

Cat. No. W261-E1-1



**SYSMAC**  
**CV500-ISX01**  
**ISA Bus Expander**

**OPERATION MANUAL**

**OMRON**



## ***Read and Understand this Manual***

Please read and understand this manual before using the product. Please consult your OMRON representative if you have any questions or comments.

## ***Warranty and Limitations of Liability***

### **WARRANTY**

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- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this manual.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

**NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.**

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**DIMENSIONS AND WEIGHTS**

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

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The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.







# **CV500-ISX01 ISA Bus Expander**

## **Operation Manual**

*Produced August 1995*



## Notice:

OMRON products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.

The following conventions are used to indicate and classify precautions in this manual. Always heed the information provided with them. Failure to heed precautions can result in injury to people or damage to the product.

 **DANGER!** Indicates information that, if not heeded, is likely to result in loss of life or serious injury.

 **WARNING** Indicates information that, if not heeded, could possibly result in loss of life or serious injury.

 **Caution** Indicates information that, if not heeded, could result in relatively serious or minor injury, damage to the product, or faulty operation.

## OMRON Product References

All OMRON products are capitalized in this manual. The word "Unit" is also capitalized when it refers to an OMRON product, regardless of whether or not it appears in the proper name of the product.

The abbreviation "Ch," which appears in some displays and on some OMRON products, often means "word" and is abbreviated "Wd" in documentation in this sense.

The abbreviation "PC" means Programmable Controller and is not used as an abbreviation for anything else.

## Visual Aids

The following headings appear in the left column of the manual to help you locate different types of information.

**Note** Indicates information of particular interest for efficient and convenient operation of the product.

**1, 2, 3...** 1. Indicates lists of one sort or another, such as procedures, checklists, etc.

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## About this Manual:

This manual describes the installation and operation of the CV500-ISX01 ISA Bus Expander and the ISA boards which can be used with the ISA Bus Expander.

This manual is intended for individuals familiar with electrical equipment and personal computers (such as electrical engineers) as well as those individuals overseeing the introduction of FA equipment, designing the FA system, or managing the FA worksite.

Please read this manual carefully and be sure you understand the information provided before attempting to install and operate the ISA Bus Expander.

**Section 1 Introduction** describes precautions that must be taken during installation and operation, special features of the ISA Bus Expander, and system configurations.

**Section 2 Compatible ISA Boards** describes the ISA boards that can be used in the ISA Bus Expander. Be sure to read this section before attempting to install an ISA board or purchasing a new board.

**Section 3 Installation** explains how to install an ISA board into the ISA Bus Expander and how to mount the ISA Bus Expander into the CPU Backplane.

**Section 4 Troubleshooting** provides troubleshooting flowcharts to help isolate and correct problems that prevent operation of the ISA board.

The **Appendices** provide information on specifications, internal configuration, connector specifications, and Personal Computer Unit specifications.

 <b>WARNING</b> Failure to read and understand the information provided in this manual may result in personal injury or death, damage to the product, or product failure. Please read each section in its entirety and be sure you understand the information provided in the section and related sections before attempting any of the procedures or operations given.
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# SECTION 1

## Introduction

This section describes precautions that must be taken during installation and operation, special features of the ISA Bus Expander, and system configurations.

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## 1-1 Before Using this Manual

To ensure proper and safe operation, observe the following precautions when installing and operating the ISA Bus Expander or PC.

### 1-1-1 Installation Precautions

Select a suitable location to install and operate the PC.

#### Unsuitable Installation Locations

- 1, 2, 3... 1. Don't install the PC next to a very hot or cold spot, in a location with severe temperature variations, or a location with high humidity where condensation is likely to occur.
2. Don't install the PC in direct sunlight or subject it to excessive heat.
3. Don't install the PC in a location with excessive dust or airborne debris.
4. Don't install the PC in a location with strong electric or magnetic fields.
5. Don't install the PC in a location where it will be sprayed with water, oil, or chemicals.
6. Don't install the PC in a location where corrosive or flammable chemicals or gases are being used.

#### Mechanical/Electrical Hazards

- 1, 2, 3... 1. Don't subject the PC to strong physical shocks or long-term vibration.
2. Make sure that the power supply voltage is within the specified range.
3. Prevent the build-up of static electricity.

#### Safety Precautions

- 1, 2, 3... 1. Ground the PC to a maximum resistance of 100  $\Omega$ .
2. Make an emergency stop circuit with an external relay circuit.
3. Be sure that all connectors and wires are connected securely.

### 1-1-2 Other Installation and Operating Precautions

Observe the following precautions when operating the ISA Bus Expander or PC.

- 1, 2, 3... 1. Always turn the power off when assembling the PC and connecting the cables. Leaving the power on can result in electrical shock or damage to the PC.
2. Tighten the Backplane mounting screws, terminal block screws, and cable screws.
3. When connecting the power supply, ground the PC to a maximum resistance of 100  $\Omega$ .
4. Attach crimp connectors to the power supply cables. Sparks and fire may occur if twisted wires are connected directly to the terminal block.
5. Make safety circuits to manage spurious signals caused by broken signal lines or electrical interference.
6. Be sure that the wiring is correct before turning on the power. Equipment damage or fire can be caused by incorrect wiring.
7. Be sure that the lock mechanisms are locked on devices that have lock mechanisms, such as Terminal Blocks, Memory Units, and Expansion I/O Cables.
8. Use shielding or other protective measures in locations where electrical noise is generated by static electricity, locations with strong electromagnetic fields, or locations where emission of radiation is possible.
9. Make sure that loads won't be shorted during operation.
10. Do not install I/O Units, CPUs, or Memory Cassettes while the power is on.
11. Do not use the Unit under bad power supply conditions.

## **1-2 Features**

The ISA Bus Expander allows a commercially available ISA board to be used as an expansion board of a Personal Computer Unit. The ISA Bus Expander has the following features.

**Allows Usage of Widely Available ISA Boards**

Standard ISA boards for applications such as communication, data files, and various kinds of I/O can be used as expansion boards for a Personal Computer Unit. This feature dramatically expands the capabilities of the Personal Computer Unit.

**Connects up to 3 Units**

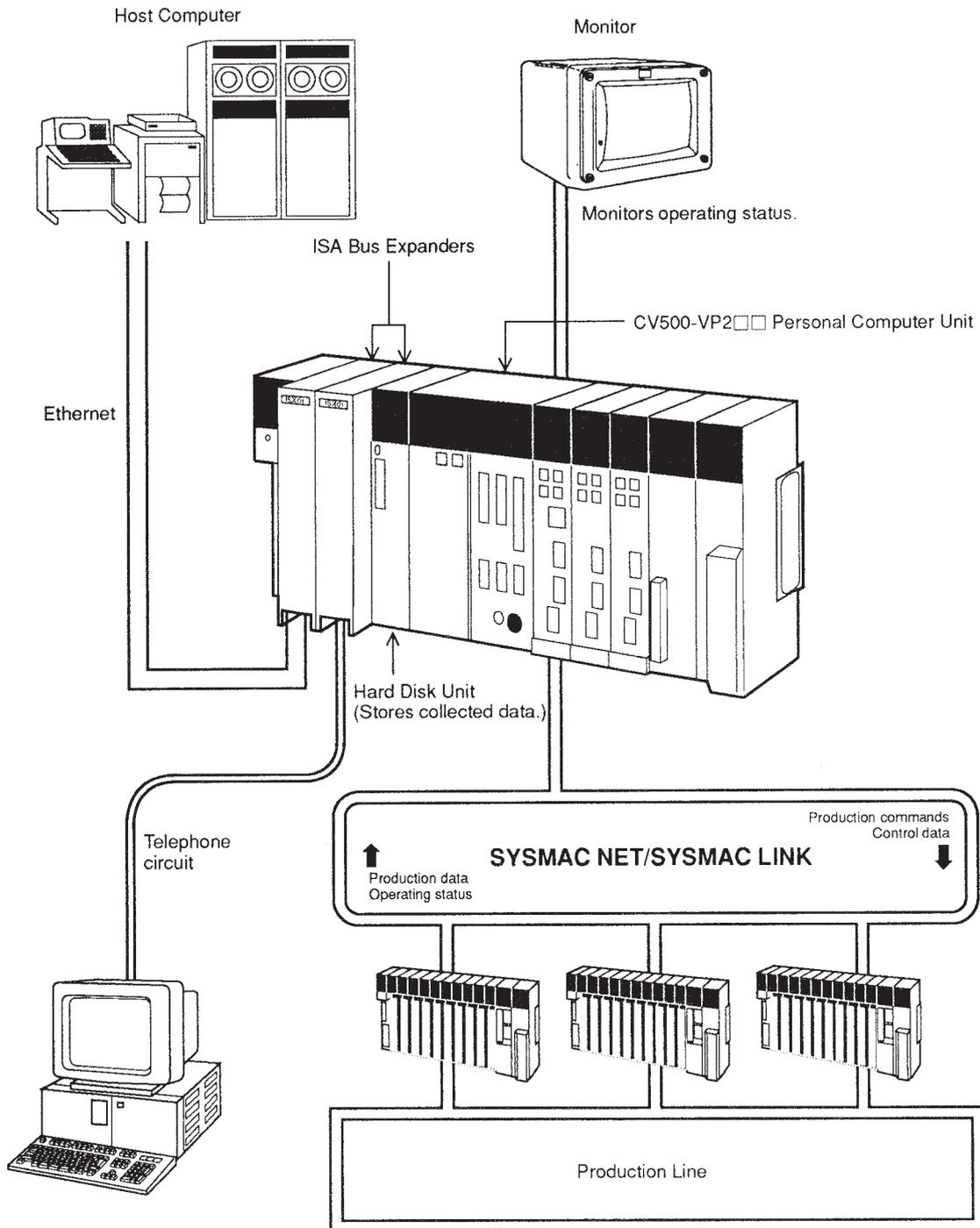
Up to 3 ISA Bus Expanders can be mounted to a CV500-BC105 CPU Backplane. ISA Bus Expanders are mounted in the same slots as a Hard Disk Units, so fewer than 3 ISA Bus Expanders can be mounted if a Hard Disk Unit is mounted.

