

# Hard Drive: SEAGATE: ST157A-1 45MB 3.5"/HH IDE / AT

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S T 1 5 7 A - 1   SEAGATE
NO MORE PRODUCED

                                     Native| Translation
                                     -----+-----
Form                3.5"/HH           Cylinders   560| 1024| 733|
Capacity form/uniform  45/ 58 MB       Heads        6|  5|  7|
Seek time / track    28.0/ 8.0 ms      Sector/track 26| 17| 17|
Controller           IDE / AT          Precompensation
Cache/Buffer         KB                Landing Zone
Data transfer rate   0.938 MB/S int    Bytes/Sector 512
                   4.000 MB/S ext
Recording method     RLL 2/7           operating | non-operating
                                     -----+-----
Supply voltage       5/12 V           Temperature *C   10 50 | -40 60
Power: sleep         W                Humidity %       8 80 |  5 90
  standby            W                Altitude km      -0.305 3.048| -0.305 9.144
  idle               W                Shock g          10 | 60
  seek               W                Rotation RPM     3600
  read/write         9.0 W             Acoustic dBA     40
  spin-up            W                ECC Bit
                                     MTBF h         150000
                                     Warranty Month
Lift/Lock/Park      YES               Certificates     CSA,FCC,IEC435,TUV,UL478,VDE
    
```

## Layout

SEAGATE ST125A/138A/157A PRODUCT MANUAL 36045-006, REV.F

```

+-----+
|                10-pin version 10--+ |
|                |J2| |
|                6-pin version  6 | |
|                | | |XX 40 PIN
|                +--1 |XX C
|                |XX O
|                |XX N
    
```



	* o o o o
Single drive	X
Dual-drive master	X X
Dual-drive slave	
(Optional) Drive Activity Indicator	X
Reserved position	X X

1-2 and 7-8 reserved positions. Do not use !!!

## J2 Master/Slave configuration

Configure up to drives on a single AT bus (table below).

Drive Type	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

Up to two drives can be daisy-chained (Master/Slave) on the same host bus.

## J2 External LED 10 pin version

pin 9-10 CLOSE External LED option enabled  
 OPEN External LED option disabled

Remote LED: When pins 9 and 10 on the User Configuration jumper block are shorted drive will indicate activity to the system via a connector on the host adapter or motherboard.

## J3 DC Power and pin connector assignments

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+-----+ pin 1 +12 VDC
| 1 2 3 4 | pin 2 +12 Volts Return
+-----+ pin 3 + 5 Volts Return
           pin 4 + 5 VDC

```

# Install

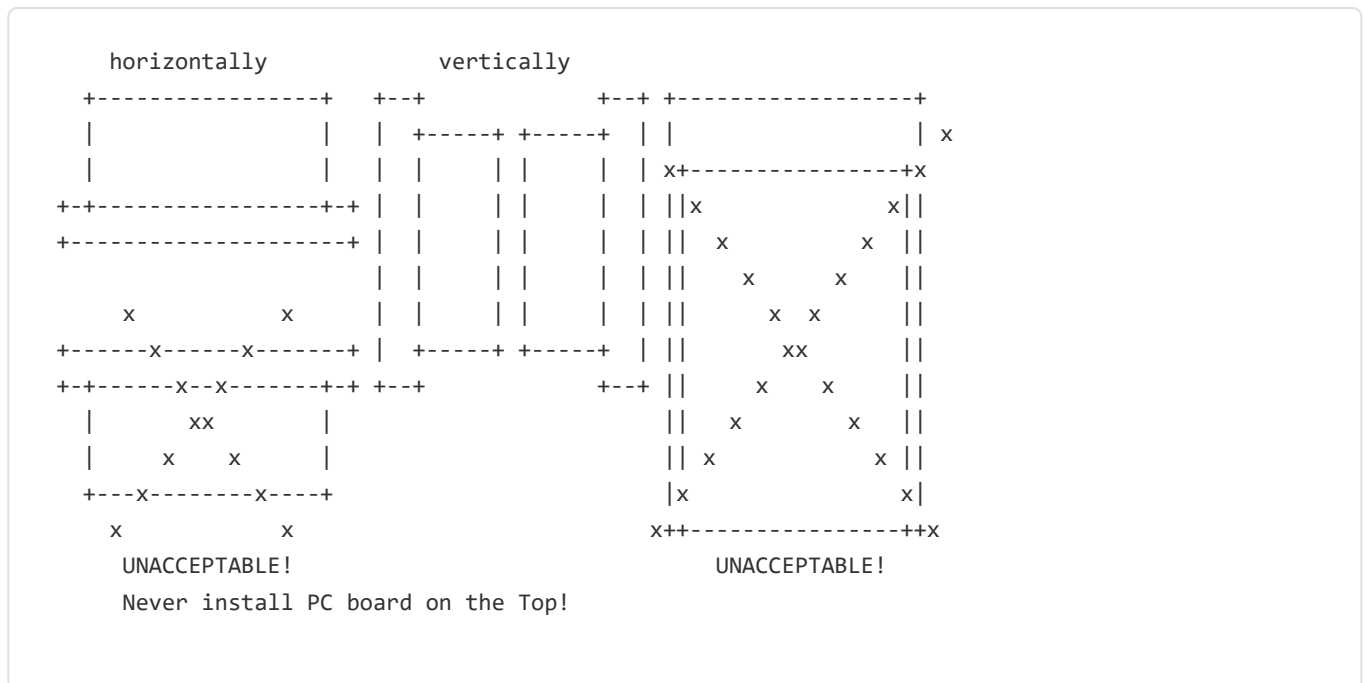
SEAGATE ST125A/138A/157A PRODUCT MANUAL 36110-001/2, REV.C

