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Seagate

BARRACUDA 2LP

Disc Drive

ST31250N/ND

ST31250W/WD/WC/DC

ST32550N/ND

ST32550W/WD/WC/DC

Installation Guide

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Preface

This manual contains information for users of the Seagate® ST31250 and ST32550 Barracuda™ 2LP SCSI disc drives. It provides support services, performance specifications, and initial setup information. Additional information is available in the *Barracuda 2LP Product Manual* (part number 83328930). 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:

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- 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.
- Turn off the power before removing or installing the DC power cable.
- 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 and repair techniques for safe, reliable operation of this unit. Service should be done only by qualified persons. We recommend the procedures in this manual as effective ways of servicing the unit. Some procedures require the use of special tools. For proper maintenance and safety, you must use these tools as recommended.

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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.

These warnings and cautions are not exhaustive. We cannot possibly know, evaluate, and advise you of all the ways in which maintenance might be performed or the possible risk of each technique. Consequently, we have not completed any such broad evaluation. If you use a non-approved procedure or tool, first ensure that the method you choose will not risk either your safety or unit performance.

Always observe the following warnings and precautions:

- Perform all maintenance by following the procedures in this manual.
- Follow all cautions and warnings in the procedures.
- Use sound safety practices when operating or repairing the unit.
- Use caution when troubleshooting a unit that has voltages present. Turn off power to the unit before servicing it.
- Wear safety shoes when removing or replacing heavy parts.

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- 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 chassis. 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, this drive is designed to be installed and operated in accordance with UL1950, IEC950, EN60950, CSA C22.2 950, and VDE0805.

Seagate takes all reasonable steps to ensure that its products are certifiable to currently accepted standards.

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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- und Reparaturverfahren, um den sicheren, zuverlässigen Betrieb dieser Einheit zu gewährleisten. Reparaturen dürfen nur von qualifiziertem Fachpersonal vorgenommen

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werden. Wir empfehlen die Verfahren in diesem Handbuch als effektive Methoden zur Wartung und Reparatur der Einheit. Einige Verfahren erfordern Spezialwerkzeuge; diese müssen zur sachgemäßen Ausführung der Wartungsarbeiten und aus Sicherheitsgründen den Empfehlungen entsprechend verwendet werden.

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

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persönliche Sicherheit noch die Leistung der Einheit gefährdet.

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

- Führen Sie alle Wartungsarbeiten entsprechend den Anweisungen in diesem Handbuch aus.
- Beachten Sie alle Warn- und Vorsichtshinweise in diesem Handbuch.
- Treffen Sie beim Betrieb oder bei der Reparatur 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 Reparaturarbeiten beginnen.
- Tragen Sie Sicherheitsschuhe, wenn Sie schwere Teile aus- bzw. einbauen.
- 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.

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- Befolgen Sie die oben unter “Electrostatic Discharge Protection” angegebenen Sicherheitsmaßnahmen.
- Nehmen Sie keine Platinen aus dem Laufwerkgehäuse. Wenn eine Platine defekt ist, muß das gesamte Laufwerk zur Reparatur eingeschickt werden. Die Herausnahme von Platinen durch anderePersonen 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 Laufwerkgehäuse 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, IEC950, EN60950, CSA C22.2 950 und VDE0805 vorgesehen.

Seagate ist ständig bemüht, die Zulassungsfähigkeit von Seagate-Produkten im Rahmen der gegenwärtig

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geltenden Standards zu gewährleisten. Zu den typischen Anwendungen dieser Festplattenwerke zählen Systemeinbau durch den Kunden und die Konstruktion von Untersystemen. Sicherheitsbehörden gewähren eine bedingte Zulassung für Komponenten wie das Barracuda-Festplattenlaufwerk vorbehaltlich der endgültigen Zulasssung 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 alssolche 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.

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Technical support services

Seagate Technology provides technical support literature and diagnostic utilities to authorized distributors. Please contact your dealer for technical support and installation troubleshooting. Product technical support is available for all Seagate products by calling the SeaFAX™, SeaFONE™, SeaTDD™, or SeaBOARD™ services. These are toll calls if you dial from outside of the number's local dialing area.

SeaFAX:
USA (408) 438-2620; England 44-62-847-7080
Use a touch-tone telephone to access Seagate's automated FAX system and select technical support information by return FAX. This service is available 24 hours a day, 7 days a week.

CompuServe Forum
Online support for Seagate products is available on CompuServe. This includes an extensive question and answer message base, downloadable utilities, and documentation files in Adobe™ Acrobat™ format which you can download and view from your own computer. Type "Go Seagate" from within CompuServe to access this service.

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SeaFONE: (408) 438-8222
Technical support specialists are available from 8:00 A.M. to 5:00 P.M. PST, Monday through Friday. Recorded technical information on selected Seagate products is provided while you are on hold. Recordings are accessible 24 hours a day, 7 days a week.

