

MODEL 2085

3.5inch HP-IB Winchester Disk

with HIGH DENSITY

Micro Floppy Disk/

Local Tape Backup Unit

Owner's Guide

ISA Co., Ltd.

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1. INTRODUCTION

The ISA MODEL 2085 is a 3.5inch Winchester type hard disk with a single HIGH DENSITY 3.5inch micro floppy unit designed for the HEWLETT -PACKARD HP9000 series computers. It is compatible with the HP9134 at the command level.

MODEL 2085 is available in following Winchester capacities. The Winchester unit can be divided into 1, 2, 4 and 8 volumes as selected by switches.

MODEL	Capacity	Emulation	Protocol
2085	1GB	HP9133	SS/80

2. SETTING UP

MODEL 2085 comprises the following basic components :

①	MODEL 2085 drive unit	1
②	Power cable	1
③	MODEL 2085 owner's guide	1
④	Spare fuses	1

3. POSITION THE DRIVE

Choose a place which satisfies the following points :

- ☑ Ventilator slots at the front of the drive and the grille at the rear must not be obstructed, so that the drive has adequate ventilation.
- ☑ The drive should be in a position where the temperature is relatively stable for example, away from open windows, fan heaters, and doors.
- ☑ The cable - run between the host and the drive should be as short as possible.

4. POWER EQUIPMENTS

MODEL 2085 accept two main voltages :

90 to 132 VAC, 50/60 Hz
180 to 264 VAC, 50/60 Hz

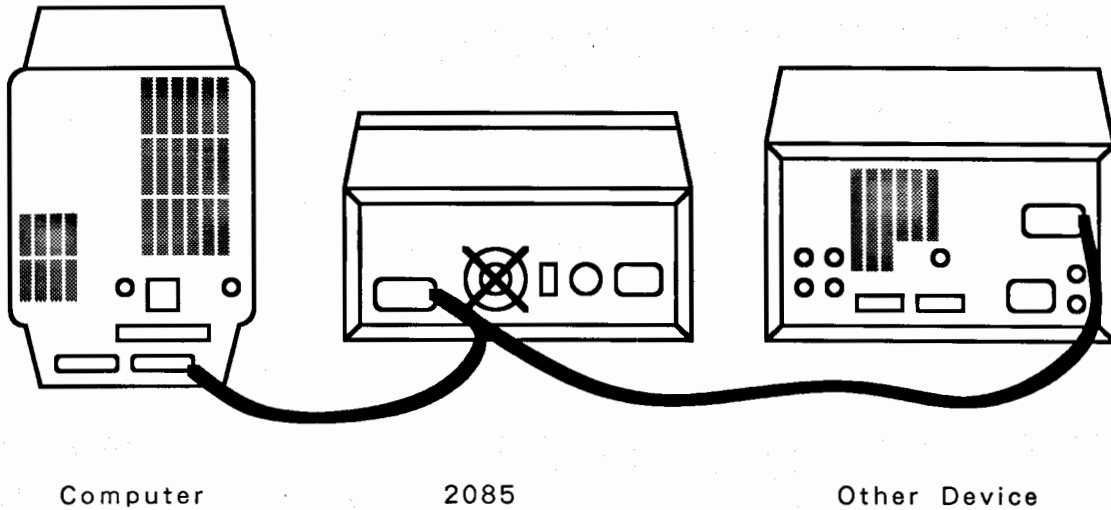
Input main voltages can be selected using a slide switch on the back panel.

The fuses used in these two versions are :

90 to 132 VAC, 1.0 amperes (slow blow)
180 to 264 VAC, 1.0 amperes (slow blow)

5. CABLE CONNECTION

MODEL 2085 must be connected to the computer through an HP-IB interface. To connect the disk unit, plug the HP-IB cable into the correct connector on the back panel of the disk unit.



♣ Be sure to turn off all power when connecting cables.

5 - 1 Device Address

All devices on an HP-IB bus must be assigned different device addresses. You can select one for the MODEL 2085 out of eight device addresses from 0 to 7. The device address can be set using the DIP switches located on the back panel of the unit. It is read by the disk control electronics at power-on time. As shipped from the factory, the device address is set to 0.

