5x86 Third Serial Port Installation

Introduction

This document explains how to add a third serial port to P3, P4, P5, or P7 PowerStations that have a 5x86 CPU card. It includes instructions for opening the PowerStation, reconfiguring the System Support card, establishing communication for COM2 on the CPU card, reinstalling the System Support card, installing the third COM port, closing the PowerStation, enabling COM2 during startup, reconfiguring the PowerStation's touchscreen, and having Windows® detect the new serial port.

Warning   You must observe normal precautions against electrostatic discharge to prevent damage to the PowerStation.

## Electrostatic Discharge Precautions

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

1. To avoid electric shock, always disconnect power from the PowerStation before you remove the back cover. Do not touch any components of the CPU card or other cards while the PowerStation is on.

2. Disconnect power before making any hardware configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

3. Only handle internal components in an ESD-safe location, using appropriate grounding methods.

4. Always ground yourself to remove any static charge before you touch the CPU card.

5. Be particularly careful not to touch the chip connectors.

6. 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.

7. Wear a grounding wrist strap for continuous protection.

Before You Start

Be sure you have the following tools:

- Keyboard (If you have a P3 or P4 PowerStation, you will also need a Y cable.)

- Flat-head and Phillips screwdrivers

- Needlenose pliers

8. Third COM Port Upgrade Kit (including the serial tang cable assembly pictured below)
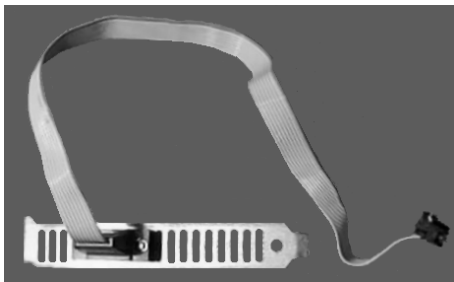
Open the PowerStation

In order to add a third serial port to the PowerStation, you must open the unit.

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

To open the PowerStation, complete the following steps:

1. Turn off the PowerStation.

2. Disconnect the unit from the power source.

3. Remove the PowerStation from its enclosure (if previously installed).

   Consult your *PowerStation User Guide* if you need help with this removal.

4. Remove the back cover from the unit by removing the screws that secure the cover.

5. Remove the Compact Flash (CF) card.

Important   Always make sure power to the PowerStation is turned off when removing the CF card.

Reconfigure the System Support Card

The first step in adding a third serial port to the PowerStation is to reconfigure the System Support card. The following sections explain how to do this, including instructions for disconnecting cables from the System Support card, and removing and reconfiguring the card.

Disconnect the Cables

Before you can remove and reconfigure the System Support card, you must first disconnect some cables that are attached to the card. Use the illustration below to find the cables and other components mentioned in the following steps.


Serial cable

Video cable

Wide ribbon cable

Backlight cable (P6)

Touchscreen cable (P5)
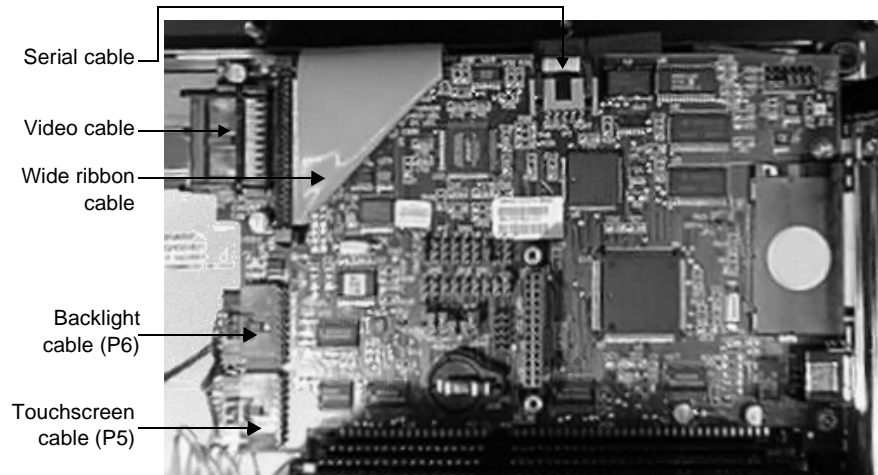
To disconnect the cables, complete the following steps:

1. Press out the locking ears to disconnect the video and wide ribbon cables.

   The video cable connects at the top left corner of the card. The wide ribbon cable connects very close to the other video cable.

