PowerStation

User Guide

Copyright and Trademark Notice

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 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 9 of this manual for more information about CTC Parker's support products and services.

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

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, and P5. 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® or Windows.® Please take time to review this manual and the other documentation included with the PowerStation before operating the unit.

Chapter Contents

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 and memory map.

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.

Appendix B — CPU Board Connectors: Lists all connectors on the CPU Board and briefly describes three that might be useful when setting up your PowerStation.

Appendix C — Additional CPU Board Jumpers: Provides information on jumpers that may be of interest in addition to those covered in the chapters of this User Guide.

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.

PowerStation Template—This document is a full-size template of the PowerStation that 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, MachineShop, 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 delivered 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				
MS-DOS 6.22 and Utilities Installation Disk KA-72953	X			X	X			
Windows 95 VGA Driver Floppy Disk KA-73126		X				X		
Windows 98 VGA Driver Floppy Disk KA-73127			X				X	
Windows NT VGA Driver Floppy Disk KA-73128				X				X
Windows 95 Touchscreen Driver Floppy Disk KA-72816		X	X			X	X	
Windows NT Touchscreen Driver Floppy Disk KA-72817				X				X

Disk Name and Part No.	MachineShop Systems				Industrial PC Systems			
	DOS	Windows			DOS	Windows		
		95	98	NT		95	98	NT
Intel Pro/100+ Ethernet Driver Disk KA-73124		X	X	X		X	X	X
Windows NT Emergency Repair Floppy Disk KA-72668				X				X
PowerStation Start Disk KA-83109	X	X	X	X				
PowerStation Utilities Disk KA-72463					X	X	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.

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 95/98/NT 4.0 VGA Driver Disks, KA-73126, KA-73127 or KA-73128: These disks are used by PowerStations that use the Windows 95, 98, or NT operating system. The disks contain the Windows VGA drivers to fully support PowerStation VGA features. The appropriate VGA driver has already been installed on your unit, but you can use the disk that matches your PowerStation configuration to reinstall these files if your VGA driver becomes 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.

Intel Pro/100+ Ethernet Driver Disk KA-73124: This disk contains an Intel Ethernet driver with Microsoft networking support.

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.

PowerStation Start Disk KA-83109: This disk is used by Power-Stations that run Machine Logic and Interact. It contains the PowerStation utilities and drivers for the P3, P4 and P5.

PowerStation Utilities Disk KA-72463: This disk is used by PowerStations that do not run Machine Logic or Interact. It contains basic utilities and drivers for the P3, P4 and P5.

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 delivered on floppy disks 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. References to "runtime system" refer to the computer you use to run the 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: Technical Support, Training and New Business Development, and the Product Support Program.

Technical Support

The 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 Trouble-shooting the PowerStation*.

If you cannot find a solution using one of the above sources, contact our 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.

Training and New Business Development

Our Training and New Business Development 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.

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.

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.

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, and expansion cards. Finally, the chapter explains important design issues concerning PowerStation touchscreens and hard drives.

Chapter Contents

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 one of the following CPUs: Pentium® 166 MHz or Pentium® 266 MHz. The P3 also includes 8 MB to 256 MB of RAM, an internal floppy drive, 3 ISA slots, and one of the following VGA displays (640 x 480 pixel): 9.7" LCD, 10.4" STN, or 10.4" TFT.

P4 PowerStation—This PowerStation is a touchscreen workstation that includes one of the following CPUs: Pentium® 166 MHz, or Pentium® 266 MHz. The P4 also includes 8 MB to 256 MB of RAM, an internal floppy drive, an optional DC power supply, 4 ISA slots and one of the following VGA displays (640 x 480 pixel): 9.7" LCD, 10.4" STN, or 10.4" TFT.

P5 PowerStation—This PowerStation is a function key workstation that includes one of the following CPUs: Pentium® 166 MHz, or Pentium® 266 MHz. The P5 also includes 8 MB to 256 MB of RAM, an internal floppy drive, 3 ISA slots and one of the following VGA displays (640 x 480 pixel): 9.7" LCD, 10.4" STN, or 10.4" TFT.

> **Note** PowerStations with MachineShop are available with your choice of Compact Flash and/or a hard drive. Industrial PC PowerStations are only available with a hard drive and one of two displays: TFT or STN.

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	Pentium® 166 MHz or 266 MHz.
Memory	8 MB min., 256 MB max.
Displays	• Monochrome LCD, 640 x 480 VGA, 16 shades of gray (unavailable on Industrial PCs). Brightness: 110 cd/m^2 (NIT). • Color TFT, 640 x 480 VGA, 256 colors. Brightness: 150 cd/m^2 (NIT). • Color STN, 640 x 480 VGA, 256 colors. Brightness: 300 cd/m^2 (NIT).
Storage	• 1.44 MB high-density floppy drive. • 1.6 GB (min.) hard drive (standard on Industrial PCs). • 8, 16, 32, 48, 96, or 128 MB solid state flash drive (field expandable and replaceable). Actual storage volumes may be higher. • PCMCIA (requires 3rd party adapter board).
I/O ports	• 1 9-pin RS232 (non-isolated). • 1 9-pin RS232/422/485 (non-isolated). • 1 25-pin IBM parallel, supports SPP/EPP/ECP • 1 RJ45 10/100 Base T Ethernet.
Expansion slots	• P3: 3 3/4-size, 16-bit, ISA slots (1 slot is convertible to full-size using an optional expansion cover). • 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). • P5: 2 full-size, 1 3/4-size, 16-bit, ISA slots.
Dimensions (H x W x D)	• P3: 11.0" (280mm) x 13.8" (350mm) x 6.0" (152mm) • P4: 11.0" (280mm) x 13.8" (350mm) x 8.5" (216mm) • P5: 14" (356mm) x 16" (406mm) x 7" (178mm)
Weight	• P3: 16.2 lbs. (7.3 Kg) • P4: 18.8 lbs. (8.5 Kg) • P5: 23.8 lbs. (10.8 Kg)

Environmental Specifications

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

Category	Specifications
Operating temperature	Pentium® CPUs: 32 to 113°F (0 to 50°C) ambient air temperature at fan inlet
Bulb life	• Monochrome LCD - 10,000 hours • Color STN - 25,000 hours • Color TFT (10.4") - 25,000 hours
Relative humidity	5% to 95% non-condensing
Altitude	-200ft. to 10,000ft. (-60.96m to 3,048m)
Shock rating	• 10g peak, 11ms (operating) • 30g peak, 11ms (non-operating)
Operating vibration	• 0.5g rms from 10 to 500Hz operating • 1.0g rms from 10 to 500Hz non-operating • With Compact Flash card, 1g rms from 10 to 500Hz operating
Faceplate designed for	NEMA 4/4X Environment **Note:** 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 • P3: 90-250 VAC, 80W max., 50/60 Hz • P4 and P5: 90-250 VAC, 110W max., 50/60 Hz DC Units • P4 and P5: 18-36 VDC in, 110W max.
Power consumption	AC Units • P3: 80W maximum • P4 and P5: 110W maximum DC Units • P4 and P5: 110W maximum
Fuse type	AC Units • 3.15A, 250 VAC Littelfuse® 216.315 or equivalent DC Units • 12A, 250 VAC Littelfuse® 314.012 or equivalent
ISA cards	Voltage and current available for expansion cards (either AC or DC Units): 2.5A @ +5V, .25A @ -5V; 1.0A @ +12V, .75A @ -12V

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.

Testing Criteria	Classification
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 PowerStation's touchscreen 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–P5) 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.
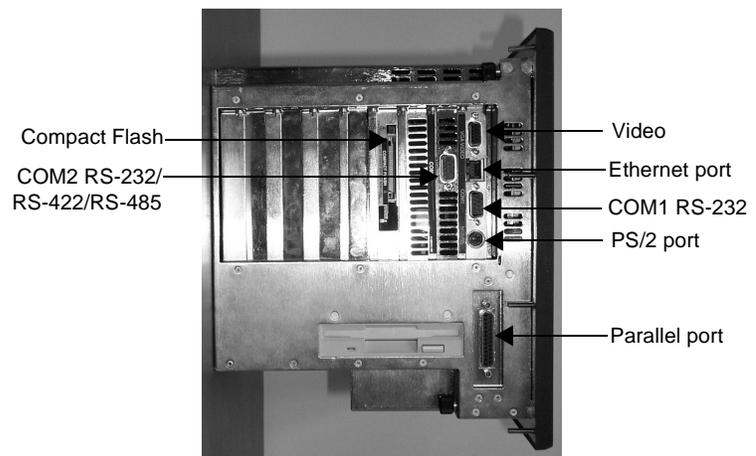
Serial Ports   The PowerStation has two serial ports, COM1 and COM2, which you can use to communicate with external devices. These ports support baud rates of up to 115 Kbaud. The COM1 port supports the RS-232 communication standard. Use a standard DB9 connector for communicating with this port.

The other serial port, COM2, 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

Pin #	Signal Name
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 71 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 +
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.

RS-232	**RS-422**	**RS-485**
COM1/COM2 RXD 2 TXD 3 RTS 7 CTS 8 RI 9 GND 5 DCD 1 DTR 4 DSR 6 232	COM2 TXD- 1 TXD+ 2 RXD+ 3 RXD- 4 GND 5 DSR 6 RTS 7 CTS 8 RI 9 422	COM2 TXD- 1 TXD+ 2 RXD+ 3 RXD- 4 GND 5 DSR 6 RTS 7 CTS 8 RI 9 485
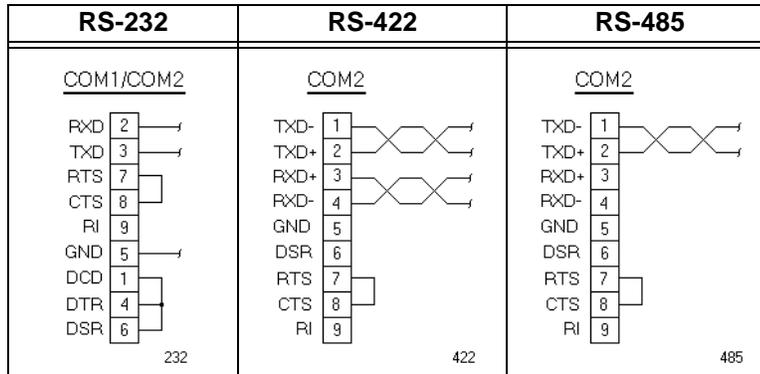
Important   Be careful not to connect any wires to unused connector pins.

