ELECRAFT® P3

HIGH-PERFORMANCE PANADAPTER

P3SVGA OPTION INSTALLATION AND OPERATING INSTRUCTIONS

Revision D, September 30, 2012

Contents

Introduction

The P3SVGA Super Video Graphics Array option adds wide screen display capability to the P3 with enhanced data terminal operations that permits sending text from a keyboard attached to the P3, storing messages in memory that may be recalled with a simple keystroke, and transmitting a stored message at regular intervals. The P3SVGA features a dedicated, high-speed Fast Fourier Transform (FFT) processor that performs a 2048 point FFT in parallel with the P3's existing processor for a much higher frequency resolution per dot on the larger screen. The P3SVGA also includes an interface for a future USB option that will permit direct digital mode operation via the K3 and P3 with data display on the P3 and P3SVGA screens.

The P3SVGA adds three connectors to the P3 rear panel: KEYBOARD, EXT. DISPLAY and AUX DATA. Only the KEYBOARD and EXT. DISPLAY connectors are active at this time. The AUX DATA connector is reserved for future use.

The P3SVGA supports the following video resolutions:

1024	X	768	For faster screen updates when using fixed tune mode, we recommend setting the P3SVGA resolution to 1440 x 900 or less. Note that 1440 x 900 will display correctly on 1920 x 1080 monitors.
1280	X	1024	
1440	X	900	
1920	X	1080	

The P3SVGA is a single-plug in board (see Figure 1). Only a few basic hand tools are needed (see pg 12) to perform the installation. No soldering or wiring is required.
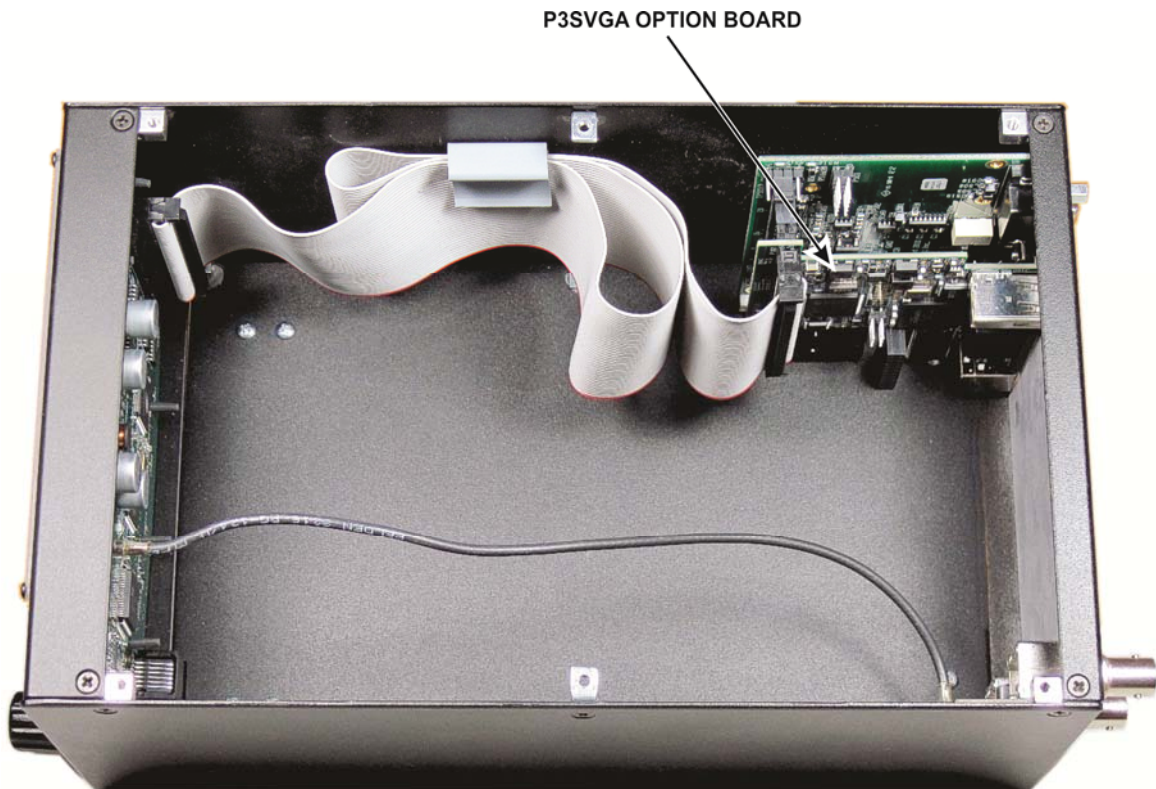
Figure 1. P3SVGA Board Installed (P3 Top Cover Removed).

Customer Service and Support

Technical Assistance

You can send e-mail to **k3support@elecraft.com** and we will respond quickly – typically the same day Monday through Friday. If you need replacement parts, send an e-mail to **parts@elecraft.com**. Telephone assistance is available from 9 A.M. to 5 P.M. Pacific time (weekdays only) at 831-763-4211. Please use e-mail rather than calling when possible since this gives us a written record of the details of your problem and allows us to handle a larger number of requests each day.

Repair / Alignment Service

If necessary, you may return your Elecraft product to us for repair or alignment. (Note: We offer unlimited email and phone support, so please try that route first as we can usually help you find the problem quickly.)

IMPORTANT: You must contact Elecraft before mailing your product to obtain authorization for the return, what address to ship it to and current information on repair fees and turnaround times. (Frequently we can determine the cause of your problem and save you the trouble of shipping it back to us.) Our repair location is different from our factory location in Aptos. We will give you the address to ship your kit to at the time of repair authorization. *Packages shipped to Aptos without authorization will incur an additional shipping charge for reshipment from Aptos to our repair depot.*

Elecraft 1-Year Limited Warranty

This warranty is effective as of the date of first consumer purchase (or if shipped from the factory, the date the product is shipped to the customer). It covers both our kits and fully assembled products. For kits, before requesting warranty service, you should fully complete the assembly, carefully following all instructions in the manual.

