ℒℒ Seagate

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ST5660N

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SCSI Interface Drive

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Installation Guide

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Contents

Read before you begin...

Application. Your Seagate® drive is designed for IBM and IBM-compatible personal computers, Sun, Macintosh and other systems using the SCSI interface.

Turn off the system power before attempting any installation.

Static discharge. Observe the following precautions:

- Keep the drive in its static-shielded bag until you are ready to complete the installation. Do not attach any cables to the drive while it is in its static-shielded bag.

- Handle the drive by its edges or frame, and do not touch the I/O connector pins or the circuit board.

- Before handling any components, put on a grounded wrist strap, or ground yourself frequently by touching the metal chassis of a computer that is plugged into a grounded outlet.

- Use antistatic padding on all work surfaces.

- Avoid static-inducing carpeted areas.

Drive handling. The drive is extremely fragile—handle it with care. Do not attach labels to any part of the drive.

Inspection. After you are familiar with the handling precautions listed above, inspect the drive. If it appears to be damaged, call your distributor or dealer immediately.

Warranty. See your authorized Seagate distributor or dealer.

Maintenance and repair. Seagate drives do not require maintenance. The head/disc assembly is sealed; if you break the seal, you void the warranty. Seagate customer service centers are the only facilities authorized to repair Seagate drives. Seagate does not sanction any third-party repair facilities.

Shipping. Keep your original box and packing materials for transporting or shipping your drive. The box has a *Seagate Approved Package* label. Shipping a drive in a nonapproved container voids the warranty. Call your authorized Seagate distributor to purchase additional boxes.

Radio and television interference. This product complies with Class B limits for radio noise emissions from computer equipment as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques depassant les limites applicable aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique edicté par le Ministère des Communications du Canada.

Sicherheitsanleitung

1. Das Gerrät ist ein Einbaugerät, das für eine maximale Umegebungstemperatur von 55°C vorgesehen ist.

2. Zur Befestigung des Laufwerks werden 4 Schrauben 6-32 UNC-2A benötigt. Bei seitlicher Befestigung darf die maximale Länge der Schrauben im Chassis nicht mehr als 5,08 mm und bei Befestigung an der Unterseite nicht mehr als 5,08 mm betragen.

3. Als Versorgungsspannugen werden benötigt:
   +5V ± 5% 0,65A
   +12V ± 5% 0,45A (1,9A fur ca. 10 Sek. fur ± 10%)

4. Die Versorgungsspannung muβ SELV entsprechen.

5. Alle Arbeiten dürfen nur von ausgebildetem Servicepersonal durchgeführt werden.

6. Der Einbau des Drives muβ den Anforderungen gemäβ DIN IEC 950V DC 0805/05.90 entsprechen.
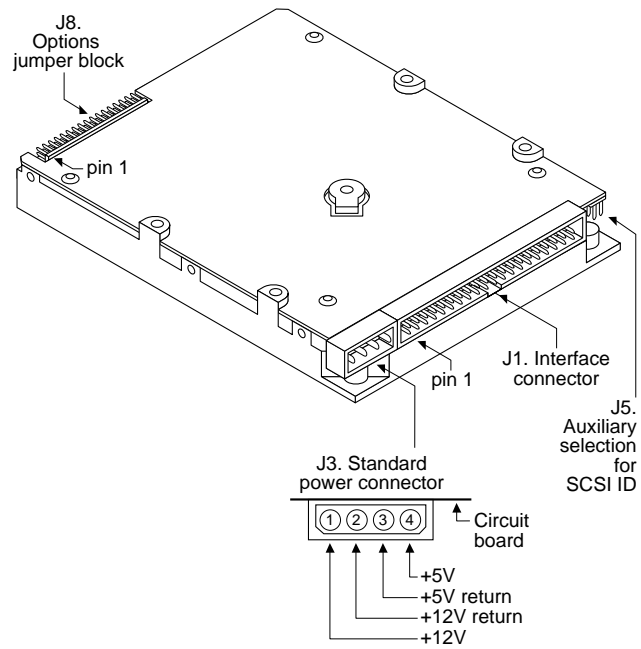
Configuring the drive

Select the appropriate drive features by installing or removing jumpers on the drive circuit board shown in Figure 1 on page 4 and according to the instructions in Figure 2 on page 5. Refer to your host adapter documentation for terminator specifications and configuration instructions.

