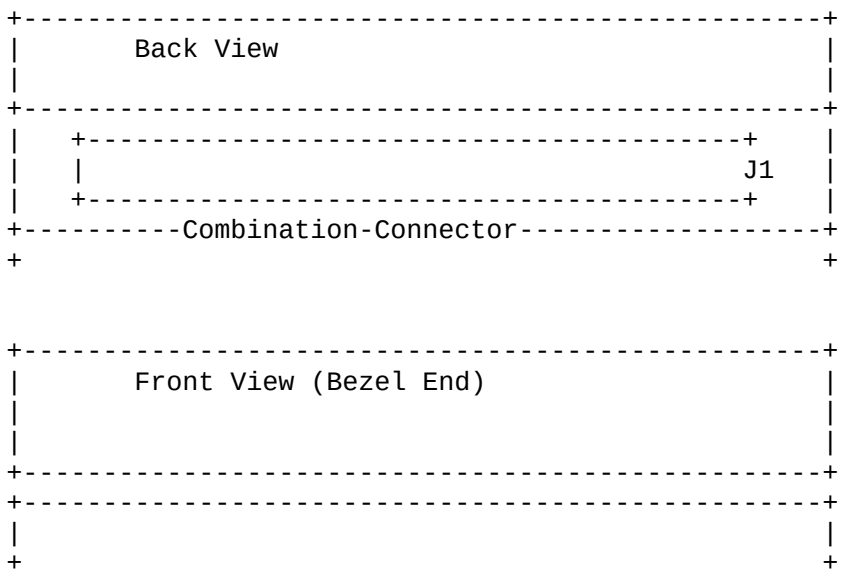
V P - 3 1 0 7 R AVASTOR

NO MORE PRODUCED

			Native	Translation	
Form	3.5"/SLIMLINE	Cylinders	3832		
Capacity form/unform	1075/ 1225 MB	Heads	5		
Seek time / track	9.0/ 1.0 ms	Sector/track			
Controller	SCSI2 SI/FAST/SCA	Precompensation			
Cache/Buffer	1024 KB SEGMENTED	Landing Zone			
Data transfer rate	4.400 MB/S int	Bytes/Sector	512		
	10.000 MB/S ext SYNC				
Recording method	RLL 1/7		operating	non-operating	
Supply voltage	5/12 V	Temperature *C	5 55	-40 60	
Power: sleep	W	Humidity %	10 80	5 95	
standby	W	Altitude km	-0.305 3.048	-0.305 12.192	
idle	7.0 W	Shock g	10	60	
seek	10.0 W	Rotation RPM	7200		
read/write	W	Acoustic dBA	32		
spin-up	W	ECC Bit	198BIT REED SOLOMON,ON THE...		
		MTBF h	800000		
		Warranty Month	60		
Lift/Lock/Park	YES	Certificates	CSA,UL1950,VDE		

80-pin SCSI Connector (Raid)



Jumper Setting

TERMPWR (SCA)

SCA drives do not provide TERMPWR, active termination, or write protection.

Termination SCA

Atlas disk drives used in SCA (or Raid) systems cannot be configured to provide bus termination. Therefore, be sure to properly terminate the SCSI bus in which this drive is installed.

NOTE
Refer to your system or SCSI controller documentation regarding any specific recommendations regarding drive placement on the SCSI bus and SCSI bus termination.

SCSI ID (SCA)

Each SCSI device on the bus must have a unique SCSI ID number assigned to it. The drive can be configured for SCSI ID numbers that range from 0 through 15.

Configure the SCSI ID by providing the proper open or ground signal input to the referenced pins of the drive's 80-pin SCA connector.

NOTE
Refer to your system or SCSI controller documentation for specific recommendation about assigning SCSI ID numbers for you specific system.

