

# **HP-IB Interface Installation Guide for HP I/O Libraries**

## **HP E2078, E2071 and E2070**



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**Declaration of Conformity**

According to ISO/IEC Guide 22 and EN 45014

## Declaration of Conformity

According to ISO/IEC Guide 22 and EN 45014

**Manufacturer's Name:** Hewlett-Packard Company  
Loveland Manufacturing Center

**Manufacturer's Address:** 815 14th Street S.W.  
Loveland, CO 80537

**declares that the product:**

**Product Name:** HPIB Interface High Performance

**Model Number:** HP E2071C

**Product Options:** All

**conforms to the following Product Specifications:**

**Safety:** IEC 950 (1991) + A1 (1992) + A2 (1993) + A3 (1994)  
EN60950 (1992) + A1 (1992) + A2 (1993) + A3 (1994)  
CSA C22.2 #950 (1995)  
UL 1950 (1995)

**EMC:** CISPR 22:1993 + A1:1995/EN55022:1994 + A1:1995 Class B  
IEC 801-2: 1991/EN50082-1 (1992) 4kV CD, 8kV AD  
IEC 801-3: 1984/EN50082-1 (1992) 3V/m  
IEC 801-4: 1988/EN50082-1 (1992) 1kV Power Line Only

**Supplementary Information:** The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the "CE" mark accordingly.



June 4, 1993

Q.A. Manager,  
Hewlett-Packard Company

## Declaration of Conformity

According to ISO/IEC Guide 22 and EN 45014

**Manufacturer's Name:** Hewlett-Packard Company  
Loveland Manufacturing Center

**Manufacturer's Address:** 815 14th Street S.W.  
Loveland, CO 80537

**declares that the product:**

**Product Name:** HPIB Interface High Performance

**Model Number:** HP E2071D

**Product Options:** All

**conforms to the following Product Specifications:**

**Safety:** IEC 950 (1986) + A1 + A2/EN60950 (1988) + A1 + A2  
CSA C22.2 #950 - M89  
UL 1950 (1993)

**EMC:** CISPR 11:1990/EN55011:1991 Group 1, Class A  
CISPR 22:1993 + A1:1995/EN55022:1994 + A1:1995: Class B\*  
EN50082-1:1992  
IEC 801-2: 1991/prEN55024-2:1992 4kV CD  
IEC 801-3: 1984/prEN55024-3:1991 3V/m  
IEC 801-4: 1988/prEN55024-4:1992 1kV Power Line,  
0.5kV Signal Lines

**Supplementary Information:** The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the "CE" mark accordingly.

\* Tested to Class B without cabling and Class A with cabling.



November 9, 1998

Q.A. Manager,  
Hewlett-Packard Company

## Declaration of Conformity

According to ISO/IEC Guide 22 and EN 45014

**Manufacturer's Name:** Hewlett-Packard Company  
Loveland Manufacturing Center

**Manufacturer's Address:** 815 14th Street S.W.  
Loveland, CO 80537

**declares that the product:**

**Product Name:** PCI/HPIB Adapter Card

**Model Number:** E2078A

**Product Options:** All

**conforms to the following Product Specifications:**

**Safety:** IEC 60950 (1991) + A1 + A2 + A3 + A4/  
EN60950 (1992) + A1 + A2 + A3 + A4  
CSA C22.2 #950:1995  
UL 1950 (1993)

**EMC:** CISPR 22:1993 + A1:1995/  
EN55022:1994 + A1:1995: Group 1, Class A  
EN50082-1:1992  
IEC 801-2: 1991/prEN55024-2:1992 4kV CD, 8kV AD  
IEC 801-3: 1984/prEN55024-3:1991 3V/m  
IEC 801-4: 1988/prEN55024-4:1992 1kV Power Line,  
0.5kV Signal Lines

**Supplementary Information:** The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the "CE" mark accordingly.

Tested in a typical Hewlett-Packard Vectra XM PC.

April 9, 1998



Q.A. Manager,  
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## **Printing History**

This is the fourth edition of the *HP E2078, HP E2071 and HP E2070 HP-IB Interface Installation Guide for HP I/O Libraries*.