2. Lift the locking ears to disconnect the serial cable from the top center of the System Support card.

3. Disconnect the backlight cable (P6) by depressing the latch on top of the connection and sliding the connector out.

4. Disconnect the touchscreen cable (P5) by depressing the latch on top of the connection and sliding the connector out.

Remove the System Support Card

Once you have disconnected the cables from the System Support card, you can remove the card. Use the illustration below to find the components mentioned in the following steps.
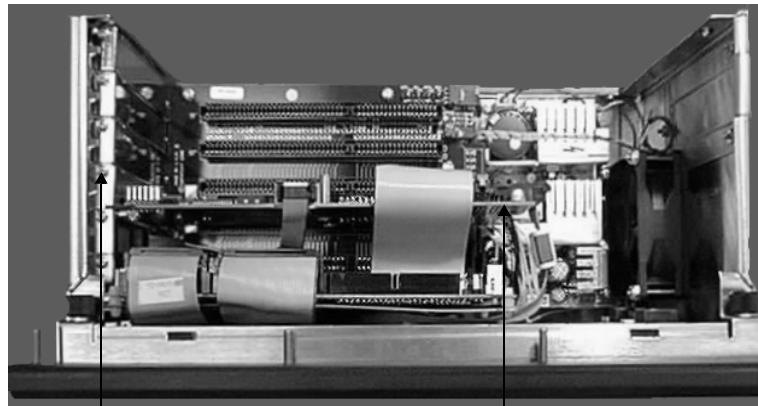
Tang screw   System Support card

To remove the System Support card, complete the following steps:

1. Remove the tang screw from the System Support card tang.

2. Carefully pull out the System Support card and lay it to the side.

Important Be careful to observe ESD guidelines when handling the System Support card.
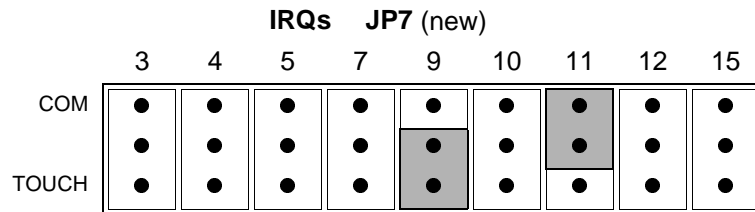
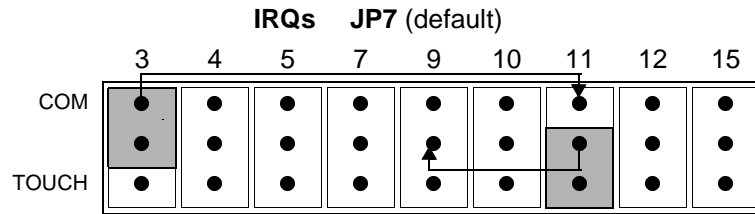# Reconfigure the System Support Card

After you have removed the System Support card from the Power-Station, you are ready to reconfigure the card.