**Reduces Wiring and Space**

ISA Bus Expanders can be mounted to the Personal Computer Unit's CV500-BC105 CPU Backplane, so there is no need for complicated wiring between the ISA Bus Expander and the Personal Computer Unit. Mounting the ISA Bus Expander directly to the Backplane also saves space.

### 1-3 System Configuration

The following diagram shows an example system with a Personal Computer Unit and 2 ISA Bus Expanders.



In this example an Ethernet board and modem board have been installed in the 2 ISA Bus Expanders.

## SECTION 2

# Compatible ISA Boards

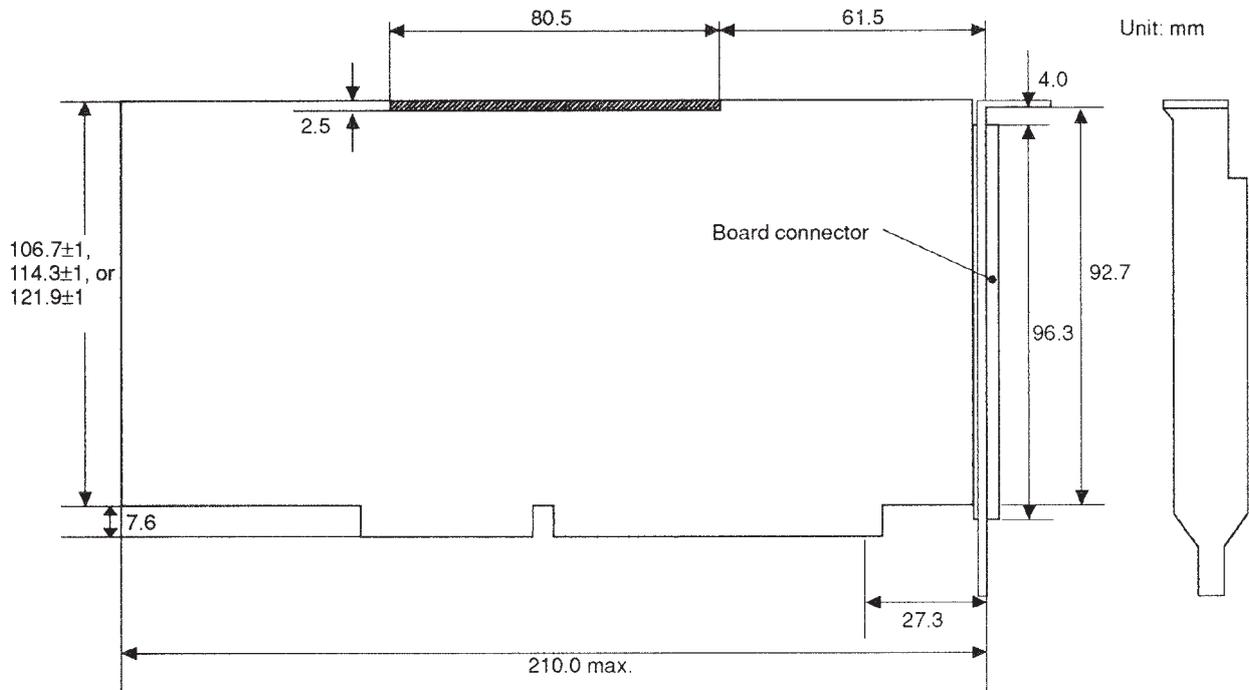
This section describes the ISA boards that can be used in the ISA Bus Expander. Be sure to read this section before using an ISA board or purchasing a new board.

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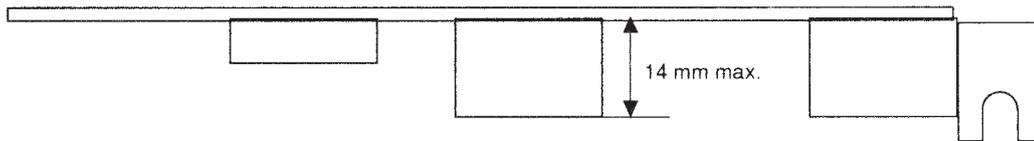
### 2-1 ISA Board Dimensions

There are some limitations on the dimensions of the ISA boards that can be used in the ISA Bus Expander. ISA boards with unacceptable dimensions can't be used. Be sure to check the dimensions before purchasing a new board or attempting to install an existing board.

The following diagram shows the dimensions of ISA boards that can be used in the ISA Bus Expander.



- Note**
1. There must not be any parts in the shaded region at the top of the diagram. This region indicates where the board's retaining bracket is pressed down.
  2. The board's connector must be less than 96.3 × 15.5 mm.



The height of parts on the board must not exceed 14 mm.

### 2-2 Power Supply Specifications

ISA boards used in the ISA Bus Expander must be compatible with the power supply of the ISA Bus Expander. ISA boards with unacceptable power supply requirements can't be used. Be sure to check the power supply requirements before purchasing a new board or attempting to install an existing board.

The following table shows the specifications of the power supplies which the ISA Bus Expander can output to the ISA board.

Output voltage	Ripple pulse	Current capacity
+5 VDC ±5%	100 mV <sub>P-P</sub>	1.45 A I(+5 VDC)
-5 VDC (not supported)	---	---
+12 VDC ±5%	120 mV <sub>P-P</sub>	0.35 A I(+12 VDC)
-12 VDC ±10%	120 mV <sub>P-P</sub>	0.09 A I(-12 VDC)

- Note** The supplied currents must conform to the following equation:  
 $I(+5 \text{ VDC}) + 3.52 \times I(+12 \text{ VDC}) + 5.22 \times I(-12 \text{ VDC}) + 0.05 \leq 1.5 \text{ A}$

## 2-3 Limitations on ISA Board Specifications

This section describes the limitations on the specifications of ISA boards used in the ISA Bus Expander. ISA boards with unacceptable specifications can't be used.

 **Caution** The characteristics and reliability of the entire system will depend on the ISA board. Be sure to check the boards specifications before purchasing a new board or attempting to install an existing board. Also, be aware that maintenance and repair won't be provided for separately purchased ISA boards.

### 2-3-1 Operating Temperature

The temperature within the ISA Bus Expander will increase when power is supplied to the ISA Bus Expander and the ISA board begins to operate. Don't use ISA boards that aren't reliable within the ambient temperatures described below.

 **Caution** The ISA board may break down or malfunction if it is operated at too high a temperature. Be especially careful when operating ISA boards that are supplied with +12 VDC and -12 VDC.

#### Factors Affecting the Operating Temperature

The temperature within the ISA Bus Expander depends upon the following factors:

- 1, 2, 3... 1. The ambient temperature where the PC is installed
2. The amount of heat generated by the ISA board
3. The amount of heat generated by the ISA Bus Expander

The temperature within the ISA Bus Expander will increase by about 8°C when the ISA board consumes the maximum amount of ±12-VDC current (+12 VDC 0.35 A, and -12 VDC 0.09 A) that can be provided by the ISA Bus Expander.

The temperature will increase in proportion to the amount of ±12-VDC current consumed. The heat generated by the ISA Bus Expander is negligible with ISA boards that don't consume ±12-VDC power.

#### Calculating the Operating Temperature

The maximum operating temperature of the ISA board must be greater than the temperature within the ISA Bus Expander.

$$\begin{aligned} \text{Operating temperature} &> \text{Ambient temperature} \\ &+ \text{Temperature increase due to the ISA board} \\ &+ 8^\circ\text{C max.} \end{aligned}$$

### 2-3-2 ISA Board Weight

The ISA board's weight must be less than 250 g. The PC's mechanical specifications such as vibration resistance and shock resistance will be reduced if the board's weight exceeds 250 g.

### 2-3-3 Personal Computer Unit Limitations

Do not allocate I/O addresses, interrupt numbers, memory addresses, or DMA numbers to the ISA board if they are being used by the Personal Computer Unit.

Refer to *Appendix D Personal Computer Unit Specifications* for details on I/O addresses, interrupt numbers, memory addresses, and DMA numbers used by the Personal Computer Unit.