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December 1996 — Third Edition

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# 1

## Introduction

Welcome to the HP-IB Interface Installation Guide for HP I/O Libraries. This manual will guide you through the configuration and installation of the HP E2078 PCI HP-IB interface, the HP E2071 high-performance HP-IB interface and the HP E2070 HP-IB interface in HP Series 700 workstations when using one of the HP I/O Libraries. The HP I/O Libraries include:

- HP Virtual Instrument Software Architecture (VISA) library
- HP Standard Instrument Control Library (SICL)

Once you have installed your HP-IB interface, refer to the *HP I/O Libraries Installation and Configuration Guide for HP-UX* for information on how to configure your HP-IB interface with the HP I/O Libraries on HP-UX version 10.20 (or later).

This guide contains the following chapters and appendices:

- **Chapter 1 - Introduction** (this chapter) describes what you will find in this manual and where to go for additional information. This chapter also explains the radio and television interference and environmental specifications for the HP-IB interface hardware.
- **Chapter 2 - Hardware Installation** describes how to configure the HP-IB interface card's switches and how to install the card into your HP-UX Series 700 workstation.
- **Appendix A - Using Fast Talker Mode with HP E2071** explains how to use the Fast Talker Mode with this HP-IB interface and HP SICL.

## Other HP I/O Libraries Documentation

- *HP I/O Libraries Installation and Configuration Guide for HP-UX* explains how to install and configure the HP I/O Libraries (including VISA and SICL) on HP-UX 10.20 (or later).
- *HP VISA User's Guide* provides detailed information on how to use the VISA library.
- *HP SICL User's Guide for HP-UX* provides detailed information on how to use the SICL library. It also provides a SICL Language Reference which gives information on the function syntax and description of each SICL function.

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## **Radio and Television Interference**

This device has been verified to comply with FCC Rules Part 15. Operation is subject to these two conditions: (1) this device may not cause radio interference, and (2) this device must accept any interference received (including interference that may cause undesired operation).

This equipment generates and uses radio frequency energy. If not installed and used in accordance with this manual, it can cause interference to radio and television communications. The rules with which it must comply afford reasonable protection against such interference when it is used in most locations. However, there can be no guarantee that such interference will not occur in a particular installation. If you think your workstation is causing interference, turn off the system. If the radio or television reception does not improve, your workstation is probably not causing the interference. If your workstation does cause interference to radio and television reception, you are encouraged to try to correct the interference by one or more of the following measures:

- Relocate the radio or TV antenna.
- Move the workstation away from the radio or television.
- Plug the workstation into a different electrical outlet, so that the workstation and the radio or television are on separate electrical circuits.
- Make sure you use only shielded cables to connect peripherals to your workstation.
- Consult your dealer, Hewlett-Packard, or an experienced radio/television technician for other suggestions.
- Order the FCC booklet *How to Identify and Resolve Radio-TV Interference Problems* from the U.S. Government Printing Office, Washington, D.C. 20402. The stock number of this booklet is 004-000-00345-4.

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## Environmental Specifications

**Table 1: Environmental Specifications**

<b>Specifications</b>	<b>Minimum</b>	<b>Maximum</b>
Power Supply Voltage	+4.75 volts	+5.25 volts
Power Supply Current	E2078: 1.3 amperes typical E2071: 0.65 amperes typical E2070: 0.5 amperes typical	
Operating Temperature	0° C	+55° C
Non-Operating Temperature	-40° C	+70° C
Operating Humidity	15% RH	95% RH
Non-Operating Humidity		90% RH/24 hours

## 2 Hardware Installation

To install your HP-IB interface, you must perform the following steps:

1. Unpack the HP-IB interface.
2. Set the configuration switches on the HP E2070C and HP E2071C interfaces. Note that you will not complete this step for the Plug and Play HP E2071D or the HP E2078A interface, since they do not have configuration switches.
3. Install the interface in the workstation.

Each of these steps is described further in the following sections.