Address	SW1	SW2	SW3
0	OFF	OFF	OFF
1	ON	OFF	OFF
2	OFF	ON	OFF
3	ON	ON	OFF
4	OFF	OFF	ON
5	ON	OFF	ON
6	OFF	ON	ON
7	ON	ON	ON

5 - 2 Unit Number

The unit number of the unit, Winchester disk section is 0, and Floppy disk section is 1. It is possible to reverse it by DIP switch setting.

DIP switch 4	Winchester Disk section	Flexible Disk section
OFF	0	1
ON	1	0

5 - 3 Volume Partition

The Winchester section of the MODEL 2085 can be partitioned into a maximum of eight volumes by setting DIP switch.

DIP switch		Number of Volume	Volume ID
5	6		
OFF	OFF	1	0
ON	OFF	2	0, 1
OFF	ON	4	0, 1, 2, 3
ON	ON	8	0, 1, 2, 3, 4, 5, 6, 7

Volume Size Table

MODEL		2085	
Sector Size		256	512
Volume	1	4,094,976 blks	2,047,488 blks
	2	2,047,488 blks	1,023,744 blks
	4	1,023,744 blks	511,872 blks
	8	511,872 blks	255,936 blks

5 - 4 Sector Size Control

The sector size of the Winchester unit is user selectable. The definition of DIP switches 7 and 8 is as follows:

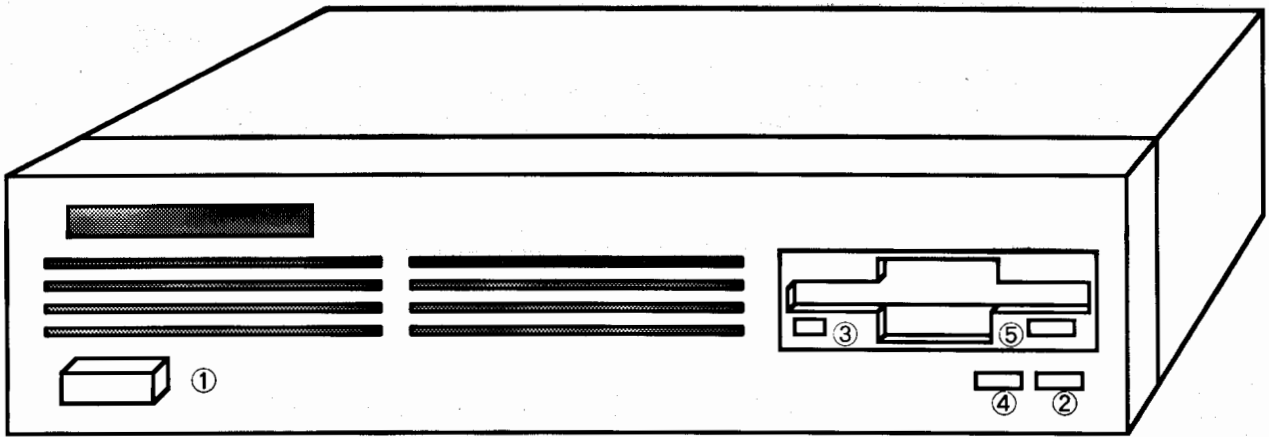
Dip Switch		Sector Size	Total Capacity
7	8		2085
OFF	OFF	256	1,048,313,856
ON	OFF	512	1,048,313,856
OFF	ON	256	1,048,313,856
ON	ON	Format Protect	

After initialized all partitions you created, you can protect your hard disk contents from formatting by mistake. By switches 7 and 8 both in the ON position. This switch setting will disregard a "INITIALIZE" command only.