SeaTDD: (408) 438-5382
TDD is a telecommunication device for the deaf where two people can communicate using a keyboard connected to the phone line. A TDD device is required to access this service, which is available from 8:00 A.M. to 5:00 P.M. PST, Monday through Friday.

SeaBOARD:
The Seagate Technical Support Bulletin Board System (BBS) is available 24 hours a day, 7 days a week. A modem is required to access this service. The communications software must be set for eight data bits, no parity, and one stop bit (8N1). These operate at 300 to 9600 baud. With this service you can access:

- Specifications and jumper configurations
- Reprints of Seagate documentation
- Utilities that you can download to your own computer

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Location	Modem number
USA, Mexico, Latin America	(408) 438-8771
England	44-62-847-8011
Germany	49-89-140-9331
Singapore	65-292-6973
Australia	61-2-756-2359
Canada	(416) 856-5581
France	33-1-40-67-1034
Korea	82-2-556-7294

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General description

Barracuda 2LP SCSI disc drives are high-speed, random-access digital-data storage devices.

The drive is a component for installation in an enclosure designed for the drive. This is often a rack within the system or an external enclosure designed to house one or more disc drives or other peripheral units. In either case, the disc drive must receive adequate cooling (refer to “Providing adequate cooling”) and it must be sufficiently grounded and shielded from emissions. The *Barracuda 2LP Product Manual* (part number 83328930) contains guidelines for a properly designed enclosure.

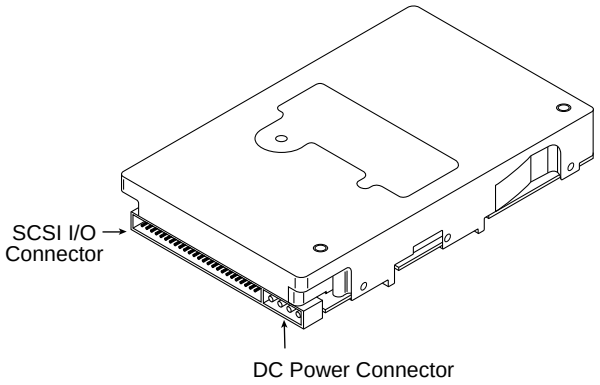


Figure 1. Barracuda 2LP disc drive (N/ND model shown)

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Characteristics	**ST31250**	**ST32550**
Interface	Fast SCSI-2[1]	Fast SCSI-2[1]
Capacity		
Unformatted	1,205.3 Mbytes	2,541.3 Mbytes
Formatted[2]	1,020.9 Mbytes	2,147.4 Mbytes
Recording		
Cylinders (user)	3,711	3,510
Read/write data heads	5	11
Servo heads	1	1
Avg bytes/track	64,160	64,160
Seek time[3]		
Average read	8.0 msec	8.0 msec
Average write	9.0 msec	9.0 msec
Disc rotation		
RPM	7,200	7,200
Average latency	4.17 msec	4.17 msec
Internal transfer rate (Mbits/sec)	47.5 to 72.0	49.4 to 72.0
Max sync. SCSI transfer rate		
N/ND	10 Mbytes/sec	10 Mbytes/sec
W/WD/WC/DC	20 Mbytes/sec	20 Mbytes/sec
Multi-segmented cache	512 Kbytes	512 Kbytes

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[1]Can also be operated according to SCSI-1 protocol.

[2]Standard factory units are formatted as follows:

512 data bytes per sector

9 spare sectors per cylinder

1 cylinder at the innter track reserved for spares

[3]Not including on-board controller overhead.

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DC power requirements

	Single-ended		Differential	
Voltage regulation[5]	**+5V[11] ± 5%**	**+12V ± 5%[2]**	**+5V[11] ± 5%**	**+12V ± 5%[2]**
		Amps		
Maximum operating current[1]	0.93	0.6	1.17	0.6
Maximum starting current				
Peak DC[3, 6]	0.93	1.35	1.00	1.35
Peak AC[3]	–	1.93	–	1.93
Delayed motor start (max)[1,4]	0.88	0.12	0.92	0.12
Peak operating current				
Typ DC[1, 10]	0.91	0.57	1.13	0.57
Max DC[1]	0.93	0.60	1.17	0.60
Max (peak)	1.00	1.56	1.95	1.56
Track following (DC)				
at OD[1]	0.91	0.5	0.99	0.50
at ID[1]	0.88	0.51	0.96	0.51
Read track				
OD DC[1, 14]	0.96	0.53	1.35	0.53
AC	1.03	0.73	1.95	0.73
Seeking				
Typical DC[1, 13]	0.89	0.78	0.99	0.78
Maximum DC[1]	0.92	0.82	1.10	0.82
Maximum (peak) AC	0.95	1.60	1.67	1.60

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[1] Measured with an average reading DC ammeter. Instantaneous +12V current peaks will exceed these values.

