

# **PowerStation**

## **User Guide**

**CTC Parker Automation**  
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## Product Warranty Information

CTC Parker Automation provides top quality products through rigid testing and the highest quality control standards. However, should a problem occur with your hardware or with the software protection key, CTC Parker's standard product warranty covers these items for 15 months from the date of shipment from CTC. Exceptions appear below:

- PowerStation backlight bulbs have a 90-day warranty.
- Third-party products, such as bus cards, carry the manufacturer's specified warranty.
- For all displays, image retention (burn-in) is not covered by warranty.
- Software revisions that occur within 60 days after purchase are available, under warranty, upon request. Please review the MachineShop License Agreement for additional software warranty information.

Should you have any questions about your application or need technical assistance, please call CTC Parker's Product Technical Support department at 513-248-1714, 8:00 a.m. to 5:00 p.m., Eastern Time. You may call this same number after hours for emergency assistance. See *Customer Support Services* on page 8 of this manual for more information about CTC Parker's support products and services.

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# Manual Overview and Support Services

Thank you for purchasing a PowerStation. CTC Parker offers a complete line of workstations that you can easily and affordably customize with a variety of hardware options.

This manual covers PowerStation Models P3, P4, P5, and P7. These PowerStations feature a durable touchscreen and can also be used with a keyboard or mouse. Model P5 PowerStations include function keys and a numeric keypad.

All PowerStations discussed in this manual have an open PC architecture that allows you to run CTC's MachineShop software and other programs compatible with MS-DOS<sup>®</sup> or Windows.<sup>®</sup> Please take time to review this manual and the other documentation included with the PowerStation before operating the unit.

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## Using this Manual

This manual is designed to help you set up and use your PowerStation. The manual lists the PowerStation's specifications and describes its replacement and optional components. It also explains how to install the unit, how to maintain the unit in good condition, and how to solve common problems that may occur in operation.

This manual is divided into the following chapters:

**Chapter 1 — Manual Overview and Support Services:**

Presents an overview of this manual, the documentation and software provided with the PowerStation, and the steps necessary to get your PowerStation up and running. This chapter also describes CTC's customer support services.

**Chapter 2 — Introducing the PowerStation:** Describes the different PowerStation models, the PowerStations' specifications, and the ports available to connect the unit to other devices and to a power source. This chapter also describes the PowerStation's drive definitions, memory map, and default jumper settings.

**Chapter 3 — Installing the PowerStation:** Explains how to install the PowerStation in a control enclosure and how to start up the unit.

**Chapter 4 — Maintaining and Troubleshooting the PowerStation:** Explains how to maintain the PowerStation and how to solve problems that may occur in operation.

**Appendix A — PowerStation Dimensional Drawings:** Displays dimensional drawings of the PowerStation that will be useful in mounting the unit.

## Documentation Components

The PowerStation documentation set contains all the information you need to configure, install, and use the PowerStation. The PowerStation documentation set is described below.

**Release Notes**—This document is provided whenever there is important information about the PowerStation that does not appear in this manual. Be sure to read the release notes before operating the unit.

**PowerStation User Guide**—This is the document you are reading. It provides detailed information about the PowerStation and describes how to configure, install, and use the unit. Please read this manual in its entirety before operating the unit.

**CPU Manual**—This is the manual provided by the manufacturer of the CPU board found in your PowerStation. Please familiarize yourself with this manual before operating the unit.

**PowerStation Template**—This document is a full-size template of the PowerStation you can use to prepare the location where you want to install the unit.

## Software Components

CTC Parker pre-loads each PowerStation with the operating system you have requested, Interact and MachineLogic if you have purchased them, and the necessary utilities so that you can run the PowerStation immediately upon its arrival at your facility. CTC Parker also provides backup copies of this software on CDs and floppy disks should you need to reinstall it. The table below shows the software that you will receive with your system. A description of each software program and its purpose follows the table.

Disk Name and Part No.	MachineShop Systems			Industrial PC Systems		
	DOS	Windows		DOS	Windows	
		95/98	NT		95/98	NT
MachineShop Installation CD KA-83103	X	X	X		X	X
MachineLogic I/O Configuration CD KA-83104	X	X	X			
MS-DOS 6.22 and Utilities Installation Disk KA-72953	X		X	X		
Windows 95/NT VGA Drivers Floppy Disk KA-72670		X	X		X	X
Windows 95 Touchscreen Driver Floppy Disk KA-72816		X			X	
Windows NT Touchscreen Driver Floppy Disk KA-72817			X			X
Windows NT Emergency Repair Floppy Disk KA-72668			X			X

**MachineShop Installation CD KA-83103:** This CD contains program files for the MachineShop Toolbar, the MachineShop Shell, PowerStation touchscreen and network drivers, system files, and utilities. Use this CD if you need to reinstall these files on your development system. See the *MachineShop Installation Booklet* for instructions on how to install the contents of this CD.

**MachineLogic I/O Configuration CD KA-83104:** This CD is shipped only with the MachineShop Development Suite. It contains the drivers you will need to configure your I/O network for MachineLogic, CTC Parker's control software. See the *MachineShop Installation Booklet* for instructions on how to install the contents of this CD.

**MS-DOS 6.22 and Utilities Installation Disk KA-72953:** This disk contains the MS-DOS operating system and utilities. These files have already been installed on your unit, but you can use this disk if you need to reinstall the operating system or utilities, or if you need to reformat a Compact Flash card.

**Windows 95/NT 4.0 VGA Drivers KA-72670:** This disk is used by PowerStations that use the Windows 95, 98, or NT operating system. The disk contains the Windows VGA drivers to fully support PowerStation VGA features. The VGA drivers on this disk provide better color support than the standard drivers. The Windows 95, 98, and NT VGA drivers exist in separate directories on the disk. The VGA drivers have already been installed on your unit, but you can use this disk to reinstall these files if your VGA drivers become corrupted.

**Windows 95 Touchscreen Driver KA-72816:** This disk is used by PowerStations that use the Windows 95 or 98 operating system. It contains files necessary to operate the touchscreen in Windows 95 or 98. The touchscreen driver has already been installed on your unit, but you can use this disk to reinstall these files if your touchscreen drivers become corrupted.

**Windows NT 4.0 Touchscreen Driver KA-72817:** This disk is used by PowerStations that use the Windows NT operating system. It contains files necessary to operate the touchscreen in Windows NT. The touchscreen driver has already been installed on your unit, but you can use this disk to reinstall these files if your touchscreen drivers become corrupted.

**Windows NT Emergency Repair Disk KA-72668:** This disk is used by PowerStations that use the Windows NT operating

system. The disk is used to reboot an NT system whenever the system does not recover from a crash. The disk will allow you to restart the system and repair the corrupted files.

## Getting Started

Now that you have opened the PowerStation package, you are ready to unpack the unit, install it in a permanent location, and begin developing your applications and projects. This section provides an overview of these activities. Additional information is available in the remaining chapters of this manual.

### Unpack the PowerStation

Before you begin operating the PowerStation, please complete the following steps:

1. Unpack the PowerStation, and verify that you have received all the components you ordered.
2. Fill out the product registration card, and return it to CTC Parker. When you register your unit, you will receive a trial membership in CTC Parker's Product Support Program, which provides complimentary telephone technical support, information on product updates, and service bulletins.
3. Back up the CTC Parker software that came with your unit using the Windows File Manager/Explorer or the MS-DOS Diskcopy command.

### Install the PowerStation

When you finish unpacking the PowerStation and developing an application, you are ready to install the unit in a permanent location. See Chapter 3 in this manual, *Installing the PowerStation*, for complete installation instructions.

### Develop Applications and Projects

If your PowerStation is a development system, you will be able to develop and run applications and projects on it. If it is a runtime-only system, you will have to develop applications or projects on a PC and download them to the PowerStation.

**Note** Throughout this manual, all references to "development PC" or "development system" refer to the computer you use to develop applications.

See the documentation that came with your development software for information about how to develop your applications or projects and, if necessary, download them to the PowerStation.

## Documentation Standards

As you read this manual, you will notice that it uses the following documentation standards:

1. Important terms are shown in **bold**.
2. Text to be entered from the keyboard is shown in `Courier` font.
3. Buttons, menu titles, and keyboard keys are shown in Initial Caps.
4. Indented paragraphs denote one of the following:
  - **Note**—Describes alternative approaches or issues you should be aware of while using a particular function.
  - **Important**—Contains information that you should pay particular attention to while reading. Follow this information to save development time and minimize problems.
  - **Warning**—Contains information on safety issues. Follow this information to prevent equipment damage or personal injury.

### ISO Symbols



This symbol is the International Standards Organization (ISO) symbol for Caution (ISO 3864 No. B.3.1). This symbol denotes information that could affect operation of the PowerStation if the information is not properly followed.



This symbol is the ISO symbol for Caution—risk of electrical shock (ISO 3864 No. B.3.6). This symbol denotes information that could cause personal injury from electrical shock or damage to equipment if the information is not properly followed.

## Customer Support Services

CTC Parker welcomes your thoughts and suggestions on our products and services. You can contact CTC Parker by telephone, email, or fax. You can also visit CTC Parker on the World Wide Web to learn the latest about our hardware, software, and customer support services.

- Telephone: 513-831-2340
- Fax: 513-831-5042
- E-mail: sales@ctcusa.com or support@ctcusa.com
- World Wide Web: <http://www.ctcusa.com>

CTC Parker recognizes that every customer and every application has different support needs, so we offer a variety of support services designed to meet these needs. CTC Parker offers three types of customer support services: Product Technical Support, Technical Support Products, and the Product Support Program.

## Product Technical Support

The Product Technical Support department welcomes any question that might arise as you develop or run your applications. We offer complimentary support for any customer, whether you are an end-user, original equipment manufacturer (OEM), system integrator, or distributor.

If you have a question about the PowerStation, be sure to complete the following steps:

1. Check any release notes shipped with the unit. These notes provide important information about the PowerStation.
2. Consult the PowerStation documentation and other printed materials included with the PowerStation.
3. Review Chapter 4 of this manual, *Maintaining and Troubleshooting the PowerStation*.

If you cannot find a solution using one of the above sources, contact our Product Technical Support department at 513-248-1714, 8:00 a.m. to 5:00 p.m., Eastern Time. You can call this same number after hours for emergency assistance.

## Technical Support Products

Our Technical Support Products department provides service in two areas: training and consulting. CTC Parker offers training on all our products, either at CTC Parker in our state-of-the-art training center or at your site. You can learn how to write custom interfaces, develop specialized applications, and implement your

complete operator interface application. You can contact the Training Coordinator by phone at 1-800-233-3329 or by email at [training@ctcusa.com](mailto:training@ctcusa.com).

CTC Parker offers consulting services through our Professional Consulting Services (PCS) group. Our PCS group can build your application from the ground up by writing custom communications drivers or by designing special modules to perform functions unique to your application. Our team of specialists is flexible, so they can create a project development schedule that meets your needs. You can contact the PCS Coordinator by phone at 1-800-233-3329 or by email at [pcs@ctcusa.com](mailto:pcs@ctcusa.com).

### **Product Support Program**

The Product Support Program (PSP) is designed to keep you up-to-date with the current versions of CTC Parker software. The PSP consists of a renewable, one-year membership that provides you with free upgrades, utilities, automatic notification of software updates, and other valuable tools for MachineShop, Interact, and MachineLogic. Single-user, site, and corporate licenses are available. The PSP is an easy, cost-effective way to automatically receive the most recent CTC Parker software and associated utilities. You can contact the PSP Coordinator by phone at 1-800-233-3329 or by email at [psp@ctcusa.com](mailto:psp@ctcusa.com).



# Introducing the PowerStation

The PowerStation family of workstations is designed to give you an operator interface solution that is powerful, cost-effective, and very easy to use. These workstations are available in a variety of configurations to fit the functionality and cost requirements of your application.

In this chapter, you will learn about the various PowerStation models. You also will learn about the PowerStations' specifications, connectors, drive definitions, memory map, jumper settings, and expansion cards. Finally, the chapter explains important design issues concerning PowerStation touchscreens and hard drives.

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## PowerStation Models

CTC Parker offers a complete line of workstations that you can easily and affordably customize with a variety of hardware options. This section describes the features of each PowerStation model covered in this manual.

All PowerStations discussed in this manual have an open PC architecture that allows you to run CTC Parker's MachineShop software and other programs compatible with MS-DOS and Windows. PowerStations without MachineShop are referred to throughout this manual as Industrial PC PowerStations.

The PowerStation models described in this manual are as follows:

**P3 PowerStation**—This PowerStation is a touchscreen workstation that includes a 5x86 133 MHz processor and one of the following 10.4" displays: LCD, STN, or TFT. The P3 also includes 8MB of RAM and an internal floppy drive.

**P4 PowerStation**—This PowerStation is a touchscreen workstation that includes one of the following CPUs: 5x86 133 MHz, Pentium 166 MHz, or Pentium MMX 200 MHz. The P4 also includes 8MB of RAM, an internal floppy drive, and one of the following 10.4" displays: LCD, STN, or TFT.

**P5 PowerStation**—This PowerStation is a function key workstation that includes one of the following CPUs: 5x86 133 MHz, Pentium 166 MHz, or Pentium MMX 200 MHz. The P5 also includes 8MB of RAM, an internal floppy drive, and one of the following 10.4" displays: LCD, STN, or TFT.

**P7 PowerStation**—This PowerStation is a touchscreen workstation that includes a large 13.8" TFT display and one of the following CPUs: 5x86 133 MHz, Pentium 166 MHz, or Pentium MMX 200 MHz. The P7 also includes 8MB of RAM and an internal floppy drive.

**Note** PowerStations with MachineShop are available with your choice of Compact Flash or a hard drive. Industrial PC PowerStations are only available with a hard drive and one of two displays: TFT or STN. The P7 industrial PC comes only with the TFT display.

## Specifications

This section describes important specifications for the PowerStation. Please familiarize yourself with these specifications before operating the unit.

### Physical Specifications

Physical specifications include the PowerStations' CPUs, memory specifications, display types, storage capacity, and other physical characteristics. These specifications are shown in the table below.

Category	Specifications
CPUs	5x86 133MHz; Pentium 166, or Pentium MMX 200MHz (unavailable on P3).
Memory	8MB min., 32MB max. (64MB max. on Pentiums).
Displays	<ul style="list-style-type: none"> <li>• Monochrome LCD, 640x480 VGA, 16 shades of gray (unavailable on P7 and Industrial PCs).</li> <li>• Color TFT, 640x480 VGA, 256 colors.</li> <li>• Color TFT, 1024x768 XGA, 256 colors.</li> <li>• Color STN, 640x480 VGA, 256 colors (unavailable on P7).</li> </ul>
Storage	<ul style="list-style-type: none"> <li>• 1.44MB high-density floppy drive.</li> <li>• 1.6GB (min.) hard drive (standard on Industrial PCs).</li> <li>• 8, 10, 20, or 40MB solid state flash drive (field expandable and replaceable). Actual storage volumes may be higher.</li> <li>• PCMCIA (requires 3rd party adapter board).</li> </ul>
I/O ports	<ul style="list-style-type: none"> <li>• 1 9-pin RS232 (non-isolated).</li> <li>• 1 9-pin RS232/422/485 (non-isolated).</li> <li>• 1 25-pin IBM parallel.</li> <li>• 1 RJ45 Ethernet.</li> </ul>
Expansion slots	<ul style="list-style-type: none"> <li>• P3: 3 3/4-size, 16-bit, ISA slots (1 slot is convertible to full-size using an optional expansion cover).</li> <li>• P4: 1 1/2-size, 3 3/4-size, 16-bit, ISA slots (1 3/4-size slot is convertible to full-size using an optional expansion cover).</li> <li>• P5 and P7: 2 full-size, 1 3/4-size, 16-bit, ISA slots.</li> </ul>

Category	Specifications
Dimensions (H x W x D)	<ul style="list-style-type: none"> <li>• P3: 11.0" (280mm) x 13.8" (350mm) x 6.0" (152mm)</li> <li>• P4: 11.0" (280mm) x 13.8" (350mm) x 8.5" (216mm)</li> <li>• P5 and P7: 14" (356mm) x 16" (406mm) x 7" (178mm)</li> </ul>
Weight	<ul style="list-style-type: none"> <li>• P3: 16.2 lbs. (7.3 Kg)</li> <li>• P4: 18.8 lbs. (8.5 Kg)</li> <li>• P5 and P7: 23.8 lbs. (10.8 Kg)</li> </ul>

### Environmental Specifications

The PowerStation conforms to the environmental specifications listed in the table below,

Category	Specifications
Operating temperature	<ul style="list-style-type: none"> <li>• 5x86 CPUs: 32 to 122°F (0 to 50°C) ambient air temperature at fan inlet</li> <li>• Pentium CPUs: 32 to 113°F (0 to 45°C) ambient air temperature at fan inlet</li> </ul>
Bulb life	<ul style="list-style-type: none"> <li>• Monochrome LCD - 10,000 hours</li> <li>• Color STN - 25,000 hours</li> <li>• Color TFT (10.4") - 25,000 hours</li> <li>• Color TFT (13.8") - 10,000 hours</li> </ul>
Relative humidity	5% to 95% non-condensing
Altitude	-200ft. to 10,000ft. (-60.96m to 3,048m)
Shock rating	<ul style="list-style-type: none"> <li>• 10g peak, 11ms (operating)</li> <li>• 30g peak, 11ms (non-operating)</li> </ul>
Operating vibration	0.35mm 10 to 18Hz, 1.0g from 18 to 150Hz
Faceplate designed for	NEMA 4/4X Environment <b>Note:</b> The PowerStation is only rated NEMA 4 if it is installed in a NEMA 4-rated enclosure.

