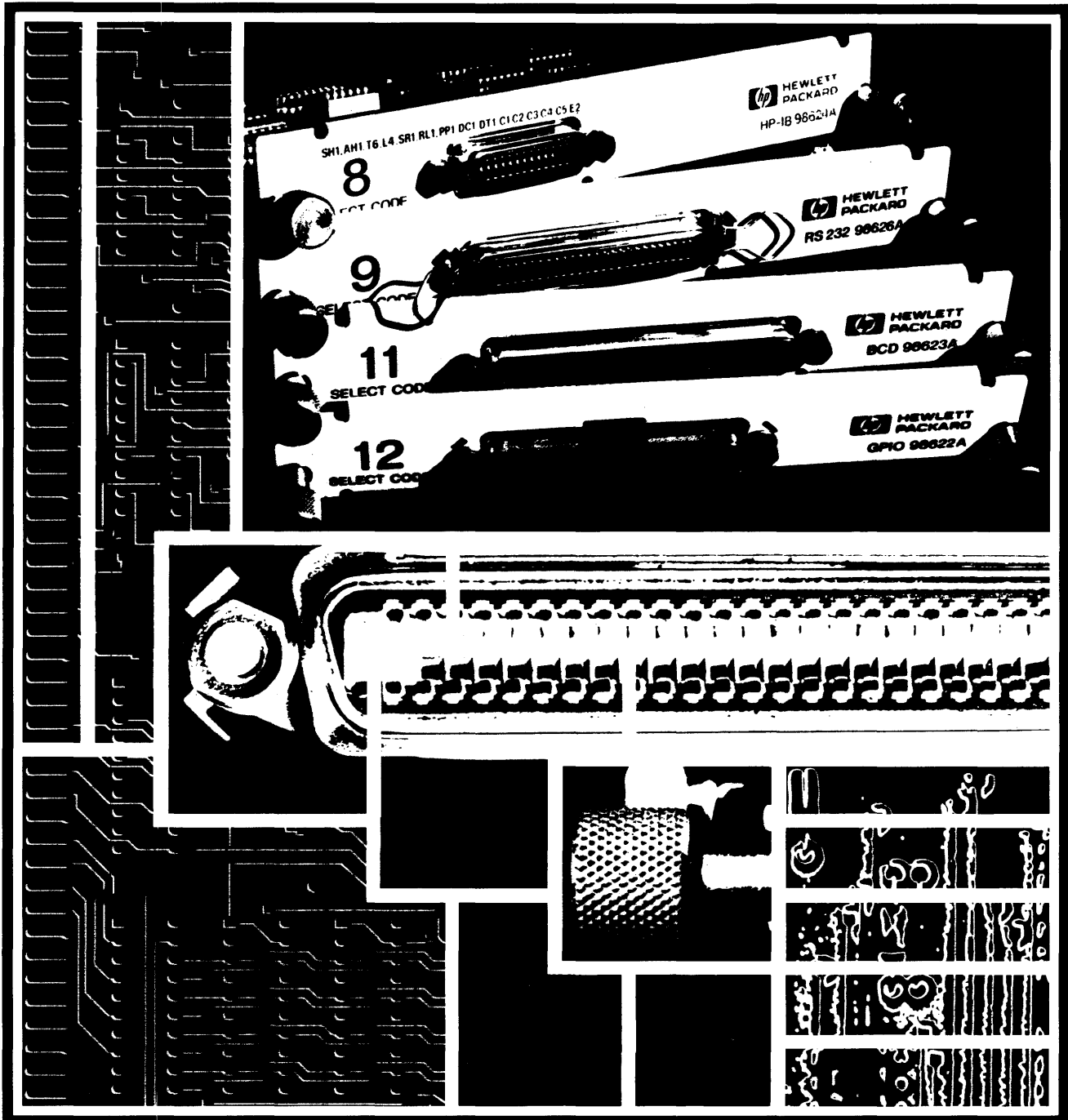
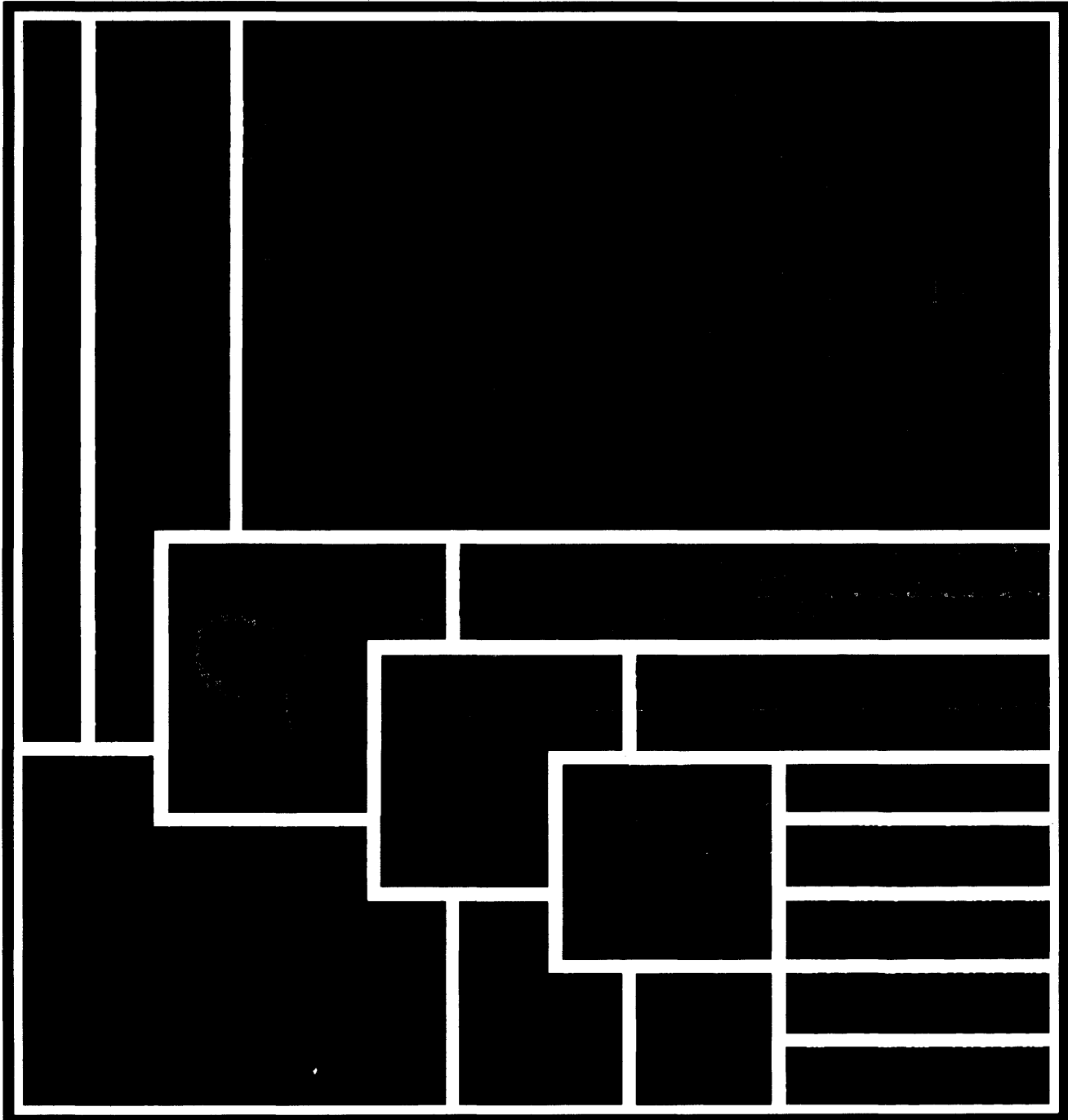