Who is covered: This warranty covers the original owner of the Elecraft product as disclosed to Elecraft at the time of order. Elecraft products transferred by the purchaser to a third party, either by sale, gift, or other method, who is not disclosed to Elecraft at the time of original order, are not covered by this warranty. If the Elecraft product is being bought indirectly for a third party, the third party's name and address must be provided at time of order to ensure warranty coverage.

What is covered: During the first year after date of purchase, Elecraft will replace defective or missing parts free of charge (post-paid). We will also correct any malfunction to kits or assembled units caused by defective parts and materials. Purchaser pays inbound shipping to us for warranty repair; we pay shipping to return the repaired equipment to you by UPS ground service or equivalent to the continental USA and Canada. For Alaska, Hawaii, and other destinations outside the U.S. and Canada, actual return shipping cost is paid by the owner.

What is not covered: This warranty does not cover correction of kit assembly errors. It also does not cover misalignment; repair of damage caused by misuse, negligence, battery leakage or corrosion, or builder modifications; or any performance malfunctions involving non-Elecraft accessory equipment. The use of acid-core solder, water-soluble flux solder, or any corrosive or conductive flux or solvent will void this warranty in its entirety. Also not covered is reimbursement for loss of use, inconvenience, customer assembly or alignment time, or cost of unauthorized service.

Limitation of incidental or consequential damages: This warranty does not extend to non-Elecraft equipment or components used in conjunction with our products. Any such repair or replacement is the responsibility of the customer. Elecraft will not be liable for any special, indirect, incidental or consequential damages, including but not limited to any loss of business or profits.

Operation

Connections

Power

Connect the P3 directly to a 10 to 15 VDC power source capable of providing at least 700 mA. You may use the K3 12VDC OUT power connector if it is labeled 1.0 A MAX SWITCHED. Older K3's were limited to 500 mA, which is adequate to power the P3 without the SVGA, but not the P3 with the SVGA option enabled. If your K3's 12VDC OUT is limited to 500 mA, you can install, or have Elecraft install, the K3 12V Output Current Modification kit to increase the current available to 1 Ampere. Order the K312MDKT.

Monitor

Connect your SVGA monitor to the EXT. DISPLAY connector on the P3 rear panel.

Keyboard

Most PC keyboards using an USB connection will work with the P3 SVGA. Apple keyboards are not supported at this time. Plug the keyboard into the KEYBOARD connector on the P3 rear panel.

Firmware

Your P3 must have firmware version 1.20 or later and the SVGA must have firmware version 1.10 or later installed. To check the firmware versions, turn the P3 on, tap MENU and then turn the ↻SELECT knob to *FW Rev*. The current P3 firmware revision is shown on the P3's internal screen. Turn the ↻SELECT knob to *SVGA menu*, and then tap it again to enter the SVGA sub menu. Turn the ↻SELECT knob to *SVGA FW* and tap the knob again to display the revision of the SVGA firmware installed.

If needed, see *Firmware Upgrades* in your P3 Owner's Manual for information on how upgrade your firmware.

Display Setup

Tap MENU and then turn the ↻SELECT knob to SVGA menu. Tap the ↻ SELECT knob enter the sub-menu.

SVGA Display On/Off

The external display is activated automatically when the P3 is turned on. You can turn the external display off or on from the SVGA sub-menu. In the SVGA sub-menu, turn the ↻SELECT knob to SVGA en and then tap the ↻SELECT knob again to toggle between *SVGA on* and *SVGA off*.

SVGA Firmware Version

In the SVGA sub-menu, turn the ↻SELECT knob to SVGA FW and then tap the ↻SELECT knob again to display the installed SVGA firmware version.

Set Resolution

In the SVGA sub-menu, turn the ↻SELECT knob to *SVGA res* and then tap the ↻ SELECT knob again. Turn the ↻SELECT knob to select the desired resolution.

Spectrum Display Fill

This setting fills the space below the spectrum line or leaves it open (see Figure 2). It does not have any effect on the waterfall display or the spectrum display on the P3's internal screen. In the SVGA sub-menu, turn the ⟳**SELECT** knob to *SVGA fill* then tap the ⟳**SELECT** knob to toggle the fill on or off.
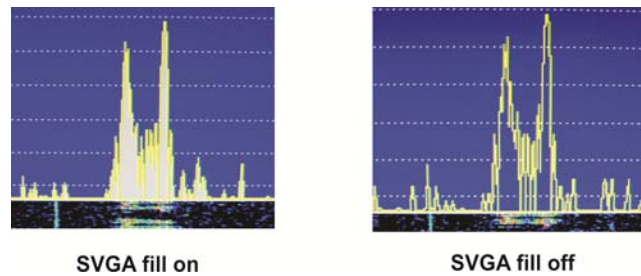

SVGA fill on   SVGA fill off

Figure 2. SVGA Spectrum Display Fill.

SVGA Font Size

In the SVGA sub-menu, turn the ⟳**SELECT** knob to *SVGA font* and tap the ⟳**SELECT** knob again. Turn the ⟳**SELECT** knob to change the font size. Three sizes are available, 0, 1 and 2, shown in the upper left of the internal P3 display. The change will appear after a brief interval on the SVGA monitor so you can see the effect of the change without leaving the menu.

SVGA Waterfall Color Bias

In the SVGA sub-menu, turn the ⟳**SELECT** knob to *SVGA waterfall color bias* and tap the ⟳**SELECT** knob again. Turn the ⟳**SELECT** knob to change the bias value (shown in upper left corner of the P3 internal display). The change will appear immediately on the SVGA monitor waterfall display so you can see the effect without leaving the menu.