**Important** Limit the PowerStation's exposure to adverse conditions, such as dust, oil, moisture, and corrosive vapors to minimize maintenance and repair costs.

Remember that the temperature within a protective enclosure is generally higher than the external temperature. Thus, if the PowerStation is operating inside an enclosure at temperature levels above its rated ambient temperature, you must cool the enclosure.

### Electrical Specifications

The PowerStation's electrical specifications for both AC and DC units appear in the table below.

Category	Unit Specifications
Power supply	AC Units <ul style="list-style-type: none"> <li>• P3: 90-250 VAC, 80W max., 50/60 Hz</li> <li>• P4, P5, and P7: 90-250 VAC, 110W max., 50/60 Hz</li> </ul> DC Units <ul style="list-style-type: none"> <li>• P3 - P7: 18-36 VDC in, 110W max.</li> </ul>
Power consumption	AC Units <ul style="list-style-type: none"> <li>• P3: 80W maximum</li> <li>• P4, P5, and P7: 110W maximum</li> </ul> DC Units <ul style="list-style-type: none"> <li>• P3 - P7: 110W maximum</li> </ul>
Fuse type	AC Units <ul style="list-style-type: none"> <li>• 3.15A, 250 VAC Littell fuse 216.315 or equivalent</li> </ul> DC Units <ul style="list-style-type: none"> <li>• 12A, 250 VAC Littell fuse 314.012 or equivalent</li> </ul>
ISA cards	Voltage and current available for expansion cards (either AC or DC Units): <ul style="list-style-type: none"> <li>• 5x86 CPUs: 2.25A @ +5V, .3A @ -5V; 1.0A @ +/-12V</li> <li>• Pentium CPUs: 2.5A @ +5V, .25A @ -5V; 1.0A @ +12V, .75A @ -12V</li> </ul>

**Important** The PowerStation's power supply automatically detects the input voltage level and adjusts accordingly. However, always use reliable sources of power, and isolate all communication cables from power lines to enhance noise immunity.

If possible, locate the PowerStation away from machinery that produces intense electrical noise (arc welders, etc.). Otherwise, isolate the input power to the PowerStation from the equipment generating electrical noise.

#### **Special note for units with replaceable lithium batteries**



There is danger of explosion if the battery is incorrectly replaced. Replace the battery only with the same type of battery or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

#### **Testing Specifications**

The PowerStation conforms to the testing specifications listed below.

<b>Testing Criteria</b>	<b>Classification</b>
Showering arc	NEMA showering arc
Surge withstanding capacitance	IEEE 472-1974
ESD requirements	IEC 801-2
Operating temperature	IEC 68-2-1
Electrical fast transient	IEC 801-4
European Harmonized EAC Standards	EN50082-2, EN55011
Operating vibration	IEC 68-2-6
Mechanical shock	IEC 68-2-27
Random vibration	MIL-STD-810D

### Faceplate Chemical Resistance

The touchscreen of the PowerStation can resist the chemicals listed in the table below with no visible effect.

Touchscreen Chemical Resistance		
Acetone	Sulfuric Acid 10%	Motor oil
MEK	Hydrochloric Acid 10%	Gasoline
Toluene	Acetic Acid 10%	Machine oil
Methylene Chloride	Phosphoric Acid	Salad oil
Isopropyl Alcohol	Sodium Hydroxide 10%	Silicone
Xylene	Carbon Tetrachloride	Silicone grease G31
Hexane	Potassium Hydroxide	Kerosene
Butyl Cellosolve	Ammonia water 10%	Gas oil
Cyclohexanone	Sodium Chloride 26%	Silicone oil
Trichloroethylene	Zinc Chloride 81%	Engine oil
Ethanol	Cottonseed oil	Cleanser
Methanol	Glycerin	
Nitric Acid 10%	Grease	

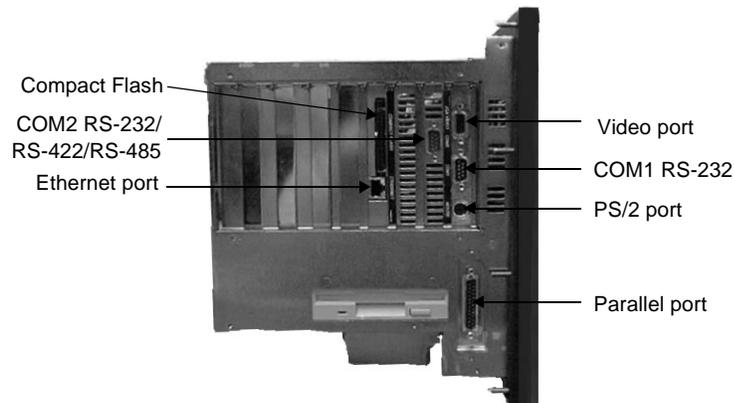
All PowerStation surfaces exposed to the outside of your enclosure are resistive to the following chemicals:

- Commercial glass cleaners
- Ammonia (10% dilute solution)
- Motor oil
- Hydraulic fluid
- Diesel fuel
- Gasoline (leaded, unleaded)
- Silicone based lubricant
- Alcohol (ethyl, methyl)
- Automatic transmission fluid

**Important** Sustained exposure to brake fluid or Gunk® brand degreaser can cause damage to monitor materials.

## Available Connectors

The PowerStation includes many of the same ports found on most PCs. All PowerStations have two serial ports, one parallel port, a video port, an Ethernet connector, a Compact Flash connector, and a PS/2 port. Each PowerStation (P3–P7) will be configured slightly differently. The following illustration shows a P4 with a Pentium CPU. Use this illustration to locate the ports on your PowerStation.



### Serial Ports

The PowerStation has two serial ports, COM1 and COM2, which you can use to communicate with external devices. These ports support baud rates of up to 115 Kbaud. The COM1 port supports the RS-232 communication standard. Use a standard DB9 connector for communicating with this port.

The other serial port, COM2, is optically isolated with 500V of isolation to provide noise immunity. This port supports RS-232C, RS-422, and RS-485 communication standards. The communication standard you select depends on the distance between the PowerStation and the controller, as well as the communication standards that the controller supports. Use a standard DB9 connector for communicating with this port.

**Note** If you are using RS-232 communications, the length of the serial cable should not exceed 50 feet (15 meters).

RS-422 and RS-485 communications offer greater noise immunity than RS-232. These standards increase the maximum cable length to 4,000 feet (1,200 meters).

RS-422 communications are full-duplex (can send and receive simultaneously), while RS-485 communications are half-duplex (can only send or receive at one time).

For either configuration, be careful not to connect any wires to unused connector pins. Information on the specific connection required for the Interact or MachineLogic drivers you will use is located in the Help file associated with the driver.

### COM1 pinouts

If you need to make a cable for communicating with COM1, the following table shows the pinouts and signal information for this port.

Pin #	Signal Name
1	DCD, data carrier detect
2	RXD, received data
3	TXD, transmitted data
4	DTR, data terminal ready
5	Signal ground
6	DSR
7	RTS, request to send
8	CTS, clear to send
9	RI

### COM2 pinouts

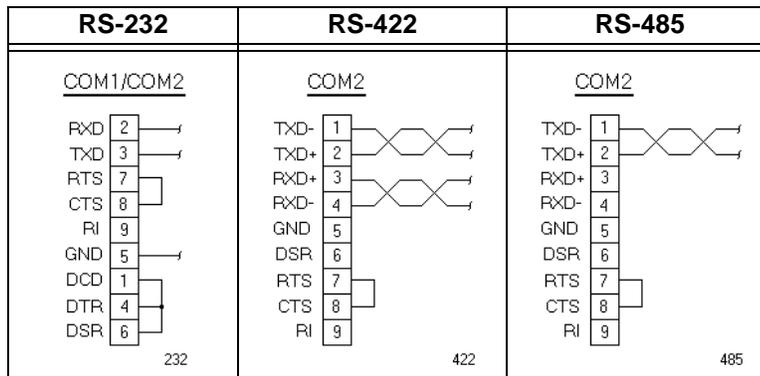
If you need to make a cable for communicating with COM2, the following table shows the pinouts and signal information for this port. COM2 is set to the RS-485 protocol by default. To change COM2 to the RS-232 or RS-422 protocol, you must change the COM2 jumper settings. See *JP8 COM2 serial port configuration* on page 76 of this manual for information about how to change these settings

Pin#	RS-232 Signal	RS-422 Signal	RS-485 Signal
1	DCD, data carrier detect	TXD-, transmitted data -	TXD-, transmitted data -
2	RXD, received data	TXD+, transmitted data +	TXD+, transmitted data +

Pin#	RS-232 Signal	RS-422 Signal	RS-485 Signal
3	TXD, transmitted data	RXD+, received data +	RXD+, received data +
4	DTR, data terminal ready	RXD-, received data -	RXD-, received data -
5	Signal ground	Signal ground	Signal ground
6	DSR, data set ready	DSR, data set ready	DSR, data set ready
7	RTS, request to send	RTS, request to send	RTS, request to send
8	CTS, clear to send	CTS, clear to send	CTS, clear to send
9	RI	RI	RI

### Cable diagrams

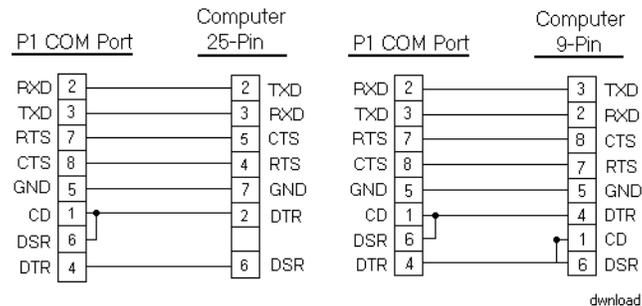
The following illustrations represent the pinouts and cable diagrams required for communicating with COM1 or COM2 using the RS-232 protocol. Also shown are cable diagrams for communicating with COM 2 using the RS-422 or RS-485 protocol.



**Important** Be careful not to connect any wires to unused connector pins.

## Connecting to a PC

To transfer files from a PC to the PowerStation, connect a serial cable with a null modem to an available serial port on the PC. Connect the other end of the cable to the serial port on the PowerStation. If you need to construct your own cables, refer to the illustration below.



## Connecting a serial mouse

If you need to connect a serial mouse to the PowerStation, you must use either COM1 or COM2.

**To configure the PowerStation to use a serial mouse, complete the following steps:**

1. If you will be using COM2 for your mouse, verify that COM2 is configured for RS-232 communications. See *JP8 COM2 serial port configuration* on page 76 of this manual for information about how to change the communications protocol for this port.
2. Connect the serial mouse to the port that you configured, and restart the PowerStation.

## Connecting to a serial printer

To connect the PowerStation to a serial printer, you must change the mode settings for one of the serial ports to match those of your printer. The easiest way to change these settings is to use MODE.COM. MODE.COM can modify the following options:

**baud:** 110, 150, 300, 600, 1200, 2400, 4800, 9600

**parity:** N - none, O - odd, E - even

**databits:** either 7 or 8

**stopbits:** either 1 or 2

CTC Parker installs MODE.COM on the PowerStation's Compact Flash card or hard drive. You will make a backup copy of the file when you create the PowerStation Start Disk from the MachineShop Installation CD shipped with your PowerStation. See the *MachineShop Installation Booklet* for instructions on how to create this disk.

**To use MODE.COM, complete the following steps:**

1. From the Windows desktop, open the Startup directory within Interact project:

```
C:\Machshop\Projects\Interact\*Project  
Name*\Startup\
```

2. Within the Startup folder, create a new AUTOEXEC.BAT file with the following line:

```
MODE COM#:baud,parity,databits,stopbits
```

3. Launch the MachineShop Toolbar and download the project that contains AUTOEXEC.BAT and MODE.COM from your development system to the PowerStation.

During the download, MachineShop transfers the AUTOEXEC.BAT file you created in step 2 into the \STARTUP directory specified by the INTERACT\_STARTUP environment variable. This environment variable resides in the PowerStation's AUTOEXEC.BAT file.

When MachineShop finishes the download, you will be asked whether you want to restart the PowerStation or not.

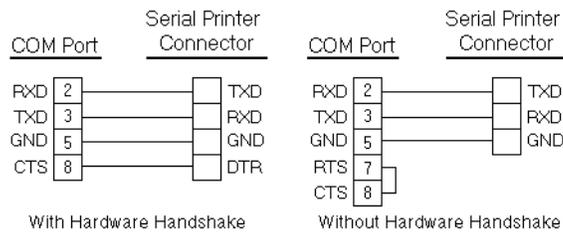
4. Restart the PowerStation.

MODE.COM will configure the COM port to the required baud rate. For example, if you are communicating at 9600, NONE, 8, and 1, use:

```
MODE COM1: 9600,N,8,1
```

**Note** To print to a port that is configured for downloading, you must disable downloading for that port and restart the PowerStation. Restarting the PowerStation allows MODE.COM to reset the communication settings for that port. On the Settings menu of the MachineShop Shell, use the Download Enable command to disable downloading.

- Use the following diagram as a reference when connecting a serial printer to the PowerStation.



## Parallel Port

The PowerStation parallel port (LPT1) pinout is identical to the standard IBM parallel printer port. The LPT1 connector pinout is shown in the table below.

Pin #	Signal Name
1	STROBE
2	DATA 0
3	DATA 1
4	DATA 2
5	DATA 3
6	DATA 4
7	DATA 5
8	DATA 6
9	DATA 7
10	- ACKNOWLEDGE
11	BUSY
12	PAPER EMPTY
13	+ SELECT
14	- AUTO FEED
15	- ERROR

Pin #	Signal Name
16	- INIT PRINTER
17	- SELECT INPUT
18-25	GROUND

### Connecting to a parallel printer

The PowerStation can interface with any parallel printer designed for use with IBM PC-compatible computers. Connect a printer to the port marked LPT1 using a standard IBM PC parallel cable.

### PS/2 Port

All PowerStations have a PS/2 port located on the CPU board. Depending upon the type of PowerStation you have, this port may be used to connect a mouse and/or keyboard to the unit.

### Connecting a keyboard (P3 and P4 only)

P3 and P4 PowerStations can receive input from a PS/2 keyboard by connecting it directly to the PowerStation's PS/2 port. However, if you want to use a keyboard and a mouse simultaneously, you must use the supplied Y-adapter cable.

The Y-adapter cable allows the P3 and P4 to accept input from a PS/2 mouse and any IBM AT- (but not XT-) compatible keyboard, including 84-key standard keyboards and 101-key enhanced keyboards.

If you have a P5 or P7, see the *Keyboard Port (P5 and P7 only)* section below for more information about connecting a keyboard.

### Connecting a PS/2 mouse

All PowerStations can receive input from a PS/2 mouse using the supplied Y-adapter cable. The mouse should be connected to the PowerStation's PS/2 port. You must use the Y-adapter cable because the PS/2 port is configured to receive input from a PS/2 keyboard.

### Keyboard Port (P5 and P7 only)

P5 and P7 PowerStations have a keyboard port located next to the parallel port. This port can accept input from any IBM AT- (but not XT-) compatible keyboard, including 84-key standard keyboards and 101-key enhanced keyboards.

**Important** Do **not** use the Y-adaptor cable to connect an IBM AT-compatible keyboard to the PowerStation's PS/2 port.

### SVGA Video Port

The PowerStation has a video port that allows you to use an external SVGA monitor in place of the flat-panel display. On TFT units, this port allows you to use an external monitor and the flat-panel display simultaneously. This port supports monochrome and high resolution color displays.

**Note** The maximum resolution of the PowerStation flat-panel display is 640 x 480, but the video port can support up to 1024 x 768.

### Ethernet Port

The PowerStation has an Ethernet RJ-45 port that allows you to connect the PowerStation to a Local Area Network. This port is software compatible with the NE-2000 protocol and supports all major network operating systems. Consult the manual that came with your network software for setup options.

Pin#	Signal
1	TX+
2	TX-
3	RX+
4	N/C
5	N/C
6	RX-
7	N/C
8	N/C

### Compact Flash

The PowerStation has a slot to accommodate Compact Flash (CF) cards. The CF card is like a removable hard drive. It provides non-volatile memory storage. A CF card is often used as a supplement to, or a replacement for, a hard drive because the CF is well-suited for environments in which the PowerStation may be vibrated or shaken. If no hard drive is present, the CF card is recognized as drive C. If you have a hard drive unit, the CF can be configured as

a secondary IDE hard drive. Although the CF is removable, it cannot be removed while the PowerStation is running because it is used as an IDE drive.

## Function Key Operation

The P5 PowerStation includes 40 function keys: F1 through F20 and (using the Shift key) F21 through F40. It also includes a programmable Select key. This section of the manual describes how to operate units equipped with function keys.

- **Function Keys**—allow you to send instructions to a software program. These instructions depend upon the software package you are using. For example, if you are using CTC Parker's Interact software, you can assign a function key to each input tool on a panel.
- **Cursor Keys**—move the cursor around the screen. In Interact, you can use the cursor keys to select options from menus.
- **Numeric Keypad**—contains keys for entering numeric data into the PowerStation.
- **Shift Key**—when active, allows you to access function keys F21 through F40. This key is set to Momentary control by default. Momentary control provides access to F21 through F40 function keys whenever you press and hold the Shift key. When you release the Shift key, you automatically regain access to the F1 through F20 keys.

If you purchased Interact with your PowerStation, you can also choose Shift Lock mode or Shift Lock Release mode.

- **Select Key**—generates a key scan code that is like pressing the right Shift key on a keyboard.

If you purchased Interact with your PowerStation, you can change the operation of this key to emulate any key.