SCSI ID	Jumper Location			
	ID3 P80	ID2 P40	ID1 P79	ID0 P39
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1

```
|   12     | 1  | 1  | 0  | 0  |
|   13     | 1  | 1  | 0  | 1  |
|   14     | 1  | 1  | 1  | 0  |
|   15     | 1  | 1  | 1  | 1  |
+----------+----+----+----+----+

/----------------------79-\
|**************************80  RAID Connector
|**************************40
+----------------------39-+
```

0 = OPEN, CKT, +2.4Vto V +0.5V
1 = GND, -0.5V to +0.4V

Spindle Synchronization SCA

The drive supports synchronized spindle operation. Whether the drive operates as master or slave is determined by the contents of the RPL field in the Rigid Disk Geometry Page (04h) for the drive.

The time interval between spindle synchronization checks is set using the Spindle Sync Check Interval bit of the SCSI MODE SELECT command Special Function Control page (25h).

The drive always maintains local speed regulation when no reference signal is applied.

When the drive operates as a master, it generates a spindle synchronization reference signal (SPINDL_SYNC_REF L). This reference signal is available as an output to other drives at pin 37 of the SCA connector.
When the drive operates as a slave, it looks for a spindle synchronization reference signal (SPINDL_SYNC_REF L) as an input from the master drive. The slave looks for this spindle synchronization input at pin 37 of the SCA connector.

CAUTION
Atlas series drives can be connected for synchronized spindle operation. Models XP31070, XP32150 and XP34300 drives must not be used for synchronized spindle operation in conjunction with drives from different model series or unpredictable results might occur. For example, XP31070R, XP32150R and XP34300R drives can be connected for spindle synchronization in the same system, but they must not include a synchronization connection to a DSP3210R drive.

NOTE
When connecting multiple drives together for spindle synchronization, be sure to use proper cabling techniques to avoid ground loop problems.

Spin Up Power On SCA

Atlas drives have three Spin-Up on Power On modes:

- Option 1
  Spin up occurs immediately when power is applied.

- Option 2
  Drive spin up occurs after a predetermined delay following power on. The delay is equal to a user-specified multiplier, multiplied by one plus the numerical SCSI ID of the drive. This will give a staggered spin-up in multiple-drive installations.

- Option 3
  Drive spin up is controlled by the START STOP UNIT command.

Configure the desired spin up option by setting the state of the RMT_START (pin 38) and DLYD_START (pin 78) inputs to the 80-pin SCA connector. The states of these signal are set by using either hardwired connections at the backplane or backplane logic.

Option	DLYS_START PIN 78	RMT_START PIN 38
1	OPEN	OPEN
2	GROUND	OPEN
3	OPEN	GROUND
RESERVED	GROUND	GROUND

Activity LED SCA

The drive provides the output ACTIVITY LED OUT to drive a user-supplied activity LED (Pin 77).

The output indicates the drive is performing a SCSI operation. To use this output, connect the user-supplied LED cathode to the ACTIVITY LED OUT (Pin 77) connection. The LED anode must be attached to the proper +5 VDC supply through an appropriate current-limiting resistor.

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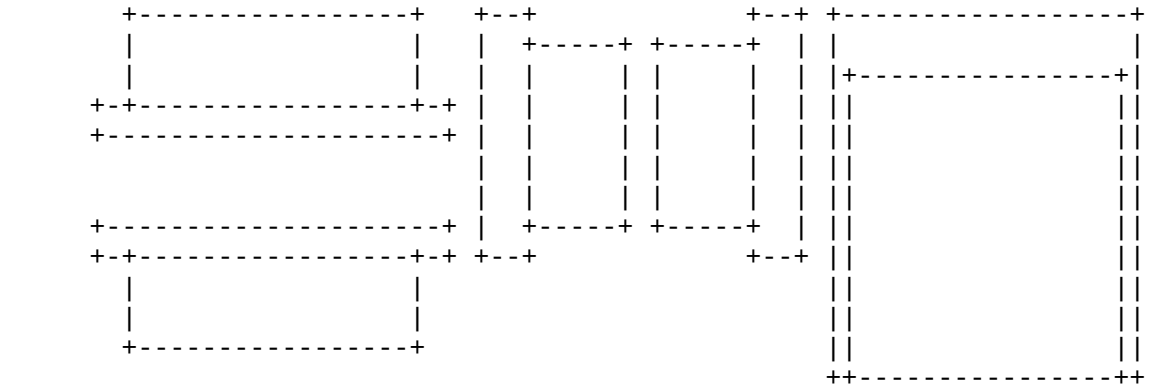
QUANTUM XP31070/32150/34300 PRODUCT MANUAL 81-108333-01 4/1995