[2] A –10% tolerance is permissible during initial start of the spindle but must return to ±5% before reaching 7,200 RPM. The ±5% must be maintained after the drive signifies that its power-up sequence has been completed and that the drive is able to accept selection by the host initiator.

[3] See the +12V current profile in the *Barracuda 2LP Product Manual* (publication number 83328930).

[4] This condition occurs when the Motor Start option is enabled and the drive has not yet received a Start Motor command.

[5] See "Conducted noise immunity" in the *Barracuda 2LP Product Manual.* The specified voltage tolerance is inclusive of ripple, noise, and transient response.

[6] At power-up, the motor current regulator limits the +12V current to an average value of less than 1.4A, although instantaneous peaks may exceed this value. These peaks should measure 5 msec duration or less.

[7] Minimum current loading for each supply voltage is not less than 4% of the maximum operating current shown.

[8] Use separate ground returns for +5 and +12V supplies.

[9] Where power is provided to multiple drives from a common supply, carefully consider individual-drive power requirements. Where multiple units are powered on simultaneously, be sure the peak starting current is available to each device.

[10] Operating condition is a third-stroke seek at OD and read one Track. The command is issued every 0.075 seconds (every 0.063 seconds on wide and SCA drives).

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[11] No terminator power. See Section 11.7.3.4 in the *Barracuda 2LP Product Manual*.

[12] All power-saving features are enabled (ASA II code only).

[13] Seeking is defined as a third-stroke seek at OD. The command is issued every 20 msec.

[14] Read track is defined as repeat reads of track 15 with a 78% duty cycle on N models, 32% duty cycle on W models, 48% duty cycle on WC models, 60% duty cycle on ND models, 44% duty cycle on WD models, and 44% duty cycle on DC models.

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Initial setup information

The general information beginning on this page applies to all of the Barracuda 2LP drive models. After reading the general information topics, refer to the appropriate drive-specific section listed below for additional information about configuring and installing your particular model.

Drive models		Page
ST31250N ST32550N	ST31250ND ST32550ND	33
ST31250W ST32550W	ST31250WD ST32550WD	38
ST31250WC ST32550WC	ST31250DC ST32550DC	44

General information

The following general information topics are discussed:

- SCSI ID jumpers
- Drive termination
- Synchronizing spindles
- Other applicable jumper options
- Providing adequate cooling
- Mounting the drive and connecting cables*
- Formatting the drive

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*This mounting procedure does not apply to WC or DC model drives. To mount a WC or DC drive, plug the drive into the system's single connector attachment (SCA) position on the system's back panel.

SCSI ID jumpers

Each device on the SCSI chain must have a unique SCSI ID. The host system's SCSI controller usually uses the highest-numbered ID available; therefore the lower-numbered SCSI IDs are normally used for the other SCSI devices such as this Barracuda disc drive.

Note. Most SCSI controllers (host adapters) allow you to skip a SCSI ID. For example, you can have ID0, ID1, and ID3 (skipping ID2). Other controllers do not allow this so be sure to refer to your system or controller user's manual for details about its requirements for proper SCSI device installation.

Most Barracuda disc drives are factory set with the SCSI ID set at 0. To change the SCSI ID, refer to the appropriate drive section for your model.

If, after completing the installation process, the drive's LED does not show on/off activity when the host is trying to communicate with the drive, a duplicate SCSI ID may be the problem. If this is the case, change the ID so that each device on the SCSI chain has its own unique ID.

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Also check your system or controller user's manual to ensure that you have not violated its SCSI ID numbering recommendations.

Drive termination

If you are installing a Barracuda 2LP drive in a system that has other SCSI devices installed, terminate only the end devices on the SCSI chain. A SCSI "device" is any disc drive, scanner, tape-backup unit, or other piece of hardware connected to your system using the SCSI bus.

The top example in Figure 2 shows an internal hard disc at one end of the SCSI bus with the SCSI controller at the other end (both are terminated). The bottom example shows two additional SCSI devices connected externally—this means the SCSI controller is no longer on the end of the SCSI chain and should not be terminated.

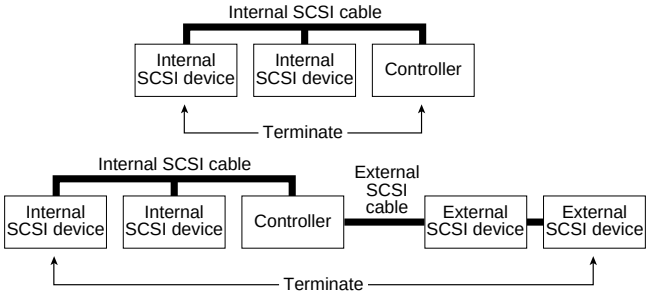


Figure 2. SCSI bus termination

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For information about how to terminate your drive, refer to the appropriate drive-specific section.

