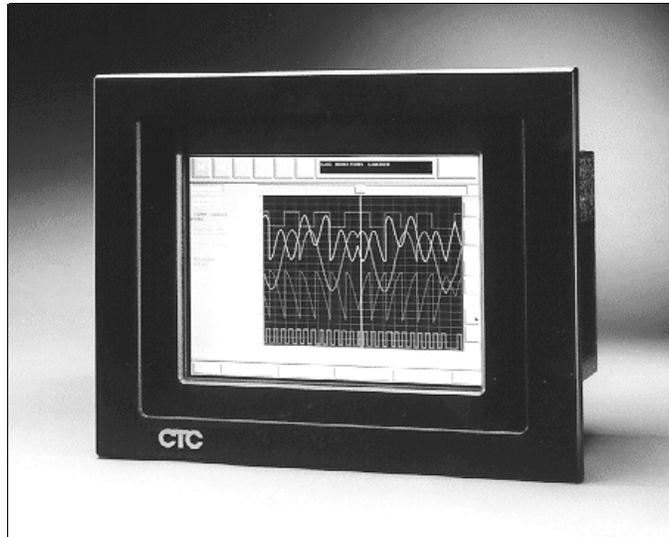


# ***POWERSTATION***



## **User Guide**





# ***POWERSTATION***

## **User Guide**

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50 W. TechneCenter Drive, Milford, Ohio 45150***

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A3-05190-102

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## Product Warranty Information

CTC Parker Automation provides top quality products through rigid testing and the highest quality control standards. However, should a problem occur with your hardware or with the software protection key, CTC'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. Push button lamps are not covered under warranty.
- Third-party products, such as PCMCIA 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 Interact License Agreement for additional software warranty information.

Should you have any questions about your application or need technical assistance, please call CTC's Product Technical Support department at 513-248-1714, 8:00am to 5:00pm, EST. You may call this same number after hours for emergency assistance. See *Customer Support Services* on page 6 of this manual for more information about CTC's support products and services.

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# Getting Started

Thank you for purchasing a PowerStation. CTC offers a complete line of workstations that you can easily and affordably customize with a variety of hardware options. You will find that the PowerStation has been designed to provide years of trouble-free operation even in the harshest environments.

This manual covers most of the PowerStation line including the P3, P4, P5, and P7. Model P3, P4, and P7 PowerStations are touch-only workstations that feature a durable touch screen and pop-up keyboards for numeric entry. Model P5 PowerStations include function keys and a numeric keypad but share many internal components with the P3, P4, and P7.

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

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## Documentation Components

The PowerStation documentation set contains all the information you need to configure, install, and use the PowerStation as well as information about the PowerStation Shell Utility program and the Interact Project Manager. 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 document is the document you are reading. It provides detailed information about the PowerStation and describes how to configure, install, and use the unit. It also contains information about the PowerStation Shell Utility. Please read this manual in its entirety prior to operating the unit.

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

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

**IPM User Guide**—This document describes how to install and use the Interact Project Manager to download Interact projects from a PC to the PowerStation. This manual is only included with Interact systems.

**Software Disks**—CTC pre-loads each PowerStation with the operating system, utilities, and Interact (if purchased) software so you can run the PowerStation immediately upon its arrival at your facility. CTC also provides source disks for this software should you need to reinstall it at a later time.

## Documentation Standards

As you read this manual, you will notice that the following documentation standards have been followed.

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 needs particular attention while reading the text. Follow this information to save development time and/or 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 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 not properly followed.

# Important Concepts

Now that you have opened the PowerStation package, you are ready to unpack the unit, configure it, and install it in a permanent location. This section provides an overview of the steps that are discussed in detail throughout the remainder of this manual.

## Before You Begin

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. The components that were shipped with the unit are listed on the packing list included in the PowerStation carton.
2. Fill out the product registration card and return it to CTC. When you register your unit, you will receive a trial membership in CTC's Product Support Program that provides complimentary telephone technical support, information on product updates, and service bulletins.
3. Back up the CTC software disks that came with your unit using the Windows File Manager/Explorer or the MS-DOS **diskcopy** command.
4. Read the PowerStation Release Notes. This document provides important information about the PowerStation that does not appear in this manual.

## Configure the PowerStation

Once you have unpacked the PowerStation and completed the steps listed in the previous section, you are ready to power up the PowerStation for the first time and configure the system defaults. Detailed information on configuring the PowerStation is described in Chapters 3 and 4.

## Develop an Interact Application

If you use Interact to develop your Man-Machine Interface (MMI), you can develop applications on the PowerStation, or you can develop applications on a PC and download them to the PowerStation.

**Note** If you use another software package to develop your MMI, refer to the documentation that came with the software for information about developing applications.

### Create an application

If you are new to Interact, read the Interact Getting Started Manual to learn more about the software. This manual includes example applications you can modify and run, providing hands-on experience with each Interact module.

### Test the application

When you finish developing an application, you should test it prior to running it in a production environment. If you develop an application on a PC using Interact, you can use Interact's Test Mode to test the application before downloading it to the PowerStation.

### Download the application

If you are using a PC or another PowerStation to develop your application, you must download it to the PowerStation you intend to use to run the application. The Interact Project Manager (IPM) allows you to assign the application to a project and download the project to the PowerStation. Refer to the Interact Project Manager User Guide for more information about downloading projects to the PowerStation.

## Install the PowerStation

When you finish unpacking the PowerStation and developing an application, you are ready to install the unit in a permanent location. Refer to Chapter 4 for complete installation instructions.

## Customer Support Services

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

Telephone: 513-831-2340

Fax: 513-831-5042

E-mail: [sales@ctcusa.com](mailto:sales@ctcusa.com) or [support@ctcusa.com](mailto:support@ctcusa.com)

World Wide Web: <http://www.ctcusa.com>

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

## Product Technical Support

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

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

1. Check the 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 5 of this manual, *Maintaining and Troubleshooting the PowerStation*.

If you cannot find a solution using one of the above sources, contact CTC's Product Technical Support department at 513-248-1714, 8:00am to 5:00pm, EST. You may call this same number after hours for emergency assistance.

## Technical Support Products

Our Technical Support Products department provides service in two areas: training and consulting. CTC offers training on all our products either at CTC in our state-of-the-art training center or at your site. You can learn how to write custom interfaces, develop specialized applications, and implement your complete operator interface application. You can contact the Training Coordinator by phone at 1-800-233-3329 or by email at [training@ctcusa.com](mailto:training@ctcusa.com).

CTC 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 designing special modules to perform functions unique to your application. Our team of specialists is flexible, so they can create a project development schedule that meets your needs. You can contact the PCS Coordinator by phone at 1-800-233-3329 or by email at [pcs@ctcusa.com](mailto:pcs@ctcusa.com).

## Product Support Program

The Product Support Program (PSP) is designed to keep you up-to-date with the current version of Interact 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 Interact. Single-user, site, and corporate licenses are available. The PSP is an easy, cost-effective way to automatically receive the most recent Interact software and the associated utilities. You can contact the PSP Coordinator by phone at 1-800-233-3329 or by email at [psp@ctcusa.com](mailto:psp@ctcusa.com).



# Understanding 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 PowerStations' drive definitions and memory maps, connectors, model numbers, and other important specifications.

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## PowerStation Models

CTC 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's Interact software and other MS-DOS or Windows compatible programs. PowerStations without Interact are referred to as Industrial PC PowerStations throughout this manual.

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

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

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

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

**Note** PowerStations with Interact are available with your choice of Compact Flash or a hard drive; Industrial PC PowerStations are only available with a hard drive and one of two displays, TFT or STN (P3, P4, and P5 only).

## Specifications

This section lists and describes some important specifications relating to the PowerStation. Please familiarize yourself with these specifications prior to operating the PowerStation.

### Physical Specifications

Physical specifications include the PowerStation's physical characteristics and compatible hardware devices. Refer to the table below:

Category	Specifications
CPUs	5x86 133MHz; Pentium 166, or Pentium MMX 200MHz (unavailable on P3)
Memory	8MB min., 32MB max. (64MB max. on Pentiums)
Displays	<ul style="list-style-type: none"> <li>• Monochrome LCD, 640x480 VGA, 16 shades of gray (unavailable on P7 and Industrial PCs)</li> <li>• Color TFT, 640x480 VGA, 256 colors</li> <li>• Color TFT, 1024x768 XGA, 256 colors</li> <li>• Color STN, 640x480 VGA, 256 colors (unavailable on P7)</li> </ul>
Storage	<ul style="list-style-type: none"> <li>• 1.44MB high-density floppy drive</li> <li>• 1.6GB (min.) hard drive (standard on Industrial PCs)</li> <li>• 4, 10, 20, or 40MB solid state flash drive (field expandable and replaceable)</li> <li>• PCMCIA (requires 3rd party adapter board)</li> </ul>
I/O Ports	<ul style="list-style-type: none"> <li>• 1 9-pin RS232 (non-isolated)</li> <li>• 1 9-pin RS232/422/485 (non-isolated)</li> <li>• 1 25-pin IBM parallel</li> <li>• 1 RJ45 Ethernet</li> </ul>
Expansion Slots	<ul style="list-style-type: none"> <li>• P3: 3 3/4-size, 16-bit, ISA slots (1 slot is convertible to full-size using an optional expansion cover).</li> <li>• P4: 1 1/2-size, 3 3/4-size, 16-bit, ISA slots (1 3/4-size slot is convertible to full-size using an optional expansion cover).</li> <li>• P5 and P7: 2 full-size, 1 3/4-size, 16-bit, ISA slots</li> </ul>
Dimensions (H x W x D)	<ul style="list-style-type: none"> <li>• P3: 11.0" (280mm) x 13.8" (350mm) x 6.0" (152mm)</li> <li>• P4: 11.0" (280mm) x 13.8" (350mm) x 8.5" (216mm)</li> <li>• P5 and P7: 14" (356mm) x 16" (406mm) x 7" (178mm)</li> </ul>

## Specifications

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Category	Specifications
Weight	<ul style="list-style-type: none"><li>• P3: 16.2 lbs. (7.3 Kg)</li><li>• P4: 18.8 lbs. (8.5 Kg)</li><li>• P5 and P7: 23.8 lbs. (10.8 Kg)</li></ul>

## Environmental Specifications

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

Category	Specifications
Operating Temperature:	<ul style="list-style-type: none"><li>• 5x86 CPU's: 32 to 122°F (0 to 50°C) ambient air temperature at fan inlet</li><li>• Pentium CPU's: 32 to 113°F (0 to 45°C) ambient air temperature at fan inlet</li></ul>
Bulb Life:	<ul style="list-style-type: none"><li>• Monochrome LCD - 10,000 hours</li><li>• Color STN - 25,000 hours</li><li>• Color TFT (10.4") - 25,000 hours</li><li>• Color TFT (13.8") - 10,000 hours</li></ul>
Relative Humidity:	5% to 95% non-condensing
Altitude:	-200ft. to 10,000ft. (-60.96m to 3,048m)
Shock Rating:	<ul style="list-style-type: none"><li>• 10g peak, 11ms (operating)</li><li>• 30g peak, 11ms (non-operating)</li></ul>
Operating Vibration:	0.35mm 10 to 18Hz, 1.0g from 18 to 150Hz
Faceplate Designed For:	NEMA 4/4X (IP65 European Std.) Environ.

**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 outside the protective enclosure is generally lower than the internal temperature. Thus, if the PowerStation is operating inside an enclosure at temperature levels above the maximum ambient temperature, you will need to cool the enclosure.

## Electrical Specifications

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

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

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

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

### Special note for units with replaceable lithium batteries



Danger of explosion if battery is incorrectly replaced. Replace only with the same or 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 faceplate of the PowerStation can resist the chemicals listed in the table below with no visible effect.

Faceplate 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	

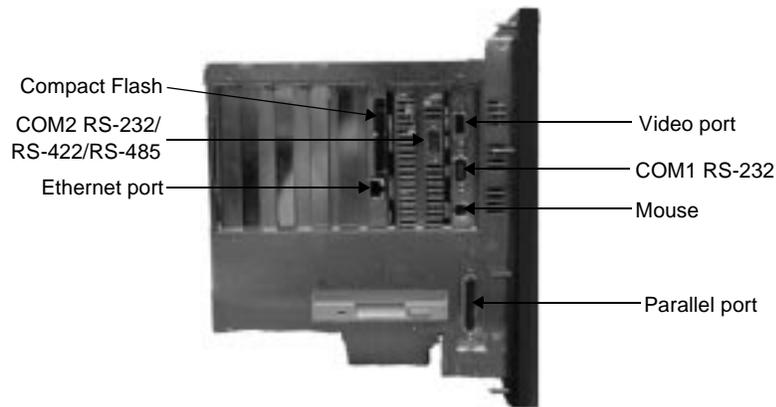
All PowerStation surfaces exposed to the outside of your enclosure are resistive to the following chemicals:

- 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<sup>®</sup> brand degreaser can cause damage to monitor materials.

## Available Connectors

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



## Serial Ports

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

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

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

RS-422 and RS-485 communications offer greater noise immunity than RS-232. These standards increase the maximum cable length to 4000 feet (1200 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 driver you use is located in the Help file associated with the driver.

## COM1 pinouts

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

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

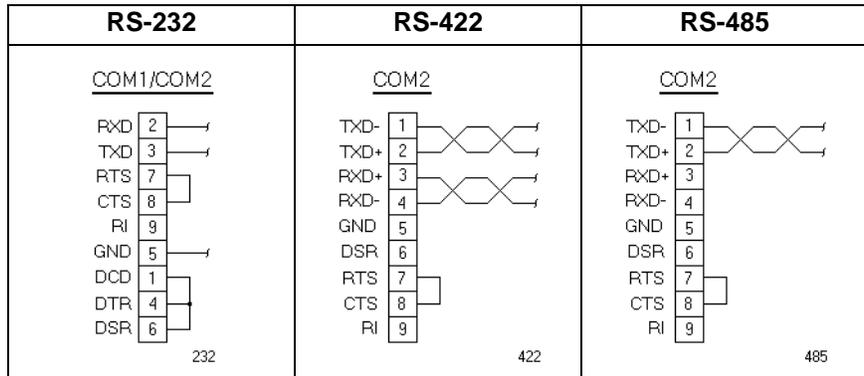
## COM2 pinouts

If you need to make a cable for communicating with COM2, the following table shows the pinouts and signal information for this port:

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

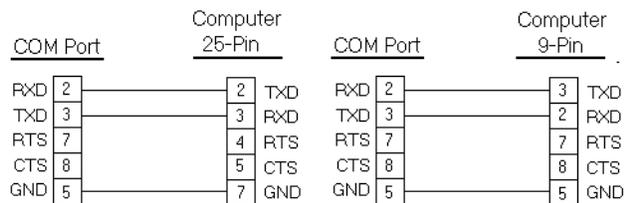
The following graphics represent the pinouts and cable diagrams required for communicating with COM1 or COM2 using the RS-232 protocol. Also shown are cable diagrams for communicating with COM2 using the RS-422 or RS-485 protocols.



