

The mounting screws must not exceed inside the mounting feet more than 3.2 mm, measured from the outside surface of the foot.

Interface and Recording Method

The ST213 and ST225 are designed for operation with the ST412 interface with MFM encoding at 5.0 MBits/sec. data transfer rate. Operation of a MFM drive with a RLL controller is not approved by SEAGATE and will void the drive warranty.

The ST225R, ST238R and ST250R are designed for operation with the ST412 interface with Run Length Limited (2,7) encoding at 7.5 MBits/sec. data transfer rate.

Radial/Daisy-Chain Mode

The Drive Select line enables the controller to select and address the drive. Control cable interface options may use either a Daisy-Chain or Radial configuration.

Drives can be configured in either a daisy-chain or radial mode.

The resistor pack must remain installed on the last drive in a chain.

The resistor pack must remain installed on all radially-selected drives.

Shock and vibrations

All shock and vibration specifications assume that the drive is mounted in an approved orientation with the input levels at the drive mounting screws.

Read/Write Head Park Zone

ST213/ST225/ST238R

The read/write heads may be parked by issuing a seek to any cylinder between 615-670

ST225R/ST250R

The read/write heads may be parked by issuing a seek to any cylinder between 667-670

At power-on the drive will recalibrate to Track 0. If the heads are parked while power is still applied, any step pulse will cause the unit to recalibrate to Track 0.

FCC Verification

These drives are devices which are intended to be contained solely within a personal computer or similar enclosure and not attached to an external device. As such, they are considered to be subassemblies even when individually marketed to the customer. As a subassembly, no Federal Communications Commission certification of the device is required.

DC Power Requirements

Power may be applied or removed in any sequence without loss of data or damage the drive.

Input Noise

Maximum permitted input noise ripple: 100 mV (peak-to-peak)

Maximum permitted input noise: 20 MHz.

Ripple measured at the host system power supply across an equivalent 8 resistive load on the +12 V line and an equivalent 3 load on the +5 V line.

DC-Unsafe

A DC-unsafe condition is defined as DC voltage input to the drive outside the specified tolerances. This condition will cause a micro-processor reset. This will prohibit writing, but will not directly cause a Write Fault

Handling and Static-Discharge Precautions

After unpacking, and prior to system integration, the drive may be exposed to potential handling and ESD hazard. Do not touch the drive connectors or board components or without observing static-discharge preferred. Handle the drive by the frame only. Always rest the drive on a padded surface until it is mounted in the host system.

Auto-Truncation

The drive will enter the auto-truncation mode if the controller issues an excessive number of step pulses, which would place the read/write heads outward beyond Track 0 or inward beyond the maximum data cylinder.

With auto-truncation active, the drive will ignore additional pulses, take control of the actuator, and recalibrate the heads to Track 0.

Caution: If the controller is still issuing slow-step pulses after the drive issues Seek Complete from auto-truncation mode, the drive will either reenter auto-truncation mode with Direction In true.

Precompensation

For optimum performance, precompensation is recommended for the ST213 and ST225 on tracks 300 through 614. Twelve nsec. is recommended for both early and late bits.

Some controllers provide a default precompensation setting from cylinder 128 to 256. The ST213 and ST225 will perform satisfactorily at these settings.



F E A T U R E S

SEAGATE ST213/ST225/ST225R/ST238R/ST250R PRODUCT MANUAL 36025-003

Media Defects

A media defect is a read error when the data, which has been correctly written, cannot be recovered within 16 retries. A printout will be provided with each drive shipped listing the location of any defect by head, cylinder, sector and byte. The defect map will specify the number of bytes from index. For MFM this will be based on 1.6 sec./byte. RLL encoding is based on 1.056 sec./byte. Some drives will have the defect map fixed to the drive top cover.

ST213 There will be no more than 11 defects total per drive. Cylinders 0, 1, 2 and 3 will be free of defects.

ST225 There will be no more than 21 defects total per drive. ST225R Cylinders 0, 1, 2 and 3 will be free of defects.

ST238R There will be no more than 33 defects total per drive. Cylinders 0, 1, and 2 will be free of defects.

ST250R There will be no more than 42 defects total per drive. Cylinders 0, 1, and 2 will be free of defects.

Access Time Definition and Timing

Access time is defined as the time from leading edge of the last step pulse received to Seek Complete (including setting). The step pulse period must be 5-200 sec.

		ST213		
		ST225	ST225R	
		ST238R	ST250R	
Track-to-Track	msec.	20	20	
	Average msec. typ.	65	70	
	Average msec. max.	150	165	
Latency	msec. avg.	8.33	10	

Bit Jitter

Bit jitter reduction determines the relationship between the leading edge of read data and the center of the data window. The data separator must provide at least -40dB of bit jitter reduction at 2F with an offset of less than 1.5 nsec. shift from the center of the data window.

UL/CSA Listing

The drive family is listed in accordance with UL 478 and CSA C22.2 (0-M1982), and meets all applicable sections if IEC 380 and VDE 0806/08.81, as tested by TUV-Rheinland, North America.