HP Computer Systems

HP 98625A Disc Interface Installation



HP 98625A Disc Interface Installation





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HP 98625A

Disc Interface Installation

Part No. 98625-90000

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Table of Contents

Chapter 1: Interface Installation and Configuration

Introduction	1
Parts Supplied	2
Handling the Interface Card	2
Installing Interface Cards in the I/O Backplane.	3
Configuring the Interface	4
Connecting the Interface to Disc Drivers.	6
Interface Cables.	6
Physical Arrangement of Equipment.	6
Limitations	7

Chapter 2: Service Information

Theory of Operation	9
Parts List and Schematic Diagram	9

Figures

HP 98625A Disc Interface Configuration Switches	4
Recommended Arrangement of Computer and Disc Drives.	7
Disc Interface Block Diagram.	9

Tables

Parts Supplied	2
Default Configuration Settings.	4
Interface Select Code Switch Settings.	5
Binary/Decimal Table of Hardware Interrupt Levels.	5
Available HP-IB Interface Cables	6
Disc Interface Cable Length Limits	7
Replaceable Parts List	10

Chapter 1

Interface Installation and Configuration

Introduction

The HP 98625A Disc Interface is used in conjunction with an HP 98620 DMA card to connect your HP 9826 or HP 9836 computer to one or more mass storage disc drives. The interface is compatible with all Hewlett-Packard CS/80 disc drives including the following HP 7900 Series¹ units:

- HP 7908
- HP 7911
- HP 7912

To minimize potential difficulties, don't forget that:

- The interface contains a high-speed HP-IB controller, and is designed specifically for disc applications. Because of its high data rates and fast signal transition times, the interface is not suitable for use with other HP-IB peripherals.
- High-speed data transfers demand direct memory access capability; therefore, the interface cannot be used without a DMA card installed in the computer.
- The HP 10833 HP-IB chaining cables used with this interface are designed for high-frequency applications. To ensure reliable operation, do not use any other cable type.

Note

The HP 98625 Disc Interface requires an HP 98620 DMA card for operation. It cannot be used without DMA capability installed in the computer. Use only 256K-byte memory boards in combination with the disc interface and DMA card.

This manual explains the installation procedure for the disc interface. Additional technical information is included for use by service personnel.

¹ As new disc drives become available through new product development, the models supported by this interface may increase. Consult with your HP Sales and Service office if you need assistance in selecting disc drives for use with this interface.

Parts Supplied

The following items are supplied with the HP 98625A Disc Interface:

Item	Part Number
Interface Card	98625-66501
Installation Manual	98625-90000
Select Code Label	7120-1957

Handling the Interface Card

The interface card contains components that are easily damaged by static electrical discharge caused by improper handling. To minimize the risk of component damage, the interface is shipped in a special conductive plastic bag for protection. Do not remove the interface from the bag until it is to be installed. When installing the interface, be sure there is no opportunity to create a static discharge. Hold the interface by the thumbscrews and backplane cover while removing it from the bag, and avoid touching the circuitry on the card. Touch the metal surface on the computer rear cover panel with one hand and maintain that contact while plugging the interface into the computer with the other hand. After the interface is seated into the backplane connector, the risk of damage is negligible. Whenever you need to remove the card from the computer for service or system changes, keep the card in its protective bag to prevent component damage, or place the interface on a work surface designed for servicing static-sensitive electronic components and assemblies.