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

## Connecting to a PC

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



### Connecting a serial mouse

If you need to connect a mouse to the PowerStation, you must use a serial mouse connected to either COM1 or COM2. If you use COM2, you may need to reconfigure this port to use the RS-232 protocol (See *JP8 serial port configuration* on page 83). Follow these steps to configure the PowerStation to use a serial mouse:

1. If you will be using COM2, verify that it is configured for RS-232 communications. See *JP8 serial port configuration* on page 83 to change the communications protocol for this port.
2. Connect the serial mouse to the port you configured, and reboot the PowerStation.

### Connecting to a serial printer

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

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

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

**databits:** either 7 or 8

**stopbits:** either 1 or 2

To use MODE.COM, complete the following steps:

1. Create a new AUTOEXEC.BAT file with the following line:  
`MODE COM#:baud,parity,databits,stopbits`
2. Copy this file into the \STARTUP directory of the IPM project on your development system.  
**Note** CTC installs MODE.COM on the PowerStation's flash drive and includes a copy on the ROM-DOS 6.22 and Utilities Disk.
3. Run Interact Project Manger (IPM), and download the project that contains AUTOEXEC.BAT and MODE.COM from your development system to the PowerStation.

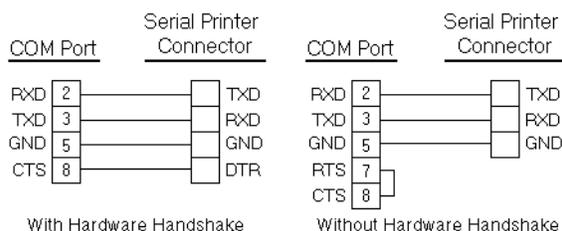
During the download, IPM transfers the AUTOEXEC.BAT file you created in step 1 into the \STARTUP directory specified by the INTERACT\_STARTUP environment variable. This environment variable resides in the PowerStation's AUTOEXEC.BAT.

When IPM finishes the download, the PowerStation automatically reboots, and MODE.COM configures 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** If you will be printing to a port that is configured for downloading, you must disable downloading for that port, and reboot the PowerStation. Rebooting the PowerStation allows MODE.COM to reset the communication settings for that port. Use the DOWNLOAD ENABLE command on the SETTINGS menu of the Shell to disable downloading.

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



## Parallel Port

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

Pin #	Signal Name
1	STROBE
2	DATA 0
3	DATA 1
4	DATA 2
5	DATA 3
6	DATA 4
7	DATA 5
8	DATA 6
9	DATA 7
10	- ACKNOWLEDGE
11	BUSY
12	PAPER EMPTY
13	+ SELECT
14	- AUTO FEED
15	- ERROR
16	- INIT PRINTER
17	- SELECT INPUT
18-25	GROUND

### Connecting to a parallel printer

The PowerStation can interface to 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 on the type of PowerStation you have, this port may be used to connect a mouse and/or keyboard to the unit. Refer to the CPU manual for the PS/2 port's pinout information.

## Connecting a keyboard (P3 and P4 only)

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

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

If you have a P5 or P7, refer to the *Keyboard Port (P5 and P7 only)* section on page 23 for more information about connecting a keyboard.

## Connecting a mouse

All PowerStations can receive input from a PS/2 mouse using the supplied 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.

## Keyboard Port (P5 and P7 only)

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

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

## CRT Port

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

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

Refer to the CPU manual for the CRT port's pinout information.

### Ethernet Port

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

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 Compact Flash (CF) card that is like a removable hard drive. It provides non-volatile memory storage. The CF is often used as a supplement to or a replacement for hard drives because it is well-suited for environments where 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. While 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 + F21 through F40 using the Shift key), and a programmable Select key. This section describes how to operate units equipped with function keys.

- **Function Keys**—allow you to send instructions to a software program. These instructions depend on the software package you are using. For example, if you are using Interact, 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. See *SHIFT KEY CONFIGURATION (P5 only)* on page 44 for more information.

- **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 to emulate any key that you might find on a standard keyboard. See *SELECT KEY CONFIGURATION (P5 only)* on page 45 for more information.

## Drive Definitions and Memory Map

This section provides information about the PowerStation's drive definitions, depending on the type of storage device. This section also includes a graphical illustration of the PowerStation's memory map.

**Table 1: Units with Compact Flash**

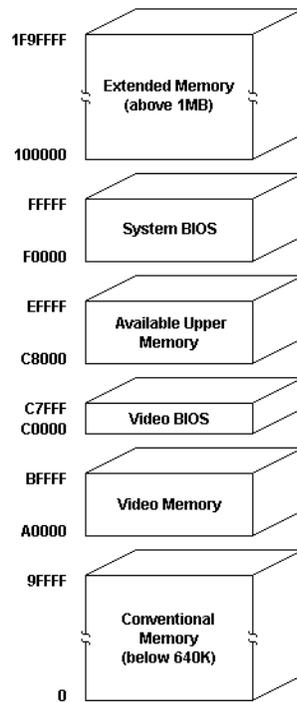
Drive Letter	Type	Size	Usage
C:	Compact Flash (CF) Card (Read/Write)	4, 10, 20, or 40MB	System boot drive and Project disk. Stores the project, Interact, applications, etc. Download files to this drive, but do not log data to this drive unless the size of your CF is sufficient because it can only accept a limited number of writes.
A:	3.5" Floppy Drive (Read/Write)	1.44MB	Can be used to download Projects to the unit, backup files from the unit, and log data.

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

Drive Letter	Type	Size	Usage
C:	Hard Disk (Read/Write)	1.6 GB or higher	System boot drive and Project disk. Stores the necessary system startup files. If you are using Interact, this drive also stores the project, Interact, applications, etc. Download files and log data to this drive.
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, you can download projects to the unit, backup files from the unit, and log data.

## PowerStation Memory Map

The following graphic illustrates how the PowerStation allocates conventional memory and extended memory. The range of available address references is listed next to each device.



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

## Memory Guidelines

If you use Interact to develop your MMI, refer to the memory guidelines listed below when you develop projects. The following table lists guidelines to follow concerning the use and capacity of memory used for runtime and development systems.

Memory Type	Runtime	Development
System DRAM	4MB system memory runs APM, PTM, and AMM runtime modules and 2 drivers. Extra modules require more memory.	Modules run one at a time in development mode so a 4MB system can support all modules and drivers.
Compact Flash	4MB Compact Flash can store APM, PTM, AMM, plus 4 additional runtime modules, 2 drivers, and approx. 30 screens. Extra modules require more storage (4 modules/MB). Use for data logging only if used in conjunction with hard drive.	4MB Compact Flash can store APM, PTM, AMM, GMM, 2 drivers, and approx. 30 screens. Extra modules require more storage (2 modules/MB).
Hard Drive	The available hard drive can store applications and logged data.	The available hard drive can store any application.
Floppy Drive	The 1.44MB floppy drive can be used to store logged data.	The 1.44MB floppy drive can store most applications.

## Adding Adapter Cards

Many ISA-bus adapter cards are available on the market to perform numerous functions. When adding cards to the PowerStation, observe the following precautions:

- The size of the card is important because the size and number of available slots varies from model to model. See *Physical Specifications* on page 11 for more information about expansion slots.
- The total compliment of adapter cards may not exceed the current limits specified for adapter cards in the PowerStation. See *Electrical Specifications* on page 13 for more information about the voltage and current available for expansion cards.

**Note** The PowerStation does not support Plug-n-Play features. When selecting adapter cards you must either select those with Plug-n-Play features that can be disabled or those without Plug-n-Play features. Adapter cards with Plug-n-Play enabled may not perform correctly and may adversely affect PowerStation operation.

## Safety Precautions

Observe normal precautions against electrostatic discharge (ESD) to prevent damage to your PowerStation or to your adapter boards. Anyone handling internal components should do so only in an ESD-safe location and should use appropriate grounding methods.

To avoid electric shock, always disconnect power from the unit before you remove the backshell cover or separate the backshell from the front panel.

## Address/IRQ Considerations

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

## Adding Adapter Cards

---

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

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

The IRQs indicated as blank usage in this table are available for use by any adapter card. The Ethernet port is software configured. See *Configuring the Ethernet Interface* on page 68 for more information. Those 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 operating software. You should only make these changes after consulting the CTC Product Technical Support department.

### Jumper settings

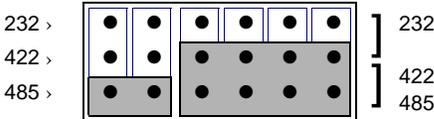
Like most PCs, the PowerStation uses jumpers to set addresses and enable or disable various functions of the system. The PowerStation's System Support card has seven sets of jumpers for configuring the serial ports, touch screen, Compact Flash, USC module, and Ethernet.

The following section will describe how the jumpers are set when they are shipped and what they control. To learn more about setting your jumpers, See *Changing the Jumper Settings* on page 83.



#### JP8 COM2 serial port configuration

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

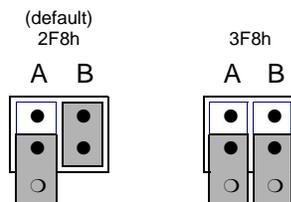


### JP9 and JP11 serial port and touch screen address

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

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

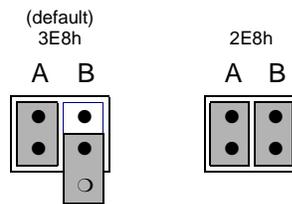
By default, the serial port jumpers (JP9) are set to I/O address COM2 (2F8h) by turning the A port “off” and the B port “on” as shown below. To configure to the 3F8h address, both the A and B ports would be turned “off,” also demonstrated below.



**Note** The clip for the “off” jumper can be completely removed or placed as in the figure above.

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

**Important** After changing the jumper settings for the touch screen I/O address, you must change the touch screen configuration drivers for the changes to be implemented. See *Configuring the Touch Screen Drivers* on page 65 for more information

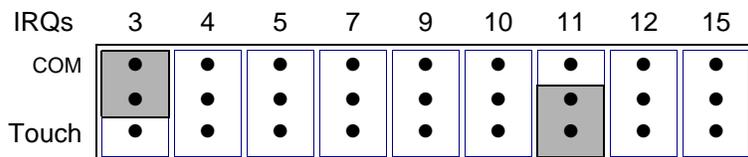


**Note** The clip for the “off” jumper can be completely removed or placed as in the figure above.

### JP7 serial port and touch screen IRQ

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

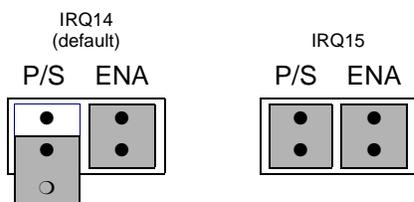
**Important** After changing the jumper settings for the touch screen IRQ, you must change the touch screen configuration drivers for the changes to be implemented. See *Configuring the Touch Screen Drivers* on page 65 for more information



**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.

### JP10 Compact Flash adaptor configuration

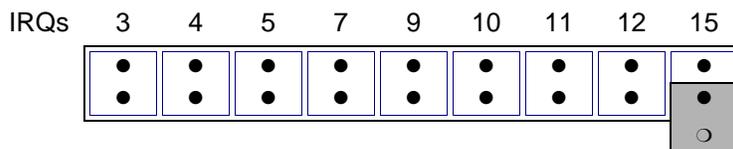
These jumpers are used to configure the Compact Flash. By default, the Compact Flash is configured to the Primary IDE adaptor (IRQ14), so the P/S jumper is set to “off,” and the ENA jumper is set to “on” as in the following figure. To configure to the Secondary IDE adaptor (IRQ15), set both jumpers to “on,” also demonstrated below.



**Note** The clip for the “off” jumper can be completely removed or placed as in the figure above.

### JP6 USC module IRQ

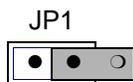
This set of jumpers configures the USC module IRQ. The jumpers are all set to “off” when shipped, as shown below.



**Note** The clip for the “off” jumper can be completely removed or placed as in the figure above.

### JP1 Ethernet default jumper

This jumper determines when the Ethernet is configured to its default settings. When the jumper is “on,” the Ethernet is forced to the default settings. While the jumper is “off,” the Ethernet is configured by the software utility. The figure below demonstrates the default “off” setting for the jumper. See *Configuring the Ethernet Interface* on page 68 for more information.



**Note** The clip for the “off” jumper can be completely removed or placed as in the figure above.

## Communication cards

This section describes the address range for each Interact communication card when 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
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
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

Driver Name	Address Range	Space Required	Memory Boundary
Texas Instruments Remote I/O (TIRIO)	C800 - DFFF	1K	resides on 1K boundaries

## Interact Design Issues

This section is provided for PowerStations with Interact, CTC's MMI software. If you do not have Interact, you can skip this section.

### Using a Touch Screen with Interact

If you are using a touch screen 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 touch screen 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 touch screen 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 touch screen 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.

## Interact Startup Directory

The INTERACT\_STARTUP environment variable determines where the Startup files will be placed (i.e. C:\STARTUP). When a download occurs, all existing files in the Startup directory are erased, which is why Startup files are saved in C:\STARTUP rather than in the root directory. The INTERACT\_STARTUP environment variable is set in the AUTOEXEC.BAT, in case you want to change it.

