POWERSTATION

User Guide

CTC COMPUTER
TECHNOLOGY
CORPORATION

POWERSTATION

User Guide

Copyright and Trademark Notice

Product Warranty Information

Computer Technology Corporation 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® or Windows® compatible programs. Please take a few minutes to review this manual and all other documentation included with the PowerStation before operating the unit.

Chapter Contents

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 or 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.

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.

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.

Understanding the PowerStation

The PowerStation family of workstations are designed to give you an operator interface solution that is powerful, cost-effective, and very easy to use. They 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' model numbers, product specifications, connectors, and their drive definitions and memory maps.

Chapter Contents

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, EL, STN, or TFT. The P3 also includes 8 MB 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 133 MHz, Pentium 166 MHz, or Pentium MMX 200 MHz. The P4 also includes 8 MB of RAM, an internal floppy drive, and one of the following 10.4" displays: LCD, EL, STN, or TFT.

P5 PowerStation - This PowerStation is a function key workstation that includes one of the following CPUs: 5x86 133 MHz, Pentium 133 MHz, Pentium 166 MHz, or Pentium MMX 200 MHz. The P5 also includes 8 MB of RAM, an internal floppy drive, and one of the following 10.4" displays: LCD, EL, 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 133 MHz, Pentium 166 MHz, or Pentium MMX 200 MHz. The P7 also includes 8 MB of RAM and an internal floppy drive.

> **Note** PowerStations with Interact are available with your choice of flash memory 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, weight, and compatible hardware devices. Refer to the table below:

Category	Specifications
CPUs	5x86 133MHz; Pentium 133, 166, or Pentium MMX 200MHz (unavailable on P3)
Memory	8MB min., 32MB max. (64MB max. on Pentiums)
Displays	• Monochrome LCD, 640x480 VGA, 16 shades of gray (unavailable on P7 and Industrial PCs) • Electroluminescent (EL), 640x480 VGA, 16 shades of gray (unavailable on P7 and Industrial PCs) • Color TFT, 640x480 VGA, 256 colors • Color TFT, 1024x768 XVGA, 256 colors • Color STN, 640x480 VGA, 256 colors (unavailable on P7)
Storage	• 1.44MB high-density floppy drive • 1.6GB (min.) hard drive (standard on Industrial PCs) • 2 to 4MB Flash SIMMS (standard on units with Inter-act); 8MB max. • PCMCIA (requires 3rd party adapter board)
I/O Ports	• 2 9-pin RS232 (non-isolated) • 1 25-pin RS232/422/485 (isolated) • 1 25-pin IBM parallel • 1 RJ45 Ethernet (5x86 133MHz CPU only)
Expansion Slots	• P3: 3 3/4-size, 16-bit, ISA slots (1 slot is convertible to full-size using an optional expansion cover). • P4: 1 1/2-size, 3 3/4-size, 16-bit, ISA slots (1 3/4-size slot is convertible to full-size using an optional expansion cover). • P5 and P7: 2 full-size, 1 3/4-size, 16-bit, ISA slots

Category	Specifications
Dimensions (H x W x D)	• P3: 11.0" (280mm) x 13.8" (350mm) x 6.0" (152mm) • P4: 11.0" (280mm) x 13.8" (350mm) x 8.5" (216mm) • P5 and P7: 14" (356mm) x 16" (406mm) x 7" (178mm)
Weight	• P3: 16.2 lbs. (7.3 Kg) • P4: 18.8 lbs. (8.5 Kg) • P5 and P7: 23.8 lbs. (10.8 Kg)

Environmental Specifications

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

Category	Specifications
Operating Temperature:	• 5x86 CPU's: 32 to 122°F (0 to 50°C) ambient air temperature at fan inlet • Pentium CPU's: 32 to 113°F (0 to 45°C) ambient air temperature at fan inlet
Bulb Life:	• Monochrome LCD - 10,000 hours • Electroluminescent (EL) - 10,000 hours • Color STN - 25,000 hours • Color TFT (10.4") - 25,000 hours • Color TFT (13.8") - 10,000 hours
Relative Humidity:	5% to 95% non-condensing
Altitude:	-200ft. to 10,000ft. (-60.96m to 3,048m)
Shock Rating:	• 10g peak, 11ms (operating) • 30g peak, 11ms (non-operating)
Operating Vibration:	0.35mm 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 • P3: 90-250 VAC, 80W max., 50/60 Hz • P4, P5, and P7: 90-250 VAC, 110W max., 50/60 Hz DC Units • P3 - P7: 18-36 VDC in, 110W max.
Power Consumption	AC Units • P3: 80W maximum • P4, P5, and P7: 110W maximum DC Units • P3 - P7: 110W maximum
Fuse Type	AC Units • 3.15A, 250 VAC Little fuse 216.315 or equivalent DC Units • 12A, 250 VAC Little fuse 314.012 or equivalent
ISA Cards	Voltage and current available for expansion cards (either AC or DC Units): • 5x86 CPUs: 2.25A @ +5V, .3A @ -5V; 1.0A @ +/-12V • Pentium CPUs: 2.5A @ +5V, .25A @ -5V; 1.0A @ +12V, .75A @ -12V

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

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

Special note for units with replaceable lithium batteries

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® brand degreaser can cause damage to monitor materials.

Available Connectors

The PowerStation includes the same ports found on most PC's. All Power-Stations have three serial ports, one parallel port, a video port, and a PS/2 port. Some PowerStations also have an Ethernet connector, depending on the type of processor. The following graphic shows a P3 with a 5x86 CPU:

COM 3 RS-232 ———————— Video port

COM 2 RS-232/
RS-422/RS-485 ———————— Ethernet port
COM 1 RS-232
PS/2 port

Parallel port
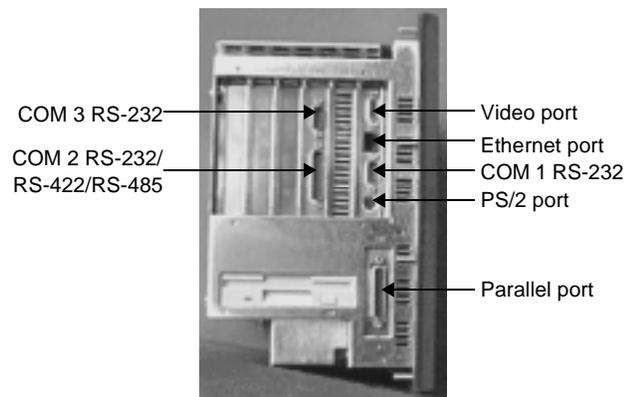
The following graphic shows a P4 with a Pentium CPU:

COM 3 RS-232 — Video port

COM 2 RS-232/
RS-422/RS-485 — COM 1 RS-232

— PS/2 port

— Parallel port
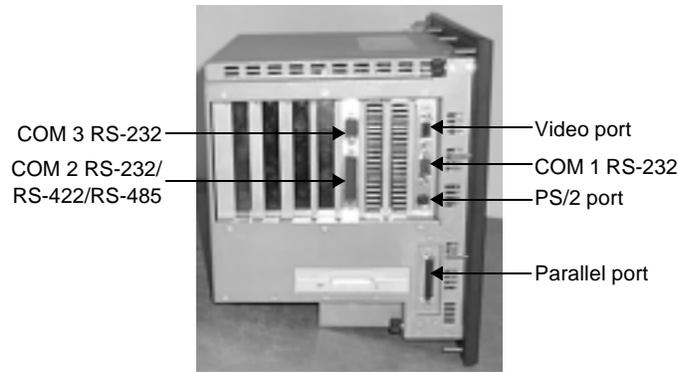
The following graphic shows a P5/P7 with a 5x86 CPU:

COM 3 RS-232 — Video port

— Ethernet port

COM 2 RS-232/
RS-422/RS-485 — COM 1 RS-232

— PS/2 port

Keyboard port — Parallel port
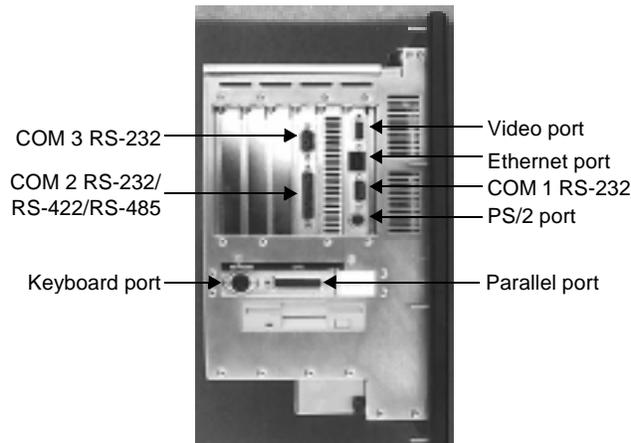
Serial Ports

The PowerStation has three serial ports you can use to communicate with external devices. These ports support baud rates of up to 115 Kbaud. COM2 and COM3 reside on the PowerStation System Support board, while COM1 resides on the CPU board.

Two of the serial ports, COM1 and COM3, are identical and support the RS-232 communication standard. Use a standard DB9 connector for communicating with these ports.

The third 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 DB25 connector for communicating with this port.

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 #	Protocol	Signal Name
1	RS-232/422/485	Chassis ground
2	RS-232	TXD, transmitted data
3	RS-232	RXD, received data
4	RS-232	RTS, request to send
5	RS-232	CTS, clear to send
6	RS-232	DSR
7	RS-232/422	Signal ground
8	RS-232	DCD, data carrier detect
9	N/A	not connected
10	RS-485	485 enable
11	RS-422	CTS+, clear to send +
12	RS-422/485	DTR+, data terminal ready +
13	RS-422/485	422/485 select
14	RS-422/485	TXD+, transmitted data +
15	RS-422/485	TXD-, transmitted data -
16	RS-422/485	RXD+, received data +
17	RS-422/485	RXD-, received data -
18	N/A	not connected
19	N/A	not connected
20	RS-232	DTR, data terminal ready
21	N/A	not connected
22	RS-485	485RTS, 485 request to send
23	RS-422	CTS-, clear to send -
24	RS-422/485	DTR-, data terminal ready -
25	RS-422/485	Signal ground

COM3 pinouts

If you need to make a cable for communicating with COM3, 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

Cable diagrams

The following graphics represent the pinouts and cable diagrams required for communicating with COM2 in RS-232, RS-422, and RS-485 formats. Refer to your CPU manual for pinout information for COM1, the CRT port, and the PS/2 port.
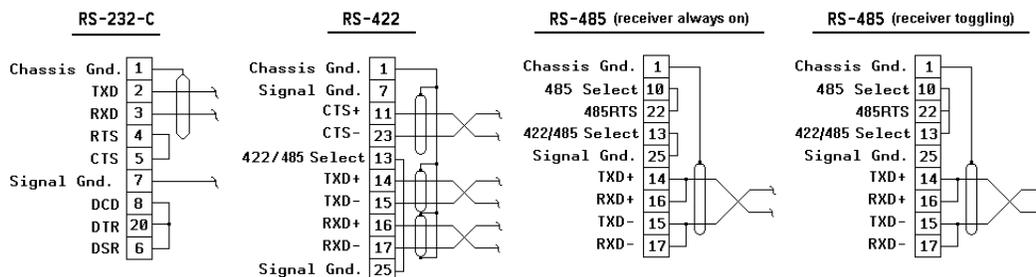
Important   To select RS-422 communications, you MUST tie pin 13 to pin 25. To select RS-485 communications, you MUST either tie pin 13 to pin 25 and pin 10 to pin 22, or tie pins 10, 13, and 22 together. Be careful not to connect any wires to unused connector pins.