Be careful to avoid touching the printed circuit edge connector fingers on the interface. Fingerprints promote contamination that can lead to unreliable operation. If it becomes necessary to clean the fingers, use a cotton swab and isopropyl alcohol. Be sure to avoid the possibility of electrostatic discharges while cleaning the connector fingers; both for safety, and to prevent component damage.

Installing Interface Cards in the I/O Backplane

The HP 9826/9836 computer has eight backplane slots that can be used for interface cards, memory boards, and other devices. However, only four slots can be used for interfacing to external peripherals. The peripheral interface slots are located slightly below the threaded fasteners that hold the interface retainer screws when the card is inserted. If you insert the interface into the wrong slot, the thumbscrews in the interface cover cannot mate properly with the threaded fasteners in the rear panel. As successive interfaces are installed, the remaining slots that are available for memory or other devices are reduced by one for each interface inserted.

To install the interface card, follow these steps:

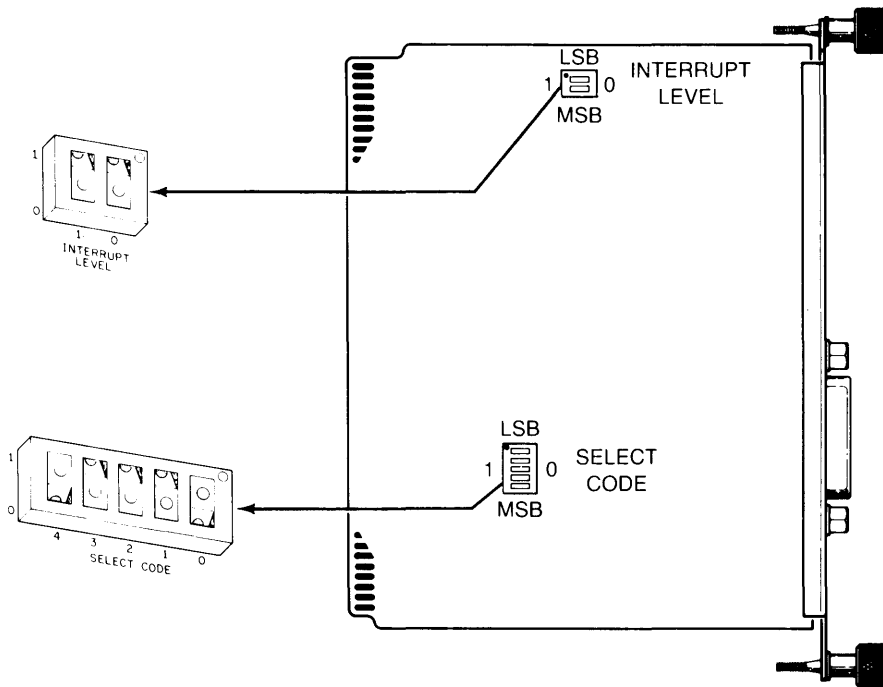
1. Set the configuration switches on the interface as instructed in the Configuring the Interface section later in this chapter.
2. Be sure that the computer power switch is OFF.
3. Remove one or more backplane covers to locate an empty I/O slot. If none is available, rearrange the memory boards as necessary. Memory boards can be installed in any slot in the backplane. Be sure all boards are firmly seated in their respective backplane connectors before replacing the covers.

If no slots are available, you must remove a memory board or other I/O card to free up the necessary backplane space. If you remove a RAM memory board, it must be the lowest address board in the backplane. Refer to the Operating Manual for your computer for information on how to identify the lowest-address memory card.

4. Slide the interface card into any available slot, component side UP. Seat the card firmly into its backplane connector, then tighten the thumbscrews until they are finger tight. Be sure a DMA card has been installed in the computer.
5. Replace any remaining covers that were previously removed, then use an appropriate cable to connect the interface to the first disc drive. Use HP 10833 cables to connect to other drives as explained later in this chapter.
6. Turn the computer and peripheral(s) on and operate as explained in the applicable operating manuals. If you encounter difficulty, contact your nearest HP Sales and Service office.

Configuring the Interface

As shown in the figure, there are two sets of configuration switches on the interface card. One determines the interface select code, and the other sets the hardware interrupt level. To set the switches, use a ball-point pen or other pointed object to depress the left or right side of the switch rocker. Be sure the rocker is fully seated in its proper position. When the right side of any rocker is fully depressed, the switch is **open**, and a binary ONE is programmed for that bit. If the rocker is fully seated, left side down, the switch is **closed** and a binary ZERO is programmed instead. Note the position of the most significant (MSB) and least significant (LSB) bits on each switch. The switches are shown in their factory-set (default) positions.



HP 98625A Disc Interface Configuration Switches

Default Configuration Settings

Configuration Switch Function	Default Value	Allowable Range
Interface Select Code	14	8 thru 31
Hardware Interrupt Level	6	3 thru 6

Interface Select Code Switch Settings

S2 Settings		Decimal Value	S2 Settings		Decimal Value
MSB	43210 LSB		MSB	43210 LSB	
0	1000	8	1	0100	20
0	1001	9	1	0101	21
0	1010	10	1	0110	22
0	1011	11	1	0111	23
0	1100	12	1	1000	24
0	1101	13	1	1001	25
0	1110	14	1	1010	26
0	1111	15	1	1011	27
1	0000	16	1	1100	28
1	0001	17	1	1101	29
1	0010	18	1	1110	30
1	0011	19	1	1111	31

Binary/Decimal Table of Hardware Interrupt Levels

S1 Settings		Decimal Value	Interrupt Level
MSB	LSB		
0	0	0	3
0	1	1	4
1	0	2	5
1	1	3	6

No other interface card can be set at the same hardware interrupt level as the HP 98625. Otherwise, system failure may result.