### Special Note for P5 Users

The Select key on the PowerStation has been preset to imitate the right Shift key. The shift mode of the unit is set for "momentary shift," which means that you must hold down the Shift key while you press another key.

## Drive Definitions and Memory Map

Tables 1 and 2 below provide information about the PowerStation's drive definitions, depending upon the type of storage and read/write devices the PowerStation is using. Following the tables is an illustration of the PowerStation's memory map.

**Table 1: Units with Compact Flash**

Drive Letter	Type	Size	Usage
C:	Compact Flash (CF) Card (Read/Write)	8, 10, 20, or 40MB	System boot drive and Project disk. Stores the project, the MachineShop Shell, Interact, MachineLogic, system files, and applications. Download files to this drive.
A:	3.5" Floppy Drive (Read/Write)	1.44MB	Can be used to download Projects to the unit, backup files from the unit, and log data.

**Table 2: Units with a Hard Drive**

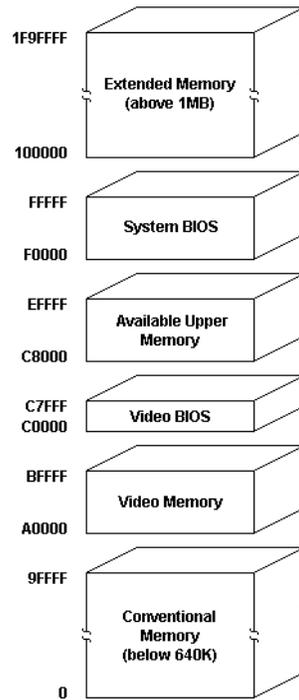
Drive Letter	Type	Size	Usage
C:	Hard Disk (Read/Write)	1.6 GB or higher	System boot drive and Project disk. Stores the necessary system start-up files. This drive also stores the project, the MachineShop Shell, Interact, MachineLogic, and applications. Download files and log data to this drive.

**Table 2: Units with a Hard Drive**

<b>Drive Letter</b>	<b>Type</b>	<b>Size</b>	<b>Usage</b>
A:	3.5" Floppy Drive (Read/Write)	1.44 MB	Can be used to install software or save files to disk. If you are using Interact or MachineLogic, you can use this drive to download projects to the unit, backup files from the unit, and log data.

## PowerStation Memory Map

The figure below illustrates how the PowerStation allocates conventional memory and extended memory. The range of available address references for 32MB of memory is listed next to each device.



**Note** The factory default for the Compact Flash card maps from C8000 to CAFFF.

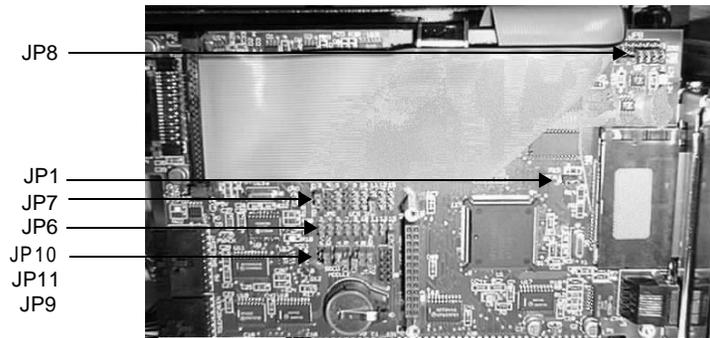
**Memory Guidelines**

If you are using Interact or MachineLogic to develop your HMI or control applications, refer to the memory guidelines listed below. The following table lists guidelines concerning the capacity and use of memory for runtime and development systems.

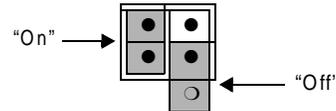
Memory Type	Runtime	Development
System DRAM	8MB system memory runs APM, PTM, and AMM runtime modules and two drivers. Extra modules require more memory.	Modules run one at a time in development mode so that a 4MB system can support all modules and drivers.
Compact Flash	8MB Compact Flash can store APM, PTM, AMM, plus four additional runtime modules, two drivers, and approximately thirty screens. Extra modules require more storage (four modules/MB). Up to 1MB is needed to store MachineLogic applications. Use for data logging only if used in conjunction with a hard drive.	8MB Compact Flash can store APM, PTM, AMM, GMM, two drivers, and approximately thirty screens. Extra modules require more storage (two modules/MB). Up to 1MB is needed to store MachineLogic applications.
Hard Drive	The available hard drive can store applications and logged data.	The available hard drive can store any application. 50MB is needed for the complete MachineShop development suite (Toolbar, Interact, and MachineLogic), 10MB for the Toolbar alone.
Floppy Drive	The 1.44MB floppy drive can be used to store logged data.	The 1.44MB floppy drive can store most applications.

## Jumper Settings

Like most PCs, the PowerStation uses jumpers to set addresses and enable or disable various functions of the system. The PowerStation's System Support card has seven sets of jumpers for configuring the serial ports, touchscreen, Compact Flash, UCS module, and Ethernet. These jumpers are shown in the illustration below.



The following sections describe the default settings for these jumpers and what the jumpers control. In this discussion, jumpers set to “on” and “off” will look like those in the illustration below.

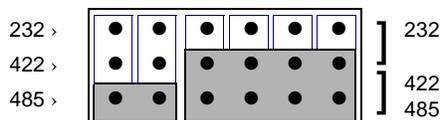


**Note** “Off” jumpers can be completely removed or placed as in the illustration above.

See *Changing Jumper Settings* on page 76 of this manual for information about changing the jumper settings.

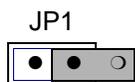
### JP8 COM2 serial port configuration

This set of jumpers, located on the upper right corner of the System Support card, is used to set the serial port configuration. The default setting is the RS-485 communication protocol, but you can configure the jumpers to the RS-232 or the RS-422 settings. The figure below demonstrates the default RS-485 setting.



### JP1 Ethernet default jumper

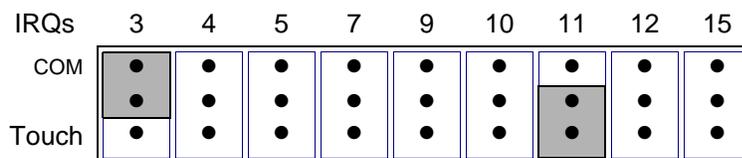
This jumper determines when the Ethernet is configured to its default settings. When the jumper is “on,” the Ethernet is forced to the default settings. While the jumper is “off,” the Ethernet is configured by the software utility. The figure below demonstrates the default “off” setting for the jumper. See *Configuring the Ethernet Interface* on page 69 of this manual for information about how to change this setting.



### JP7 serial port and touchscreen IRQ

This set of jumpers is used to configure the hardware IRQs for the serial port and the touchscreen. By default, these jumpers are set to serial port = IRQ3 and touchscreen = IRQ11.

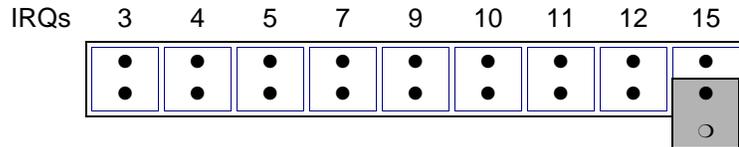
**Important** After changing the jumper settings for the touchscreen IRQ, you must change the touchscreen configuration drivers for the changes to be implemented. See *Reconfiguring the Touchscreen Driver* on page 60 of this manual for information about how to do this.



**Important** IRQ 12 is used by the PS/2 port. If you intend to use a keyboard and/or a mouse, do not map to this IRQ.

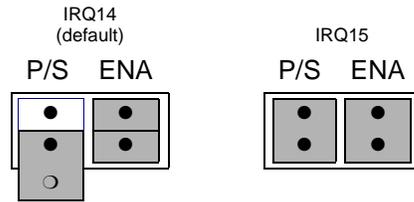
**JP6 USC module IRQ**

This set of jumpers configures the USC module IRQ. The jumpers are all set to “off” when shipped, as shown below.



**JP10 Compact Flash adaptor configuration**

These jumpers are used to configure the Compact Flash. In a Compact Flash-only unit, the Compact Flash is configured, by default, to the Primary IDE adaptor (IRQ14). Therefore, the P/S jumper is set to “off,” and the ENA jumper is set to “on” as in the following illustration. To configure to the Secondary IDE adaptor (IRQ15), set both jumpers to “on,” also as shown below.

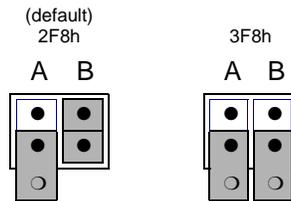


**JP9 and JP11 serial port and touchscreen address**

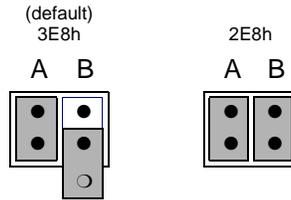
These sets of jumpers configure the addresses for the serial port (JP9) and the touchscreen (JP11). Each is configured by turning the A and B ports “on” or “off.” The chart below demonstrates the on/off combinations for each of the ports.

I/O Address	A	B
COM1 (3F8h)	off	off
COM2 (2F8h)	off	on
COM3 (3E8h)	on	off
COM4 (2E8h)	on	on

By default, the serial port jumpers (JP9) are set to I/O address COM2 (2F8h) by turning the A port “off” and the B port “on” as shown below. To configure to the COM 1 address (3F8h), both the A and B ports would be turned “off,” also shown below.



The touchscreen jumpers (JP11) are set to I/O address COM3 (3E8h) with the A port “on” and the B port “off” by default. The touchscreen could also be configured to the COM4 (2E8h) address by turning the A and B ports “on,” as shown below.



**Important** After changing the jumper settings for the touchscreen I/O address, you must change the touchscreen configuration drivers for the changes to be implemented. See *Reconfiguring the Touchscreen Driver* on page 60 of this manual for information about how to do this.

## Expansion Cards

The PowerStation supports ISA-bus expansion cards. See *Adding Expansion Cards* on page 74 of this manual for guidelines about adding expansion cards to the PowerStation.

The table below lists PLC adapter cards that can be used with CTC Parker's Interact software and the address range for each card when it is used in the PowerStation. Do **not** put all cards at the same location. In all cases, use the highest address location possible. This will provide contiguous memory for applications.

Driver Name	Address Range	Space Required	Memory Boundary
ACCESS4000 (ACC)	C800 - DFFF	2K	Resides on 2K boundaries
Allen-Bradley Remote I/O (ABREMIO)	C800 - DFFF	32K	Resides on 32K boundaries
CTC Parker Automation MachineLogic Control Adapter (MLCA)	C800 - EFFF	4, 8, 16, or 32K	Dependent upon "Space Required"
DCSNET PC Link Module (DCSNET)	A000 - FC00	16K	Resides on 16K boundaries
Device Net (DVNT)	C800 - E000	16K	Resides on 16K boundaries
GE Fanuc Genius I/O (GENIUS)	C000 - E000	16K	Resides on 16K boundaries
Giddings & Lewis (GLP9)	C000 - E180	2K	Resides on 2K boundaries
Mitsubishi A7BDE (MITS) - MELSEC-NET and A3N	C800 - DFFF	16K	Resides on 16K boundaries
Mitsubishi A7BDE (MITS) - RS4	C800 - DFFF	8K	Resides on 8K boundaries
Modicon ModBus Plus (MBPL)	C800 - DFFF	2K	Resides on 2K boundaries
OMRON SYSMAC Link (SLNK)	C000 - D800	2K	Resides on 2K boundaries
Opto 22 (MIST)	C000 - E180	2K	Resides on 2K boundaries
Reliance R-NET PC Link Module (RLNT)	C800 - DFFF	16K	Resides on 16K boundaries

Driver Name	Address Range	Space Required	Memory Boundary
Siemens TIWAY (TIWAY)	C000 - E000	4K	Resides on 4K boundaries
Square D SY/MAX Module (SDSL)	CA00 - D300	4K	Resides on 4K boundaries
Sutherland-Schultz SD Adapter (SSSD)	C800 - DFFF	32K	Resides on 32K boundaries
Texas Instruments Remote I/O (TIRIO)	C800 - DFFF	1K	Resides on 1K boundaries

## Design Issues

This section concerns special design issues in PowerStations using touchscreens and hard drives. Please read the following sections carefully if you are using a touchscreen with Interact or if you are using a PowerStation with a hard drive.

### Using a Touchscreen with Interact

If you are using a touchscreen with Interact, and your application uses PTM Slide input tools, be sure to select the Arrow cursor type using the Interact Settings command in Application Manager. When you select the Arrow cursor type, touching the Slide tool selects the tool, and moving your finger over the touchscreen moves the slide knob.

If you use the Box Cursor type, the slide knob immediately moves to the location where you press the tool. For example, if the knob is currently positioned at 100, and you press the touchscreen at a value of 800, the knob immediately moves to 800 and writes this value to the controller.

**Warning** Using the Box Cursor with a touchscreen and an application that uses Slide input tools may cause you to inadvertently select input values. If your application requires you to use a cursor, select the Arrow cursor type instead.

### Flash Units vs. Hard Drive Units

Some differences between units with Compact Flash and units with hard drives may affect the portability of projects containing startup files between these units.

On hard drive units, the main CONFIG.SYS file (in the root directory of drive C) cannot call a user's CONFIG.SYS file that may be included in the Startup directory. In this case, you will need to incorporate the information from CONFIG.SYS in the Startup directory into the main CONFIG.SYS file.

# Installing the PowerStation

You are now ready to install the PowerStation in a permanent location. This chapter will help you select an appropriate location for the unit. It also provides instructions for creating a cutout for the unit, installing the unit, and starting up the PowerStation.

## Chapter Contents

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## Selecting a Location

The first step in installing the PowerStation is to select an appropriate location for the unit. This is the most important aspect of installation because the location you select can affect the PowerStation's performance, ease-of-use, and life-expectancy. This section provides some guidelines to follow when selecting a location for the PowerStation.

### Class I, Division 2 Guidelines

If you purchased a Class I, Division 2-compliant PowerStation, you must always follow these guidelines to maintain a safe operating environment:

1. Suitable for use in Class I, Division 2, Groups A, B, C, and D hazardous locations only.
2. **Warning: Explosion Hazard**—Do not disconnect equipment or replace or insert cards unless power has been switched off, or the area is known to be non-hazardous.
3. **Warning: Explosion Hazard**—Substitution of components may impair suitability for Class 1, Division 2.
4. Make sure that power is always secured to the unit using the supplied L-bracket (AC units).
5. When performing field wiring, always use copper wire with 60C or 60/75C insulation and a tightening torque of 7.0 lb./in. (0.79 N-m).

### Environmental Guidelines

The environment is the area where the PowerStation will be located. In general, you should select a place that limits the unit's exposure to adverse conditions, such as dust, oil, moisture, and corrosive vapors.

### Touchscreen considerations

The PowerStation's touchscreen is designed to the NEMA 4 (IP65 European standard) rating. You should mount the PowerStation in an enclosure that supports this rating in order to provide further protection.

The PowerStation's touchscreen is resistant to a variety of chemicals. See *Faceplate Chemical Resistance* on page 17 of this manual for a complete list of these chemicals. Make sure that the touchscreen is exposed only to the chemicals on this list.

**Electrical Guidelines**

To minimize unwanted electrical interference, select a location away from machinery that produces intense electrical noise. If this cannot be avoided, isolate input power to the unit, and separate all data communication cables used with the unit from power lines.

**Important** In order to comply with UL 508 and 1604 requirements, use copper wire with 60C or 60/75C insulation and a tightening torque of 7.0 lb./in. (0.79 N-m) when connecting field terminal wiring to the PowerStation.

See *Electrical Specifications* on page 15 of this manual for a list of the PowerStation's electrical specifications. Make sure that your power source is completely compatible with the PowerStation before starting the unit.

**Temperature Guidelines**

You can safely operate the PowerStation within the temperature range specified in the *Environmental Specifications* section on page 14 of this manual. However, if you are using a protective enclosure, remember that the temperature within an enclosure is generally higher than the external temperature. If the PowerStation is operating inside an enclosure at temperature levels above its rated ambient temperature, you must cool the enclosure.

**Enclosure Guidelines**

Select an enclosure that is large enough to allow free airflow in and around the unit. You should allow a minimum of 2 inches between the enclosure and the top, bottom, and sides of the PowerStation.

Also, make sure that the surface of the enclosure on which the PowerStation is mounted is flat and free of raised or depressed areas.

**Backlight Accessibility Guidelines**

Occasionally, you may need to replace the PowerStation's backlight bulbs. A bulb replacement kit, including instructions for replacing the bulbs, is available from CTC Parker. However, to replace the backlight bulbs, you must be able to remove the PowerStation's backshell and the backlight assembly from the unit. Be sure to design your enclosure with this in mind. Otherwise, you will have to completely remove the PowerStation from its enclosure in order to replace the backlight bulbs.

## Preparing for Installation

Once you have selected a location for the PowerStation, you can begin preparing it to accept the unit. Before installing the PowerStation, you must create a cutout for the unit and clean the area of any dirt or debris that might come in contact with the unit.

## Creating the Cutout

The PowerStation comes with a template designed to simplify the task of creating the cutout for the unit. Be sure to follow the drill hole and cutout dimensions precisely so that the PowerStation will seal properly in its enclosure.

