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***Barracuda 9LP FC***

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***Fibre Channel***

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***Disc Drive***

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***ST39173FC***

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***Installation Guide***

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## Preface

This manual contains information for users of Seagate Barracuda 9LP FC (Fibre Channel interface) disc drives. It provides technical support information, performance specifications, installation instructions, and a troubleshooting section. Additional information is available in the Barracuda 9LP FC Product Manual (part number 77767522). Contact your Seagate sales representative if you need to order this publication.

## Electrostatic discharge protection

**Caution.** Removal of circuit boards by personnel not performing depot repair will damage components and may void the warranty.

All drive electronic assemblies are sensitive to static electricity, due to the electrostatically sensitive devices used within the drive circuitry. Although some devices such as metal-oxide semiconductors are extremely sensitive, all semiconductors, as well as some resistors and capacitors, may be damaged or degraded by exposure to static electricity.

Electrostatic damage to electronic devices may be caused by the direct discharge of a charged conductor or by exposure to the static fields surrounding charged objects. To avoid damaging drive electronic assemblies, observe the following precautions when installing or servicing the drive:

- Ground yourself to the drive whenever the drive electronics are or will be exposed. Connect yourself to ground with a wrist strap (Seagate part number 12263496). Connection may be made to any grounded metal assembly. As a general rule, remember that you and the drive electronics must all be

grounded to avoid potentially damaging static discharges.

- Do not remove any circuit boards from the drive.
- Never use an ohmmeter on any circuit boards.
- When installing the drive on a carrier or tray, discharge the static electricity from the carrier or tray prior to inserting it into the system.

## **Important safety information and precautions**

**Caution.** Use forced-air ventilation when bench-testing the drive to ensure proper cooling of drive components.

Use proper safety techniques for safe, reliable operation of this unit.

The procedures in this manual and labels on the unit contain warnings and cautions that must be carefully read and followed to minimize or eliminate the risk of personal injury. The warnings point out conditions or practices that may endanger you or others. The cautions point out conditions or practices that may damage the unit, possibly making it unsafe for use.

Always observe the following warnings and precautions:

- Follow all cautions and warnings in the procedures.
- Use sound safety practices when operating, installing, or removing the unit.
- Use caution when troubleshooting a unit that has voltages present. Turn off power to the unit before removing it.
- Ensure that the internal temperature of the rack or cabinet does not exceed the limits defined for the drive when the drive is mounted in an equipment rack or cabinet. When units are stacked vertically, pay special attention to the top where temperatures are usually highest.

- Follow the precautions listed above in “Electrostatic discharge protection.”
- Do not remove any circuit boards from the drive chassis. Return the entire drive for depot repair if any circuit board is defective. Removal of circuit boards by personnel not performing depot repair will damage components and may void the warranty.
- Do not remove the head and disc assembly (HDA) from the drive. Return the entire drive for depot repair if the HDA is defective.
- Do not attempt to disassemble the HDA. It is not field repairable. If the sealed HDA is opened by personnel not performing depot repair, this will damage components and void the warranty.

As a component, the drive is designed to be installed and operated in accordance with UL1950, EN60950, CAN\CSA C22.2 950-95, VDE0805 and IEC950.

Seagate takes all reasonable steps to ensure that its products are certifiable to currently accepted standards. Typical applications of these disc drives include customer packaging and subsystem design. Safety agencies conditionally certify component assemblies, such as the Barracuda disc drive, based on their final acceptability in the end-use product. The subsystem designers are responsible for meeting these conditions of acceptability in obtaining safety-regulatory agency compliance in their end-use products and for certifying where required by law. A necessary part of meeting safety requirements is the provision for overcurrent protection on drive SELV supply voltages.

This unit is a component part and as such is not meant to comply with FCC or similar national requirements as a stand-alone unit. Engineering radiated emissions test results are available through the Seagate Safety Department to assist the subsystem designer.

## **Wichtige Sicherheitshinweise**

**Vorsicht.** Beim Testen des Laufwerks auf dem Prüftisch ist Fremdbelüftung vorzusehen, um eine ausreichende Kühlung der Laufwerkkomponenten sicherzustellen.

Verwenden Sie geeignete Sicherheits- um den sicheren, zuverlässigen Betrieb dieser Einheit zu gewährleisten.

