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ST3655 Family:
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ST3390A, ST3550A
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ST3655A
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AT Interface Drives
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Installation Guide
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Publication Number: 36257-001, Rev. A
December 1993

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Read before you begin...

Application. Your drive is designed for IBM AT and compatible personal computers.

Warning. Turn off the computer before you open the case, touch any internal components or install the drive.

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.
- Before handling the drive, 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. Wear a grounded wrist strap throughout the installation procedure.
- Always rest the drive on a padded, antistatic surfaces until you mount it in the computer.
- Handle the drive by its edges or frame only.
- Do not touch the connector pins or the printed circuit board. Do not touch the printed circuit cable between the circuit board and the head/disc assembly.
- Avoid wool or synthetic clothing, carpet, plastics and Styrofoam; these items cause static discharge.

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

Inspection. Once 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.

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 dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Sicherheitsanleitung

1. Das Gerät ist ein Einbaugerät, das für eine maximale Umgebungstemperatur von 55°C vorgesehen ist.
2. Zur Befestigung des Laufwerks werden 3 Schrauben 6-32 UNC-2A benötigt. Bei seitlicher Befestigung darf die maximale Länge der Schrauben im Chassis nicht mehr als 3,3 mm und bei Befestigung an der Unterseite nicht mehr als 5,08 mm betragen.
3. Als Versorgungsspannungen werden benötigt:
+5V \pm 5% 0,5A
+12V \pm 5% 0,5A (1,9A für ca. 30 Sek. für \pm 10%)
4. Die Versorgungsspannung muß SELV entsprechen.
5. Alle Arbeiten dürfen nur von ausgebildetem Servicepersonal durchgeführt werden.
6. Der Einbau des Drives muß den Anforderungen gemäß DIN IEC 950V DC 0805/05.90 entsprechen.

Configuring the drive

1. **Turn off the computer.**
2. **Remove the cover of your computer.**
Caution. Special training or tools may be needed to service portable computers. Removing the cover may void your warranty. Review the terms and conditions of your warranty before removing the cover.
3. **Put on a wrist strap and ground it to the chassis of the computer.** The computer power cord should be plugged into a grounded outlet.
4. **Remove the drive from its antistatic bag.**

5. Install master/slave jumpers. In a two-drive system, you need to designate one drive as the master, or drive 0, and the other drive as the slave, or drive 1. In a one-drive system, configure the drive as a master.

To configure the drive as a master or slave, install jumpers on the master/slave jumper block as shown in Figure 1 on page 4.

Note. Do not configure the drive as a slave to a non-ATA-compatible master.

Attaching cables

See Figure 1 for the locations of the connectors and jumper blocks.

- 1. Make sure the computer is off.**
- 2. Put on a grounded wrist strap.**
- 3. Synchronize the drive spindles (disc arrays only).** You can synchronize the spindle motors of an array of drives either of two ways:
 - Attach a two-line cable to each drive. Use one strand of the cable to connect together pin 9 of the options jumper block of each drive. Use the other strand to connect together pin 10 of the options jumper block of each drive. The cable should be no longer than 18 inches (0.457 meters).
 - Enable pin 28 (SPSYNC-) of the AT interface by installing a jumper on pins 8 and 10 of the options jumper block.
- 4. Connect the remote LED.** If you want to connect a remote LED to your drive, attach a two-pin LED connector to pins 13 and 14 of the options jumper block.
- 5. Attach the power cable.** Attach a computer power cable to the appropriate drive power connector: either the standard 4-pin power connector or the optional 3-pin mini power connector.