Default switch settings are compatible with most applications.

Connecting the Interface to Disc Drives

The HP 98625 Disc Interface is intended ONLY for connecting the HP 9826/HP 9836 Computer to HP 7900 Series disc drives equipped with CS/80 (Command Set 1980) controllers. Do not attempt to use the interface with any other disc or controller. If you have any question concerning compatibility of the interface and a specific drive, contact your nearest HP Sales and Service office. This chapter explains which interface cables can be used, and establishes guidelines for connecting multiple drives to a single interface.

Interface Cables

Use only HP 10833 HP-IB chaining cables to connect the disc interface to disc drives. These cables are also used to chain multiple drives together. HP 10833 Series cables are similar in appearance to standard HP-IB or IEEE-488 chaining cables, but they have additional shielding and other features to minimize RFI and improve noise characteristics. HP 10833 cables can be identified by the model number printed on the cable jacket at each end of the cable. **Do not use any other model cable to connect the interface to disc drives or controllers.**

Chaining cables are usually supplied with disc drives, so none is included with the interface. Cables are available in several lengths. If you need additional or different length cables, you can order any of the following:

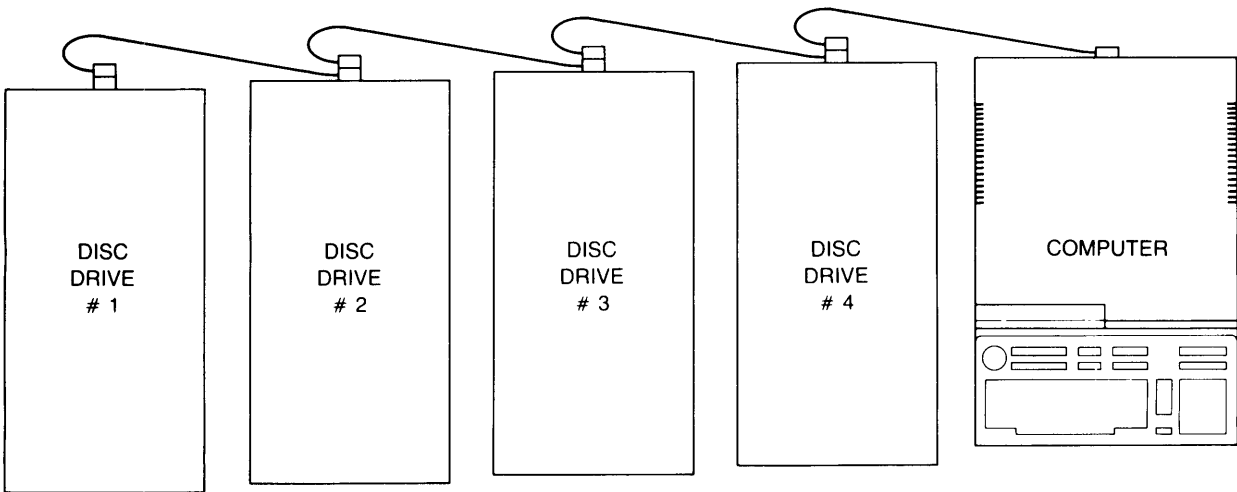
Available HP-IB Interface Cables

Catalog Number	Cable Length
10833A	1 metre
10833B	2 metres
10833C	4 metres
10833D	0.5 metre

Note that the total cable length in any application must not exceed 10 metres.

Physical Arrangement of Equipment

HP-IB connections can usually be made using either linear (“daisy-chain”) or star configurations. However, the linear configuration is preferred because it allows shorter cable lengths and maximizes noise and performance safety margins.



Recommended Arrangement of Computer and Disc Drives

Limitations

Electrical design limits require that the combined bus connections must not exceed 11 equivalent loads and 10 metres total line length for each interface. In addition, line length must not exceed **one** metre per equivalent load. (These restrictions are due to transmission line reflection characteristics and timing constraints for high data rates.) The interface presents seven equivalent loads. Most disc drive controllers in the CS/80 series present one equivalent load. Therefore, up to four discs can be connected to a single interface. If only one disc is used, line length must not exceed eight metres. Two discs can be connected with up to nine metres of cable; three or four discs with up to 10 metres. The maximum length of cable that can be connected to a single interface and up to four discs or equivalent loads is as follows:

Disc Interface Cable Length Limits

Equivalent Loads	Maximum Total Cable Length
1	8 Metres
2	9 Metres
3	10 Metres
4	10 Metres

Consult disc operating manuals to verify the number of equivalent loads presented by each controller.

