

MICROPOLIS 1568 DISK DRIVE  
SPECIFICATIONS

Unformatted Capacity:

Model Number

1568-15

Total Mbytes	-----	765	-----
Disk Platters	-----	8	-----
Read/Write Heads	-----	15	-----
Cylinders	-----	1632	-----
Bytes per track	-----	31250	-----

Formatted Capacity (typical)

Total Mbytes	-----	676	-----
Bytes per Sector	-----	512	-----
Sectors per Track	-----	54	-----

PC Drive Types

If you are using third-party installation software or an on-board BIOS on the controller, follow the instructions included with the software or controller. Otherwise, examine the entries in your system drive table and find the type that most resembles the head and cylinder parameters of the drive without exceeding these parameters.

Performance Specifications

Seek Time (including settling time)	Track-to-Track	4 msec
	Average	16 msec
	Maximum	35 msec
Average Rotational Latency		8.33 msec
Rotational Speed		3600 rpm +/- 0.5%
Data Transfer Rate		15 Mbits/sec
MTBF		150,000 hours
Positioner	Fully balanced rotary voice coil	
Parking	Automatic park and lock	

General Functional Specifications

Interface	ESDI
Sectoring (see W1 description, below)	Hard or Soft
Write Precompensation Start Cylinder	1632*
Reduced Write Current Start Cylinder	1632*
Landing Zone	1632
Mounting Plane	Any orientation

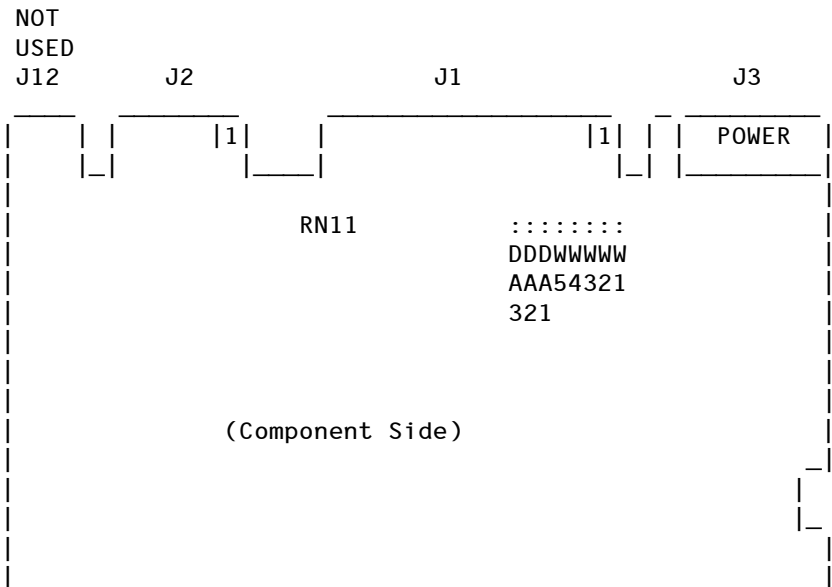
\* These are effectively turned off by specifying a non-existent cylinder. Some systems accomplish this by using a value of "-1"

Power Requirements

+12V +/-5%		2.0A avg.
		(4.3A max during start-up)
+5V +/-5%		1.5A avg.
Heat dissipation, typical		29 Watts

1560-series drives require the use of an ESDI Controller capable of a data transfer rate of at least 15 Mbits/sec.

Drive Addressing and Interface Termination



The Interface Terminator factory installed at RN11 will provide proper termination for the interface lines. When daisy-chaining multiple drives, leave the terminator installed only in the last physical drive on the daisy chain cable; remove the terminator from each of the other drives. In most PC/AT installations, the C: drive is actually at the end of the cable and should retain the terminator.

The drive address jumpers are identified as DA1, DA2 and DA3. Address selection is binary, as shown in the table below. The ESDI controller's documentation will specify the drive address to use.