Terminator power

You usually will not need to change this option and can normally leave the drive configured as it was shipped from the factory. For information about how to change the terminator power option on your drive, refer to the appropriate drive-specific section.

Synchronizing spindles

If you are installing two or more Barracuda drives, you may (optionally) synchronize their spindles to reduce the latency associated with switching from one drive to another. Spindle sync cables are used to connect the drives.

After connecting each drive with spindle sync cables, designate a master spindle sync reference source. This master source is normally a disc drive located on the same SCSI bus as the other drives you want to synchronize with. To designate a drive as the master, use SCSI interface commands. Refer to the product manual for information about using these commands.

For information about how to synchronize the spindles for your drive, refer to the appropriate drive-specific section.

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Providing adequate cooling

The enclosure design must ensure adequate cooling for the drive. The maximum ambient temperature is 50°C.

The drive's product manual (83328930) 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 3 shows two design approaches with one or more fans used to generate air flow. The air-flow patterns can be created by the fans either pushing or drawing air. The overall flow pattern can be directed from front to back, back to front, or side to side.

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Kühlung des Systems

Die Gehäusekonstruktion muß eine ausreichende Kühlung des Laufwerkes gewährleisten. Die Umgebungstemperatur darf maximal 50°C betragen.

Die Produkthandbuch Barracuda 2LP (Dokument 83328930) 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 erzeugt wird und gleichzeitig ein Luftstrom über den Platinen und um die Kopf- und Festplatteneinheit (HDA) gegeben ist. Wählen Sie einen möglichst kurzen Weg zwischen Lufteinlaß und -auslaß. Dadurch wird die Strecke, die die vom Laufwerk und anderen nahegelegenen Hitzequellen aufgewärmte Luft zurücklegt, auf ein Minimum beschränkt.

Abbildung 3 zeigt zwei Konstruktionsmöglichkeiten, bei denen ein oder mehrere Lüfter den Luftstrom erzeugen. Der Luftstromverlauf wird durch die Lüfter gesteuert, die entweder Luft einblasen oder abziehen. Generell kann der Luftstrom entweder von vorne nach hinten oder von hinten nach vorne verlaufen.

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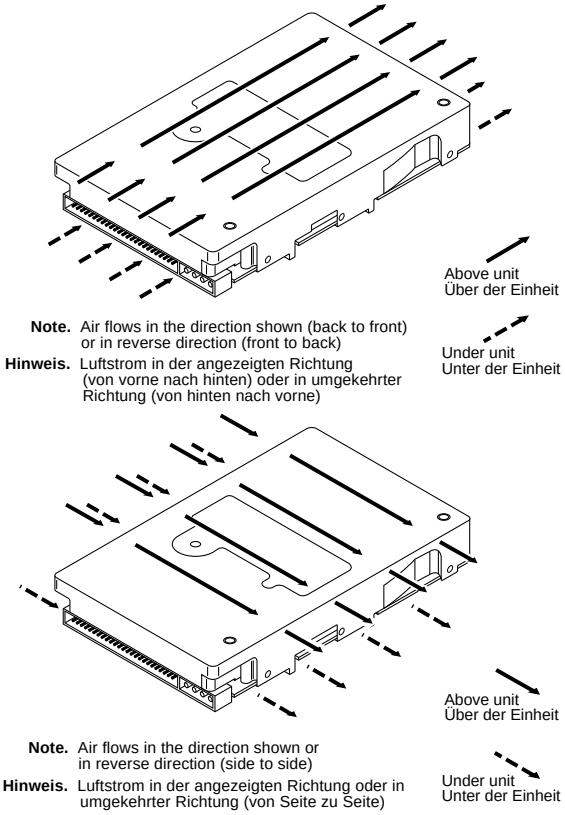


Figure 3. Suggested air flow
Abbildung 3. Empfohlener Luftstromverlauf

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Mounting the drive and connecting cables

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.

The drive may be mounted in any orientation (horizontally, vertically, and any combination thereof); however, you must ensure that the drive receives adequate air flow for cooling.

1. 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.

   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, because this means the threads are not properly aligned. In this case, back the screw out and try again.

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Installation des Laufwerkes und Anschluß der Kabel

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.

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

   Gemessen von der Außenfläche des Gehäuses dürfen die Schrauben maximal 3,81 mm in die Befestigungslöcher des Gehüuses 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. In diesem Fall die Schraube nicht in das Gewindeloch forcieren, sondern die Schraube herausnehmen und erneut in das Gewindeloch einführen.

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2. Verify that all connections between the drive and the host system are correctly installed.

2. Prüfen Sie, ob alle Verbindungen zwischen dem Laufwerk und dem Host-System korrekt hergestellt sind.

3. Verify that you have correctly installed jumpers.

3. Stellen Sie sicher, daß die Kennungsbrücken installiert sind.

4. Connect the 50-pin SCSI cable into the drive's SCSI connector (shown earlier in Figure 1). Take care not to stretch or crimp this cable, and do not block the system's cooling air flow with the cable.