8 Interface Installation and Configuration

Chapter 2

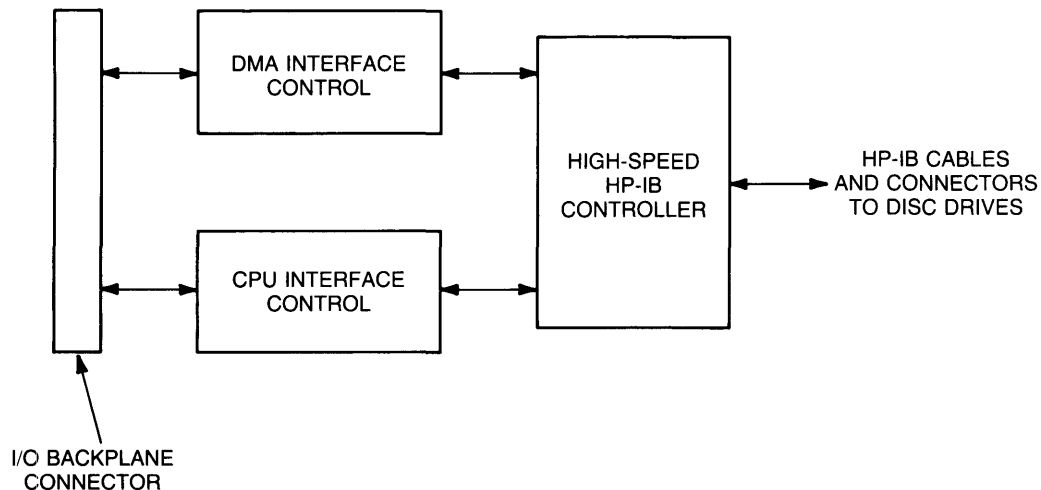
Service Information

Theory of Operation

The disc interface is, conceptually, relatively simple. It consists of:

- a high-speed HP-IB controller contained in a single integrated circuit package,
- a DMA interface/control state machine that manages the interaction between the HP-IB controller and the DMA card, and
- interface select/control circuitry that interacts with the computer through the I/O backplane.

The following block diagram shows the relationship of the circuit functions:



Disc Interface Block Diagram

Data transfers are set up and initiated by the computer through interaction with the interface. A DMA channel is activated, and all data transmission and reception is handled through the DMA channel. Upon completion of the transfer, an interrupt to the computer is generated. The computer then suspends the DMA channel and deactivates the interface. DMA capability is required because the high data rates exceed the capabilities of normal CPU-based I/O drivers.

Parts List and Schematic Diagram

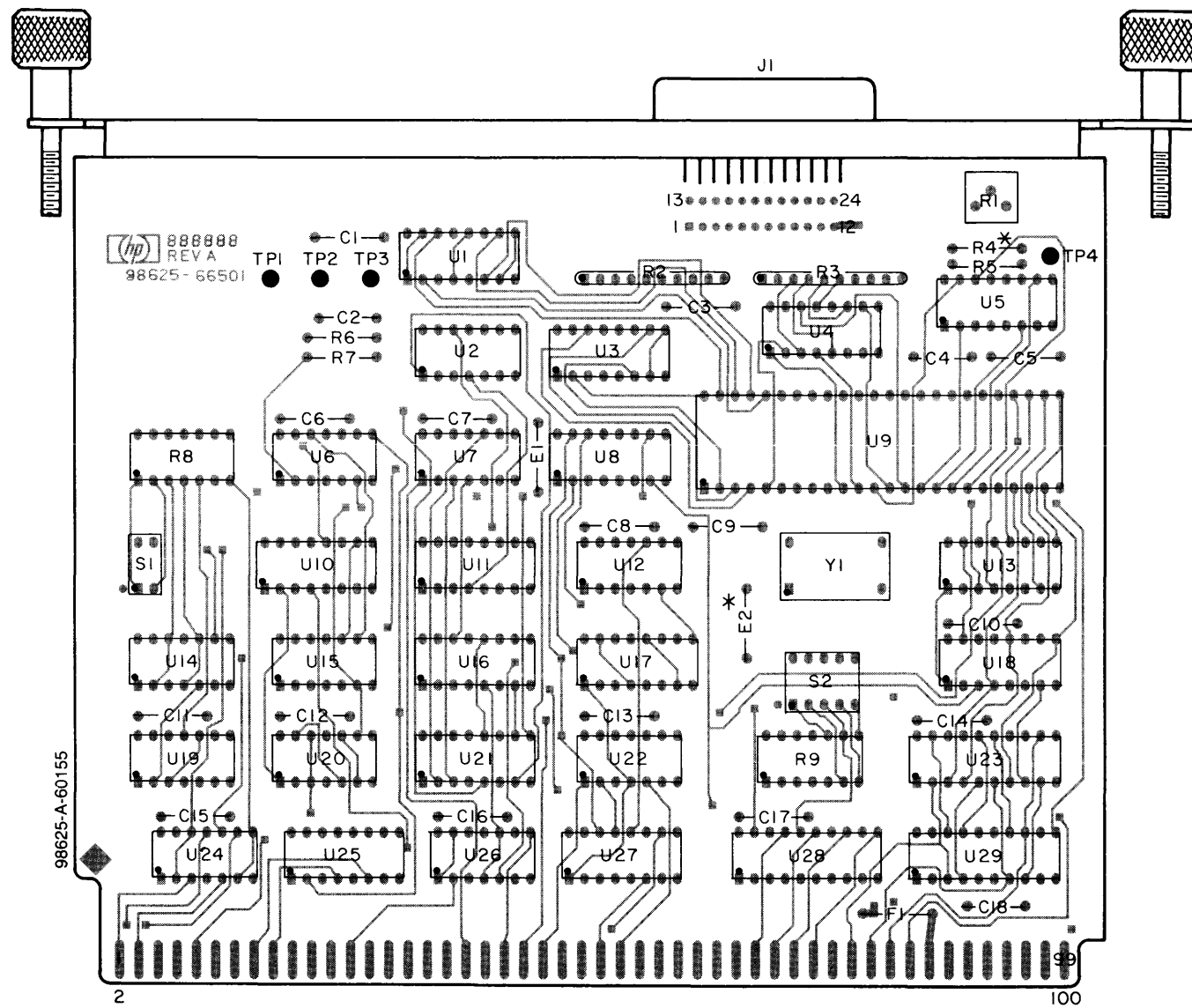
The Disc Interface is normally serviced on a replacement basis. However, the following list of replacement parts is provided for your convenience.