## SECTION 3

### Installation

This section explains how to install an ISA board into the ISA Bus Expander and how to mount the ISA Bus Expander into the CPU Backplane.

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### 3-1 ISA Bus Expander Components

This section describes the components of the ISA Bus Expander. Familiarize yourself with the components before installing an ISA board.

**1 Cover Retaining Tabs**

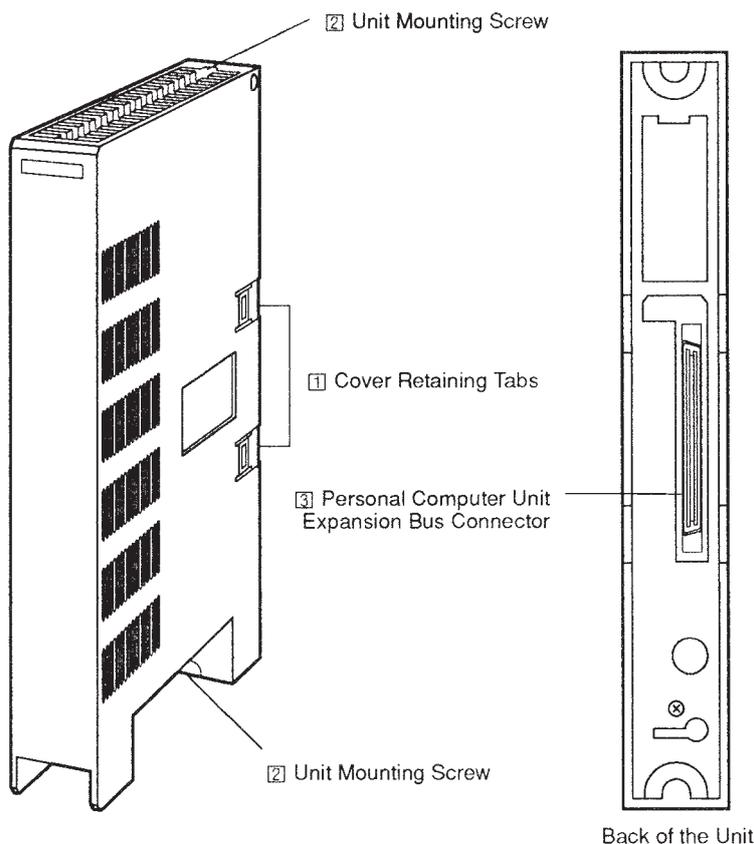
The cover retaining tabs attach the cover to the Unit. Press the tabs with a tool such as a standard screwdriver.

**2 Unit Mounting Screws**

These screws attach the Unit to the CPU Backplane.

**3 Personal Computer Unit Expansion Bus Connector**

This connector connects with the Personal Computer Unit Expansion Bus Interface Connector in the CV500-BC105 CPU Backplane.



**4 Board Retaining Bracket**

This bracket holds the ISA board. The bracket is needed to prevent vibration from loosening the board, so be sure to adjust the bracket to hold the board.

**5 Bracket Screws**

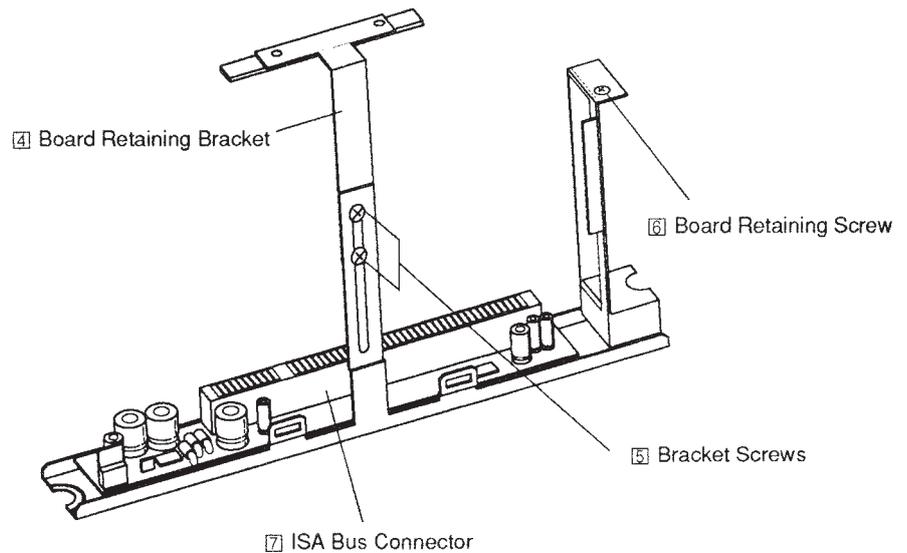
These screws fix the height of the retaining bracket.

**6 Board Retaining Screw**

This screw attaches the ISA board. The screw is needed to prevent vibration from loosening the board, so be sure to tighten the screw to hold the board.

**7 ISA Bus Connector**

Insert the board's card-edge connector into this connector.



### 3-2 Installing an ISA Board

This section explains how to install an ISA board into the ISA Bus Expander. A Phillips-head screwdriver is needed to loosen and tighten the mounting screws.

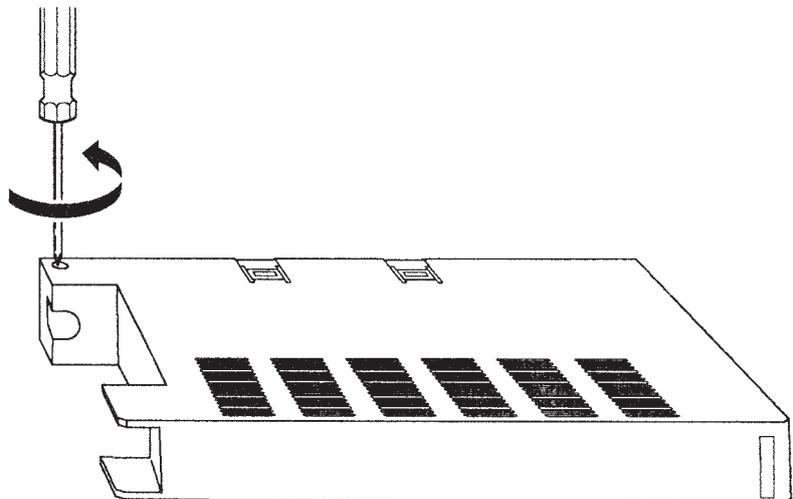
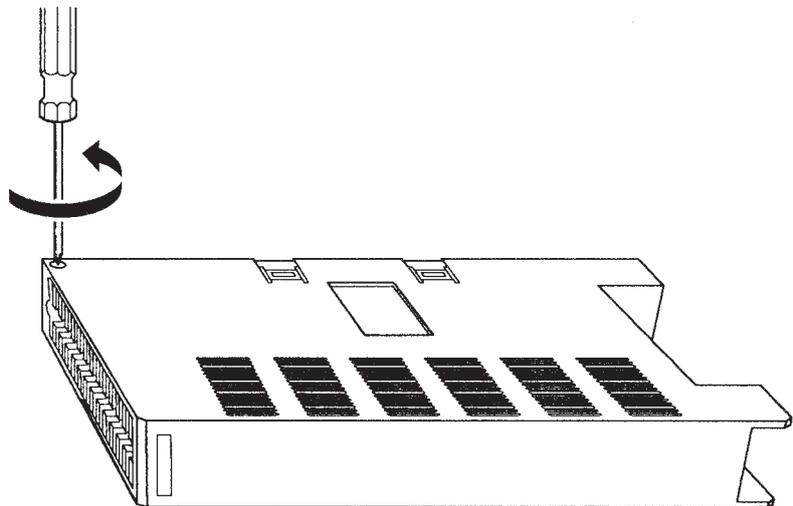
Before installing the ISA board, be sure to read the ISA board's instruction manual and follow any precautions for handling the ISA board.

When tightening screws, be sure to apply the torque recommended in the text.