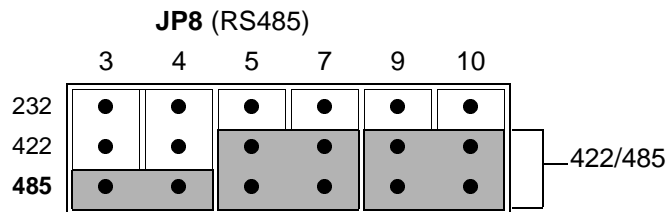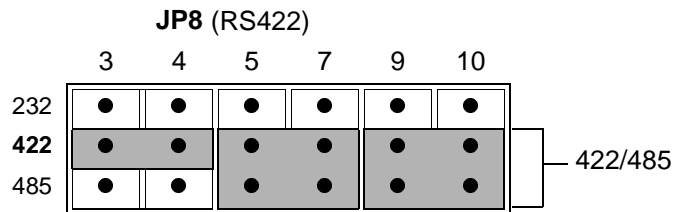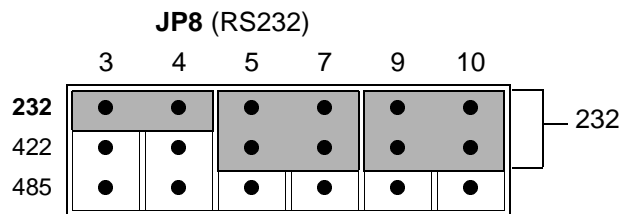**To reconfigure the System Support card, complete the following steps:**

1. On the System Support card, find the IRQ jumpers JP7 and the jumpers JP8, JP9, and JP11, as shown below.
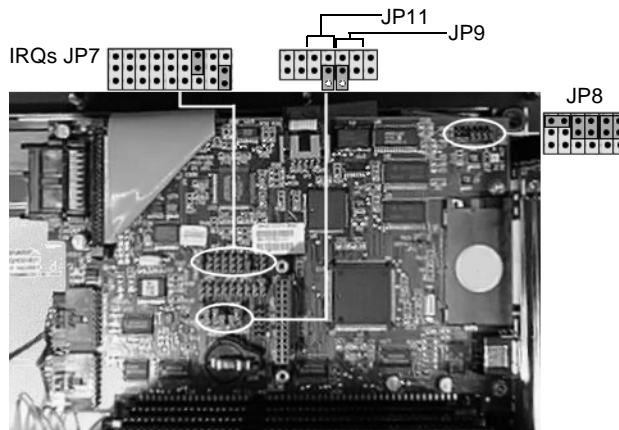
2. Move the COM jumper at IRQ 3 to IRQ 11 and the TOUCH jumper at IRQ 11 to IRQ 9, as shown below.

IRQs **JP7** (default)

	3	4	5	7	9	10	11	12	15

COM

TOUCH

IRQs **JP7** (new)

	3	4	5	7	9	10	11	12	15

COM

TOUCH

3. Change jumper JP8 according to the RS setting you need.

JP8 (RS232)

	3	4	5	7	9	10	
232							232
422							
485							

JP8 (RS422)

	3	4	5	7	9	10	
232							
422							422/485
485							

JP8 (RS485)

	3	4	5	7	9	10	
232							
422							422/485
485							

4. Change jumper JP9-A from Off To On, and jumper JP9-B from On To Off.

Default | New
(A-Off) 2F8h | (A-On) 3E8h
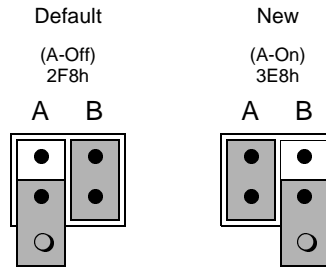
Making these changes sets the System Support card to COM3.

5. Change jumper JP11-B from Off to On.

Default | New
| (B-On) 2E8h
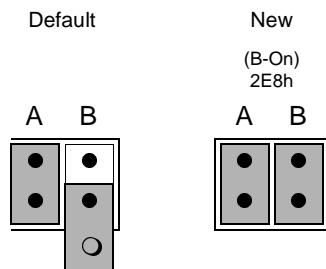
Making this change sets the touchscreen to COM4.

Establish Communication for COM2 on the CPU Card

The next step in adding a third serial port to the PowerStation is to establish communication for COM2 on the CPU card. To do this, you may need to change jumper settings (if you need to change the interface to RS422 or RS485 communication). Then you will connect the 9-pin COM2 cable to the CPU card.

Change Jumper Settings (if required)

Perform this step **only** if you need to change the interface to RS422 or RS485 communication.

Important You do **not** need to remove the CPU card from the back-plane to complete this step.