5 - 5 Dip Switch Definition

1	}	HP - IB Address Switch	1LSB	3 = MSB
2				
3				
4	—	Unit number control		
5	}	Setting Number of Volume Switch		
6				
7	}	Setting Sector Size Switch		
8				

6. FRONT PANEL DESCRIPTIONS



- | | | | |
|---|--------------|---|---------------------------------------|
| ① | POWER switch | ☐ | A.C. power to unit |
| ② | POWER lamp | ☐ | Lit to indicate unit powered ON |
| ③ | BUSY lamp | ☐ | Lit to indicate floppy drive accessed |
| ④ | ACCESS lamp | ☐ | Lit to indicate hard drive accessed |
| ⑤ | EJECT button | ☐ | Press to eject the diskette |

7. OPERATING PROCEDURE

7 - 1 Hard Drive Operation

7 - 1 - 1 Turning Power ON

After making sure that the cables are properly connected turn on the POWER switch. The POWER lamp will light and the disks start rotation. When the specified rotational speed is attained, the disk unit makes self-diagnostics (during this period the ACCESS lamp on the front panel will be on.) If no error is found, the disk unit makes a seek to sector 0 on each volume, then to the innermost cylinder. The computer can access the disk unit approximately 30 seconds after power-on if no error is detected. If error is found then the disk unit continues self-diagnostics. During this period the controller can gain no access to the disk unit. If this condition occurs, the controller will display an error message "DEVICE NOT PRESENT OR BAD ADDRESS" after an unsuccessful access.

7 - 1 - 2 System Operation

Once the disk unit is ready the computer can initialize, store, and loads data and programs into and from the disk unit. The procedures for performing these operations will differ depending on the computer and programming language used. The rest of this section describes the basic procedure for operating the disk unit for the HP9000 and series 200/300 computing systems using BASIC 3.0.

The BASIC 3.0 and 4.0 programming systems use different I/O driver programs. When using BASIC 3.0 or 4.0, you must install I/O driver programs CS80 and HP-IB. Refer to 《BASIC 3.0 User's Guide》 for the procedure to load CS80 and HP-IB.

Initialize the disks when using the disk unit for the first time. The sample code shown below is used to initialize the disk unit that is divided into four volumes.

```
eg. INITIALIZE" : CS80,700,0,0"  
      INITIALIZE" : CS80,700,0,1"  
      INITIALIZE" : CS80,700,0,2"  
      INITIALIZE" : CS80,700,0,3"
```

For this configuration, DIP switch 5 must be set to OFF and 6 must be set to ON, respectively.

Once the disk unit is initialized, it will be accessible to the OS under which it was initialized. For example, you can copy a file as shown in the example below.

```
eg. STORE SYSTEM "SYSTEM_B30 : CS80,700,0,0"  
      COPY "file_name : CS80,702,0" TO "file_name : CS80,700,1,0"
```

You may omit "CS80".

■ CAUTION ■

Copying must be done in file units. Copying from a larger disk onto a smaller disk (volume copying specifying no file name) will not work properly and copying from a smaller disk onto a larger disk will reduce the size of the directory of the larger disk down to that of the smaller disk.

7 - 1 - 3 Winchester Disk Initialization

All volumes must be initialized after the MODEL 2085 is installed or whenever the number of volumes is changed. Exercise extreme care when initializing the MODEL 2085 volumes as initialization destroys all data on the target the volume. It takes approximately 10 to 20 minutes.

During initialization, sectors are checked for errors and any defective sectors are replaced by alternate sectors. This also recovers the media from errors that are caused during transportation.

IMPORTANT

Volume 0 must be initialized first before other volumes can be initialized, otherwise error will occur.

INITIALIZING VOLUME 0 WILL DESTROY ALL DATA ON DRIVE!

- ① Switches 7 and 8 should be set to the desired value before initializing volume 0.
- ② Must not change the 7 and 8 switch setting once volume 0 has been initialized. If 7 and 8 switch setting is not the same as the present sector format on the Winchester then an uninitialized error will be generated. (Except Format Protect setting - 7 & 8 on)
- ③ 512 B/S is recommended for HP - UX systems.
- ④ 512 B/S cannot be used under BASIC language systems.
- ⑤ Unit is formatted to 256 B/S before shipped.