Die Verfahren in diesem Handbuch und die Aufkleber auf dem Gerät enthalten Warn- und Vorsichtshinweise. Diese Hinweise sind sorgfältig durchzulesen und zu beachten, um das Risiko von Verletzungen auf ein Mindestmaß zu beschränken oder ganz zu vermeiden. Die Warnhinweise machen auf Situationen oder Praktiken aufmerksam, die Sie oder andere gefährden könnten. Die Vorsichtshinweise machen auf Situationen oder Praktiken aufmerksam, die die Einheit beschädigen können, so daß deren Gebrauch mit Risiko behaftet ist.

Die Warn- und Vorsichtshinweise sind nicht allumfassend! Es ist uns einfach nicht möglich, alle Wartungsmethoden oder die eventuellen Risiken jeder Methode zu kennen, zu beurteilen und Sie entsprechend zu beraten. Aus diesem Grund haben wir auf eine derartige umfassende Beurteilung verzichtet. Falls Sie ein hier nicht beschriebenes Verfahren oder Werkzeug verwenden, stellen Sie zuerst sicher, daß das gewählte Verfahren weder Ihre persönliche Sicherheit noch die Leistung der Einheit gefährdet.

Beachten Sie in jedem Fall die folgenden Warn- und Vorsichtshinweise:

- Beachten Sie alle Warn- und Vorsichtshinweise in diesem Handbuch.
- Treffen Sie beim Betrieb, bei der Installation oder bei der Entfernung der Einheit angemessene Sicherheitsvorkehrungen.
- Wenn eine Einheit unter Spannung steht, gehen Sie bei der Fehlerdiagnose besonders vorsichtig vor. Schalten Sie die Einheit aus, bevor Sie mit den Installations- und Entfernungsarbeiten beginnen.
- Wenn das Laufwerk in einem Einbaugestell oder Gehäuse montiert ist, sorgen Sie dafür, daß die Temperatur im Inneren des Gestells oder Gehäuses die für das Laufwerk vorgegebenen Grenzwerte nicht übersteigt. Wenn Einheiten vertikal übereinander betestigt werden, achten Sie besonders auf den oberen Stapelbereich, da dort die Temperatur gewöhnlich am höchsten ist.
- Befolgen Sie die oben unter "Electrostatic Discharge Protection" angegebenen Sicherheitsmaßnahmen.
- Nehmen Sie keine Platinen aus dem Laufwerk. Wenn eine Platine defekt ist, muß das gesamte Laufwerk zur Reparatur eingeschickt werden. Die Herausnahme von Platinen durch andere Personen als die für die werkseitige Reparatur zuständigen kann zu einer Beschädigung der Komponenten und Erlöschen des Garantieanspruchs führen.
- Die vormontierte Kopf- und Festplatteneinheit (HDA) nicht aus dem Laufwerk nehmen! Falls die HDA beschädigt ist, schicken Sie das gesamte Laufwerk zur Reparatur ein.

- Die HDA ist nicht vor Ort reparierbar und darf nicht auseinandergenommen werden! Öffnen der versiegelten HDA durch andere Personen als die für die werkseitige Reparatur zuständigen hat eine Beschädigung der Komponenten und Erlöschen des Garantieanspruchs zur Folge.

Als Teilkomponente ist dieses Laufwerk für die Installation und den Betrieb in Übereinstimmung mit UL 1950, EN60950, CAN\CSA C22.2 950-95 und VDE0805 vorgesehen.

Seagate ist ständig bemüht, die Zulassungsfähigkeit von Seagate-Produkten im Rahmen der gegenwärtig geltenden Standards zu gewährleisten. Zu den typischen Anwendungen dieser Festplattenwerke zählen Systemeinstbau durch den Kunden und die Konstruktion von Untersystemen. Sicherheitsbehörden gewähren eine bedingte Zulassung für Komponenten wie das Barracuda-Festplattenlaufwerk vorbehaltlich der endgültigen Zulassung im Endprodukt. Designer von Untersystemen sind dafür verantwortlich, die Voraussetzungen für die Einhaltung sicherheits- oder aufsichtsbehördlicher Vorschriften in ihren Endprodukten und - falls gesetzlich vorgeschrieben - für die Zulassung zu schaffen. Eine Grundvoraussetzung zur Einhaltung der Sicherheitsanforderungen ist die Bereitstellung eines Überlastschutzes für die SELV-Versorgungsspannungen des Laufwerks.

Dieses Gerät ist eine Baugruppe und unterliegt als solche nicht den Anforderungen der FCC oder ähnlicher nationaler Behörden für eigenständige Geräte. Technische Testergebnisse zu elektromagnetische Strahlung sind für Designer von Untersystemen auf Anfrage von der Seagate-Sicherheitsabteilung erhältlich.