1. **Setting the SCSI ID.** Each device on the bus must have a unique SCSI ID. If you are installing only one drive, use SCSI ID 0 (no jumper installed). If you install a second drive, you can use any ID (SCSI ID 1 is recommended). SCSI ID 7 is usually reserved for the SCSI host adapter. To set the SCSI ID, install jumpers on options jumper block J8 as shown in Figure 2 on page 5, and leave all pins of J5 open. For special applications, you can use J5 to set the SCSI ID (see Figure 3 on page 6); in these cases, leave the SCSI ID pins of J8 open. For details, refer to the *Seagate ST5660N Product Manual*, publication number *36245-00x.*)

2. **Terminating resistors**. The drive supports Fast SCSI transfer rates and contains 110 ohm resistors for active termination. (The drive uses single-ended drivers and receivers.) These resistors can be enabled or disabled as required.

   If you are installing only one drive, and your system contains only one initiator (for example, a stand-alone host adapter), enable active termination by leaving pins 19 and 20 of jumper block J8 open.

   If you are installing multiple drives in a daisy-chain, disable active termination on all drives not at a cable end. Do this for each intermediate ST5660N drive by installing a jumper on pins 19 and 20 and on pins 23 and 24 of J8.

J8.
Options
jumper block

pin 1

J1. Interface
connector

pin 1

J5.
Auxiliary
selection
for
SCSI ID

J3. Standard
power connector

① ② ③ ④   Circuit
board

+5V
+5V return
+12V return
+12V

Figure 1. Connector and jumper block locations

J8. Options jumper block

33 31 29 27 25 23 21 19 17 15 13 11 9 7 5 3 1				
• • • • • • • • • • • • • • • • •				
• • • • • • • • • • • • • • • • •				
34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2				

Circuit board

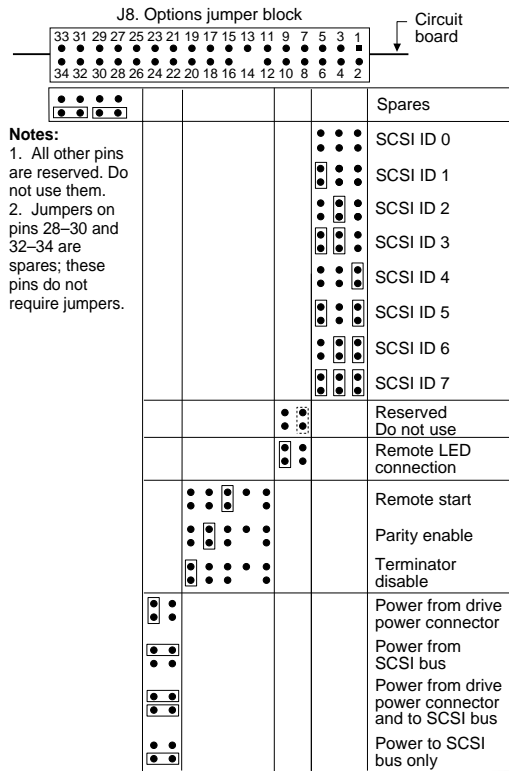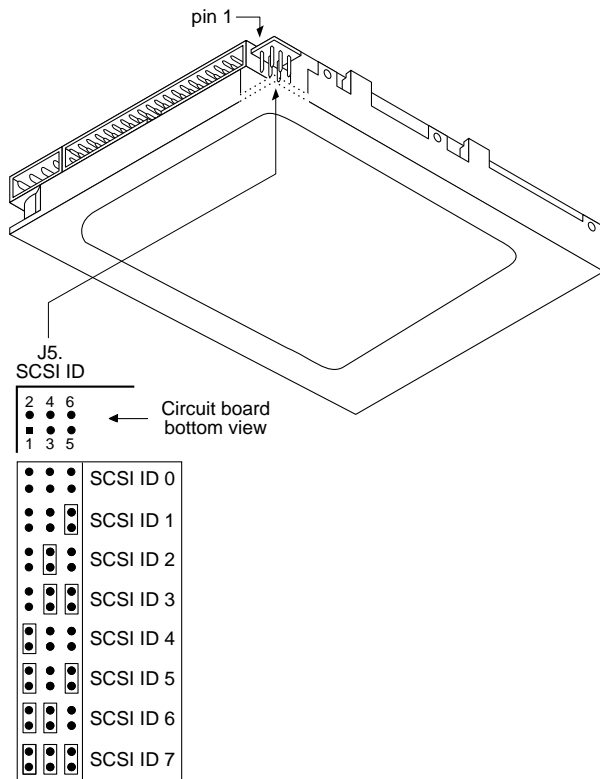|					
					Spares
Notes: 1. All other pins are reserved. Do not use them. 2. Jumpers on pins 28–30 and 32–34 are spares; these pins do not require jumpers.					SCSI ID 0
					SCSI ID 1
					SCSI ID 2
					SCSI ID 3
					SCSI ID 4
					SCSI ID 5
					SCSI ID 6
					SCSI ID 7
					Reserved Do not use
					Remote LED connection
					Remote start
					Parity enable
					Terminator disable
					Power from drive power connector
					Power from SCSI bus
					Power from drive power connector and to SCSI bus
					Power to SCSI bus only