### 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 the CONFIG.SYS in the Startup directory into the main CONFIG.SYS file.



# Using the PowerStation Shell Utility

Now that you are familiar with some of the PowerStation's features, it's time to configure your system. This chapter is provided for those users who purchased PowerStations with Interact, CTC's MMI software. If you do not have Interact, you may skip this chapter.

This chapter will show you how to use the PowerStation Shell Utility (also referred to throughout this manual as "the Shell") to configure your system. The PowerStation Shell Utility is a program that runs on the PowerStation and is used to configure the unit and enable various features for using the PowerStation with Interact.

## Chapter Contents

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# Introduction

Prior to using the PowerStation, you should understand the features available with the PowerStation Shell Utility. The PowerStation Shell comes pre-installed on your system. However, if you need to reinstall the Shell software or the touch screen drivers, you can use the PowerStation Shell Setup disk. See *Recalibrating the Touch Screen* on page 55 for more information.

When you first power up the PowerStation, the Shell Main Menu appears. The Shell Main Menu contains information about the project currently loaded on the PowerStation. If no project exists, these settings will be set to NONE. See *Main Menu* on page 41 for more information about the Shell Main Menu.

## Selecting Screen Options

To select screen options, touch the menu item or move the cursor over the menu item you want to select and press the left mouse button. A submenu of options appears that you can change for this menu item. Upon selecting a submenu, you can return to the previous menu by:

- pressing the PREVIOUS MENU button on the screen
- touching outside the pop-up menu area
- pressing the left mouse button outside the pop-up menu area
- pressing the Esc key on the keyboard
- pressing the right mouse button
- pressing the Cancel button on units with function keys.

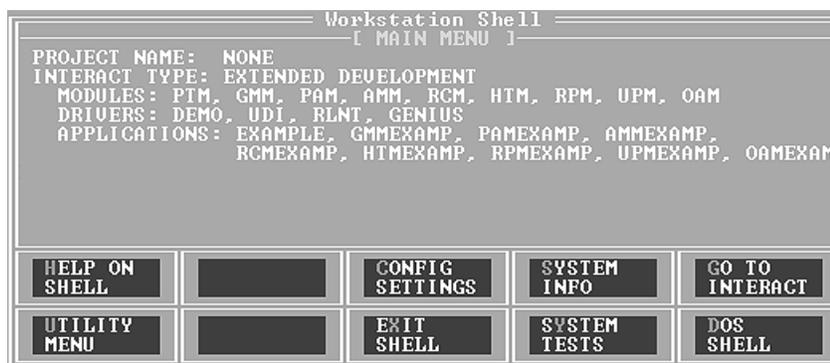
Throughout the remainder of this section, it is assumed that you are using a keyboard and mouse.

## Menu Definitions

This section provides a description of each item on the Shell Main Menu and the function of each selection button.

### Main Menu

When you power up the PowerStation, the Shell performs an internal check of the configuration settings for the unit and displays the Shell Main Menu as shown below.



The following items appear on the Shell Main Menu:

Name	Description
PROJECT NAME	Displays the name of the currently loaded project.
INTERACT TYPE	Displays whether Interact software is installed on your PowerStation. Will display "UNKNOWN," "EXTENDED DEVELOPMENT," or "RUNTIME."
MODULES	Displays the abbreviated name of each Interact module installed with the application you are using on the PowerStation. For example, if the Panel Toolkit Module is loaded, the acronym "PTM" is displayed.
DRIVERS	Displays the abbreviated name of each Interact driver installed with the application you are using on the PowerStation. For example, if the Siemens Programming Port driver is loaded, the acronym "SIEMPP" is displayed.

Name	Description
APPLICA-TIONS	Displays a list of applications in the project that were created in Interact or copied from another project.

## Help On Shell

Select the HELP ON SHELL button to enter the Shell help system. To request help on a menu button or option, move the cursor to the function, and press the F1 key on the keyboard. A page of text is displayed similar to the one below.

```

[ HELP ]
HELP ON POWERSTATION SHELL                               Page 1

                POWERSTATION SHELL
                Copyright (c) 1998
                Computer Technology Corporation
                All Rights Reserved

To exit the help screen, or to exit a menu and return to
the previous menu, do one of the following:
- press the [Esc] key on the keyboard
- click outside of the help window or menu
- press the right mouse button

                                           PgDn
    
```

To exit the Help, press the Esc key on the keyboard, press the right mouse button, or click outside the Help box. If more than one page of information is available for an item, press the PgUp or PgDn buttons on the lower right corner of the screen.

## Configuration Settings

Select the CONFIG SETTINGS button to change the PowerStation hardware settings. Once assignments have been made, they are stored in the PWR.CFG file on drive C.

**Important** The hardware configuration settings stored in the PWR.CFG file are saved on drive C. Do not delete this file, or you will have to reset the hardware configuration.

## Set Hardware

Select the SET HARDWARE button to change or modify the PowerStation setup. For most options, just select the item to toggle the selection. Other options display a submenu with additional selections. Any changes you make on this menu do not take effect until you exit this menu.

### POWER ON OPERATION

Use the POWER ON OPERATION option to select whether Interact or the Shell will run after the PowerStation is turned on. The selections are:

- RUN INTERACT
- SHELL MAIN MENU (default)

If you select RUN INTERACT, the PowerStation loads Interact automatically without interaction from the user. When the user exits Interact, the Shell Main Menu is displayed. This selection is particularly useful if a power cycle should occur because the unit would automatically run Interact when the power is restored.

If you select SHELL MAIN MENU, then the PowerStation loads the Shell and displays the Shell Main Menu.

### MOUSE PORT

The MOUSE PORT option automatically detects and displays the port where the mouse is connected if an external mouse is connected to the PowerStation. This port setting is displayed for informational purposes and cannot be changed through the Shell.

**Important** A mouse will only work if it is attached to COM1, COM2, or the PS/2 port, using the supplied Y-adaptor cable. You can attach download cables to either COM1 or COM2.

### TOUCH SCREEN

The TOUCH SCREEN option automatically detects and displays the port where the touch screen is connected if your PowerStation is configured to use a touch screen. This port setting is displayed for informational purposes and cannot be changed through the Shell.

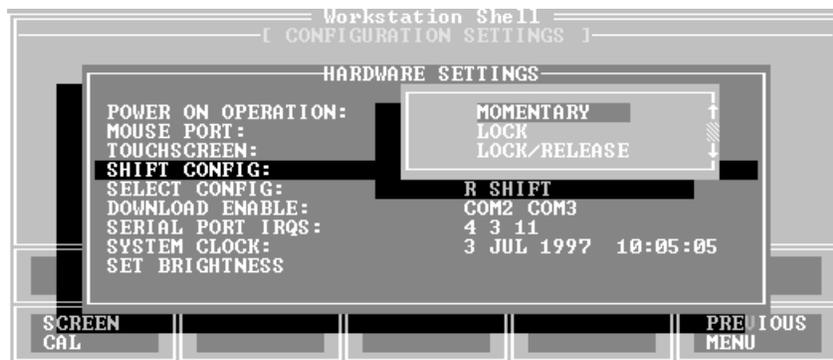
### SHIFT KEY CONFIGURATION (P5 only)

Use the SHIFT CONFIG option to select the mode for the Shift key that appears on the faceplate of P5 PowerStations. You can select one of three modes for the Shift key:

- **Momentary**—When you press and hold the Shift key, you have access only to the F21 through F40 function keys. When you release the Shift key, you automatically regain access to the F1 through F20 keys.
- **Lock**—When you press the Shift key, it locks, allowing access only to the F21 through F40 function keys. To regain access to the F1 through F20 keys, you must press the Shift key again to release the lock.
- **Lock/Release**—When you press the Shift key, it locks, allowing access to the F21 through F40 function keys only until you press and release any other key.

An indicator on the Shift key is lit whenever the Shift key is activated or in the locked mode.

**Note** Operating a Message Input tool or a popup Numeric Keypad tool when the faceplate Shift mode is on, will input values of 2, 4, 6, and 8 for the Down, Left, Up, and Right arrow keys, respectively. To avoid entering these values when you want to use the arrow keys to control the cursor, make sure the Shift mode is off.



### SELECT KEY CONFIGURATION (P5 only)

Use the SELECT CONFIG option to select the key scan code that you want to be generated whenever the Select button is pressed. This option is only available on P5 PowerStations.

**Important** The button you select here must agree with the Selection Key that you select in Interact for the Select button to work correctly with Interact.



### DOWNLOAD ENABLE

Use the DOWNLOAD ENABLE option to select which of the installed serial ports can be used for downloading projects to the PowerStation. When a serial port is enabled for download, the Shell “takes control” of the port to “listen” for the start of a project download; this takeover may interfere with TSRs or network drivers that use that serial port.

To allow other software drivers to use a particular serial port, that port should be set to **DISABLED**. The Shell automatically disables any serial port enabled for downloading whenever it detects a touch screen or a mouse is connected to it.



**Note** It is possible that all the download ports could become disabled by multiple changes to the configuration file. If this occurs, then you will have to manually enable them using the **DOWNLOAD ENABLE** setting on the **SETTINGS** menu.

### SERIAL PORT IRQS

Use the **SERIAL PORT IRQS** option to select the communication port IRQ. In order for the Shell to use the installed serial ports for downloading, and for touch screen operation, the Shell must have knowledge of the hardware IRQ numbers used by each serial port. These IRQ numbers are typically set by hardware jumpers on the System Support card. The IRQ numbers in the Shell must match the hardware jumper settings for proper operation.

## SYSTEM CLOCK

Use the SYSTEM CLOCK option to change the PowerStation's date and time. After you select a parameter, use the numeric keypad to enter the desired value.



The range for each parameter appears below:

<b>DAY</b>	1 - 31	<b>HOUR</b>	0 - 23
<b>MONTH</b>	1 - 12	<b>MINUTE</b>	0 - 59
<b>YEAR</b>	1980 - 2099	<b>SECOND</b>	0 - 59

## SET BRIGHTNESS/SET CONTRAST

Use these options to change the brightness and contrast levels of your display. When you select either one of these options, a popup menu will display Increase/Decrease options. Each click on a selection will increase or decrease the brightness or contrast by one level.

**Note** Not all display types support brightness and contrast adjustments. If the installed display does not support brightness and contrast adjustments, these menu options will not appear.

## Set Path

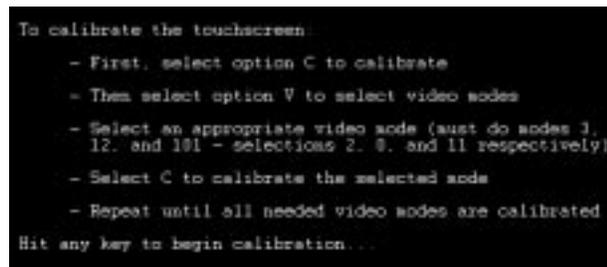
Select the SET PATH button to enter the path where the Interact application and executable files reside.



**Important** Any changes you make to this setting are also made to the “SET INTERACT=” and “SET INTERACT\_FILES=” lines in your AUTOEXEC.BAT file. However, these changes will not take effect until you restart the PowerStation or exit the Shell.

## Touch Screen Calibration

Select the SCREEN CAL button to launch the touch screen calibration utility. When you select this button, the following message appears:



**Important** The touch screen calibration utility requires you use an external keyboard. See *Connecting a keyboard (P3 and P4 only)* on page 23 for more information about connecting a keyboard.

See *Recalibrating the Touch Screen* on page 55 for more information about calibrating the touch screen.

## System Information

Select the SYS INFO button to provide information on system resources such as the Shell version number, processor type, installed memory, etc. Use this information to assist you during PowerStation configuration. This information will be requested whenever you contact CTC's Product Technical Support department for assistance.

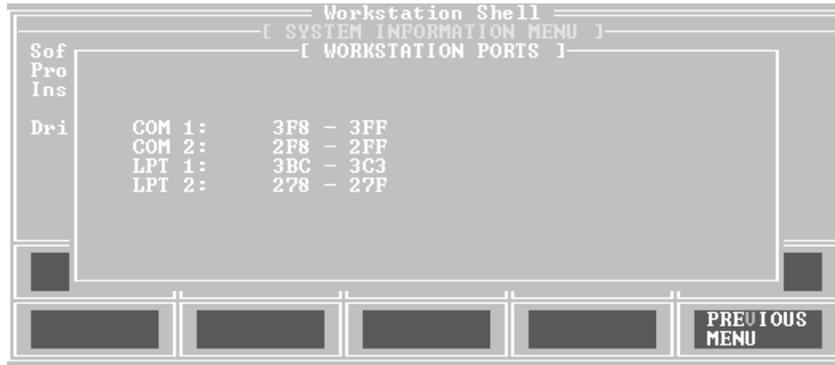


The following items appear on the System Information Menu:

Name	Description
SOFTWARE ID	Identifies the version of the Shell utility.
PROCESSOR	Identifies the type of processor installed in the PowerStation.
INSTALLED MEMORY	Lists the amount of DRAM installed in the PowerStation in Kbytes.
DRIVES	Lists the type and size of the drives installed on the PowerStation along with the amount of free disk space. The Compact Flash is identified as a "device driver" in the list.

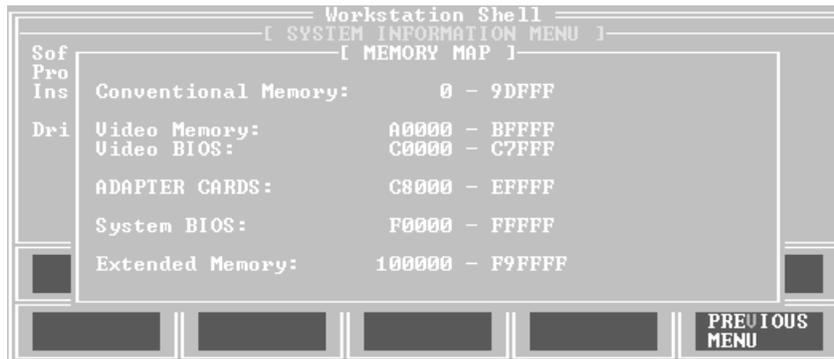
## Port Usage

Select the PORT USAGE button to view the port memory assignments for the PowerStation. An example of this window appears below:



## Memory Map

Select the MEMORY MAP button to display the memory map of the PowerStation. Use this menu whenever you install I/O cards that use memory addresses to make sure the card does not conflict with the PowerStation's memory addresses. See *Adding Adapter Cards* on page 29 for more information.