## **European Union Compliance**

If this model has the CE Marking, it complies with the European Union requirements of the Electromagnetic Compatibility Directive 89/336/EEC of 03 May 1989 as amended by Directive 92/31/EEC of 28 April 1992 and Directive 93/68/EEC of 22 July 1993.

## **Australian C-Tick**

If this model has the C-Tick Marking, it complies with the Australia/New Zealand Standard AS/NZS3548 1995 and meets the Electromagnetic Compatibility (EMC) Framework requirements of Australia's Spectrum Management Agency (SMA).

Seagate uses an independent laboratory to confirm compliance to the above directives. The drive was tested in a representative system for typical applications. The selected system represents the most popular characteristics for test platforms. The system configurations include:

- 486, Pentium, and PowerPC Microprocessors
- 3.5-inch Floppy Disc Drive
- Keyboard
- Monitor/Display
- Mouse
- Printer

Although the test system with this Seagate model complies to the directives, we cannot guarantee that all systems will comply. The computer manufacturer or system integrator shall confirm EMC compliance and provide CE Marking for their product.

## Seagate Technology support services

### Presales support

To determine which Seagate products are best suited for your specific application, contact us about configuration and compatibility and for current product availability. You can leave a voice message after business hours or send an e-mail message—we reply during business hours.

**Disc Drives** 1-877-271-3285 or 405-936-1210

**Fax: 405-936-1683** (8:00 A.M. to 12:15 P.M., 1:30 P.M. to 6:00 P.M., central time, M-F); e-mail: DiscPresales@Seagate.com

**Tape Products** 1-800-626-6637 or 714-641-2500

**Fax: 714-641-2410** (6:00 A.M. to 5:00 P.M., pacific time, M-F); e-mail: Tape\_Sales\_Support@Seagate.com

**Note.** You can purchase select tape products and tape accessories through Seagate Express 24 hours daily by calling 1-800-531-0968 or by faxing your order to 972-481-4812.

### 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® drive or other Seagate products, use one of the Seagate technical support services listed below.

**SeaFONE® 1-800-SEAGATE**

Seagate's 800 number (1-800-732-4283) 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. International callers can reach this automated self-help service by dialing 405-936-1234.

## 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 about Seagate products 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 can also send e-mail with your questions to [DiscSupport@Seagate.com](mailto:DiscSupport@Seagate.com) or [TapeSupport@Seagate.com](mailto:TapeSupport@Seagate.com).

### ***SeaBOARD®***

SeaBOARD is a computer bulletin board system that contains information about Seagate 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).

| <b>Location</b> | <b>Phone number</b> |
|-----------------|---------------------|
| Australia       | 61-2-9756-2359      |
| France          | 33 1-48 25 35 95    |
| Germany         | 49-89-1409331       |
| Taiwan          | 886-2-2719-6075     |
| Thailand        | 662-531-8111        |

| <b>Location</b> | <b>Phone number</b>                    |
|-----------------|--|
| UK              | 44-1628-478011                         |
| USA             | Disc: 405-936-1600; Tape: 405-936-1630 |

## **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.

| <b>Location</b> | <b>Phone number</b>  |
|-----------------|--|
| Australia       | 61-2-9756-5170   |
| Germany         | 49-89-14305102   |
| UK              | 44-1628-894084   |
| USA             | 1-800-SEAGATE or<br>Disc: 405-936-1620; Tape: 405-936-1640 |

### ***Technical support FAX***

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

| <b>Location</b> | <b>Phone number</b> |
|-----------------|---------------------|
| Australia       | 61-2-9725-4052      |
| France          | 33 1-46 04 42 50    |
| Germany         | 49-89-14305100      |
| Hong Kong       | 852-2368 7173       |
| Japan           | 81-3-5462-2979      |
| Korea           | 82-2-556-4251/7395  |
| Singapore       | 65-488-7528         |
| Taiwan          | 886-2-2715-2923     |

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| <b>Location</b> | <b>Phone number</b>                    |
|-----------------|--|
| UK              | 44-1628-890660                         |
| USA             | Disc: 405-936-1685; Tape: 405-936-1683 |

## **Direct-support services**

### ***Technical support***

For one-on-one help, you can talk to a technical support specialist during local business hours. Before calling, note your system configuration and drive model number (STxxxx).