## **Unpacking the Interface**

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### **Caution**

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Observe the following precautions to reduce the risk of damaging the interface.

- Protect the interface from static electricity. The interface can be damaged by static electricity. For protection, the interface is packed in an antistatic bag. Leave the interface in its antistatic bag until you're ready to install it. Save the antistatic bag so you can protect the interface if you have to remove it from the workstation.
- Handle the interface gently. Do not drop the interface or handle it roughly. Be careful while unpacking and installing the interface.
- Hold the interface only by its edges. Never touch any other part of the interface. Do not touch the connector. Clean the connector removing any fingerprints if it is inadvertently touched.

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## Setting the HP E2070C and HP E2071C Configuration Switches

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### Note

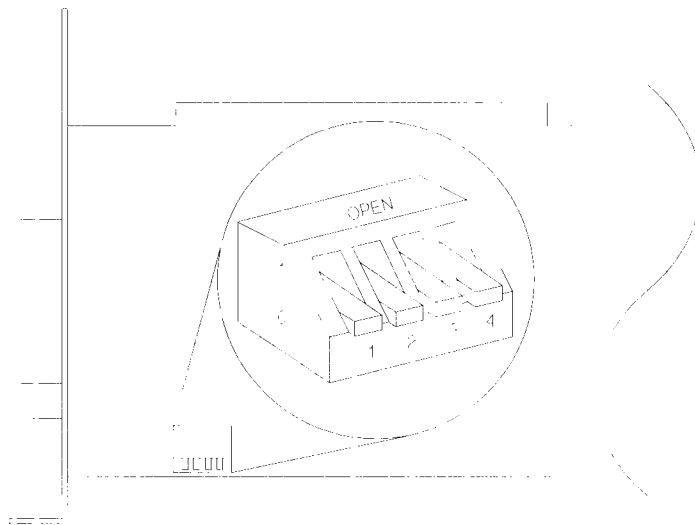
This section does not apply to the Plug and Play **HP E2071D** ISA/EISA or the **HP E2078A** PCI interfaces (which do not have configuration switches). If you have an HP E2071D or HP E2078A interface, simply skip this section and go on to the section titled "Installing the Interface" later in this chapter.

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The following two subsections explain switch settings on the HP E2070C and HP E2071C interfaces. Please use the section for the interface you are installing.

### Setting Switches on the HP E2071C

The configuration switches on the interface set the HP-IB interface's I/O base address. The switches are set at the factory as shown in the following figure, which selects the default hexadecimal I/O base address of 250. Switches 1, 2, and 3 determine the I/O base address of the HP-IB interface. Switch 4 is not used.





**Setting the HP E2070C and HP E2071C Configuration Switches**

If you are installing additional interfaces, you need to change the switch settings. Use the following table for switch positions to set unique address ranges for each interface.

**Note**

The chosen I/O address ranges must not conflict with other I/O interfaces installed in your workstation, including other manufacturer's products. Refer to the documentation for the other interfaces and the table below to select unique addresses for all interfaces in your workstation.