Notes on installation

Drive mounting



You can mount the disk drive in any position. R models mount in RAID storage subsystems. The drive (with bezel) attaches to the system bay and accept #6-32 screws. Screws should not exceed 0.25 inch (6.25 millimeters) in length, otherwise damage to the PCB may result.

CAUTION
The placement of the drive in the computer system must permit sufficient air-flow to maintain drive environment temperature within 41*CF to 131*F (+5*C to +55*C) and maintain component surface temperatures below the maximums.

Mounting brackets may be required when installing the drive in a 5.25-inch form factor bay. We recommended using brackets supplied by Quantum Corporation to mount the drive. Otherwise, the drive's isolation characteristics could be compromised. A bracket kit including four screws is available from the Quantum Corp. The part number is 70-30695-01.

The drive base contains threaded holes on its sides and bottom to mount the drive assembly. The holes accept #6-32 UNC screws.

Installation in a 3.5-inch Bay

The drive base contains threaded holes on its sides and bottom to mount the drive. The holes accept #6-32 screws.

Installation in a 5.25-inch Bay

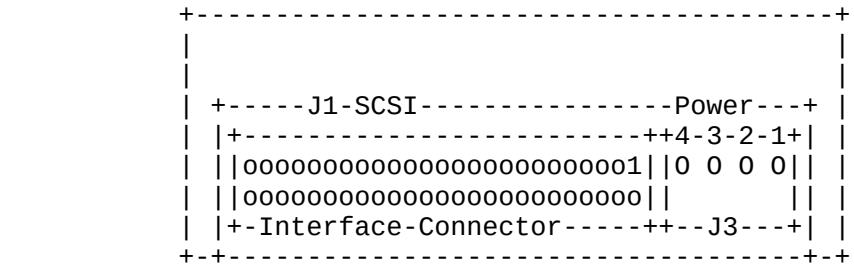
A Bracket kit including four screws is available from the Quantum

Corp. The part number is 70-30695-01. Attach the brackets to the drive using four #6-32 screws.

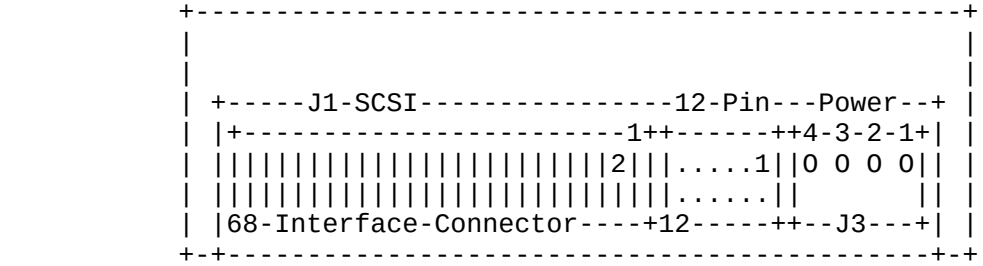
CAUTION
Screw-length must not exceed 0.25-inch (6.25 millimeters); or the drive may be damaged.

Cables

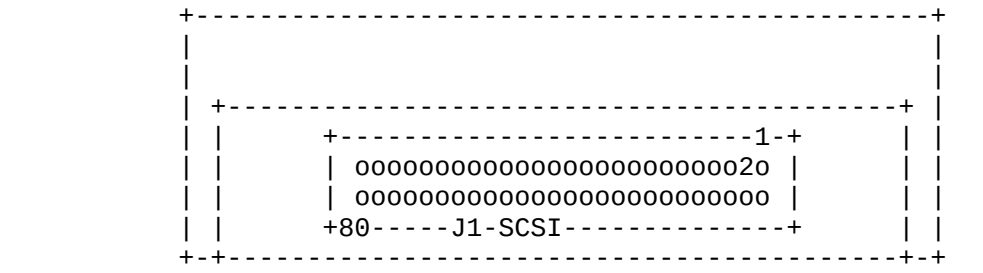
Atlas drives use single-ended or differential drivers and receivers. The user furnishes the appropriate cables and connectors to match the drive connectors listed in the following table.