Replaceable Parts List

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
	98625-66501	0	1	DISC INTERFACE ASSEMBLY	28480	98625-66501
C1	0160-4832	4	15	CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C2	0160-0127	2	3	CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
C3	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C4	0160-0127	2		CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
C5	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C6	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C7	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C8	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C9	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C10	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C11	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C12	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C13	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C14	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C15	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C16	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C17	0160-4832	4		CAPACITOR-FXD .01UF +-10% 100VDC CER	28480	0160-4832
C18	0160-0127	2		CAPACITOR-FXD 1UF +-20% 25VDC CER	28480	0160-0127
F1	2110-0592	2	1	FUSE 4A 125V NTD .201X.093	28480	2110-0592
J2	1251-7162	3	1	CONNECTOR 24-PIN F MICRO-RIBBON	28480	1251-7162
R1	2100-3210	6	1	RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	28480	2100-3210
R2	1810-0328	5	2	NETWORK-RES 10-5TP MULTI-VALUE	28480	1810-0328
R3	1810-0328	5	1	NETWORK-RES 10-5TP MULTI-VALUE	28480	1810-0328
R5	0698-3136	8	1	RESISTOR 17.3K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-1782-F
R6	0698-3150	6	2	RESISTOR 2.37K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2371-F
R7	0698-3150	6		RESISTOR 2.37K 1% .125W F TC=0+-100	24546	CT4-1/8-T0-2371-F
R8	1810-0122	7	2	NETWORK-RES 14-DIP3.3K OHM X 13	01121	314A332
R9	1810-0122	7		NETWORK-RES 14-DIP3.3K OHM X 13	01121	314A332
S1	3101-2506	4	1	SWITCH ASSEMBLY-ROCKER	28480	3101-2506
S2	3101-2508	6	1	SWITCH ASSEMBLY-ROCKER	28480	3101-2508
U1	1820-2058	3	4	IC MISC TTL S QUAD	07263	MC3448AL
U2	1820-1199	1	2	IC INV TTL LS HEX 1-INP	01295	SN74LS04N
U3	1820-2058	3		IC MISC TTL S QUAD	07263	MC3448AL
U4	1820-2058	3		IC MISC TTL S QUAD	07263	MC3448AL
U5	1820-2058	3		IC MISC TTL S QUAD	07263	MC3448AL
U6	1820-1203	8	1	IC GATE TTL LS AND 1PL 3-INP	01295	SN74LS11N
U7	1820-1201	6	1	IC GATE TTL LS AND QUAD 2-INP	01295	SN74LS08N
U8	1820-1195	7	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	SN74LS175N
U9	1805-6101	9	1	AEI-DIP	28480	1805-6101
U10	1820-1428	9	1	IC MUXR/DATA-SEL TTL LS 2-TO-1-LINE QUAD	01295	SN74LS159N
U11	1820-1445	0	1	IC LCH TTL LS 4-BIT	01295	SN74LS375N
U12	1820-1645	2	2	IC BFR TTL LS BUS QUAD	01295	SN74LS126AN
U13	1820-1438	1	3	IC MUXR/DATA-SEL TTL LS 2-TO-1-LINE QUAD	01295	SN74LS257AN
U14	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	SN74LS74AN
U15	1820-1208	3	1	IC GATE TTL LS OR QUAD 2-INP	01295	SN74LS32N
U16	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	SN74LS138N
U17	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE TRIG COM	01295	SN74LS175N
U18	1820-1438	1		IC MUXR/DATA-SEL TTL LS 2-TO-1-LINE QUAD	01295	SN74LS257AN
U19	1820-1144	6	2	IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
U20	1820-1144	6		IC GATE TTL LS NOR QUAD 2-INP	01295	SN74LS02N
U21	1820-1440	5	1	IC LCH TTL LS QUAD	01295	SN74LS279N
U22	1820-1199	1		IC INV TTL LS HEX 1-INP	01295	SN74LS04N
U23	1820-2102	8	2	IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
U24	1820-1645	2		IC BFR TTL LS BUS QUAD	01295	SN74LS126AN
U25	1820-1427	8	1	IC DCDR TTL LS 2-TO-4-LINE DUAL 2-INP	01295	SN74LS156N
U26	1820-1568	8	1	IC BFR TTL LS BUS QUAD	01295	SN74LS125AN
U27	1820-1438	1		IC MUXR/DATA-SEL TTL LS 2-TO-1-LINE QUAD	01295	SN74LS257AN
U28	1820-2740	0	1	IC COMPTT TTL LS MAGTD 2-INP 8-BIT	01295	SN74LS680N
U29	1820-2102	8		IC LCH TTL LS D-TYPE OCTL	01295	SN74LS373N
Y1	1813-0190	5	1	CRYSTAL-CLOCK-OSCILLATOR	28480	1813-0190
				MISCELLANEOUS		
	0360-0124	3	4	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND	28480	0360-0124
	0380-1324	9	2	STANDOFF-THD	28480	0380-1324
	0380-1332	9	2	STANDOFF-HEX M/F	28480	0380-1332
	0515-0104	8	2	SCREW-MACH #3 X 0.5 BHM-LG PAN-HD	28480	0515-0104
	0515-0145	7	2	SCREW-MACH #3 X 0.5 BHM-LG 90-DEG-FLH-HD	00000	ORDER BY DESCRIPTION