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Data Terminal Setup

Data terminal mode adds three windows at the bottom of the SVGA monitor: one for received data, one for transmitted data and a status bar (see Figure 3). These windows occupy part of the area used by the waterfall display. The height of the status bar is fixed. The sizes of the receive and transmit data windows, and the sizes of the fonts used for them, are variable using the setup menu as described below.
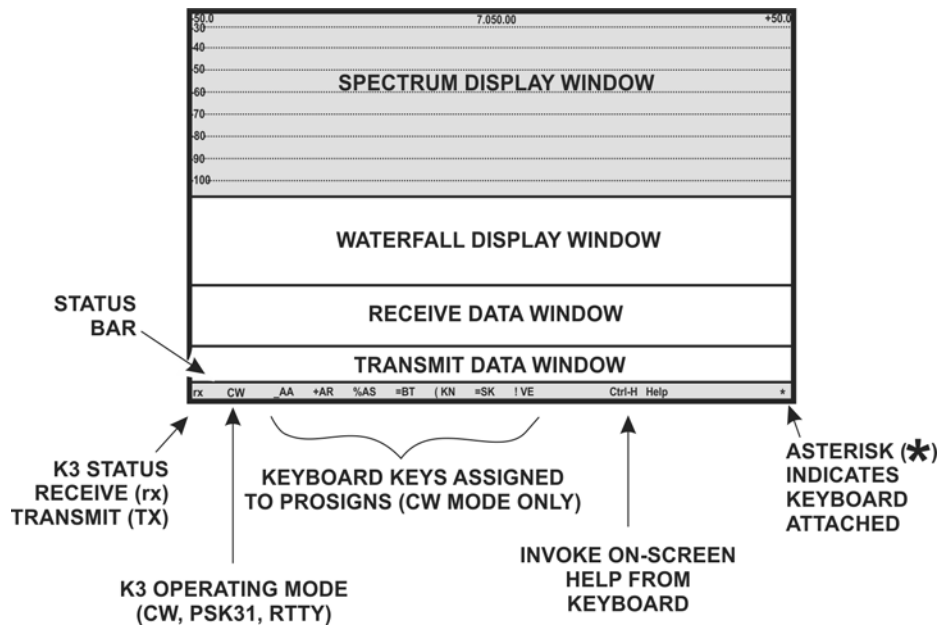

Figure 3. SVGA Display with Data Terminal Mode Enabled.

Adjusting the Receive and Transmit Windows and Font Sizes

The area occupied by the receive and transmit data windows depends upon the font size and monitor resolution used. Since the data windows occupy part of the space normally available to the waterfall display, you may need to increase the size of the waterfall display to provide room for them.

> ⚠ If the transmit data window size is set to zero, data transmission is disabled, the transmit data window will disappear and the keyboard becomes inactive.

To set the window and font sizes, tap MENU and then turn the ⟲SELECT knob to SVGA menu. Tap the ⟲ SELECT knob enter the sub-menu. Turn the ⟲SELECT knob to the desired parameter tap the ⟲SELECT knob again. Turn the ⟲SELECT knob to change the parameter:

- *SVGA WinR*   Sets the size of the receive data window (in lines).

- *SVGA WinT*   Sets the size of the transmit data window (in lines).

- *SVGA fntD*   Sets the size of the font. 0 is the smallest, 3 is the largest.

Decoding Text

The decoding of signals takes place in the K3. See your K3 Owner's manual for details about how to configure the K3 to decode text in CW and each of the data modes.

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Transmit Setup

Using the Keyboard

An asterisk on the SVGA display data line (see Figure 3) indicates that the keyboard is connected and active. Keyboard shortcuts are listed below. (Hyphenated keys must be pressed at the same time.)

Keyboard Shortcuts

KEYS	FUNCTION
Ctrl-H	Opens help screen except when editing messages or macros. Press any key to exit.
Backspace	Deletes character to the left.
Ctrl-Backspace	Deletes word to the left.
Ctrl-Alt-M	Opens K3 macro entry pop-up window.
Ctrl-Alt-T	Opens text messages pop-up window.
Ctrl-Alt-S	Opens setup menu.
Ctrl-Alt-B	Starts beacon transmit.
Esc	Switches K3 to receive and clears the transmit data window.
Scroll Lock	Freezes receive data window. Press again to resume.
Ctrl-R	Switches the K3 to receive. If the K3 is transmitting data or CW, transmission pauses.
Ctrl-T	Resume transmission
Ctrl-C	Clears the transmit and receive data windows.
Scroll Lock	Freezes the receive data window.
I	When inserted into a text message, causes the K3 to revert to receive mode at the end of the message

⚠ **NOTE:** On-screen menus use the carat, **∧** (upper case 6), to denote the Control (Ctrl) key.

Setup Options

The transmit mode options and text color parameters that you can set are listed below. Press Ctrl-Alt-S to open the setup menu on the SVGA screen. This screen will cover the transmit data window and status bar temporarily. Use the up/down arrows on the keyboard to select a parameter and the left/right arrows to change the parameter. Pressing Ctrl-arrow changes the values in larger steps. Press Esc to save the changes and close the menu. The parameters are saved in non-volatile memory so they will be retained after power has been turned off and then on again.

Transmit Mode: CR, ^T, VOX

Allows you to control when text entered on the keyboard is sent:

- CR: The K3 will start transmitting the text only after the Enter key is pressed.
- ^T: The K3 will start transmitting the text only after Ctrl-T is pressed.
- VOX: The K3 will transmit each character as it is typed on the keyboard.

⚠ **NOTE:** Pressing Ctrl-R will interrupt a transmission. In CR or VOX modes, press Enter to restart a transmission. In ^T mode, press Ctrl-T to restart the transmission. Pressing Esc stops the transmission and clears any unsent text.

Transmit Timeout: 0 to 90,000 ms (0 to 90 seconds) in 200 ms (0.2 second) increments.

The length of time an idle signal will be transmitted in PSK or RTTY modes after the last character is sent. Any character entered on the keyboard during this time will be sent and the timeout period will start over. Pressing **|** (the vertical bar) on the keyboard will terminate the delay and return the K3 to receive mode immediately.

Transmitted Text Color: 1 to 50

The color of the text in the transmit data window changes as each character is sent. Use this parameter to choose the color of the characters after they have been sent.

Tx Text Color: 1 to 50

Use this parameter to choose the color of the unsent characters in the transmit data window.