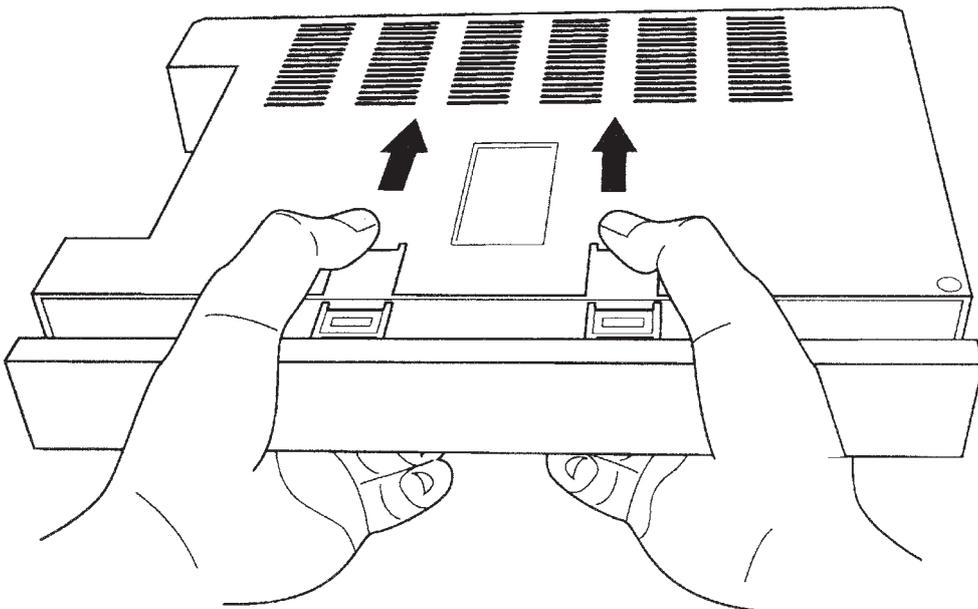
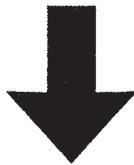
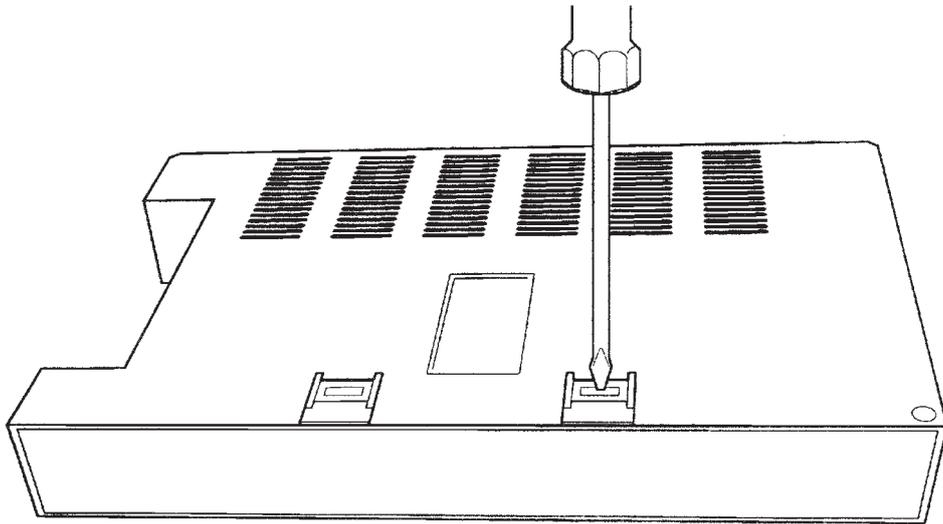
#### Installation Procedure

Use the following procedure to install an ISA board.

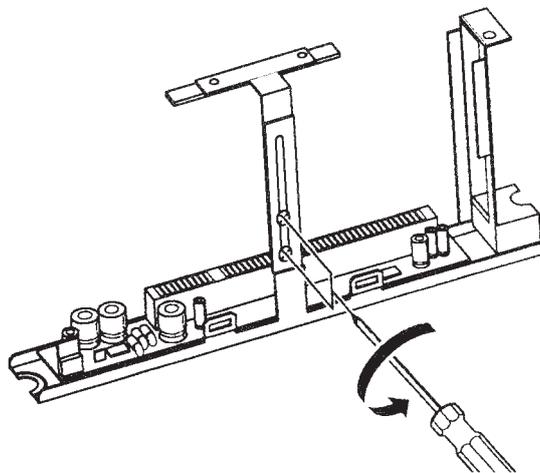
- 1, 2, 3... 1. Use a Phillips-head screwdriver to remove the screws that fasten the cover. There is one screw on each side of the Unit, as shown in the following diagram.



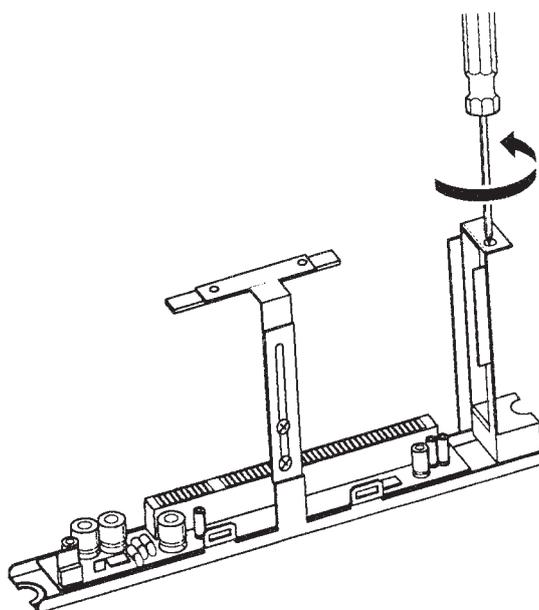
2. Remove the cover by releasing the retaining tabs with a standard screwdriver and then sliding the cover off of the Unit. There are two retaining tabs on each side of the Unit.



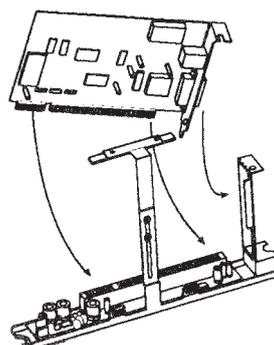
3. Loosen the bracket screws that hold the board-retaining bracket so that the bracket can be adjusted up and down.



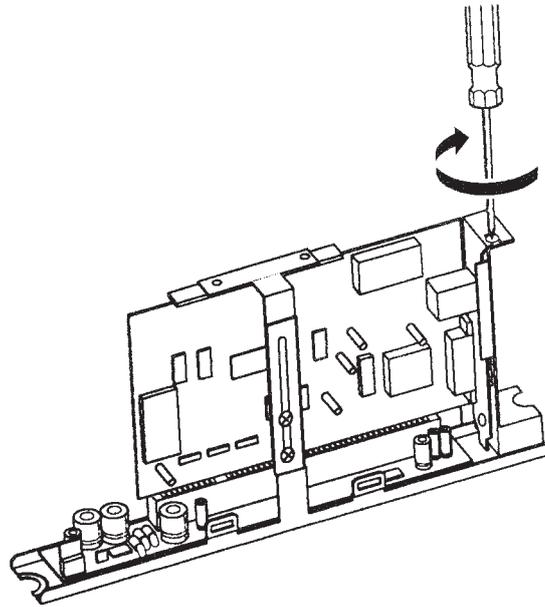
4. Remove the board retaining screw. The following diagram shows the location of this screw.



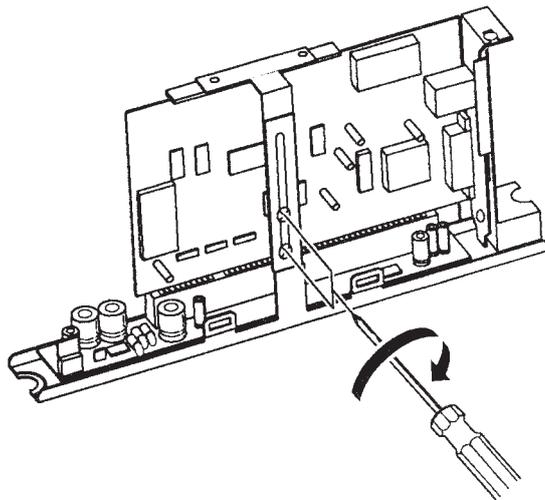
5. Raise the retaining bracket and insert the ISA board into the ISA connector. The ISA board must be facing the right direction. Make sure that the connectors are aligned and press the board firmly into place.



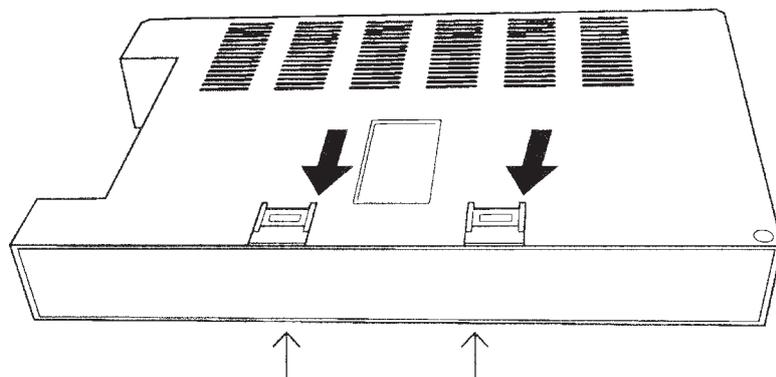
6. Tighten the board retaining screw. Tighten the screw to 0.54 N-m.



7. Check that the retaining bracket fits snugly against the ISA board and tighten the bracket screws. Torque the screws to 0.54 N-m.

