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ST3144 Family:

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ST3096A,

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ST3120A,

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ST3144A

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Installation Guide

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Overview

Installation of the drive can be divided into distinct steps as outlined below. Some of these may not be applicable to your particular installation requirements. Refer to the drive installation section for specific information on your drive model.

- **Drive jumper settings.** Select the appropriate drive features by installing or removing jumpers on the jumper blocks on the drive circuit board.
- **CMOS configuration.** Basic information about the drive must be entered into the host system CMOS so that it may properly access the drive for reading and writing data. The number of heads, cylinders, and sectors per track are specific to each drive and collectively define the drive's geometry.
- **Low-level formatting.** Seagate AT interface drives are low-level formatted at the factory and do not need low-level formatting.
- **Partitioning.** A drive can be divided into partitions that behave as individual drives within the system. Versions of DOS earlier than 4.0 limit the maximum drive capacity and consequently require higher capacity drives to be divided into smaller partitions. For DOS users, each partition is assigned a different letter, for example, C: and D: for a drive with two partitions.

Use the DOS FDISK utility to partition the drive. After the drive has been defined in CMOS, you must boot the system to the floppy drive with a bootable DOS diskette. Then run the FDISK utility to partition the drive. Refer to your DOS manual for using FDISK. Use DOS 3.3 or higher.

Caution. If you partition or format a drive at any level, you erase all your data. Backup the drive first. Seagate assumes no liability for lost user data.

- **High-level formatting**, This procedure verifies the information written by the low-level format and establishes drive access information used by the system. High-level formatting also creates the File Allocation Table (FAT) used by DOS for drive access. The high-level format is initiated by the FORMAT command. Refer to your DOS manual for instructions on using the FORMAT command.

ST31 44 family drives

This guide provides installation information for the ST3096A, ST31 20A, and ST31 44A drives. All drives in this family automatically park their heads at power-down.

Power management option

ST31 44 family drives are available with power management. The identifying nine-digit number is found on the drive. Use of this feature is system-dependent.

Drive Model	Supports Power Management	Without Power Management
ST3096A	911008-0XX, 911008-1 XX, 911008-4XX, 911008-6XX	911008-3XX 911008-5XX
ST31 20A	911003-0XX, 911003-1 xx, 911003-4XX, 911003-6XX	911003-3XX, 911003-5xx
ST31 44A	911006-0XX, 911006-4Xx, 911006-6XX	911006-3Xx, 911006-5XX

AT interface setup

This section describes drive geometries, compatible BIOS revisions, jumper settings, and installation procedures for ST3144 family drives.

AT drive geometries

The following table shows the recommended drive geometries for ST31 44 family drives.

Model	Formatted MBytes	Cyl.	Heads	Sectors/Track	Formatted CMOS MBytes
ST3096A	89.1	1,024	10	17	85.0
ST31 20A	106.9	1,024	12	17	102.0
ST3144A	130.7	1,001	15	17	124.6

Use a system utility, usually called SETUP, to enter the drive geometry into the system CMOS. If the drive types offered by the CMOS do not support the number of heads, cylinders, and sectors/track shown by the table, and your system does not support a “user-defined” drive type, select a drive type in your system CMOS with a capacity less than or equal to the capacity given in the “Formatted CMOS Megabytes” column of the table above.

Note. The number of Heads times the number of Sectors cannot exceed 255, as given by the following equation:

$$(\text{Heads}) \times (\text{Sectors}) \leq 255$$

When you enter the drive geometry using the “user-defined” or “custom” drive type, the CMOS calculates the drive capacity. This capacity is listed in the “Formatted CMOS Megabytes” column of the table. It is the same effective capacity as the capacity shown in the “Formatted Megabytes” column, even though the CMOS value is lower. After high-level formatting, you can check the drive

capacity using the DOS CHKDSK utility. If you do not know what drive types your CMOS supports, use the FINDTYPE utility from the Seagate Technical Support BBS to assist you in choosing an appropriate drive type. See Page 2.

Compatible BIOS revisions

ST3144 family drives are compatible with the BIOS revisions listed in the table below. To find out which BIOS your system uses, reboot the system. The BIOS manufacturer, version, and date are displayed on the monitor.

Typically, BIOS compatibility problems include intermittent drive access errors or system time-out errors. If you have compatibility problems, call your system dealer or manufacturer.