### **To create a cutout for the PowerStation, complete the following steps:**

1. Attach the template securely to the mounting surface.
2. Cut out the shaded area of the template referred to as the “Panel Cutout Area.” To maintain the flatness of the mounting surface, CTC Parker recommends that you **cut** out the Panel Cutout Area rather than punch it out.
3. Drill the appropriate number of 0.23-inch diameter mounting holes as seen on the template. Once again, be careful to protect the flatness of the surface.
4. Debur the edges of the cutout area and the drill holes.
5. Ensure that the mounting surface has remained flat and that the panel surface is clean and free of foreign materials.
6. See *PowerStation Dimensional Drawings* on page 93 of this manual for the depth and port dimensions of your PowerStation. Use these dimensions to customize the mounting of your unit.

## Installing the PowerStation

Once you have prepared the location for the PowerStation, you can install the unit. For your convenience, CTC Parker includes all the necessary mounting hardware with the unit.

### To mount the unit, complete the following steps:

1. Gently insert the PowerStation into the cutout.
2. Install a nut on each of the protruding studs on the back of the PowerStation's bezel, and tighten each nut to a torque of 17 inch/pounds.

**Important** The unit must fit flush in the enclosure. Tighten the nuts in a crosswise sequence to ensure a good seal and prevent damage to the unit.

## Starting Up the PowerStation



Once the PowerStation has been mounted, you are ready to start up the unit. This procedure appears below.

Before connecting power to your unit, make sure that you have read and understood *Electrical Specifications* on page 15 of this manual and *Testing Specifications* on page 16. Also, make sure that you follow the guidelines listed below:

- For **permanently connected equipment**, a readily accessible disconnect device must be incorporated in the fixed wiring.
- For **pluggable equipment**, the socket-outlet must be installed near the equipment and should be easily accessible.

**Important** Proper installation of the PowerStation in European Union countries requires the use of a harmonized power cord (the power cord must be identified with the <HAR> symbol). Make sure that the PowerStation is only connected to the main supply with a harmonized power cord.

1. Verify that the power switch is off.
2. Connect the power cord to your voltage source. Voltage input to the unit should be within the range specified in *Electrical Specifications* on page 15 of this manual.

**Note** If you are using AC power, you must first connect the power supply to the power connector on the back of the PowerStation.

3. Connect the power cord plug to the PowerStation.

4. Turn the PowerStation on.

The fan should come on, followed immediately by the display.

Following are guidelines for starting up under MS-DOS; under Windows, 95, 98, or NT; or under a multiboot system, in which you can start in either Windows NT or MS-DOS.

### Starting in MS-DOS

If you are running your PowerStation under MS-DOS, the PowerStation will automatically load the MachineShop Shell.

### Starting in Windows 95 or 98

If you have purchased Windows 95 or 98, the PowerStation will automatically load your Windows operating system.

### Starting in Windows NT

**To load Windows NT at startup, complete these steps:**

**Important** You must have a keyboard to log in to Windows NT. See *Connecting a keyboard (P3 and P4 only)* on page 24 of this manual for instructions on how to connect a keyboard to the model P3 and P4 PowerStations. See *Keyboard Port (P5 and P7 only)* on page 25 for instructions on how to connect a keyboard to the model P5 and P7 PowerStations.

1. Press Ctrl + Alt + Delete on the keyboard when prompted.
2. Press the Enter key (or touch the OK button) when the Logon Information window prompts you for the Administrator's password (the password is blank by default).

Touch the Close button on the help window if you do not want help when you first enter Windows NT.

### Starting in Multiboot Systems

When starting up in a multiboot system, you will be presented with a menu, in which you have the option of booting into Windows NT or MS-DOS mode. The PowerStation is set to default to Windows NT. You may change the default so that every time the unit starts up, MS-DOS will be the default selection. You may wish to do this so that operators do not have to change the default selection every time the unit starts up.

**To set MS-DOS mode as the default selection, complete these steps:**

1. Select Windows NT as the operating system. This is the default selection upon starting the PowerStation.

2. On the Windows taskbar, click Start; then click Settings and Control Panel.

The Control Panel window will open.

3. In the Control Panel window, click System.

The System Properties dialog box will open.

4. In the System Properties dialog box, click the Startup/Shut-down tab.

5. Select MS-DOS mode from the Startup drop-down list box.

6. Select the number of seconds the menu is displayed upon startup, from the Show List For spin box.

7. Click OK.

The next time the system starts, MS-DOS mode will be the default selection.

You are now ready to begin using the PowerStation. If you are using the PowerStation as a development system, you can begin developing your HMI or control projects. If you are using Interact or MachineLogic software, refer to the *Interact Getting Started Guide* or the *MachineLogic Getting Started Guide* for help in developing your projects.

If you are using the PowerStation as a runtime system, you are ready to download a project from a development system. If you are using Interact or MachineLogic to develop your projects, refer to the *MachineShop Getting Started Guide* for information about how to download projects to the PowerStation.



# Maintaining and Troubleshooting the PowerStation

The PowerStation has been designed to provide years of trouble-free operation even in the harshest environments. However, occasionally, you may need to perform routine maintenance on some of the PowerStation's components. This chapter provides instructions on PowerStation maintenance, as well as steps for troubleshooting problems that may occur in operation.

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## Cleaning the Touchscreen

Occasionally, you may wish to clean the PowerStation's touchscreen. Clean the touchscreen using warm, soapy water and a cloth. You may also use any non-abrasive cleaner. See *Faceplate Chemical Resistance* on page 17 of this manual for a list of substances the screen can resist with no visible effect.

Do not use any harsh material or powder, such as steel wool or abrasive cleansers to clean the polyester surface. The surface is sensitive to scraping, sharp blows, or punctures. Therefore, keep screwdrivers or other sharp objects away from the touchscreen surface.

**Warning** Do **not** clean the unit while Interact is in Run mode. Clean the unit while power is removed to keep from inadvertently activating an Interact device (button, slide, etc.).

## Using the Compact Flash Card

You will only need to read this section if you are using a Compact Flash card in your PowerStation.

The PowerStation has a slot to accommodate Compact Flash (CF) cards so that you can use a CF card for storage purposes. You can remove the CF card, update the application files on it from a PC, and then reinstall the CF card in the PowerStation.

CTC Parker recommends that you purchase at least one additional CF card to serve as a backup for your primary CF card; you may wish to have several cards to store different projects. You can purchase additional CF cards from CTC Parker.

The remainder of this section explains how to remove and replace the CF card and how to reformat the Compact Flash.

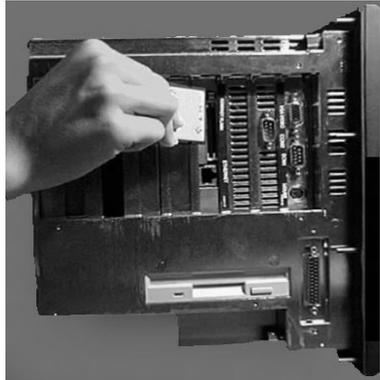
## Removing and Replacing the Compact Flash

**To remove and replace the Compact Flash card, complete the following steps:**

1. Turn off the PowerStation.

**Important** Make sure that the PowerStation is turned off when inserting or removing the CF card.

2. Press the eject button and remove the CF card by sliding it out of its slot toward you, as shown in the illustration on the next page.



3. When you are ready, reinstall the CF card by carefully inserting the card into the slot and pushing it into the slot until the card is securely seated.

### Reformatting the Compact Flash

This section explains the procedure to create a bootable Compact Flash (CF) card for the PowerStation from a “blank” CF card. This procedure may be necessary to replace deleted or corrupted critical files on the card or to prepare a new card for use.

You can perform this procedure on the PowerStation, using the PowerStation’s floppy drive, or on a PC with a Type II PCMCIA slot or CF card reader

**Note** This procedure will only work correctly under MS-DOS, Windows 95, or Windows 98. Do not run this utility under Windows NT.

This procedure requires the following items:

- MS-DOS 6.22 and Utilities Installation Disk (KA-72953)
- PowerStation Start Disk
- MachineShop Shell Installation Disk

**Note** The PowerStation Start Disk and MachineShop Shell Installation Disk make up the Runtime Workstation Disk Set, which you can create from the MachineShop Installation CD shipped with your PowerStation. See the *MachineShop Installation Booklet* for instructions on how to create these disks.

The following additional items are required when using a PC:

- PC with a Type II PCMCIA slot or a CF card reader, and a 3.5" floppy drive. The PC should be running MS-DOS, Windows 95, or Windows 98.
- CF-to-PCMCIA adapter (for use with PCMCIA slot only).

**To reformat the Compact Flash card from the PowerStation, complete the following steps:**

1. With the CF card in the PowerStation, enter MS-DOS mode.
2. At the DOS prompt, type `Format C:`
3. Press Enter to execute this command.
4. Insert the MS-DOS 6.22 and Utilities Disk into the PowerStation's floppy drive, and restart the PowerStation.
5. At the DOS prompt, type `Install A: C:`
6. Press Enter to execute this command.  
This will install the MS-DOS 6.22 system files, utilities, and necessary drivers onto the CF card).
7. Eject the MS-DOS 6.22 Disk from the PowerStation's floppy drive, insert the PowerStation Start Disk, and restart the PowerStation.
8. At the DOS prompt, type `A: \Install A: C:`
9. Press Enter to execute this command.
10. You will be asked whether you wish to install the standard CTC AUTOEXEC.BAT and CONFIG.SYS files as part of the installation. CTC Parker recommends that you type Y for Yes.  
If you answer Yes, the existing AUTOEXEC.BAT and CONFIG.SYS files will be renamed as AUTOEXEC.OLD and CONFIG.OLD. If you answer No, the factory-default files will be copied as AUTOEXEC.CTC and CONFIG.CTC in the root directory of drive D, and you must manually update your existing AUTOEXEC.BAT and CONFIG.SYS later.
11. After the AUTOEXEC.BAT and CONFIG.SYS files have been copied onto your system, press any key to continue.  
You will be asked if this installation is for a Model P1 PowerStation.

12. Type N for No.

The PowerStation installation is complete.

13. Eject the PowerStation Start Disk from the PowerStation's floppy drive, and insert the MachineShop Shell Installation Disk.

14. At the DOS prompt, type `A: Install A: C:`

You will be asked if you would like to continue with the installation.

15. Type Y for Yes in order to continue.

The MachineShop Shell installation is complete.

The CF card is now reformatted and ready to use in the PowerStation.

16. Restart the PowerStation.

The PowerStation will automatically load the MachineShop Shell.

17. Recalibrate the touchscreen. See *Recalibrating the Touchscreen* on page 65 of this manual for complete instructions.

**To reformat the Compact Flash card on a PC, complete the following steps:**

1. Turn off the PowerStation.

**Important** Make sure that the PowerStation is turned off when inserting or removing the CF card.

2. Remove the CF card from the PowerStation's flash card slot as described in the preceding section.
3. Insert the CF card into the PC's PCMCIA slot, using the CF-to-PCMCIA adapter as shown below, or into a CF card reader.



The computer should recognize and configure the card as an ATA card, assigning an additional drive letter for the card (e.g., D)

**Note** In this example, drive D represents the PCMCIA card or card reader; however, your system may assign a different drive letter to either of these devices.

4. Enter MS-DOS mode.
5. At the DOS prompt, type `Format D:`
6. Press Enter to execute this command.
7. Insert the MS-DOS 6.22 and Utilities Disk into the PC's floppy drive.

**Important** If you are performing the install procedure in a DOS window under Windows 95 or 98, you must execute the command `LOCK D:` before entering the `INSTALL` command shown below. After MS-DOS installation is complete, execute the `UNLOCK D:` command.

8. At the DOS prompt, type `A: Install A: D:`
9. Press Enter to execute this command.

This will install the MS-DOS 6.22 system files, utilities, and drivers onto drive D (or the drive assigned to the CF card).

10. Eject the MS-DOS 6.22 Disk from the PowerStation's floppy drive, and insert the PowerStation Start Disk.
11. At the DOS prompt, type `A: Install A: D:`
12. Press Enter to execute this command.
13. You will be asked whether you wish to install the standard CTC `AUTOEXEC.BAT` and `CONFIG.SYS` files as part of the installation. CTC Parker recommends that you type `Y` for Yes.

If you answer Yes, the existing `AUTOEXEC.BAT` and `CONFIG.SYS` files will be renamed as `AUTOEXEC.OLD` and `CONFIG.OLD`. If you answer No, the factory-default files will be copied as `AUTOEXEC.CTC` and `CONFIG.CTC` in the root directory of drive D, and you will need to manually update your existing `AUTOEXEC.BAT` and `CONFIG.SYS` later.

14. After the AUTOEXEC.BAT and CONFIG.SYS files have been copied onto your system, press any key to continue.  
You will be asked if this installation is for a Model P1 PowerStation.
  15. Type N for No.  
The PowerStation Utilities installation is complete.
  16. Eject the PowerStation Start Disk from the PC's floppy drive, and insert the Machinshop Shell Installation Disk.
  17. At the DOS prompt, type A: Install A: D:  
You will be asked if you would like to continue with the installation.
  18. Type Y for Yes in order to continue.  
The MachineShop Shell installation is complete.
  19. Eject the CF-to-PCMCIA adapter and remove the CF from the adapter, or remove the CF card from the card reader.  
The CF card is now ready to use in the PowerStation.
- Important** Make sure that the PowerStation is turned off when inserting or removing the CF card.
20. Insert the CF into PowerStation's flash card slot.
  21. Start up the PowerStation.  
The PowerStation will automatically load the MachineShop Shell.
  22. Recalibrate the touchscreen. See *Recalibrating the Touchscreen* on page 65 of this manual for complete instructions.

## Reinstalling the PowerStation Utilities

The PowerStation utilities come pre-installed on all PowerStations. If you need to reinstall these utilities, you can do so by using the PowerStation Start Disk.

**Note** The PowerStation Start Disk is part of the Runtime Workstation Disk Set, which you can create from the MachineShop Installation CD shipped with your PowerStation. See the *MachineShop Installation Booklet* for instructions on how to create this disk.

You can install the PowerStation utilities in MS-DOS mode or under Windows 95, 98, or NT. The procedures for these approaches are described below.

### Reinstalling under MS-DOS

**To install the PowerStation utilities under MS-DOS, complete the following steps:**

1. Insert the Powerstation Start Disk into drive A.
2. Enter MS-DOS mode, and change to drive A by typing A :
3. Press Enter to execute this command.
4. At the DOS prompt, type `Install A: C:`
5. Press Enter to execute this command.

At the end of the installation, you will be asked if you would like the factory-default AUTOEXEC.BAT and CONFIG.SYS files to be copied to the root directory of drive C. If you answer Yes, the existing AUTOEXEC.BAT and CONFIG.SYS files will be renamed as AUTOEXEC.OLD and CONFIG.OLD. If you answer No, the factory-default files will be copied as AUTOEXEC.CTC and CONFIG.CTC in the root directory of drive C.

6. After the AUTOEXEC.BAT and CONFIG.SYS files have been copied onto your system, press any key to continue.

You will be asked if this installation is for a Model P1 PowerStation.

7. Type N for No.

The PowerStation Utilities installation is complete.

8. Restart the PowerStation.

### Reinstalling under Windows

**To install the PowerStation utilities under Windows 95, 98, or NT, complete the following steps:**

1. Insert the Powerstation Start Disk into the A drive.
2. Change to MS-DOS mode.
3. At the DOS prompt, type `A: Install A: C:`
4. Press Enter to execute this command.
5. Restart the PowerStation when the installation program is finished.

### Reinstalling the Shell Software

The MachineShop Shell comes pre-installed on all DOS- based units (those not running Windows 95, 98, or NT). If you need to install or reinstall the Shell, you can do so by using the MachineShop Shell Installation Disk.

**Note** The MachineShop Shell Installation Disk is part of the Runtime Workstation Disk Set, which you can create from the MachineShop Installation CD shipped with your PowerStation. See the *MachineShop Installation Booklet* for instructions on how to create this disk.

**To install the Shell software, complete the following steps:**

1. Insert the Machinshop Shell Installation Disk into drive A.
2. Change to the root directory of drive A.
3. At the DOS prompt, type `Install A: C:`
4. Press Enter to execute this command.

You will be asked if you want to continue with the installation.

5. Type Y for Yes in order to continue.

If you have the PowerStation Utilities installed on your hard drive, this command will copy the MachineShop Shell files into the C:\CTC directory, the touchscreen drivers into the C:\TOUCH directory, and the network drivers into the C:\NET directory.

## Enabling Interact to Run Under Windows

If you have had to install the PowerStation Utilities or the MachineShop Shell software under Windows, you can use the following steps to enable Interact and the MachineShop Shell to run under Windows. If you are not running Windows, you may skip this section.

**To enable Interact and the MachineShop Shell to run under Windows, complete the following steps:**

1. Start Windows Explorer.
2. Open the Windows folder, and find the file EXIT TO DOS.PIF.
3. Right click on the file EXIT TO DOS.PIF, and select the Properties command from the menu that appears.

The EXIT TO DOS.PIF Properties dialog box will appear.

4. Click the Program tab in the dialog box.
  5. Click the Advanced button.
- The Advanced Program Settings dialog box will appear.
6. Click the Specify a New MS-DOS Configuration radio button.
  7. Type the following text or edit the existing text in the CONFIG.SYS for MS-DOS mode dialog box to match the text that appears below:

```
FILES=30
DOS=HIGH, UMB
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS RAM
DEVICE=C:\DOS\SETVER.EXE
```

8. Type the following text, or edit the existing text in the AUTOEXEC.BAT for MS-DOS mode dialog box to match the text that appears below:

```
PROMPT $P$G
SET TEMP=C:\DOS
PATH C:\; C:\DOS; C:\CTC
LH C:\CTC\BIOSTR
IF EXIST C:\CTC\MOUSE.INI DEL C:\CTC\MOUSE.INI
LH C:\CTC\MOUSE
LH C:\TOUCH\DOX\SC3DOX.EXE /NOBOUNDS
```

**Important** If you enter the Interact runtime environment while running Windows, the touchscreen will become inoperable, and you will have to use a mouse and a keyboard for development. If you want to run your application and use the touchscreen, you must restart Windows in MS-DOS mode.