Figure 2. Options jumper settings

Figure 3. J5. Auxiliary block for SCSI ID

3. **Installing jumpers on the terminator power source jumper block.** To select the termination power source, install jumpers for the appropriate case as follows:

   - To provide terminator power to the SCSI connector and the drive terminator packs, install jumpers on pins 21 and 23 and on pins 22 and 24 of J8. This is the default case.

   - To select the drive power connector as the termination power source for the resistor packs, install a jumper on pins 23 and 24 of J8.

   - To select the SCSI connector as the termination power source for the resistor packs, install a jumper on pins 21 and 23 of J8.

   - To provide terminator power to the SCSI connector from the drive power connector only, install a jumper on pins 22 and 24 of J8.

Attaching cables

Figure 1 on page 4 shows connector and jumper block locations.

1. **Turn off the system power and put on a grounded wrist strap before proceeding.**

2. **Connecting a remote LED.** (Optional) Connect a remote LED to pins 9 and 10 of jumper block J8. Pin 9 is ground.

3. **Attaching the power cable.** Attach a system power cable to the drive power connector J3.

4. **Attaching the 50-pin SCSI interface cable.** Attach one end of the cable to the drive interface connector J1 and the other end to the interface connector on the host system mother-

board or the host adapter. If you are installing multiple drives, use a daisy-chain cable.

Verify that pin 1 of the connector on each end of the interface cable aligns with pin 1 of its matching connector on the drive and on the host. Pin 1 is usually denoted by a stripe on the side of the ribbon cable. The location of pin 1 is shown in Figure 1.
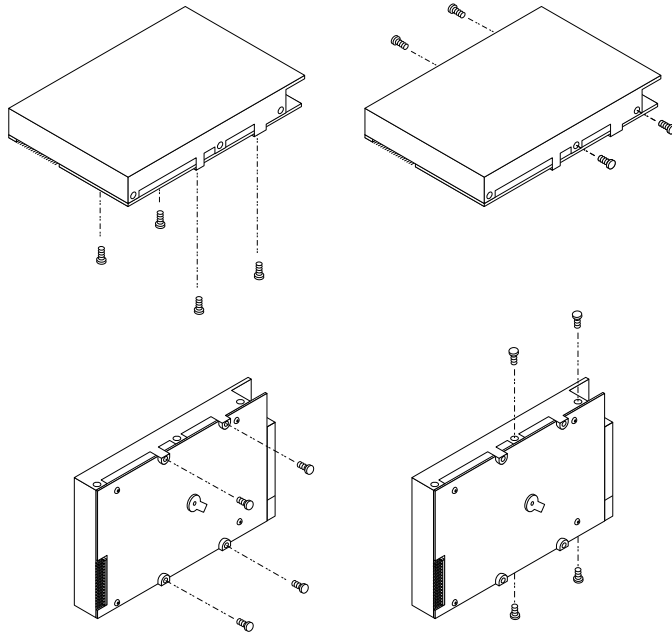
Mounting the drive

You can mount the drive in any orientation. Use the following guidelines for either bottom mounting or side mounting. Figure 4 on page 9 shows mounting hole locations.