Connecting to a PC

To transfer files from a PC to the PowerStation, connect a standard IBM PC null modem cable to an available serial port on the PC. Connect the other end of the cable to an available serial port on the PowerStation. You can construct your own cable, or you can purchase a cable from CTC. If you decide to construct your own cable, refer to the following diagram for the cable pinouts.
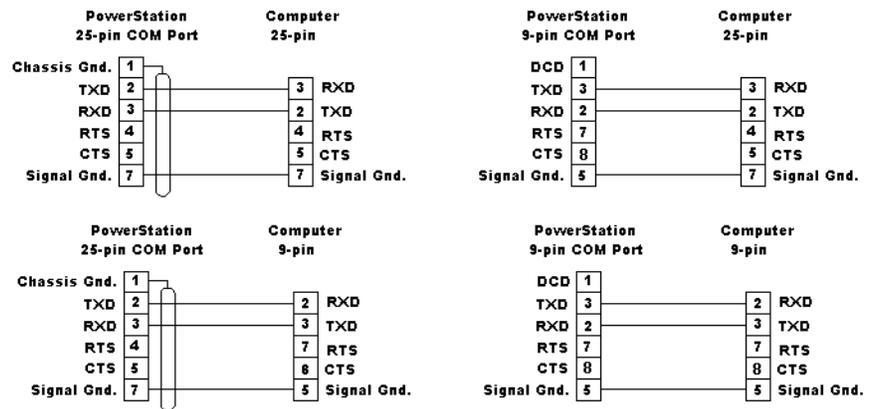
Connecting a serial mouse

If you need to connect a serial mouse to the PowerStation, you must use either COM1 or COM2. If you use COM2, you may need to reconfigure this port to use the RS-232-C protocol. 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-C communications. See *Jumper settings* on page 28 to change the communications protocol for this port. You will also need to use a serial 9 to 25 pin adapter to connect the mouse to the COM2 port.

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.

2. Connect the serial mouse to the port you configured, and reboot the PowerStation.

Connecting to a serial printer

To connect a serial printer to the PowerStation, you must use a printer that communicates at baud rates equal to or less than 115K baud. If you need to configure the ports for any setting other than the default, use your own device driver loaded from the AUTOEXEC.BAT file. Use the following diagram as a reference when connecting a serial printer to the PowerStation. Refer to your serial printer documentation for additional connection information.

```
       PowerStation          Serial Printer
      25-pin COM Port           Connector

Chassis Gnd. | 1 |
       TXD   | 2 |                  | RXD
       RXD   | 3 |                  | TXD
       CTS   | 5 |                  | RTS
 Signal Gnd. | 7 |                  | Signal Gnd.


       PowerStation          Serial Printer
      9-pin COM Port            Connector

       TXD   | 3 |——————————————— | RXD
       RXD   | 2 |——————————————— | TXD
       CTS   | 8 |                  | RTS
 Signal Gnd. | 5 |——————————————— | Signal Gnd.
```
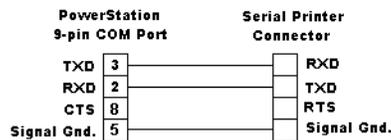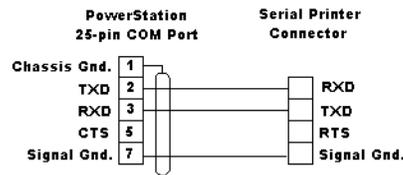
Parallel Port

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

Pin #	Signal Name
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 22 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

Some PowerStation CPU cards have an Ethernet RJ-45 port. Use this port to connect the PowerStation to a Local Area Network. This port is software compatible with NE-1000 and NE-2000 protocols and supports all major network operating systems. Refer to the CPU manual for information about configuring I/O addresses and interrupts.

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 - Use these keys to 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 40 for more information.

- Select Key - Pressing this 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 41 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 a Flash Disk

Drive Letter	Type	Size	Usage
C:	Flash Disk (Read/Write)	4 to 8 MB	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 because it can only accept a limited number of writes.
A:	3.5" Floppy Drive (Read/Write)	1.44 MB	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.

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

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

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

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

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

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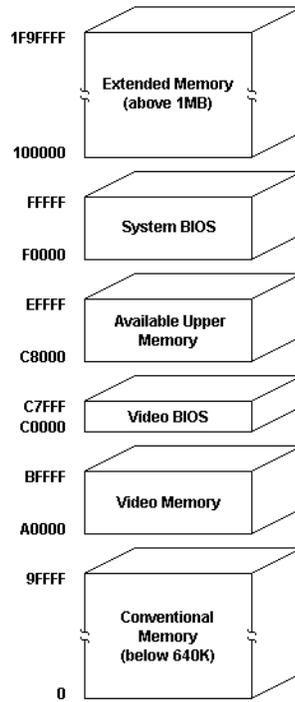
Note   The factory default for the flash card maps from C8000 to CAFFF.

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	4 MB 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 4 MB system can support all modules and drivers.
Flash Memory	4 MB flash memory can store APM, PTM, AMM, plus 4 additional runtime modules, 2 drivers, and approx. 30 screens. Extra modules require more storage (4 modules/MB). Do not use for data logging.	4 MB flash memory 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 1.44 MB floppy drive can be used to store logged data.	The 1.44 MB 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. 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.

> **Note** PowerStations with flash memory use upper memory starting at C800. Contact the CTC Product Technical Support department if you need to use upper memory for specialized adapter cards. Address conflicts may cause improper operation of the unit.

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	
11	COM3*
15	Touch Screen*

The IRQs indicated as blank usage in this table are available for use by any adapter card. 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 four sets of jumpers for configuring the serial ports, touch screen, and flash memory (if available).

JP1

This set of jumpers is used to configure the hardware IRQs for Serial Ports A and B that are found on the PowerStation's System Support card. COM1, which is found on the CPU card is mapped to IRQ4 by default.

By default, these jumpers are set to Serial Port A = IRQ3 and Serial Port B = IRQ11. However, you can map these ports to IRQs 3, 4, 5, 7, 9, 10, 11, or 15.

```
IRQs     3    4    5    7    9    10   11   12   15
Serial B ■    ■    ■    ■    ■    ■   [■]   ■    ■
Serial A[■]   ■    ■    ■    ■    ■   [■]   ■    ■
        [■]   ■    ■    ■    ■    ■    ■    ■    ■
```
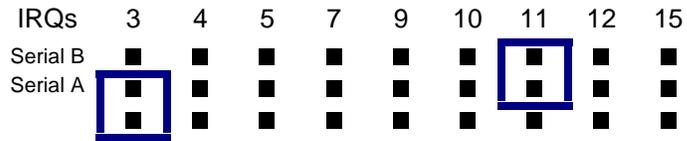
Important   IRQ 12 is used by the PS/2 port. If you intend to use a keyboard and/or a mouse, do not map to this IRQ.

JP3 and JP4

These jumpers allow you to select the address for Serial Port A and B. By default, these jumpers are set to Serial Port A = COM2 and Serial Port B = COM3.

```
Serial Port A              Serial Port B
■ [■  ■]                   [■] ■  [■]
■ [■  ■]                   [■] ■  [■]
A   B  C                    A   B   C
```
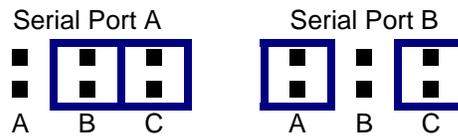
If you need to change the address for a serial port, use the following table to find the desired jumper configuration.