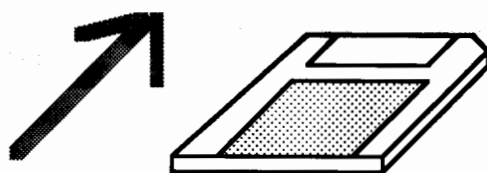
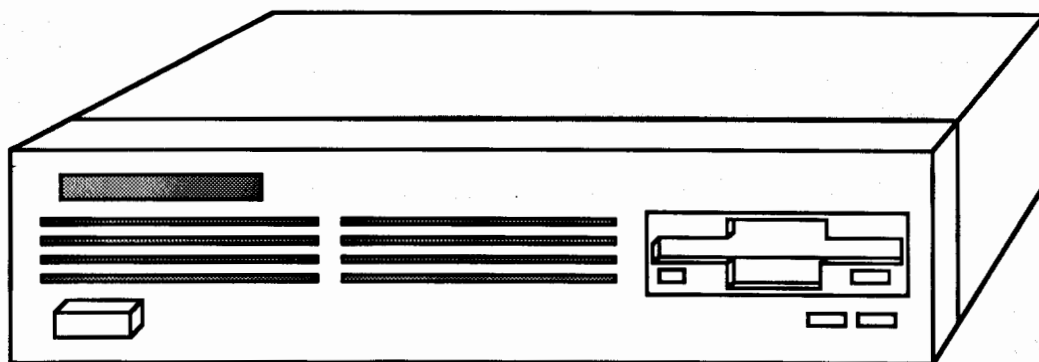
7 - 2 Floppy Disk Operation 1

7 - 2 - 1 Floppy Unit

The Floppy unit of the MODEL 2085 can use either double/single-sided, double density (2DD type, 135 TPI) or double-sided, high density (2HD, 135 TPI) 3.5 micro floppy diskettes. The two types of diskettes will give storage capacities of approximately 750Kbytes and 1.6Mbytes respectively. Consult the individual manual attached to the HP computer for details on media initialization.

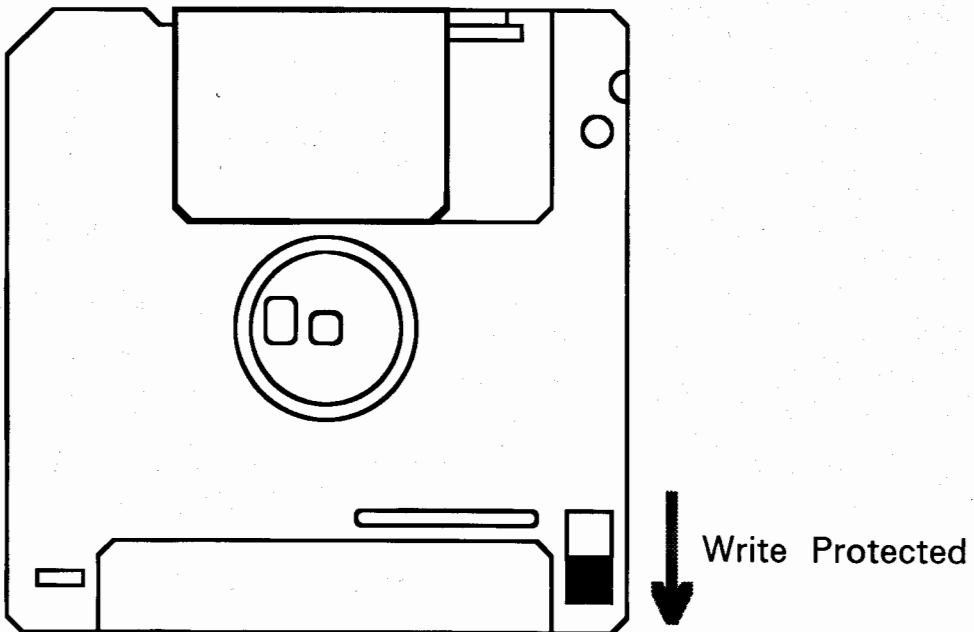
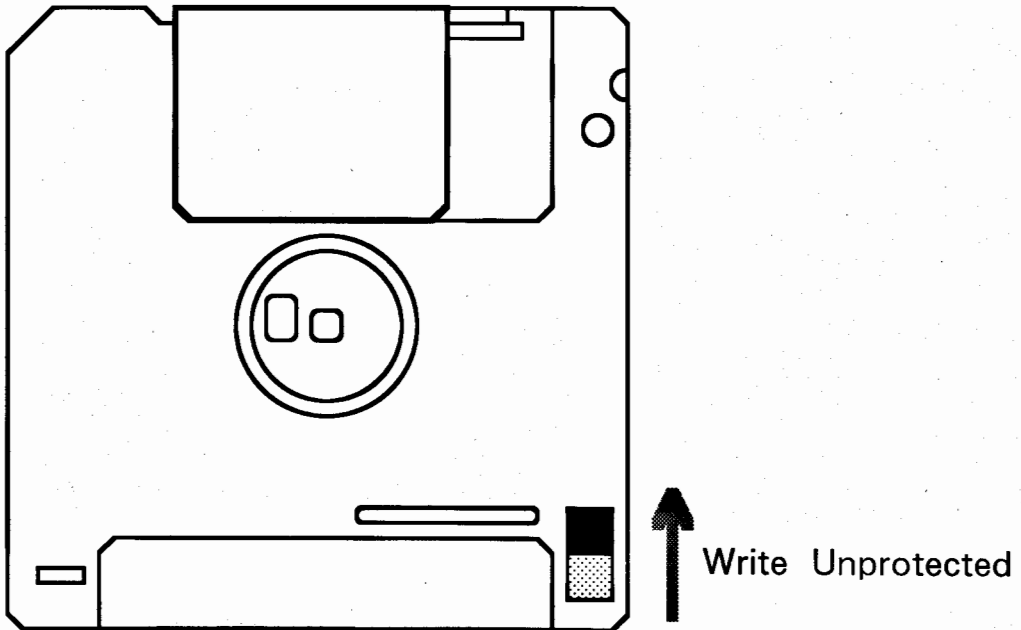
7 - 2 - 2 Insert the Floppy Disk