Drive Address	Select Jumpers		
	DA3	DA2	DA1
1	out	out	in
2	out	in	out
3	out	in	in
4	in	out	out
5	in	out	in
6	in	in	out
7	in	in	in

"Drive address 0" (no jumper at DA1, DA2, or DA3) is a "deselect" (i.e., no drive selected).

Drives are factory configured as Drive Address 1.

For many multiple drive installations, each drive must have a unique address. An exception is that for every drive in a PC/AT installation, verify that only Drive Address is at DA2; move the jumper if necessary (the special twisted interface cable that is generally used takes care of assigning a unique address to each drive). PC/AT controller can typically support a maximum of two drives.

\* W5 selects the spindle a control option. If W5 is installed, The drive waits for a Start Spindle command(after power is applied) to start the spindle motor.

If W5 is not installed (the factory default configuration),the drive automatically starts the spindle motor at power-on. W5 is not installed for PC/AT applications.

\* W1 selects the sectoring mode. If W1 is installed, the drive operates in the soft-sectored mode.

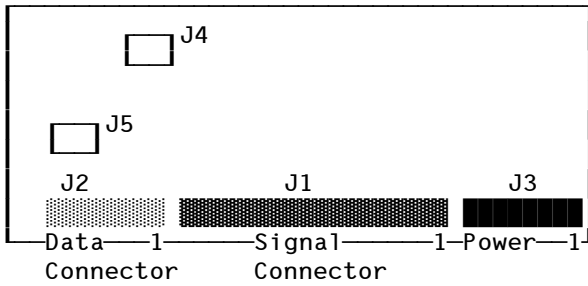
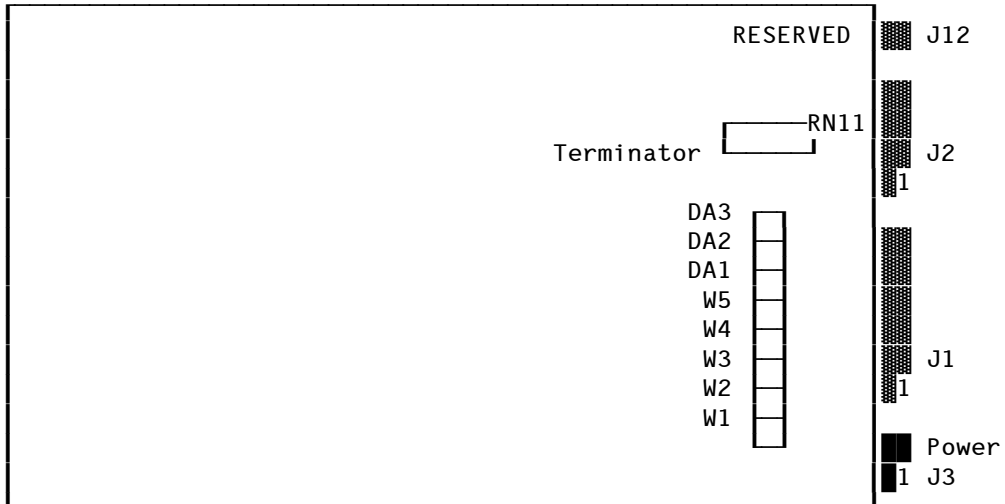
If W1 is not installed (the factory default configuration), the Drive operates in the hard-sector mode. W1 is not installed for most PC/AT in applications.

W28 is for the Frame ground option.