Rx Text Color: 1 to 50

Use this parameter to choose the color of the text shown in the receive data window.

Beacon Text Mem# and **Beacon Interval**

See *Beacon Mode* on pg 10.

Text Message Entry

There are 50 text message memory locations available that can be used in CW, RTTY or PSK modes. Each location can store up to 124 characters (including spaces). These messages are stored in non-volatile memory so they will not be lost when power is cycled. Create a text message as follows:

- Press Ctrl-Alt-T to enter the text message window. The window opens on top of the data and status windows. Press the up and down arrows to find an available (empty) message location (indicated by an <empty> key assignment), or you can select a message that is no longer needed. Figure 4 shows that memory location 1 is available.
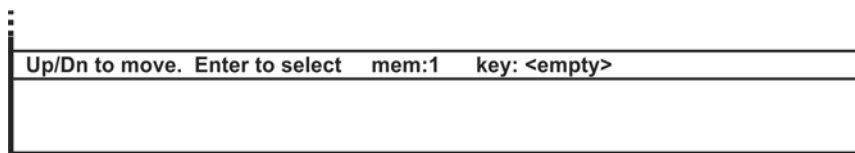

Figure 4. Empty Text Message Location.

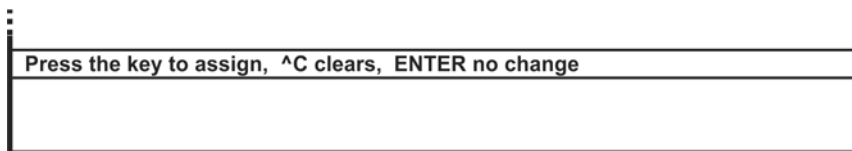- Press Enter to use the selected memory location.

Figure 5. Assigning a Recall Key.

- Press the key(s) that you want to use to recall this message. In the example shown in Figure 6, the ALT-B key combination was assigned to the message. If the name of the key does not appear when it is pressed, it has already been assigned to another message. You must choose a different key.

- Enter the text of the message. In this example the message is "Rig is an Elecraft K3 with P3/SVGA." Correct errors using the Backspace, Ctrl-Backspace or Ctrl-C keys as needed.

```
Enter text, press ENTER when done, Ctrl-C to clear     mem:1     key: Alt-B
Rig is an Elecraft K3 with P3/SVGA.
```
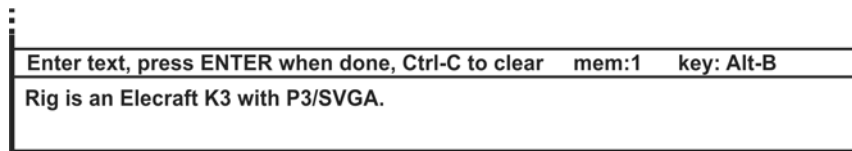
Figure 6. Editing a Message.

- When finished, press Enter to save the message and prepare to select the next location and enter another message. When finished, press Esc to exit.

- To send a message, press the assigned key to recover any message. In this example, pressing Alt-B transfers the test message to the transmit text window and begins transmission.

- To edit a message, select it and return to the key assignment (Figure 5) or editing (Figure 6) screens and make the desired changes. To erase a message select it and, at the key assignment window, press Ctrl-C.

Beacon Mode

Beacon mode transmits a text message repeatedly with a time interval between each transmission. The message is stored in memory in advance. You choose the message and the time interval desired. The message will be transmitted using the mode selected at the K3: CW, RTTY, or PSK.

Set up a message to be sent as a beacon as follows:

- Store your message to be sent (see *Text Message Entry*, pg 9). You can use any memory location. Press Esc when you are done entering the message. Note that the key assigned to the message when you stored it in memory is not used when transmitting it in beacon mode. The key is used only when manually choosing a message to send.

- Press Ctrl-Alt-S to enter the setup screen.

- Press the down arrow key to select Beacon Text Mem #.

- Use the right/left arrows to enter the memory location where the beacon message is stored. Right arrow increments the numbers by 1 and left arrow decrements the number by 1. Ctrl-Arrow moves the count in steps of 10.

- Press the down arrow to Beacon Interval.

- Press the right/left arrows to select the desired interval between transmissions. You can select any interval between 0 and 3600 seconds (1 hour). Right arrow increments the numbers by 1 and left arrow decrements the number by 1. Ctrl-Arrow moves the count in steps of 10.

- Press Esc to exit the setup screen.

- Press Ctrl-Alt-B to start the beacon transmission. A flashing letter B will appear in the lower right corner of the status line.

If a station answers, you may:

- Press Esc. That stops the transmission and clears the transmit window. You can then type a reply that will be transmitted immediately or when you enter CR or ^T, depending upon the transmit mode you have selected (see *Transmit Mode*, pg 8).

- Start typing your reply. This automatically cancels further beacon transmission but does not interrupt the beacon message while it is being transmitted. Your reply will be transmitted immediately after the beacon message. You do not need to initiate transmission.

Using Macros

Macros are used to automate a sequence of control setting and button pushes on the K3 so that they may be accomplished with a single entry on the keyboard. For example you may want to create macros to shift the K3 into a particular mode on a specific frequency or band by a simple one or two key entry on the keyboard. You can create and enter up to 50 macros of up to 124 characters each. They are stored in non-volatile memory so they will not be lost when power is cycled. These memory locations are independent of the message memories. You can store 50 messages and 50 macros at the same time.

Entering Macros

Press Ctrl-Alt-M to open the macro entry window. The process of entering the various windows, assigning a key used to recall the macro and editing macros is identical to that used for text messages. See *Text Message Entry*, above. Note that to enter the text message entry window you pressed Ctrl-Alt-T but you must press Ctrl-Alt-M to enter the macro entry window.

Sample Macro:

Assign a macro memory to the F1 key (see Figure 5) and enter and save the following macro (see Figure 6):

FA00014970000;MD6;FA00014070000;DT3

Now pressing F1 on the keyboard will send the above macro to the K3 setting VFO A to 14.070 and the mode to DATA, PSK31.