Replaceable Parts List

Reference Designation	HP Part Number	C D	Qty	Description	Mfr Code	Mfr Part Number
	0535-0004	9	2	NUT-HEX DBL-CHAM M3 X 0.5 2.4MM-THK	00000	ORDER BY DESCRIPTION
	2190-0003	8	2	WASHER-LK HLCL NO. 4 .115-IN-ID	28480	2190-0003
	2190-0577	1	2	WASHER-LK HLCL NO. 10 .194-IN-ID	28480	2190-0577
	2190-0918	4	2	WASHER-LK HLCL NO. 6 .141-IN-ID	28480	2190-0918
	7101-0624	7	1	I/O COVER	28480	7101-0624
	8159-0005	0	1	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	28480	8159-0005
	7121-1957	3	1	LABEL-SELECT CODE	28480	7121-1957
	98625-90000	5	1	MANUAL-INSTALLATION	28480	98625-90000

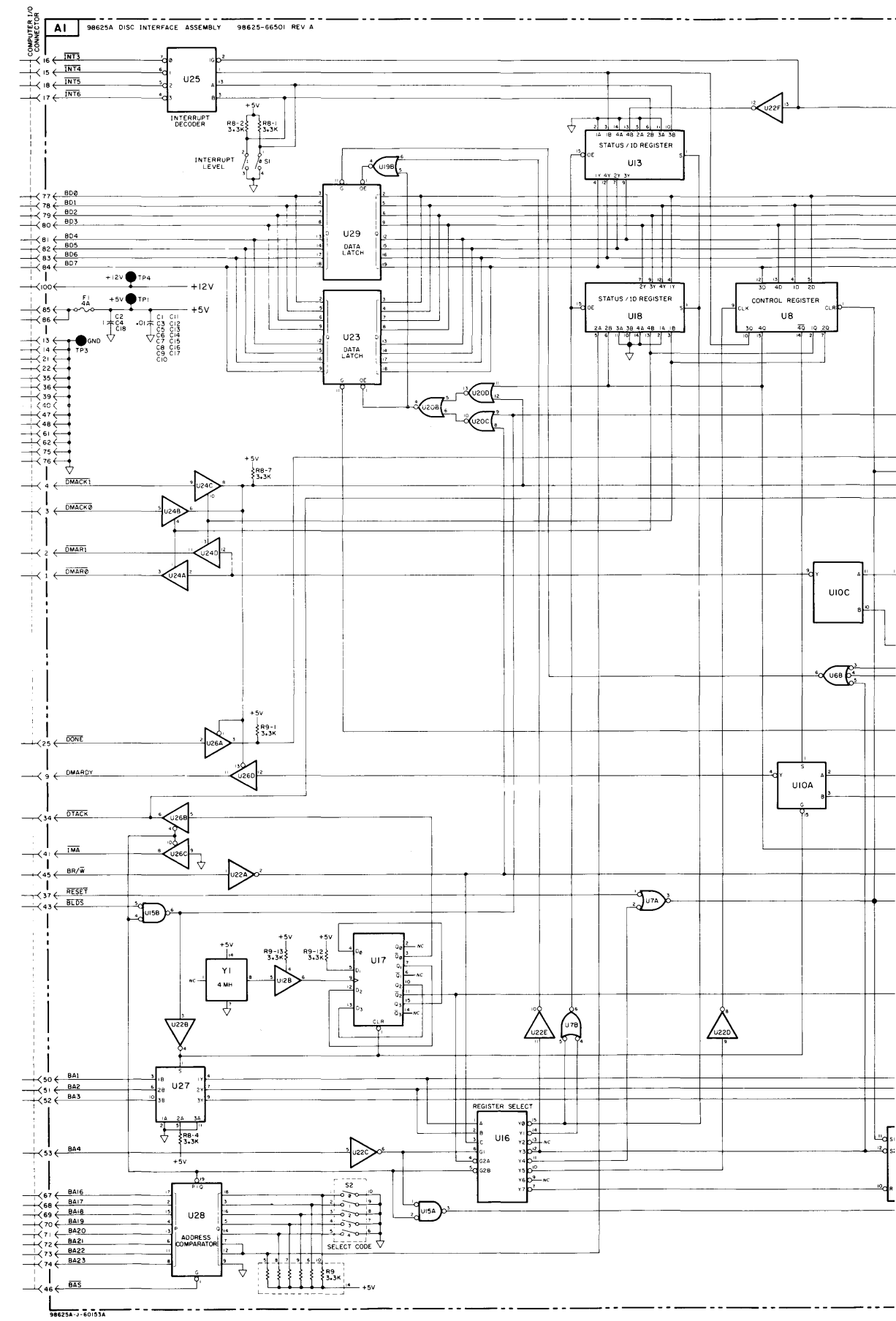


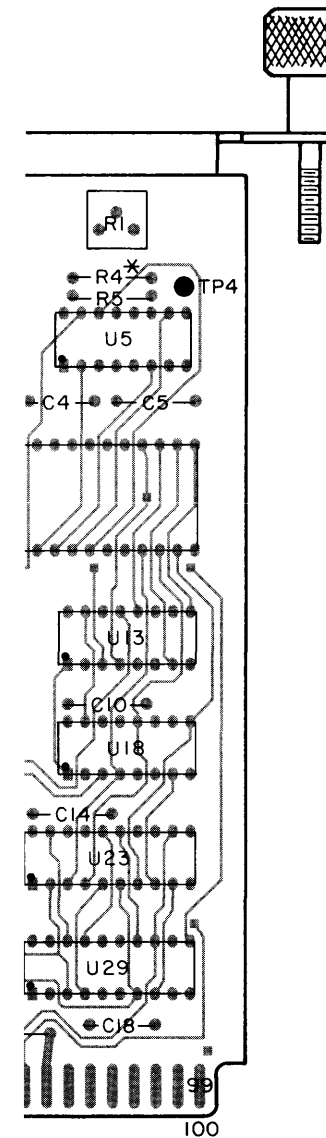