   The drive receives DC power through a 4-pin connector mounted next to the SCSI connector. The output of a power supply must meet SELV (safety extra low voltage) as defined in IEC 950. Figure 4 provides the pin information for the DC power connector. To connect the DC power cable to the drive, insert the cable end into the drive's DC power connector.

4. Schließen Sie das 50-polige SCSI-Kabel an den SCSI-Steckverbinder des Laufwerkes an (wie bereits in Abbildung 1 gezeigt). Das Kabel darf nicht gedehnt oder gedrückt werden und es darf den Luftstrom zur Kühlung des Systems nicht behindern.

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Das Laufwerk wird über einen 4-poligen, neben dem SCSI-Anschluß befestigten Steckverbinder mit Gleichstrom versorgt. Der Ausgang eines Netzteils muß SELV (safety extra low voltage) nach IEC 950 entsprechen. Abbildung 4 zeigt die Steckerbelegung für den Gleichstromanschluß. Zum Anschluß des Gleichstromkabels an das Laufwerk das Kabelende in den Gleichstromanschluß des Laufwerkes stecken.

Pin	Power
1	+12V
2	+12V return
3	+ 5V return
4	+ 5V

Pin	Gleichstrom
1	+12 V
2	+12 V Rückleitung
3	+ 5 V Rückleitung
4	+ 5 V

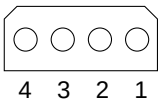


Figure 4. DC power connector
Abbildung 4. Gleichstromanschluß

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Note. Signal ground on the power control board (PCB) and the head and disc assembly (HDA) are connected together in this drive and you cannot separate them. The equipment in which you have mounted the drive is connected directly to the HDA and PCB without electrically isolating shock mounts. Maximizing the conductive contact area between HDA ground and system ground may reduce radiated emissions. If you do not want the system chassis to be connected to the HDA/PCB ground, you must provide a nonconductive (electrically isolating) method of mounting the drive in the host system. This may increase radiated emissions and is the system designer's responsibility.

Hinweis:

Die Signalerde auf der Stromregelungskarte (PCB) und der Kopf- und Festplatteneinheit (HDA) sind in diesem Laufwerk miteinander verbunden und können nicht getrennt werden. Das Gerät, in das Sie das Laufwerk eingebaut haben, ist ohne elektrisch isolierende Stoßdämpfer direkt an die HDA und PCB angeschlossen. Die elektromagnetische Strahlung kann reduziert werden, indem Sie eine möglichst große leitende Kontakfläche zwischen der HDA-Erdung und der Systemerdung vorsehen. Wenn Sie das

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Systemgehäuse nicht an die HDA/PCB-Erdung anschließen wollen, müssen Sie das Laufwerk auf nichtleitende Weise (galvanisch isoliert) im Host-System einbauen. Die daraus u.U. resultierende verstärkte elektromagnetische Strahlung fällt in den Zuständigkeitsbereich des Systemdesigners.

5. Replace the host system's cover.

---

5. Setzen Sie das Gehäuseoberteil des Host-Systems wieder auf.

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 your intention is to erase all user data.

1. Turn on DC power.
2. Boot the system from a system floppy disc or from a previously installed hard disc drive if there is one.
3. Format the disc drive. The Barracuda 2LP disc drive is designed to operate with a variety of operating systems; therefore, please refer to your system or SCSI controller manual for information about formatting and setting up the drive.

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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 is 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. 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 "Technical support services" on page 9).

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Setting the SCSI ID jumpers

Use the J4 connector to set the SCSI ID (see Figure 5). To change the SCSI ID, install jumpers on the appropriate pins as shown in the illustration.

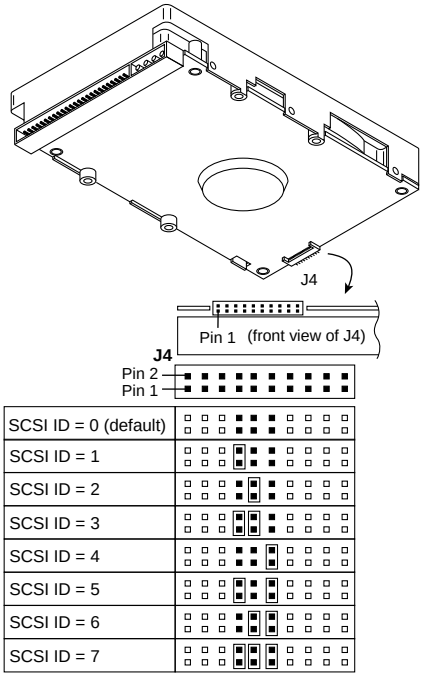


Figure 5. Setting the SCSI ID

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Terminating the drive

ST31250N and ST32550N drives are terminated with permanently mounted IC active terminators. If you install one of these drives and it is not on the end of the SCSI bus, disable the terminators by removing the jumper from pins 5 and 6 of connector J1 (see Figure 6). If you install the drive on the end of the SCSI bus, enable termination by installing a jumper on pins 5 and 6 of connector J1.