## Notes on installation

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## Drive mounting

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The drive may be mounted horizontally with the PC board down or on either side. Mounting vertically on either end is a prohibited orientation.

The drive should not be tilted front or back, in any position, by more than 5°. For optimum performance, the drive should be formatted in the same position as it will be mounted in the host system.

## AT Interface Connector Requirements

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The drive connector is a 40-conductor connector with 2-rows of 20 male pins on 100 mil centers.

The mating cable connector is a 40-conductor nonshielded connector with 2-rows of 20 female contacts on 100 mil centers.

## Translation/Native Mode Selection

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The drive(s) will always power-up in their respective default Translation modes.

## Virtual Emulation

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The drive will support any 17-sector-based disc geometry as long as the number of logical heads is 16, the number of logical cylinders is 1,024 and the resulting number of sectors does not exceed the drive's total guaranteed sector count.

### Input Noise

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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 20 resistive load on the +12 V line and an equivalent 8 load on the +5 V line.

## Shock and vibrations

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

## Shipping Zone

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When the read/write heads are positioned in the shipping zone, all portions of the head/slider assembly park inboard of the maximum data cylinder.

The read/write heads automatically move to the shipping zone at power-down.

The read/write heads may be parked by issuing a seek command to any cylinder between 614 and 666.

When power is applied, the heads will recalibrate to Track 0. If the heads are parked while power is applied, any step pulse will cause the unit to recalibrate to Track 0.

## FCC Verification

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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 authorization, verification or certification of the drive is required.

Seagate Technology, Inc. has tested these devices in an enclosure as described above to ensure that the total assembly (enclosure, disk drive, motherboard, power supply, etc.) does comply with the limits for a Class B computing device. Operation with non-certified assemblies is likely to result in interference to radio and television reception.

## DC Power specifications

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Power may be applied or removed in any sequence without loss of data or damage to the drive, except during a write operation. Typical current and power specifications assume nominal voltages applied, 25°C ambient temperature, sea level and spindle rotating.

Voltage tolerance (incl. ripple): 5%

## Handling and Static-Discharge Precautions

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After unpacking, and prior to system integration, the drive may be exposed to potential handling and ESD hazards. It is mandatory that you observe standard static-discharge precautions. A grounded wrist-strap is preferred. Handle the drive by the frame only and always rest the drive on a padded surface until it is mounted in the host system.

## Shipping

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When transporting or shipping a drive, a Seagate-approved container **MUST BE USED**. SHIPPING A DRIVE IN A NON-APPROVED CONTAINER WILL VOID THE DRIVE WARRANTY!

## Supported System BIOS revisions

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The system will report the BIOS type and version number on a cold boot. The ST125A, ST138A and ST157A are AT interface compatible drives. The BIOS manufacturers listed below have indicated that the referenced BIOS revisions are fully compatible with the IBM AT Task

## File Interface specifications.

Earlier BIOS revisions may provide only partial AT support. Compatibility problems may include repeated drive access errors or system timeout errors.

AMI	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	

## CMOS Configuration

Seagate AT interface drives mimic (translate) other drive geometries. If none of the drive types offered by the CMOS supports the numbers of heads, cylinders and sectors shown by the table, and your system does not support a "user defined" drive type, then select a drive type in your systems CMOS with a capacity which is less than or equal to the capacity of the drive.

When specifying drive geometry to the system CMOS, different values may be used for the cylinders, read/write heads and sectors/track than those given below. However, the final drive capacity shown by the CMOS cannot exceed the capacity of the drive.

After the drive has been properly configured for the system, and the correct drive type has been specified to the system CMOS, the drive should be low-level formatted.

## Low Level Formatting

Seagate AT Interface drives are low-level formatted at the factory and do not require low-level formatting!