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 Power-Station. If you need to construct your own cables, refer to the illustration below.

P1 COM Port	Computer 25-Pin	P1 COM Port	Computer 9-Pin
RXD 2	2 TXD	RXD 2	3 TXD
TXD 3	3 RXD	TXD 3	2 RXD
RTS 7	5 CTS	RTS 7	8 CTS
CTS 8	4 RTS	CTS 8	7 RTS
GND 5	7 GND	GND 5	5 GND
CD 1	2 DTR	CD 1	4 DTR
DSR 6		DSR 6	1 CD
DTR 4	6 DSR	DTR 4	6 DSR

dwnload
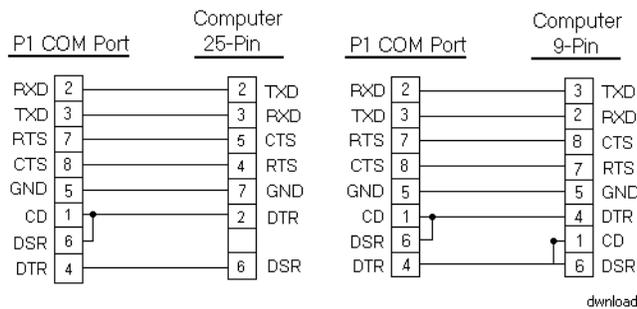
Connecting a serial mouse

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 71 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 the program called MODE.COM. MODE.COM can modify the following serial port 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 Machine-Shop 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.

5. Use the following diagram as a reference when connecting a serial printer to the PowerStation.
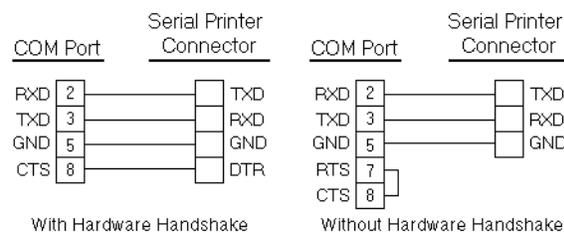
Parallel Port The PowerStation parallel port (LPT1) pinout is identical to the standard IBM parallel printer port. The LPT1 connector pinout is shown in the table below.

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
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 Y-adapter cable shipped with your PowerStation.

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, see the *Keyboard Port (P5 only)* section below for more information about connecting a keyboard.

Connecting a PS/2 mouse

PowerStations can receive input from a PS/2 mouse using the Y-adapter cable. You must use the Y-adapter cable because the PS/2 port is configured to receive input from a PS/2 keyboard directly or a mouse and a keyboard simultaneously, using the Y-adapter.

Keyboard Port (P5 only)   P5 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-adapter 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, or an external monitor and the flat-panel display simultaneously. This port supports monochrome and high resolution color displays (256 colors).

> **Note**   The maximum resolution of the flat-panel display is 640 x 480. When using an external monitor, the video port supports up to 1280 x 1024.

Ethernet Port   The PowerStation has a fully integrated 10 baseT/100 baseTX Ethernet port connected to the 32-bit PCI Bus. The port allows you to connect the PowerStation to a Local Area Network, motion controller or I/O system. Novell, TCP/IP and all other Ethernet protocols are supported.

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 a solid state, 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, 16, 32, 48, 96, or 128MB	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, back up 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

Drive Letter	Type	Size	Usage
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, back up 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.

```
1F9FFFF ─┐  ┌──────────────────┐
         │  │  Extended Memory  │
         │  │    (above 1MB)    │
100000 ──┘  └──────────────────┘

FFFFF ───┐  ┌──────────────────┐
         │  │    System BIOS    │
F0000 ───┘  └──────────────────┘

EFFFF ───┐  ┌──────────────────┐
         │  │  Available Upper  │
         │  │      Memory       │
C8000 ───┘  └──────────────────┘

C7FFF ───┐  ┌──────────────────┐
C0000 ───┘  │     Video BIOS    │
            └──────────────────┘

BFFFF ───┐  ┌──────────────────┐
         │  │   Video Memory    │
A0000 ───┘  └──────────────────┘

9FFFF ───┐  ┌──────────────────┐
         │  │   Conventional    │
         │  │      Memory       │
         │  │    (below 640K)   │
0 ───────┘  └──────────────────┘
```
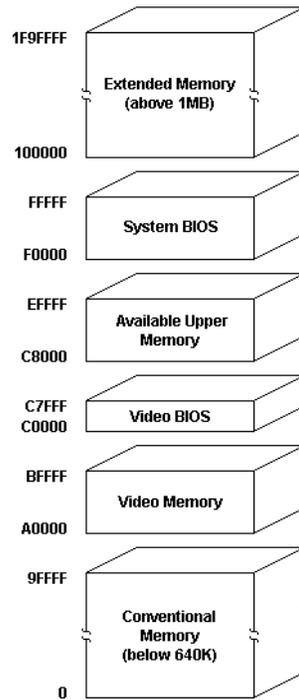
Note The factory default for the Compact Flash card maps from C8000 to CAFFF.

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.

Expansion Cards

The PowerStation supports ISA-bus expansion cards. See *Adding Expansion Cards* on page 68 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 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

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 Power-Station'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. The PowerStations described in this Guide are 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 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 16 of this manual for a complete list of these chemicals.

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 Specification*s 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. This involves creating a cutout for the unit and cleaning 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. 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 87 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 Power-Station 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 only)* on page 24 for instructions on how to connect a keyboard to the model P5 PowerStation.

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.

Chapter Contents

Cleaning the Touchscreen

Occasionally, you may wish to clean the PowerStation's touch-screen. Clean the touchscreen using warm, soapy water and a cloth. You may also use any non-abrasive cleaner. See *Faceplate Chemical Resistance* on page 16 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. 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.
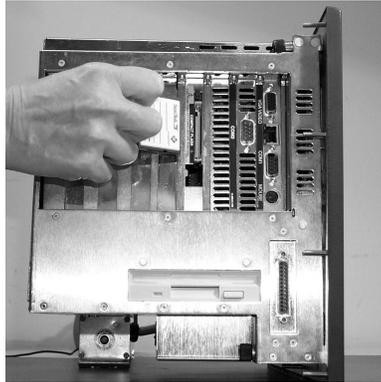
3. When you are ready, reinstall the CF card by carefully inserting the card into the slot and pushing it into the slot until the card is securely seated.

Restoring the System Files using the Flashback Utility

The FlashBack Utility restores the MS-DOS operating system and PowerStation operating files to a Compact Flash card in one, simple operation. These instructions tell you how to start Flash-Back from its location on the MachineShop Installation CD. If you wish, you also can download the utility from the CTC Parker Web site (http://www.ctcusa.com).

To start the FlashBack Utility from the MachineShop Installation CD, follow these steps:

1. Insert the MachineShop Installation CD (version KA-83102 or later) into the CD-ROM drive of your development PC.

2. Use Windows Explorer to locate the file FlashUtil.exe on your CD-ROM drive. (It will be in the Utilities\Flashback directory.)

3. Click **FlashUtil.exe**.

    The Flashback Utility Dialog box will appear.
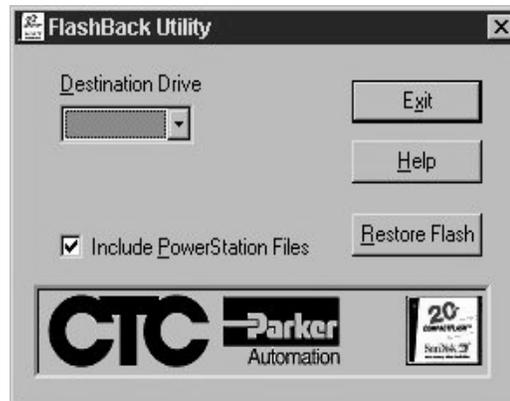
> **Note** If you have a hard drive, you can copy FlashUtil.exe to a
> directory of your choosing on the hard drive and run the
> utility from there.

4. Select a Destination Drive.

> **Note** Click the Help button to find complete, online instructions
> for using the FlashBack Utility.

5. Click Restore Flash.

Reinstalling the MS-DOS Operating System

To install the MS-DOS operating system, complete the following steps:

1. Turn on the PowerStation.

2. Insert the MS-DOS 6.22 and Utilities Installation Disk into the floppy drive. The system will boot to the floppy.

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

   Important In this example, C represents the drive letter of the device on which you want to install the PowerStation utilities-- either your hard drive or CF card. If you are using both a hard drive and a CF card in your PowerStation, type the appropriate drive letter.

4. Press Enter to execute this command.

   You will be asked if you want to install MS-DOS 6.22 on the drive you designated.

5. Type `Y` for Yes.

   You will be asked if you want to install all the MS-DOS utilities.

6. We recommend that you type `Y`, for Yes.

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 (KA-83109).

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. Boot to MS-DOS, and change to drive A by typing `A:`

3. Press Enter to execute this command.

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

Important In this example, C represents the drive letter of the device on which you want to install the PowerStation utilities-- either your hard drive or CF card. If you are using both a hard drive and a CF card in your PowerStation, type the appropriate drive letter.

5. Press Enter to execute this command.

    You will be asked if this installation is for a Model P1 Power-Station.

6. Type `N` for No.

    You will be asked if this installation is for a Model P9.

7. Type `N` for No.

    The system will copy the necessary PowerStation files from the Start Disk and unzip them.