## Modifying the AUTOEXEC.BAT File

The lines shown below must appear in the AUTOEXEC.BAT file for the PowerStation to operate properly. The AUTOEXEC.BAT file that CTC Parker supplies includes these lines and is located in the \CTC directory of the PowerStation in a file called AUTOEXEC.CTC.

Make sure that the AUTOEXEC.BAT file on your PowerStation includes the command lines shown in the left-hand column of the table below.

Command line parameters	Description
PATH C:\; C:\DOS; C:\CTC	Sets up the default DOS path.
C:\TOUCH\IDTOUCH -S IF ERRORLEVEL 3 GOTO ITSAP1 LH C:\CTC\BIOSTSR	Loads special functions if the unit is not a P1.
CD\CTC IF EXIST C:\CTC\MOUSE.INI DEL C:\MOUSE.INI	Required for the Machine-Shop Shell to detect a mouse in some situations.
LH C:\CTC\MOUSE	If a mouse is connected, installs the mouse and creates a new MOUSE.INI file.
C:\CTC\ISVESA IF NOT ERRORLEVEL 1 GOTO YESVESA LH C:\CTC\VESA :YESVESA	Loads VESA TSR video support, if necessary.
IF NOT EXIST C:\MACHLOG\NUL.EXT MD C:\MACHLOG CD\MACHLOG IF NOT EXIST C:\CTC\MLCA.EXE GOTO NOMLCA CD\CTC LH C:\CTC\MLCA	Loads the MachineLogic Control Adapter driver if it is present.
SET TOUCH_PATH=C:\TOUCH CALL %TOUCH_PATH%\TCHINIT.BAT	Initializes the touchscreen drivers.
*SET INTERACT=C:\INTERACT	Sets the Interact path.

Command line parameters	Description
*SET INTERACT_FILES=C:\INTERACT\APPFILES	Sets the application path for Interact.
*SET INTERACT_STARTUP=C:\STARTUP	Sets up Interact startup variables.
**SET MACHINELOGIC=C:\MACHLOG	Sets up MachineLogic environment variables.
CD\NET LH C:\NET\TCPIP	Loads network drivers -- Novell and/or TCPIP stack.
**IF NOT EXIST C:\MACHLOG\NUL.EXT MD C:\MACHLOG CD\MACHLOG IF NOT EXIST C:\MACHLOG\MACHLOG.EXE GO TO NOML C:\CTCMLDU IF ERRORLEVEL 1 GOTO NOML C:\MACHLOG\RTXDOS C:\MACHLOG\MACHLOG :NOML	Loads MachineLogic if present and set for startup operation. Determined by MLDU.EXE return value: 0 = enabled; 1 = disabled.
IF NOT EXIST C:\STARTUP\NUL.EXT MD C:\STARTUP CD\STARTUP IF EXIST C:\STARTUP\ AUTOEXEC.BAT CALL C:\ STARTUP\AUTOEXEC.BAT	Calls the second AUTOEXECBAT file if the line is contained within a project file.
CD\CTC PSU	Starts the MachineShop Shell.

\* Denotes a command line that is unnecessary on units without Interact.

\*\* Denotes a command line that is unnecessary on units without MachineLogic

See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 82 of this manual for more information about the command lines that should appear in the AUTOEXEC.BAT file.

## Reinstalling the Video Driver

You can only reinstall the video driver if you are running your PowerStation under Windows 95, 98, or NT. If you are not running your PowerStation under Windows, you may skip this section.

PowerStations are shipped with the video driver installed. However, you may have to reinstall the video driver if it becomes lost or corrupted. If you must reinstall the video driver, follow the procedures below. The necessary files and drivers are located in the directory C:\CTC and are provided on the Windows 95/NT VGA Drivers disk (KA-72670).

Some Windows systems contain different response options in the Display Properties dialog box. Therefore, two different reinstallation procedures are described below.

### **To reinstall the video driver under Windows 95, 98, or NT, complete the following steps:**

1. On the Windows taskbar, click Start; then click Settings and Control Panel.  
The Control Panel window will appear.
2. Click Display in the Control Panel window.  
The Display Properties dialog box will appear.
3. In the Display Properties dialog box, click the Settings tab.  
The Settings dialog box will appear.
4. In the Settings dialog box, click Change Display Type in the lower right-hand corner.
5. Click Change in the Adapter Type group box.  
The Select Device dialog box will appear.
6. Click Have Disk . . .  
The Install from Disk dialog box will appear.
7. Click Browse.  
The Open dialog box will appear.
8. Select the operating system that you are running, and then double-click the .INF file.
9. Click OK.

10. Select the following Chips Video Accelerator:  
C64300/10 65535/40/45/48/50/54/55.
11. Click OK.  
The Third Party Drivers Display Window will appear.
12. When the Third Party Drivers Display window appears, click Yes.  
The Installing Driver Window will appear.
13. When the Installing Driver window is displayed, click OK.
14. Close the Display Type and the Display Properties windows.
15. Click Yes to restart the PowerStation.

**Important** You must restart the PowerStation for your changes to take effect.

**On some Windows 95 systems, you will use the following steps:**

1. On the Windows taskbar, click Start; then click Settings and Control Panel.  
The Control Panel window will open.
2. Click Display.  
The Display Properties dialog box will open.
3. Click the Settings tab.  
The Settings dialog box will open.
4. In the Settings dialog box, click Advanced Properties.  
The Advanced Display Properties dialog box will open.
5. In the Advanced Display Properties dialog box, click the Monitor Tab.  
The Monitor dialog box will appear.
6. In the Monitor dialog box, click Change.  
The Select Device dialog box will appear.
7. From the Models list in the Select Device dialog box, click Laptop Display Panel (640 x 480).

8. Click OK at the lower right side of the Select Device dialog box.
9. Click the Close button. Do **not** press the Cancel button; you will lose the changes you made.

**Important** Verify that 256 color is selected in the Color palette.

10. Restart your computer.

**Important** You must restart the PowerStation for your changes to take effect.

## Reinstalling the Touchscreen Driver

PowerStations are shipped with the touchscreen driver installed. However, you may have to reinstall the touchscreen driver if it becomes lost or corrupted. If you must reinstall the touchscreen driver, follow the procedure below. The files and drivers are located in the directory C:\CTC or are provided on the Windows Touchscreen Driver disk (KA-72816 for Windows 95/98 and KA-72817 for Windows NT).

**Note** CTC Parker recommends that you install a mouse before continuing with this procedure to make navigating around the screen easier.

### To reinstall the touchscreen driver under Windows 95, 98, or NT, complete the following steps:

1. Insert the Windows Touchscreen Driver disk into drive A.
2. Use Windows Explorer to access the A drive.
3. Select File Install from the A drive.
4. Click Next.
5. Change the Port Type to Custom.
6. Change the Interrupt to 11.
7. Change the I/O Address to 3E8h.

**Note** The configuration settings in steps 5-7 match the factory default jumper settings.

8. Click Install.

9. After installation is complete, restart your computer.

**Important** You must restart the PowerStation for your changes to take effect.

## Reconfiguring the Touchscreen Driver

CTC Parker installs in the PowerStation the appropriate touchscreen driver for your unit's operating system. However, you may have to reconfigure the touchscreen driver if it becomes lost or corrupted.

This section explains how to reconfigure the touchscreen driver under MS-DOS and under Windows 95, 98, or NT.

**Note** If you are using an older PowerStation, your touchscreen configuration procedure and the screens displayed may differ from those described in the following instructions.

### Reconfiguring under MS-DOS

You will use the `CALL TOUCH_PATH%\INIT.BAT` file to configure the touchscreen. This file initializes the touchscreen driver.

**Important** If you purchased a PowerStation with the touchscreen disabled, and you want to enable it, remove the `REM` statement that appears at the beginning of the line `CALL TOUCH_PATH%\INIT.BAT`. Likewise, if you purchase a PowerStation with the touchscreen enabled, and you want to disable it, add the word `REM` to the beginning of this line.

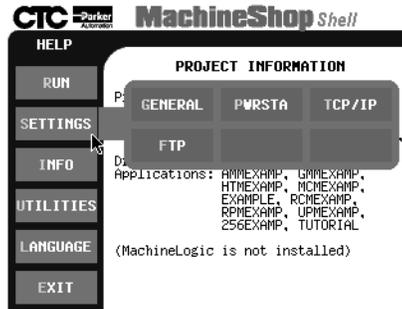
If you need to permanently disable the touchscreen, remove the file `CALL TOUCH_PATH%\INIT.BAT` from your system.

The `CALL TOUCH_PATH%\INIT.BAT` file accepts the command line parameter `NOBOUNDS`. This parameter specifies the touchscreen boundaries in Interact. **Do not** change this parameter.

To configure the touchscreen drivers, complete the following steps:

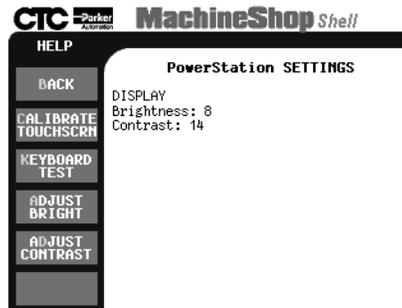
1. On the MachineShop Shell main menu, click Settings.

The settings submenu will appear as shown below.



2. On the Settings submenu, press the PWRSTA button.

The PowerStation Settings screen will appear as shown below.



3. Press the Calibrate Touchscrn button.

A message window will appear, reminding you that a keyboard is required.

4. When you have a keyboard connected to the PowerStation, click Yes to continue.

The screen shown at the top of the next page will appear.

```

The calibration program will now be started automatically. To
calibrate your touchscreen, perform the following steps in the
calibration program:

- First, select option C to calibrate
- Then select option V to select video modes
- Select an appropriate video mode (must do modes 3,
  12, and 101 - selections 2, 0, and 11 respectively)
- Select C to calibrate the selected mode
- Repeat until all needed video modes are calibrated

Strike a key when ready . . .

```

5. Press any key on the keyboard when you are ready to continue.

The following touchscreen driver configuration screen will appear.

```

Touch Screen Driver Configuration Utility 2.0.2 02-Nov-98
Dynapro Technologies Inc (C)

  Calibration
  Display
  Touchsurround
  Buttons
  Interface
  eXit

Enter your selection (C\D\T\B\I\X) :

```

6. Type I for Interface.

The following Interface Configuration Options screen will appear.

```

Interface Configuration Options

Interrupt:      IRQ11
Address:        3E8h
Connection:     UART
calibratioN data: Controller
Set COM1:
Set COM2:
Set COM3:
Set COM4:
Reset:
aDvanced:
Ok:

Enter your selection (I/A/C/N/1/2/3/4/R/D/O) :

```

7. Type **I** to change the Interrupt, or press 1, 2, 3 or 4 to change the COM port.

**Note** If you use Set COM3 or Set COM4, the COM port will default to COM1 and COM2 IRQs. You will need to reset the IRQs.

8. Type **A** to change the Address.
9. Type **C** to change the Connection.

**Important** The Connection must be set to UART.

10. Type **O** to set your touchscreen driver.
11. Press Escape or X to exit.
12. Restart the PowerStation.

**Important** You must restart the PowerStation for your changes to take effect.

### Reconfiguring under Windows

If you are using Microsoft Windows 95, 98, or NT, you can configure the touchscreen drivers by using a utility provided by the manufacturer of the touchscreen.

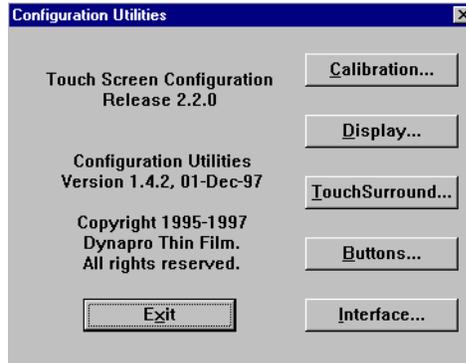
**To configure the touchscreen drivers under Windows 95, 98, or NT, complete the following steps:**

1. On the Windows taskbar, click Start; then click Programs and Touchscreen Utilities.

The Touchscreen Utilities folder will open.

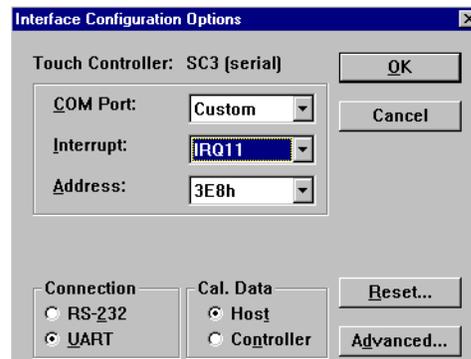
- In the Touchscreen Utilities folder, click the Configuration icon.

The Calibration Utilities dialog box will appear as shown below.



- In the Calibration Utilities dialog box, click the Interface button.

The Interface Configuration Options dialog box will appear as shown below.



- By default, the touchscreen is set to COM3, IRQ11, 3E8h. Click on the drop-down arrows to change these settings.

**Note** As you change the COM port, the other settings will change automatically.

- Click OK when you are finished.

- Restart the PowerStation.

**Important** You must restart the PowerStation for your changes to take effect.

## Recalibrating the Touchscreen

The PowerStation's touchscreen is calibrated before leaving CTC Parker. However, you may need to recalibrate the touchscreen when you begin using the PowerStation for the first time or whenever the cursor location and the location on the screen where the user touches do not match.

You can calibrate the touchscreen in MS-DOS mode from the MachineShop Shell or under Windows 95, 98, or NT.

**Note** If you are using an older PowerStation, your touchscreen calibration procedure and the screens displayed may differ from those described in the following instructions.

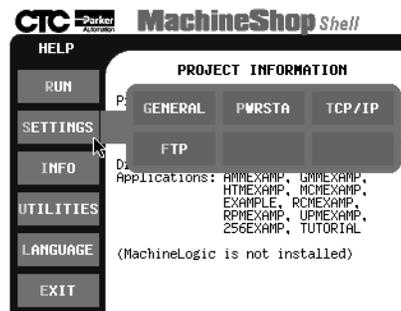
### Recalibrating under MS-DOS

The MachineShop Shell comes with a calibration utility that you can use to calibrate the touchscreen in MS-DOS mode. The calibration utility requires a keyboard and involves calibrating the touchscreen for text and for graphics.

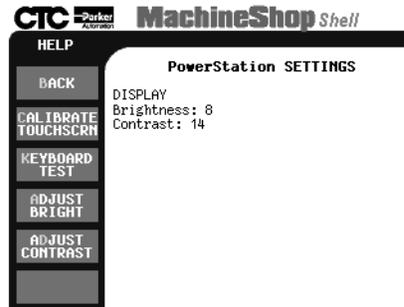
**To calibrate the touchscreen, complete the following steps:**

- On the MachineShop Shell main menu, press the Settings button.

The Settings submenu will appear as shown below.



2. On the Settings submenu, press the PWRSTA button.  
The PowerStation Settings menu will appear, as shown below.



3. On the PowerStation Settings submenu, press the Calibrate Touchscrn button.  
You will be prompted that a keyboard is needed to calibrate the touchscreen. Then you will be asked if you want to continue.
4. If necessary, install a keyboard on the PowerStation. See *Connecting a keyboard (P3 and P4 only)* on page 24 of this manual and *Keyboard Port (P5 and P7 only)* on page 25 for information about connecting a keyboard to the PowerStation.
5. When you have attached a keyboard to the PowerStation, press the Yes button to continue the calibration.

The following screen will appear.

```
The calibration program will now be started automatically. To
calibrate your touchscreen, perform the following steps in the
calibration program:

- First, select option C to calibrate
- Then select option V to select video modes
- Select an appropriate video mode (must do modes 3,
  12, and 101 - selections 2, 0, and 11 respectively)
- Select C to calibrate the selected mode
- Repeat until all needed video modes are calibrated

Strike a key when ready . . .
```

6. Press any key on the keyboard when you are ready to begin the calibration program.

The following screen will appear:

```
Touch Screen Driver Configuration Utility 2.0.2 02-Nov-98
Dynapro Technologies Inc (C)

  Calibration
  Display
  Touchsurround
  Buttons
  Interface
  eXit

Enter your selection (C\D\T\B\I\X) :
```

7. Type C for Calibration.  
When the next screen appears, you will be calibrating video mode 80 x 25 Text (2,3).
8. Type C again for Calibrate.
9. When the next screen appears, follow the instructions on the screen by touching each square as it appears until you hear a beep—there will be three squares all together.  
After you touch the third square, a new screen will appear.
10. When the new screen appears, press V to select a new video mode.
11. When the next screen appears, type 0 for 640 x 480 16 color Graphics mode.
12. Press Enter.
13. When the next screen appears, type C for Calibrate.
14. When the next screen appears, follow the instructions on the screen by touching each square as it appears until you hear a beep—there will be three squares all together.  
After you touch the third square, a new screen will appear.
15. When the new screen appears, type V for video mode.
16. When the next screen appears, type 11 for 640 x 480 256 color Graphics mode.
17. Press Enter.
18. When the next screen appears, type C for Calibrate.

19. When the next screen appears, follow the instructions on the screen by touching each square as it appears until you hear a beep—there will be three squares all together.

After you touch the third square, a new screen will appear.

20. When the new screen appears, type O for OK.
21. Press Escape or X to exit the calibration utility.

**Important** After calibrating the touchscreen, enter Interact in Program Mode. Verify that the cursor appears on the screen where you touch. If it does not, recalibrate the touchscreen. The calibration must be accurate to avoid activating a button unintentionally during Run Mode.