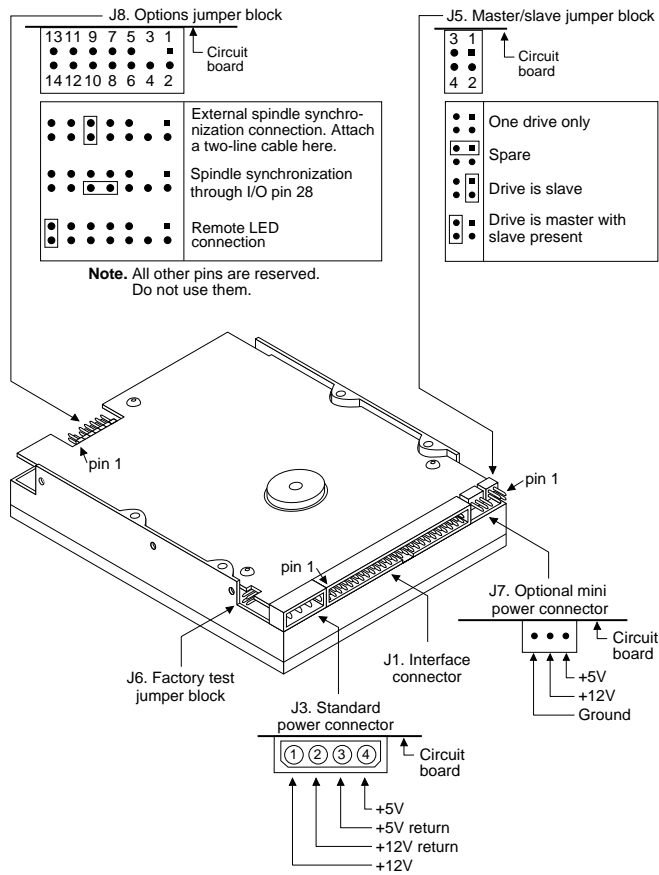


Figure 1. Connectors and jumpers

6. Attach the 40-pin AT interface cable. Match pin 1 of the interface (ribbon) cable to pin 1 of the interface connector on the drive and on the computer. Pin 1 is usually denoted by a stripe along one edge of the ribbon cable. The location of pin 1 of the drive interface connector is shown in Figure 1.

Caution. If you attach the interface cable incorrectly, you could damage the computer and the drive.

If you are installing two drives, use a daisy-chain ribbon cable. The ribbon cable should be no longer than 18 inches. Ribbon cables are delicate. Be careful not to crimp or strain them.

Mounting the drive

Mount the drive securely in the computer using either the bottom or side mounting holes, as described below. Position the drive so that you do not strain or crimp the cables. Figure 2 on page 6 shows the recommended mounting orientations and the optimum placement of mounting screws.

Bottom mounting holes. Insert 6-32 UNC-2A mounting screws in three of the four available bottom mounting holes as shown in Figure 2. Do not insert the screws more than 0.20 inches (6 turns) into the drive frame.

Side mounting holes. Insert 6-32 UNC-2A mounting screws in three of the six available side mounting holes as shown in Figure 2. Do not insert the screws more than 0.13 inches (4 turns) into the drive frame.

Caution. To prevent damage to the drive:

- Use mounting screws of the correct size and length.
- Gently tighten the mounting screws—do not apply more than 6 inch-lbs of torque.

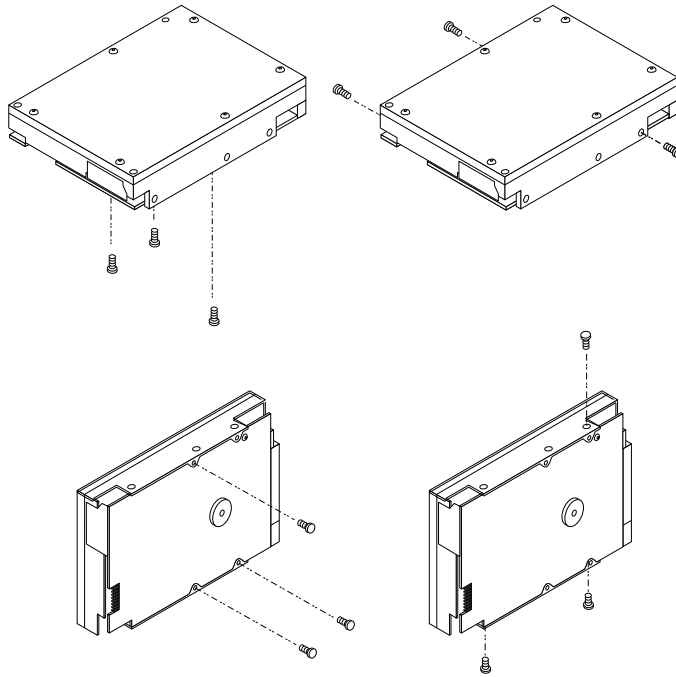


Figure 2. Recommended mounting orientations

Configuring the computer

1. Turn on the computer.
2. Enter the CMOS SETUP routine and define the translation geometry of the new drive in the computer CMOS.
3. Select a drive type that matches your drive's translation geometry.

If none of the standard drive types offered by the CMOS match the translation geometry shown in the following table, select the *user-defined* or *custom* drive type to enter your drive's translation geometry.