    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 CTC directory of drive C.

8. We recommend that you type `Y` for Yes.

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

    The PowerStation Utilities installation is complete.

    You will be asked if you want to recalibrate the touchscreen.

10. If your PowerStation has a touchscreen, type `Y` for Yes, and recalibrate the touchscreen (see *Recalibrating the Touch-screen on page 56* for instructions). If you do not have a touch-screen, type `N` for No.

    At this point, you will be prompted to install the MachineShop Shell. If you have to do this, see *Reinstalling the Shell Soft-ware on page 47* for instructions.

11. Restart the PowerStation.

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 Machine-Shop 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 Machineshop 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 installed the PowerStation Utilities or the Machine-Shop Shell software under Windows, use the following steps to enable Interact and the MachineShop Shell to run under Windows. If you are not running under 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
SET TOUCH_ADDR=3E8
SET TOUCH_IRQ=11
PATH C:\;C:\DOS;C:\CTC
C:\CTC\IDPWR -T -S
IF ERRORLEVEL 3 GOTO ITSAP1
LH C:\CTC\BIOSTSR
CD \CTC
IF EXIST C:\CTC\MOUSE.INI DEL C:\CTC\MOUSE.INI
LH C:\CTC\MOUSE
:ITSAP1
```

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
SET TEMP=C:\DOS SET TOUCH_ADDR=3E8 SET TOUCH_IRQ=11	Sets the IRQ and address for the touchscreen driver.
PATH C: \; C: \DOS; C: \CTC	Sets up the default DOS path.
C:\CTC\IDPWR	Identifies touchscreen, video and network drivers.
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 :ITSAP1	If a mouse is connected, installs the mouse and creates a new MOUSE.INI file.
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
 	
:NOMLCA
	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.
*SET INTERACT_FILES=C: \INTER-ACT\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.

Command line parameters	Description
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 GOTO 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 AU-TOEXECBAT 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 77 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 are provided on the Windows VGA Drivers disks, KA-73126, KA-73127 or KA-73128.

To reinstall the video driver under Windows 95, complete the following steps:

1. Start the PowerStation, and insert the Windows 95 VGA Driver disk (KA-73126) into the system's floppy drive.

2. On the Windows taskbar, click Start and then Run.

3. Next to the word "Open," type A:\w95500.exe, and then click OK.

4. Follow the installation wizard to install the video driver.

5. When installation is complete, restart the system.

Important You must restart the system for your installation to take effect.

To reinstall the video driver under Windows 98, complete the following steps:

1. Start the PowerStation, and insert the Windows 98 VGA Driver disk (KA-73127) into the system's floppy drive.

2. On the Windows taskbar, click Start and then Run.

3. Next to the word "Open," type A:\w98600.exe, and then click OK.

4. Follow the installation wizard to install the video driver.

5. When installation is complete, restart the system.

Important You must restart the system for your installation to take effect.

To reinstall the video driver under Windows NT 4.0, complete the following steps:

1. Start the PowerStation.

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

    The Control Panel will appear.

3. Click Display.

    The Display Properties dialog box will appear.

4. Click the Settings tab.

    The Settings dialog box will appear.

5. Click Display Type.

    The Change Display Type dialog box will appear.

6. Click Change in Adapter Type.

    The Select Device dialog box will appear.

7. Insert the Windows NT VGA Driver disk (KA-73128) into the system's floppy drive.

8. Click Have Disk**.**

    The Install from Disk dialog box will appear.

9. Under "Copy manufacturer's files from," type `A:\`, and then click OK.

10. Select Chips Video Accelerator from the Display list, and then click OK.

    A warning about third-party drivers will appear.

11. Click Yes to complete the installation.

12. When installation is complete, restart the system.

Important   You must restart the system for your installation 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 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. You will also need to reconfigure if you change the Touchscreen Address or IRQ setting from the system defaults (IRQ=11, ADDR=3E8).

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

To configure the touchscreen driver, complete the following steps:

1. Reboot the PowerStation, and when "Starting MS-DOS..." appears, press the F5 key on your keyboard.

2. At the DOS prompt, type edit AUTOEXEC.BAT.

3. In the AUTOEXEC.BAT file, change the Address and/or IRQ setting, and save the file.

   > **Note** The following segment of the AUTOEXEC.BAT file shows the default values for IRQ and Address.

   ```
   PROMPT $p$g
   SET TEMP=C:\DOS
   SET TOUCH_ADDR=3E8
   SET TOUCH_IRQ=11
   PATH C:\;C:\DOS;C:\CTC
   ```

4. Shut off the PowerStation.

5. If necessary, change the jumpers to match the configuration you designated in the AUTOEXEC.BAT file (see *Changing Jumper Settings on page 71* for instructions).

6. Restart the PowerStation.

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.
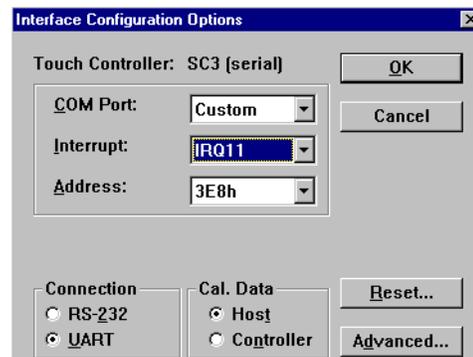
   The Touchscreen Utilities folder will open.

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

The Calibration Utilities dialog box will appear as shown below.
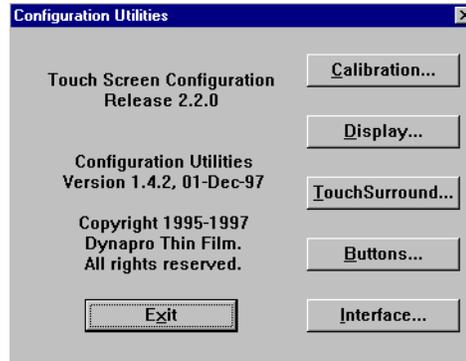
3. In the Calibration Utilities dialog box, click the Interface button.

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

4. 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.

5. Click OK when you are finished.

6. 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:

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

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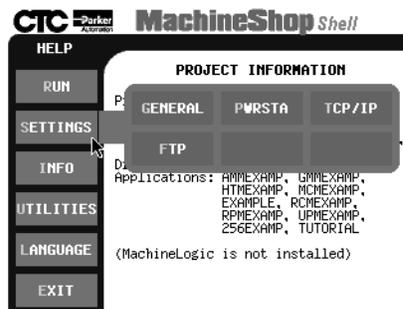
2. On the Settings submenu, press the PWRSTA button.

    The PowerStation Settings menu will appear as shown at the top of the next page.
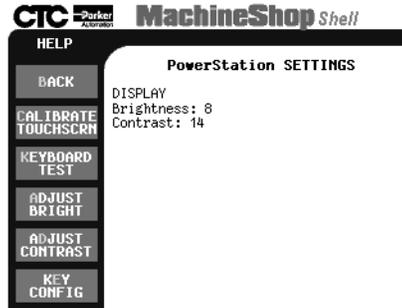
3. On the PowerStation Settings submenu, press the Calibrate Touchscrn button.

   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 only),* also on page 24, 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.



    - Select "H" to perform a Hard calibration.

    - Select "X" to exit the calibration utility
      when finished




Press any key to continue . . .
```

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

The following screen will appear.

```
DynaPro Thin Film Products Inc.        (c) Touch-Base Ltd. 1989-2000
Touchscreen Calibration Program (EEEPROM version)      Version 4.26

─────────────────────── Main Menu ───────────────────────
H  -  Hard calibrate
T  -  Test menu
F  -  Display calib details
X  -  Exit


        You must hard calibrate if you have not yet done so.
```
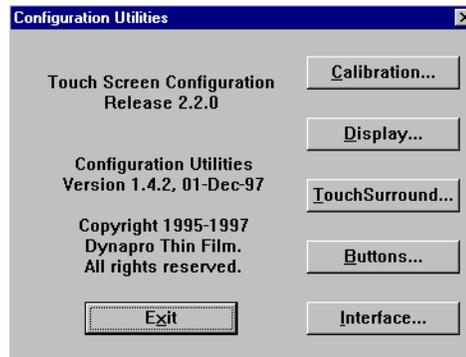
7. Type H for Hard calibrate.

8. When the next screen appears, follow the instructions on the screen by touching each square as it appears until you hear a beep.

9. When you have finished, press any key.

10. Press X or Esc 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 at the top of the next page.

Configuration Utilities

Touch Screen Configuration
Release 2.2.0

Calibration...

Display...

Configuration Utilities
Version 1.4.2, 01-Dec-97

TouchSurround...

Copyright 1995-1997
Dynapro Thin Film.
All rights reserved.

Buttons...

Exit

Interface...

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.

Reinstalling Ethernet Drivers

PowerStations are shipped with an Intel Ethernet Driver, which supports the Microsoft Network Services. Use the following procedure to reinstall the Intel Pro/100+ Ethernet Driver on your PowerStation.

For additional information on the Microsoft Network, please consult the documentation on your Intel Pro/100+ Ethernet Driver Disk, or your network administrator.

To reinstall this disk under Windows 95 or 98, do the following:

1. Start the PowerStation.

2. Insert the Intel Pro/100+ Ethernet Driver Disk into your PowerStation's floppy drive.

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

   The Control Panel will appear.

4. Click System.

    The System Properties dialog box will appear.

5. Click the Device Manager tab.

    A list of devices will appear.

6. Check to see if the item "? PCI Ethernet Controller" is on the list. If it is, click on it and follow the instructions. If it isn't, close the Device Manager window, and proceed to the next step.

7. Click Add New Hardware.

    The Add New Hardware Wizard will appear.

8. Click Next.

9. Click Next, again.

    You will be asked if you would like Windows to search for your new hardware.

10. Select the No option.

11. Click Next.

    A list of hardware options will appear.