Reliability

MTBF 100,000 Power-on hours
PM: Not required
MTTR: 30 Minutes
Service life: 5 Years



SEAGATE SUPPORT SERVICES

Seagate Technology

 Technical Support Services

If you need assistance installing your drive, consult your dealer. Dealers are familiar with their unique system configurations and can help you with system conflicts and other technical issues. If you need additional assistance with your Seagate(r) drive or other Seagate products, use one of the Seagate technical support services listed below.

SeaFONE at 1-800-SEAGATE (1-800-732-4283)
 Seagate's 800 number allows toll-free access to automated self-help services, providing answers to commonly asked questions, troubleshooting tips and specifications for disc drives and tape drives. This service is available 24 hours daily and requires a touch-tone phone. If you need to speak to a technical support engineer, dial this number and listen to the options for technical support. (International callers can also reach this automated self-help service by dialing 408-456-4496).

Seagate Technology online services
 Using a modem, you can obtain troubleshooting tips, free utility programs, drive specifications and jumper settings for Seagate's entire product line. You can also download software for installing and analyzing your drive.

SeaNET
 You can obtain technical information on Seagate drives, Seagate software and much more over the Internet from Seagate's World Wide Web home page (<http://www.seagate.com>) or Seagate's ftp server (<ftp://ftp.seagate.com>).

You may also send E-mail with your questions to DiscSupport@Seagate.com or TapeSupport@Seagate.com.

SeaBOARD
 SeaBOARD is a computer bulletin board system (BBS) that contains information about Seagate's disc and tape drive products and is available 24 hours daily. 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.

BBS Location	Modem number
United States	Disc: 408-434-1080; Tape: 408-456-4415
England	44-1628-478011
France	33 1-48 25 35 95
Germany	49-89-140-9331
Singapore	65-292-6973
Thailand	662-531-8111
Australia	61-2-9756-2359
Taiwan	886-2-719-6075

Seagate CompuServe forum
 Online technical support for Seagate products is available on CompuServe. To access our technical support forum, type go seagate. This forum provides information similar to that found on SeaBOARD. In addition, you can type questions or browse through previous questions and answers on the forum messages.

Seagate Technology FAX services
 SeaFAX
 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	1-800-SEAGATE or 408-456-4496
England	44-1628-894084
Australia	61-2-9756-5170

Seagate technical support FAX
 You can FAX questions or comments to technical support specialists 24 hours daily. Responses are sent during business hours.

Location	FAX number
United States	408-944-9120
England	44-1628-890660
France	33 1-46 04 42 50
Germany	49-89-1430-5100
Australia	61-2-9725-4052
Singapore	65-293-4722
Hong Kong	852-2368 7173
Taiwan	886-2-715-2923
Korea	82-2-556-7294/4251

Seagate technical support
 You can talk to a technical support specialist during business hours Monday through Friday for one-on-one technical help. Before calling,

note your system configuration and drive model number (STxxxx). There are several technical support phone numbers available for various Seagate products.

Location	Telephone number
United States	Please dial 1-800-SEAGATE for the specific product telephone number. (6:00 A.M. to 11:15 A.M., 12:30 P.M. to 5:00 P.M., Pacific time, M-F)
England	44-1628-894083 (10:00 A.M. to 1:00 P.M., 2:00 P.M. to 5:00 P.M., M-F)
France	33 1-41 86 10 86 (9:30 A.M. to 12:30 P.M., 2:00 P.M. to 5:00 P.M., M-F)
Germany	Disc: 49-89-140-9332; (9:30 A.M. to 12:30 P.M., 2:00 P.M. to 4:00 P.M., M-F) Tape: 49-89-140-9333
Australia	61-2-9725-3366 (9:00 A.M. to 5:00 P.M., M-F)
Singapore	65-290-3998 (9:00 A.M. to 12:00 P.M., 2:00 P.M. to 5:00 P.M., M-F)
Hong Kong	852-2368 9918
Taiwan	886-2-514-2237
Korea	82-2-556-8241

SeaTDD 408-944-9121

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 6:00 A.M. to 11:15 A.M. and 12:30 P.M. to 5:00 P.M. (Pacific time) Monday through Friday.

Customer Service Centers

Seagate direct OEM, Distribution, System Integrator and Retail customers should contact your Seagate Service Representative for warranty information. Other customers contact your place of purchase. Seagate offers comprehensive customer support for all Seagate drives. Seagate customer service centers are the only facilities authorized to service Seagate drives. These services are available worldwide.

Location	Telephone number	FAX number
United States	1-800-468-3472;	405-949-6740
Other Americas (Canada & Brazil)	405-949-6706;	405-949-6738
Mexico	525-546-6965;	525-546-4888
Europe, Middle East & Africa	31-2065-43300;	31-2065-34320
Asia Pacific & Australia	65-485-3595;	65-485-4980
Japan	81-3-5462-2904;	81-3-3462-2979

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