\* The number of bytes per sector may be specified using the Set Bytes Per Sector command or by selecting a default sector configuration with jumpers W2, W3, and W4 as follows:

Jumpers			Sectors Per Track	Bytes/Sector	
W4	W3	W2		Formatted	Unformatted
out	out	out	53	512	588
* out	out	in	54	512	576
out	in	out	28	1024	1116
out	in	in	14	2048	2232
in	out	out	7	4096	4464
in	out	in		(Reserved)	
in	in	out	97	256	321
in	in	in	1	31,248	31,248

\* This is the default (factory installed) configuration and is recommended for PC/AT applications



**Jumper setting**

\* = Jumper set at factory

Drive Select DA3/DA2/DA1

Drive Address	Select Jumpers		
	DA3	DA2	DA1
* 1	OPEN	OPEN	CLOSED
2	OPEN	CLOSED	OPEN
3	OPEN	CLOSED	CLOSED
4	CLOSED	OPEN	OPEN
5	CLOSED	OPEN	CLOSED
6	CLOSED	CLOSED	OPEN
7	CLOSED	CLOSED	CLOSED

Drive Address 0 is used as a "deselect" (i.e., no drive is selected).

The three Drive Select interface lines are decoded to select the correspondingly addressed drive to the host controller/formatter. In multiple drive systems, each drive must have its own unique address.

Terminator Pack RN11 provides proper termination for the interface lines. When daisy-chaining multiple 1560 drives, the terminator is installed only in the last drive on the daisy chain.

W1 Hard- or Soft-sectored mode

- CLOSED The drive is configured to operate in the SOFT SECTOR mode. Address mark generation and detection are enabled, and the Sector/Address Mark Found interface signal is used to report address mark found. Sector size is selected by the host controller.
- OPEN The drive is configured to operate in the HARD SECTOR mode. The Sector/Address Mark Found interface signal is used to transmit sector pulses to the host controller.

Sector pulses are derived from the servo disk. The number of sector pulses generated is equal to:

$$\text{INT} \left[ \frac{31,250}{n} \right]$$

Where 31,250 = byte clock derived from servo disk  
 INT = integer part of  
 n = the number of unformatted bytes/sector  
 (82 minimum)

W2/W3/W4 Hard Sector Configuration

Sectors	Bytes/Sector		Jumpers		
	Formatted	Unformatted	W4	W3	W2
	Reserved		OPEN	OPEN	OPEN
* 54	512	577	OPEN	OPEN	CLOSED
28	1024	1116	OPEN	CLOSED	OPEN
14	2048	2232	OPEN	CLOSED	CLOSED
7	4096	4464	CLOSED	OPEN	OPEN
-	Reserved		CLOSED	OPEN	CLOSED
97	256	321	CLOSED	CLOSED	OPEN
1	31248	31248	CLOSED	CLOSED	CLOSED

\* Factory default configuration

W5 Spindle Control Option

- CLOSED The drive must wait for a Start Spindle command to start the spindle motor.
- OPEN The drive automatically starts the spindle motor at power-on. (Factory default configuration)

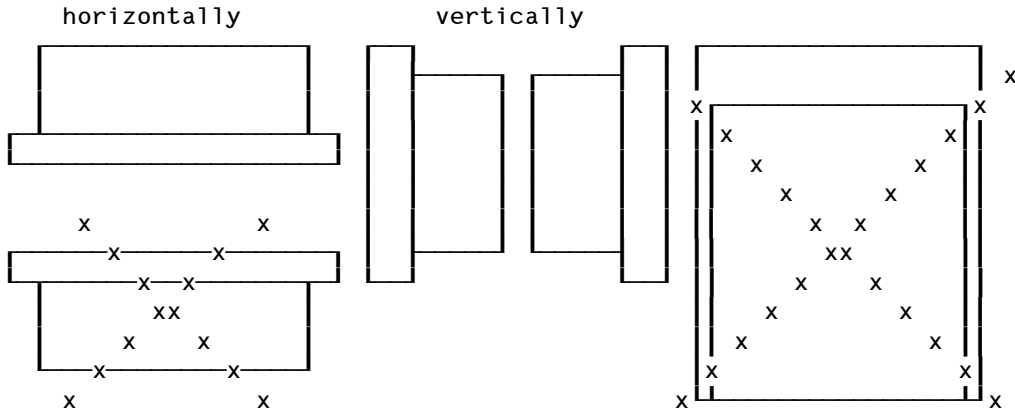
J3 DC Power and pin connector assignments

1	2	3	4	pin 1	+12 V
				pin 2	+12 V Return
				pin 3	+ 5 V Return
				pin 4	+ 5 V

J12 RESERVED!