## Go To Interact

Select the GO TO INTERACT button to execute Interact from the Shell. This execution provides the proper environment for Interact to create and use the applications within the currently selected project.

The Interact module displayed is determined by the project's Startup Application configuration setting in the Application Manager. If this setting is None, then the Application Manager Main Menu is displayed. Upon exiting Interact, the Shell Main Menu appears.

## Utility Menu

Select the UTILITY MENU button to enter the Shell Utility menu. The Utility menu allows you to do the following:

- Access the Interact security device
- Restore an Interact project backup from a floppy disk to the hard drive
- View directory names and file names, including their size and date/time information

## Security Key

Use this option to activate the Interact Setup Utility (ISU), which allows you to enable options and transfer enabled options between security keys. Refer to the Interact Getting Started guide for more information about using security keys. To upgrade the key and enable or transfer modules and drivers, follow the basic guidelines listed below:

- To upgrade the PowerStation's internal key, place the upgrade key on the LPT1 (parallel) port and use the Upgrade command in ISU.
- To enable modules and drivers on the PowerStation's internal key, use the Enable Option command in ISU.
- To transfer modules and drivers to the PowerStation's Internal Key, place a key with the enabled module or driver on the LPT1 port of the PowerStation and use the Transfer Option command in ISU.

**Note** When you choose the Enable Option command, a numeric keypad appears so you can enter enabling codes. This eliminates the need for an external keyboard.

### Restore Project

Use this option to restore a project from a floppy drive to Compact Flash or a hard drive. The following warning message appears when you select this option:

```
WARNING! You are restoring a project from a floppy drive to the  
Interact Disk. Any existing project will be ERASED. Continue?
```

```
< YES >
```

```
< NO >
```

### Dir

Use this option to display a list of all files and directories on the PowerStation. Select the desired drive letter and directory to display the files in that directory.

The directory path is listed at the top of the screen. The number of files, the total number of bytes in this directory, and the total number of bytes remaining on this drive are listed at the bottom of the screen. This menu also displays file names with their size and the date and time the file was created.

If the list of files is greater than what can be displayed on screen, then you can scroll and page through the list. Use the arrow keys to scroll through the list, or press the Page Up or Page Down keys.

### Exit Shell

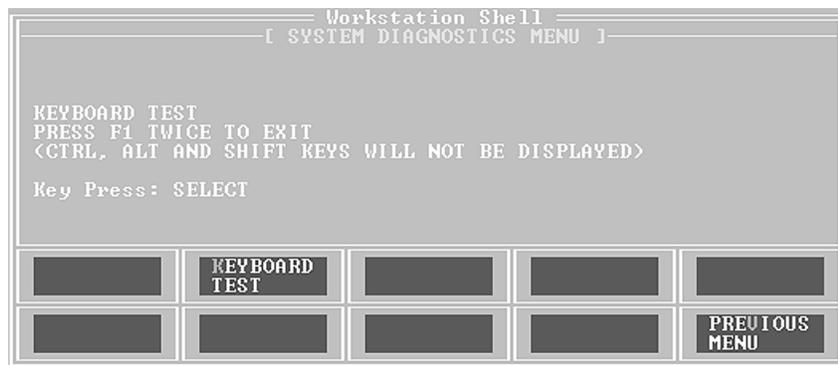
Select the EXIT SHELL button to exit the Shell program and return to DOS. When you select this button, the Shell reminds you that you must have a keyboard connected to the PowerStation before you can exit the Shell. If you have a keyboard connected to the PowerStation, select YES to exit the Shell. You can restart the Shell at any time by typing PSU and pressing the Enter key on the keyboard.

## System Tests

Select the SYSTEM TESTS menu to display a submenu of tests that you can perform on the PowerStation. At this time, you can perform a keyboard test by pressing the KEYBOARD TEST button.

### Keyboard Test

Select the KEYBOARD TEST button to begin the keyboard test. When you press a key, the PowerStation will display the text string that matches that key.



**Note** If your PowerStation has a touch screen, upon pressing the display the text string, "SELECT" is displayed. Also, pressing the Shift, Ctrl, or Alt keys does not display a text string.

## DOS Shell

Select the DOS SHELL button to enter DOS mode without exiting the Shell. You will need to connect a keyboard to the PowerStation prior to selecting this feature. CTC includes all DOS utilities on all PowerStations equipped with a hard drive. Refer to your DOS manual for information about using DOS commands. To return to the Shell, type `exit` at the prompt.

# Reinstalling the Shell Software

The PowerStation Shell comes pre-installed on all MS-DOS based (without Windows) units. If you need to install or reinstall the Shell software or the touch screen drivers, you can use the PowerStation Shell Setup disk. This disk automatically installs the PowerStation Shell, touch screen drivers, and the factory default AUTOEXEC.BAT and CONFIG.SYS files (if desired) on a Compact Flash drive or hard drive. To install the PowerStation Shell and touch screen drivers, complete the following steps:

1. Insert the setup disk into drive A.
2. Change to the root directory of drive A.
3. Type `Install A: C:` at the DOS prompt. This will copy the Shell files into the C:\CTC directory and the touch screen drivers into the C:\TOUCH directory.

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 C. If you answer Yes, the existing AUTOEXEC.BAT and CONFIG.SYS files will be renamed to AUTOEXEC.OLD and CONFIG.OLD. If you answer No, the factory-default files will be copied to AUTOEXEC.CTC and CONFIG.CTC in the root directory of drive C.

Then you will be asked if you would like to calibrate the touch screen. CTC recommends you calibrate at this time.

After the AUTOEXEC.BAT and CONFIG.SYS files have been copied on to your system, press any key to continue. If the \TOUCH directory was erased or did not exist prior to running the installation program, you will be prompted as to whether or not you would like to calibrate the touch screen. Your PowerStation will not run properly if the touch screen is not calibrated. Otherwise, you are finished reinstalling the Shell software.

Press Y to enter the touch screen calibration utility, or press N to perform the calibration at a later time. If you decide to perform the calibration now, the following screen will appear to guide you through the calibration process.

```
You must calibrate the PowerStation touchscreen for proper
Do you wish to do this now?
[Y,N]Y

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

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

Hit any key to begin calibration...
```

## Recalibrating the Touch Screen

The PowerStation's touch screen is calibrated prior to leaving CTC. However, you may need to recalibrate the touch screen 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.

The PowerStation Shell comes with a calibration utility that you can use to calibrate the touch screen. The calibration utility requires a keyboard and involves calibrating the touch screen for text and for graphics. Follow these steps to calibrate the touch screen:

## Recalibrating the Touch Screen

---

1. Select the SCREEN CAL button from the CONFIG SETTINGS menu.  
The following screen appears:

```
To calibrate the touchscreen
- First, select option C to calibrate
- Then select option V to select video modes
- Select an appropriate video mode (just do modes 1,
  12, and 101 - selections 2, 0, and 11 respectively)
- Select C to calibrate the selected mode
- Repeat until all needed video modes are calibrated
Hit any key to begin calibration...
```

2. Press any key when you are ready to begin the calibration program.  
The following screen appears:

```
Touch Screen Driver Configuration Utility 2.0.1T1 22-Sep-98
Dynapro Technologies Inc (C)

Calibration
Display
Toucharound
Buttons
Interface
Exit

Enter your selection (C/D/T/B/I/E):
```

3. Press C for Calibration. When the next screen appears, you will be calibrating video mode 80 x 25 Text (2,3).
4. Press C again for Calibrate.
5. Place your finger on the square on the screen and hold until you hear a beep.
6. Follow the instructions on the screen by touching each square as it appears—there will be three all together.
7. Press V to select a new video mode.
8. Enter 0 for 640 x 480 16 color Graphics mode.
9. Press Enter.
10. Press C for Calibrate.
11. Follow the instructions on the screen by touching each square as it appears—there will be three all together.

12. Press V for video mode.
13. Enter 11 for 640 x 480 256 color Graphics mode.
14. Press Enter.
15. Press C for Calibrate.
16. Follow the instructions on the screen by touching each square as it appears—there will be three all together.
17. Press O for OK.
18. Press Escape or X to exit.

**Important** After calibrating the touch screen, enter Interact in Program Mode. Verify that the cursor appears on the screen where you touch, otherwise recalibrate the screen. The calibration **MUST** be accurate to avoid activating a button unintentionally during Run Mode.



# Installing and Configuring the PowerStation

When you finish configuring the PowerStation, you can begin making preparations to install the unit in a permanent location. This chapter will help you select an appropriate location for the unit, provide instructions for creating a cutout for the unit, and describe how to install the unit.

## Chapter Contents

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# Selecting a Location

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

## Class I, Division II Guidelines

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

1. Suitable for use in Class I, Division II, 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 to off or the area is known to be non-hazardous.
3. **Warning: Explosion Hazard**—Substitution of components may impair suitability for Class I, Division II.
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 limit the unit's exposure to adverse conditions, such as dust, oil, moisture, and corrosive vapors.

## Faceplate Considerations

The PowerStation's faceplate is designed to the NEMA 4 (IP65 European standard) rating. You should mount the PowerStation in a similar enclosure to provide further protection. The PowerStation's faceplate is resistant to a variety of chemicals. See *Faceplate Chemical Resistance* on page 14 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.

See *Electrical Specifications* on page 13 for a list of electrical specifications. Make sure that your power source is completely compatible with the PowerStation before starting the unit.

## Temperature Guidelines

You can safely operate the PowerStation within the temperature range specified in the *Environmental Specifications* section on page 13. If you are using a protective enclosure, remember that the temperature outside the enclosure is generally lower than the internal temperature. Thus, 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 a 2-inch gap 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.

## Creating the Cutout

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

The PowerStation comes with a template designed to simplify the task of creating the cutout for the unit. It is important that you follow the drill hole and cutout dimensions precisely so the PowerStation properly seals.

Follow these steps to create the cutout:

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 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, you should be careful to protect the flatness of the surface.
4. Debur 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 101 in Appendix A for the depth and port dimensions of your PowerStation. Use these dimensions to customize the mounting of your unit.

## Mounting the Unit

Once the mounting surface has been prepared, you can install the PowerStation. For your convenience, CTC includes all necessary mounting hardware with the unit. Follow these steps to mount the unit:

1. Gently insert the PowerStation into the cutout.
2. Install a nut on each of the protruding studs on the back of the panel, 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 cross-wise sequence to ensure a good seal and prevent damage to the unit.

## Powering Up the Unit

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



Before connecting power to your unit, make sure you have read and understand the following sections of this manual: *Electrical Specifications* on page 13 and *Testing Specifications* on page 14. Also, make sure you follow the guidelines listed below:

- For PERMANENTLY CONNECTED EQUIPMENT, a readily accessible disconnect device shall be incorporated in the fixed wiring.
- For PLUGGABLE EQUIPMENT, the socket-outlet shall be installed near the equipment and shall be easily accessible.

### Special note for use in EU member countries

Proper installation of this PowerStation model for use in European Union countries requires the use of a harmonized power cord. (The power cord must be identified with the <HAR> symbol.) Ensure that this 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 the *Electrical Specifications* section on page 13 of this manual.
3. Connect the power cord plug to the PowerStation.
4. Turn the power switch ON.

**Note** The fan should come on followed immediately by the display.

If you are using Interact, you are now ready to download your project to the PowerStation. Refer to the Interact Project Manager User Guide for more information about downloading projects to the PowerStation.

## Modifying the AUTOEXEC.BAT File

The following lines must appear in the AUTOEXEC.BAT file for proper operation of the PowerStation. The AUTOEXEC.BAT file that CTC supplies includes these lines and is located in the \CTC directory of the PowerStation in a file called AUTOEXEC.CTC.

Command line parameter	Description
PATH C:\; C:\DOS; C:\CTC	Sets up default DOS path.
C:\CTC\BIOSTSR	Loads special functions.
C:\CTC\MOUSE	Loads MOUSE.COM if a mouse is connected.
C:\CTC\NOMOUSE	Loads NOMOUSE.COM if a mouse is not connected.
C:\TOUCH\DOX\SC3DOX /NOBOUNDS/	Initializes touch screen driver.
C:\NET\NET.BAT	Loads network batch file if unit is connected to a LAN.
* SET INTERACT=C:\INTERACT	Sets the Interact path.
* SET INTERACT_FILES= C:\INTERACT\APPFILS	Sets application path for Interact.
* SET INTERACT_STARTUP= C:\STARTUP	Sets up Interact startup variables.
* IF EXIST C:\STARTUP\ AUTOEXEC.BAT CALL C:\STARTUP\AUTOEXEC.BAT	Calls second AUTOEXEC.BAT file if contained within a Project.
* C:\CTC\PSU	Starts the PowerStation Shell.

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

## Configuring the Touch Screen Drivers

CTC includes the touch screen drivers with the PowerStation that correspond to your unit's operating system. Refer to the section below that corresponds to your operating system.

**Note** The instructions for MS-DOS also apply to units with ROM-DOS operating systems.

### Configuring the Touch Screen Drivers in MS-DOS

The C:\TOUCH\DOX\SC3DOX.EXE file is needed to configure the touch screen in MS-DOS. This file initializes the touch screen driver.:

**Important** If you purchased a PowerStation with the touch screen disabled and you want to enable it, remove the REM statement that appears at the beginning of the above line.

Likewise, if you purchase a PowerStation with the touch screen enabled and you want to disable it, add the word REM to the beginning of this line. If you need to permanently disable the touch screen, remove the file SC3DOX.EXE from your system.

The SC3DOX accepts the following command line parameter NOBOUNDS—this specifies the touch screen boundaries in Interact.