| <b>Location</b> | <b>Phone number</b>   |
|-----------------|---|
| Australia       | 61-2-9725-3366 (9:00 A.M. to 5:00 P.M., eastern time, 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         | 49-89-1409332 (9:30 A.M. to 12:30 P.M., 2:00 P.M. to 4:00 P.M., M–F)  |
| Hong Kong       | 852-2368 9918 (9:00 A.M. to 12:00 P.M., 2:00 P.M. to 5:30 P.M., M–F)  |
| Korea           | 82-2-531-5800 (9:00 A.M. to 12:00 P.M., 1:00 P.M. to 6:00 P.M., M–F)  |
| Singapore       | 65-488-7584 (9:00 A.M. to 12:00 P.M., 2:00 P.M. to 5:00 P.M., M–F)  |
| Taiwan          | 886-2-2514-2237   |
| UK              | 44-1628-894083 (10:00 A.M. to 1:00 P.M., 2:00 P.M. to 5:00 P.M., M–F)   |
| USA             | Please dial 1-800-SEAGATE or 405-936-1234 for the specific product telephone number. (8:00 A.M. to 12:15 P.M., 1:30 P.M. to 6:00 P.M., central time, M–F) |

**SeaTDD™ 405-936-1687**

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. to 12:15 P.M. and 1:30 P.M. to 6:00 P.M. (central time) Monday through Friday.

**Customer service centers**

Seagate direct OEM, Distribution, and Systems Integrator customers should contact their Seagate service representative for warranty information. Other customers should contact their place of purchase. Seagate offers comprehensive customer support for all Seagate drives. These services are available worldwide.

| <b>Location</b>            | <b>Phone number</b> | <b>FAX number</b> |
|----------------------------|---------------------|-------------------|
| Asia Pacific and Australia | 65-485-3595         | 65-488-7503       |
| Middle East and Africa     | 31-2031-67222       | 31-2065-34320     |
| Europe                     | 31-2031-67222       | 31-2065-34320     |

*European toll-free phone numbers are available for you to contact customer service representatives between 8:30 A.M. and 5:00 P.M. (European central time) Monday through Friday. The European call center is located in Amsterdam, The Netherlands.*

| <b>Location</b> | <b>Toll-free phone number</b> |
|-----------------|-------------------------------|
| Austria         | 0 800-20 12 90                |
| Belgium         | 0 800-74 876                  |
| Denmark         | 80 88 12 66                   |
| France          | 0 800-90 90 52                |
| Germany         | 0 800-182 6831                |
| Ireland         | 1 800-55 21 22                |
| Italy           | 1 677 90 695                  |
| Netherlands     | 0 800-732 4283                |

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| <b>Location</b> | <b>Toll-free phone number</b> |  |
|-----------------|-------------------------------|--|
| Norway          | 800-113 91                    |  |
| Poland          | 00 800-311 12 38              |  |
| Spain           | 900-98 31 24                  |  |
| Sweden          | 0 207 90 073                  |  |
| Switzerland     | 0 800-83 84 11                |  |
| Turkey          | 00 800-31 92 91 40            |  |
| United Kingdom  | 0 800-783 5177                |  |

| <b>Location</b>                            | <b>Phone number</b> | <b>FAX number</b> |
|--|---------------------|-------------------|
| Japan                                      | 81-3-5462-2904      | 81-3-5462-2979    |
| USA  | 1-800-468-3472      | 405-949-6740      |
| Other Americas (Brazil,<br>Canada, Mexico) | 405-949-6706        | 405-949-6738      |

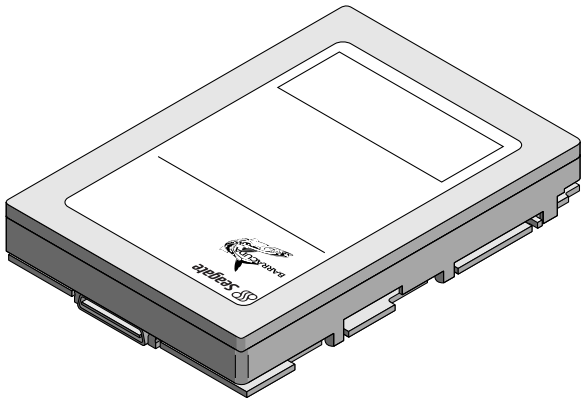
*Manufacturer's representatives*

|                           |                |                |
|---------------------------|----------------|----------------|
| Brazil                    |                |                |
| MA Informatica            | 55-21-516-6649 | 55-21-516-5280 |
| Canada                    |                |                |
| Memofix                   | 905-660-4936   | 905-660-4951   |
| Adtech                    | 905-812-8099   | 905-812-7807   |
|                           | 1-800-624-9857 |                |
| Mexico                    |                |                |
| Abicom Seamax<br>SA DE CV | 525-546-4888   | 525-546-4888   |
| Southern Europe           |                |                |
| Caesar Italia             | 39-688-18149   | 39-688-02103   |