Note. Use active terminators when terminating the bus.

ST31250ND and ST32550ND drives do not have internal terminators or any other way of adding internal termination to the drive. You must provide external active termination (ANSI SCSI-2 Alternative 2) to these drives when termination is required.

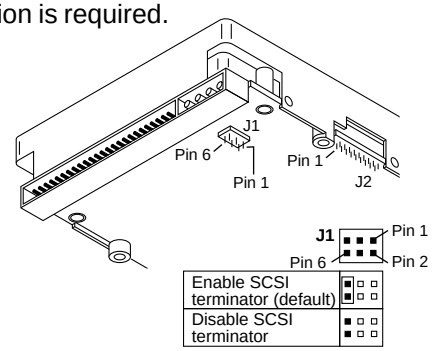


Figure 6. Terminating the drive

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Terminator power

There are four possible terminator power configurations for ST31250N and ST32550N drives (see Figure 7). You will not normally need to change this option and can leave the drive configured as it was shipped from the factory.

ST31250ND and ST32550ND drives should be configured with a jumper connecting J1 pins 1 and 3 (and no jumper on J1 pins 2 and 4) as illustrated in Figure 7.

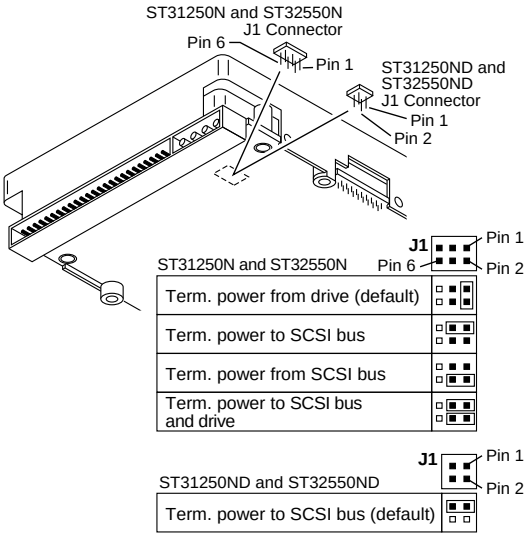


Figure 7. Setting terminator power jumpers

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Synchronizing spindles

Use pins 5 and 6 on the J4 connector to attach the spindle sync cable. See Figure 8.

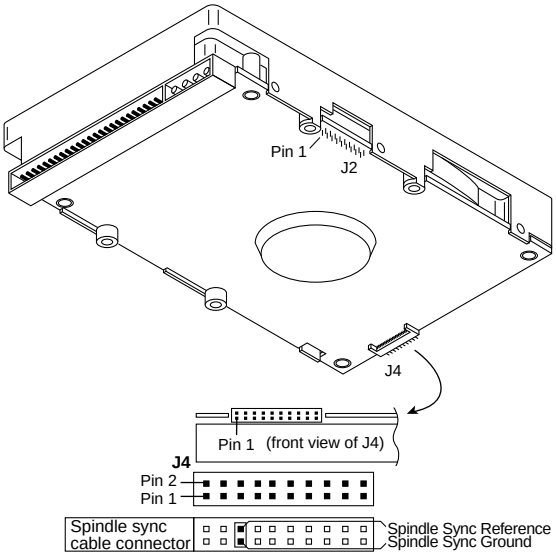


Figure 8. Spindle sync connectors

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Other applicable jumper options

Several other jumper options are available as illustrated.

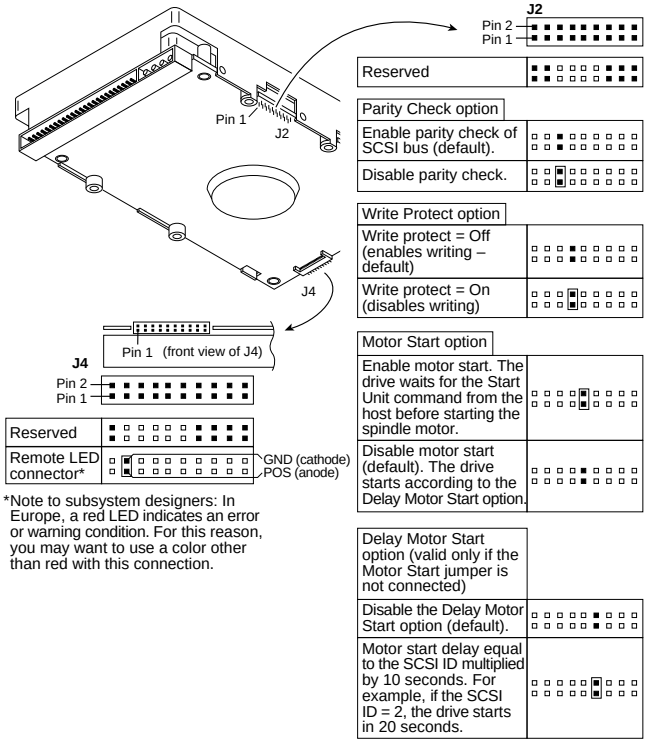


Figure 9. Additional jumper options

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Setting the SCSI ID jumpers

Use the J5 connector to set the SCSI ID (Figure 10). To change the SCSI ID, install jumpers on the appropriate pins as shown in the illustration.