**To change jumper settings, complete the following steps:**

1. Gently lay the unit face down to enable easy access to the CPU card.

2. Use the needlenose pliers to set jumpers JP35, JP36, JP37, JP38, and JP39.

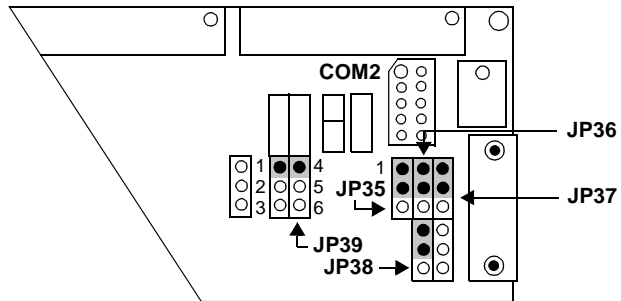   Use the following cut-away diagrams to determine the exact locations and settings for these jumpers.

   RS232 Configuration (Default)
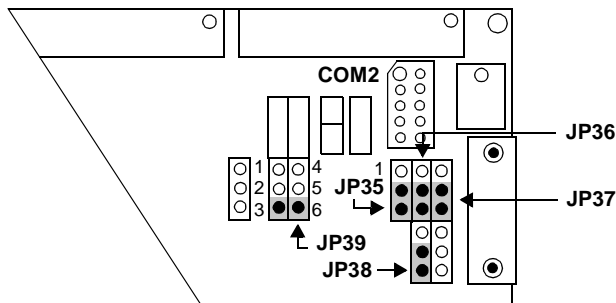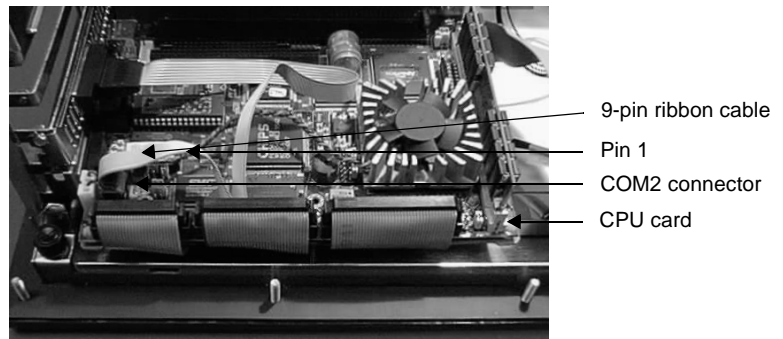

   RS422 Configuration

CTC Parker Automation
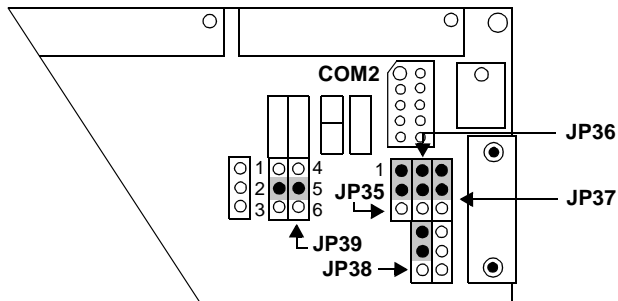
RS485 Configuration

Connect the 9-pin COM2 Cable to the CPU

Connect the 9-pin ribbon cable attached to the vented tang to the COM2 connector of the CPU card, as shown below.


9-pin ribbon cable
Pin 1
COM2 connector
CPU card

Important   Be sure that pin 1 is on the outer edge of the CPU card, toward the top of the PowerStation, or the connection will not function properly.

Reinstall the System Support Card

After you have reconfigured the System Support card and established communication for COM2 on the CPU card, reinstall the System Support card in the PowerStation.

