted automatically upon each command sent to the drive after that time.

When a command is received and the drive is ready but not initialized, the controller will read the drive information before executing the command.

The first command processed after a drive has been determined to be ready will be terminated with a check condition. Unit attention sense information will be presented.

Once a drive is formatted, the host can determine the drive size (READ CAPACITY, 25h, command) and self-configure the driver software. This device independence provides a major advantage for host systems using true SCSI controllers over the SASI-like units that must receive parameters after each reset.