Caution. Use of mounting screws that are too long can damage the drive. Do not insert a bottom mounting screw more than 0.20 inches (6 turns) into the drive frame. Do not insert a side mounting screw more than 0.20 inches (6 turns) into the drive frame.

Bottom mounting holes. Use 6-32 UNC-2A screws in four of the four available bottom mounting holes as shown in Figure 4.

Side mounting holes. Use 6-32 UNC-2A screws in four of the six available side mounting holes as shown in Figure 4.

Figure 4. Mounting hole locations

Physical geometry for non-DOS operating systems

When installing the drive in systems not using MS-DOS or PC-DOS, use the following information to configure your host system:

Data cylinders	3,002
Spare cylinders	2
Read/write heads	4
Total sectors	1,065,036
Spindle speed (RPM)	4,500

CMOS setup for AT systems

For drives used in IBM PCs or compatibles:

After mounting and cabling the drive, you must configure the computer to operate with the drive. This is done using the computer's CMOS SETUP routine, which enables you to define a new drive for the system BIOS. However, because the SCSI host adapter BIOS handles all I/O procedures, do not define the drive type in the system BIOS. Instead, set the CMOS parameter for drive type to drive type zero, or the *no hard drive installed* option.

Note. If you are installing your drive in an AT system and a hard drive is not presently installed, the CMOS drive type is already set to zero, or the *no hard drive installed* option.

Low-level formatting

Your drive was low-level formatted at the factory to 512 bytes per sector. In most applications, you do not have to format it again. However, you may need to low-level format the drive to make it compatible with your SCSI host adapter or to change the interleave. See your host adapter manual for details.

If you choose to low-level format your drive, use the DOS DEBUG utility. The most common DEBUG low-level formatting command is: g=c800:5. Verify the BIOS address (c800) and the offset (5) with your host adapter manual.

Caution. Performing either a low-level format or a high-level format on a drive erases all data on it. Save all files to a different storage device before formatting a disc drive. Seagate assumes no liability if you destroy your data.

Partitioning

If you are using a version of DOS earlier than Version 4.0, the effective capacity of each drive is limited to about 32 Mbytes. Therefore, you must divide higher-capacity drives into individual logical drives, called partitions. Each partition is assigned a different letter, for example, C and D for a drive with two partitions.

Regardless of the DOS version you are using, you need to prepare the drive by writing partitioning information on it. After you have configured the drive and defined it in the CMOS, boot the system from the diskette drive with a bootable DOS diskette. Then, run the FDISK utility (DOS Version 3.3 or higher) to partition

the drive. Make sure the primary partition is active. See your DOS manual for instructions.

Caution   Partitioning a drive erases all data on it. Before partitioning a disc drive, first save all files to a different storage device. Seagate assumes no liability if you destroy your data.

Many Unix-based operating systems allow you to partition the drive for DOS applications. See your system manual for details.

High-level formatting

High-level formatting verifies the information written by the low-level format and establishes drive access information used by the operating system. High-level formatting creates the File Allocation Table used by DOS to access the drive.

To high-level format the drive, perform the following operations:

1. Use the FORMAT utility to high-level format the drive. Refer to your DOS manual for the FORMAT command options.

2. If you are formatting the boot drive, copy the necessary system files to the drive.

In Unix, high-level formatting creates the i-node used for file access information. Drive formatting and partitioning are both performed by a single operating system utility. Refer to your Unix system documentation for instructions.

Basic troubleshooting

Before you begin troubleshooting, read all the suggestions discussed in the following list; they resolve the majority of installation problems.

Warning. Always turn off the system before changing jumpers or unplugging cables and cards.

- **Verify compatibility.** Reread the documentation for the host adapter and the drive to confirm that these components are appropriately matched to each other and to your computer.

- **Verify your configuration.** Using the instructions in the drive and host adapter installation guides, make sure all jumpers are installed (or removed) to suit your application.