12. Click Network Adapters, and then click Next.

    A Select Device screen will appear.

13. Click Have Disk.

14. Click Browse. Check that the file net82557.inf is present on the disk.

15. Click Okay.

    A new Select Device window will appear.

16. If you are running under Windows 95, select "Intel[R] PRO/ 100+ Server Adapter". If you are running under Windows 98, select "8255x-based PCI Ethernet Adapter (10/100)". Click Okay.

17. Click Next.

    The driver will be installed.

18. When installation is complete, restart the system.

Important   You must restart the system for your installation to take
effect.

To reinstall this disk under Windows NT, do the following:

1.   Start the PowerStation.

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

3.   Click Network.

You will be told that Networking is not installed, and asked if
you want to install.

4.   Click Yes.

The Network Setup Wizard will ask you to choose between
remote access, or being wired to the network.

5.   Choose "Wired to network", and click Next.

6.   Click "Select from list".

7.   Click Have Disk.

8.   Choose A:.

9.   Choose "Intel[R] PRO Adapter", and click Okay.

10. Click Next.

A list of Network Protocols will appear.

11. Select the appropriate item, and click Next.

A list of Network Services will appear.

12. Choose the appropriate item; then click Next, and Next again.

A message will appear indicating the system is ready to install.

13. Insert the Intel Pro/100+ Ethernet Driver Disk into your
PowerStation's floppy drive.

You will be asked if your server is DHCP aware.

14. Choose the appropriate answer for your system; then click Next, and Next again.

   A message will display asking you to choose between Work and Domain.

15. Select Work and click Next.

16. Click Finish.

   You will be asked if you want to restart the PowerStation.

17. Click Yes.

Important You must restart the system for your installation to take effect.

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
NET.BAT	A batch file which determines the type of Ethernet interface (10Base-T NE2000 or 100Base-T Intel 82559) in the PowerStation and load the correct Novell drivers for the installed interface.
NE2000.CFG	A Novell NET.CFG file used by NET.BAT to load NE2000 Ethernet drivers.
PRO100.CFG	A Novell NET.CFG file used by NET.BAT to load Intel 82559 Ethernet drivers.
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.
NE2000.COM	A Novell driver that supports the NE2000 10Base-T Ethernet interface.
PRO100\ E100BODI.COM	A Novell driver that supports the Intel 82559 100Base-T Ethernet Interface.

File Name	Description
NETBIOS.EXE	A Novell driver to support NETBIOS protocol, used by Interact to communicate over a network.
AT5CFG.EXE	A configuration utility for setting the I/O address and interrupt of the NE2000 10Base-T Ethernet interface. Use this utility if the 10Base-T Ethernet interface is located on the System Support Card, or for a P2 PowerStation.
RSET8019.EXE	The configuration utility for setting the I/O address and interrupt of the NE2000 10Base-T Ethernet interface. Use this utility if the 10Base-T Ethernet interface is located on the CPU card.
PRO100\ SETUP.EXE	The configuration utility for the Intel 82559 100Base-T Ethernet interface. This is normally not needed, since the 82559 is assigned an I\O address and interrupt by the PCI BIOS.
TCPIP.EXE	TCP/IP protocol driver for the PowerStation.
TCPIP.INI	Configuration file for the PowerStation TCP/IP driver.

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

• Adding expansion cards

• 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.

If you are adding expansion cards or changing jumper settings, skip to step 9. If you are installing DRAM, do all remaining steps.

7. Loosen the fasteners that hold the display panel in place.

8. Carefully tilt the frame away from the display panel, placing the frame upright, and allowing the display panel to remain face down. The display panel will still be attached to the unit by connecting cables.

9. Proceed to the specific procedures you need to perform.

   - See *Replacing DRAM* on page 65.
   - See *Adding Expansion Cards* on page 68.
   - See *Changing Jumper Settings* on page 71.

Replacing DRAM

The CPU card provides two 144 pin SODIMM sockets, each of which accepts 8, 16, 32, 64 or 128 MB 3.3 V power level SODIMMs, available from CTC Parker.

> **Note** The CPU card only supports SDRAM SODIMM modules. EDO SODIMM is not supported.

Removing a DRAM module

The PowerStation's DRAM is located on the CPU card, which is seated right behind the display panel.

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

1. Perform the PowerStation disassembly procedures beginning on page 64 of this manual.

2. Disconnect the connector and move the connector and ribbon cable aside.

Connector

Protective Cover over CPU Card

Display Panel
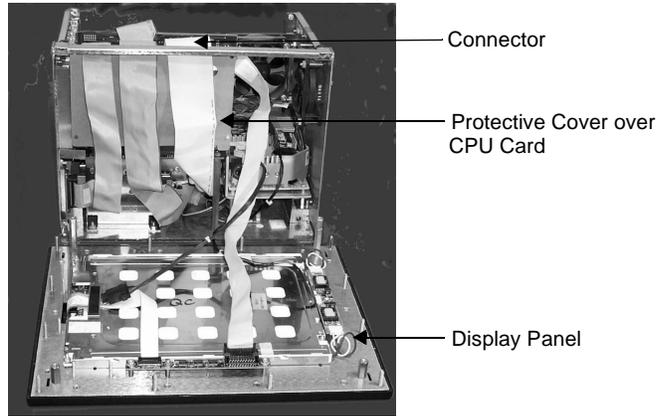
3. Use a pair of needle nose pliers to squeeze the fasteners securing the protective cover for the CPU card. Remove the protective cover, carefully sliding it from beneath the remaining ribbon cables.

Protective Cover

Fastener

Connector and Ribbon Cable
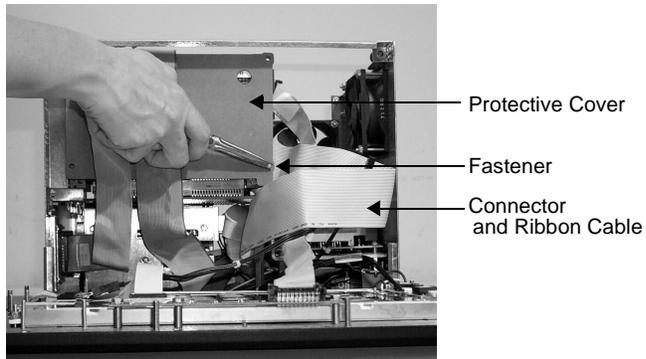
4. Locate the DRAM module on the right side of the CPU card. The number of DRAM modules present varies, depending upon the PowerStation model and the manufacturer of the CPU card.
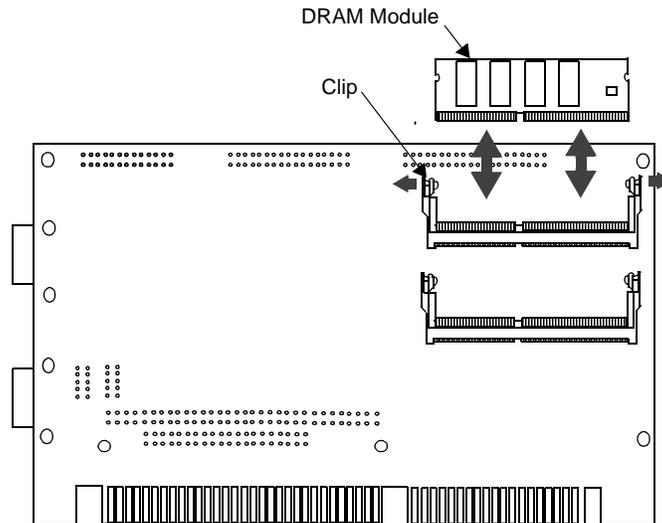
5. Push outward on the two clips holding the DRAM Module in its socket. As you push on the clips, the module will tilt forward. It may be necessary to use a small screwdriver or the tip of a pen to push on the clips.

6. Slide the module up to remove it from its socket.

7. 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 DRAM module into its socket at a 30 degree angle.

   Note: If only one DRAM module is required, it can be installed in either of the two sockets.

2. Press the DRAM module upright into the socket until the metal clips snap into place, securing the module.

3. Press the protective cover into place over the CPU card, making sure the plastic fasteners are completely inserted through the holes.

4. Connect the connector and ribbon cable.

5. Tilt the PowerStation display toward the frame, making sure the cables are not pinched between the display and the frame.

6. Tighten the fasteners to secure the display in place.

7. Perform the PowerStation reassembly procedure beginning on page 75 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:

Size

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.

Voltage and Current

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.

Plug and Play Configuration

If you add an expansion card which is not configured for Plug and Play (a Legacy card), the following procedure is recommended to avoid resource conflicts:

1. Turn on the PowerStation, and **before** the system boots, press the Delete key to go to the CMOS Setup Utility.

2. Use the Down Arrow key to tab to PNP/PCI Configuration and press Enter.

3. When you reach the PNP/PCI Configuration screen, be sure that Resources Controlled By is set to Manual. If necessary, use the Down Arrow key to tab to Resources Controlled By and the Page Up and Page Down keys to change the setting to Manual.

4. Use the Down Arrow key to tab to the IRQ used by the Legacy card, and use the Page Up and Page Down keys to change PCI/ISA PnP to Legacy ISA.

5. Press Esc.

6. Press F10 to reach the Save to CMOS and Exit prompt.

7. Select Y, then Enter, to save to CMOS and exit the CMOS Setup Utility.

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 expansion 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	IRQ	Usage
0	Interval timer	8	Real-time clock
1	Keyboard	9	Video
2	Interrupt from controller 2 (cascade)	10	Available
3	COM2*	11	Touchscreen*
4	COM1	12	PS/2 mouse (non-releasable)
5	Available	13	INT from co-processor
6	Diskette Controller (FDC)	14	Fixed disk controller (Primary)
7	Available	15	Available

The IRQs with no use indicated in this table are available for use by any adapter card. 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 Technical Support department.