**Important** DO NOT change this parameter.

Follow the directions below to configure the touch screen drivers:

1. Enter MS-DOS mode and change to the C:\TOUCH\DOX directory.
2. Start the touch screen calibration program by typing `touchcfg`. The following touch screen driver configuration screen will appear.

```

Touch Screen Driver Configuration Utility 2.0.171 22-Sep-98
Dynapro Technologies Inc (C)

  Calibration
  Display
  Toucharound
  Buttons
  Interface
  Exit

Enter your selection (C/D/T/B/I/E):

```

## Configuring the Touch Screen Drivers

---

3. Press **I** for Interface. The following Interface Configuration Options screen will appear.



```
Interface Configuration Options
Interrupt:      IR011
Address:       3E8h
Connection:    UART
calibration data: Controller
Set COM1
Set COM2
Set COM3
Set COM4
Reset
Advanced:
Ok
Enter your selection (I,A,C,N,1,2,3,4,R,D,O):
```

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

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

5. Press **A** to change the Address.
6. Press **C** to change the Connection.
7. Press **O** to set your touch screen driver.
8. Press **Escape** or **X** to exit.

**Important** You must reboot your system for the changes to take effect.

## Configuring the Touch Screen Drivers in Windows

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

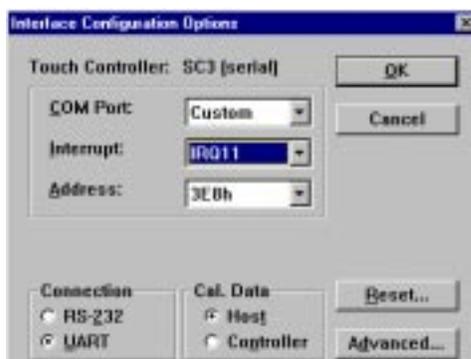
Follow the directions below to configure the touch screen drivers:

1. Select the Start button and select Programs.
2. Select the Touch Screen Utilities folder from the Programs menu.

3. Select the Configuration icon from the Touch Screen Utilities folder. The Calibration Utilities dialog box should appear as shown below.



4. Select the Interface button from the Calibration Utilities dialog box. The Interface Configuration Options dialog will appear as shown below.



5. The touch screen is set to COM3, IRQ11, 3E8h by default. Click on the drop-down arrows to change these settings.  
**Note** As you change the COMPort, the other settings will change automatically.
6. Select OK when finished.

## Configuring the Ethernet Interface

The \NET directory of the PowerStation's flash drive contains a configuration utility and all drivers necessary to configure the Ethernet interface. CTC also includes backup copies of these files on the PowerStation Shell Installation Disk. These files are described below:

File Name	Description
AT5CFG.EXE	A configuration utility you can use to change the interrupt and address of the Ethernet interface.
NET.BAT	A sample batch file you can use to run NetBIOS.
NET.CFG	Stores the interrupts and memory for the network drivers. The default PowerStation configuration reserves the following interrupts and I/O addresses. You cannot use these for the Ethernet interface. <ul style="list-style-type: none"> <li>• COM1: Int 4, I/O 3F8</li> <li>• COM2: Int 3, I/O 2F8</li> <li>• Touch Screen: Int 15, I/O 310</li> </ul> CTC recommends that you use the following interrupt and I/O address setting for the Ethernet interface: Int 10, I/O 280H
NETX.EXE	The Novell Netware shell program that makes the final connection with the server.
*LSL.COM	A Novell driver that enables the workstation to communicate with different protocols.
*IPXODI.COM	A Novell driver that supports the IPX protocol and other protocols over the same network.
*NE2000.COM	A Novell driver that supports the NE2000 protocol. It allows the PowerStation to communicate over a local area network.
*NETBIOS.EXE	Used by Interact to communicate over a network.

\* Denotes files that can be downloaded from Novell's FTP site: <ftp://137.65.3.15/pub/updates/dsktop/nw111/111d03.exe>

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

## Using the Utility Disks

PowerStations are shipped with several disks included in the package. These disks contain various utilities and files you may occasionally need. This section provides a table that can be used to cross-reference your particular system with the disks needed for that system. A description of each disk and what it is used for is also presented.

Disk Name and Part No.	Interact Systems			Non-Interact Systems		
	DOS	Windows		DOS	Windows	
		95	NT		95	NT
IPM KA-82228	X	X	X			
Shell Install KA-72451	X	X	X			
Windows 95/NT VGA Drivers KA-72670		X	X		X	X
Windows 95 Touch-screen Driver KA-72816		X			X	
Windows NT Touch-screen Driver KA-72817			X			X
Windows NT Emergency Repair Disk KA-72668			X			X
Utilities Disk KA-72463				X	X	X

**Interact Project Manager KA-82228:** This disk is used by all development PowerStations shipped with Interact software. This disk contains all program files for the Interact Project Manager (IPM) utility. You must install the IPM from this disk to your development PowerStation after installing Interact in order to download projects to runtime PowerStations. Refer to the IPM User Guide for installation and usage instructions.

**PowerStation Shell Install Disk KA-72451:** This disk is used by all runtime PowerStations shipped with Interact software. The PowerStation Shell is used by runtime systems to receive Interact project files and to configure PowerStation hardware. This disk contains all PowerStation shell files and DOS touch screen drivers, which are already installed on your unit. This disk is provided as a backup copy.

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

**Windows 95 Touchscreen Driver KA-72816:** This disk is used by PowerStations that use the Windows 95 operating system. It contains files necessary to operate the touch screen in Windows 95. The touch screen driver has already been installed on your unit. Install the files from this disk to the PowerStation only if your touch screen 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 touch screen in Windows NT. The touch screen driver has already been installed on your unit. Install the files from this disk to the PowerStation only if your touch screen drivers become corrupted.

**Windows NT Emergency Repair Disk KA-72668:** This disk is used by PowerStations that use the Windows NT operating system. This disk is used to reboot an NT system whenever the system will not recover from a crash. This disk will allow you to restart the system and repair the corrupted files.

**PowerStation Utilities Disk KA-72463:** This disk contains several PowerStation utilities and DOS touch screen drivers. The disk is included with all units that are not shipped with Interact software. PowerStations that ship with Interact already contain these utilities. These utilities support various PowerStation features such as the Brightness/Contrast Utility, Ethernet drivers, VESA VGA driver, etc. Use this disk if you need to use the utilities and drivers included on the disk.

# Maintaining and Troubleshooting the PowerStation

The PowerStation has been designed to provide years of trouble-free operation even in the harshest environments. However, you will occasionally need to perform routine maintenance on some of the PowerStation's components.

This chapter provides troubleshooting advice as well as instructions on cleaning the touch screen, recalibrating the touch screen, and reformatting the Compact Flash.

## Chapter Contents

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## Cleaning the Touch Screen

Occasionally, you might find it necessary to clean the touch screen of the PowerStation. Clean the touch screen using warm soapy water and a cloth. You may also use any non-abrasive cleaner. See *Faceplate Chemical Resistance* on page 14.

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. Thus, keep screwdrivers or other sharp objects away from the surface of the touch screen.

**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.).

## Reformatting the Compact Flash

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

- PC with a Type II PCMCIA slot and a 3.5" floppy drive running MS-DOS 6.22 or Windows 95
- CF-to-PCMCIA adapter
- ROM-DOS 6.22 and Utilities distribution disk (KA-72579-101 or later)
- Shell Installation disk (KA-72451-120 or later)

**Note** This procedure will work correctly under only MS-DOS 6.22 or Windows 95. Do not run this utility under Windows NT.

**To reformat the CF:**

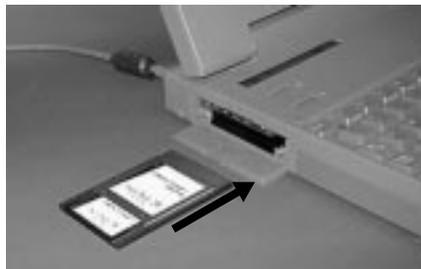
1. Power down the PowerStation.

**Important** Always make sure power to the PowerStation is turned OFF when inserting or removing the CF card.

2. Press the eject button and remove the flash card from the PowerStation flash card slot.



3. Insert the CF card into the PC's PCMCIA slot, using the CF-to-PCMCIA adapter.



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

**Note** In this example, drive D: represents the PCMCIA card; however, your system may assign a different drive letter to the PCMCIA card.

4. Enter MS-DOS mode.

5. At the DOS prompt, type the following command sequence:

```
FORMAT D:
```

6. Press Enter to execute this command.
7. Insert the ROM-DOS 6.22 and Utilities disk into the PC's floppy drive.

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

8. At the DOS prompt, type the following command sequence:

```
A:INSTALL A: D:
```

9. Press Enter to execute this command.

This will install the ROM-DOS system files onto the CF card to make the card bootable and create a DOS directory containing a few basic ROM-DOS utilities (`HIMEM.SYS`, `EMM386.EXE`, etc.).

10. Insert the Shell Installation disk into the PC's floppy drive.

11. At the DOS prompt, type the following command sequence:

```
A:INSTALL A: D:
```

12. Press Enter to execute this command.

This will install the PowerStation Shell files and necessary drivers onto drive D (or the drive assigned to the CF card in the PCMCIA slot). You will be asked whether you wish to install the standard CTC `AUTOEXEC.BAT` and `CONFIG.SYS` files as part of the installation. CTC recommends that you answer "Yes."

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

After the `AUTOEXEC.BAT` and `CONFIG.SYS` files have been copied on to your system, press any key to continue. You will be asked if you want to calibrate the touch screen; however, you cannot do this until you reinstall the CF card in the PowerStation.

13. Press N when you are asked if you want to recalibrate the touch screen.

The PowerStation Shell installation is complete.

14. Eject the CF-to-PCMCIA adapter, and remove the CF from the adapter.

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

**Important** Always make sure power to the PowerStation is turned OFF when inserting or removing the CF card.

15. Insert the CF into PowerStation's flash card slot.

16. Power up the PowerStation.

The PowerStation automatically boots into the PowerStation Shell.

17. Recalibrate the touch screen.

## Recalibrating the Touch Screen

The PowerStation's touch screen is calibrated prior to leaving CTC. However, you may need to recalibrate the touch screen 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.

**Note** The calibration utility requires a keyboard and involves calibrating the touch screen for text and for graphics.

## Recalibrating Under MS-DOS

Follow these steps to recalibrate the touch screen in MS-DOS mode:

1. Enter MS-DOS mode and change to the C:\touch\dox directory.
2. Start the touch screen calibration program by typing `touchcfg`.
3. Press C for Calibration. When the next screen appears, you will be calibrating video mode 80 x 25 Text (2,3).
4. Press C again for Calibrate.
5. Place your finger on the square on the screen and hold until you hear a beep.

## Recalibrating the Touch Screen

---

6. Follow the instructions on the screen by touching each square as it appears—there will be three all together.
7. Press V to select a new video mode.
8. Enter 0 for 640 x 480 16 color Graphics mode.
9. Press Enter.
10. Press C for Calibrate.
11. Follow the instructions on the screen by touching each square as it appears—there will be three all together.
12. Press V for video mode.
13. Enter 11 for 640 x 480 256 color Graphics mode.
14. Press Enter.
15. Press C for Calibrate.
16. Follow the instructions on the screen by touching each square as it appears—there will be three all together.
17. Press O for OK.
18. Press Escape or X to exit.

## Recalibrating Under 95/Windows NT

Follow these steps to recalibrate the touch screen under Windows 95 or Windows NT:

1. Select the Start button and select Programs.
2. Select the Touch Screen Utilities folder from the Programs menu.
3. Select the Configuration icon from the Touch Screen Utilities folder. The Calibration Utilities dialog box will appear as shown below.



4. Select the Calibration button from the Calibration Utilities dialog box.
5. Select the Calibrate button from the Calibration dialog box.
6. Place your finger on the target in the upper left corner and follow the instructions on the screen.
7. Select Exit when finished.

## Performing Internal Maintenance

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

- Remove and replace DRAM
- Change the jumper settings

## 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.

1. To avoid electric shock, always disconnect the power from the PowerStation before you remove the backshell cover or separate the backshell from the front panel. Do not touch any components of the CPU card or other cards while the PowerStation is on.
2. 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.
3. Only handle internal components in an ESD-safe location using appropriate grounding methods.
  - 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.
  - Wear a grounding wrist strap for continuous protection.

## Disassembling the PowerStation

If you have read and understand the ESD safety precautions, you are ready to disassemble the PowerStation. Follow these steps to disassemble the unit:

**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 result in damage to the unit.

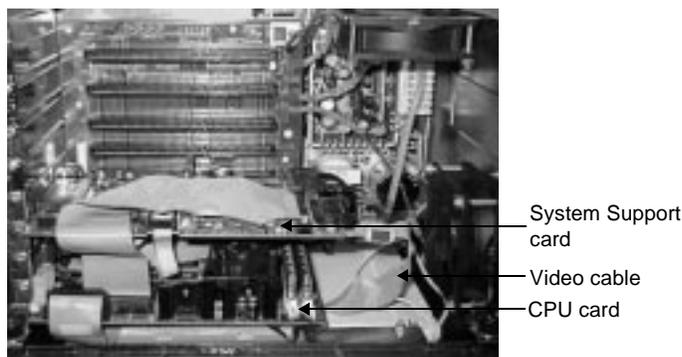
1. Turn off power to the unit.
2. Disconnect the unit from the power source.
3. Remove the unit from its enclosure, if installed.
4. Place the unit on a static dissipative mat in a location free from dirt and moisture and protected against static discharge. You must also wear an ESD wrist strap connected to a good known earth ground.
5. Place the unit face down, and remove the screws securing the back cover.
6. Remove the back cover from the unit.
7. Proceed to the specific configuration or replacement procedures you need to perform.