Address	A	B	C
COM1 (3F8)	●	●	●
COM2 (2F8)		●	●
COM3 (3E8)	●		●
COM4 (2E8)			●
Disabled	X	X	

JP2

This set of jumpers is used to configure the hardware IRQs for the touch screen.
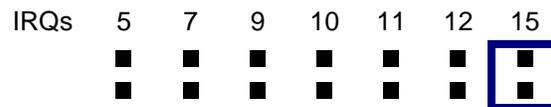
```
IRQs     5    7    9    10   11   12   15
         ■    ■    ■    ■    ■    ■   [■]
         ■    ■    ■    ■    ■    ■   [■]
```

JP5

This set of jumpers is only available on units with flash memory. This
set of jumpers controls where the flash memory appears in memory.
The flash memory uses a 12 Kbyte region of memory starting at the
specified address.

A	B
●	
	●

C8000
D4000   Starting address of mapped (used) region
DC000

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.Interact Design Issues

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

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

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 flash memory 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

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 52 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 37 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.
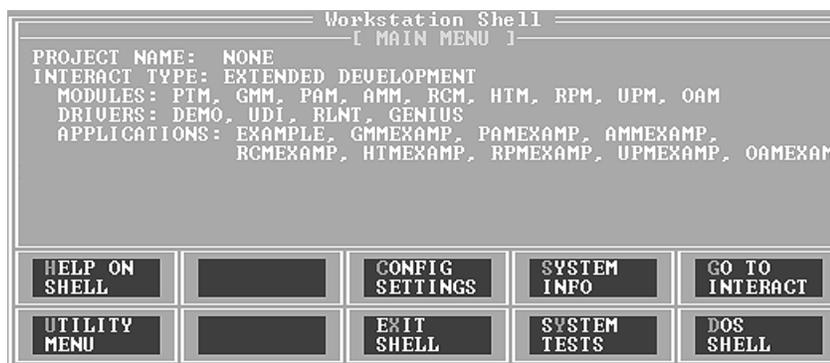
The following items appear on the Shell Main Menu:

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) 1996
            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.

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-adapter cable. You can attach download cables to any COM port, 1 through 3.

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, in order 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 serial boards. The IRQ numbers in the Shell must match the hardware jumper settings for proper operation.

In almost all cases, serial port COM1 uses IRQ4 and COM2 uses IRQ3. There are, however, no standard IRQ assignments for serial ports COM3 and COM4, so these settings must be determined from examining the system hardware configuration.

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.

```
                     Workstation Shell
                 [ CONFIGURATION SETTINGS ]

                      HARDWARE SETTINGS

        POWER ON OPERATION:        S
        MOUSE PORT:                C   DAY:       2
        TOUCHSCREEN:               X   MONTH:     12
        DOWNLOAD ENABLE:           C   YEAR:      1996
        SERIAL PORT IRQS:          4   HOUR:      14
        SYSTEM CLOCK:                  MINUTE:    41
        SET BRIGHTNESS                 SECOND:    59
        SET CONTRAST


    SCREEN                                      PREVIOUS
    CAL                                         MENU
```

The range for each parameter appears below:

DAY	1 - 31	HOUR	0 - 23
MONTH	1 - 12	MINUTE	0 - 59
YEAR	1980 - 2099	SECOND	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:

```
To calibrate the touchscreen:
  - First select option H (Hard calibrate)
  - Then select option 2 (80x25 text mode)
  - Select option 6 (640x480) graphics mode)
  - Finally, select X to exit calibration.
Hit any key to begin calibration...
```

Important   The touch screen calibration utility requires you to use an external keyboard. See *PS/2 Port* on page 21 for more information about connecting a keyboard to the PowerStation.

See *Recalibrating the Touch Screen* on page 52 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.

```
═══════════════════ Workstation Shell ═══════════════════
──────────────[ SYSTEM INFORMATION MENU ]──────────────
Software ID: EX-82289-112
Processor: Pentium
Installed Memory: 16000  Kbytes

Drives:   A:  FLOPPY DISK
          B:  NOT INSTALLED
          C:  HARD DISK        25248 Kbytes free


┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐
│          │ │PORT      │ │          │ │MEMORY    │ │          │
│          │ │USAGE     │ │          │ │MAP       │ │          │
└──────────┘ └──────────┘ └──────────┘ └──────────┘ └──────────┘
┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐
│          │ │          │ │          │ │          │ │PREVIOUS  │
│          │ │          │ │          │ │          │ │MENU      │
└──────────┘ └──────────┘ └──────────┘ └──────────┘ └──────────┘
```