To load a floppy disk in the MODEL 2085 series, place diskette with its label facing upward. Insert diskette into drive until a click is heard. When removing the floppy disk, push the EJECT button, and the floppy disk will pop out. Do not press the EJECT button while the disk is being accessed (Busy lamp ON).



7 - 2 - 3 Write Protect

To write protect a floppy disk, lower the write protect slide.



7 - 4 Media Initialization

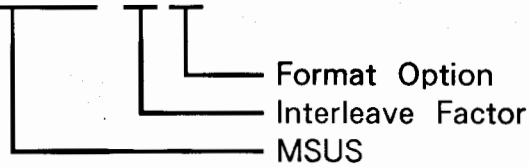
The MODEL 2085 can be handled in the same way as the HP9153C. Possible to designate Interleave Factor as well as format option which allow 1.4MB/1.2MB 2HD format selection.

《HP - UX》

mediainit -i 2 -f 3 device file name

《HP - BASIC》

INITIALIZE" : CS80,700,0", 2, 3



☞ The most suitable no. of Inter leave Factor depends on operation system, application and so forth. Set it 2 when the most suitable number is unknown.

☞ The media initialization takes approximately 2 minutes, during which the disk ACCESS LAMP lights up.

【FORMAT OPTION】

Format Option		0/1	2	3	4	15	16	17
2DD	Bytes/Sector	256	512	1024	256	256	512	1024
	No. of Track	77	77	77	66	80	80	80
	Head	2	2	2	1	2	2	2
	Sector/Track	16	9	5	16	16	9	5
	Capacity	630784	709632	788480	270336	655360	737280	819200