**Table 2: HP E2071C Switch Settings**

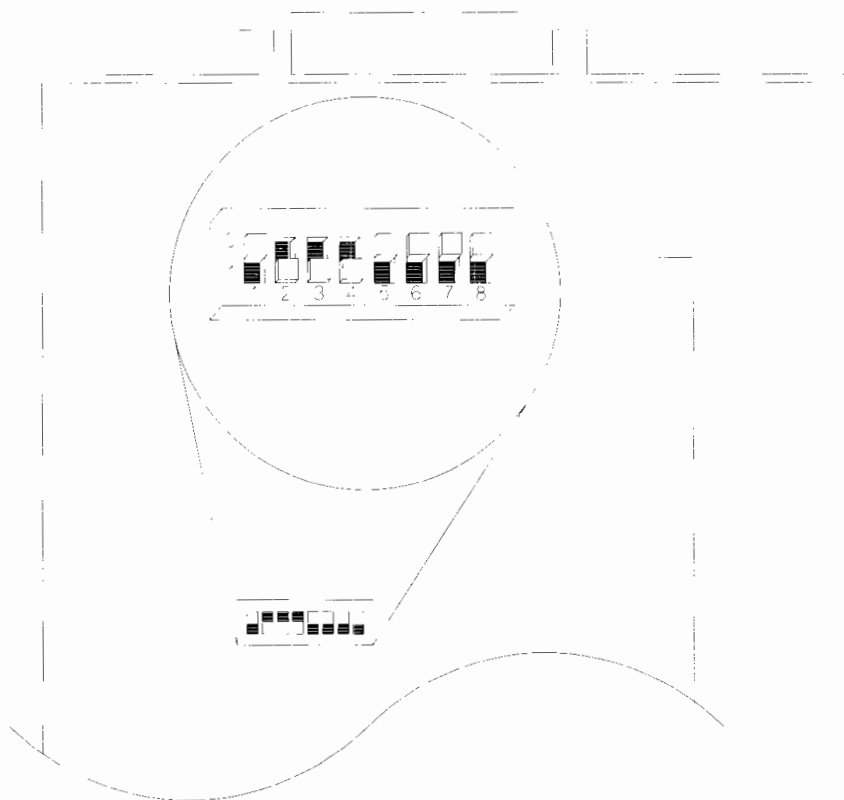
<b>Switches 1 2 3 4*</b>	<b>I/O Base Address (Hexadecimal)</b>	<b>I/O Address Range Used (Hexadecimal)</b>
0 0 0 0	250	250-257
1 0 0 0	270	270-277
0 1 0 0	350	350-357
1 1 0 0	370	370-377
0 0 1 0	220	220-227
1 0 1 0	280	280-287
0 1 1 0	390	390-397
1 1 1 0	380	380-387

\* A 0 (zero) indicates a closed switch.

Now go on to the section, "Installing the Interface".

## Setting Switches on the HP E2070C

The configuration switches on the HP-IB interface set the interface's operating parameters. The switches are set at the factory as shown in the following figure, which specifies memory address DC000 and interrupt level 3. Switches 1 through 4 determine the memory address of the interface. Switches 5 and 6 select 1 of 4 available interrupt lines on the backplane. Switches 7 and 8 are not used.



If you are installing additional interfaces, you need to change the switch settings. Use the table on the next page to help set the address and interrupt selection for each interface. The table shows recommended switch settings for each of four ISA/EISA slots.

**Setting the HP E2070C and HP E2071C Configuration Switches****Note**

The chosen memory address ranges and interrupt selections must not conflict with other interfaces installed in your workstation, including other manufacturer's products. Refer to the documentation for the other interfaces and the table below to select unique addresses and interrupt selections for all interfaces in your workstation.

**Table 3: HP E2070C Switch Settings**

<b>ISA/EISA Slot</b>	<b>Switches 1 2 3 4 5 6 7 8</b>	<b>Memory Address Range</b>	<b>Interrupt Selection</b>
1	0 1 1 1 0 0 0 0	DC000-DFFFF	3
2	0 1 1 0 0 1 0 0	D8000-DBFFF	4
3	0 1 0 1 1 0 0 0	D4000-D7FFF	5
4	0 1 0 0 1 1 0 0	D0000-D3FFF	7

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## Selecting the HP E2078A +5V PCI Slot

The HP E2078A PCI HI-IB interface requires a +5V PCI slot. Some computers may have +3V PCI slots or a combination of +3V and +5V slots.

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### Note

You must install the HP E2078A in a +5V PCI slot. When installing more than one interface, you cannot place two HP-IB interfaces in adjacent slots due to the HP-IB cable connector width. You must space them apart by at least one slot. Additionally, an end slot may cause a tight fit for the HP-IB cable connector and the workstation case. It is recommended you do not use an end slot if other slots are available.