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.
INSTALLED FLASH	This parameter only appears if flash memory is installed in the unit. It indicates the amount of available flash memory in Kbytes.
DRIVES	Lists the type and size of the drives installed on the PowerStation along with the amount of free disk space. The flash memory 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:
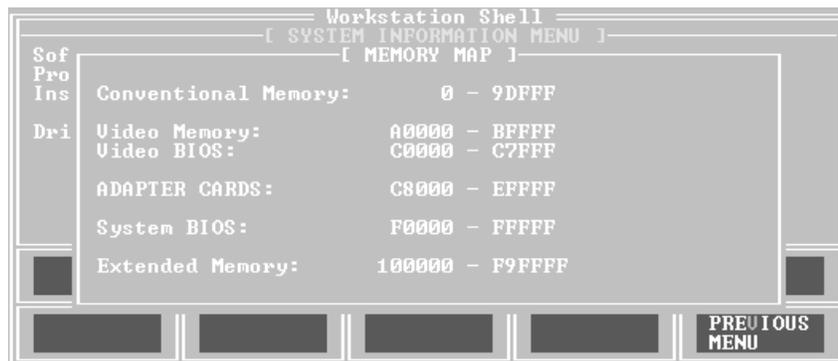
```
═══════════════ Workstation Shell ═══════════════
─────[ SYSTEM INFORMATION MENU ]─────
Sof┌───────────[ WORKSTATION PORTS ]───────────┐
Pro│                                           │
Ins│                                           │
   │                                           │
Dri│    COM 1:     3F8 — 3FF                    │
   │    COM 2:     2F8 — 2FF                    │
   │    COM 3:     3E8 — 3EF                    │
   │    COM 4:     2E8 — 2EF                    │
   │    LPT 1:     378 — 37F                    │
   │    LPT 2:     278 — 27F                    │
   │                                           │
   ■                                           ■
   ┌──────┐ ┌──────┐ ┌──────┐ ┌──────┐ ┌─PREVIOUS─┐
   │      │ │      │ │      │ │      │ │  MENU    │
```
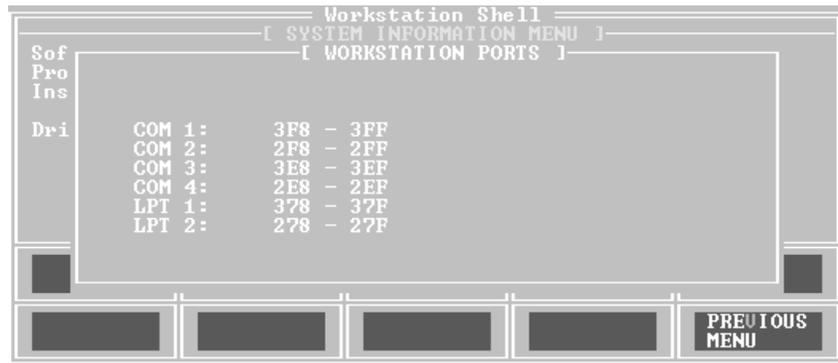
Memory Map

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 Power-Station's memory addresses. See *Adding Adapter Cards* on page 27 for more information.

```
═══════════════ Workstation Shell ═══════════════
─────[ SYSTEM INFORMATION MENU ]─────
Sof┌──────────────[ MEMORY MAP ]──────────────┐
Pro│                                          │
Ins│ Conventional Memory:      0 — 9DFFF       │
   │                                          │
Dri│ Video Memory:        A0000 — BFFFF        │
   │ Video BIOS:          C0000 — C7FFF        │
   │                                          │
   │ ADAPTER CARDS:       C8000 — EFFFF        │
   │                                          │
   │ System BIOS:         F0000 — FFFFF        │
   ■                                          ■
   │ Extended Memory:    100000 — F9FFFF       │
   ┌──────┐ ┌──────┐ ┌──────┐ ┌──────┐ ┌─PREVIOUS─┐
   │      │ │      │ │      │ │      │ │  MENU    │
```

Go To Interact

Select the GO TO INTERACT button to execute Interact from the Shell. Doing so 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 flash memory 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.
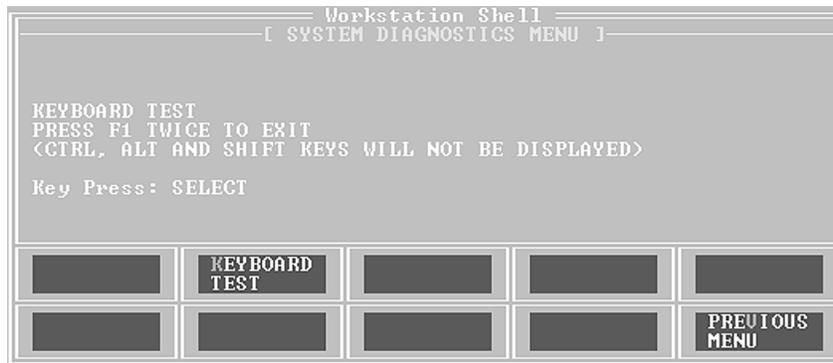
> **Note**   If your PowerStation has a touch screen, upon pressing the display the text string "SELECT" is displayed. Also, pressing the Shift, Ctrl, and Alt keys does not display a text string.

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 formatted flash drive or hard drive. To install the Power-Station 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.

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, the following screen appears prompting you to calibrate the touch screen. Otherwise, you are finished reinstalling the Shell software.

Press any key to enter the touch screen calibration utility, or press the "x" key to perform the calibration at a later time. If you decide to perform the calibration now, the on-screen commands will guide you through the calibration process.

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:

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

```
To calibrate the touchscreen:
  - First select option H (Hard calibrate)
  - Then select option 2 (80x25 text mode)
  - Select option 6 (640x480) graphics mode)
  - Finally, select X to exit calibration.
Hit any key to begin calibration...
```

2. Press any key when you are ready to begin the calibration program.

The following screen appears:

3. Select option H - Hard calibrate, and follow the instructions that appear on the screen.

4. Select option 2 - 80 x 25 text, and follow the instructions that appear on the screen.

5. Select option 6 - 640 x 480 graphics, and follow the instructions that appear on the screen.

6. For P7 units with an XGA display, select option 8- 800 x 600 graphics, and follow the instructions that appear on the screen.

7. For P7 units with an XGA display, select option 9- 1024 x 768 graphics, and follow the instructions that appear on the screen.

8. For any other video modes that you might wish to calibrate, select the appropriate option.

9. Select X to exit the calibration program.

Note Calibration data is stored in the TBCALIB file in the directory specified by the SET TBPATH= statement in the AUTOEXEC.BAT file. If this file is deleted, the touch screen will not work until it is recalibrated.

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

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 that you should 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, replace, or insert cards unless power has been switched to the 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 produce 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 Specification*s 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, it will be necessary to 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 that is 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.

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 crosswise 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 mains 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.
SET TBDPATH=C:\TOUCH	Sets touch screen driver path.
SET TBDINT=61	Sets touch screen driver software interrupt.
C:\TOUCH\TBDRIVER /A:310 /I:15	Initializes touch screen driver.
C:\TOUCH\TBMOUSE1	Initializes mouse emulation for touch screen (DOS).
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\APPFILES	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.

Configuring the Touch Screen Drivers in MS-DOS

The following files are needed to configure the touch screen in MS-DOS:

Command line parameters	Description
C:\TOUCH\TBDRIVER /A:310 / I:15 (See note below)	Initializes touch screen driver.
C:\TOUCH\TBMOUSE1	Initializes mouse emulation for touch screen (DOS).

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 lines.

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 these lines. If you need to permanently disable the touch screen, remove the files TBDRIVER.EXE and TBMOUSE.EXE from your system.