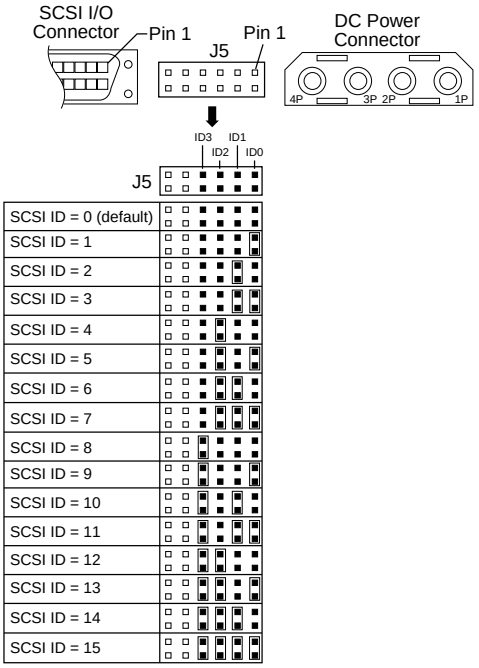


Figure 10. Setting the SCSI ID

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Terminating the drive

ST31250W and ST32550W drives are terminated with permanently mounted IC active terminators. If you install one of these drives and it is not on the end of the SCSI bus, disable the terminators by removing the jumper from pins 5 and 6 of connector J1. If you install the drive on the end of the SCSI bus, enable termination by installing a jumper on pins 5 and 6 of connector J1 (see Figure 11).

Note. Use active terminators when terminating the bus.

ST31250WD and ST32550WD drives do not have internal terminators or any other way of adding internal termination to the drive. You must provide external active termination (ANSI SCSI-2 Alternative 2) to these drives when termination is required.

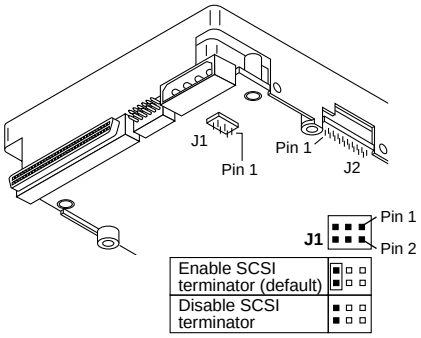


Figure 11. Terminating the drive (ST32550W shown)

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Terminator power

There are four possible terminator power configurations for ST31250W and ST32550W drives (see Figure 12). You will not normally need to change this option and can leave the drive configured as it was shipped from the factory.

ST31250WD and ST32550WD drives should be configured with a jumper connecting J1 pins 1 and 3 (and no jumper on J1 pins 2 and 4) as illustrated in Figure 12.

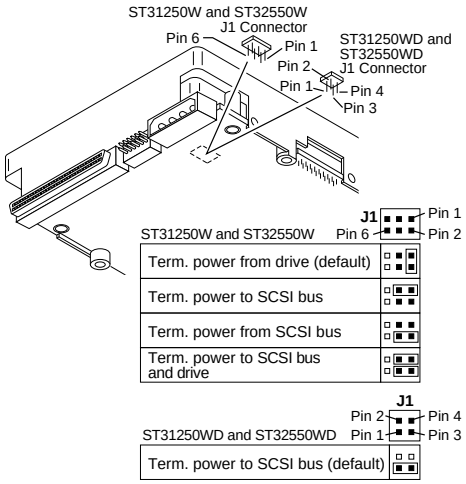


Figure 12. Setting terminator power jumpers

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Synchronizing spindles

Use pins 11 and 12 on the J5 connector to attach the spindle sync cable. See Figure 13.

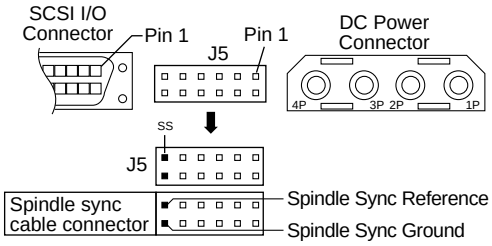


Figure 13. Spindle sync connectors

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Other applicable jumper options

Other option jumpers are available as illustrated below.