## Notes on installation

### Drive mounting



### Dimensions and Mounting

Recommended orientation is vertical on either side, or horizontal with the Device Electronics board down; other mounting orientations may be used provided the ambient air temperature around the drive is kept at or below 50°C (122°F).

Inasmuch as the drive frame acts as a heat sink to dissipate heat from the unit, the enclosure and mounting structure should be designed to allow natural convection of heat around the HDA and outer frame. If the enclosure is small or natural convection is limited, a fan may be required.

The 1560 Series uses industry-standard mounting 5 1/4-inch Winchester disk drives (the same as for 5-inch flexible disk drives).

### Mounting Screws

2 per side 6-32 UNC-2B x 0.156 max deep.  
4 on bottom 6-32 UNC-2B x 0.20 max deep

Caution: The length of the mounting screws must be such that the screws do not penetrate the bottom mounting holes more than .20 inches and the side mounting holes more than .156 inches. Maximum torque applied to the screws must not exceed 10 in-lbs.

### Control Signal Connector J1

J1 is a 34-pin board-edge connector. The signals on this connector control the drive and transfer drive status to the host controller.

Recommended Cable: 3M Scotchflex 3365/34

Mating Connector: AMP 88373-3 (key slot between pins 4 and 6)

Data Transfer Connector J2

J2 is a 20-pin board-edge connector. The signals on this connector contain read or write data.

Recommended Cable: 3M Scotchflex 3365/20

Mating Connector: AMP 88373-6 (key slot between pins 4 and 6)

DC Power Connector J3

J3 is a 4-pin, keyed AMP MATE-N-LOK Connector. This connector supplies DC power (+5V and +12V) to the drive.

Mating Connector: AMP 1-480424-0  
Pins: AMP 350078-4

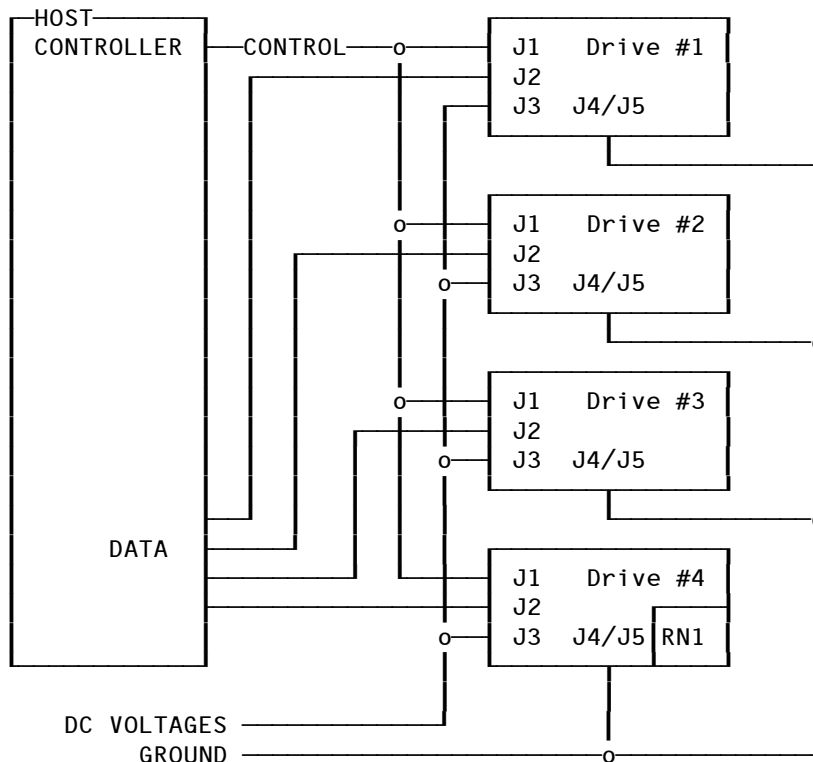
Suggested Wire Size: 18 AWG

Ground Connectors J4/J5

3/16-inch spade lugs J4 and J5 are provided for grounding; system characteristics determine the proper ground connection.