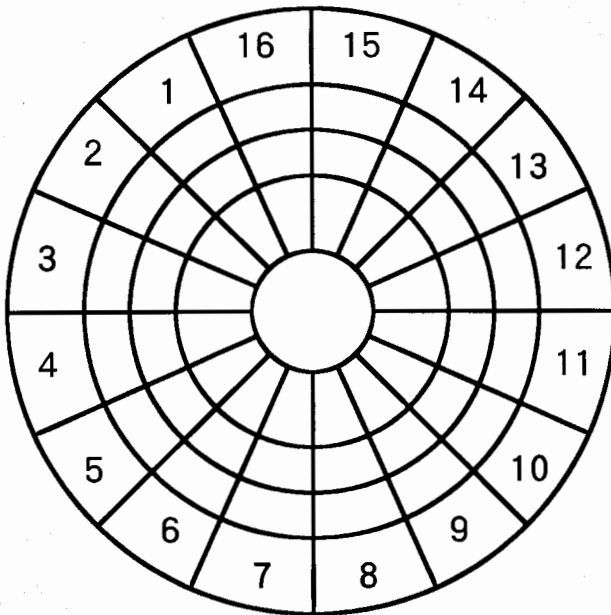
Format Option		0/1	2	3	5	6
2HD	Bytes/Sector	256	512	1024	256	512
	No. of track	77	77	77	80	80
	Head	2	2	2	2	2
	Sector/Track	32	18	10	26	15
	Capacity	1261568	1419264	1576960	1064960	1228800

Format Option		7	15	16	17	-----
2HD	Bytes/Sector	1024	256	512	1024	-----
	No. of track	80	80	80	80	-----
	Head	2	2	2	2	-----
	Sector/Track	8	32	18	10	-----
	Capacity	1310720	1310720	1474560	1638400	-----

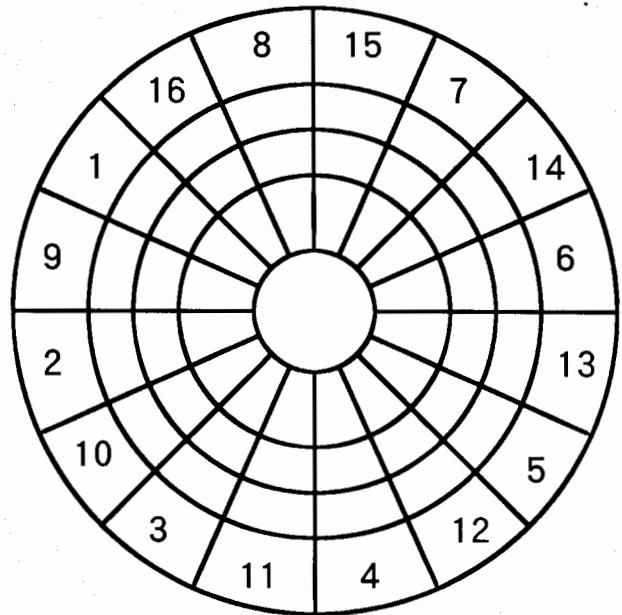
♣ note ♣

- ① The MODEL 2085 automatically detects the presence of 2DD or 2HD diskettes.
- ② The speed of read and write with 2DD is slightly slower than 2HD.
- ③ 2DD type media initialized by format option 16 provides highest compatibility with other devices and suitable for data change with MS-DOS and various workstations.
- ④ Select format option 0~4 to change data with HP disk using 2HD type media. Otherwise media cannot be read by some HP devices such as HP9122. The others format options are available for data - change with other manufacturer's machines.
i.e. Format option 7 is compatible with NEC-PC, EWS4800, etc.
Format option 16 is compatible with IBM-PC, SUN workstation etc.
- ⑥ The format option 2 (512 bytes/sector) is not available for BASIC language systems.

7 - 5 Track Formats



Interleave Factor = 1



Interleave Factor = 2

♣ note ♣

The above figure shows sector format for 2DD,256B/S. Other sector format differs depending on the format option selected.

8. MISCELLANEOUS CONSIDERATIONS

8 - 1 Transportation

Winchester drives are sensitive to shocks and vibrations. Exercise extreme care when transporting your disk unit. When packing your hard disk drive for relocation, observe the following steps:

- ① Turn off hard disk power and disconnect the power and HP-IB cables.
- ② Place the disk drive in the original shipping container checking for proper orientation.