To reinstall the System Support card, complete the following steps:

1. Slide the System Support card back into its slot in the Power-Station.

2. Reconnect the touchscreen and backlight cables to the System Support card, as shown in the illustration below.

3. Reconnect the video cable and wide ribbon cable to the System Support card, as shown in the illustration below.

4. Attach the card to the PowerStation with the tang screw.
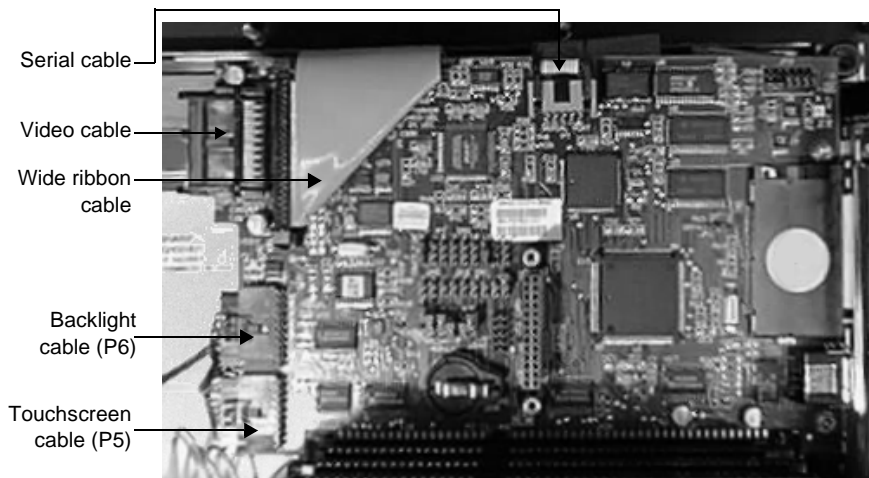
Install the Third COM Port (COM3)

After you have reinstalled the reconfigured System Support card, you are ready to install the third COM port (COM3) on your PowerStation.

To install the third COM port, complete the following steps:

1. Insert the new serial tang (from the Third COM Port Upgrade Kit) into the next available slot, as shown in the illustration below.

New serial tang

9-pin ribbon cable

System Support card
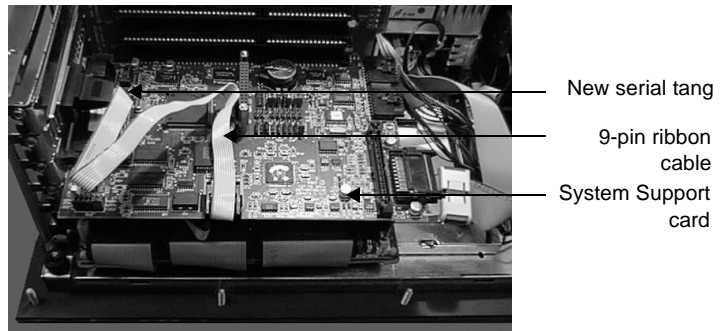
    Note   You may need to remove a blank cover if an insertion slot is not available for the new serial tang.

2. Attach the 9-pin ribbon cable from the new serial tang to the System Support card, as shown in the preceding illustration.

Close the PowerStation

After you have established COM2 on the CPU card and installed the reconfigured System Support card and the third COM port, close the PowerStation.

In order to close the PowerStation, complete the following steps:

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

Important   Make sure that the PowerStation is turned off when you insert the CF card.

2. Replace the back cover on the PowerStation and fasten the screws that you removed in step 4 of *Open the PowerStation* on page 3.

3. Reconnect the PowerStation to the power source.

Enable COM2 During System Startup

Before the PowerStation can use the new COM2 port, you must enable the port.

To enable COM2 during startup, complete the following steps:

1. Turn the PowerStation on.

2. While the system is starting up, press the Delete key during the memory test to enter the CMOS setup utility.

3. From the CMOS setup utility main menu, select Chipset Features Setup; then press Enter.

4. Press the arrow up or arrow down key to highlight Onboard UART 2.

5. Press the Page Up key to select 2F8/IRQ3.

6. Press Esc to save and return to the main menu.

7. Highlight Save & Exit Setup; then press Enter.

8. Press Y at the Save to CMOS and Exit prompt; then press Enter.

Reconfigure the Touchscreen

The final step in adding a third serial port to your PowerStation is to reconfigure the touchscreen. You must do this because the COM port for the touchscreen has now changed from COM3 to COM4. You can calibrate the touchscreen in MS-DOS mode by running the touchscreen configuration utility from the Machine-Shop Shell. If you are running Windows on your PowerStation, you can reconfigure the touchscreen by running the Touch Screen Utilities program in Windows. If you use both MS-DOS and Windows operating systems, you must reconfigure the touchscreen in both DOS and Windows. Instructions for both procedures follow.

