

# CTRL-X

## INSTALLATION MANUAL & USER'S GUIDE

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### 1. PACKAGE CONTENTS

One (1) nine-pin output jack  
One (1) battery clip with foam pad  
One (1) cable tie  
One (1) 470 pf capacitor  
One (1) black switch button  
One (1) white switch button  
Mounting hardware

### 2. OVERVIEW AND CAUTIONS

The following instructions are for a traditional Strat with three knobs and a 5-way switch. It is recommended that installers perform a dry run through the entire procedure before cutting or drilling. We recommend that this system be installed by a professional dealer/installer. We do not provide installation advice or support for home or hobbyist installations. Installers: please read the instructions carefully before proceeding. We will not be responsible for any damage to the guitar or personal injury resulting from installation, use or misuse of the product.

### 3. INSTALLATION

1. If you do not already have an X-Bridge in your guitar, install one according to the installation instructions that come with the bridge. Remove the middle tone pot and its wire to the 5-way switch (as stated in the instructions), but do not install the 5 meg volume pot or stereo jack. The only soldering connection to make at this time is to put a jumper between the two lugs on the 5-way switch that go to the tone pots, also stated in the instructions.

2. If you already have an X-Bridge with passive wiring, unhook the connections from the 5 meg volume pot and remove the pot. Unsolder the wires that come from the output jack into the control cavity; in a regular Strat there will be two. On the passive X-Bridge hookup there will be three.

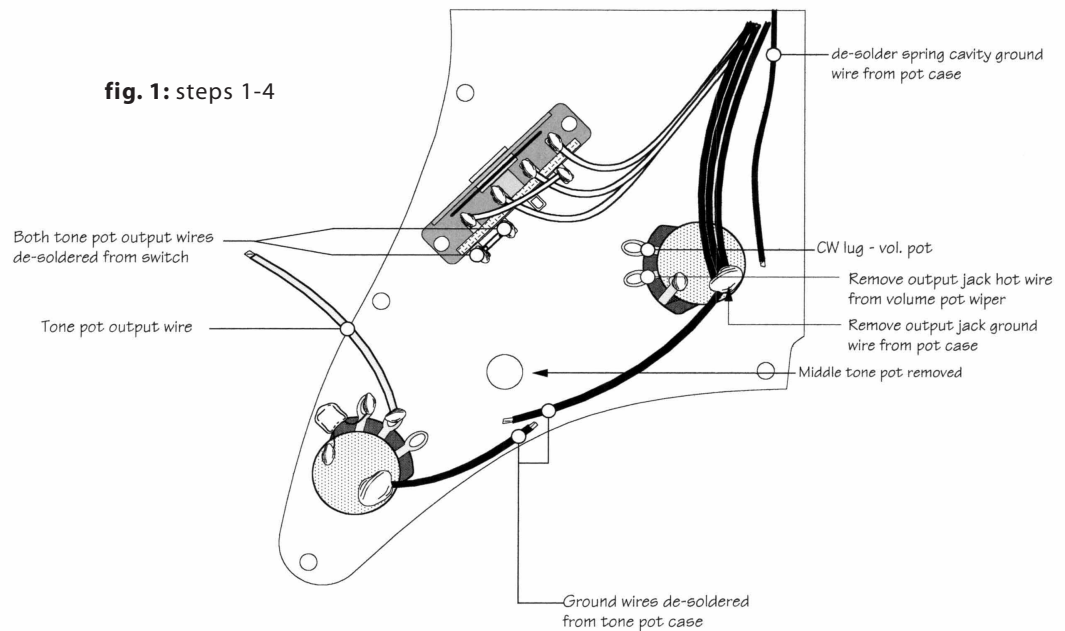
3. Unscrew the jack plate and remove the jack from the plate. Unsolder the ground wire from the bridge (it usually goes from the volume pot case through the hole to the spring cavity), so the pickguard will come completely off the guitar.

4. Completely remove the wire that runs from the 5-way switch to the CW (clockwise) lug of the Volume control. You should also temporarily unsolder one end of the wire that goes from the lower tone pot to the 5-way switch, to give yourself more room to work. Figure 1 shows all the wiring you will need to remove.