## General description

Barracuda 9LP FC disc drives are high-speed, random-access digital-data storage devices designed to be used within a Fibre Channel host system.

The drive is a component for installation in an enclosure designed for the drive. The disc drive must receive adequate cooling (refer to “Providing adequate cooling”) and it must be sufficiently grounded and shielded from emissions. The Barracuda 9LP FC Product Manual (part number 77767522) contains guidelines for a properly designed enclosure.



**Figure 1:** Barracuda 9LP FC disc drive



| <b>Characteristics</b>                          | <b>ST39173FC</b> |
|---|------------------|
| Interface                                       | Fibre Channel    |
| Capacity  |                  |
| Unformatted (Gbytes)                            | 11.57            |
| Formatted (Gbytes) <sup>1</sup>                 | 9.10             |
| Recording                                       |                  |
| Cylinders (user)                                | 7,501            |
| Read/write data heads                           | 10               |
| Avg bytes/track                                 | 155,000          |
| Access time                                     |                  |
| Average read (msec)                             | 7.4              |
| Average write (msec)                            | 8.2              |
| Disc rotation                                   |                  |
| RPM   | 7,200            |
| Average latency (msec)                          | 4.17             |
| Data transfer rate                              |                  |
| Maximum instantaneous<br>(Mbytes/sec, per port) | 106              |

1. The specified formatted capacities are calculated with the standard OEM sector size (512 bytes per logical block) and sparing.

### **ST39173FC**

| <b>DC power requirements(±5%)<sup>1</sup></b> | <b>+5 V</b> | <b>+12 V</b> |
|---|-------------|--------------|
| Maximum start current                         | 1.70A       | 2.2A         |
| Maximum operating current                     | 1.70A       | 0.85A        |
| Average idle current                          | 1.50A       | 0.45A        |

1. For more detailed power information, refer to the Barracuda 9LP FC Product Manual, publication number 77767522.

## **Installing the Barracuda 9LP FC drive**

To install a Barracuda 9LP FC drive, simply plug the drive directly into your system's Fibre Channel backpanel 40-pin single connector attachment (FC-SCA). There are no jumpers or terminators on the drive, and power is supplied through the connector. Table 1 on page 25 lists the pin descriptions of the 40-pin FC-SCA.

Read the following general information topics to ensure your drive is installed properly:

- Providing adequate cooling
- Mounting the drive
- Formatting the drive

### **Providing adequate cooling**

The enclosure design must ensure adequate cooling for the drive. The maximum ambient temperature is 50°C (30°C for the rated MTBF). Refer to Figure 2 on page 18 for an illustration showing suggested air flow patterns.

The drive's product manual (77767522) describes how to evaluate the air-flow design. The evaluation consists of ensuring that the case temperatures of certain critical components remain within acceptable limits during drive operation.

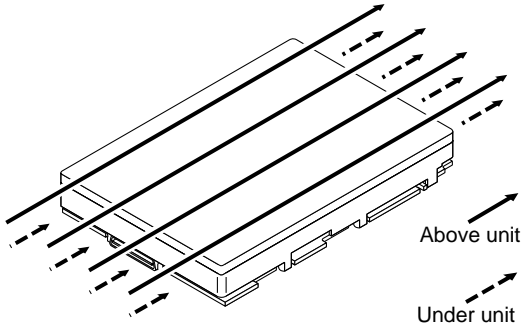
We recommend orienting the drive or directing the air flow in a way that creates the least amount of air-flow resistance while providing air flow above the circuit boards and around the head and disc assembly (HDA). Also, choose the shortest possible path between the air inlet and exit. This minimizes the distance traveled by air that is heated by the drive and by other nearby heat sources.

Figure 2 shows one design approach with one or more fans used to generate air flow. The air-flow pattern can be created by the fans either pushing or drawing air. The overall flow pattern must be directed from side to side in most FC-SCA systems.