## Adding and Replacing DRAM

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

### Removing a DRAM module

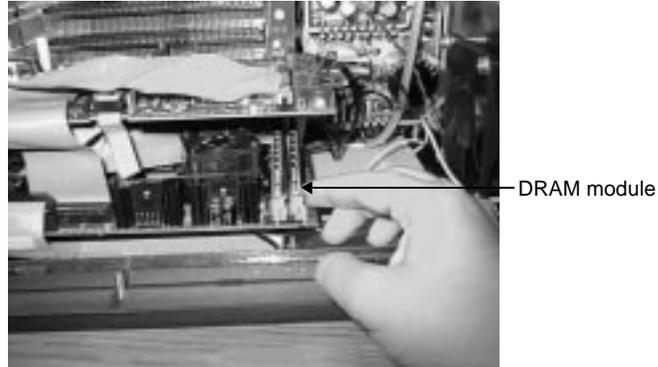
The PowerStation's DRAM is located on the CPU card, under the System Support card. You can identify the System Support card as the card with the Compact Flash Card and the Ethernet port. The System Support card is shown below:



Follow these instructions to remove a DRAM module from the CPU card.

1. Lift the locking ears to disconnect the video cable from the right edge of the System Support card.
2. Locate the DRAM SIMM socket(s) located on the right side of the CPU card. The number of SIMM sockets varies depending on the PowerStation model and the manufacturer of the CPU card.

3. Push outward on the socket ejectors. You may need to use a small screwdriver or the tip of a pen to push on the ejectors.



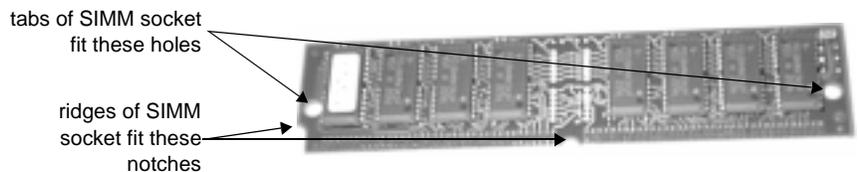
4. Tilt the DRAM module slightly to the right (away from the fan on the CPU card) and lift the module out of its socket at an angle.
5. Place the DRAM module in an anti-static bag for storage if you do not plan to reinstall the DRAM module at this time.

## Installing a DRAM module

Follow these instructions to install a DRAM module in the CPU card.

1. Carefully insert the DRAM module into its socket at a 45-degree angle.

**Note** The notch on the bottom of the DRAM module will align with the ridge on the socket.



2. Gently but firmly push the module upright into the socket until the metal clips snap into place securing the module.
3. Press the video cable into the socket to reattach the video cable to the System Support card. The locking ears should be secure.

This completes DRAM memory installation in your PowerStation. The PowerStation will automatically recognize the additional memory. If errors occur, refer to the CPU manual that came with the PowerStation.

## Adding PC/104 Modules

The PowerStation supports PC/104 expansion modules. These modules perform a variety of functions that are typically done by traditional plug-in expansion cards. However, the advantage of using PC/104 modules is that you can stack several modules together, saving valuable space. When adding modules to the PowerStation, remember the following information:

- The total combination of modules may not exceed the current limits specified for PC/104 modules in the PowerStation. See *Electrical Specifications* on page 13 for more information about the voltage and current available for expansion cards.
- The PowerStation does not support Plug-n-Play features. When selecting PC/104 modules, you must either select those with Plug-n-Play features that can be disabled or those without Plug-n-Play features. PC/104 modules with Plug-n-Play enabled may not perform correctly and may adversely affect PowerStation operation.

## Changing the Jumper Settings

Like most PCs, the PowerStation uses jumpers to set addresses and enable or disable various functions of the system. The PowerStation's System Support card has seven sets of jumpers for configuring the serial ports, touch screen, Compact Flash, USC module, and Ethernet.

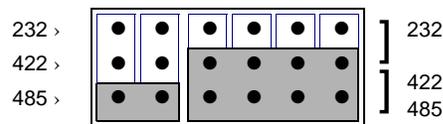
The following section will describe how the jumpers are set, what they control, and what options you have in configuring your own jumpers.



### JP8 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.

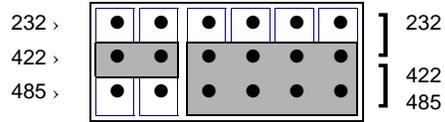
Place the clips in the positions shown below to configure to the default RS-485 protocol.



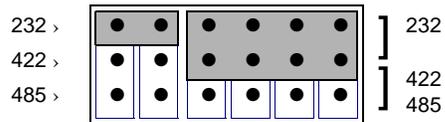
## Performing Internal Maintenance

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To configure to the RS-422 protocol, place the clips in the positions shown below.



To configure to the RS-232 protocol, place the clips in the positions shown below.



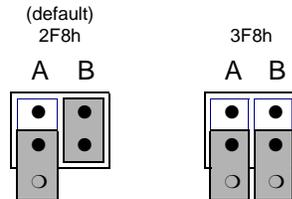
### JP9 and JP11 serial port and touch screen address

These sets of jumpers configure the addresses for the serial port (JP9) and the touch screen (JP11). Each is configured by turning “on” or “off” the ports A and B. 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.

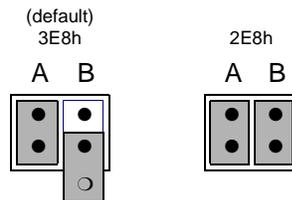
**Important** If the COM port is configured as COM1, the COM1 must be disabled in the system BIOS.



**Note** The clip for the “off” jumper can be completely removed or placed as in the figure above.

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

**Important** After changing the jumper settings for the touch screen I/O address, you must change the touch screen configuration drivers for the changes to be implemented. See *Configuring the Touch Screen Drivers* on page 65 for more information..

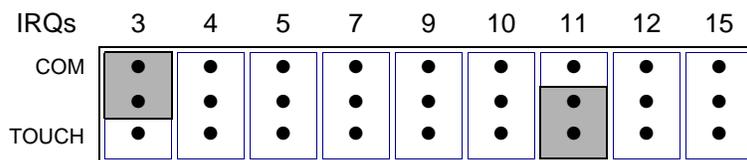


**Note** The clip for the “off” jumper can be completely removed or placed as in the figure above.

### JP7 serial port and touch screen IRQ

This set of jumpers is used to configure the hardware IRQs for the serial port and the touch screen. Place the clips as shown below to map to the default protocols: serial port = IRQ3 and touch screen = 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 touch screen IRQ, you must change the touch screen configuration drivers for the changes to be implemented. See *Configuring the Touch Screen Drivers* on page 65 for more information



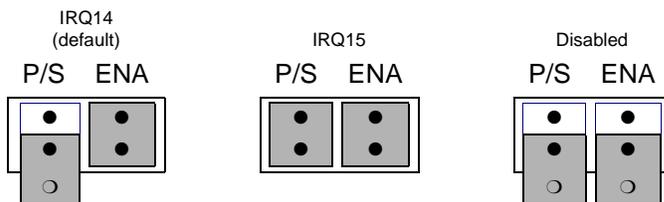
**Important** IRQ 12 is used by the PS/2 port. If you intend to use a keyboard and/or a mouse, do not map to this IRQ.

### JP10 Compact Flash adaptor 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.

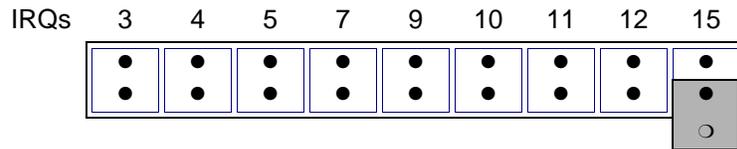
Finally, to disable your CF, set the ENA jumper to “off.” Once the ENA jumper is set to “off,” the P/S setting doesn’t matter, so you can set it however you want. In the third example below, both jumpers are set to “off.”



**Note** The clip for the “off” jumper can be completely removed or placed as in the figure above.

### JP6 USC module IRQ

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

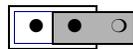


**Note** The clip for the “off” jumper can be completely removed or placed as in the figure above.

### JP1 Ethernet default jumper

This jumper determines when the Ethernet is configured to its default settings. When the jumper is “on,” the Ethernet is forced to the default settings. While the jumper is “off,” the Ethernet is configured by the software utility. To turn the default settings off, set the jumper to off as shown in the figure below. See *Configuring the Ethernet Interface* on page 68 for more information.

JP1



**Note** The clip for the “off” jumper can be completely removed or placed as in the figure above.

### Reassembling the PowerStation

When you are finished performing internal maintenance on the PowerStation, follow these steps to 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 result in damage to the unit.

1. Replace the back cover and reinstall the screws that secure the back cover.
2. Reinstall the unit in its enclosure, if previously installed.
3. Reconnect power to the unit.
4. Turn on the unit.

### Resolving Common Problems

This section provides some basic troubleshooting steps to help you identify and correct problems you may encounter with the PowerStation. If you encounter a problem, please consult this section to see if you can correct the problem yourself. If you encounter a problem that is not documented in this section, contact your CTC equipment supplier or the CTC Product Technical Support department at (513) 248-1714.

Refer to the lists below for the possible troubleshooting topics, how they are organized, and where they are located in this section.

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

#### **Resolving other problems during power up**

- During power up, the fan does not come on, and the display is blank. (page 92)
- During power up, the fan starts, but the display does not. (page 92)
- During power up, the RAM test fails, or the total memory installed does not match the total contiguous RAM listed on the display following the RAM test. (page 93)

### **Resolving problems with the touch screen**

- After power up, the touch screen does not work (page 94)
- After power up, the touch screen does not work properly, or the touch screen calibration appears to be incorrect (page 94)
- After calibrating the touch screen, it either does not work or follow your finger (page 95)

### **Resolving other problems after power up**

- The PowerStation locks up while booting and will not reboot (page 95)
- A PS/2 mouse does not work (page 96)
- A serial mouse does not work (page 96)
- A keyboard does not work (page 96)
- The Ethernet port does not work (page 96)

### **Resolving problems with Interact**

- After power up, the DOS prompt is displayed instead of the PowerStation Shell Main Menu (page 97)
- After selecting the Go To Interact button from the Shell Main Menu, Interact does not run (page 97)
- After selecting the Go To Interact button from the Shell Main Menu, Interact loads, but the screen is blank (page 97)
- You are unable to communicate with the PowerStation's COM ports (page 97)
- You are unable to transfer a project to the PowerStation (page 98)
- Sending a project results in a message on the display indicating the ????.FIL could not be found (page 98)
- A message appears on the PowerStation stating that the disk is full (page 98)
- When you try to run Interact, a message appears on the PowerStation stating that the Interact Security Device is missing or invalid (page 99)
- The PowerStation has corrupted application files, a panel will not load, or modules/drivers will not load (page 99)
- An Interact module (i.e., HTM) does not start up (page 99)

- A driver does not work with the installed hardware card (page 99)
- The code <00> appears on the display during Super User mode (page 100)

## Resolving Problems When Powering the Unit

One of the most common problems that users encounter with PCs occurs while booting up their system. This section describes some possible problems and solutions for booting up the PowerStation.

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

Some bootup problems are caused by a corrupted or modified AUTOEXEC.BAT or CONFIG.SYS file. CTC includes backup copies of these files (AUTOEXEC.CTC and CONFIG.CTC) on the PowerStation Utilities Disk. The text for AUTOEXEC.CTC appears below:

```
@ECHO OFF
PROMPT $p$g
SET TEMP=C:\DOS
PATH C:\;C:\DOS;C:\CTC
REM *****
REM Install PowerStation Special Functions
REM *****
LH C:\CTC\BIOSTSR
REM *****
REM If an external mouse is connected, MOUSE will install success
REM fully, and NOMOUSE will do nothing. If external mouse is not
REM found, MOUSE will fail, and NOMOUSE will successfully load.
REM *****
IF EXIST C:\CTC\MOUSE.INI DEL C:\CTC\MOUSE.INI
LH C:\CTC\MOUSE
REM *****
REM Install Dynapro touchscreen drivers
REM *****
LH C:\TOUCH\DOS\EMOUSE /NOBOUNDS/
REM *****
REM Uncomment next statement to load network batch file
REM *****
REM C:\NET\NET.BAT
```

The following lines only appear on PowerStations with Interact.

```

REM *****
REM Set up Interact environment variables for CTC Shell
REM *****
SET INTERACT=C:\INTERACT
SET INTERACT_FILES=C:\INTERACT\APPFILES
SET INTERACT_STARTUP=C:\STARTUP
REM *****
REM Call AUTOEXEC.BAT file contained in project, if it exists
REM *****
IF EXIST C:\STARTUP\AUTOEXEC.BAT CALL C:\STARTUP\AUTOEXEC.BAT
REM *****
REM Start the CTC Shell
REM *****
CD \CTC
PSU

```

The text for CONFIG.CTC appears below:

```

;MS-DOS V6.22
FILES=30
DOS=HIGH,UMB
DEVICE=C:\DOS\HIMEM.SYS

```

The following lines only appear on PowerStations with Interact.

```

REM          !!! NOTE !!!
REM If EMM386 is used on a Flash-disk PowerStation, a 12KB window
REM for the flash disk must be excluded with the "/X=" parameter,
REM as shown in the example below. This window address MUST match
REM the jumper settings on the System Support card!
REM
REM DEVICE=C:\DOS\EMM386.EXE NOEMS RAM /X=C800-CAFF
DEVICE=C:\DOS\SETVER.EXE

```

The following lines only appear on PowerStations without Interact.

```

DEVICE=C:\DOS\EMM386.EXE NOEMS RAM
DEVICE=C:\DOS\SETVER.EXE

```

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

```

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

```

### Resolving other problems during power up

This section lists some additional problems and solutions for booting up the PowerStation. The problem is listed first followed by a list of possible solutions. Begin with the first one, and continue through the list until you have solved the problem or reached the end of the list.

If the problem persists, look through the other problems listed in this section to determine if additional symptoms exist that require further action. Otherwise, contact your CTC equipment supplier or the CTC Product Technical Support department.

#### **During power up, the fan does not come on, and the display is blank.**

1. Turn off the PowerStation.
2. Make sure that power is properly connected. Otherwise, make sure that the connection between the unit and the power source is complete and firmly attached.
3. Turn on the PowerStation. If the fan does not come on, continue with step 4.
4. Disconnect power to the PowerStation.
5. Remove the PowerStation's back cover.
6. Check the fuse located on the internal power supply. If the fuse is blown, replace it.
7. Turn on the PowerStation. If the fan does not come on, continue with step 8.
8. Check connector J8 (fan connection) on the backplane board to see if the fan is plugged in.
9. Secure the PowerStation's back cover.
10. Reconnect power and turn on the PowerStation.