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

Reconfiguring the Touchscreen under MS-DOS
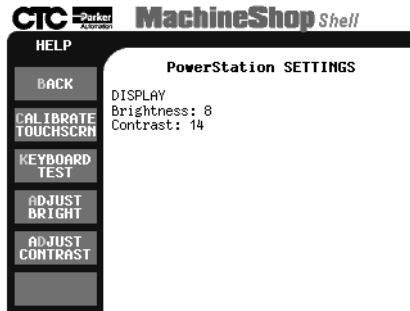
To reconfigure the touchscreen from the MachineShop Shell, complete the following steps:

1. From the MachineShop Shell Main Menu, click Settings.

    The Settings submenu will appear as shown below.
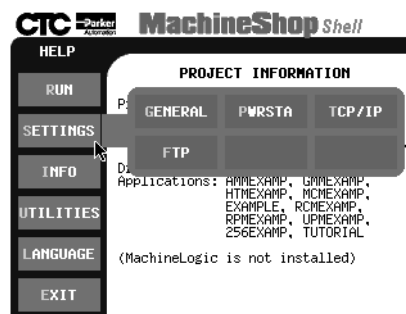
2. From the Settings submenu, click the PWRSTA button.

   The PowerStation Settings screen will appear as shown below.

3. Click the Calibrate Touchscreen button

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

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

   The following screen will appear.

5. Press any key when you are ready to continue.

    The following screen will appear.

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

     Calibration
     Display
     Touchsurround
     Buttons
     Interface
     eXit