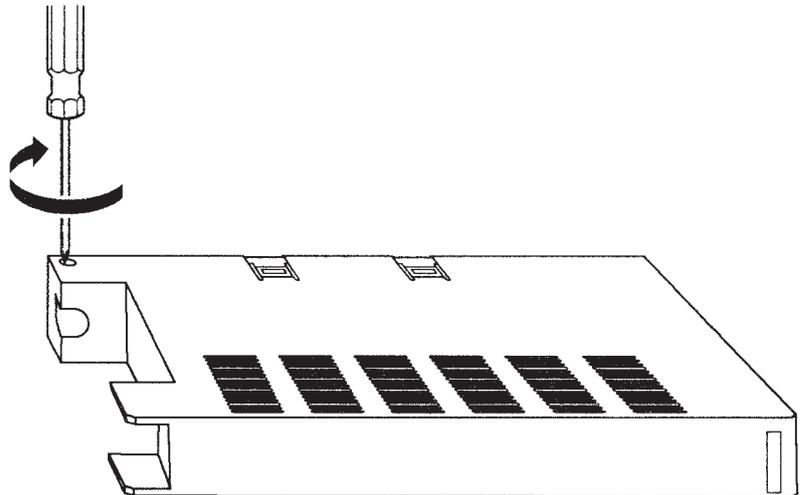
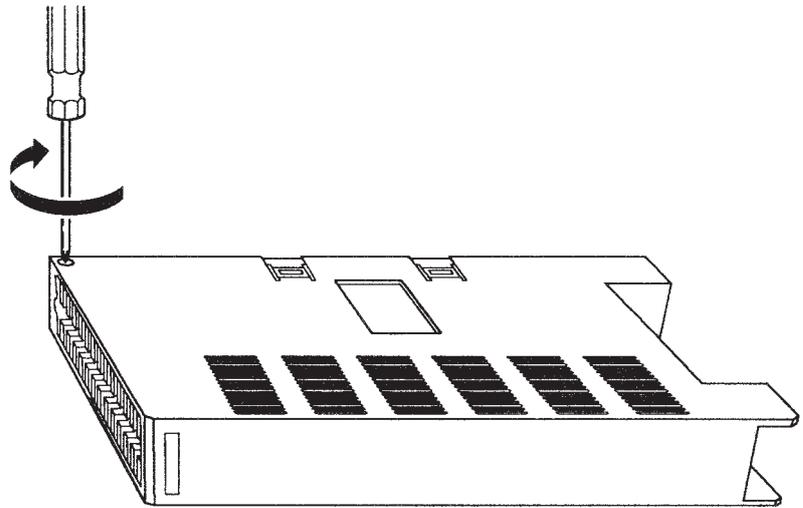


8. Replace the cover onto the Unit. Check that the four retaining tabs on the sides of the Unit lock into their holes.



There are two retaining tabs on this side of the Unit.

9. Tighten the 2 screws that fasten the cover. The following diagram shows the location of these screws. Torque the screws to 0.30 N-m.



This step completes the installation procedure.

## 3-3 Installing the ISA Bus Expander

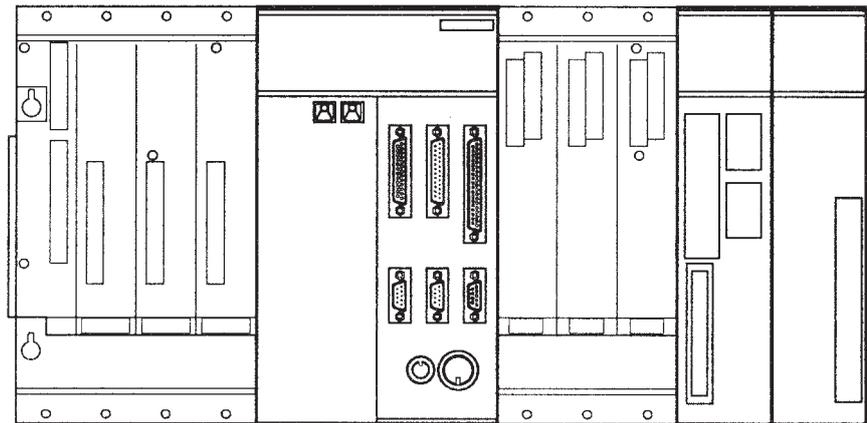
This section explains how to mount the ISA Bus Expander into the CPU Backplane.

### 3-3-1 Usable Slots

ISA Bus Expanders can be mounted in the 3 slots highlighted in the following diagram. ISA Bus Expanders are mounted in the same slots as the Hard Disk Units, so a total of 3 ISA Bus Expanders and Hard Disk Units can be mounted.

ISA Bus Expanders can be mounted in CV500-BC105 Backplanes only.

CV500-BC105 CPU Backplane



ISA Bus Expanders and Hard Disk Units  
can be mounted in these three slots.

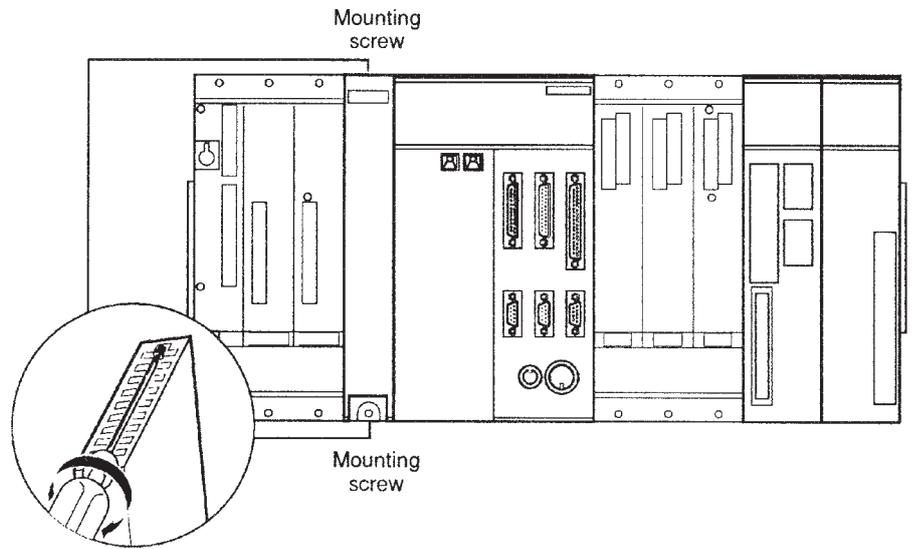
**Note** The components on the ISA Bus Expander's circuit board will become hot during operation. Turn off the power and allow the components to cool before touching them.

### 3-3-2 Installation Procedure

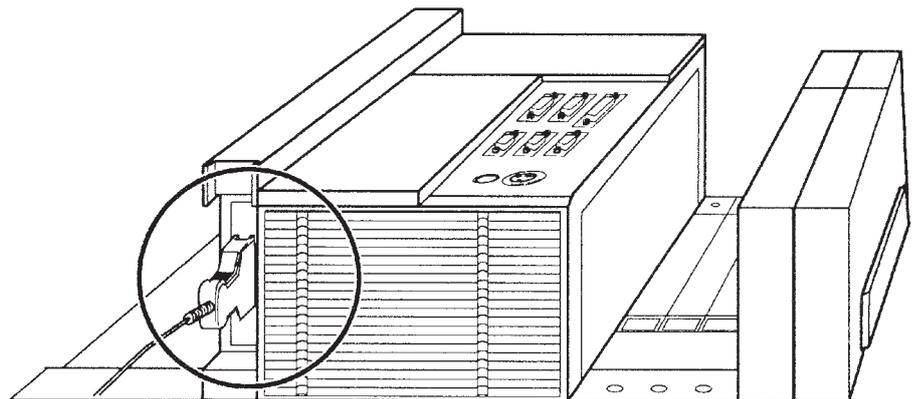
Use the following procedure to install an ISA Bus Expander.

- 1, 2, 3...** 1. Mount the ISA Bus Expander into an expansion slot in the CPU Backplane. Push the ISA Bus Expander into the slot so that the Personal Computer Unit Expansion Bus Connectors on the ISA Bus Expander and Backplane connect firmly.

2. Use a Phillips-head screwdriver to tighten the two mounting screws on the top and bottom of the ISA Bus Expander. Torque the screws to 1.2 N-m.