5. Now replace the old output jack with the one that comes in the Ctrl-X kit. You will most likely need to do some woodworking in the jack cavity to make room for the new jack (see figure 2), which is slightly larger than the original jack. Use a Dremel router or chisel to extend the inside of the cavity (toward the bridge) by about 1/2". Make sure the large nut on the jack bushing is tight, feed the jack wires through the hole into the control cavity, and replace the jack plate screws.

6. Drill a 1/4" hole in the pickguard for the toggle switch. The correct position for this hole is between the 5-way switch and volume knob, centered on the 5-way switch, and volume knob, centered on the 5-way switch, about 5/8" away from it, measured from center to center (see figure 3). Before you drill, hold the toggle switch up to the inside of the pickguard, 5/8" away from the 5-way, to make sure the bodies of the two switches will clear each other. The toggle switch should not be any farther than 3/4" away from the 5-way slot, or it may hit the battery when the whole thing is assembled. Start with a 1/16" pilot hole, and recheck the location before drilling the real hole.

fig. 1: steps 1-4



7. To position the hole for the push-button switch, temporarily in-stall the Ctrl-X pot and circuit board in the hole where the middle tone pot used to be. Center the pot in the hole, with the circuit board parts facing the outside edge of the pickguard, as shown in figure 4. Be sure that the edges of the circuit board aren't touching the 5-way switch or the bottom of the tone pot. With the push-button switch in the out position, it will almost touch the pickguard. Trace around the switch plunger, remove the Ctrl-X assembly and drill a 1/16" pilot hole where the center of the plunger will be. Hold the Ctrl-X assembly in place and make sure the switch can still be centered on the pilot hole. Then drill the real hole. A 15/64" bit is preferred; however, you can use a 1/4" bit (although this may look a bit large). Gently de-burr the outside of the hole using a countersink held in the hand.

8. Now install the Ctrl-X assembly. The pot should go directly against the pickguard on the inside, and the washer and nut on the outside. Finger tighten the assembly. Center the switch plunger over its hole, and add the button (we've provided a choice of white or black). Then tighten the nut, making sure the button stays centered in its hole. On some guitars, the Ctrl-X circuit board will come close to one lug of the lower tone pot. If it does, bend the lug a bit to make sure nothing will short out.

9. Figure 5 shows the wiring for the following three steps. Solder the black ground wire from the circuit board to the volume pot case. Run the orange output wire to the CW lug of the volume pot, but don't solder it yet.

10. Install the toggle switch. Remove the decorative nut from the threaded bushing and adjust the remaining nut and lock-washer so that the bushing sticks out of the hole by about 2 or 3 threads; this is enough for the decorative nut to catch the threads and tighten. If the bushing sticks up too far, the decorative nut will bottom out before the switch is tight in its hole. Move the inside nut out a bit and try again. Before you tighten the nut all the way, position the switch on the underside of the pickguard so the side with three wires is closest to the 5-way switch. This is necessary so that each position on the switch (up, middle and down) functions the way it is explained in the owner's manual.

11. Solder the white wire from the toggle switch to the 5-way switch output (the same lug from which you removed the original wire to the volume control). Solder the orange wire from the toggle switch to the CW lug of the volume control, along with the orange wire from the PC board. Both orange wires go to the same lug. Solder the ground wire from the other two pot cases to the Ctrl-X pot case. It will be necessary to first scrape some of the yellow finish from the side of the pot for the solder to stick to it.

12. The following three steps are shown in figures 6 and 7. Now, with the guitar on its back, lay the pickguard next to it, open-book fashion, and resolder the main ground wire (from the spring cavity) to one of the pot cases. You will need to solder three wires to the circuit board. The solder pads are located in the upper right hand corner of the board away from the 5-way switch. First solder the yellow wire from the output jack to the lowest of the three pads (labeled Y), then the white wire from the jack to the next one up (labeled W), and the X-Bridge coax to the top connections (with the box around them). See figure 6. The braid of the coax goes to the largest hole and the inner "hot" wire to the small one next to it. Be sure the sleeve insulator is on the coax, and pull the braid through the circuit board hole as far as it will go before soldering it. Clip any long wire ends after soldering, and make sure the clippings don't end up in the cavity to short things out later.