The next section of this manual explains how to change the Power-Station'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 and USC module. These jumpers are shown below.
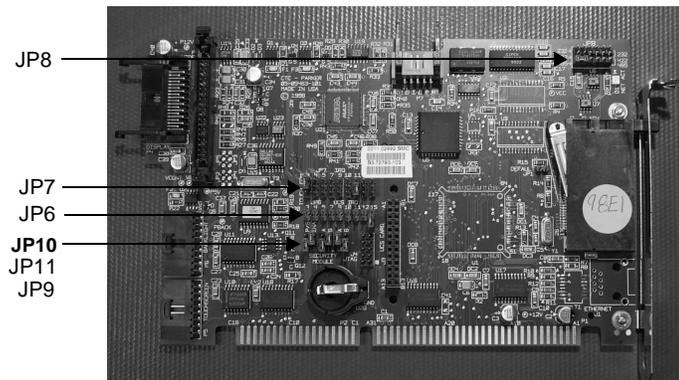
The following sections will describe how the jumpers are set, what they control, and what options you have in configuring your own jumpers. Jumpers set to "on" and "off" will look like those in the illustration below.
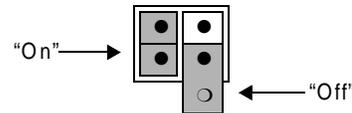
Note "Off" jumpers can be completely removed or placed as in the illustration above.

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.
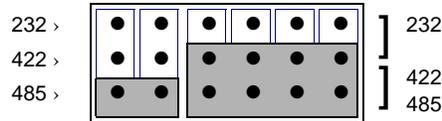
To configure to the RS-422 protocol, set the jumpers as shown below.
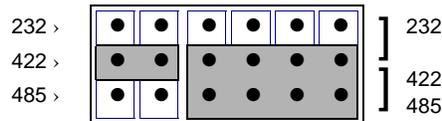
To configure to the RS-232 protocol, set the jumpers as shown below.
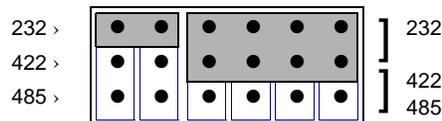
JP7 serial port and touchscreen IRQ

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 AUTOEXEC.BAT file to reflect the new configuration. See *Reconfiguring the Touch-screen Driver* on page 53 for complete instructions.
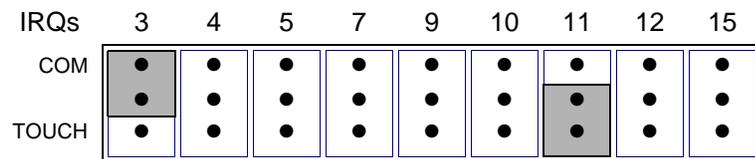
Important IRQ 12 is used by the PS/2 port. If you intend to use a keyboard and/or a mouse, do not map to this IRQ. Also, if you are using a Compact Flash card as a secondary IDE device, then you cannot use IRQ 15.

JP6 UCS module IRQ

UCS modules are DeviceNet or Profibus communication daughter cards that can plug into the PowerStation's System Support card. 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.

IRQs	3	4	5	7	9	10	11	12	15
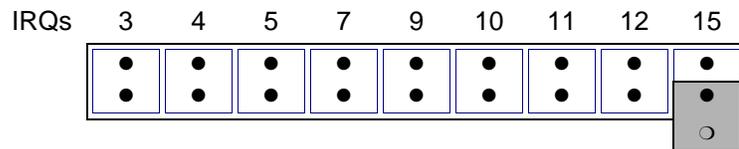
JP10 Compact Flash adapter configuration

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 below.

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."

IRQ14 (default)   IRQ15   Disabled

P/S ENA   P/S ENA   P/S ENA
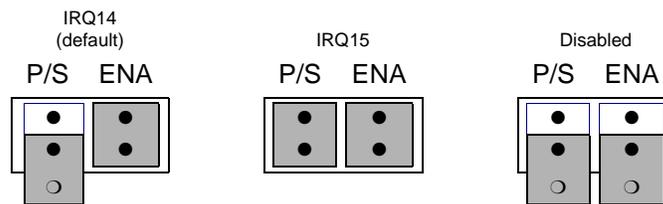
JP9 and JP11 serial port and touchscreen address

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.

(default)
2F8h   3F8h

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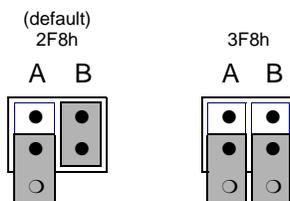
To set the touchscreen jumpers (JP11) to the default I/O address COM3 (3E8h), set the jumpers as shown below, with the A port "on" and the B port "off." Set both jumpers to "on" to map the touchscreen to the COM4 port, also shown below.

(default)
3E8h   2E8h

A   B   A   B
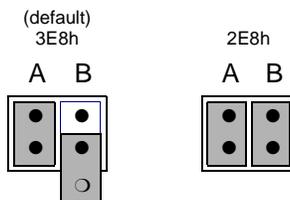
Important   After changing the jumper settings for the touchscreen I/O address, you must change the AUTOEXEC.BAT file to reflect the new configuration. See *Reconfiguring the Touchscreen Driver* on page 53 of this manual for complete instructions.

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.

1. Replace the back cover, and reinstall the screws that secure the back cover.

2. If necessary, reinstall the unit in its enclosure.

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 Power-Station. 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 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 Technical Support department at (513) 248-1714.

Use the table below to find discussions of specific problems.

Resolving problems when starting up	Page
Resolving AUTOEXEC.BAT and CONFIG.SYS problems	77
The fan does not come on, and the display is blank	80
The fan starts, but the display does not	81
The RAM test fails, or the total memory installed does not match the total contiguous RAM listed on the display following the RAM test	82
Resolving problems with the touchscreen	
After startup, the touchscreen does not work	82
After startup, the touchscreen does not work properly, or touchscreen calibration is incorrect	83
After calibrating the touchscreen, it either does not work or does not follow your finger	83
Resolving problems after starting up	
The PowerStation locks up while starting and will not restart	83
The DOS prompt is displayed instead of the MachineShop Shell main menu	84
A PS/2 mouse does not work	85
A serial mouse does not work	85
A keyboard does not work	85
The expansion card does not work in your system.	85
A driver does not work with the installed adapter card	86

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 *PowerSta-
tion 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
SET TOUCH_ADDR=3E8
SET TOUCH_IRQ=11
PATH C:\;C:\DOS;C:\CTC

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

C:\CTC\IDPWR -T -S
IF ERRORLEVEL 3 GOTO ITSAP1
LH C:\CTC\BIOSTSR

REM****************************************************
REM If an external mouse is connected, MOUSE will install
REM successfully 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\IDPWR -V -S
IF NOT ERRORLEVEL 1 GOTO YESVESA
LH C:\CTC\VESA
:YESVESA
```

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

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

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

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

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

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

REM*****************************************************
REM Load MachineLogic if ML kernel present, and set for
REM boot operation. (determined by MLDU.EXE return value
REM 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, EMM386.EXE V4.49
SHELL=C:\COMMAND.COM /E:1024 /P
FILES=30
BUFFERS=30
STACKS=9,256
DEVICE=C:\DOS\HIMEM.SYS
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 Machine
REM Logic is not being used, then DOS should be loaded
REM HIGH into the HMA to conserve conventional memory. To
REM load DOS HIGH use DOS=HIGH,UMB -- otherwise use
REM DOS=LOW,UMB.
REM
REM DOS=HIGH,UMB
DOS=LOW,UMB
REM
REM                   !!! NOTE !!!
REM EMM386 can be used to free up more conventional memory
REM for use by MachineLogic and Interact, by allowing TSRs
REM to be loaded high. Just remove the word REM in front
REM of the appropriate command, and adjust the parameters
REM as required for your system's configuration.
```

```
REM
REM If EMM386 is used, any upper (UMB) memory used by
REM adapter cards must be excluded with the
REM "X=" parameter, as shown in the example below.  This
REM example is for a MachineLogic Control Adapter at
REM address D800, configured to use 4KB of NVRAM (the
REM factory default). Please adjust the "X=" parameter to
REM match your system configuration.
REM
REM DEVICE=C:\DOS\EMM386.EXE NOEMS NOVCPI X=D800-D8FF
REM
REM The following settings can be used on a system using
REM the SST Profibus ISA I/O adapter (D000-D7FF), with the
REM MachineLogic Control Adapter configured to provide
REM 32KB of NVRAM (D800-DFFF).
REM
REM DEVICE=C:\DOS\EMM386.EXE NOEMS NOVCPI X=D000-DFFF
REM
REM On a P1 PowerStation, the range C800 through CFFF must
REM be excluded and the E000-EFFF range must be explicitly
REM included. Use the following command for loading EMM386
REM on a P1.
REM
REM DEVICE=C:\DOS\EMM386.EXE NOEMS NOVCPI X=C800-CFFF
REM X=D800-D8FF I=E000-EFFF
REM
REM IMPORTANT: Always include the NOEMS and NOVCPI
REM switches when using EMM386 with MachineLogic and
REM Interact.
```

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 over-write 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 9.

8. Disconnect the PowerStation.

9. Check connector J8 (fan connection) on the backplane board to see if the fan is plugged in.

10. Secure the PowerStation's back cover.

11. Connect the PowerStation to its power source.

12. Turn on the PowerStation.

13. If the fan still fails to power on, then replace the fan.

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. Remove the display panel.

5. Remove the protective cover from the CPU board.

6. Check the installation of the DRAM on the CPU board. Make sure that the DRAM is firmly seated in the sockets and that the socket latches are fully engaged.

7. Make sure that all cards are firmly seated in the backplane board.

8. Replace the protective cover on the CPU board.

9. Replace the display panel.

10. Secure the PowerStation's back cover.

11. 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 display panel.

3. Remove the protective cover from the CPU board.

4. 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.