The TBDRIVER accepts the following command line parameters:

- /A:310 - This specifies the port address of the touch screen controller. DO NOT change!

- /I:15 - This specifies the hardware IRQ used by the touch screen controller. The factory default is IRQ15. This must match jumpers on the System Support card.

The following DOS environment variables must be set up in the AUTOEXEC.BAT file for correct touch screen operation.

- SET TBDPATH=C:\TOUCH - Specifies the directory containing touch screen drivers and calibration files. If the touch screen behaves strangely or does not appear to be calibrated, check to make sure this environment variable is set correctly.

Note   Calibration data for the touch screen is stored in a file named TBCALIB, in the directory specified by the TBDPATH environ-ment variable. If the TBCALIB file is erased or corrupted, the touch screen will behave incorrectly, and must be recalibrated.

• SET TBDINT=61 - Specifies the software interrupt number (in hex) used by the touch screen drivers. Make sure that no other system soft-ware (such as Interact, which uses interrupt 60H) uses this interrupt. This value may be set between 60 and 66.

Configuring the Touch Screen Drivers in Windows

If you are using Microsoft Windows 3.x, Windows 95, or Windows NT, you can configure the touch screen drivers using a utility provided by the manufacturer of the touch screen. These utilities are located in the \CTC directory on the PowerStation. When you use the configuration utility, be sure to select the following parameters:

• Select Dynapro-Bus, post version J2LB5 as touch screen type.

• Select 310 as the port address of the touch screen controller.

• Select 15 as the hardware IRQ used by the touch screen controller. This is the factory default. This address must match the jumpers on the System Support card.

Configuring the Ethernet Interface

The \NET directory of the PowerStation's Network Utility Disk contains a configuration utility and all drivers necessary to configure the Ethernet interface on the PowerStation. A list of these files appears below:

File Name	Description
RSET8019.EXE	A configuration utility you can use to change the in-terrupt and address of the Ethernet interface.
NET.BAT	A sample batch file you can use to run NetBIOS.

File Name	Description
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. • COM1: Int 4, I/O 3F8 • COM2: Int 3, I/O 2F8 • COM3: Int 11, I/O 3E8 • Touch Screen: Int 15, I/O 310 CTC recommends that you use the following interrupt and I/O address setting for the Ethernet interface: Int 10, I/O 280H. The Ethernet interface requires 20H bytes for the I/O address (280H to 2A0H).
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 network card to communicate with the 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/nwl11/l11d03.exe

Interact will also communicate over any network or operating system that supports NetBIOS protocols. Examples include Lantastic, TCP-IP, Microsoft, and IBM.

If you need assistance with NetBIOS and networking, contact CTC's Product Technical Support department.See *Product Technical Support* on page 6 for more information.

Using the Utility Disks

PowerStations ship with several disks included in the package. These disks contain various utilities and files you may need from time-to-time. 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		
		3.1	95	NT		3.1	95	NT
IPM KA-82228	X	X	X	X				
Shell Install KA-72451	X	X	X	X				
Windows 3.1X VGA Driver (Pentium) KA-72717		X				X		
Windows 3.1X VGA Driver (486/5x86) KA-72716		X				X		
Windows 95/NT VGA Drivers KA-72670			X	X			X	X
Windows 3.1X Touch-screen Driver KA-82569		X				X		
Windows 95 Touch-screen Driver KA-82570			X				X	
Windows NT Touch-screen Driver KA-72669				X				X
Windows NT Emer-gency Repair Disk KA-72668				X				X
Utilities Disk KA-72463					X	X	X	X
Flash Setup KA-72452	This disk is used on all Flash memory based PowerStations.							

Interact Project Manager KA-82228: This disk is used by all development PowerStations that ship 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 that ship 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, which are already installed on your unit. This disk is provided as a backup copy.

Windows 3.1X 6555X VGA Drivers (For Pentium CPU Boards) KA-72717: This disk is used by Pentium-based PowerStations that use the Windows 3.1 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. Install the files from this disk to the PowerStation only if your VGA drivers become corrupted.

Windows 3.1X 6554X VGA Drivers (For 486 and 5x86 CPU Boards) KA-72716: This disk is used by non-Pentium-based PowerStations that use the Windows 3.1 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. Install the files from this disk to the PowerStation only if your VGA drivers become corrupted.

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.

DOS Touchscreen Driver KA-82576: This disk is for PowerStations that use the DOS operating system. This disk contains files necessary to operate the touch screen in a DOS-based system. 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 3.1X Touchscreen Driver KA-82569: This disk is for Power-Stations that use the Windows 3.1 operating system. This disk contains files necessary to operate the touch screen in Windows 3.1. 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 95 Touchscreen Driver KA-82570: This disk is used by PowerStations that use the Windows 95 operating system. This disk 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-72669: This disk is used by PowerStations that use the Windows NT operating system. This disk 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 is included with all units that do not ship 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.

PowerStation Flash Setup Disk KA-72452: This disk is used by all PowerStations that incorporate flash memory. This disk contains the Flash Setup Utility and all files necessary to format and rebuild the flash drive on your PowerStation if it becomes corrupted. In addition, you will need to run the Flash Setup Utility if you add additional flash memory to your unit. See *Formatting the flash memory* on page 75.

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 flash memory.

Chapter Contents

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.).

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 directory.

2. Start the touch screen calibration program by typing TBCAL.

3. Select option H - Hard calibrate, and follow the screen instructions.

4. Select option 2 - 80 x 25 text, and follow the screen instructions.

5. Select option 6 - 640 x 480 graphics, and follow the screen instructions.

6. Select X to exit the calibration program.

   Note   Calibration data is stored in the TBCALIB file in the directory spec-
             ified by the SET TBPATH= statement in the AUTOEXEC.BAT
             file. If this file is deleted, the touch screen will not work until it is
             recalibrated.

Recalibrating Under Windows 3.x

Follow these steps to recalibrate the touch screen in Windows 3.x:

1. Type Win at the MS-DOS prompt to enter Windows.

2. Select the file TWSETUP.EXE 3.31 using the icon in the Main pro-
   gram group.

3. Select the Calibrate menu from the Touchscreen Driver Setup
   program. Follow the instructions on the display.

4. Select the User Controls menu, and use the settings below to set up the
   User Controls.

Click Time	9
Double Click Speed	900
Sensitivity	2
Stabilization	3
Button Simulation	Left
Sound	Optional

   Note   You can select the Activate new settings button to test the settings.
             Test the settings by pressing the Test button.