13. After you've completed the soldering, bundle the three wires together with the cable tie provided in the kit. Tighten the cable tie around the three wires about one inch away from the circuit board. This ensures that the insulation for the X-Bridge coax will not slip back and expose the bare braid, and helps to keep the wires under control. **Caution: finger tighten only. Using pliers to tighten the cable may cut the insulation, causing a short.** Clip off the excess cable tie (see figure 6).

14. Solder the black wire from the output jack to the volume pot ground, and the red wire from the jack to the volume pot wiper (middle) lug. Resolder the wire from the lower tone pot to the 5-way switch. If there is enough length, run it behind the Ctrl-X circuit

fig. 2: step 5

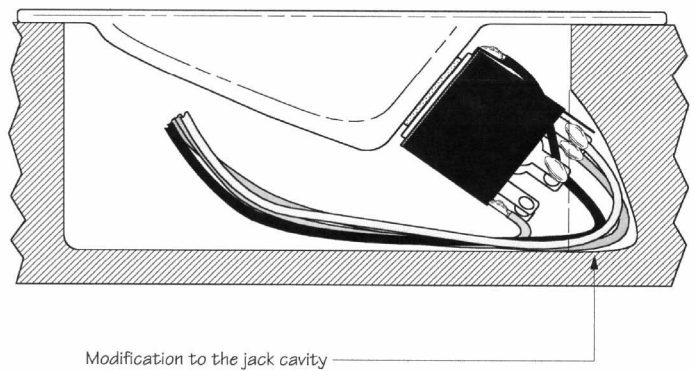


fig. 3: outside view

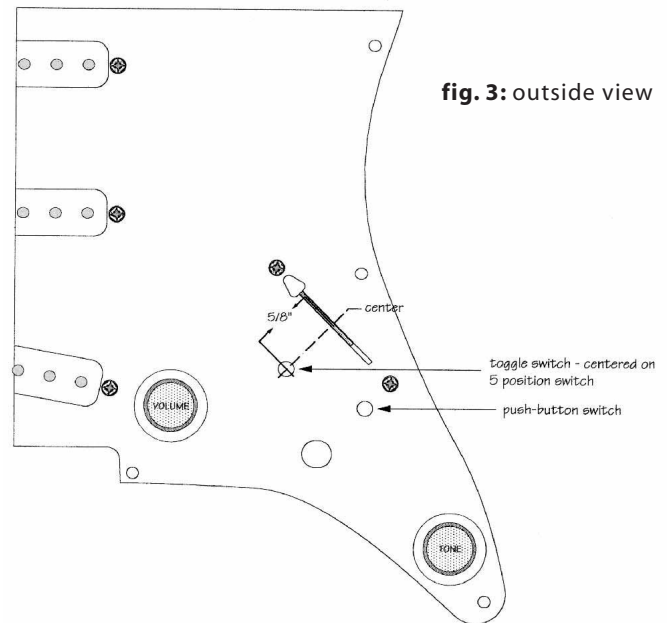
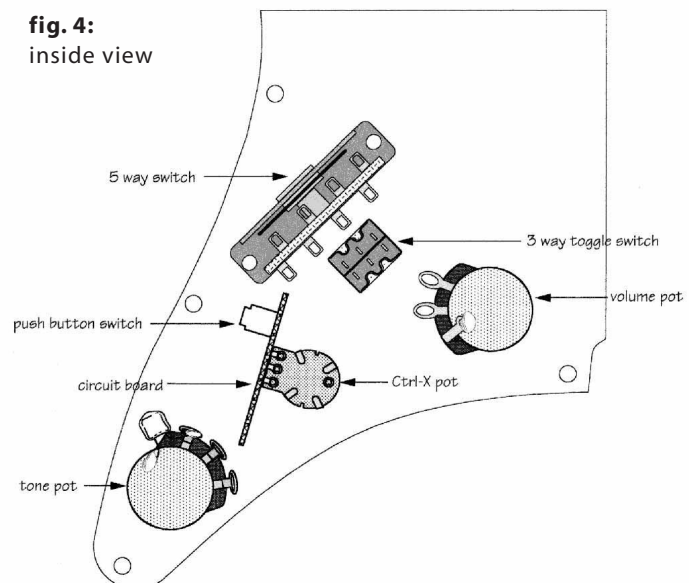
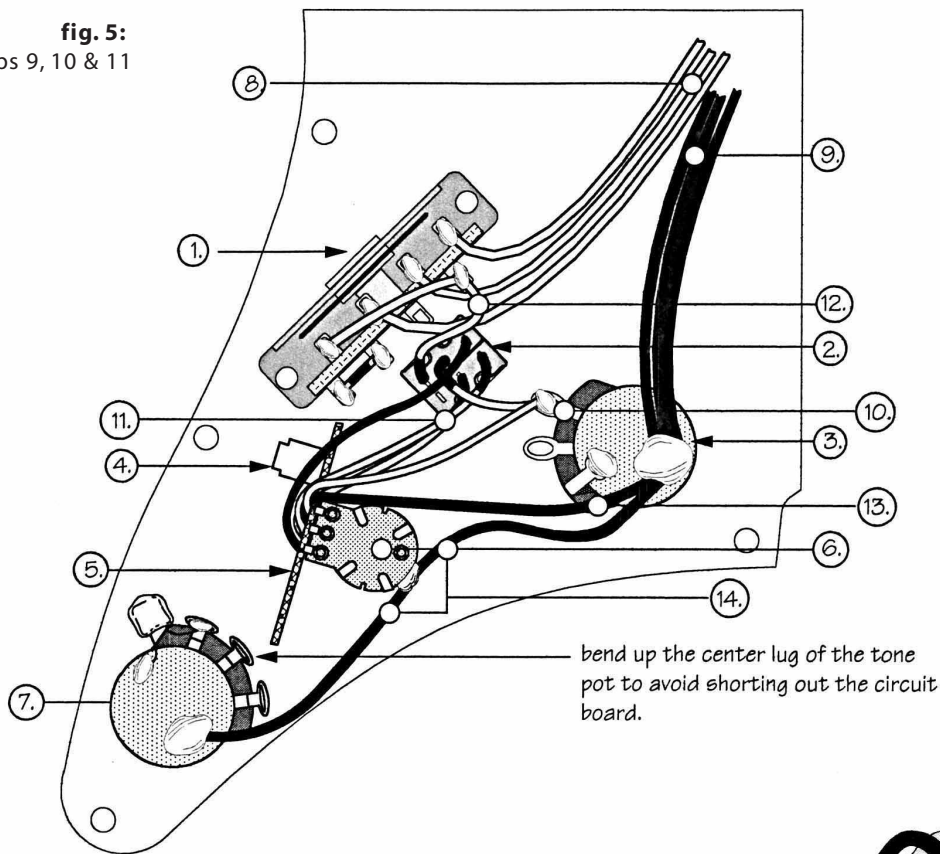


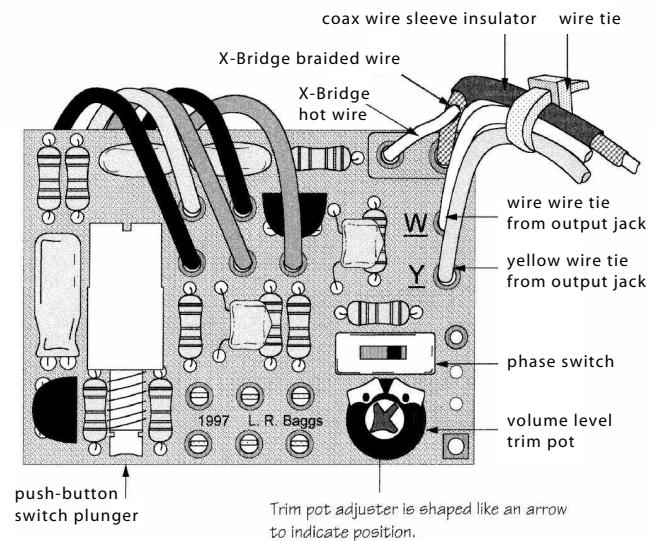
fig. 4: inside view



**fig. 5:**  
steps 9, 10 & 11



**fig. 6:** steps 12, 13 & 14



board so it will not be in the way of the little trim pot and switch that are on the board; you will be adjusting these soon.