1. Open the case on your computer and examine the connector for the slot you intend to install the HP E2078A. The connector may be marked as 5V PCI identifying the slot as a +5V PCI slot.
2. If the connector is not marked as 5V PCI, examine the keys that appear in the slot of the connector (bars that go across the opening of the connector).
3. Compare the connector's keys to the slots in the HP E2078A PC board. A 5V PCI slot will have a key that matches the slot on the PC board. A 3V PCI slot will have a key in a different location on the connector and will not allow the HP E2078A PC board to be inserted in the connector. In addition, a 3V PCI connector has more contacts than a 5V PCI connector and therefore will be a wider connector than the HP E2078A PC board.
4. If you have an ISA/EISA computer, the ISA/EISA connector will be offset and not allow the HP E2078A to be installed from the expansion slot opening.
5. Move on to the next section titled "Installing the Interface" after identifying the 5V PCI slot you will use.



## Installing the Interface

Use the following steps to install the HP-IB interface in your workstation:

1. Shut down your workstation as described in your HP-UX System Administration Tasks manual *before turning the power off*.
2. Power down the workstation and all its peripherals and disconnect the power cord from the workstation.
3. Expose the ISA/EISA or PCI expansion slots and remove the backpanel cover plate as described in your workstation documentation.

---

### Note

You cannot place two HP-IB interfaces in adjacent slots due to the HP-IB cable connector width. You must space them apart by at least one slot. Additionally, an end slot may cause a tight fit for the HP-IB cable connector and the workstation case. It is recommended you use a slot not on the end if one is available.

4. Insert the HP-IB interface edge connector into the expansion slot connector of the workstation. (Make sure you have a +5V PCI slot for the HP E2078A.) Make sure the interface is fully seated by pushing down firmly with the palm of your hand. The HP-IB connector should extend through the backpanel opening to allow cable installation.
5. Connect an HP-IB cable to the interface using one of the following cables:
  - HP 10833A (1 meter).
  - HP 10833B (2 meters).
  - HP 10833C (4 meters).
  - HP 10833D (0.5 meter).
  - HP 92220R (0.3 meter, right-angle connector).

Tighten the HP-IB connector screws with your fingers. (Do not use a screwdriver. The screwdriver slots in the lock screws are provided for removal purposes only.)

6. Replace the backpanel cover plate screw to hold the interface in place. (Store the backpanel cover plate for use if the interface is removed later from the workstation.)
7. Replace the covers removed in step 3 as described in your workstation documentation.

You have finished installing the HP-IB interface. Please refer to the *HP I/O Libraries Installation and Configuration Guide for HP-UX* for software installation and configuration instructions.

Hardware Installation  
**Installing the Interface**



# A

## Using Fast Talker Mode with the HP E2071 and HP E2078

The HP E2071 and HP E2078 high-performance HP-IB cards are capable of high-speed HP-IB operation, but only under the conditions specified by the IEEE 488 specification for such operation. To turn on Fast Talker mode, call:

```
igpibsettdelay (intf_id, I_GPIB_T1DELAY_MIN);
```

This will turn on Fast Talker mode for all session attached to the interface specified by *intf\_id*.

To turn Fast Talker mode off, call:

```
igpibsettdelay (intf_id, I_GPIB_T1DELAY_MAX);
```

For more information, refer to `igpibgettdelay` and `igpibsettdelay` in the *HP SICL Language Reference in the HP SICL User's Guide for HP-UX*.

The critical parameter is the so-called "T1 delay," or settling time for multiline messages, as defined in the IEEE 488 specification. The specified value for this parameter is 2 microseconds minimum. However, it can be reduced to 350 nanoseconds minimum if the following special considerations are met:

- The device capacitance per line (except for REN and IFC) should be less than 50 picofarads per device. This requires the use of tri-state electrical HP-IB drivers, instead of open-collector HP-IB drivers.



- While it is difficult to determine this specification unless it is published for a particular instrument, in practice devices designed for fast operation will meet the specification. It can be assumed that a device not specified for fast operation will not meet it.
- All devices in the system should be powered-up.
- The total length of HP-IB cables connected to the HP-IB interface should be no more than 15 meters, and there should be one device for each meter (or less) of cable.