5. Install the protective cover over the CPU board.

6. Replace the display panel.

7. Turn on the PowerStation.

Problems with the Touchscreen

This section lists some problems that may occur with the touch-screen and solutions to these problems.

After startup, the touchscreen does not work

1. If the PowerStation appears to be operating correctly other-wise, restart the unit.

2. The touchscreen calibration might be in error. See *Recalibrating the Touchscreen* on page 56 for complete instructions.

3. Check the AUTOEXEC.BAT file.

   See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 77 for information about the lines that should appear in the AUTOEXEC.BAT file.

   a. Verify that the following lines appear in the AUTOEX-EC.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 lines:

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

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 53 and *Recalibrating the Touchscreen* on page 56 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 to restore the system defaults.

    This will restore the CMOS settings to their factory default configuration.

11. Save these settings, and exit the setup program.

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

1. If the PowerStation appears to be operating correctly other-wise, 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 77 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-adapter 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 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 expansion card does not work in your system.

See *Plug and Play Configuration* on page 68 for instructions on how to make sure the IRQ is set properly for the expansion card.

A driver does not work with the installed adapter card

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

See *Expansion Cards* on page 31 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
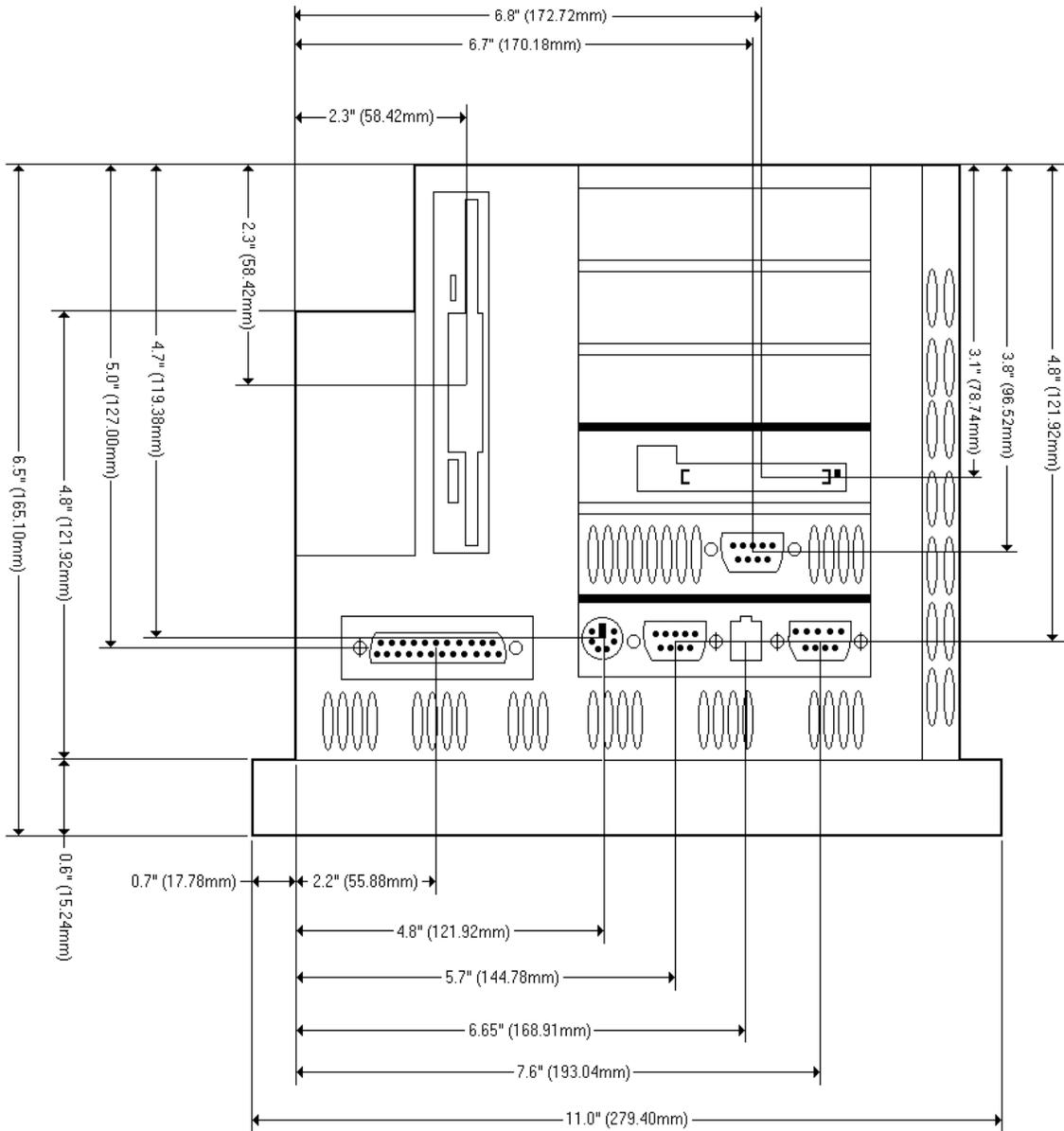
P3 Back View

P3 Mounting Cutout Dimensions
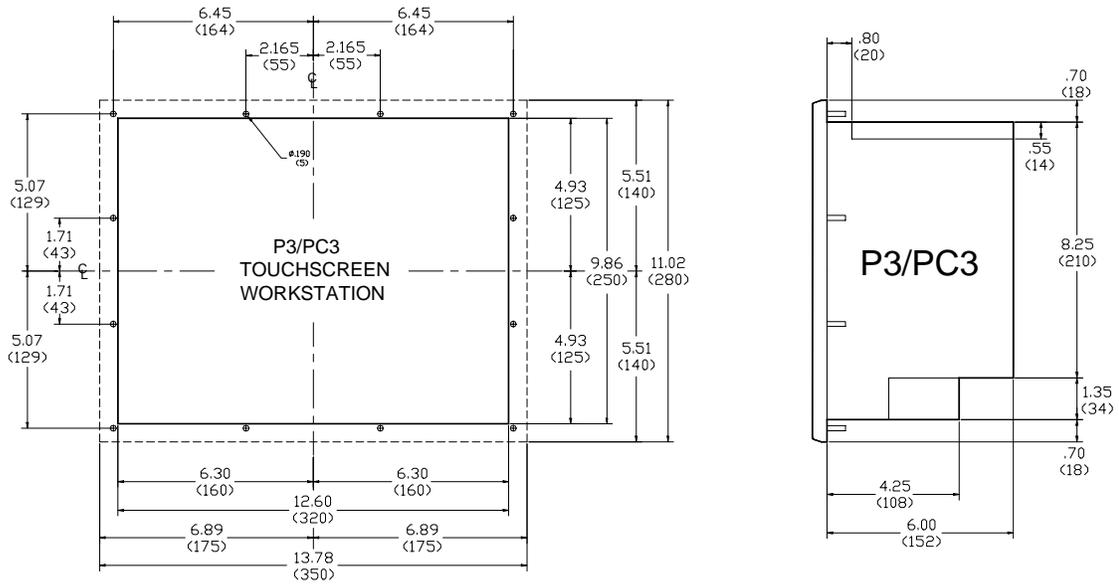
P4 Side View
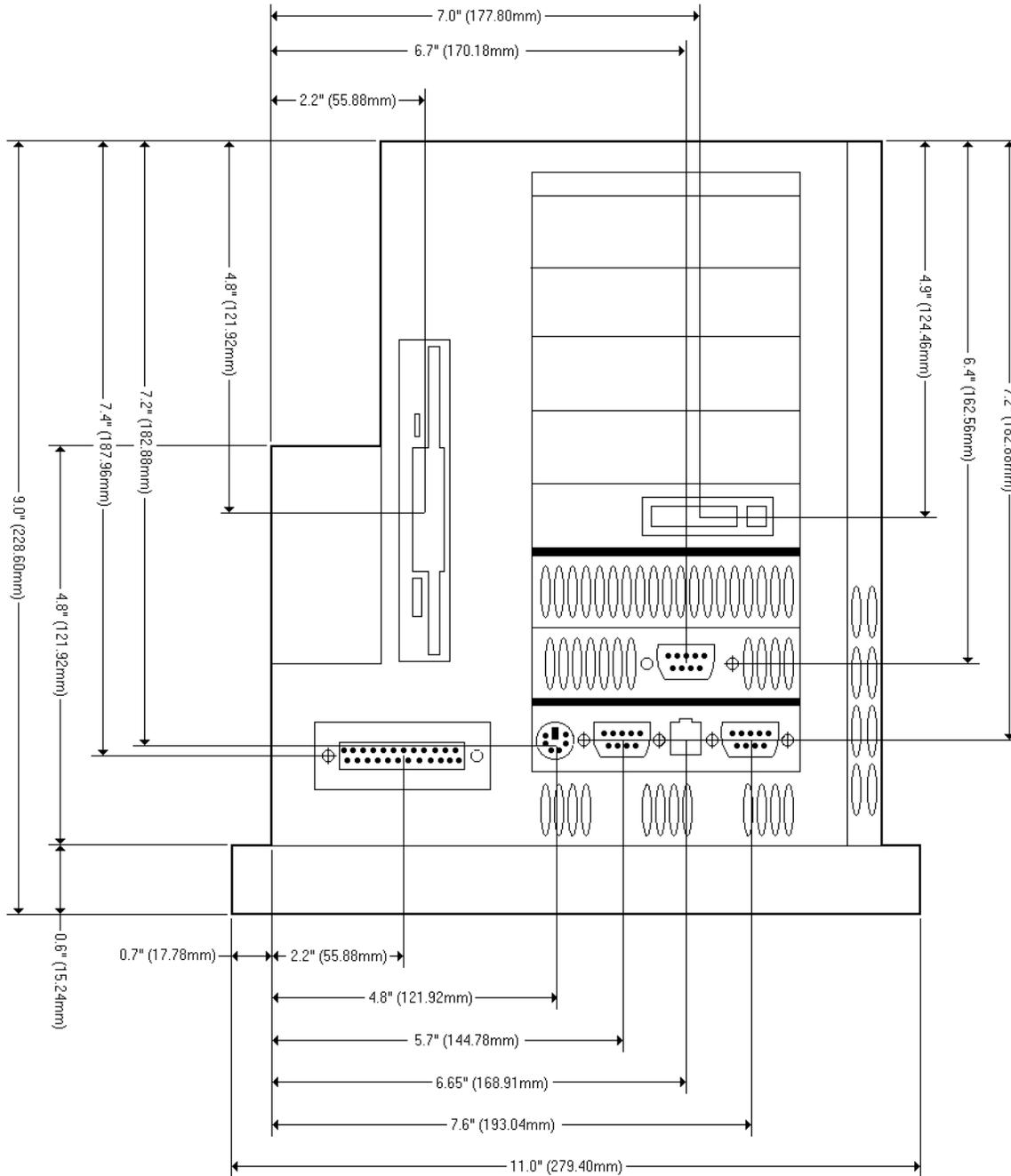
P4 Back View