15. To install the battery clip in the cavity, first make sure the surface of the cavity is clean of oil, dust or solder flux. Then place the battery in the clip, remove the backing from the adhesive pad and press them down into the cavity with the battery connectors facing away from the bridge, as shown in figure 8. Attach the battery snap; the wires coming off the battery should exit upward.

16. Fold the wire harnesses into the cavity as you close the pickguard assembly like the cover of a book. You may need to open it and close it a few times to tuck the wires into their places.

17. At this time, screw the pickguard down with only a couple of the screws, leaving all of the screws surrounding the control cavity off. There is a phase switch and a level control on the circuit board that you need to access by lifting up the lower corner of the pickguard before the job is complete. If this is a new X-Bridge installation, go back to the X-Bridge installation instructions and finish setting up your bridge, then come back to this manual for the final adjustment of the Ctrl-X.

#### 4. FINAL ADJUSTMENTS

Lift up the pickguard until you can see the Ctrl-X circuit board, as shown in figure 9. In the upper left corner of the board there is a small trim pot. Make sure the white arrow is set to about the 2:00 position (a small Phillips screwdriver works well). Set the push-button switch to the "in" position (mono mode), and the toggle switch to the middle (mix) position. Plug into an amp using a regular guitar cord. Turn the volume pot and lower tone pot to 10 and play. Turn the mix pot (middle pot) from 1 to 10 while playing. You should hear the magnetic pickups when the mix is on 1, and the X-Bridge when it is on 10. If you hear a drop in volume in the middle of the mix pot's range, the X-Bridge and magnetic pickups are out of phase. Lift the pickguard and flip the little phase switch. You may wish to flip this switch a couple of times to make sure you have it in the best position. Finally, adjust the X-Bridge volume with the trim pot on the circuit board. With this adjustment you can make the overall output level of the X-Bridge either quieter, louder, or the same as the magnetic pickups. Set it to your liking, replace the rest of the pickguard screws, and you're done!

(see following page for more figures and user's guide)