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**Note**

Reliable high-speed operation cannot be guaranteed if these specifications are not met by all devices on the interface.

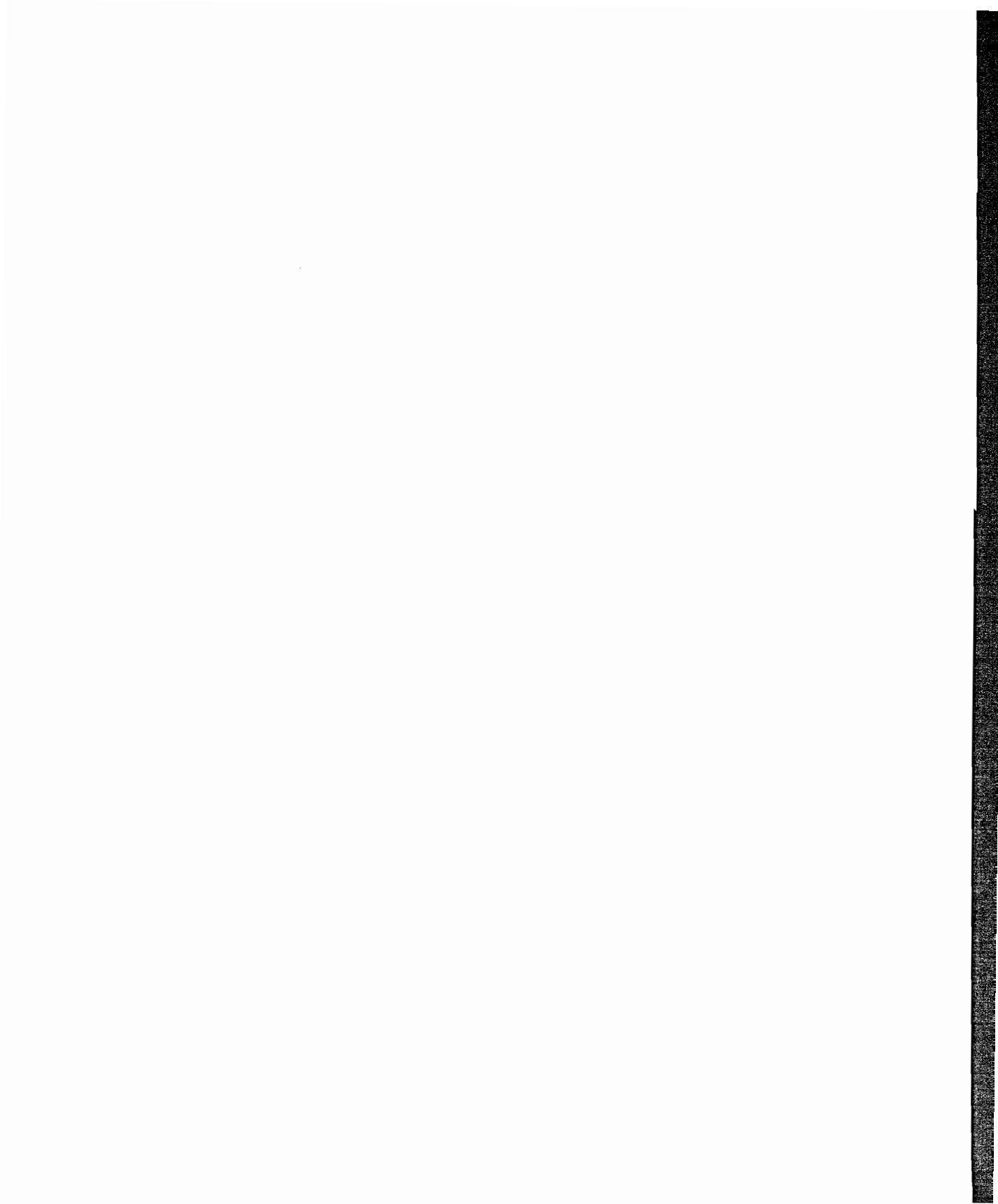
In practice, this means that a system where speed is of critical importance may require the use of two HP-IB cards: one for slow-speed operation with most of the accessory devices, and one with only the fast device(s) on it for high-speed operation.