68-Pin Wide SCSI Connector and 12-Pin Auxiliary Connector



80-pin Single Connector Attachment (SCA) SCSI Connector J1



Combination Connector - 8-bit

Part Number	Vendor
12-41254-01	Quantum
87711-502	Berg Electronics (formerly Dupont Electronics)

Includes 0.1-in pitch, 50-pin SCSI connector and 4-pin power

connector.

Combination Connector - 16-bit

Part Number	Vendor
12-43123-01	Quantum
87360-0003	Molex

Includes 68-pin SCSI connector, 4-pin power connector, and a 2-mm pitch, 12-pin (2x6) Option connector.

Option Connector - 8-bit

Part Number	Vendor
12-36484-08	Quantum
954339-01-10-15	3M
P92-300-204-6	AMP, Inc.
87049-2085	Molex, Inc.

A 2-mm pitch, 19-pin (2x10) keyed (missing pin) connector

Secondary Option Connector - 16-bit

Part Number	Vendor
12-36484-09	Quantum
P93-300-204-7	AMP
954339-01-07-15	3M

A 2-mm pitch, 13-pin (2x7) keyed (missing pin) connector

Shunt Jumper - All Models

Part Number	Vendor
12-36482-01	Quantum
86730-001	Berg Electronics (formerly Dupont Electronics)
LPC-SPG	Honda

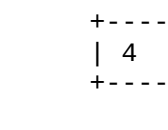
A 2-mm pitch shunt for configuring termination characteristics

RAID Connector - SCA Models

Part Number	Vendor
12-41319-01	Quantum
SSC80-D01	Specialty Electronics

Chamo 0.050 inch Series I 80-position plug

DC Power and pin connector assignments



pin 1	+12 VDC
pin 2	+12 Volts Return GROUND
pin 3	+ 5 Volts Return GROUND
pin 4	+ 5 VDC

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F E A T U R E S
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QUANTUM XP31070/32150/34300 PRODUCT MANUAL 81-108333-01 4/1995

General Description

The Atlas disk drives are 3.5-inch, high-capacity, state-of-the-art drives designed for applications where high-capacity, performance, and space demands are critical, such as Macintosh (TM), and Windows (TM)-driven desktop and multi-tasking systems, local area networks, and file servers.

Caching

The disk cache is a look-ahead buffer used for combining or coalescing I/O commands on a track-by track basis prior to accessing the disk media. Throughput performance is greatly improved by gathering and combining commands on a track basis rather than on a command basis. With this unique system, multiple commands for a particular track are coalesced in the buffer before accessing the media.

As a result, multiple I/O commands, that address a single track are logically combined, avoiding multiple disk accesses on multiple rotations. Since most reads and writes are sequential, buffering data before it is stored on the media yields greatly increased throughput for most applications.

The drive electronics contains a 1MB segmented buffer that maximizes the cache hit rate for sequential read streams. The cache is organized in RAM as separate track line segments. Each track line segment can hold data from one complete track on the media, temporarily assuming the identity of the track for all input/output functions.

Embedded Servo System

Embedded servo information is written in a spoke configuration, 54 times on every track, on every disk surface. The spokes (or headers) consist of quadrature analog pattern and digital address data. The digital portion of the spoke data are read and used to locate the desired track, spoke, and head number. The quadrature analog signal portion is detected and used by a servo feedback control loop to precisely position the head on the track center.

Data integrity and security

Atlas disk drives use a combination of parity checking, error detection coding (EDC), error correction coding (ECC), and check-pointing to protect stored data from media errors, transfer or addressing errors, or errors introduced during sector reallocation.