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A1**

HP Part No. 98625-66501 Rev A

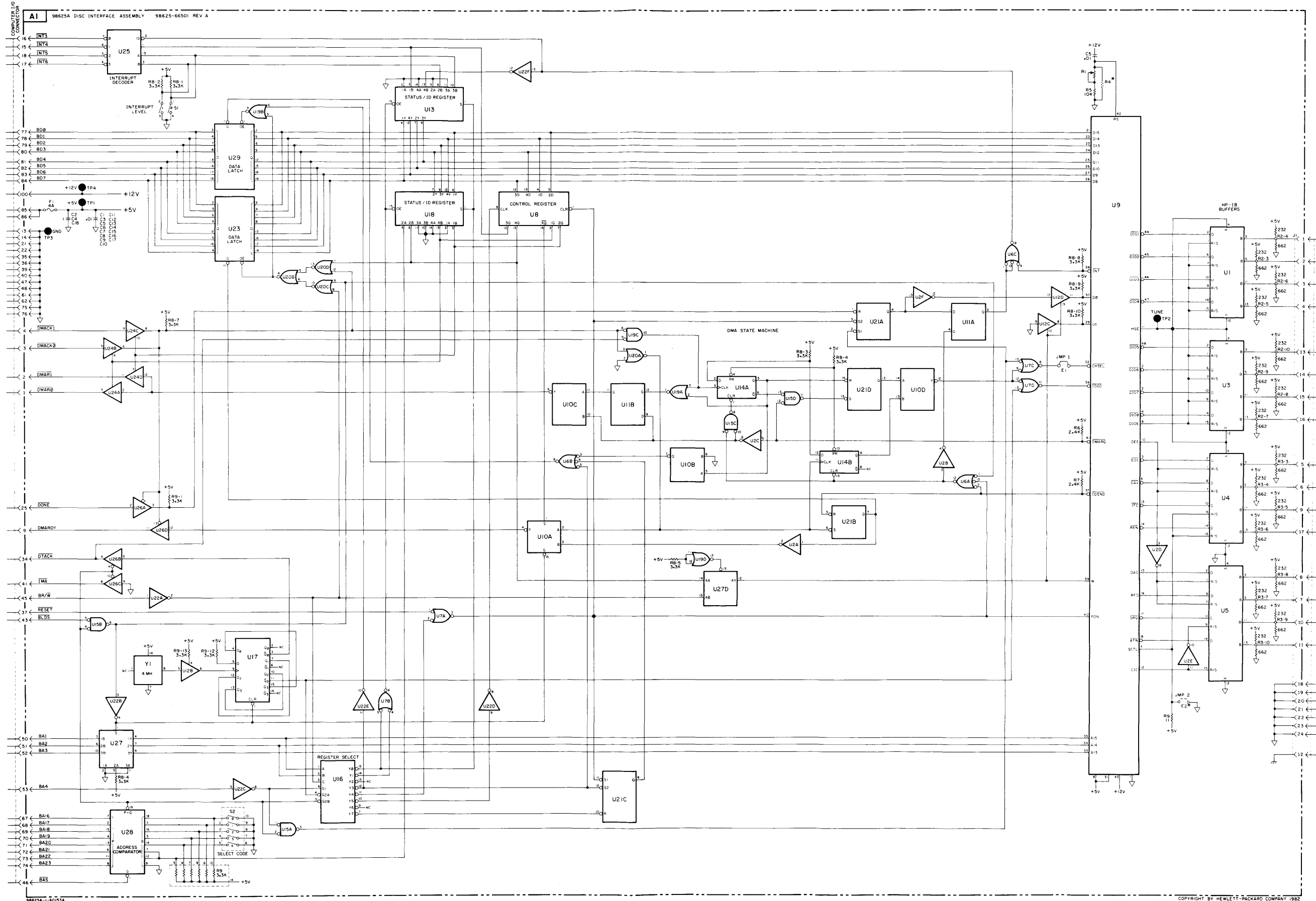
SCHEMATIC NOTES

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, PREFIX WITH ASSEMBLY OR SUBASSEMBLY DESIGNATION(S) OR BOTH FOR COMPLETE DESIGNATION.
2. COMPONENT VALUES ARE SHOWN AS FOLLOWS UNLESS OTHERWISE NOTED.
RESISTANCE IN OHMS
CAPACITANCE IN MICROFARADS
3. * DENOTES THAT COMPONENT IS NOT NORMALLY LOADED.





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A1
HP 98625A DISC INTERFACE
SCHEMATIC DIAGRAM

Manual Part No. 98625-90000 Dwg Rev A Sheet 1 of 1



**MANUAL PART NO. 98625-90000
R0983**

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