## Partitioning

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A drive can be subdivided into "partitions", which behave as individual drives within the system. Earlier versions of DOS have a limitation on maximum drive capacity and consequently require high capacity drives to be divided into smaller partitions. For DOS users, each partition will be assigned a different letter, i.e., C: and D: for a drive with two partitions.

Drive partitioning in DOS is done by using the FDISK utility. After the drive has been configured, defined in CMOS and low-level formatted (if necessary), the user must boot the system to the floppy drive with a bootable DOS diskette. The user must then run the FDISK utility to partition the drive. Refer to your DOS manual for instruction on using FDISK.

Many UNIX based operating systems allow partitioning of the drive for use by DOS applications. In UNIX, drive formatting and partitioning are both done by a single operating system utility. Refer to your system documentation for instructions.

## High level formatting

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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 in DOS creates the File Allocation Table used by DOS for all drive access. The high-level format is initiated in DOS by the FORMAT command.

High-level formatting in UNIX creates the I-NODE used by the system for file access information. In UNIX, drive formatting and partitioning are both done by a single operating system utility.

# Features

SEAGATE ST125A/138A/157A PRODUCT MANUAL 36045-006, REV.F

## Media Defects

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A media defect is a read error when the data, which has been correctly written, cannot be recovered within 16 retries.

A label is fixed to the drive listing the location of any media defects by cylinder, head and bytes from index. For MFM encoding, this is based on 1.6 sec./byte. AT interfaces drives have the controller onboard. This allows bad sectors to be mapped out; thereby



transparent to the user. Seagate specifies gurabteed megabytes for ST157 family AT interface drives.

## AT Interface

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 This drive family uses the industry-standard IBM AT task file interface. It support both 8 and 16-bit data transfer and has no DMA capability.

All data transfers are done via programmed I/O.

### AT Interface Connector Pin Assignments

pin	signal	I/O	pin	signal	I/O
01	/Host Reset	0	21	Reserved	0
02	Ground		22	Ground	
03	Host Data 7	I/O	23	/HIOW	0
04	Host Data 8	I/O	24	Ground	
05	Host Data 6	I/O	25	/HIOR	0
06	Host Data 9	I/O	26	Ground	
07	Host Data 5	I/O	27	Reserved	
08	Host Data 10	I/O	28	Host ALE	0
09	Host Data 4	I/O	29	Reserved	
10	Host Data 11	I/O	30	Ground	
11	Host Data 3	I/O	31	IRQ14	I
12	Host Data 12	I/O	32	Host IO16	I
13	Host Data 2	I/O	33	Host ADDR 1	0
14	Host Data 13	I/O	34	/PDIAG	Notes
15	Host Data 1	I/O	35	Host ADDR 0	0
16	Host Data 14	I/O	36	Host ADDR 2	0
17	Host Data 0	I/O	37	/Host CS0	0
18	Host Data 15	I/O	38	/Host CS1	0
19	Ground		39	/Host SLV/ACT	Notes
20	Key		40	Ground	

#### Notes:

- \* /Indicates active low signal
- \* Direction is with respect to the host
- \* I indicates to the host, 0 indicates from the host
- \* Reserved pins/ground do not have direction
- \* /PDIAG and HOST/SLAVE are used for communication between Master and Slave drive
- \* Pin-1 is referenced in LAYOUT. It may also be located by the square solder pad on the PC board.

### AT Bus Signal Levels

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Signal driven by the drive must have the following output characteristics at the drive connector:

Logic Low: 0 to 0.4 VDC  
Logic High: 2.5 to 5.25 VDC

Signal received by the drive must have the following input characteristics, measured at the drive connector:

Logic Low: 0 to 0.8 VDC  
Logic High: 2.0 to 5.25 VDC

### Seek Time Definition and Timing

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Seek time is a true statistical average (at least 5,000 measurements) of the time to execute the seek, less overhead.

All measurements assume a block size of 512 bytes, nominal voltages, 25°C ambient temperature and sea level.

Track-to-track seek time is the average of all possible single-track seeks in both directions. Average seek time is measured by executing seek in both directions between random cylinders or Logical Block Addresses (LBA). Full-stroke seek time is one-half the time needed to seek from LBA zero to the maximum LBA and back to LBA zero.

		ST1**A
-----+-----+		
Track-to-Track	msec. typ.	8
	msec. max	10
Average	msec. typ.	28
	msec. max.	30
Full-Stroke	msec. typ.	70
	msec. max.	75
Latency	msec. avg.	8.33
-----+-----+		

### DC Power Specifications

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

### Bit Jitter

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Bit jitter reduction determines the relationship between the leading edge of read data and the center of the data window.

The specified read error rates are based on the following bit jitter

specifications: 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

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The St157 drive family is listed in accordance with UL 478 and CSA C22.2 (0-M1982), and meets all applicable sections of IEC 380 and VDE 0806/08.81, as tested by TUV-Rheinland, North America.

## General

### 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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