Mating Connector: AMP 60972-2 or equivalent.

Daisy-Chaining the 1560 Drive



Interface Terminator RN11 is installed ONLY in the last physical drive in the control chain.

Connectors J4 and J5 are provided for grounding; system characteristics determine the proper ground connection.

### Interface Electrical Characteristics

The signals at Control Signal Connector J1 control the drive and transfer drive status to the host controller. The signals are low-true at the interface, high-true into drivers and out receivers, and have the following logic levels:

True = 0.0 VDC to 0.4 VDC @ I = -48 milliamps (maximum)

False = 2.5 VDC to 5.25 VDC @ I = +250 microamps (open collector)

All interface data transfer signals are differential in nature.

Up to seven drives can be connected to one host controller/formatter. Drive Select 1, 2 and 3 carry the binary-coded address of the drive to be selected. The address of the drive is set with driveselection jumpers DA1, DA2, and DA3 as a binary combination. When the address is decoded and the decoded value matches the value specified by the three drive-selection jumpers, that drive is enabled to receive commands and transmit status. Drive Select 1 is the least significant bit.

### Adjustments and Maintenance

The 1560 Series of drives requires no adjustments or periodic maintenance. Additionally, no mechanical adjustments are required to prepare the drives for handling or shipment.

### Field-Replaceable Components

The concept of repair by replacement of complete functional components is utilized in the 1560 Series, resulting in an MTTR of less than 15 minutes.



## MICROPL. 1560 SERIES PRODUCT DESCRIPTION 104742 REV. B

Micropolis 1560 Series high-performance, 5 -inch Winchester Disk Drives provide OEMs with high-speed, high-capacity, random-access storage. They are fully compatible with the Serial mode of the Enhanced Small Device Interface (ESDI) standard and are designed to meet the needs of diverse applications environments.

### Media Defects

Media defects are physical characteristics of the media which result in repetitive read errors when a functional drive is operated within specified operating conditions.

At the time of manufacture, a media test system evaluates every drive and identifies each media defect location. The defects are logged on a label affixed to the drive. The defective areas are identified by head (HD) address, cylinder (CYL) address, and number of Bytes from Index (BFI). A printed listing of the defects is also shipped with each drive.

A defect list is written for each data surface. The list is written on the corresponding surface in Sector 0 at three cylinder locations:

- 1) The maximum cylinder (1631).
- 2) The maximum cylinder minus 8 (1623).
- 3) A special cylinder which is accessed as "Cylinder 4095 (FFF in hex.)". This is in compliance with the industry-standard ESDI specification. Do not attempt to write to Cylinder 4095.

Micropolis specifies that all 1560-series disk drives will meet or surpass the following criteria:

All drives shall have no more than one defect per megabyte of unformatted media. Additionally, Cylinder 0 and the cylinder at 4095 shall be defect-free at the time of shipment.

### Head/Disk Assembly

The Head/Disk Assembly (HDA) consists of a die-cast structure that contains virtually all the drive's mechanical components. Two die-cast members create a sealed clean area. Components included in the clean area are the read/write heads, the magnetic disks, the head preamplifier, and the rotary positioner. Electrical connection between the mechanics in the clean area and the electronic circuit boards is made with flexible circuits.

### Data Transfer Signals

Four pairs of balanced signals are used to transfer data: NRZ Write Data, NRZ Read Data, Write Data Clock, and Read/Reference Clock.

### Seek Time

			1560
Track-to-Track		msec. typ.	4
	Average	msec. typ.	16
		msec. max.	35
One-Third Stroke		msec. max.	17
Latency		msec. avg.	8.33
	Nominal	msec. max.	16.67