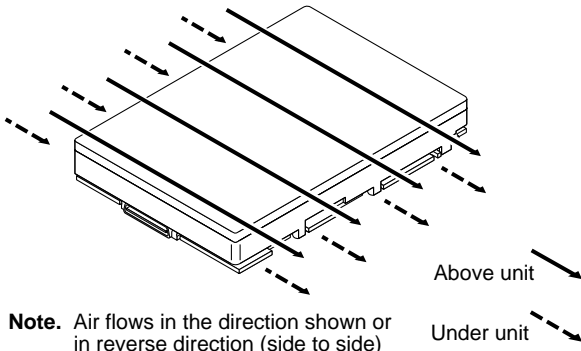
## **Kühlung des Systems**

Die Gehäusekonstruktion muß eine ausreichende Kühlung des Laufwerkes gewährleisten. Die Umgebungstemperatur darf maximal 50°C betragen (30°C für der MTBF).

Die Produkthandbuch Barracuda 9LP FC (Dokument 77767522) enthalten Anweisungen zur Beurteilung der Luftstromkonstruktion. Die Beurteilung muß sicherstellen, daß sich die Gehäusetemperatur bestimmter kritischer Komponenten bei Laufwerkbetrieb innerhalb zugelassener Grenzen hält. Wir empfehlen, das Laufwerk so zu orientieren oder den Luftstrom so zu lenken, daß der geringste Luftstromwiderstand von vorne nach hinten oder von hinten nach vorne verlaufen.



**Note.** Air flows in the direction shown (front to back) or in reverse direction (back to front)



**Note.** Air flows in the direction shown or in reverse direction (side to side)

**Figure 2: Suggested air flow**

**Abbildung 2. Empfohlener Luftstromverlauf**

## Mounting the drive

Do not touch the connector pins or any components on the control board without observing static-discharge precautions. Always handle the drive by the frame only.

You may mount the drive in any orientation (horizontally, vertically, or any combination thereof); however, you must ensure that the drive receives adequate air flow for cooling.

Mount the drive to the host system's chassis using four 6-32 UNC screws. Two mounting holes are in each side of the drive and there are four mounting holes in the bottom of the drive. See Figure 3.

The maximum length that the screws should extend into the chassis mounting holes is 0.15 inch (3.81 mm), measured from the outer surface of the chassis. Tighten the screws down evenly. Do not over-tighten or force the screw if it does not seem to screw in easily.

## Installation des Laufwerkes

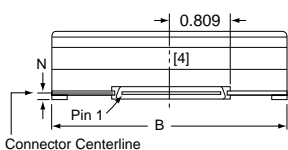
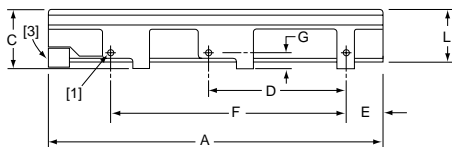
Beachten Sie beim Handhaben und Anfassen der Anschlußstifte und Komponenten die Vorsichtsmaßnahmen zur Verhinderung statischer Aufladung. Fassen Sie das Laufwerk nur am Rahmen an.

Das Laufwerk kann in beliebiger Orientierung (horizontal, vertikal oder schräg) installiert werden; jedoch muß dafür gesorgt werden, daß ein ausreichender Luftstrom zur Kühlung des Laufwerkes vorhanden ist.

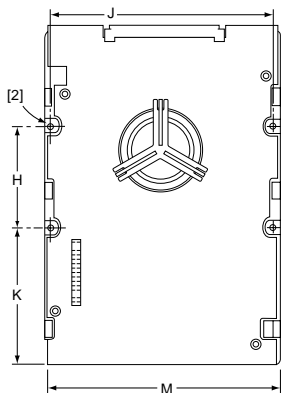
Befestigen Sie das Laufwerk mit vier 6-32-UNC-Schrauben am Gehäuse des Host-Systems. Die beiden Seiten des Laufwerkes sind mit jeweils zwei Befestigungslöcher versehen, die

Unterseite des Laufwerkes weist vier weitere Befestigungslöcher auf. Siehe Abbildung 3.

Gemessen von der Außenfläche des Gehäuses dürfen die Schrauben maximal 3,81 mm in die Befestigungslöcher des Gehäuses hineinragen. Die Schrauben müssen gleichmäßig, jedoch nicht zu fest, angezogen werden. Wenn sich eine Schraube nicht ohne Widerstand einschrauben lässt, sind die Gewinde nicht korrekt aneinander ausgerichtet.