If your CMOS does not offer a *user-defined* drive type, select a standard drive type with a capacity that most closely approximates, but does not exceed, your drive's CMOS capacity (shown in the last column of the table). If you do not know what drive types your CMOS supports, download the FindType utility from SeaBOARD (see page 16) to assist you in choosing an appropriate drive type.

The following table shows the recommended translation geometry for the drive.

Model	CHKDSK Mbytes	Translation geometry			CMOS Mbytes
		Cyl	Heads	Sectors per track	
ST3390A	340.6	768	14	62	325.0
ST3550A	452.4	1018	14	62	431.4
ST3655A	527.6	1024	16	63	503.4

4. The drive does not use the write precomp and landing zone parameters. For both parameters, enter the number of cylinders plus 1.
5. Save your CMOS changes and exit CMOS SETUP.

Low-level formatting

AT drives are low-level formatted at the factory to 512 bytes per sector. You do not need to low-level format AT drives.

Partitioning

If you are using DOS Version 3.3 or earlier, your partitions are limited to roughly 33 Mbytes. Beginning with DOS Version 4.0, you can put the entire drive on one partition.

Caution. If you partition or format a drive at any level, you erase all your data. Back up the drive first. Seagate assumes no liability if you erase your data.

Boot up your computer from the diskette drive with a bootable DOS diskette and run the FDISK utility. This utility is easy to use. For most applications, you only need to accept the defaults offered by the utility and press the Enter key.

1. At the DOS prompt, type FDISK and press the Enter key.
2. Select *create DOS partition or logical DOS drive* and press the Enter key.
3. Select *create primary DOS partition*. Use the maximum available size for your primary partition and make the partition active. (This puts the entire drive on one partition and makes the drive bootable, which means that the computer uses the drive to load DOS every time you turn it on.) Press the Enter key after every selection.
4. After you make all the appropriate selections, the computer automatically reboots itself.

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

High-level formatting

High-level formatting verifies the information written by the low-level format and builds the File Allocation Table (FAT) used by DOS to access files on the drive. Use the FORMAT utility to high-level format the drive.

1. Type the following command line at the DOS prompt:
format *drive:* /v /s

drive: designates the drive you are formatting. Use *c:* if you are formatting the boot drive, or if your system contains only one drive. If you are formatting a nonboot drive, type *d:* instead.

/v tells the computer you want to label the drive after it is formatted. Labeling the drive can prevent someone from accidentally deleting the partition and losing your data.

/s tells the computer to make the drive bootable and copy the necessary system files to the drive.

2. When the computer prompts you for a volume label, type any name you want to use to designate 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 operating system documentation for instructions.

Using the MIRROR utility

If a virus or a faulty computer program destroys your drive's file allocation table (FAT) or its partition information, you can usually recover your data if you save copies of these important files. To do this, add the MIRROR command to your autoexec.bat file.

1. Using an ASCII text editor, open the autoexec.bat file, which is located in the boot drive's root directory.
2. At the end of the autoexec.bat file, add the following command line to back up the FAT of the C: drive:
c:\DOS\MIRROR c:

If you have many partitions, or logical drives, you can add additional drive letters (for example, d: e: f:) to the command line to represent these drives.

Note. If the mirror utility on your computer is not in the DOS directory under the root directory, you need to specify a different pathname.

3. Save your changes, exit the editor and reboot your computer. After every reboot, the computer automatically executes the autoexec.bat file. Check to see that the MIRROR command runs successfully. The MIRROR command makes a copy of the FAT in a file called mirror.fil in the drive's root directory. If a virus or a faulty program destroys the FAT, recovery utilities use this file to recover the FAT.

Now, back up the partition record of the boot drive to a diskette.

1. Insert a blank, formatted diskette in the floppy drive and type the following command line at the DOS prompt:
c:\DOS\mirror /partn
The computer copies the partition record to the floppy diskette.
2. Remove the diskette from the drive and keep it in a safe place. If your drive's partition record ever becomes corrupted, recovery utilities can use this diskette to recover your data. If you ever repartition the drive, back up the partition record again.

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 computer 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 must approximate, but not exceed, the physical specifications of your drive.
- **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 is matched to 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 can damage the computer and the drive.

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

- **Check for viruses.** Before you use someone else's diskette in your system for the first time, scan the diskette for viruses.

Before continuing, carefully read the preceding checklist. You need to refer to the introductory material to effectively use the following information.

The system does not recognize the presence of the drive.

- Check all cables.
- Check the power supply specifications.
- Reboot the computer and make sure the drive spins up. (If your drive is very quiet, it may be difficult to hear it spin up.) If the drive does not spin up, check all drive cables.
- Verify the CMOS drive type.