#### **During power up, 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 the corresponding plug.

4. Check the installation of the DRAM SIMMs on the CPU board. Make sure that the SIMMs are firmly seated in their sockets and the socket latches are fully engaged.
5. Make sure that all boards are firmly seated in the backplane board.
6. Secure the PowerStation's back cover.
7. Turn on the PowerStation.

**During power up, the RAM test fails, or the total memory installed does not match the total contiguous RAM listed on the display following the RAM test.**

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

## Resolving Problems After Powering the Unit

This section lists some possible solutions for problems that may occur after you power up the PowerStation. This section is divided into three subsections, one for touch screen problems, one for Interact problems, and one for other problems.

Each section lists some possible solutions for problems that may occur. The problem is listed first followed by a list of possible solutions. Begin with the first one, and continue through the list until you have solved the problem or reached the end of the list.

If the problem persists, look through the other problems listed in this section to determine if additional symptoms exist that require further action. Otherwise, contact your CTC equipment supplier or the CTC Product Technical Support department.

### Resolving problems with the touch screen

This section lists some possible solutions for problems that may occur with the touch screen.

#### **After power up, the touch screen does not work.**

1. If the PowerStation appears to be operating correctly otherwise, reboot the unit.
2. The touch screen calibration might be in error. See *Performing Internal Maintenance* on page 78 to recalibrate the touch screen.
3. Check the AUTOEXEC.BAT file. See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 90 for more information.
  - a. Verify that the following lines appear before the lines that load touch screen driver:

```
IF EXIST C:\CTC\MOUSE.INI DEL C:\CTC\MOUSE.INI
LH C:\CTC\MOUSE
```
  - b. Verify that the touch screen drivers are being loaded. Look for the following lines:

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

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

#### **After power up, the touch screen does not work properly, or the touch screen calibration is incorrect.**

1. Enter MS-DOS mode.
2. Change to the \Touch directory.
3. Type TBCAL, and perform the following calibrations: H, 2, and 6.
4. If you are using Windows, choose the Touch Screen icon.
5. Make sure that the touch screen hardware settings are correct:  
Address =3E8H, IRQ = 11.
6. Recalibrate the touch screen. See *Performing Internal Maintenance* on page 78 for more information.

**After calibrating the touch screen, it either does not work or follow your finger.**

1. Make sure the touch screen cable has been properly connected. If the touch screen cable is damaged, replace the touch screen. Contact CTC for information about purchasing a replacement.
2. Inspect the touch screen for broken, loose, or frayed wiring. If you encounter wiring problems, replace the damaged wiring.

## Resolving other problems after power up

This section lists other possible problems and solutions that may occur after power up.

**The PowerStation locks up while booting and will not reboot.**

1. Turn off the PowerStation.
2. Connect a keyboard.
3. Turn on the PowerStation. 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. If the “Starting MS-DOS” message does not appear, go to step 6.
4. Step through the CONFIG.SYS and AUTOEXEC.BAT files line-by-line until the lockup is found. Remove or correct the offending line in the CONFIG.SYS or AUTOEXEC.BAT. 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.
5. Restart the PowerStation to see if the problem has been solved.
6. If the system locks up before the “Starting MS-DOS” message appears, reboot the unit, and press the Delete key to enter the BIOS setup program.
7. Select the Standard CMOS Setup option or its equivalent, and restore the system defaults. This will restore CMOS settings to their factory default configuration. Save these settings, and exit the setup program.

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

### **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 20 for information on how to configure the PowerStation to accept a serial mouse.

### **A keyboard does not work.**

1. If you have a P3 or P4, make sure that you are using the supplied Y-adapter cable to connect any AT compatible keyboard to the PS/2 port.  
If you have a P5 or P7, 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, try using a new Y-adapter cable.
4. Try using a new keyboard.

### **The Ethernet port does not work.**

1. Make sure the Ethernet cable is plugged in.
2. Make sure the networking software is being loaded. Check the AUTOEXEC.BAT file. See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 90 for more information.
  - a. Verify that the following line does NOT have the word "REM" in front of it:  
`C:\NET\NET.BAT`
3. Make sure that you have properly configured the networking software. See *Configuring the Ethernet Interface* on page 68 for more information.

## Resolving problems with Interact

This section lists some possible problems and solutions that may occur on a PowerStation that is running Interact.

### **After power up, the DOS prompt is displayed instead of the PowerStation Shell Main Menu.**

1. If the PowerStation appears to be operating correctly otherwise, reboot the unit.
2. The AUTOEXEC.BAT file may be corrupted or has been modified. See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 90 for information about correcting this problem.

### **After selecting the Go To Interact button from the Shell Main Menu, Interact does not run.**

1. Verify that the Interact security key is connected to the PowerStation.
2. Verify that Interact is loaded for this project. Go to the Shell Main Menu, and observe the selection for INTERACT TYPE. If the word UNKNOWN is displayed, return to your development system and download a project that has Interact included. Refer to the Interact Project Manager User Guide for information on downloading projects.

### **After selecting the Go To Interact button from the Shell Main Menu, Interact loads, but the screen is blank.**

Interact device driver communications have stopped. Check the following:

- a. On a development system, check to ensure you selected the correct device driver communications parameters (baud rate, number of data bits, etc.)
- b. Go to the Shell Settings menu and ensure the COM port that the driver is using is selected.
- c. Make sure the COM2 hardware jumpers are selected for the particular protocol used with the driver.

### **You are unable to communicate with the PowerStation's COM ports.**

1. Refer to the Interact device driver Program Mode screen of the driver being used to determine if the driver is correctly setup.
2. Verify that the communication cable is wired properly.
3. Make sure the jumpers are set correctly for address and IRQ, without conflicts.

4. Make sure the proper interrupts have been selected in Application Manager.
5. Refer to the programmable controller documentation for proper cable connection instructions.
6. Use a serial port communication test device to check communications between the PowerStation and your controller. These devices can be purchased at local electronics stores.

### **You are unable to transfer a project to the PowerStation.**

1. Make sure the PowerStation Shell program is running.
2. Verify the COM port you are using is enabled for download. This parameter is located on the Config Settings/Set Hardware menu of the Shell.
3. Verify that the IRQs match the jumper settings on the System Support card. Default = COM1:4, COM2:3.
4. Disconnect any communication cables connected to PowerStation communication cards.
5. Make sure you are not logged onto a network and a print spooler is not connected to your system.
6. Make sure a defective or incompatible mouse or keyboard is NOT connected to the PowerStation.
7. On your computer, do not load a disk cache such as "Smartdrive." This will interfere with your project transfer. Smartdrive could exist either in your computer's CONFIG.SYS or AUTOEXEC.BAT files.
8. Verify that the IPM baud rate located on the Transfer Settings menu is compatible with your PC's COM port.
9. Cycle power to the unit to see if the problem clears.

### **Sending a project results in a message on the display indicating the ????.FIL could not be found.**

You must use a Project developed using Interact version 2.1 or higher on a PowerStation. Previous versions of Interact do not have the .FIL file.

### **A message appears on the PowerStation stating that the disk is full.**

Verify that Interact Project Manager is set to download to a Runtime Only system. If not, select Runtime Only from the Settings menu of Interact Project Manager, and re-send the project.

If it is already set to Runtime Only, you must add more Compact Flash, make more hard drive space available, or the reduce the size of the application.

**When you try to run Interact, a message appears on the PowerStation stating that the Interact Security Device is missing or invalid.**

1. Make sure the version of Interact sent to the PowerStation is 4.X or higher.
2. If the error occurred after sending an old PSU Backup to the PowerStation, then the version of Interact is wrong. Restore the old backup to the PC using Interact Project Manager, and send the project to the PowerStation. Refer to the Interact Project Manager User Guide for more information about converting PSU backups.
3. If the security key is still not recognized, use the Interact Setup Utility to verify if the key is recognized.

**The PowerStation has corrupted application files, a panel won't load, or modules/drivers won't load.**

1. Attempt to restore a previous backup of your system. If this is not successful go to step 2.
2. Verify that the PowerStation has enough memory available by using the Interact Memory Available button. Your system may need more extended memory.
3. If your PowerStation is equipped with a hard drive, run the MS-DOS Scandisk utility.
4. Download the Interact Project.

**An Interact module (i.e. HTM) does not start up.**

Verify that the security key is programmed with the correct module using the Security Key selection under the Utility Menu of the Shell. See *Security Key* on page 51 for more information about using Interact Security Keys.

**A driver does not work with the installed hardware card.**

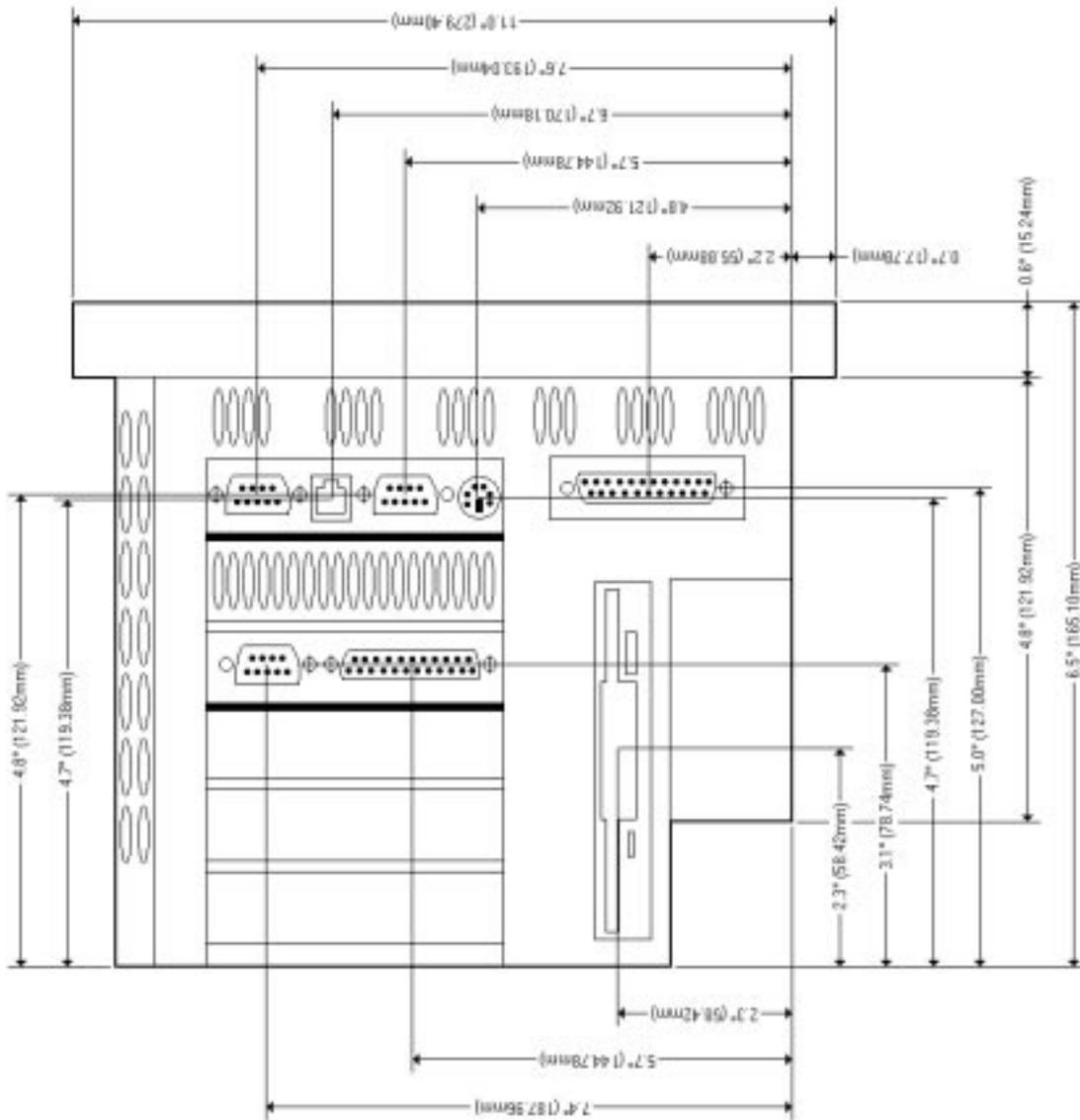
Make sure there are no interrupt or memory conflicts with other adapter cards. See *Communication cards* on page 35 for a list of hardware cards and their associated memory locations. Also, refer to the Windows help file that corresponds to your Interact Device Driver.

**The code <00> appears on the display during Super User mode.**

Reboot the PowerStation and return to the Shell or type `exit` to return to the Main Menu. This indicates that a communication problem on the computer occurred. Verify that Interact Project Manager was only executed once.

