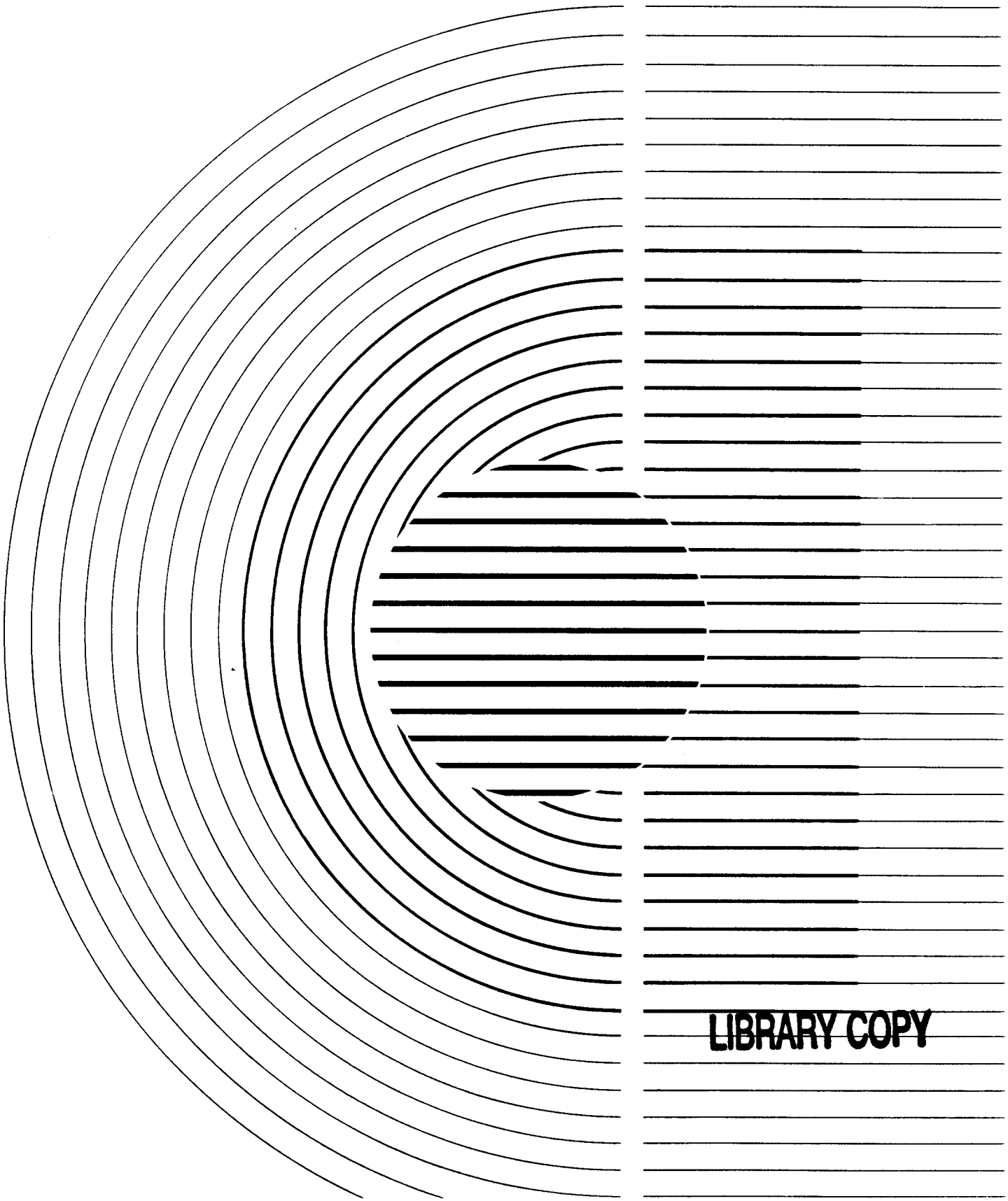
adaptec, inc.

ACB-5580
User's Manual



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ACB-5580 Family User's Manual
SCSI to SMD/ESMD Controllers

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

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

ACB-5585
15 Mbit/s ESMD Controller
With Single-Ended SCSI Drivers

ACB-5585D
15 Mbit/s ESMD Controller
With Differential SCSI Drivers

0 INSTALLATION

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

1 UNPACKING

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

CAUTION

l circuit boards containing VLSI circuitry have some sensitiv- y to electrostatic discharge. The ACB-5580 is no exception. oper handling precautions, including personnel grounding and rk surface grounding, should be taken to prevent circuit stress ich can cause premature circuit failure.