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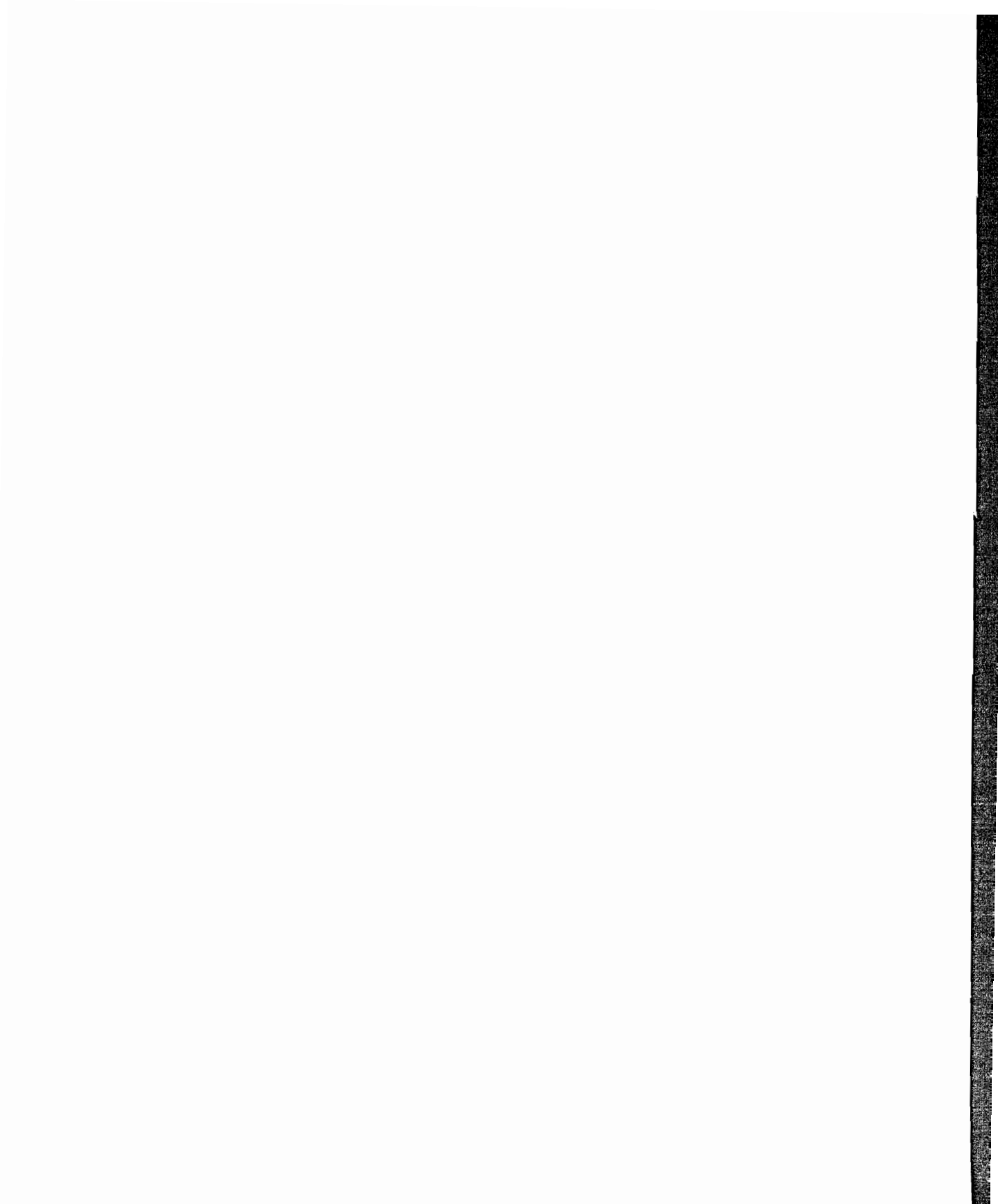














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