3. If the ISA board requires a cable connection, connect the cable as shown in the following diagram.



# SECTION 4

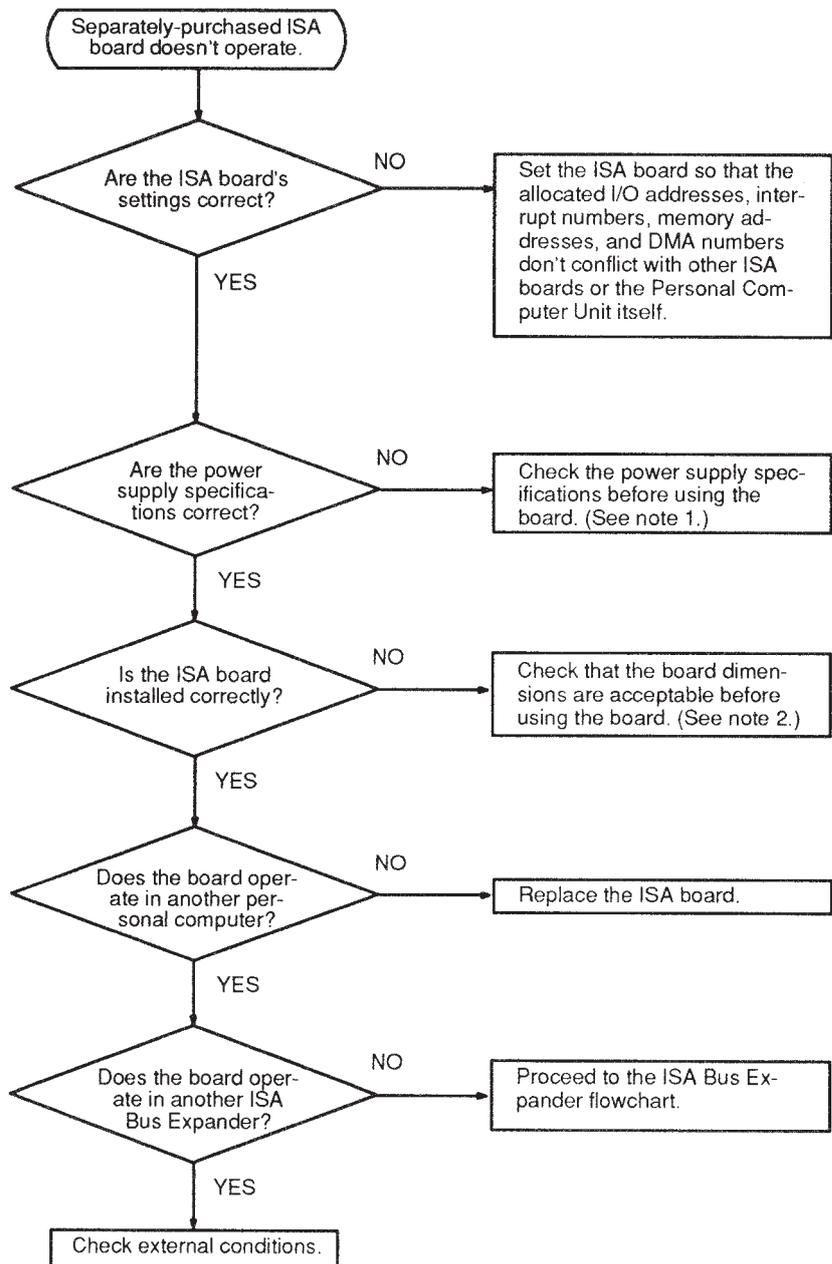
## Troubleshooting

This section provides troubleshooting flowcharts to help isolate and correct problems that prevent operation of the ISA board.

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## 4-1 Main Flowchart

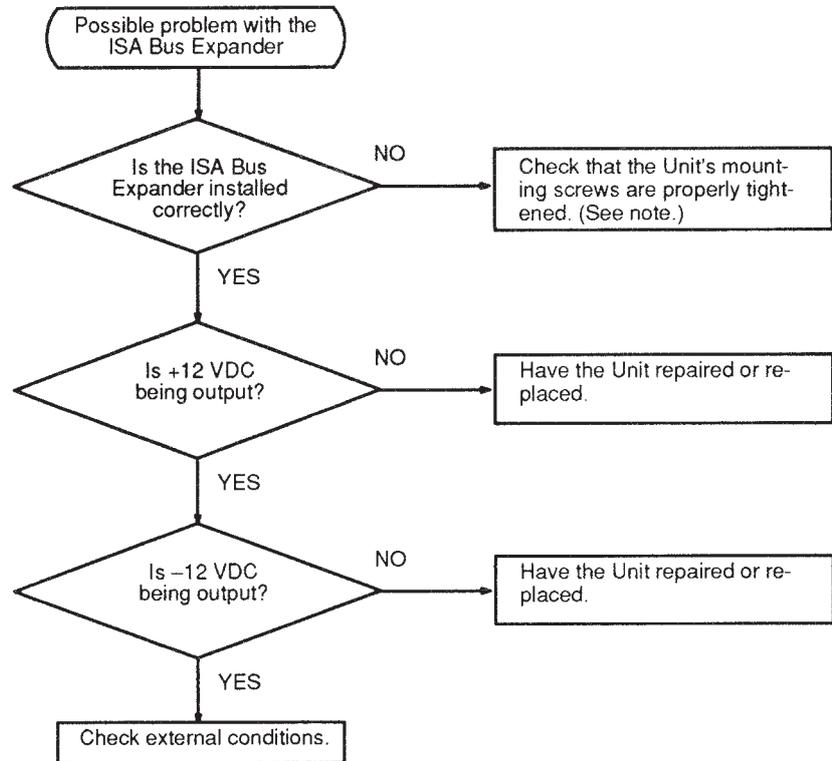
Use the following flowchart to isolate the problem when the ISA board installed in the ISA Bus Expander fails to operate.



- Note**
1. Refer to 2-2 *Power Supply Specifications* for details on power supply specifications.
  2. Refer to 3-2 *Installing an ISA Board* for details on ISA board installation. Refer to 2-1 *ISA Board Dimensions* for details on acceptable ISA board dimensions.

## 4-2 ISA Bus Expander Flowchart

Use the following flowchart to troubleshoot the ISA Bus Expander.



**Note** Refer to 3-3 *Installing the ISA Bus Expander* for details on mounting the ISA Bus Expander to the CPU Backplane.



# Appendix A Specifications

## General Specifications

All dimensions are in mm.

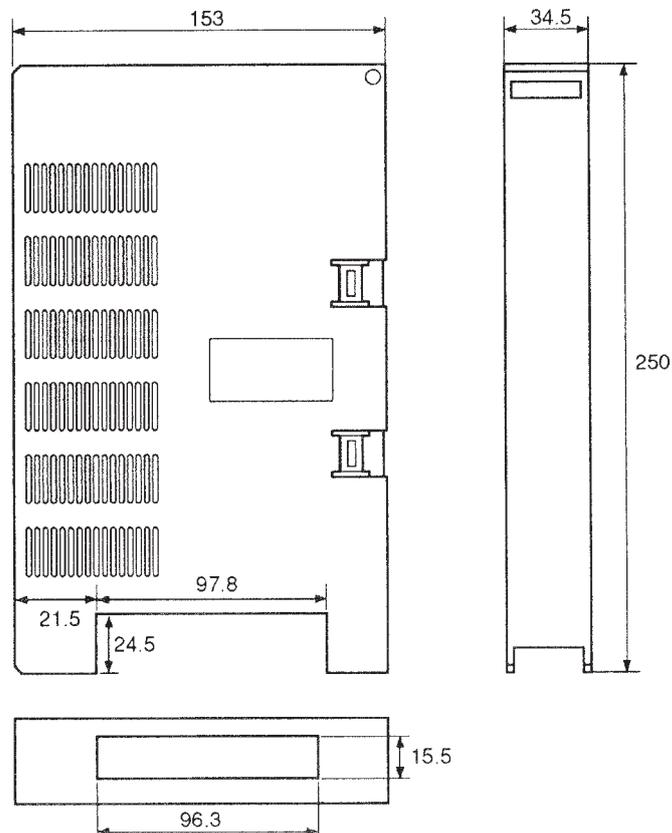
Item	Specification	
Power consumption	1.5 A max. at +5 VDC $\pm$ 5%	
Max. ISA board current consumption (see note 2.)	+5 VDC	1.45 A max. I(+5 VDC)
	+12 VDC	0.35 A max. I(+12 VDC)
	-12 VDC	0.09 A max. I(-12 VDC)
Power supply output (see note 3.)	+5 VDC $\pm$ 5%	1.45 A (ripple noise: 100 mV <sub>P-P</sub> )
	+12 VDC $\pm$ 5%	0.35 A (ripple noise: 120 mV <sub>P-P</sub> )
	-12 VDC $\pm$ 10%	0.09 A (ripple noise: 120 mV <sub>P-P</sub> )
Weight	550 g max.	
Dimensions	34.5 $\times$ 250 $\times$ 153 (W $\times$ H $\times$ D)	
Usable ISA boards (board dimensions)	106.7 $\times$ 210.0 max. (H $\times$ L)	
	114.3 $\times$ 210.0 max. (H $\times$ L)	
	121.9 $\times$ 210.0 max. (H $\times$ L)	

- Note**
- Any specifications not listed conform to the specifications of the CV-series Personal Computer Units.
  - The output current must conform to the following equation:  

$$I(+5 \text{ VDC}) + 3.52 \times I(+12 \text{ VDC}) + 5.22 \times I(-12 \text{ VDC}) + 0.05 \leq 1.5 \text{ A}$$
  - A -5-VDC power supply isn't provided.