5. Choose the User-Defined User Mode 1, then Edit Mode.

6. Use the settings below to set the Button Events in the Set User Defined
   Button Mode window.

Button Event	Currently...
Down 1	Touchdown
Up 1	LiftOff
Down 2	Touchdown
Up 2	LiftOff
Down 3	Touchdown
Up 3	LiftOff

> **Note** You can select the Activate New Button Mode button to test the settings. Test the settings by pressing the Test Button.

7. Return to the File Manager, and select drive A.

8. Run INSTALL.BAT to complete the installation.

Important Enter Windows in the future by typing `Windows`, not `Win`. The setup program has created the WINDOWS.BAT file that will load the correct touch screen drivers prior to entering Windows.

Recalibrating Under Windows 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 folder from the Programs menu.

3. Select the Touchscreen Control icon from the Touch folder to start the Touchscreen Control program.

4. Select the Calibrate button from the Touchscreen Control toolbar.

5. Place your finger on the "X" in the lower left corner, and follow the instructions on the screen.

6. Select OK when finished.

7. Select the User Controls button, and use the settings below to set up the User Controls.

Click Time	9
Double Click Speed	900
Sensitivity	2
Stabilization	3
Button Simulation	Left
Sound	Optional

> **Note** You can select the Apply button to test the settings. Test the settings by pressing the Click or Double Click button in the Test Panel.

8. Select OK when finished.

9. Select Button Modes, and set them to the settings below:

Event	Current Value
Down 1	Touchdown
Up 1	Liftoff
Down 2	Touchdown
Up 2	Liftoff
Down 3	Touchdown
Up 3	Liftoff

Note You can select the Apply button to test the settings. Test the settings by pressing the Click or Double Click button in the Test Panel.

10. Select OK to complete the procedure.

Performing Internal Maintenance

This section includes helpful information for performing internal mainte-nance 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 flash memory

- Remove and replace DRAM

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 precau-tions to protect you and the PowerStation from harm resulting from ESD.

1. To avoid electric shock, always disconnect the power from the Power-Station before you remove the backshell cover or separate the back-shell 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 chang-es. 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.

- See *Adding and Replacing Flash Memory* on page 73
- See *Adding and Replacing DRAM* on page 76

Adding and Replacing Flash Memory

Some PowerStations come equipped with flash memory in place of a hard drive. This section describes how to remove and replace flash memory for these units.

Important The PowerStation uses special flash memory SIMM modules that are available from CTC. Using flash memory modules from a different source will cause unreliable memory storage. Also, CTC cannot guarantee the integrity of backup operations.

Before you begin removing or replacing the flash memory, be sure to back up any important data or Interact projects on the existing flash disk. Refer to the Interact Project Manager User Guide for details on backing up Interact projects.

Removing a flash memory module

The flash memory modules are located on the System Support Card located directly in front of the CPU card as you face the back of the unit. You can also identify the System Support card as the card with the 9-pin and 25-pin D-SUB connectors. The System Support card is shown below:

1. Locate the flash SIMM sockets located in the upper left corner of the System Support Card.
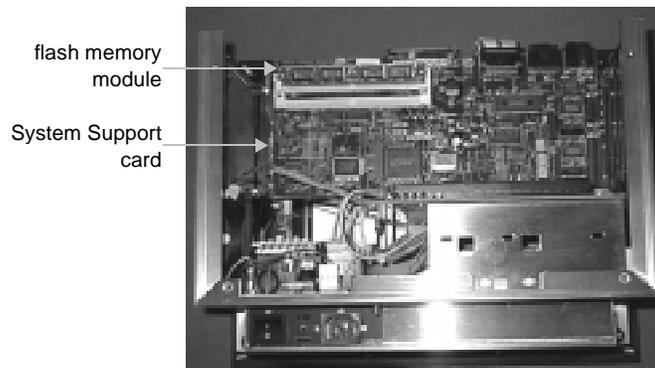
2. Push outward on the socket ejectors. It might be necessary to use a small screwdriver or the tip of a pen to push on the ejectors.

3. Gently flip the flash memory module upright from the 45-degree an-gle.

4. Pull the flash memory module outward to remove. Place the flash memory module on an anti-static surface.

Installing a flash memory module

The steps to installing a flash memory module are the reverse of removing a module. Follow these steps to install a flash memory module:

1. Insert the flash memory module into the SIMM socket aligning the notches in the memory module with the ridges in the socket. Refer to the picture below:

tabs of SIMM socket fit these holes

ridges of SIMM socket fit these notches
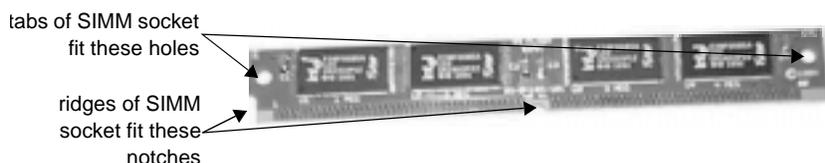
2. Gently push the module down to a 45 degree angle until the tabs on the socket snap onto the flash memory module. Make sure the socket ejectors are holding the flash memory module in place.

Setting the flash memory jumpers

Like most PCs, the PowerStation uses jumpers to set addresses and enable or disable various functions of the system. The PowerStation has four sets of jumpers for configuring the serial ports, touch screen, and flash memory (if available). See *Jumper settings* on page 28 for a complete list of jumper settings. The jumper settings for the flash memory are shown below.

JP5

This set of jumpers is only available on units with flash memory. This set of jumpers controls where the flash memory appears in memory. The flash memory uses a 12 Kbyte region of memory starting at the specified address.

A	B
●	
	●

C8000   Starting address of mapped
D4000   (used) region
DC000

Formatting the flash memory

PowerStations equipped with flash memory include a setup utility for formatting the flash memory. If the flash memory becomes corrupted or you install new flash memory, you must format the flash memory using the flash setup disk. This format procedure will erase all data on the module.

Important   DO NOT use the PowerStation's DOS Format command to format the flash memory.

1. Insert the flash setup disk into the PowerStation's floppy drive.

2. Power up the PowerStation.

3. Select option 2 from the Startup Menu, and press Enter to begin the flash memory test.

Important   The flash memory test erases the flash memory prior to testing the capabilities of the flash memory. Be sure to back up any important data stored on the module before you begin the flash memory test.