⚠ **NOTE:** When creating a macro, pressing ^F will place the K3's current frequency (including RIT) into the macro in the form of an FA command. For example, if VFO A is set to 7.123 and ^F is pressed while entering the macro, FA00007123000; will be inserted into the macro string.

For more information about writing macros, refer to the ***K3 Programmer's Reference*** available on the Elecraft web site at www.elecraft.com or the ***K3 Utility*** help screens.

Installing the P3SVGA Option Board

Preventing Electrostatic Discharge Damage

We strongly recommend you take the following anti-static precautions (listed in order of importance) to avoid trouble:

- Leave ESD-sensitive parts in their anti-static packaging until you install them. The packaging may be a special plastic bag or the component's leads may be inserted in conductive foam. Parts which are especially ESD-sensitive are identified in the parts list and in the assembly procedures.

- Wear a conductive wrist strap with a series 1-megohm resistor. If you do not have a wrist strap, touch a ground briefly before touching any sensitive parts to discharge your body. Do this frequently while you are working. You can collect a destructive static charge on your body just sitting at the work bench. **DO NOT attach a ground directly to yourself as this poses a serious shock hazard.**

- Use a grounded anti-static mat on your work bench.

- If you choose to use a soldering iron to work on your P3 for any reason, be sure your iron has an ESD-safe grounded tip tied to the same common ground used by your mat or wrist strap.

Tools Required

1. #1 size Phillips screwdriver. To avoid damaging screws and nuts, a power screwdriver is *not* recommended.
2. Pliers or wrenches for installing 1/4" (6.4mm) nuts 3/16" (4.8 mm) jack screw nuts.

The following tools are strongly recommended:

1. ESD wrist strap.
2. Static dissipating work pad.

Parts Included

The following parts should be included in your kit. Check to ensure you have them all. If any parts are damaged or missing, contact Elecraft for replacements (see *Customer Service and Support*, pg 4).

ILLUSTRATION	DESCRIPTION	QTY.	ELECRAFT PART NO.
	P3SVGA Circuit Board Assembly ⚠ *ESD Sensitive.*	1	E850482
	Jackscrew Nut, 4-40 (may be mounted on the Circuit Board Assembly Connector)	2	E700078
	Lock Washer, Inside Tooth, #4 (may be mounted on the Circuit Board Assembly Connector)	2	E700010
	Power cord assembly (used to connect the P3 directly to a 10 to 15 VDC power supply). **NOTE:** Do not attempt to power your P3 from the K3's 12V outlet unless it is labeled 1.0A Max. See *Power* on pg 5 for details.	1	E850427

Installation Procedure

☐ Disconnect power and all cables from your P3.

☐ Remove the six screws to free the top cover (Figure 7 ①) and lift the cover off. There is a slot at one end that you can use to lift the cover once it is free.

⚠ **Whenever you remove screws from a panel, if one screw seems too tight to loosen without damaging it, first loosen the other screws then try again. Sometimes one screw binds in its hole when the other screws are tightened.**
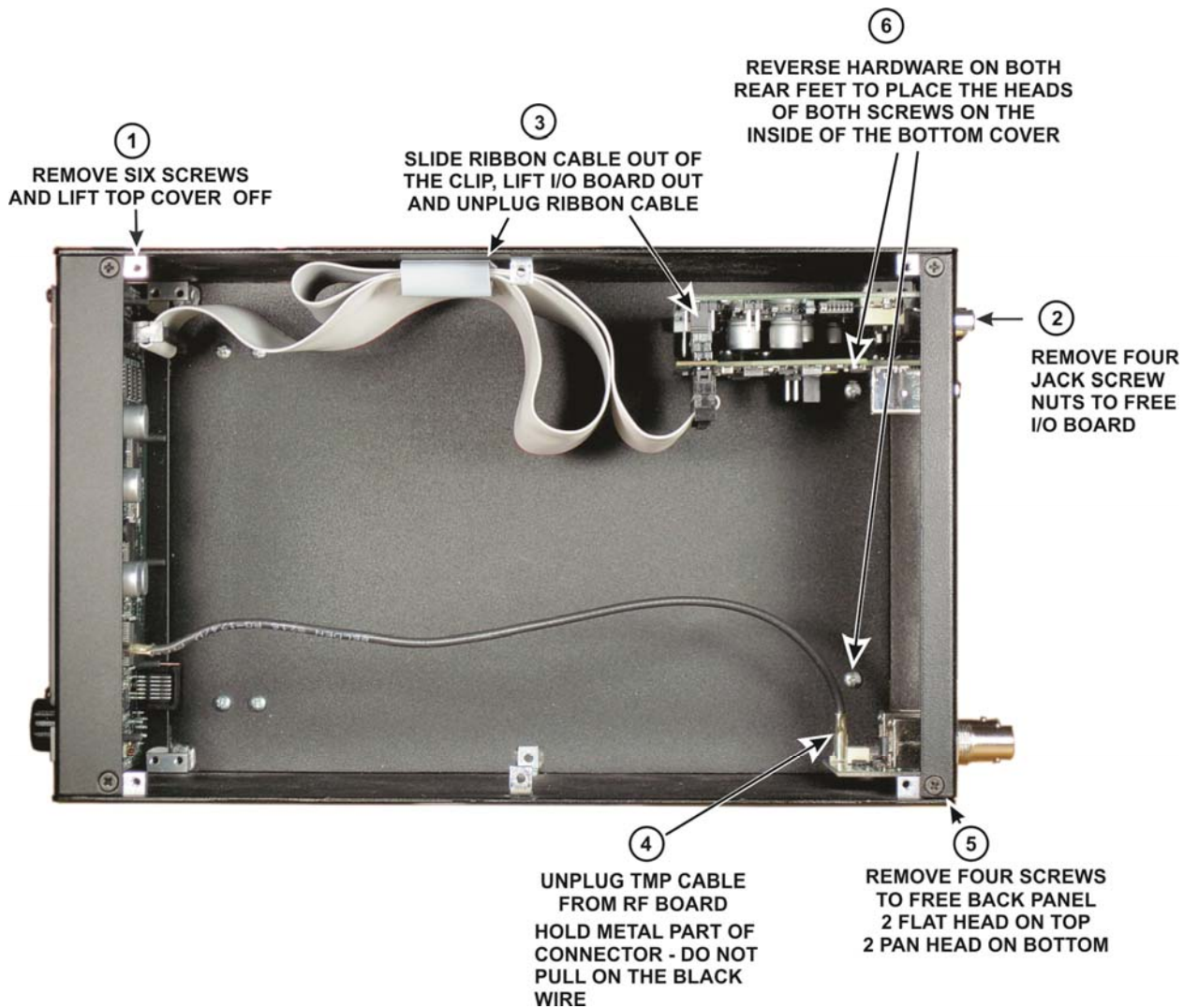