BIOS Manufacturer	Version
American Megatrends	Dated 4/9/90 or later
Award	Version 3.04 or higher
Quadtel	Single Drive System: Any Version Dual Drive System: 3.04 or higher
Phoenix	BIOS Plus 286: 3.10 or higher BIOS Plus 386: 1.10 or higher
PhoenixBIOS	Version 1 .00 or higher

Configuring and installing the drive

- 1. Turn off the system power.**
- 2. Wear a grounded wrist strap.** If you are grounding yourself to the chassis of the host computer, the power cord must be plugged into an electrical outlet that has an earth ground.

3. **Master/Slave configuration.** The table below defines jumper settings for configuring up to two drives on a single AT bus, Refer to Figure 1 for jumper locations.

System Configuration	Jumper	
	Master	Slave Present
Only drive in system	Installed	Removed
Drive 1 in a two-drive system	Installed	Installed
Drive 2 in a two-drive system	Removed	Removed

4. **Drive Activity LED jumper.** If you install a jumper on pins 9 and 10 of the User Configuration jumper block, the drive indicates activity to the system through a connector on the host adapter or motherboard.
5. **Attach the 40-pin AT interface cable.** A dual-drive system requires a 40-pin AT interface daisy-chain cable. Pin 20 has been removed on the connector for keying purposes.

Most interface cables have a stripe on one side to designate Pin 1. Make sure Pin 1 on the cable connector is aligned to Pin 1 on the drive connector and Pin 1 on the host connector. The maximum cable length is 18 inches (**457** mm).

For systems without an embedded AT interface connector on the motherboard, Seagate offers the ST07A/ST08A AT interface host adapters.

Note. To prevent improper pin alignment during installation, it is recommended that the mating cable connector be keyed, by inserting a plug into the Pin-20 location of the cable connector.

6. **Attach a system power cable to the drive power connector.** The ST31 44 family drives have both 3-pin and 4-pin power connectors.
7. **Mount the drive in the host system chassis.**