P4 Mounting Cutout Dimensions
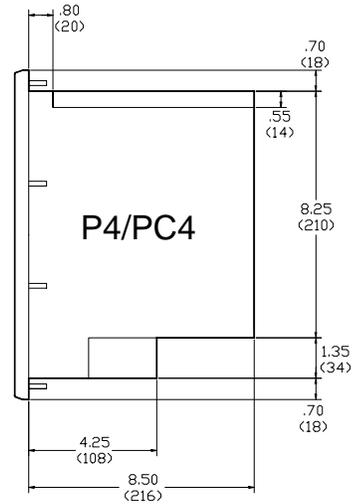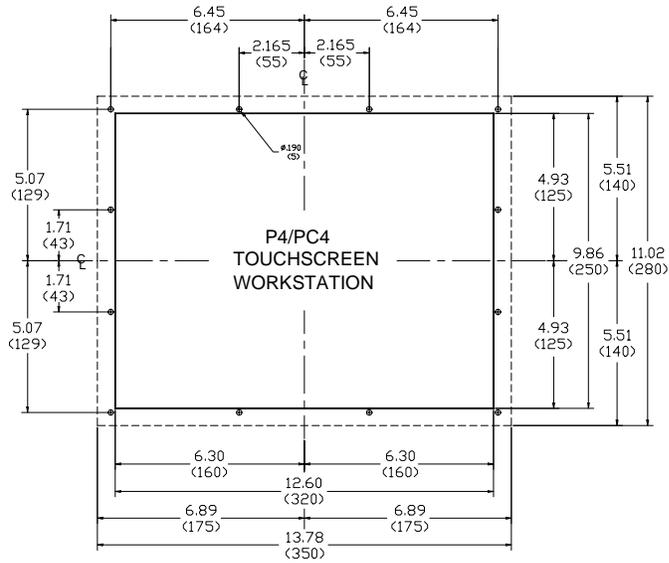
P5 Side View
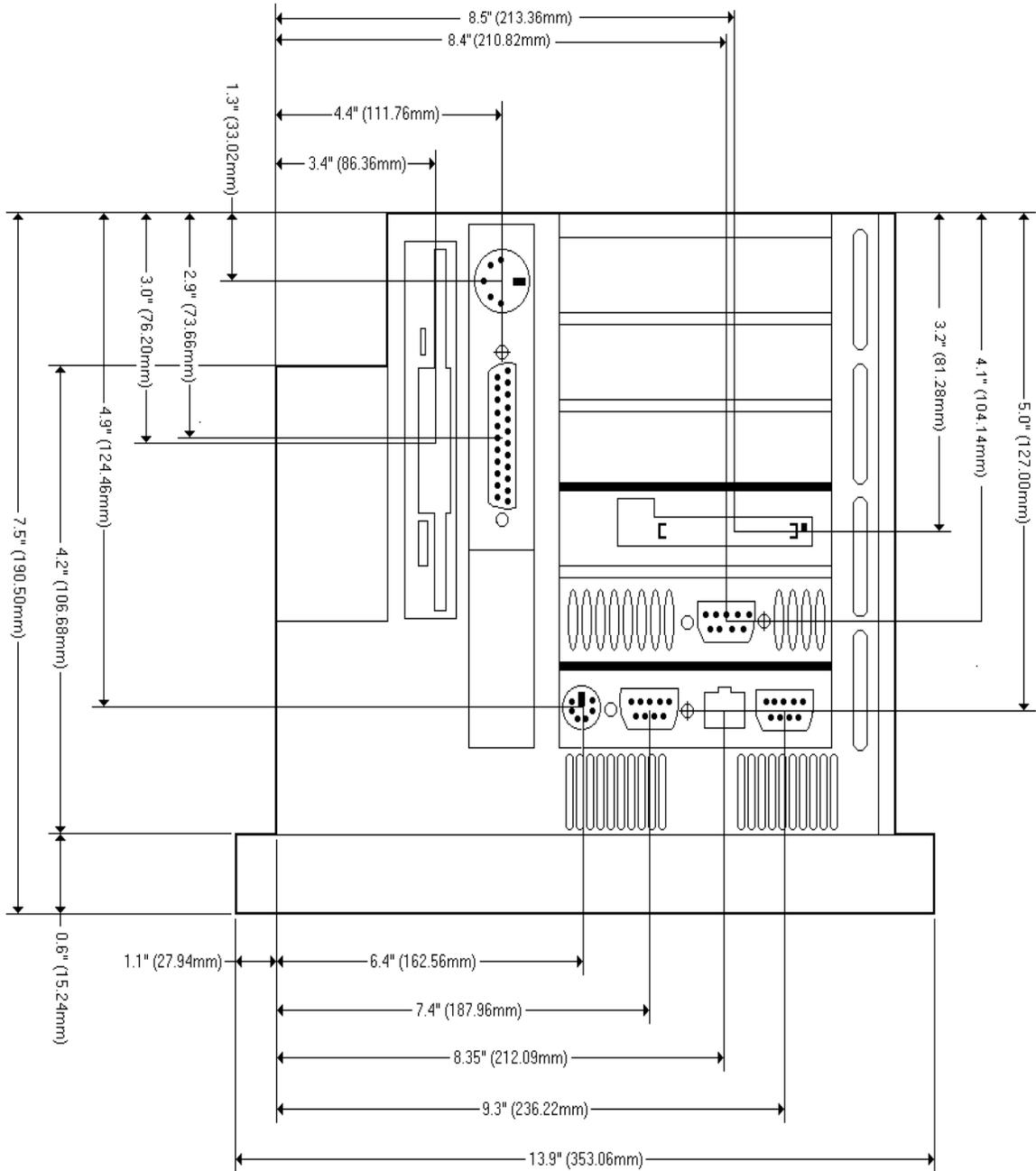
P5 Back View
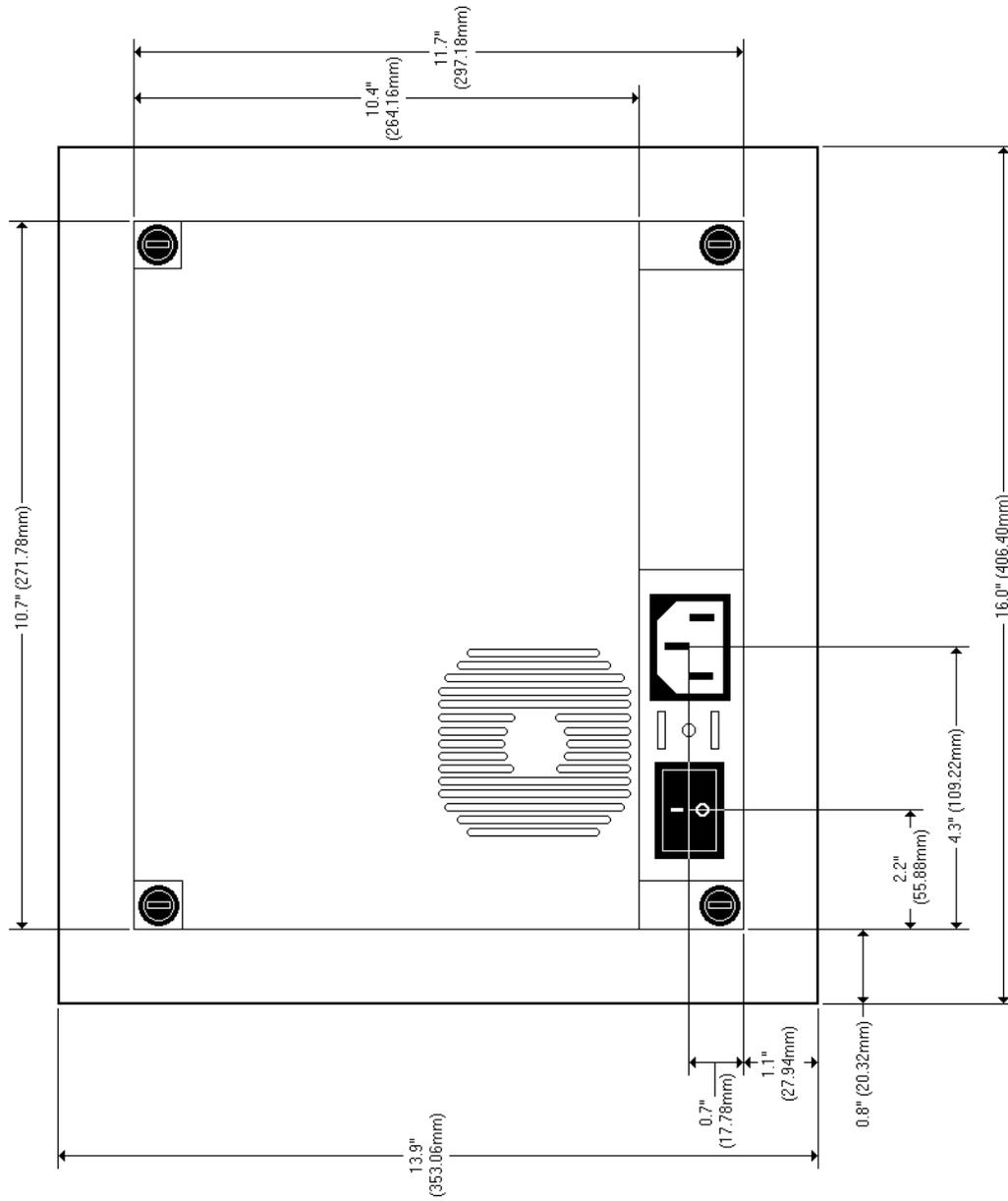
P5 Mounting Cutout Dimensions
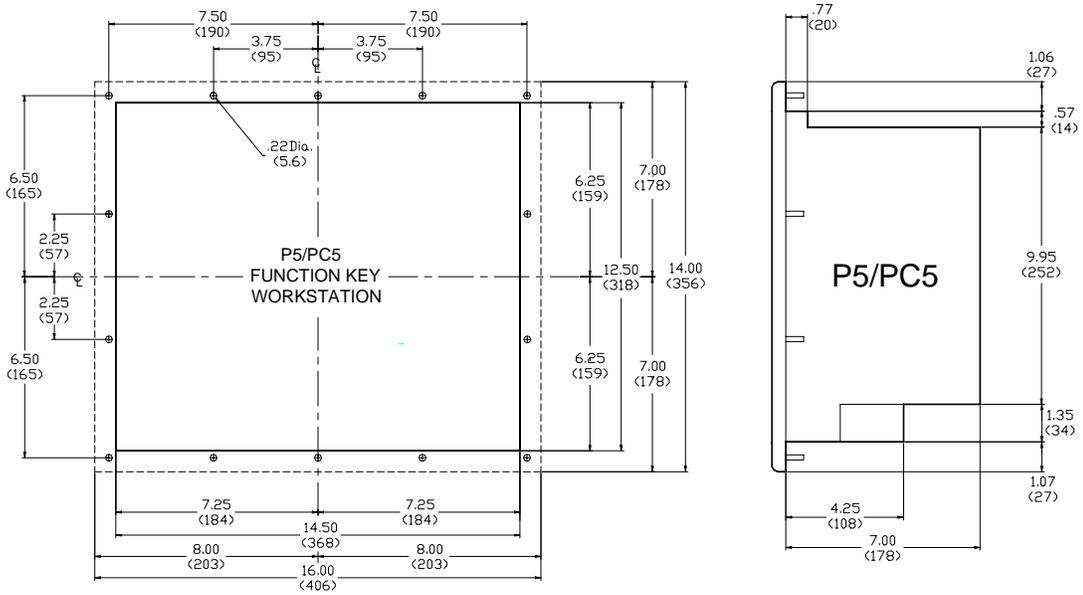
CPU Board Connectors