- **Check the power supply specifications.** The output of your power supply may not meet the requirements of the new devices you are installing. If you are not sure whether your power supply meets your needs, consult your dealer.

- **Check all cards.** Make sure all cards are seated in their slots on the motherboard; then secure them with mounting screws.

- **Verify the CMOS drive type.** The CMOS drive type parameter must be set to a value of zero in AT systems.

- **Check all cables.** Make sure all cables are securely connected. Ribbon cables are especially fragile. Make sure they are not crimped or damaged in any way. Keeping extra cables on hand for troubleshooting saves time and frustration.

  For each ribbon cable, verify that pin 1 of the cable aligns with pin 1 of the connector. Pin 1 is usually denoted by a stripe on the side of the ribbon cable.

Caution. Do not randomly reverse-plug the cables. This may damage some systems.

When connecting the diskette drive, make sure you use a control cable for a diskette drive and not a hard drive. Unlike the hard drive cable, the diskette drive control cable has seven lines split and twisted.

- **Check the BIOS memory address.** Make sure the address you typed during DEBUG agrees with the address you selected with the host adapter BIOS address selection jumper.

  Assuming you have configured the host adapter correctly and a memory conflict exists, the problem may be that the host adapter is trying to use the same BIOS memory address as another peripheral on your system. The easiest solution is to try all possible BIOS addresses.

  If the memory conflict persists, isolate the conflict by disconnecting all other peripherals (except the video card) and installing the drive and the host adapter separately from the other components. Then, install the other peripherals one at a time until the conflict resurfaces.

  After you have isolated the source of the address conflict, you can resolve the conflict either by changing the BIOS address of the peripheral that appears to cause the conflict, or by changing the BIOS address of the host adapter.

- **Check for viruses.** Before you load new software, scan the diskette for viruses.

Advanced troubleshooting

If you have performed the preceding basic checks but the problem has not been solved, follow these guidelines for analyzing specific cases:

The system does not recognize the presence of the drive or system error message, "No Drives Found," appears.

- Check all cables.
- Check all cards.
- Check the BIOS memory address.
- Check the drive type. In AT systems, the drive type must be set to zero. Check the partition with the FDISK utility. Make sure that the partition you are trying to boot from is the active partition.
- Check the drive and host adapter terminating resistors. See "Configuring the drive" on page 3 and refer to your host adapter documentation.
- Check the terminator power source jumper settings.
- Check the power supply specifications.
- Reboot and make sure the drive comes up to rotating speed. (It may be difficult to hear the discs spin.) If the drive does not spin its discs, check all drive cables.
- If you tried to install more than two hard drives or two diskette drives, you may have installed more drives than your host adapter can support. Check your host adapter documentation for details.

System error message, "Drive not Ready," appears.

- Check all cables. For each ribbon cable, verify that pin 1 of the cable is aligned with pin 1 of the connector. Pin 1 is usually denoted by a stripe on the side of the ribbon cable.
- Check the power supply specifications.
- Turn off the system and wait 20 seconds. Turn it back on and make sure the drive spins up. If the drive does not spin up, check the drive power cable.

The screen stays blank when you power up the system.

- Make sure the monitor is plugged in and turned on.
- Check all cards. Make sure the video card is seated in its slot and secured with mounting screws.
- Check all cables. Make sure the video card cables are securely attached.
- While the system is turned off, remove the drive host adapter. If the screen turns on after you reboot, the host adapter may be incompatible or defective. See your dealer.

The system hangs in FDISK or fails to create or save the partition record.

- Check all cables.
- The DOS utilities diskette may be corrupted. Try your backup DOS diskette.
- If you have DOS Version 4.0 or earlier, make the drive partitions smaller.
- Check for media defects at the beginning of the drive. Use a third-party surface scan utility.

The FDISK error message, "No Fixed Disk Present," appears.

- Check all cables.
- Check the power supply specifications.
- Make sure the drive spins up when you turn on the system.
- Check the drive type. In AT systems, the drive type must be set to zero.
- Check for I/O address conflicts.

During the DOS high-level format, the drive keeps retrying hard errors and reporting the following message. "Attempting to recover allocation units. . ."