4. Press <Y> to continue with the flash memory test when the warning message appears.

5. Press any key to reboot the PowerStation when the test is complete.

6. Select option 1 from the Startup Menu, and press Enter to format the flash memory and make it bootable. The setup utility copies the most common DOS commands onto the flash memory.

7. When the flash memory preparation is complete, remove the flash set-up disk. Failure to remove the disk will restart the cycle when you re-boot the PowerStation.

8. Press any key to reboot the PowerStation. The flash memory becomes drive C.

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 the System Support card

The PowerStation's DRAM is located on the CPU card, behind the System Support card. You can identify the System Support card as the card with the 9-pin and 25-pin D-SUB connectors. The System Support card is shown below:
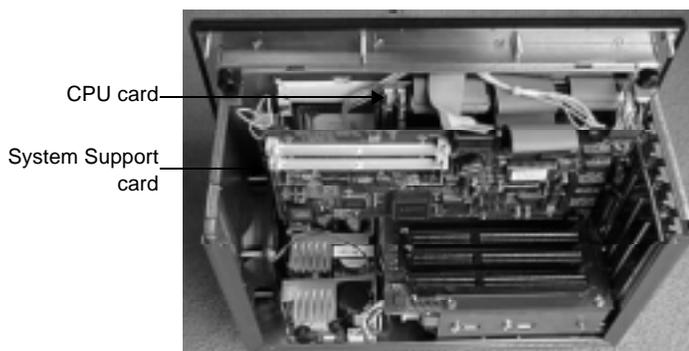
To add or replace DRAM you must remove the System Support card. Follow these steps to remove the System Support card.

1. Disconnect the cables from the top of the System Support card.

2. Remove the screw that secures the System Support card to the unit.

3. Remove the System Support card by carefully pulling up on the card.

    Note   If necessary, remove any other cards that will give you additional room to access the CPU card.

4. Place the System Support card (and any other cards removed) on a clean and static-free work surface. If possible, place the cards in anti-static bags until you are ready to reassemble the unit.

Removing a DRAM module

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

1. Locate the DRAM SIMM socket(s) located on the left side of the CPU card. The number of SIMM sockets varies depending on the PowerStation model and the manufacturer of the CPU card.
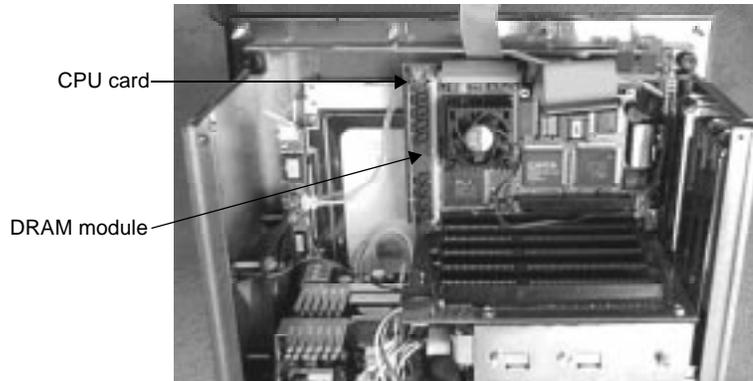
2. Push outward on the socket ejectors. It might be necessary to use a small screwdriver or the tip of a pen to push on the ejectors.

3. Tilt the DRAM module slightly to the left (away from the fan on the CPU card), and lift the module out of its socket at an angle.

4. 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.
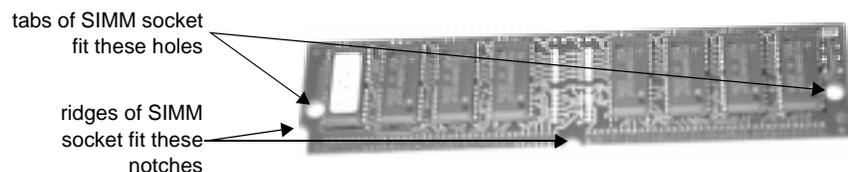
2. Gently but firmly push the module upright into the socket until the metal clips snap into place securing the module.

Reinstalling the System Support card

1. Place the System Support card in its slot (J3), and gently but firmly push down on the card until it is fully seated.

2. Replace the screw that secures the System Support card to the unit.

3. Reinstall any other cards removed, and secure them to the unit.

4. Reattach the cables to the System Support card.

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.

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.

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-
fully,
REM and NOMOUSE will do nothing.  If external mouse is not found,
MOUSE
REM will fail, and NOMOUSE will successfully load.
REM *******************************************************
LH C:\CTC\MOUSE
LH C:\CTC\NOMOUSE
REM *******************************************************
REM Install TouchBase touchscreen drivers
REM *******************************************************
SET TBDPATH=C:\TOUCH
SET TBDINT=61
```

```
LH C:\TOUCH\TBDRIVER /A:310 /I:15
LH C:\TOUCH\TBMOUSE 1
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 following lines only appear on PowerStations without Interact.

```
REM ********************************************************
REM Load for Windows 3.1 only, not for Windows95
REM ********************************************************
Windows
```

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 con-nected. 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 follow-ing 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 problems and solutions that may occur after you power up the PowerStation. This section is divided into three sub-sections, one for touch screen problems, one for Interact problems, and one for other problems.

Each section lists some possible problems and solutions 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 problems and solutions 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 71 to recalibrate the touch screen.

3. Check the AUTOEXEC.BAT file. See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 79 for more information.

    a. Verify that the following lines appear before the lines that load touch screen driver:
        ```
        LH C:\CTC\MOUSE
        LH C:\CTC\NOMOUSE
        ```
    b. Verify that the touch screen drivers are being loaded. Look for the following lines:
        ```
        SET TBDPATH=C:\TOUCH
        SET TBDINT=61
        LH C:\TOUCH\TBDRIVER /A:310 /I:15
        LH C:\TOUCH\TBMOUSE 1
        ```

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 =310H, IRQ = 15.

6. Recalibrate the touch screen. See *Performing Internal Maintenance* on page 71 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 flash memory, make sure that the memory region used by the flash memory (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 19 for information on how 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 79 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 62 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 79 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, COM3:11.

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 flash memory, 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 Power-Station, 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 48 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 30 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.

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