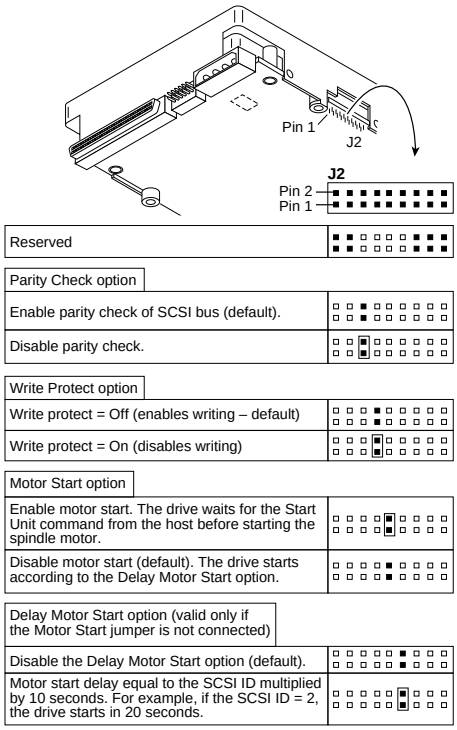
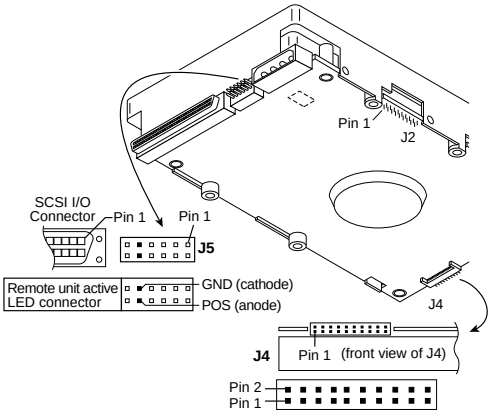


Figure 14a. Additional jumper options

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SCSI ID = 0	
Fault LED pin (+)	
SCSI ID = 1	
Vendor Unique	
SCSI ID = 2	
SSREF (+)	
SCSI ID = 3	
Unit Active LED pin (+)	
Enable termination	
Ground	
+5 volts	
Not connected	
Reserved	

Figure 14b. Additional jumper options

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Setting the SCSI ID jumpers

The SCSI ID for WC drives is normally set over the SCSI bus by the host system using connector contacts 39 (ID0), 40 (ID2), 79 (ID1), and 80 (ID3). Systems designers may, optionally, install a remote operator panel connection to set the SCSI ID. Figure 15b illustrates the SCSI ID pins used for this purpose.

Terminating the drive

ST31250WC and ST32550WC drives do not have internal terminators or any other way of adding internal termination to the drive. You must provide single-ended external active termination (ANSI SCSI-2 Alternative 2) to these drives when termination is required.

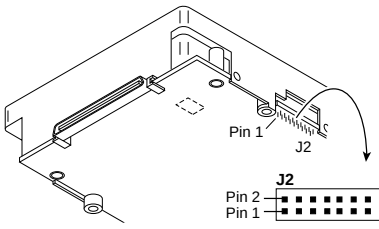
Synchronizing spindles

Spindle synchronization for WC drives is normally handled on the SCSI bus by the host system using connector contact 37 for the spindle sync reference signal. System designers may, optionally, install a spindle sync cable using pin 6 on the J4 connector to provide +SSREF (see Figure 15b).

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Applicable jumper options

Option jumpers are available as illustrated below.

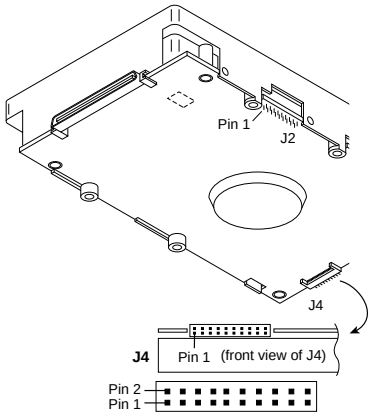


Reserved	
Parity Check option	
Enable parity check of SCSI bus (default).	
Disable parity check.	
Write Protect option	
Write protect = Off (enables writing – default)	
Write protect = On (disables writing)	
Motor Start option	
Enable motor start. The drive waits for the Start Unit command from the host before starting the spindle motor.	
Disable motor start (default). The drive starts according to the Delay Motor Start option.	
Delay Motor Start option (valid only if the Motor Start jumper is not connected)	
Disable the Delay Motor Start option (default).	
Motor start delay equal to the SCSI ID multiplied by 10 seconds. For example, if the SCSI ID = 2, the drive starts in 20 seconds.	

Figure 15a. Jumper options

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WC/DC drives



SCSI ID = 0	
Fault LED pin (–)	
SCSI ID = 1	
Vendor Unique	
SCSI ID = 2	
SSREF (+)	
SCSI ID = 3	
Unit Active LED pin (–)	
Not used	
Ground	
+5 volts	
Not connected	
Reserved	

Figure 15b. Additional jumper options

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