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

6. Press I for Interface.

    The following Interface Configuration Options screen will
    appear.

```
    Interface Configuration Options

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

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

7. Press 4 to Set COM4.

8. Press I to change the interrupt.

9. Press 4 to Set IRQ9(2), then enter IRQ9.

10. Verify that the address reads 2E8h.

11. Press O to save the new settings.

12. Press the Esc key or X to exit the TOUCHCFG.EXE utility.

13. Restart the PowerStation.

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

The third serial port to your PowerStation has been successfully
installed. You can now use this port to communicate with external
devices.

Reconfiguring the Touchscreen under Windows

If you run Microsoft Windows 95, 98, or NT on your PowerStation, you must configure the touchscreen under Windows.

To reconfigure the touchscreen under Windows, complete the following steps:

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

   The Configuration application will launch.

2. Press the Tab key to highlight the Interface button.

3. Press Enter.

4. Press the Tab key to highlight the Interrupt drop-down box.

5. Press the arrow up or arrow down keys until IRQ9 is highlighted.

6. Press the Tab key to highlight the Address drop-down box.

7. Press the arrow up or arrow down keys until 2E8h is highlighted.

8. Verify that the COM Port reads Custom.

9. Press the Tab key until the OK button is highlighted.

10. Press OK or Enter.

11. Press Enter again.

12. Exit the Touch Screen Utilities.

13. Restart the PowerStation.

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

Recalibrating the Touchscreen

After reconfiguring the touchscreen, you must also recalibrate it. You can calibrate the touchscreen in MS-DOS mode from the MachineShop Shell or under Windows 95, 98, or NT. If you use both DOS and Windows operating systems, you must recalibrate

the touchscreen in both DOS and Windows. Instructions for both procedures follow.

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

Recalibrating the Touchscreen under MS-DOS

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

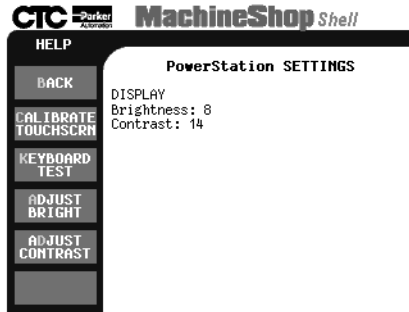**To calibrate the touchscreen, complete the following steps:**

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

   The Settings submenu will appear as shown at the top of the next page.
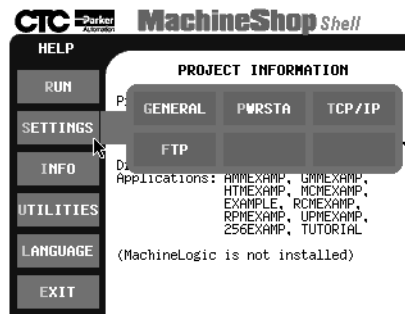
2. On the Settings submenu, press the PWRSTA button.

   The PowerStation Settings menu will appear, as shown at the top of the next page.

3. On the PowerStation Settings submenu, press the Calibrate Touchscreen button.

   You will be prompted that a keyboard is needed to calibrate the touchscreen. Then you will be asked if you want to continue.

4. If necessary, install a keyboard on the PowerStation. See your *PowerStation User Manual* for information about connecting a keyboard to the PowerStation.

5. When you have attached a keyboard to the PowerStation, press the Yes button to continue the calibration.

   The following screen will appear.

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

   The following screen will appear:

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

     Calibration
     Display
     Touchsurround
     Buttons
     Interface
     eXit

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

7. Type C for Calibration.

   When the next screen appears, you will be calibrating video mode 80 x 25 Text (2,3).

8. Type C again for Calibrate.

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

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

10. When the new screen appears, press V to select a new video mode.

11. When the next screen appears, type 0 for 640 x 480 16 color Graphics mode.

12. Press Enter.

13. When the next screen appears, type C for Calibrate.

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

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

15. When the new screen appears, type V for video mode.

16. When the next screen appears, type 11 for 640 x 480 256 color Graphics mode.

17. Press Enter.

18. When the next screen appears, type C for Calibrate.

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

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

20. When the new screen appears, type O for OK.

21. Press Escape or X to exit the calibration utility.

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

Recalibrating the Touchscreen under Windows

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

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

   The Touchscreen Utilities window will open.

2. In the Touchscreen Utilities window, click Configuration.

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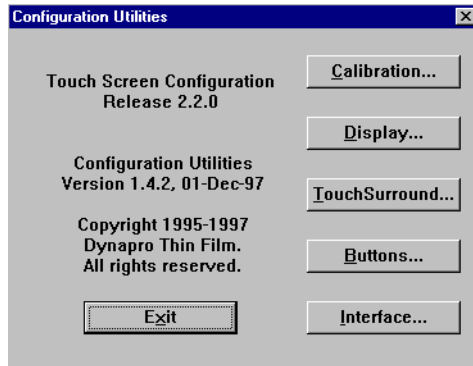
3. In the Configuration Utilities dialog box, click the Calibration button.

   The Calibration dialog box will appear.

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

5. Place your finger on the target in the upper left corner of the screen and follow the instructions on the screen.

6. Select Exit when you are finished.

Let Windows Detect the New Serial Port

If you are running Windows 95, 98, or NT, it is best to let Windows automatically detect the new serial port when you start up your system.

In order to enable Windows to detect the new serial port, complete the following steps when you restart the PowerStation:

1. On the Windows taskbar, click Start and then click Settings.

2. On the Setting submenu, click Control Panel.

   The Control Panel window will open.

3. In the Control Panel window, click Add New Hardware.

   The Add New Hardware Wizard dialog box will appear.

4. In the Add New Hardware Wizard, click Next.

   Another dialog box, shown at the top of the next page, will appear telling you that Windows will detect your new hardware and asking if you want to continue.

5. Select Yes and click Next.

    Windows will detect the new serial port.

Your third serial port is now installed, configured, and ready to communicate with external devices.