List of Connectors

Number	Function
CN1	FDD connector
CN2	Parallel port connector
CN3	Keyboard lock, LED connector
CN4	USB connector
CN5	LCD 24-bit connector
CN6	LCD 36-bit connector
CN7	LCD invertor connector
CN8	IR connector
CN9	External speaker connector
CN10	Watchdog timer PROG connector
CN11	VGA connector
CN12	PC/104 connector
CN13	Ethernet connector
CN14	COM2 RS-422/485 connector
CN15	COM2 RS-232 connector
CN16	COM1 RS-232 connector
CN17	External keyboard connector
CN18	ATX power connector
CN19	CPU fan power connector
CN20	AT power connector
CN21	Keyboard and PS/2 mouse connector
CN22	ISA goldfinger connector
CN23	ISA goldfinger connector
CN24	CompactFlash card connector
CN25	HDD LED
CN26	System reset switch connector
CN27	ATX power button
CN28	IDE connector

USB1/USB2 Connector (CN4)

The PowerStation CPU card provides two USB (Universal Serial Bus) interfaces, which are accessed through a 10-pin flat-cable connector, CN4. The adapter cable has a 10-pin connector on one end and a USB connector on the bracket.

These two interfaces give complete Plug and Play as well as hot attach/detach for up to 127 external devices. The interfaces are fuse protected, comply with USB specification revision 1.0, and can be disabled in the system BIOS setup.

Some systems may auto-detect the USB connector, but it is not supported as a physical, external port on the PowerStation P3, P4 or P5 models. External tang connectors are commercially available. Contact CTC Parker's Sales department at 513-831-2340 for more information.
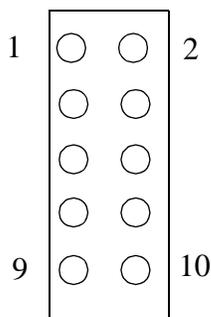
Pin	USB1 Signals	Pin	USB2 Signals
1	+5 V	2	+5 V
3	UV -	4	UV -
5	UV +	6	UV +
7	GND	8	GND
9	Chassis GND	10	N/C

External Speaker Connector (CN9)
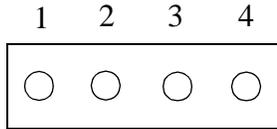
Pin	Signal
1	Vcc
2	N/C
3	Internal speaker
4	External speaker

1   2   3   4

○   ○   ○   ○

To use an internal speaker, install a jumper on pins 3 and 4 (default setting). To use an external speaker, attach pins 1 and 4 to an 8 ohm speaker.

Important   The user configurable external speaker output requires the use of a standard 8 ohm impedance speaker. Using a different speaker may damage the speaker, the driving circuitry, or both.

.

Internal Speaker (default)

1   2   3   4

External Speaker

1   2   3   4
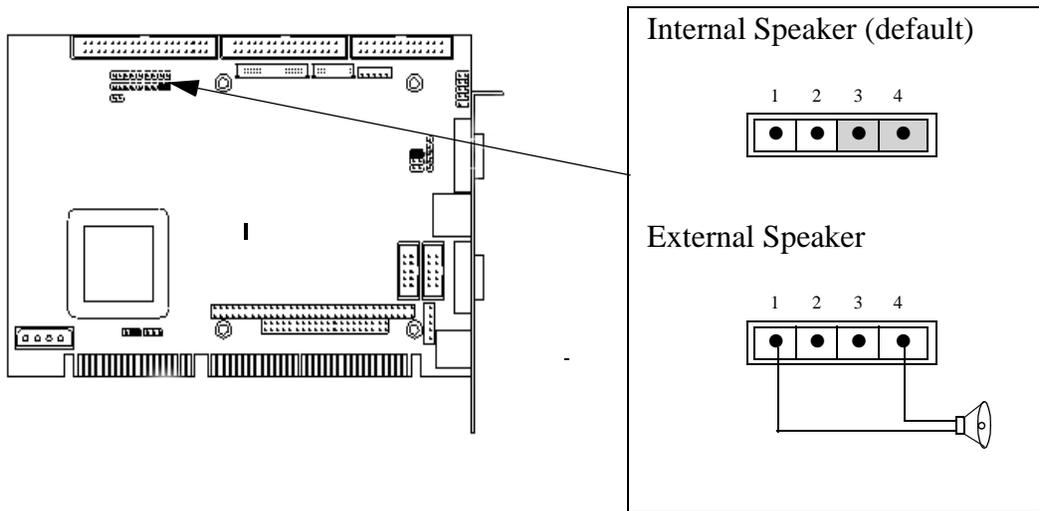
CRT Display Connector CN11
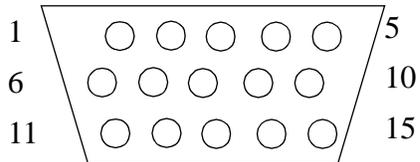
Pin	Signal	Pin	Signal
1	RED	9	N/C
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	N/C
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	N/C
8	GND		

Additional CPU Board Jumpers

CMOS Backup Select (JP3)

To avoid damaging the computer, always turn off the power supply before setting "Clear CMOS". Set jumper pins 2 and 3 for approximately 30 seconds, then set the jumper back to the normal default setting before turning on the power supply.

Normal (Default Setting).

CMOS Data Clear Setting.
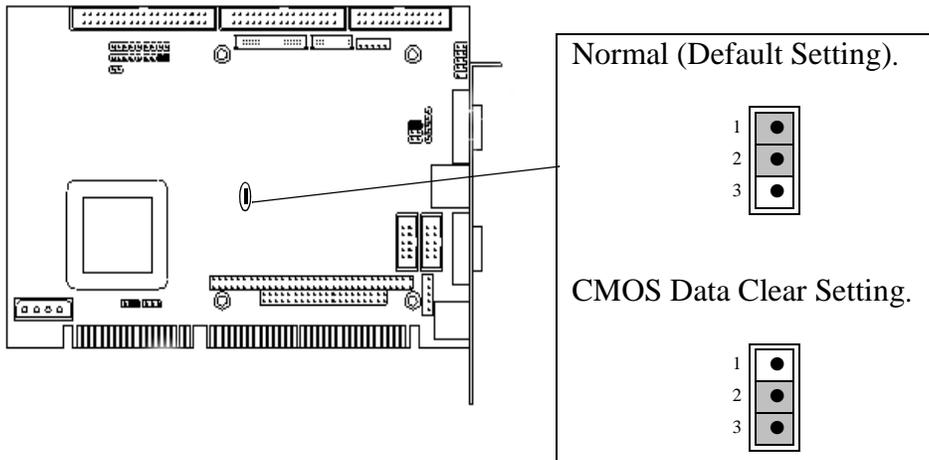
Watchdog Timer Configuration (JP4)

To reduce the chance of electro-magnetic pulse interference, a watchdog timer may be set to either generate an interrupt on IRQ11, or to shut down the system. The time interval can be set anywhere from 1 to 62 seconds. This jumper is set to the default position at the factory, and must remain that way in order for the PowerStation software to operate properly.

.

Index

Index

Index