⑥
REVERSE HARDWARE ON BOTH
REAR FEET TO PLACE THE HEADS
OF BOTH SCREWS ON THE
INSIDE OF THE BOTTOM COVER

③
SLIDE RIBBON CABLE OUT OF
THE CLIP, LIFT I/O BOARD OUT
AND UNPLUG RIBBON CABLE

①
REMOVE SIX SCREWS
AND LIFT TOP COVER OFF

②
REMOVE FOUR
JACK SCREW
NUTS TO FREE
I/O BOARD

④
UNPLUG TMP CABLE
FROM RF BOARD
HOLD METAL PART OF
CONNECTOR - DO NOT
PULL ON THE BLACK
WIRE

⑤
REMOVE FOUR SCREWS
TO FREE BACK PANEL
2 FLAT HEAD ON TOP
2 PAN HEAD ON BOTTOM

Figure 7. Preparing the P3 to Install the P3SVGA Board.

⚠ **CAUTION: Touch an unpainted metal ground or wear a grounded wrist strap before touching components or circuit boards inside the P3. See *Preventing Electrostatic Discharge Damage* on page 12 for more information.**

☐ Remove the four jack screw nuts and lock washers to free the I/O board (Figure 7 ②)

☐ Lift the I/O board out of the P3 and unplug the ribbon cable (Figure 7 ③). Take care not to damage the board. Hold the board while working the connector side to side to "walk" it off of the pins as shown in Figure 8.
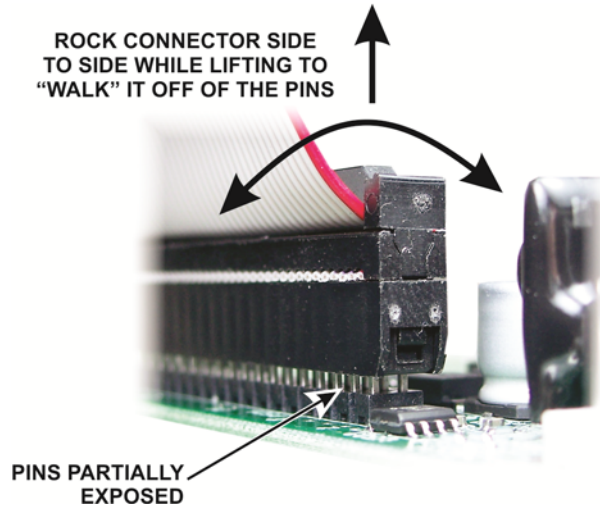

Figure 8. Unplugging the Ribbon Cable from the I/O Board.

☐ Unplug the TMP coaxial cable from the RF board (Figure 7 ④). This is a friction-fit connector. Do not pull on the black coaxial cable. Grip and pull only on the metal connector.

☐ Remove the four screws holding the rear panel in place (Figure 7 ⑤) and lift the rear panel off of the P3.

☐ Remove and reverse the mounting hardware for both rear feet as shown in Figure 7 ⑥). Install the hardware as shown in Figure 9.

INSTALLATION HINT: Put the washer and screw in the foot opening and press your finger over the opening until the threads on the nut are caught by the screw. It may help to turn the unit over so gravity helps. Once the nut is started pull the foot away from the bottom cover while tightening the screw. The friction of the washer against the bushing inside the foot will keep the nut from turning as you tighten.
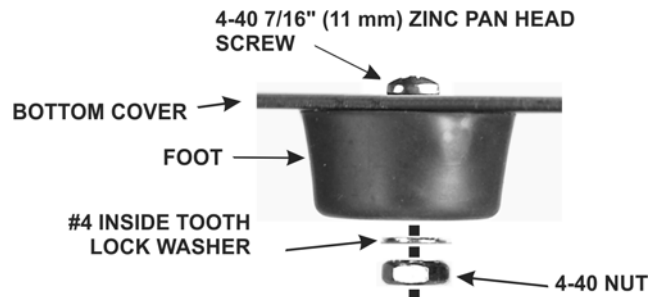

Figure 9. Reversing the Foot Hardware.

☐ Remove the plastic covering from the AUX. DATA, EXT. DISPLAY and KEYBOARD openings on the rear cover, but leave the covering over the SENSOR opening (see Figure 10). The plastic cover will snap apart at the score mark as you bend it away from the panel.
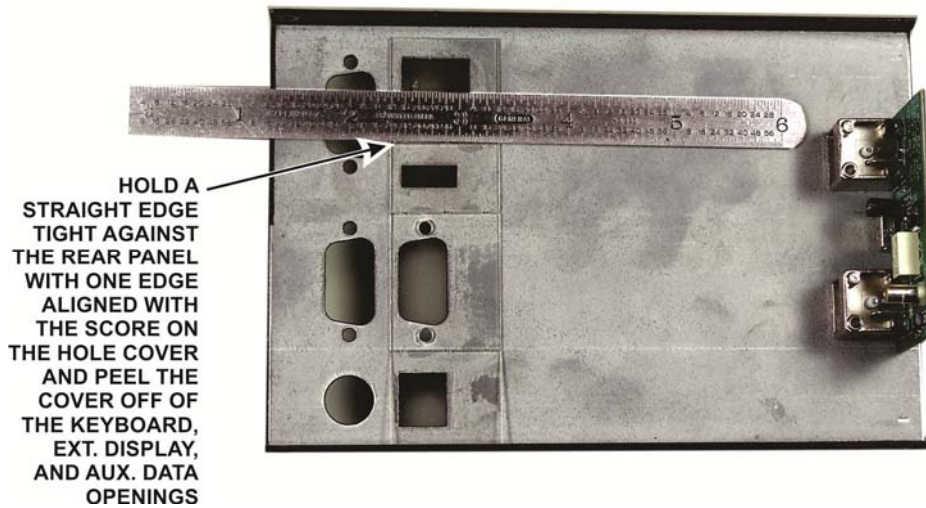