## Recalibrating under Windows

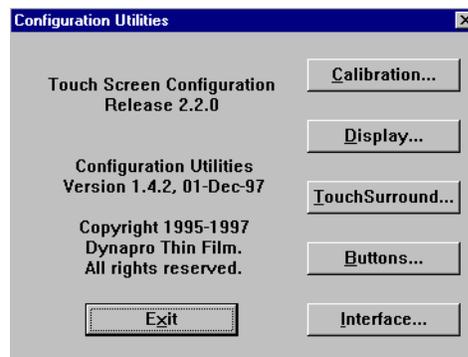
To recalibrate the touchscreen under Windows 95, 98, or NT, complete the following steps:

1. On the Windows taskbar, click the Start button; then click Programs and Touchscreen Utilities.

The Touchscreen Utilities window will open.

2. In the Touchscreen Utilities window, click Configuration.

The Configuration Utilities dialog box will appear as shown below.



3. In the Configuration Utilities dialog box, click the Calibration button.

The Calibration dialog box will appear.

4. In the Calibration dialog box, click the Calibrate button.

5. Place your finger on the target in the upper left corner of the screen and follow the instructions on the screen.
6. Select Exit when you are finished.

## Configuring the Ethernet Interface

The PowerStation's \NET directory contains a configuration utility and all drivers necessary to configure the Ethernet interface. Backup copies of these files are included on the MachineShop Shell Installation Disk. These files are described below.

**Note** The MachineShop Shell Installation Disk is part of the Runtime Workstation Disk Set, which you can create from the MachineShop Installation CD shipped with your PowerStation. See the *MachineShop Installation Booklet* for instructions on how to create this disk.

File Name	Description
AT5CFG.EXE	A configuration utility you can use to change the interrupt and address of the Ethernet interface.
NET.BAT	A sample batch file you can use to run NetBIOS.
NET.CFG	Stores the interrupts and memory for the network drivers. The default PowerStation configuration reserves the following interrupts and I/O addresses. You cannot use these for the Ethernet interface. <ul style="list-style-type: none"> <li>• COM1: Int 4, I/O 3F8</li> <li>• COM2: Int 3, I/O 2F8</li> <li>• Touchscreen: Int 11, I/O 3E8</li> </ul> CTC Parker recommends that you use the following interrupt and I/O address setting for the Ethernet interface: Int 10, I/O 280.
NETX.EXE	The Novell Netware shell program that makes the final connection with the server.
*LSL.COM	A Novell driver that enables the workstation to communicate with different protocols.
*IPXODI.COM	A Novell driver that supports the IPX protocol and other protocols over the same network.
*NE2000.COM	A Novell driver that supports the NE2000 protocol. It allows the PowerStation to communicate over a local area network.
*NETBIOS.EXE	Used by Interact to communicate over a network.
RSET8019.EXE	Configures interrupts and I/O addresses for the network.
TCPIP.EXE	Used by the PowerStation for TCP/IP communications.

File Name	Description
TCPIP.INI	Stores settings for TCP/IP communications.

\* Denotes files that can be downloaded from Novell's FTP site.

Interact will also communicate over any network or operating system that supports NetBIOS protocols. Examples include Lantastic, TCP/IP, Microsoft, and IBM. If you need assistance with NetBIOS and networking, consult your network administrator or a certified network technician.

## Performing Internal Maintenance

This section includes helpful information for performing internal maintenance on the PowerStation. To prevent injury to yourself or damage to the PowerStation, be sure to read and understand the procedures described in this section before performing them. This section will show you how to perform the following operations:

- Disassembling the PowerStation
- Replacing DRAM
- Changing jumper settings
- Reassembling the PowerStation



**Warning** For safety reasons, the PowerStation should be opened only by qualified service personnel.

### Electrostatic Discharge Precautions



Modern integrated electronic devices, especially CPUs and memory chips, are extremely sensitive to electrostatic discharges (ESD) and fields. Before you disassemble the PowerStation, be sure to follow these simple precautions to protect you and the PowerStation from harm resulting from ESD.

- To avoid electric shock, always disconnect the power from the PowerStation before you remove the back cover. Do not touch any components of the CPU card or other cards while the PowerStation is on.
- Disconnect power before making any hardware configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

- Only handle internal components in an ESD-safe location, using appropriate grounding methods.
- Wear a grounding wrist strap for continuous protection.
- Always ground yourself to remove any static charge before you touch the CPU card.
- Be particularly careful not to touch the chip connectors.
- Keep any card in its anti-static packaging when it is not installed in the PowerStation, and place it on a static dissipative mat when you are working on it.

### Disassembling the PowerStation

If you have read and understand the ESD safety precautions, you are ready to disassemble the PowerStation.

**Important** As you begin to disassemble the unit, you will encounter several different screw sizes. When you reassemble the PowerStation, be sure to replace the same size screw in the same location as the one that was removed. Failure to do so could damage the unit.

#### To disassemble the unit, complete the following steps:

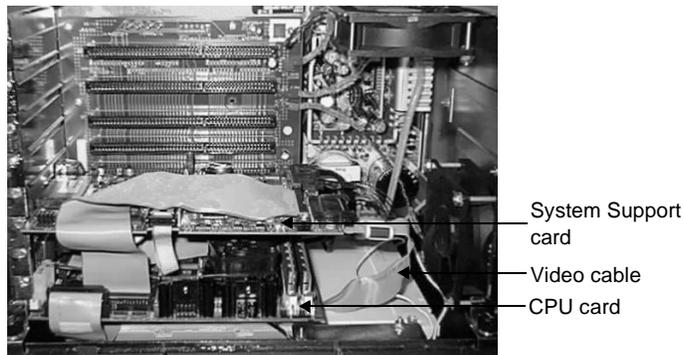
1. Turn off the PowerStation.
2. Disconnect the unit from the power source.
3. Remove the unit from its enclosure, if it is installed in one.
4. Place the unit face-down on a static dissipative mat in a location free from dirt and moisture and protected against static discharge.
5. Remove the screws securing the back cover.
6. Remove the back cover from the unit.
7. Proceed to the specific procedures you need to perform.
  - See *Replacing DRAM* on page 72.
  - See *Adding Expansion Cards* on page 74
  - See *Changing Jumper Settings* on page 76

## Replacing DRAM

All PowerStations use DRAM that is comparable to what is found in most PCs. The size and quantity of DRAM varies depending on the PowerStation model and the CPU card that it uses. However, you can use the same procedure to add and replace DRAM on all models. Refer to the CPU manual that came with your PowerStation for more information about the size and quantity of DRAM your unit can support.

## Removing a DRAM module

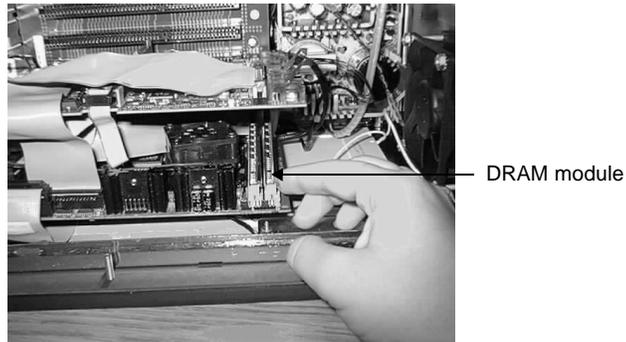
The PowerStation's DRAM is located on the CPU card, under the System Support card. You can identify the System Support card as the card with the Compact Flash Card and the Ethernet port. The System Support card and CPU cards are shown below.



**To remove a DRAM module from the CPU card, complete the following steps:**

1. Perform the PowerStation disassembly procedures beginning on page 71 of this manual.
2. With the back cover removed, lift the locking ears to disconnect the video cable from the right edge of the System Support card.

3. Locate the DRAM module, or SIMM, located on the right side of the CPU card as shown below. The number of SIMMs present varies depending upon the PowerStation model and the manufacturer of the CPU card.

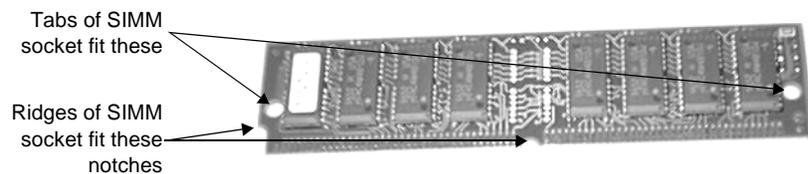


4. Push outward on the two clips holding the SIMM in its socket. As you push on the clips, the SIMM will move outward. It may be necessary to use a small screwdriver or the tip of a pen to push on the clips.
5. Tilt the SIMM slightly to the right (away from the fan on the CPU card), and lift the module out of its socket at an angle.
6. Place the DRAM module in an anti-static bag for storage if you do not plan to reinstall the DRAM module at this time.

### Installing a DRAM module

**To install a DRAM module in the CPU card, complete the following steps:**

1. Carefully insert the SIMM into its socket at an angle. The notch on the bottom of the SIMM will align with the ridge on the socket as shown below.



2. Press the SIMM upright into the socket until the metal clips snap into place, securing the SIMM. The tabs on the socket must fit into the holes in the SIMM.

3. Press the video cable into the socket to re-attach the video cable to the System Support card. The locking ears should be secure over the top of the cable connector.
4. Perform the PowerStation reassembly procedures beginning on page 80 of this manual.

This completes the DRAM memory installation in your PowerStation. The PowerStation will automatically recognize the additional memory.

### **Adding Expansion Cards**

When adding expansion cards to the PowerStation, please observe the following precautions:

- The size of the card you choose is important because the size and number of available slots in the PowerStation varies from model to model. See *Physical Specifications* on page 13 of this manual for more information about expansion slots.
- The total compliment of expansion cards in the unit may not exceed the current limits specified for expansion cards in the PowerStation. See *Electrical Specifications* on page 15 of this manual for more information about the voltage and current available for expansion cards.
- The PowerStation does not support Plug-n-Play features. When selecting adapter cards you must either select those with Plug-n-Play features that can be disabled or those without Plug-n-Play features. Adapter cards with Plug-n-Play enabled may not perform correctly and may adversely affect PowerStation operation.

### **Address considerations**

As in most ISA-bus computer port addresses, 300 through 31F are available for adapter functions. Addresses 310 through 317 are reserved for use by the PowerStation. Make sure that any adapter cards you install do not conflict with these addresses.

### IRQ considerations

IRQs 3, 4, 5, 7, 9, 10, 11, and 15 are available to adapter devices connected to the ISA-bus. The PowerStation configures these as shown below.

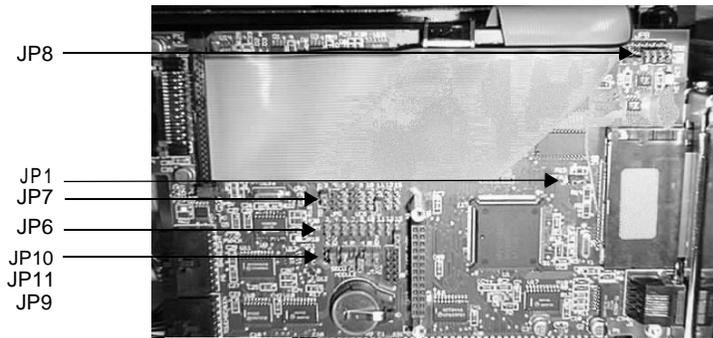
IRQ	Usage
3	COM2*
4	COM1
5	
7	
9	
10	Ethernet (software configured)
11	Touchscreen*
15	

The IRQs with no use indicated in this table are available for use by any adapter card. The Ethernet port is software configured. See *Configuring the Ethernet Interface* on page 69 of this manual for more information. Those uses marked with an asterisk (\*) may be reconfigured by changing the jumper settings on the System Support card. Changing jumpers requires you to also change the PowerStation's operating software. Therefore, you should only change the IRQs in your PowerStation after consulting the CTC Parker Product Technical Support department.

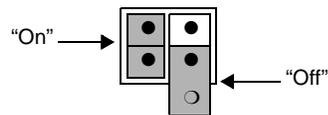
The next section of this manual explains how to change the PowerStation's jumper settings.

### Changing Jumper Settings

Like most PCs, the PowerStation uses jumpers to set addresses and enable or disable various functions of the system. You can change these jumpers if necessary. The PowerStation’s System Support card has seven sets of jumpers for configuring the serial ports, touchscreen, Compact Flash, USC module, and Ethernet. These jumpers are shown below.



The following sections will describe how the jumpers are set, what they control, and what options you have in configuring your own jumpers. Jumpers set to “on” and “off” will look like those in the illustration below.



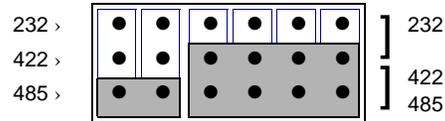
**Note** “Off” jumpers can be completely removed or placed as in the illustration above.

See *Jumper Settings* on page 31 of this manual for information about the default settings of these jumpers.

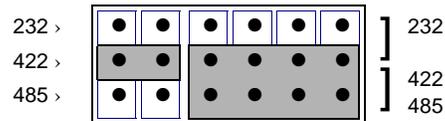
#### JP8 COM2 serial port configuration

This set of jumpers, located on the upper right corner of the System Support card, is used to set the serial port configuration. The default setting is the RS-485, but you can configure the jumpers to the RS-232 or the RS-422 protocols.

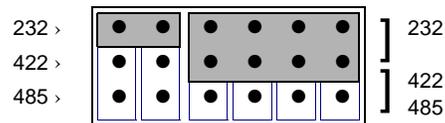
To configure to the default RS-485 protocol, set the jumpers in the positions shown below.



To configure to the RS-422 protocol, set the jumpers as shown below.



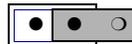
To configure to the RS-232 protocol, set the jumpers as shown below.



### JP1 Ethernet default jumper

This jumper determines when the Ethernet is configured to its default settings. When the jumper is “on,” the Ethernet is forced to the default settings. While the jumper is “off,” the Ethernet is configured by the software utility. To turn the default settings off, set the jumper to “off” as shown in the illustration below. See *Configuring the Ethernet Interface* on page 69 of this manual for a list of files that configure the Ethernet Interface.

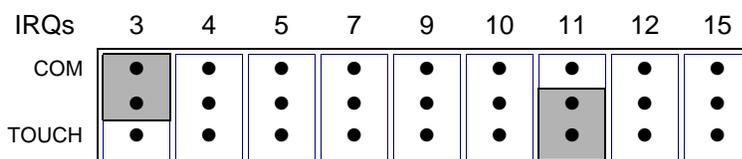
JP1



### JP7 serial port and touchscreen IRQ

This set of jumpers is used to configure the hardware IRQs for the serial port and touchscreen. Place the clips as shown below to map to the default protocols: serial port = IRQ3 and touchscreen = IRQ11. You can map these ports to IRQs 3, 4, 5, 7, 9, 10, 11, or 15.

**Important** After changing the jumper settings for the touchscreen IRQ, you must change the touchscreen configuration drivers for the changes to be implemented. See *Reconfiguring the Touchscreen Driver* on page 60 for complete instructions.

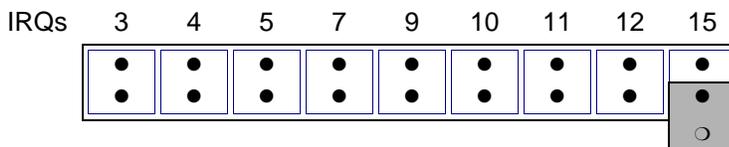


**Important** IRQ 12 is used by the PS/2 port. If you intend to use a keyboard and/or a mouse, do not map to this IRQ.

If you are using a Compact Flash card as a secondary IDE device, then you cannot use IRQ 15.

### JP6 UCS module IRQ

This set of jumpers configures the UCS module IRQ. The jumpers are all set to “off” when shipped, as shown below, but you can configure the jumpers to 3, 4, 5, 7, 9, 10, 11, 12, or 15.

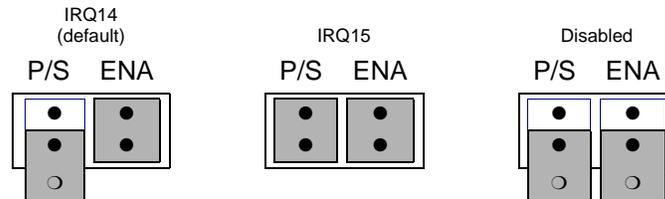


### JP10 Compact Flash adapter configuration

These jumpers are used to configure the Compact Flash. By default, the Compact Flash is configured to the Primary IDE adaptor (IRQ14). To configure your CF to the Primary IDE adaptor, set the P/S jumper to “off” and the ENA jumper to “on,” as in the first example at the top of the next page.

To configure to the Secondary IDE adaptor (IRQ15), set both jumpers to “on,” as in the second example below.

Finally, to disable your CF, set the ENA jumper to “off.” Once the ENA jumper is set to “off,” the P/S setting doesn’t matter, so you can set it however you want. In the third example below, both jumpers are set to “off.”



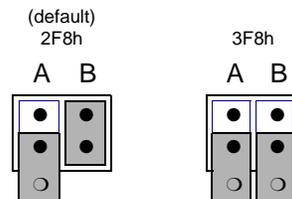
### JP9 and JP11 serial port and touchscreen address

These sets of jumpers configure the addresses for the serial port (JP9) and the touchscreen (JP11). Each is configured by turning the A and B ports “on” or “off.” Use the following chart to determine the on/off combination for the port to which you would like to configure: COM1, COM2, COM3, or COM4.