2 PREPARATION OF INSTALLATION AREA

e ACB-5580 is generally designed into the host system or the ripheral disk system. Proper attention should be given to the cation of the ACB-5580 so the necessary ventilation, stallation clearances, and cabling paths are provided.

e power output is low enough that convective ventilation ll be sufficient if the air and surrounding surfaces are at a mperature of 55 degrees Celsius or less. If this requirement nnot be met by the system enclosure in its worst case environ- nt, then the system enclosure must provide for appropriate ntilation and cooling.

re should be taken to support the card mechanically. Any propriate combination of the six mounting holes provided can be ed, depending on the forces to which the system will be sub- cted. No conductive material should come in contact with the B-5580.

stallation clearances, for both the ACB-5580 and the selected wer and signal cabling configuration, should be sufficient to timize system cost, manufacturability, and maintainability.

The ACB-5580 emits a small amount of radio-frequency s
Extremely sensitive components, such as high bandwidth
sensors, should be properly shielded from the ACB-5580.
case construction is sufficient to shield the ACB-5
required by the FCC. If FCC compliance is required and t
leaves the box in which the ACB-5580 is installed, t
frequency signals generated by normal SCSI operatio
probably require connector and cable shielding.

The ACB-5580, and all other partially shielded ele
devices, are sensitive to high-power, high-frequency, el
or magnetic sources. The ACB-5580 should be protected fr
sources while it is operating. In particular, uns
switching power supplies should be physically isolated f
electronic boards and their interconnecting cables. E
noise sources, such as welding machines and radio trans
should be similarly isolated from electronic systems. Ca
connector shielding may be required in some environments.
cable shield ground points are provided to allow flexibi
the design of grounding systems.

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

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

3.3 INSTALLATION

The following steps are required for installation of t
5580 into a system properly designed to accept it. Thes
are separate from any other testing and installation pr
required by other portions of the system, but can often
in conjunction with those other installation steps.

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

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

3) Install the ACB-5580 with appropriate mounting hard

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 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.

3.3.1 TERMINATOR INSTALLATION

3.3.1.1 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.

3.3.1.2 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 P reinstalling it at R15 ('SCSI PWR'), the terminator po be optionally provided from the SCSI TERM POWER, pin 2 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 terminated. To facilitate this termination process, t 5580D has removable DIP terminators at IC locations 10C, 10F. These should be removed for all controllers that the first nor the last SCSI device on the SCSI cable. user's convenience, all terminators may be removed and bus terminated with terminator blocks which are plugged with the cables.

The ACB-5580D terminators are powered from the controller supply. By removing the 0-ohm resistor in CR4 ('LOCAL P reinstalling it at R15 ('SCSI PWR'), the terminator po be optionally provided from the SCSI TERM POWER, pins 2 of the SCSI cable.

3.3.2 DIFFERENTIAL PROTECTION CIRCUITS

If an ACB-5580D is inadvertently plugged into a single-en system, the DIFFSENS pin (SCSI pin 21) grounded sta automatically protect the controller by disabling t drivers.

3.4 CONFIGURING THE ACB-5580

The ACB-5580 has a number of options that must be select installation of hardware jumpers located at position J controller. The function of each jumper pair is shown 3-1. The jumper header is designed to accommodate jump optimum reliability, the jumper pairs may be wire together.

3.4.1 PARITY ENABLE

The installation of the PAR jumper will cause the ACB check for SCSI bus out (data into the ACB-5580) parity This jumper should only be installed if all SCSI communicating with the ACB-5580 generate SCSI data pari ACB-5580 will always generate parity on bus in data.

3.4.2 Y Reserved

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

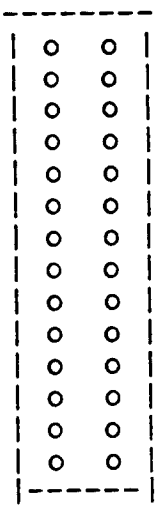
The SCSI allows for both a hard SCSI reset and a soft SCSI reset option. The implementation is described in detail in the SCSI specification. When the HR jumper is installed, the hard reset option will be executed by the ACB-5580. When the HR jumper is not installed, the soft reset option will be executed. 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



3.5 POWERING-ON THE ACB-5580

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

If the drive has not come ready within 40 seconds, t
will be executed and present a Drive Not Ready (04h)
the drive comes ready, the initialization proce
executed and the command will then be executed normal

If the host does not allow disconnection, the comm
fetched. Inquiry commands will be processed normall
commands will return a No Sense indication. All oth
return Busy status.

If the drive does not come ready within 40 second
controller is powered on, the controller will
automatic initialization if and when the drive be
Reinitialization will be attempted automatically upo
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.