8 - 2 Error Recovery

It is necessary to reinitialize the hard disk and perform alternate track processing if a hardware or unrecoverable error occurs on track. When reinitializing, save necessary files onto another volume or floppy disk as reinitialization will destroy all data on the volume. Note that the file on which the error occurred may not contain correct data.

Hardware errors may be caused not only during transportation but also by power shut-off or failures during write processing. It is recommended to take backup copies of important files.

9. SPECIFICATIONS

Winchester Disk Specification

MODEL	2085	
Formatted Capacity (Bytes)	1.3GB	
Sector Size (Bytes)	256	512
Number of cylinders	2142	
Number of data heads	13	
Ave. seek time (ms)	12/< 11	
Ave. loatency (ms)	5.56	
Revolution (rpm)	5400	
MTBF (H)	500,000	

♣ Formatted Capacity can be changed depending on the sector size.

Physical Specification

Item	MODEL 2085
Power Requirements (V)	90~132/180~264 (Switch selectable)
Power Consumption (W)	40
Frequency (Hz)	47~440
Operating Temperature (°C)	5~50
Operating Humidity (%RH)	8~80
Operating Altitude (m)	- 305~3000
Dimensions H × W × D (mm)	75 × 325 × 285
Weight (Kg)	6.0

Floppy Drive Specification

2DD									
Formatted Capacity (KB)*1	270	630	655	709	737	788	819	----	----
Bytes/Sector	256	256	512	512	512	1024	1024	----	----
Sector/Track	16	16	9	9	9	5	5	----	----
Track/Surface*2	66	77	77	77	80	77	80	----	----
Surface/Disk	1	2	2	2	2	2	2	----	----
Data Transfer Rate (KB/S)	250							----	----
Recording Density (BPI)	8717							----	----
Average Access Time (ms)	175							----	----
Rotational Speed (rpm)	300							----	----
Track Density (TPI)	135							----	----
Roading Method	MFM							----	----

2HD										
Formatted Capacity (KB)*1	1261	1310	1419	1474	1576	1638	1064	1228	1310	
Bytes/Sector	256	256	512	512	1024	1024	256	512	1024	
Sector/Track	32	32	18	18	10	10	26	15	8	
Track/Surface	77	80	77	80	77	80	80	80	80	
Surface/Disk	2	2	2	2	2	2	2	2	2	
Data Transfer Rate (KB/S)	500						500			
Recording Density (BPI)	17434						14528			
Average Access Time (ms)	95						95			
Rotational Speed (rpm)	300						360			
Track Density (TPI)	135									
Roading Method	MFM									

♣ note ♣

* 1 KB = 1024bytes

* 2 Indicate the number of valid track.
 Single - sided = 66
 Double - sided = 77 or 80.

10. WARRANTY

ISA warrants the disk units to be free from defects in materials and workmanship for a period of one year after shipment. This warranty will not cover failures of the disk units which result from accident, abuse, negligence, alteration, or misuse of the unit by the purchaser. Products which, upon investigation by ISA, prove to be defective in accordance with the provisions of this warranty will be repaired or replaced by ISA at no cost to the purchaser.

Products for repair or examination must be returned to ISA prepaid. All shipping expenses for return of the product to our plant for warranty or non-warranty service are to be borne by the purchaser. ISA shall pay shipping charges for returns of the product to the purchaser.

When returning a product for repair, attach a memo describing the symptom and pack the product carefully to prevent possible damage during transportation. The repair of damage incurred during transportation is not covered by this warranty. It is recommended that products be shipped insured to ISA.

11. APPENDIXES

Resources Required for Operating the Disk Unit

HP80 series		EXTENDED MASS STORAGE ROM	
HP150 series		HP150B or C	
HP9000 series	S/300	- BASIC	○
		- PASCAL	○
		- HPL	---
		- HP - UX	9.X or later
	S/400	- BASIC	○
		- HP - UX	9.X or later
HP1000		RTE - A or RTE - 6VM	
HP64000		○	

♣ Contact ISA for computing systems other than those listed above.