HOLD A STRAIGHT EDGE TIGHT AGAINST THE REAR PANEL WITH ONE EDGE ALIGNED WITH THE SCORE ON THE HOLE COVER AND PEEL THE COVER OFF OF THE KEYBOARD, EXT. DISPLAY, AND AUX. DATA OPENINGS

Figure 10. Removing Hole Covers.

☐ Mount the P3SVGA board on the I/O board as shown in Figure 11. The connector on the P3SVGA board mates with the connector on the I/O board that originally received the ribbon cable. **Be sure the connectors are aligned so that all pins engage. To avoid over-stressing the boards, place the I/O board on a firm surface. You may need to rock the P3SVGA board slightly while pressing down to "walk" the pins into the connector like you did when removing the ribbon cable earlier.**

I/O BOARD   P3SVGA BOARD

BE SURE ALL PINS ARE ENGAGED AND THE CONNECTORS FULLY MATED SO NO PINS ARE SHOWING (SEE TEXT)
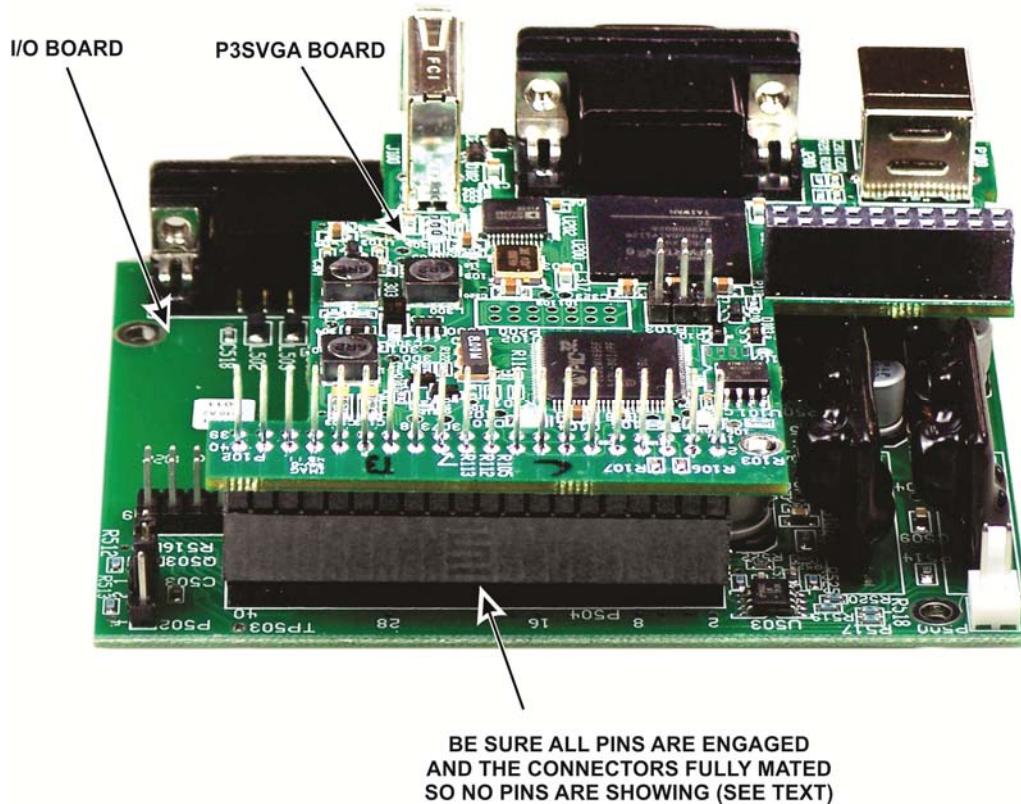
Figure 11. Mating the I/O and P3SVGA Boards.

☐ Connect the ribbon cable to the P102 on the P3SVGA board as shown in Figure 12. Place the boards on a firm surface to avoid over-stressing them. **Be certain that:**

1. **The connector is aligned so that that it covers all of both rows of pins.**

2. **The ribbon cable is oriented so that the red wire is at the pin 1end of the connector as shown. Your ribbon cable may exit the connector toward the board instead of away from it as shown here. That is not a problem as long as you orient it to place the red wire at the pin 1 end as shown.**
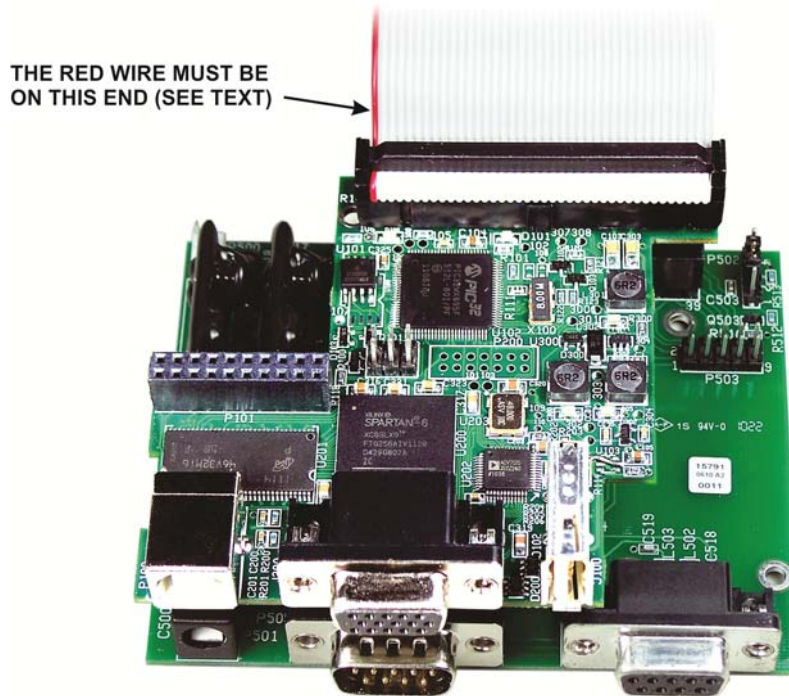

Figure 12. Connecting the Ribbon Cable to the P3SVGA and I/O Boards.