Connector Centerline

**Notes:**

- [1] Mounting holes three on each side, 6-32 UNC. Max screw length into side of drive 0.15 in. (3.81 mm). Screw tightening torque 6.0 in-lb (.675 NM) max with minimum thread engagement of 0.12 in. (3.05 mm).
- [2] Mounting holes four on bottom, 6-32 UNC. Max screw length into bottom of drive 0.20 in. (5.08 mm). Screw tightening torque 6.0 in-lb (.675 NM) max with minimum thread engagement of 0.12 in. (3.05 mm).
- [3] Interface connector can extend past the "A" dimension by 0.040 in. (1.02 mm).
- [4] Connector is centered (side to side) on drive within  $\pm 0.020$  in. (.508 mm).

**Dimension Table**

|   | Inches           | Millimeters      |
|---|------------------|------------------|
| A | 5.74 $\pm$ .010  | 145.80 $\pm$ .25 |
| B | 4.00 $\pm$ .010  | 101.60 $\pm$ .25 |
| C | 1.00 + .021      | 25.40 + .53      |
|   | -.010            | -.25             |
| D | 2.362 $\pm$ .010 | 60.00 $\pm$ .25  |
| E | .620 $\pm$ .020  | 15.75 $\pm$ .50  |
| F | 4.000 $\pm$ .010 | 101.60 $\pm$ .25 |
| G | .250 + .010      | 6.35 + .25       |
|   | -.005            | -.12             |
| H | 1.750 $\pm$ .010 | 44.45 $\pm$ .25  |
| J | 3.750 $\pm$ .010 | 95.25 $\pm$ .25  |
| K | 2.370 $\pm$ .020 | 60.20 $\pm$ .50  |
| L | 1.00 $\pm$ .010  | 25.4 $\pm$ .25   |
| M | 4.000 $\pm$ .010 | 101.6 $\pm$ .25  |
| N | 0.181 + .018     | 4.597 + .45      |
|   | -.013            | -.33             |

**Figure 3: Dimensions****Abbildung 3: Laufwerkabmessungen**

## Inserting the drive

Most systems provide a way to insert the drive using a carrier or tray which allows the drive to be hot-plugged into the system's Fibre Channel 40-pin single connector attachment (FC-SCA). Refer to your system documentation about the method they provide and follow their instructions.

When installing the drive on a carrier or tray, discharge the static electricity from the carrier or tray prior to inserting it into the system.

## Formatting the drive

**Warning.** Formatting a drive erases all user data. Be sure that you understand this principle before formatting any hard disc drive (it is not necessary to format a drive which has previously been used to store data unless you intend to erase all user data).

**Note.** Seagate is not responsible for lost user data.

1. Supply DC power to the drive (power is supplied to the drive through the 40-pin FC-SCA).
2. Format the disc drive. This drive is designed to operate with a variety of operating systems. Refer to your system and Fibre Channel controller manual for information about selecting and formatting the drive.



## Enabling write cache

Write caching is a feature that allows the drive to transfer write data to its own cache, tell the controller that the task is complete, and then actually complete the write at a later time. This improves write performance by freeing the CPU to go on to its next command.

**Warning.** Information can be lost if you enable write cache and there is a system failure (for example, power failure) before the data has actually been physically written to the disc.

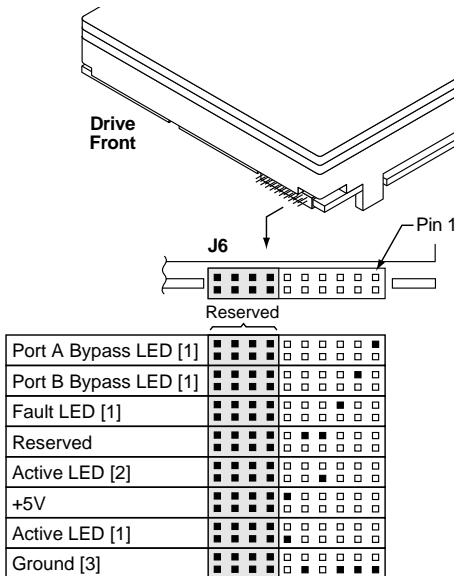
OEM drives are shipped with write cache disabled by default to enhance data integrity. If you want to enable the write cache, refer to your system's drive controller and software utility documentation. Seagate provides an ASPI utility that you can use in a PC compatible system to enable the write cache. It is available on Seagate's CompuServe forum and on the Seagate BBS (refer to "Seagate Technology support services" on page 8).