Media Error Protection

To ensure that data is the same as data written, the drive computes and appends an Error Correction Code (ECC) to each sector of data stored. The drive uses a 198-bit Reed Solomon code. This allows correction of up to 10 bytes in each sector.

The ECC can correct a single burst error up to 73 bits in length or a double burst error up to 25 bits in length for each burst.

The drive has the capability of correcting in hardware ("on-the-fly") a single burst error up to 25 bits long with no increase in latency time.

Spindle Synchronization

Spindle Synchronization is the process of causing the disk assemblies in several disk drives to rotate to the same address location at the same time. Synchronization is used in RAID (redundant arrays of independent devices) mass storage systems, allowing a set of disk drives to function as one drive.

To accomplish this, sector 0, track 0 of each drive must be under the read/write heads at exactly the same time. With spindle synchronization, all the drives are locked to the same relative position.

If all the drives are synchronized exactly, the time used to access one drive results in the next drive passing the correct position. This problem is resolved by using an offset that is the sum of the transmission delays of the interconnecting bus cable, data transfer times, and the rotational latency of the drives.

Knowing how long it takes to set up an I/O operation and transfer data to a drive, the SCSI controller can send the data to one drive and, while that data is being transferred, set up the I/O transfer to the next one. When the current transfer is complete, the controller is ready to transfer the next, and so on.

Spindle Synchronization is controlled by the Rigid Disk Geometry and (Vendor) Special Function Control pages of the MODE SELECT command.

NOTE
The drives must be homogenous. Other drive model series such as Capella cannot function with Atlas-series drives.

Special Functions

Quantum has incorporated a number of unique options into the drive. The (Vendor) Special Function Control page is used to control these options. The options include:

- Spin Delay - delays the spin-up of the drive to reduce startup load of system power.

- Initiate Synchronous Data Transfer Negotiation - a toggle-type parameter that allows the initiator to move between asynchronous

and synchrounous modes of data transfer.

- Slow Cable - adds an additional delay to REQ/ACK for very long bus cables.

- No Multiple Active I/O Process - a toggle-type command to enable/ disable multiple I/O process.

- Force Disconnect - the drive can be forced to disconnect from the SCSI bus after a SCSI Command is received in order to reduce on-bus time. Force Disconnect works only when a typical, error-free command is received.

- Write Protect - Prevents writing to the disk drive.

- Spindle Sync Check Interval - specifies the time, in minutes, of the interval between spindle synchronization status checks.

- Stagger Spin Delay - specifies the time in 100 ms increments of the delay the drive uses in the spin-up delay formula, allowing a series of drives to be spin up at staggered time intervals.

Banded recording

In banded recording, the disk is divided into multiple bands or partitions (also called notches or bit-zoned areas). Starting at inner band, each next outer band has a hihger recording frequency. The Atlas drives have 16 bands. The use of multiple-frequency recording greatly increases the capacity of the drive.

Diagnostics

The drive has extensive diagnostic capabilities, including those described below:
power-up self-test, periodic self-adjustments, and host diagnostics. Quantum uses self-diagnostic tests and sense data tracking to manage drive errors, in addition to logical sector address (LBA) revectoring.

Power-Up Self-Test

The disk drive performs a self-diagnostic test immediately at power up. If the drive fails its self-diagnostic tests, it will report sense information but will not spin up. Both the Fault LED and a Busy LED briefly illuminate during spin-up as a lamp test.

If the drive passes its self-tests and the spin-up jumper is installed, it spins up and perform further diagnostics on the HDA. The drive indicates "not ready" until the HDA tests are completed successfully.

The drive diagnostics test the following:

- Drive master microprocessor

- RAM and ROM chips

- Buffer memory

- Gate array chips

- Read/write encoding circuits

- Basic servo functions

- SCSI interface control circuits

Following a selection time after power-on, the disk drive is able to respond with appropriate status and sense data to the TEST UNIT READY, INQUIRY, and REQUEST SENSE commands.