## Dimensions

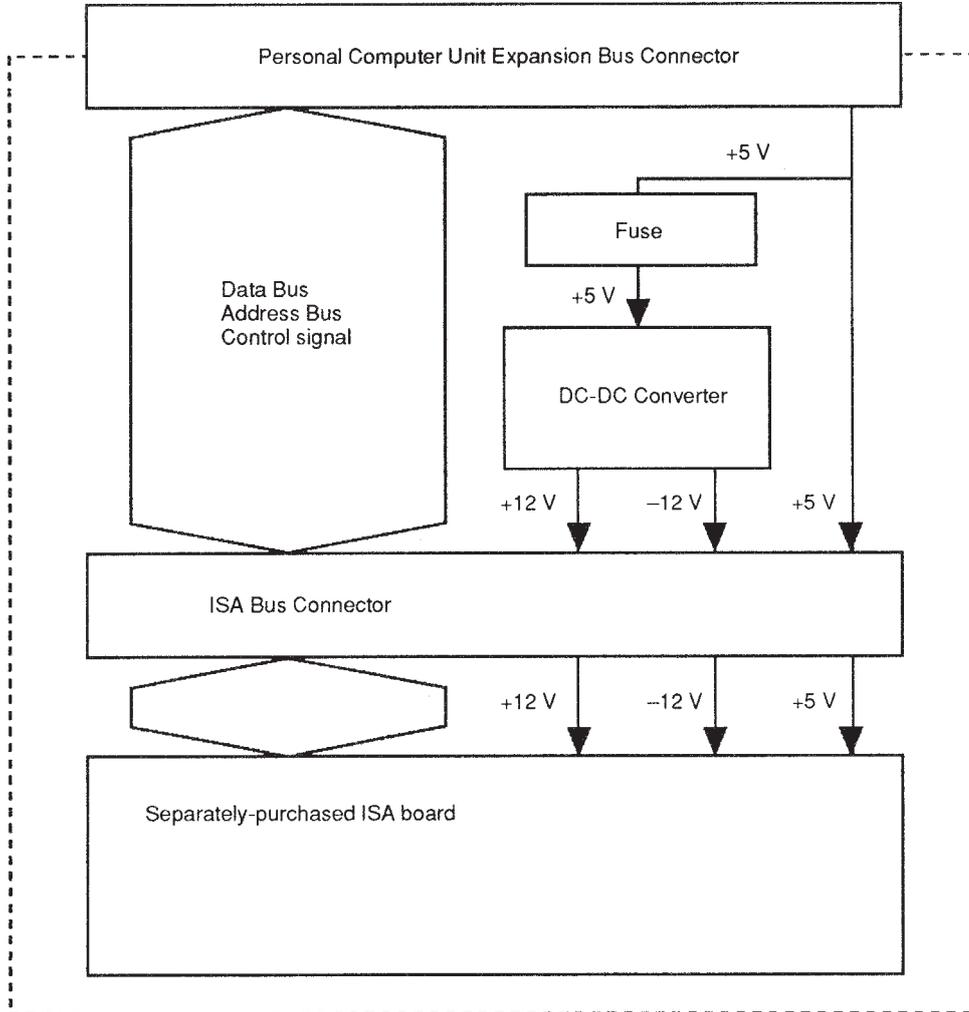
All dimensions are in mm.





# Appendix B

## Internal Configuration





# Appendix C

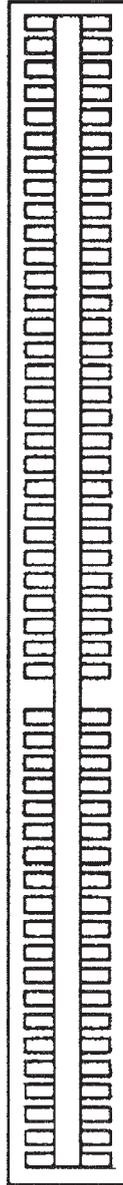
## Connector Specifications

### ISA Bus Connector

Model: 176139-2

Pin	Signal name
B1	GND
B2	RESETDRV
B3	+5 VDC
B4	IRQ9
B5	NC
B6	DRQ2
B7	-12 VDC
B8	0WS
B9	+12 VDC
B10	GND
B11	* SMEMW
B12	* SMWMR
B13	* IOW
B14	* IOR
B15	* DACK3
B16	DRQ3
B17	* DACK1
B18	DRQ1
B19	* REFRESH
B20	CLK
B21	IRQ7
B22	IRQ6
B23	IRQ5
B24	IRQ4
B25	IRQ3
B26	* DACK2
B27	T/C
B28	BALE
B29	+5 VDC
B30	OSC
B31	GND
D1	* MEM CS16
D2	* I/O CS16
D3	IRQ10
D4	IRQ11
D5	IRQ12
D6	IRQ15
D7	IRQ14
D8	* DACK0
D9	DRQ0
D10	* DACK5
D11	DRQ5
D12	* DACK6
D13	DRQ6
D14	* DACK7
D15	DRQ7
D16	+5 VDC
D17	* MASTER
D18	GND

B1      A1



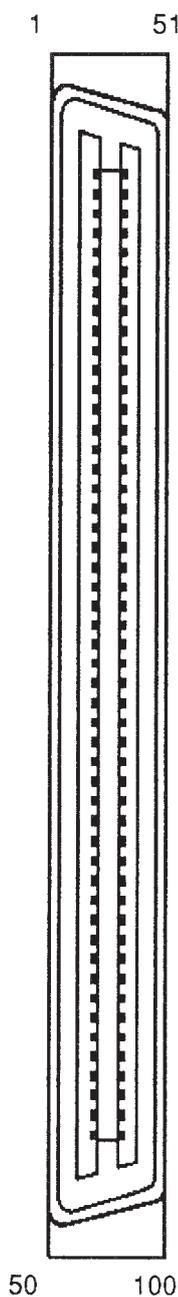
Pin	Signal name
A1	* IOCHK
A2	SD7
A3	SD6
A4	SD5
A5	SD4
A6	SD3
A7	SD2
A8	SD1
A9	SD0
A10	I/O CHRDY
A11	AEN
A12	SA19
A13	SA18
A14	SA17
A15	SA16
A16	SA15
A17	SA14
A18	SA13
A19	SA12
A20	SA11
A21	SA10
A22	SA9
A23	SA8
A24	SA7
A25	SA6
A26	SA5
A27	SA4
A28	SA3
A29	SA2
A30	SA1
A31	SA0
C1	SBHE
C2	LA23
C3	LA22
C4	LA21
C5	LA20
C6	LA19
C7	LA18
C8	LA17
C9	* MEMR
C10	* MEMW
C11	SD8
C12	SD9
C13	SD10
C14	SD11
C15	SD12
C16	SD13
C17	SD14
C18	SD15

D18      C18

# Personal Computer Unit Expansion Bus Interface Connector

Model: XH2B-0141

Pin	Signal name
1	* IOCHK
2	SD7
3	SD6
4	SD5
5	SD4
6	SD3
7	SD2
8	SD1
9	SD0
10	I/O CHRDY
11	AEN
12	SA19
13	SA18
14	SA17
15	SA16
16	SA15
17	SA14
18	SA13
19	SA12
20	SA11
21	SA10
22	SA9
23	SA8
24	SA7
25	SA6
26	SA5
27	SA4
28	SA3
29	SA2
30	SA1
31	SA0
32	GND
33	SBHE
34	LA23
35	LA22
36	LA21
37	LA20
38	LA19
39	LA18
40	LA17
41	* MEMR
42	* MEMW
43	SD8
44	SD9
45	SD10
46	SD11
47	SD12
48	SD13
49	SD14
50	SD15