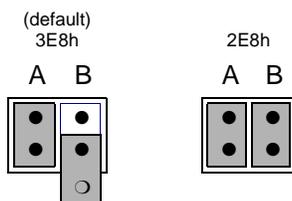
I/O Address	A	B
COM1 (3F8h)	off	off
COM2 (2F8h)	off	on
COM3 (3E8h)	on	off
COM4 (2E8h)	on	on

To set the serial port jumpers (JP9) to the default I/O address COM2 (2F8h), place the clips as seen below with the A port “off” and the B port “on.” Set both jumpers to “off” to map to the COM1 port, also shown below.

**Important** If the COM port is configured as COM1, the COM1 must be disabled in the system BIOS.



To set the touchscreen jumpers (JP11) to the default I/O address COM3 (3E8h), set the jumpers as shown below, with the A port “on” and the B port “off.” Set both jumpers to “on” to map the touchscreen to the COM4 port, also shown below.



**Important** After changing the jumper settings for the touchscreen I/O address, you must change the touchscreen configuration drivers for the changes to be implemented. See *Reconfiguring the Touchscreen Driver* on page 60 of this manual for complete instructions

## Reassembling the PowerStation

When you are finished performing internal maintenance on the PowerStation, you can reassemble the unit.

**Important** When you reassemble the PowerStation, be sure to replace the same size screw in the same location as the one that was removed. Failure to do so could damage the unit.

### To reassemble the PowerStation, complete the following steps:

1. Replace the back cover, and reinstall the screws that secure the back cover.
2. Reinstall the unit in its enclosure, if it was previously installed in one.
3. Reconnect power to the unit.
4. Start up the PowerStation.

## Resolving Common Problems

This section provides some basic troubleshooting steps to help you identify and correct problems that you may have with the PowerStation. Each problem is described, followed by one or more possible solutions. Begin with the first solution and continue until you have solved the problem or exhausted the possible solutions.

If the problem persists, look through the other problems listed in this section to determine if additional symptoms exist that might require action. If you cannot solve the problem yourself, or if you encounter a problem that is not documented in this section, contact your CTC Parker equipment supplier or the CTC Parker Product Technical Support department at (513) 248-1714.

Use the table below to find discussions of specific problems.

<b>Resolving problems when starting up</b>	<b>Page</b>
Resolving AUTOEXEC.BAT and CONFIG.SYS problems	82
The fan does not come on, and the display is blank	85
The fan starts, but the display does not	86
The RAM test fails, or the total memory installed does not match the total contiguous RAM listed on the display following the RAM test	86
<b>Resolving problems with the touchscreen</b>	
After startup, the touchscreen does not work	87
After startup, the touchscreen does not work properly, or touchscreen calibration is incorrect	87
After calibrating the touchscreen, it either does not work or does not follow your finger	87
<b>Resolving problems after starting up</b>	
The PowerStation locks up while starting and will not restart	88
The DOS prompt is displayed instead of the MachineShop Shell main menu	
A PS/2 mouse does not work	89
A serial mouse does not work	90
A keyboard does not work	90
The Ethernet port does not work	89
A driver does not work with the installed adapter card	89

## Problems when Starting Up

Some of the most common problems that users encounter with PCs occur while starting up their systems. This section describes some possible problems that may occur in the PowerStation during startup and solutions for these problems.

### Resolving AUTOEXEC.BAT and CONFIG.SYS problems

Some startup problems are caused by a corrupted or modified AUTOEXEC.BAT or CONFIG.SYS file. CTC Parker includes backup copies of these files (AUTOEXEC.CTC and CONFIG.CTC) on the PowerStation Start Disk, which you can create from the MachineShop Installation CD. See the *PowerStation Installation Booklet* for instructions on how to create this disk.

The text for AUTOEXEC.CTC appears below:

```
@ECHO OFF
REM*****
REM PowerStation Autoexec.bat file
REM Copyright (c)1999 CTC Parker Automation
REM*****

PROMPT $p$g
SET TEMP=C:\DOS
PATH C:\;C:\DOS;C:\CTC

REM*****
REM Install PowerStation Special Functions if not running
REM on a P1.
REM*****

C:\TOUCH\IDTOUCH -S
IF ERRORLEVEL 3 GOTO ITSAP1
LH C:\CTC\BIOSTSR

REM*****
REM If an external mouse is connected, MOUSE will install
REM successfully
REM and create a new MOUSE.INI file.
REM*****

CD \CTC
IF EXIST C:\CTC\MOUSE.INI DEL C:\CTC\MOUSE.INI
LH C:\CTC\MOUSE

:ITSAP1

REM*****
REM Load VESA TSR if not already supported by the video
REM system.
REM*****
```

```

C:\CTC\ISVESA
IF NOT ERRORLEVEL 1 GOTO YESVESA
LH C:\CTC\VESAS
:YESVESA

REM*****
REM Initialize touchscreen drivers.
REM*****

SET TOUCH_PATH=C:\TOUCH
CALL %TOUCH_PATH%\TCHINIT.BAT

REM*****
REM Load NETWORK drivers -- NOVELL and/or TCPIP stack.
REM Remove REM on the CALL statement to load NOVELL
REM network batch file.
REM If used, this must be called BEFORE loading the TCPIP
REM stack.
REM*****

CD \NET
REM CALL C:\NET\NET.BAT
LH C:\NET\TCPIP

```

The following lines appear only on PowerStations with Interact and MachineLogic.

```

REM*****
REM Load the MachineLogic Control Adapter driver if it is
REM present.
REM*****

IF NOT EXIST C:\MACHLOG\NUL.EXT MD C:\MACHLOG
CD \MACHLOG
IF NOT EXIST C:\CTC\MLCA.EXE GOTO NOMLCA
CD \CTC
LH C:\CTC\MLCA

:NOMLCA

REM*****
REM Set up Interact and MachineLogic environment variables
REM for MS Shell.
REM*****

SET INTERACT=C:\INTERACT
SET INTERACT_FILES=C:\INTERACT\APPPFILES
SET INTERACT_STARTUP=C:\STARTUP
SET MACHINELOGIC=C:\MACHLOG

REM*****

```

```

REM Load MachineLogic if ML kernel present, and set for
REM boot operation.
REM (determined by MLDU.EXE return value 0 = ENABLED, 1 =
REM DISABLED)
REM*****

IF NOT EXIST C:\MACHLOG\NUL.EXT MD C:\MACHLOG
CD \MACHLOG
IF NOT EXIST C:\MACHLOG\MACHLOG.EXE GOTO NOML
C:\CTC\MLDU
IF ERRORLEVEL 1 GOTO NOML

C:\MACHLOG\RTXDOS
C:\MACHLOG\MACHLOG

:NOML

REM*****
REM Call AUTOEXEC.BAT file contained in project, if it
REM exists.
REM*****

IF NOT EXIST C:\STARTUP\NUL.EXT MD C:\STARTUP
CD \STARTUP
IF EXIST C:\STARTUP\AUTOEXEC.BAT CALL
C:\STARTUP\AUTOEXEC.BAT

REM*****
REM Start the MachineShop Shell.
REM*****

CD \CTC
PSU

```

**The text for CONFIG.CTC appears below:**

```

;MS-DOS V6.22
SHELL=C:\COMMAND.COM /E:1024 /P
FILES=30
DEVICE=C:\DOS\HIMEM.SYS

```

**The following lines appear only on PowerStations with Interact and MachineLogic.**

```

REM
REM MachineLogic uses the High Memory Area (HMA) to store
REM all I/O and variable data. Therefore, DOS should be
REM loaded entirely into conventional memory. If
REM MachineLogic is not being used, then DOS should be
REM loaded HIGH into the HMA to conserve conventional
REM memory. To load DOS HIGH use DOS=HIGH,UMB -- otherwise
REM use DOS=LOW,UMB.
REM

```

```

REM DOS=HIGH,UMB
DOS=LOW,UMB
REM
REM                                     !!! NOTE !!!
REM If EMM386 is used, any upper (UMB) memory used by
REM adapter cards must be excluded with the "X="
REM parameter, as shown in the example below. This
REM example is for a MachineLogic REM Control Adapter at
REM address D800, configured to use 4KB REM of the factory
REM default). Please adjust the "X=" parameter to match
REM your system configuration.
REM
REM DEVICE=C:\DOS\EMM386.EXE NOEMS X=D800-D8FF
REM
REM On a P1 PowerStation, the range C800 through CFFF must
REM be excluded. Use the following command for loading
REM EMM386 on a P1.
REM
REM DEVICE=C:\DOS\EMM386.EXE NOEMS X=C800-CFFF X=D800-
REM D8FF

```

If you suspect a problem with either the AUTOEXEC.BAT or the CONFIG.SYS file of the PowerStation, use the DOS Copy command to create a backup copy of your current file, and overwrite the suspect file with the appropriate backup file. For example, if the AUTOEXEC.BAT file becomes suspect, type the following commands at the DOS prompt:

```

copy autoexec.bat autoexec.old
copy \ctc\autoexec.ctc autoexec.bat

```

#### **The fan does not come on, and the display is blank**

1. Turn off the PowerStation.
2. Make sure that power cord is properly plugged in.  
If it is not, make sure that the plug is firmly attached to the unit and the power source.
3. Turn on the PowerStation.  
If the fan does not come on, continue with step 4.
4. Disconnect power to the PowerStation.
5. Remove the PowerStation's back cover.
6. Check the fuse located on the internal power supply.  
If the fuse is blown, replace it.

7. Turn on the PowerStation.  
If the fan does not come on, continue with step 8.
8. Check connector J8 (fan connection) on the backplane board to see if the fan is plugged in.
9. Secure the PowerStation's back cover.
10. Connect the PowerStation to its power source.
11. Turn on the PowerStation.

**The fan starts, but the display does not**

1. Turn off the PowerStation.
2. Remove the PowerStation's back cover.
3. Make sure that the cables that connect to the display are properly connected.  
If they are not, make sure that each connector is firmly seated in its corresponding plug.
4. Check the installation of the DRAM SIMMs on the CPU board. Make sure that the SIMMs are firmly seated in their sockets and that the socket latches are fully engaged.
5. Make sure that all cards are firmly seated in the backplane board.
6. Secure the PowerStation's back cover.
7. Turn on the PowerStation.

**The RAM test fails, or the total memory installed does not match the total contiguous RAM listed on the display following the RAM test**

1. Turn off the PowerStation.
2. Remove the PowerStation's back cover.
3. Re-seat the DRAM modules on the CPU board. Make sure that the modules are firmly seated in their sockets and that the socket latches are fully engaged.
4. Secure the PowerStation's back cover.
5. Turn on the PowerStation.

## Problems with the Touchscreen

This section lists some problems that may occur with the touchscreen and solutions to these problems.

### After startup, the touchscreen does not work

1. If the PowerStation appears to be operating correctly otherwise, restart the unit.
2. The touchscreen calibration might be in error. See *Recalibrating the Touchscreen* on page 65 for complete instructions.
3. Check the AUTOEXEC.BAT file.

See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 82 for information about the lines that should appear in the AUTOEXEC.BAT file.

- a. Verify that the following lines appear in the AUTOEXEC.BAT file before the lines that load touchscreen driver:
 

```
IF EXIST C:\CTC\MOUSE.INI DELC:\CTC\MOUSE.INI
LH C:\CTC\MOUSE
```
- b. Verify that the touchscreen drivers are being loaded. Look in the AUTOEXEC.BAT FILE for the following line:

```
LH C:\TOUCH\DOX\SC3DOX /NOBOUNDS
```

**Important** You cannot use a serial mouse and the touchscreen simultaneously on units running Interact under Windows 95 or 98. The PowerStation will only load the driver for the device that is listed first in the AUTOEXEC.BAT file.

### After startup, the touchscreen does not work properly, or touchscreen calibration is incorrect

You may need to reconfigure or recalibrate the touchscreen.

See *Reconfiguring the Touchscreen Driver* on page 60 and *Recalibrating the Touchscreen* on page 65 of this manual for complete instructions.

### After calibrating the touchscreen, it either does not work or does not follow your finger

1. Make sure that the touchscreen cable has been properly connected.

If the touchscreen cable is damaged, replace the touchscreen. Contact CTC Parker for information about purchasing a replacement.

2. Inspect the touchscreen for broken, loose, or frayed wiring. Secure any loose wiring. If you find broken or frayed wiring, replace the damaged wiring.

### **Problems after Starting Up**

This section lists problems that may occur after startup and solutions to these problems.

#### **The PowerStation locks up while starting and will not restart**

1. Turn off the PowerStation.
2. Connect a keyboard.
3. Turn on the PowerStation.
4. When the message “Starting MS-DOS” appears, press the F8 key.

This will cause the system to step through the CONFIG.SYS or AUTOEXEC.BAT files line-by-line.

5. If the “Starting MS-DOS” message does **not** appear, go to step 9.
6. Step through the CONFIG.SYS and AUTOEXEC.BAT files line-by-line until the lockup is found.
7. Remove or correct the offending line in the CONFIG.SYS or AUTOEXEC.BAT file.

In particular, on PowerStations with Compact Flash, make sure that the memory region used by the Compact Flash (configured by jumpers on the System Support card) is excluded (with the “X/=” parameter) when loading EMM386.EXE.

8. Restart the PowerStation to see if the problem has been solved.

9. If the system locks up before the “Starting MS-DOS” message appears, restart the unit, and press the Delete key to enter the BIOS setup program.
10. Select the Standard CMOS Setup option or its equivalent, and restore the system defaults.  
This will restore the CMOS settings to their factory default configuration.
11. Save these settings, and exit the setup program.

Refer to the CPU manual that came with the PowerStation for more information about using the BIOS setup program.

### **The DOS prompt is displayed instead of the MachineShop Shell main menu**

1. If the PowerStation appears to be operating correctly otherwise, restart the unit.
2. Make sure that the MachineShop Shell software is being loaded. Specifically, verify that the following lines appear in the AUTOEXEC.BAT file and do **not** have the word “REM” in front of them:

```
CD \CTC  
PSU
```

3. The AUTOEXEC.BAT file may be corrupted or has been modified.

See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 82 of this manual for information about the command lines that should appear in the AUTOEXEC.BAT file.

### **A PS/2 mouse does not work**

1. Make sure that you are using a Microsoft PS/2 mouse.  
Some PS/2 mice that claim to be Microsoft compatible, will not work correctly with the PowerStation. Do **not** use a serial mouse with a serial-to-PS/2 port adapter.
2. Make sure that you are using the supplied Y-adaptor cable to connect the mouse to the PS/2 port. Do **not** plug the mouse directly into the PS/2 port.

**A serial mouse does not work**

See *Connecting a serial mouse* on page 21 of this manual for instructions on how to configure the PowerStation to accept a serial mouse.

**A keyboard does not work**

1. If you have a P3 or P4 PowerStation, make sure that you are using the supplied Y-adapter cable to connect any AT-compatible keyboard to the PS/2 port.

If you have a P5 or P7 PowerStation, make sure that you plug the keyboard into the AT socket located next to the parallel port. Do **not** use the Y-adapter cable to connect an IBM AT-compatible keyboard to the PS/2 port.

2. Make sure the keyboard is an AT keyboard, not an XT keyboard.
3. If you have a P3 or P4 PowerStation, try using a new Y-adapter cable.
4. Try using a new keyboard.

**The Ethernet port does not work**

1. Make sure that the Ethernet cable is plugged in.
2. Make sure that the networking software is being loaded. Specifically, verify that the following lines appear in the AUTOEXEC.BAT file and do **not** have the word “REM” in front of them:

```
CD \NET
CALL C:\NET\NET.BAT
```

See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 82 of this manual for information about the lines that should appear in the AUTOEXEC.BAT file.

3. Make sure that you have properly configured the networking software.

See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 82 of this manual for information about how your networking software can be configured.