- This is normal with DOS Version 4.0 or later.

DOS messages, "Disk Boot Failure," "Non-System Disk," or "No ROM Basic - SYSTEM HALTED," appear.

- Open the floppy door.
- Check all cables.
- Use the same version of DOS throughout your system.
- Reinstall the DOS system files using the DOS SYS utility.
- Make sure the primary partition is active in FDISK.
- Check for viruses.

Technical support services

Always consult your system dealer first for technical support. Dealers are generally knowledgeable about unique system configurations.

Technical support is available for all Seagate products by calling the SeaFAX™, Seagate Technical Support FAX, SeaFONE™, SeaBOARD™ and SeaTDD™ services.

SeaFAX. 408/438-2620

You can use a touch-tone telephone to access Seagate's automated FAX system to receive technical support information by return FAX. This service is available 24 hours daily.

Location	Telephone number
United States	408-438-2620
England	44-62-847-7080

Seagate Technical Support FAX. 408/438-8137

You can FAX questions or comments to technical support specialists 24 hours daily. Responses are sent between 8:00 A.M. and 5:00 P.M. (Pacific time), Monday through Friday.

SeaFONE. 408/438-8222

You can talk to a technical support specialist between 8:00 A.M. and 5:00 P.M. (Pacific time), Monday through Friday. SeaFONE provides recorded technical information on selected Seagate products while you are on hold. You can

access the recordings 24 hours daily. Before calling, note your system configuration and drive model number (ST*xxxx*).

SeaBOARD

Using a modem, you can:

- Access documentation, drive specifications and jumper settings for Seagate's entire product line.

- Download software for installing and analyzing your drive.

- Request a return phone call from the technical support staff.

SeaBOARD is available 24 hours daily. It supports communications up to 9,600 baud. Set your communications software to eight data bits, no parity and one stop bit (8-N-1). SeaBOARD phone numbers are listed in the following table.

| Location	Modem number
United States	408-438-8771
Canada	416-856-5581
England	44-62-847-8011
France	33-1 40 67 10 34
Germany	49-89-140-9331
Singapore	65-292-6973
Australia	61-2-756-2359
Korea	82-2-556-7294

SeaTDD. 408/438-5382

Using a telecommunications device for the deaf (TDD), you can send questions or comments 24 hours daily and exchange messages with a technical support specialist between 8:00 A.M. and 5:00 P.M. (Pacific time), Monday through Friday.

Storing and shipping your drive

Keep your original box and packing materials for storing or shipping your drive. The box has a *Seagate Approved Package* label. Shipping a drive in an unapproved container voids the warranty. Call your authorized Seagate distributor to purchase additional boxes.

Figure 5 shows how to pack a drive in an approved single-pack box. Please use the original packing materials as shown.

Foam

Antistatic bag

Drive

Foam
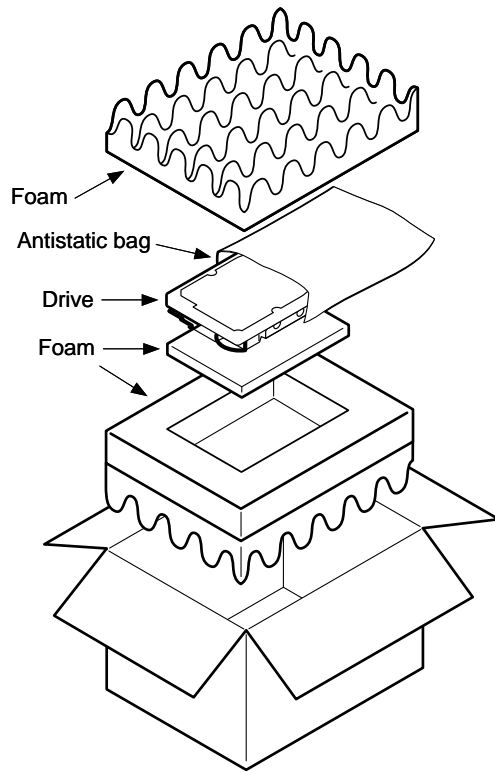
Figure 5. A drive in an approved package