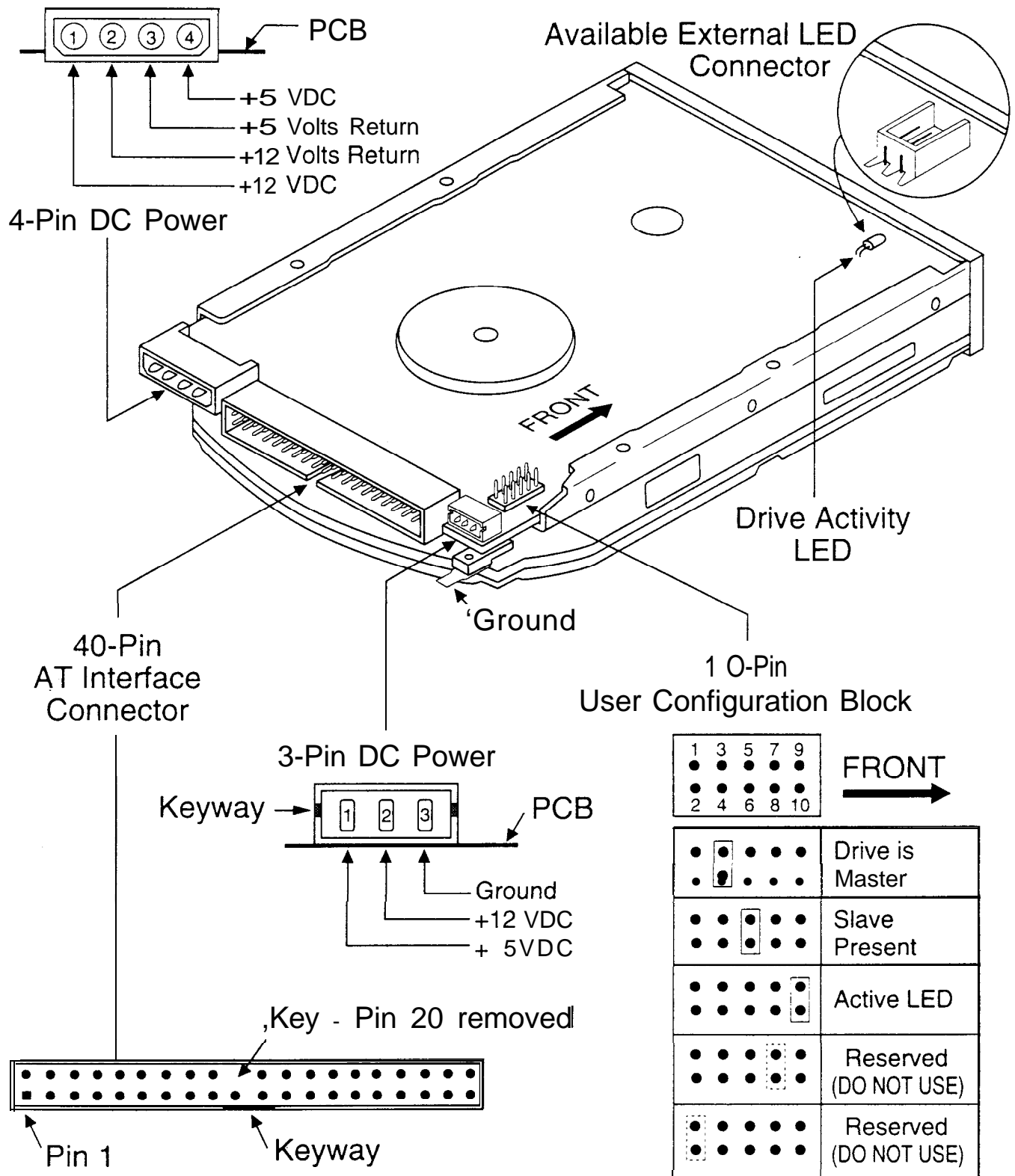


Figure 1: AT jumpers and connectors

Mounting the drive

You can mount the drive in any orientation, provided you do not mount it more than 5° from a vertical or horizontal axis. For best results, format the drive in its final mounting orientation.

Bottom mounting. Insert four mounting screws not more than 0.20 inches (6 full turns) into the drive frame. If you use a screw that is too long, you could damage the drive.

Side mounting. Insert four mounting screws not more than 0.13 inches (4 full turns) into the drive frame. If you use a screw that is too long, you could damage the drive.

Screw sizes: Use 6-32 UNC screws on drives with standard-size mounting holes. These drives have an "S" stamped on the frame runner. Use M4 screws on drives with metric mounting holes. These drives have an "M" stamped on the frame runner.

Caution. Be careful not to over-tighten screws. You could damage the drive. (Max torque: 6 inch-lbs)

Formatting the drive

Seagate AT Interface drives are low-level formatted at the factory and do not need low-level formatting. Partition the drive using the DOS FDISK utility. Then, high-level format the drive using the DOS FORMAT utility. Use DOS 3.3 or higher. Consult your DOS manual for FORMAT and FDISK command syntax. If the drive is to be made bootable, copy the system files onto it and mark the primary DOS partition active.

Caution. If you partition or format a drive at any level, you erase all your data. Backup the drive first. Seagate assumes no liability for lost user data.

Frame kit and remote LED

To install this 3.5inch drive in a 5.25inch frame, use a Seagate frame kit, part number 54459-016. This frame kit can only be used with drives that have standard-size mounting holes. These drives have an “S” stamped on each frame runner. If your drive has an “M” (for metric) stamped on each frame runner, do not attempt to mount it in this frame kit.) The frame kit contains a remote LED.

Installation trouble-shooting

Before you begin trouble-shooting, read and be aware of all the considerations discussed in this section. The suggestions presented here resolve the vast majority of installation problems.

Warning. Always power down the system before changing jumper settings or unplugging cables and cards.

- **Verify compatibility.** Check the documentation for the host adapter and the drive to confirm that these components are appropriately matched for each other and to your system.
- **Verify your configuration.** Refer to the drive and controller installation guides to make sure all jumper settings suit your configuration requirements.
- **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. Having extra cables on hand for trouble-shooting saves time and frustration.

Note. Most cables have a stripe on one side to designate the Pin 1 location. Make sure Pin 1 on the interface cable connector is connected to Pin 1 on the drive interface connector and Pin 1 on the host connector. Refer to Figure 1 for the location of Pin 1 on the drive interface connector.

- **Check all cards.** Make sure all cards are securely seated in the expansion slots on the motherboard. Full size (16-bit) cards cannot be plugged into half-size (8-bit) slots. Make sure all cards are plugged into appropriately sized expansion slots. Once the cards are permanently installed, and the system is running properly, use mounting screws to secure them in place.
- **Check the power supply specifications.** The output of your power supply may not meet the power requirements of the new devices you are installing. If you are not sure whether the power supply meets the system requirements, consult your system dealer or distributor.
- **Use the same version of DOS throughout your system.** The same version of DOS must be used throughout all phases of building and configuring your system.
- **Verify the CMOS drive type.** The CMOS drive type must approximate, but not exceed, the physical specifications and maximum drive capacity of the disc drive. Refer to the Default Drive Geometry section of this installation guide for drive specifications and CMOS configuration information.
- **Check for viruses.** Before installing any new software, scan the installation diskettes for viruses. After the software has been installed on the hard disc, scan that drive for viruses. Symptoms of viruses can include intermittent system lock-ups, re-boots, drive errors, etc.