☐ Mount the boards on the rear panel as shown in Figure 13. Start all of the jack screw nuts before tightening them. Do not over-torque them. It is possible to twist the head off of the threaded section, especially if you use a wrench.
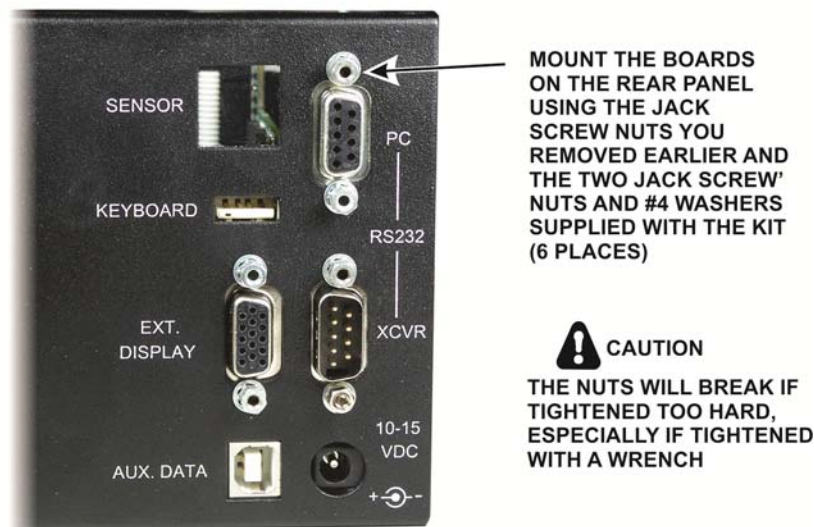

Figure 13. Mounting Boards in Rear Panel.

☐ Replace the rear panel assembly on the P3 as shown in Figure 14. Tilt the assembly so the P3SVGA board does not strike the screw head for the rear foot. The screw head fits in a notch on the P3SVGA board. Secure the rear panel assembly with the screws you removed earlier (Figure 7 ⑤).
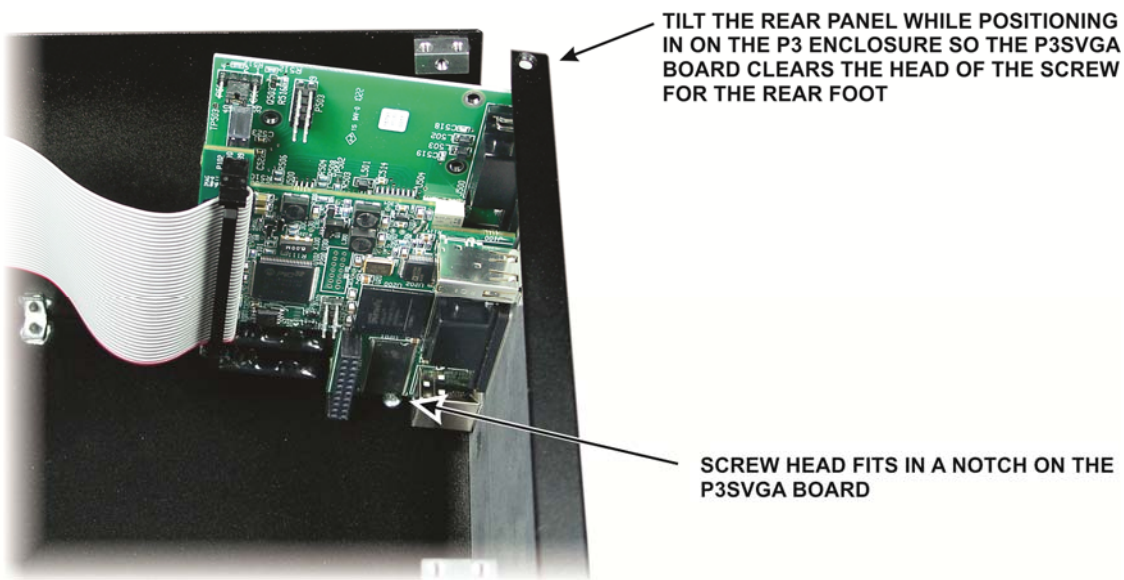

TILT THE REAR PANEL WHILE POSITIONING IN ON THE P3 ENCLOSURE SO THE P3SVGA BOARD CLEARS THE HEAD OF THE SCREW FOR THE REAR FOOT

SCREW HEAD FITS IN A NOTCH ON THE P3SVGA BOARD

Figure 14. Replacing the Rear Panel on the P3.

☐ Reconnect the TMP cable to the rear panel RF board (Figure 7 ④).

☐ Replace ribbon cable in the clip on the side panel (Figure 7 ③). It is important that the excess cable not be allowed to float freely in the P3 where it may be close to the RF board to avoid digital interference on the P3 display.

☐ Replace the top cover on the P3 with the notch to the rear using the screws you removed earlier:

⚠ REPLACE ALL THE SCREWS!

The P3's chassis strength depends upon all the screws being in place. Be sure to replace all the screws and verify they are tight, but do not over-torque the screws.

That completes the installation of the P3SVGA option in your P3. Operating instructions are on pg 5.