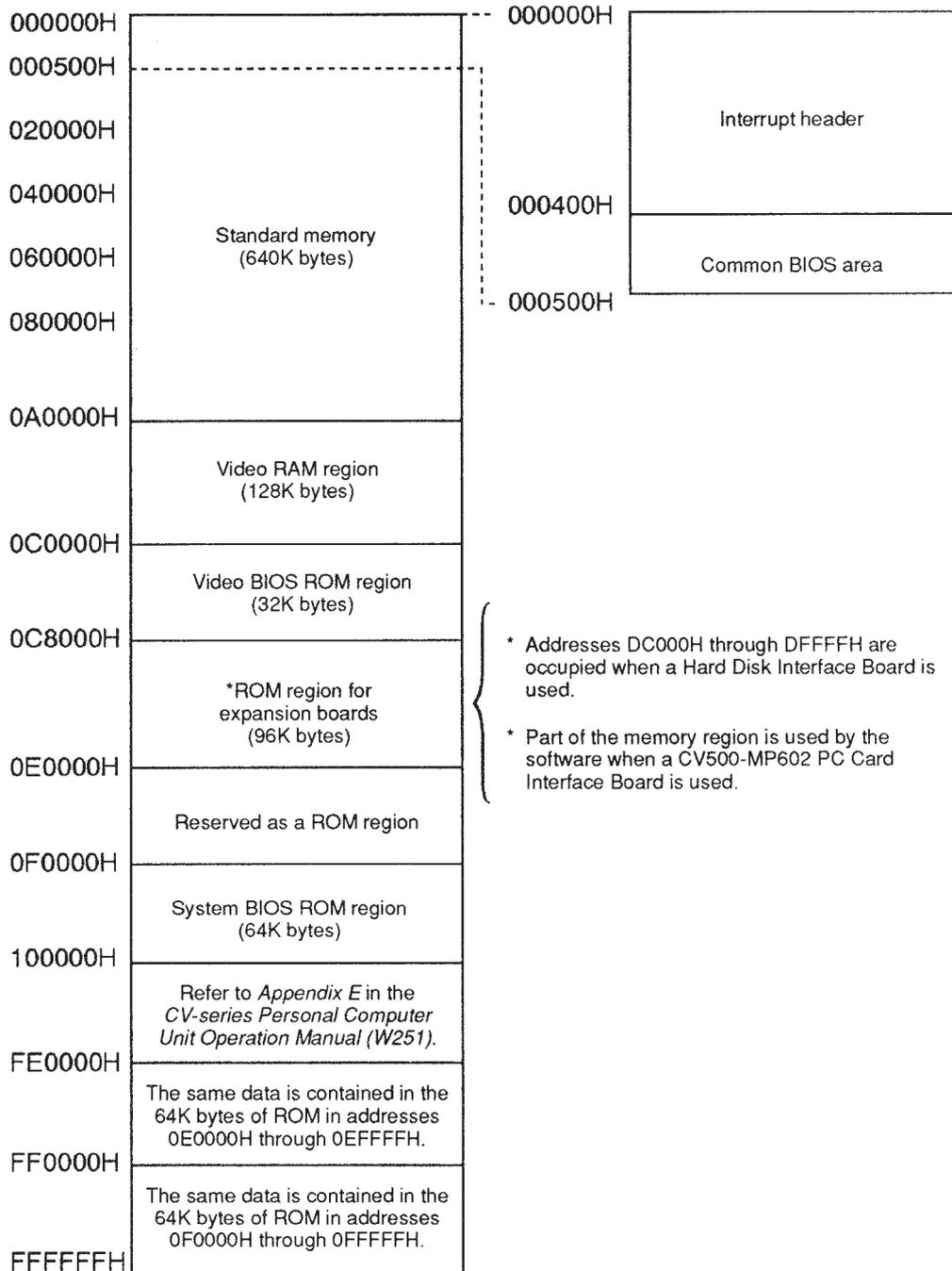
Pin	Signal name
51	GND
52	RESETDRV
53	+5 VDC
54	IRQ9
55	NC
56	DRQ2
57	NC
58	0WS
59	NC
60	GND
61	* SMEMW
62	* SMWMR
63	* IOW
64	* IOR
65	* DACK3
66	DRQ3
67	* DACK1
68	DRQ1
69	* REFRESH
70	CLK
71	IRQ7
72	IRQ6
73	IRQ5
74	IRQ4
75	IRQ3
76	* DACK2
77	T/C
78	BALE
79	+5 VDC
80	OSC
81	GND
82	N.C.
83	* MEM CS16
84	* I/O CS16
85	IRQ10
86	IRQ11
87	IRQ12
88	IRQ15
89	IRQ14
90	* DACK0
91	DRQ0
92	* DACK5
93	DRQ5
94	* DACK6
95	DRQ6
96	* DACK7
97	DRQ7
98	+5 VDC
99	* MASTER
100	GND

# Appendix D

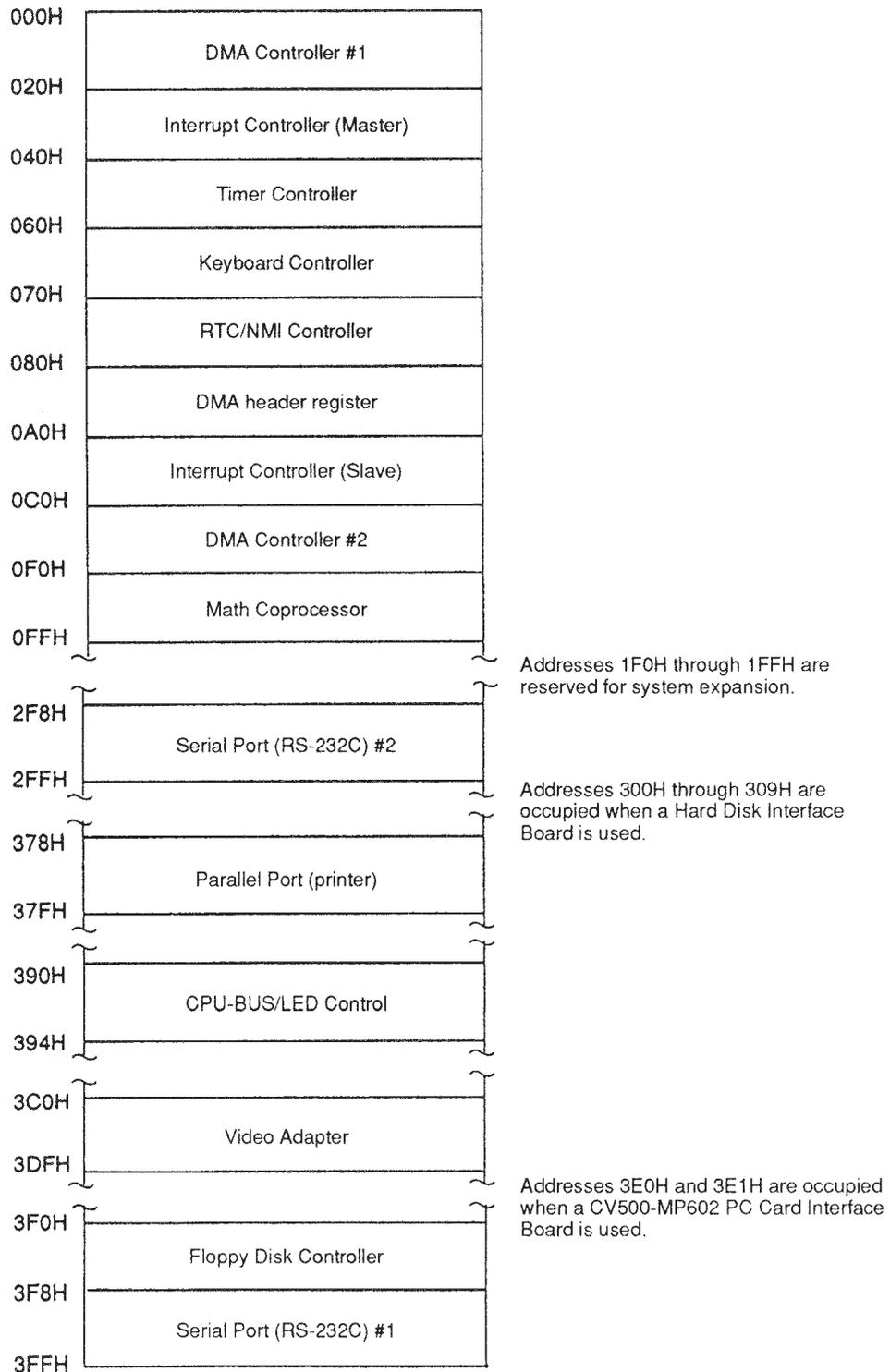
## Personal Computer Unit Specifications

This appendix provides the specifications for the CV500-VP2□□-E Personal Computer Units.

### Memory Configuration



## System I/O Configuration



## Interrupts

Interrupt	Function	Notes
00	Division error	---
01	Single step	---
02	NMI	---
03	Breakpoint	---
04	Overflow	---
05	Print screen (hard copy of display)	---
06	Reserved	---
07	Reserved	---
08	IRQ0 Timer interrupt (Master)	These are hardware interrupts.
09	IRQ1 Keyboard hardware interrupt (Master)	
0A	IRQ2 Cascade connection of interrupt controller 2 (Master)	
0B	IRQ3 Serial port #2 interrupt (Master)	
0C	IRQ4 Serial port #1 interrupt (Master)	
0D	IRQ5 Not used. (Master)	
0E	IRQ6 Disk controller interrupt (Master)	
0F	IRQ7 Parallel port 1 or 2 interrupt (Master)	
10	Video BIOS call	---
11	Machine configuration information reference	---
12	Memory size reference	---
13	Disk BIOS call	---
14	RS-232C BIOS call	---
15	Other system service	---
16	Keyboard BIOS call	---
17	Printer BIOS call	---
18	Reserved	---
19	Bootstrap	---
1A	Timer service	---
1B	Keyboard break	---
1C	User timer interrupt	---
1D	Video parameter	---
1E	Floppy disk parameter	---
1F	Graphics character	---
20 to 32	MS-DOS function calls	---
33	Mouse driver	---
34 to 3F	Reserved for MS-DOS	---
40 to 5F	Reserved for BIOS	---
60 to 66	Used as user program interrupts	---
67	LIM EMS driver	---
68 to 6F	Reserved	---
70	IRQ8 Real time clock interrupt (Slave)	These are hardware interrupts. IRQ14 is used when a CV500-HDD11 Hard Disk Unit is being used. IRQ15 is used when a CV500-MP602 PC Card Interface Board is being used.
71	IRQ9 Redirect to INT 0A (Slave)	
72	IRQ10 Power interruption interrupt (Slave)	
73	IRQ11 CPU bus interrupt (Slave)	
74	IRQ12 Mouse (Slave)	
75	IRQ13 Math processor interrupt (Slave)	
76	IRQ14 Hard Disk Unit (Slave)	
77	IRQ15 PC Card (Slave)	

<b>Interrupt</b>	<b>Function</b>	<b>Notes</b>
78 to F0	Reserved	---
F1 to FF	Reserved for the AX System	---

## **DMA List**

<b>DMA No.</b>	<b>Function</b>
0	Not used.
1	
2	Floppy Disk Controller
3	Not used.
4	
5	
6	
7	

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