## Connecting remote LEDs

You can connect remote LEDs using J6 (see Figure 4).

Connect the anode (usually the longer LED connector) to the +5V pin, and the cathode to the appropriate LED output pin. For example, if you want to attach an LED which indicates drive activity, connect the LED's anode connector to J6 pin 11 and the cathode to J6 pin 12 or connect to J6 pin 8 through an appropriate external current-limiting resistor.

**Note.** The LED is on when the drive is idle and off when the drive is processing commands.



- [1] The drive has a 2.2K ohm resistor in series with this LED driver. Tie the minus side of an external high-efficiency LED (i.e., 2ma) to this pin. Connect the plus side of the LED to +5V.
- [2] An external current-limiting resistor is required when connecting an LED to this pin. Connect the minus side of the resistor/LED combination to this pin. Connect the plus side to +5V. This pin is connected in parallel with the signal of the same name in the interface connector (J1).
- [3] Jumper storage location (across pins 2 and 4).

**Figure 4: LED indicator connector (J6)**

**Table 1: FC-SCA pin descriptions**

| Pin/contact | Signal name           | Signal type           |
|-------------|-----------------------|-----------------------|
| 1*          | –EN bypass port A     | TTL output            |
| 2*          | 12 Volts              |                       |
| 3*          | 12 Volts              |                       |
| 4*          | 12 Volts              |                       |
| 5*          | –Parallel ESI         |                       |
| 6*          | Ground <sup>[1]</sup> |                       |
| 7*          | Active LED out        | Open collector out    |
| 8*          | Reserved              |                       |
| 9*          | Start_1               | TTL input             |
| 10*         | Start_2               | TTL input             |
| 11*         | –EN bypass port B     | TTL output            |
| 12*         | SEL_6                 | TTL input/output      |
| 13*         | SEL_5                 | TTL input/output      |
| 14*         | SEL_4                 | TTL input/output      |
| 15*         | SEL_3                 | TTL input/output      |
| 16*         | Fault LED out         | Open collector out    |
| 17*         | Reserved NC           |                       |
| 18*         | Reserved NC           |                       |
| 19*         | 5 Volts               |                       |
| 20*         | 5 Volts               |                       |
| 21          | 12 Volts charge       |                       |
| 22          | Ground                |                       |
| 23          | Ground                |                       |
| 24*         | +Port A_in            | Diff. PECL input pair |
| 25*         | –Port A_in            |                       |

| <b>Pin/contact</b> | <b>Signal name</b> | <b>Signal type</b>     |
|--------------------|--------------------|------------------------|
| 26                 | Ground             |                        |
| 27*                | +Port B_in         | Diff. PECL input pair  |
| 28*                | –Port B_in         |                        |
| 29                 | Ground             |                        |
| 30*                | +Port A_out        | Diff. PECL output pair |
| 31*                | –Port A_out        |                        |
| 32                 | Ground             |                        |
| 33*                | +Port B_out        | Diff. PECL output pair |
| 34*                | –Port B_out        |                        |
| 35                 | Ground             |                        |
| 36                 | SEL_2              | TTL input/output       |
| 37                 | SEL_1              | TTL input/output       |
| 38                 | SEL_0              | TTL input/output       |
| 39                 | Reserved NC        |                        |
| 40                 | 5 Volts charge     |                        |

\*Short pins in mating backpanel connector.

- [1] This pin may be connected to external logic to detect the presence of the drive. The drive connects this pin to the common ground.

## Troubleshooting

Before calling Seagate Technical Support, please read the possibilities discussed below. The suggestions presented here will resolve the majority of installation problems.

### General installation troubleshooting

- **Check system compatibility.** This is a Fibre Channel (FC) device. Check your system documentation to ensure that it supports FC devices.
- **Check the physical attachment.** Ensure that the drive is properly mated with the backpanel Fibre Channel single connector attachment (FC-SCA).
- **Check to ensure that drive is receiving power.** Insert the drive into your system. Listen carefully for the sound of the drive motor spinning up. If the drive motor does not spin up, check the power supply. If your power supply is functioning properly, but the drive does not spin up, contact the company from which you purchased the drive.
- **Check your system or backpanel documentation to ensure you have set options in accordance with the manufacturer's recommendations.** All device options, including addresses, are set at the backpanel within the host system or through system software. Check your host system documentation about how to set these options in your particular system.







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