# PowerStation Dimensional Drawings

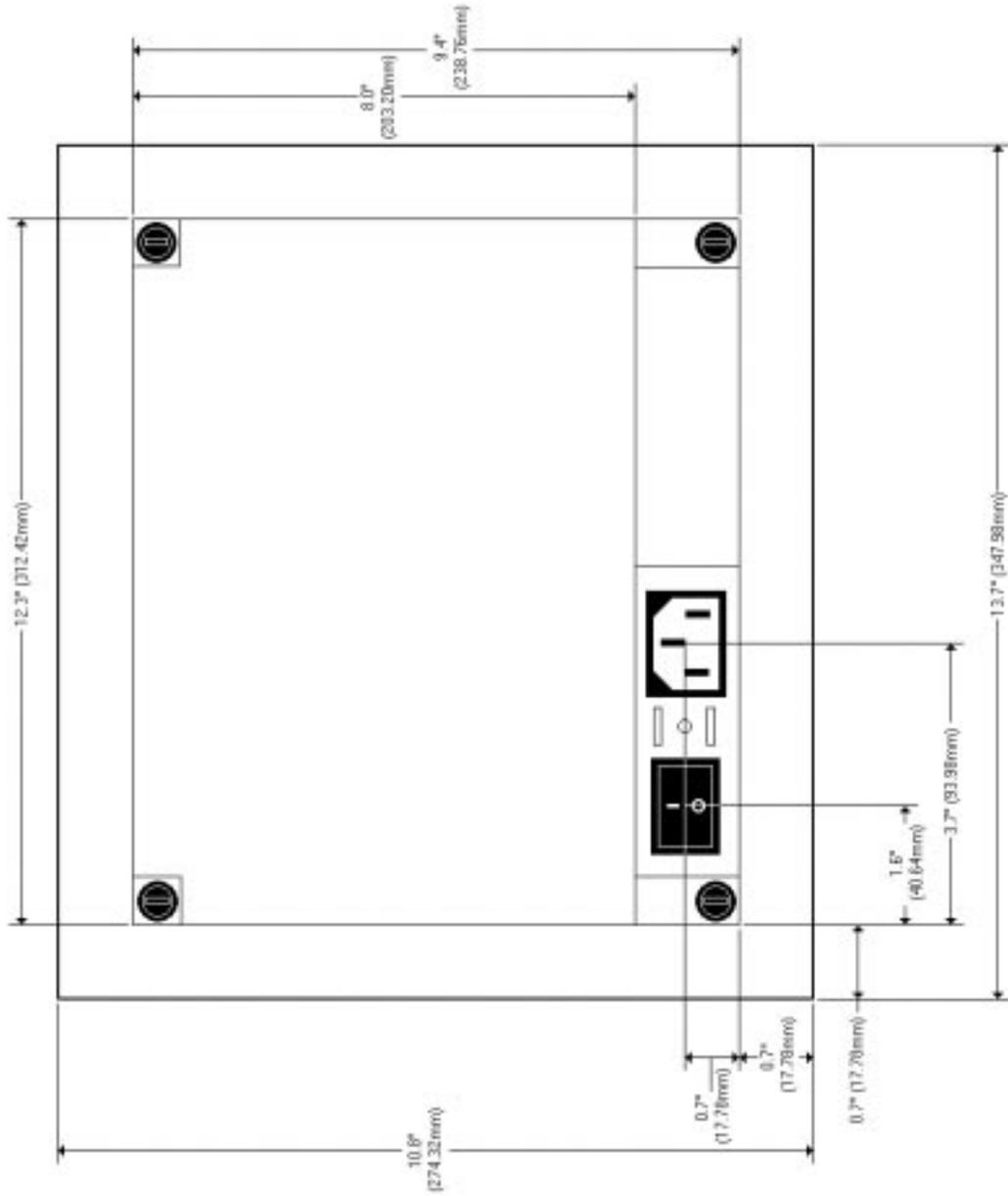
## P3 Side View



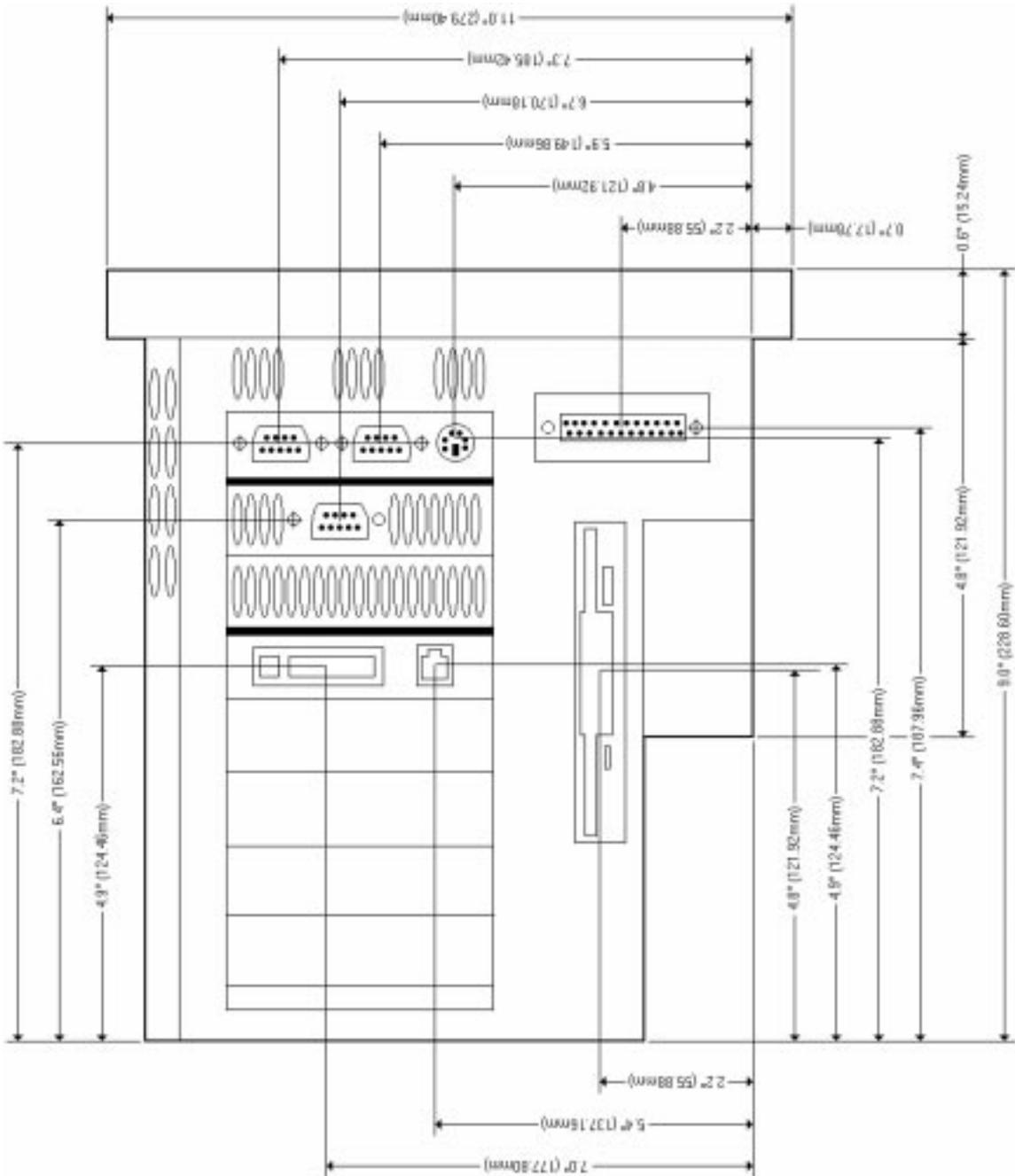
# Appendix A

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## P3 Back View

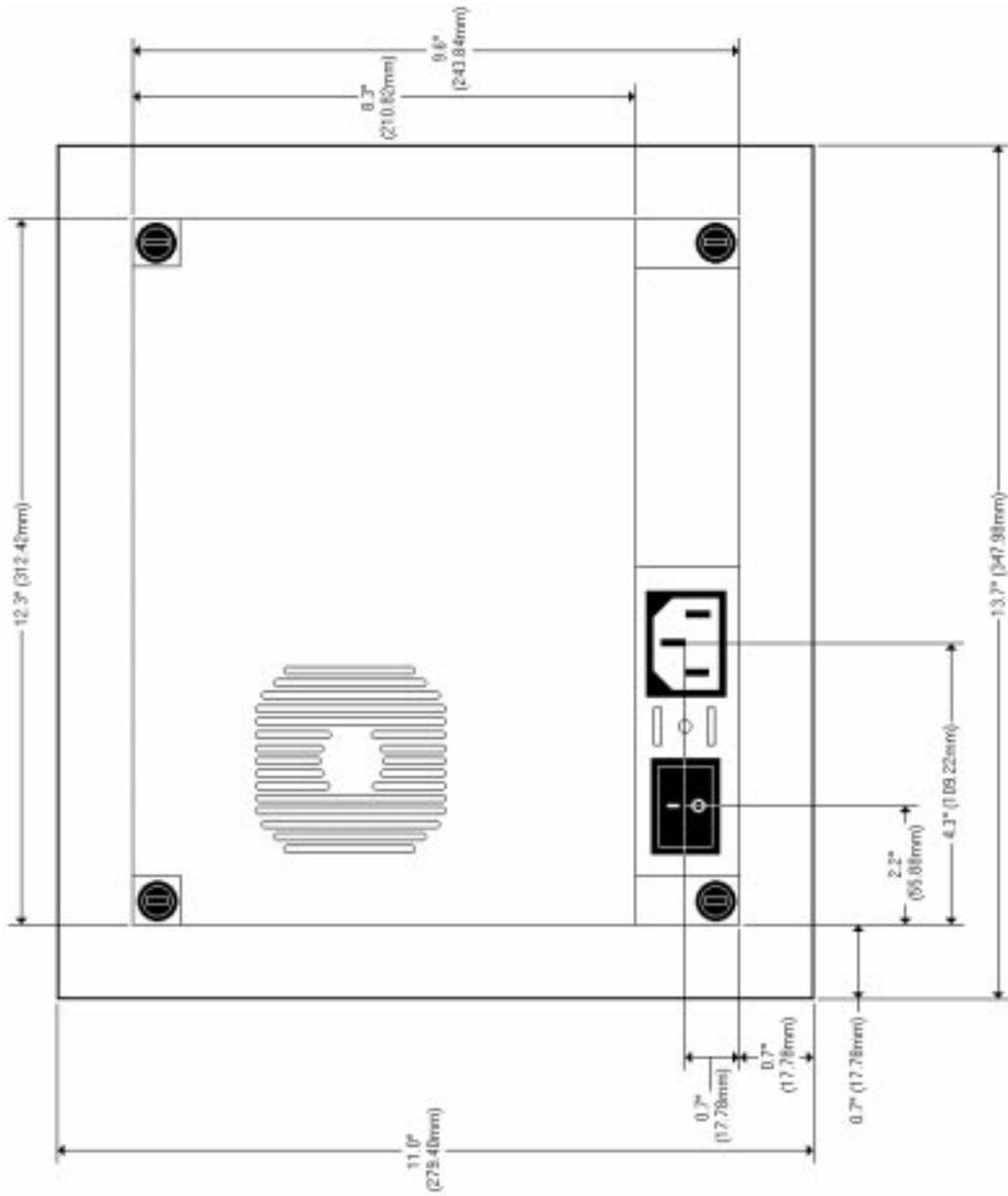


## P4 Side View



# Appendix A

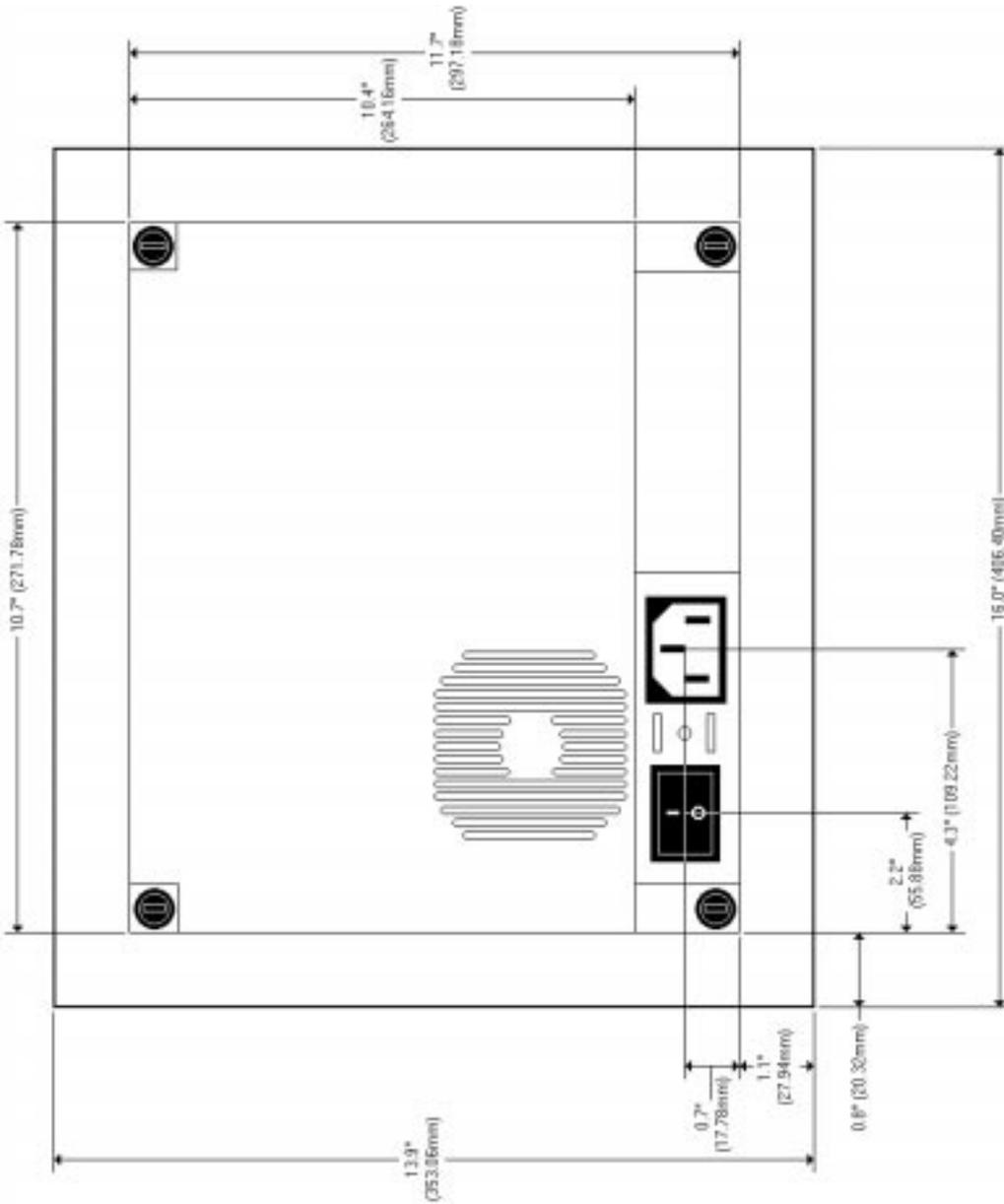
## P4 Back View





# Appendix A

## P5/P7 Back View



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