- Try a warm boot. Press CTRL, ALT, and DELETE at the same time to reboot the computer without turning off the power.

If a warm boot causes a previously unrecognized drive to become recognized, there may be a timing problem in which the drive fails to become ready before the computer's power-on self-test is complete.

One possible solution is to slow the processor speed of your computer during startup. If your computer has a Turbo switch, turn it off before powering-on the computer. If your computer does not have a Turbo switch, you may be able to use keyboard commands to slow the processor speed. Once the computer is up and running, return your processor speed to fast. (See your computer manual for details.) Another solution is to simply warm-boot your computer after every power-on.

- Check for I/O address conflicts. To isolate the conflict, first verify that the drive and host adapter are compatible with your computer by disconnecting all of the other peripherals (except the video card) and installing the drive and host adapter first. Then, install the other peripherals one at a time until the conflict resurfaces.

After you have isolated the source of the address conflicts, you can resolve the conflict by changing the I/O address of the peripheral that appears to cause the conflict.

The dealer partitioned and high-level formatted the drive for you in the store. Later, you installed the drive and it does not work at all.

- Reboot the computer and make sure the drive spins up.
- Check all cables.
- Check the power supply specifications.
- Use the same version of DOS throughout your computer. Make sure the DOS version the dealer used to partition and high-level format the drive is the same as the version you have installed on your computer. If it isn't, see your dealer.

- Verify the CMOS drive type. You must use the same CMOS drive type or translation geometry to install the drive that the dealer used to partition and high-level format it.
- Check for memory conflicts.
- Check for viruses.

The screen goes 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 computer is powered down, remove the drive host adapter. If the screen turns on after you reboot, the host adapter may be incompatible or defective. If so, 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.
- Make the partitions smaller.
- Use another drive type or translation geometry. Sometimes, the computer's BIOS does not accept a particular translation geometry even if the geometry is written in the CMOS.
- Change the interrupt jumper setting on the host adapter.
- 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.
- Reboot the computer and make sure the drive spins up.

- Verify the CMOS drive type.
- Check for I/O address conflicts.

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

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

System error message, “Drive not Ready,” appears.

- Check all cables. For each ribbon cable, verify that pin 1 of the cable is matched to 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.
- Reboot the computer and make sure the drive spins up.

During the DOS high-level format, the drive does not format to full capacity.

- Verify your CMOS drive type. One of the following problems may have occurred: 1) you made a typing mistake when entering the drive type or translation geometry in the CMOS; 2) you attempted to exceed the physical capacity of the drive with respect to one of these parameters; or 3) you selected a CMOS geometry or drive type that does not take full advantage of the drive’s capacity.

Whichever the case, follow the instructions in “Configuring the computer” on page 6. After you reset the CMOS drive type, partition and high-level format the drive again. (Remember, DOS does not allow more than 1,024 cylinders.)

- If you partitioned the drive into individual logical drives, you may need to make the partitions smaller so that the computer can use all of the drive’s capacity.

Technical support services

Always consult your computer dealer first for technical support. Dealers are generally more familiar with 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.

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 (STxxxx).

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.

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

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.

The following figure shows how a drive fits in an approved single-pack box, including the packing materials.

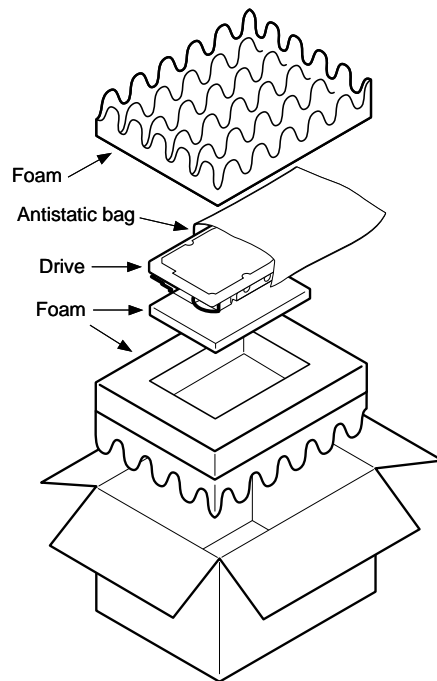


Figure 3. A drive in an approved package



Seagate Technology, Inc.
920 Disc Drive, Scotts Valley, CA 95066, USA
Publication Number: 36257-001, Rev. A, Printed in USA