**A driver does not work with the installed adapter card**

1. Make sure that there are no interrupt or memory conflicts with other adapter cards.

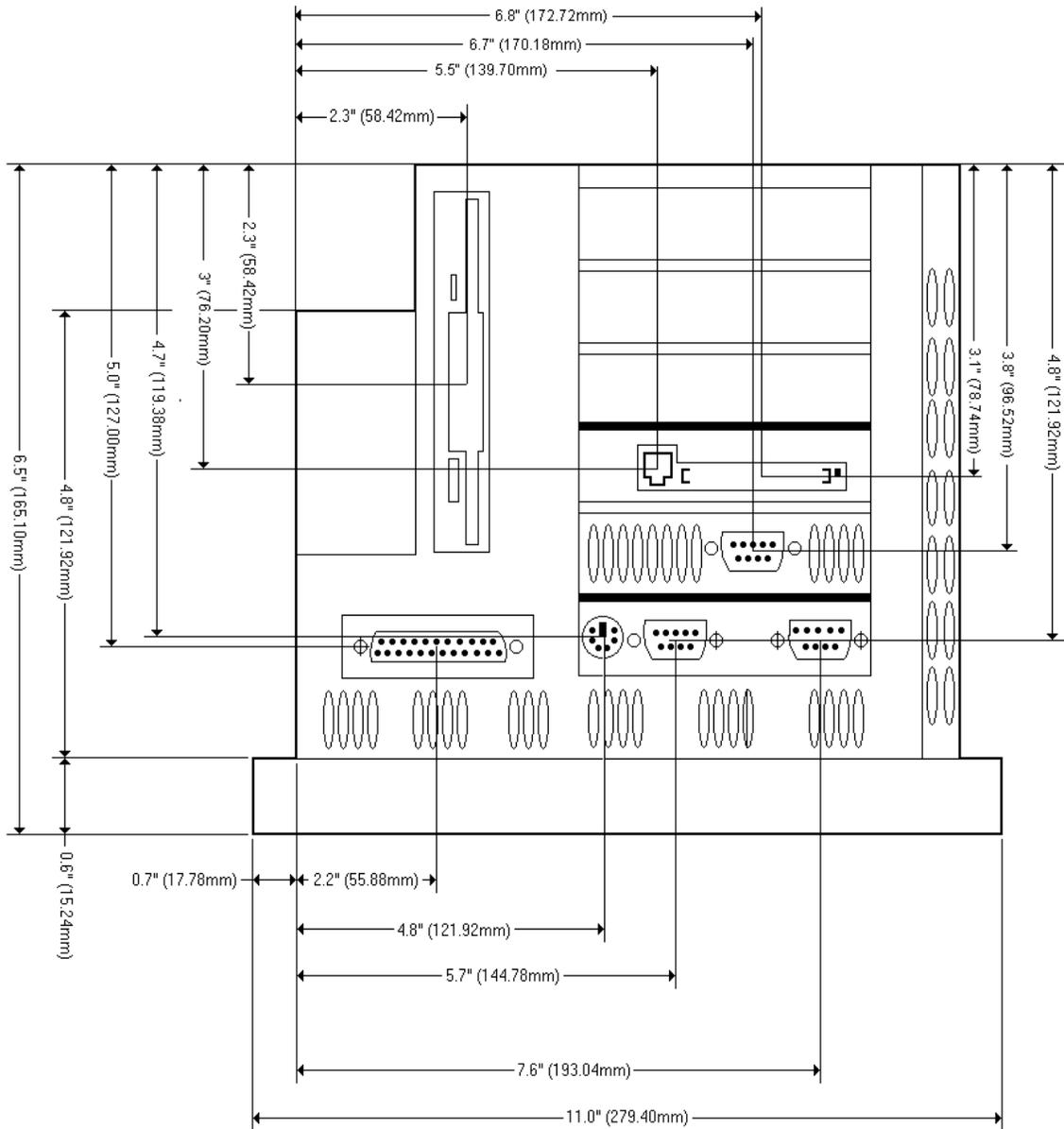
See *Expansion Cards* on page 35 of this manual for a list of adapter cards that the PowerStation will support and their associated memory locations.

For additional information about adapter cards supplied by CTC Parker, see the Windows help file that corresponds to your Interact Device Driver or the I/O Driver help file (accessible from the MachineShop toolbar).



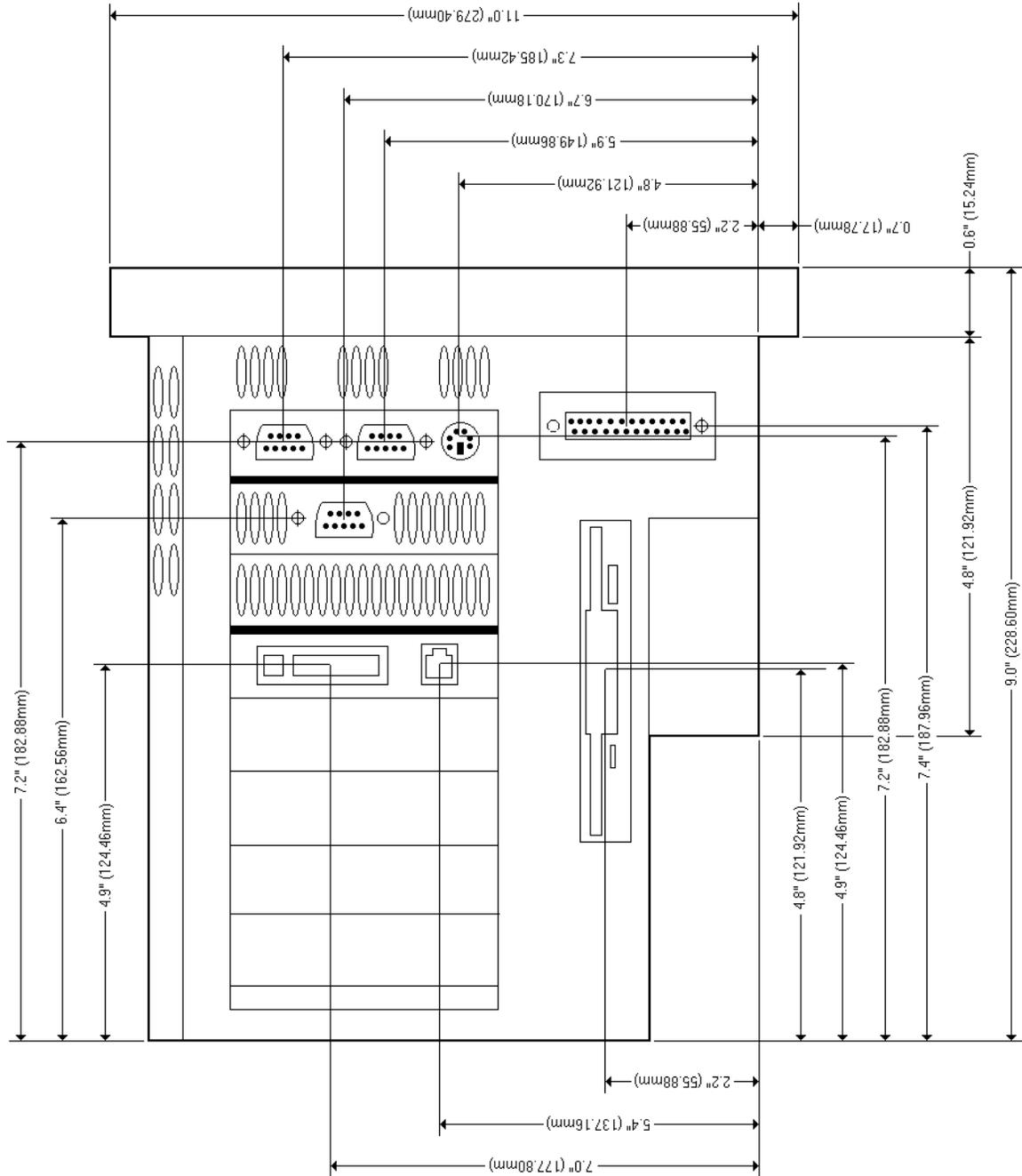
## PowerStation Dimensional Drawings

### P3 Side View

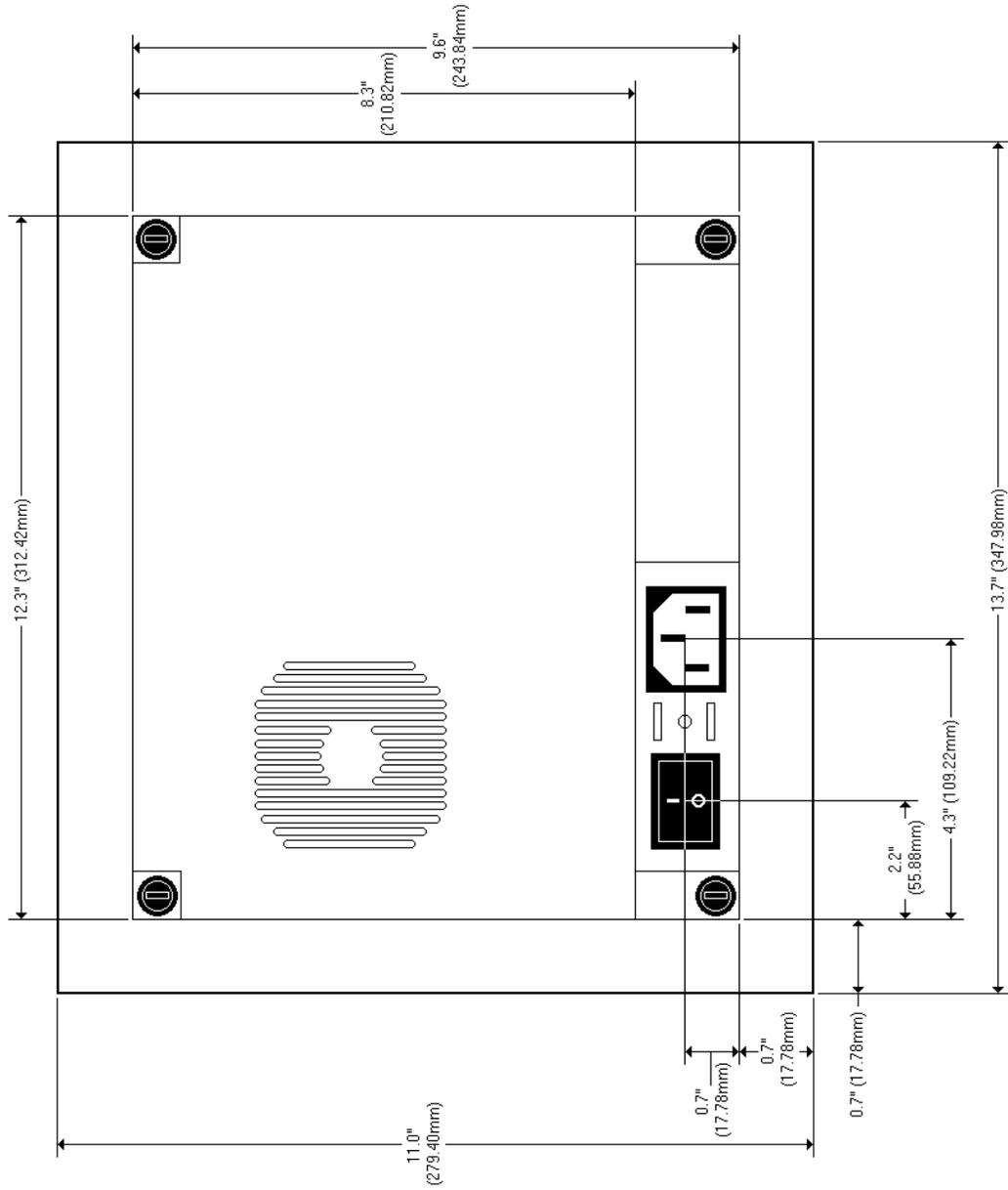




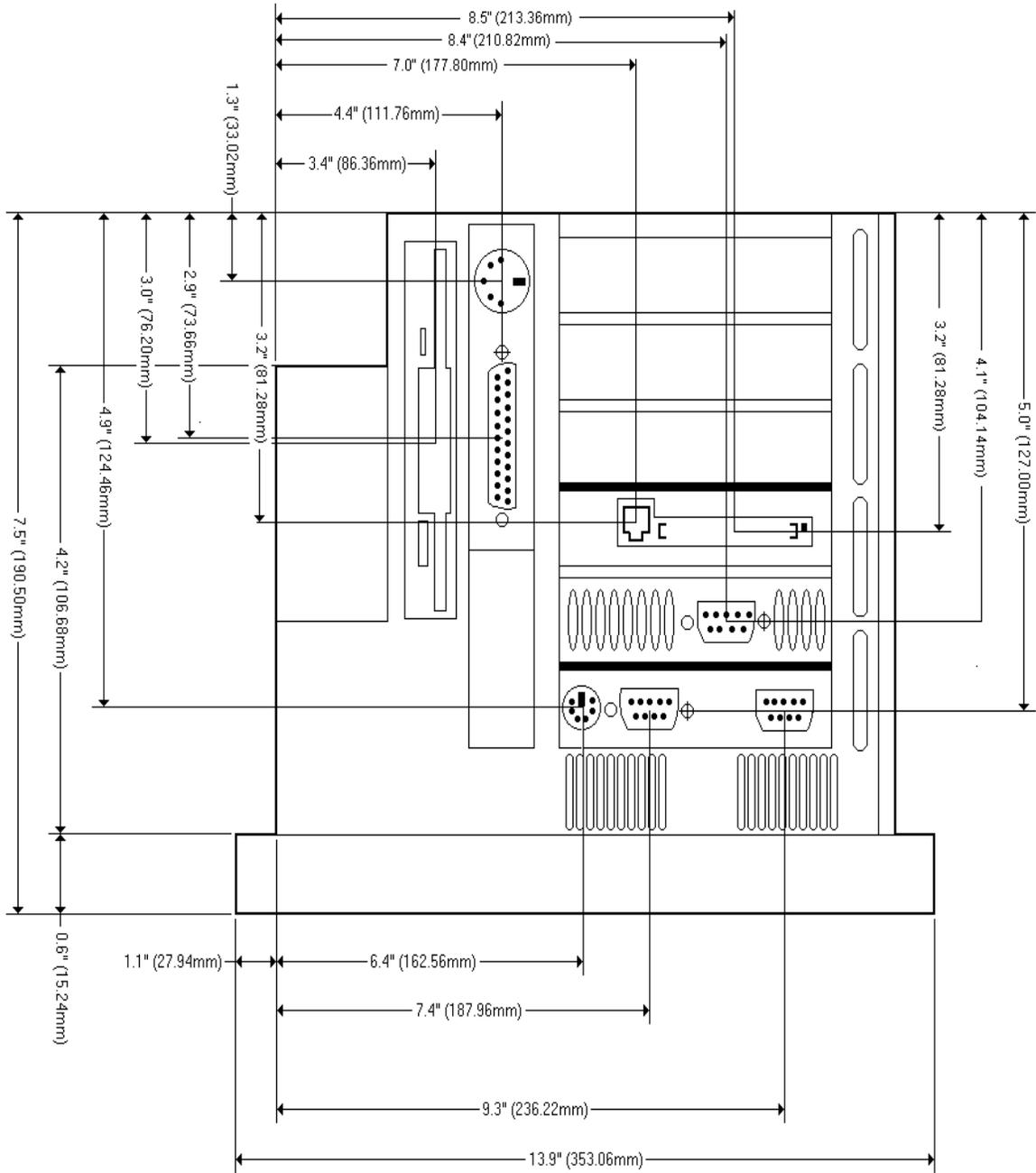
### P4 Side View



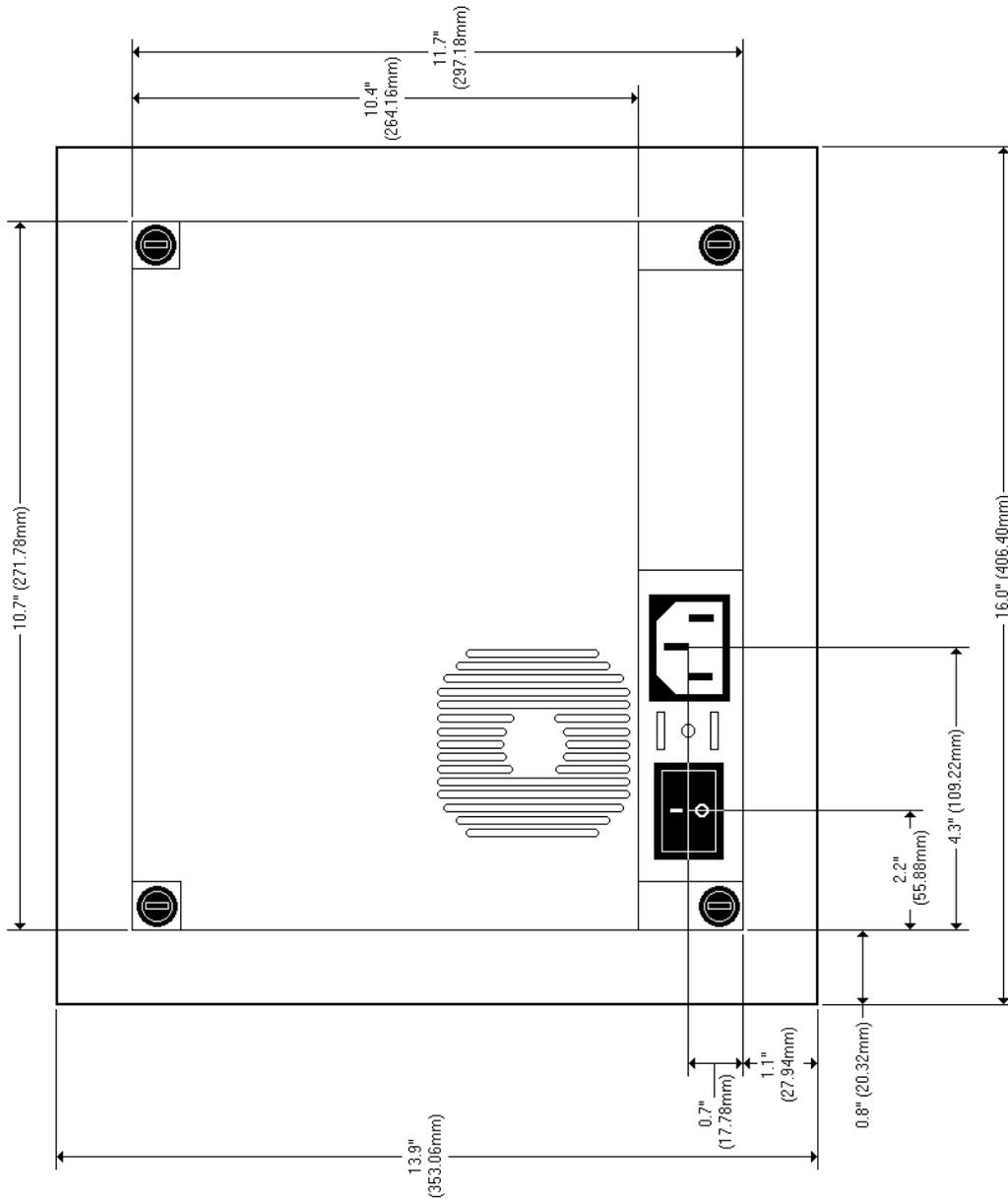
# P4 Back View



### P5/P7 Side View



### P5/P7 Back View



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