fig. 7

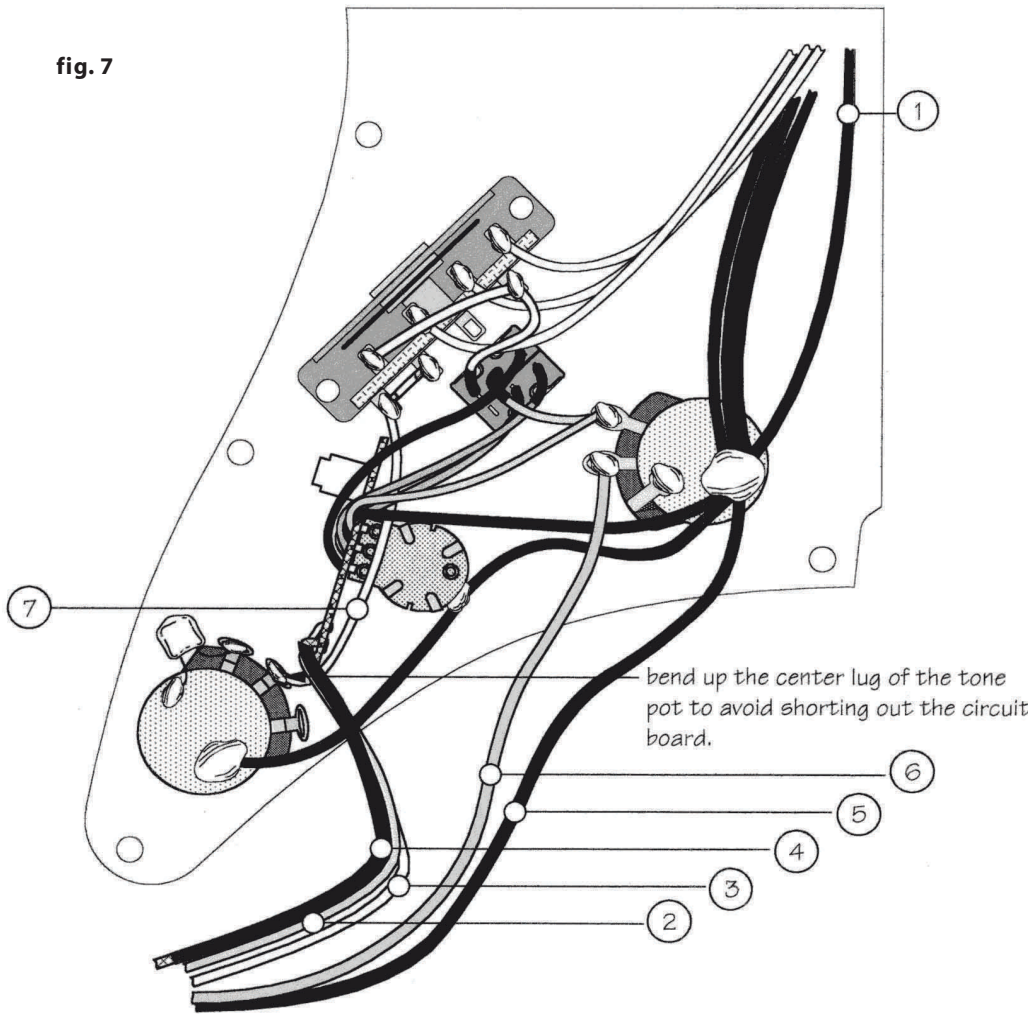
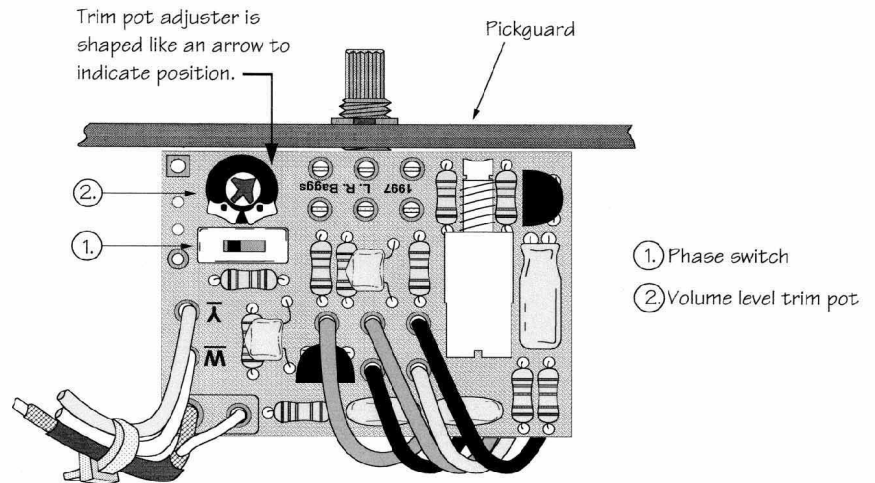
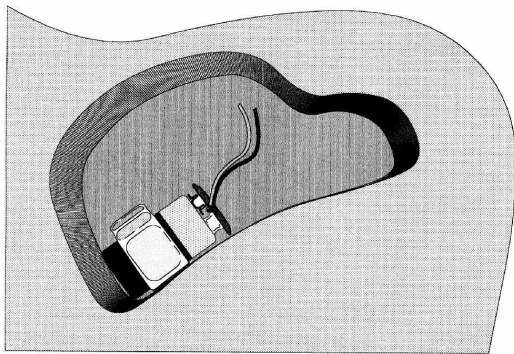


fig. 9:  
final adjustments

fig. 8: step 15



## 5. USER'S GUIDE

### Advantages of Ctrl-X:

- Magnetic pickups remain passive at all times. Even when mixed with the active X-Bridge signal, your stock magnetics are unchanged.
- **Onboard massive mixing:** A stereo Y-cable and two amps are no longer necessary in order to mix the magnetic and X-Bridge pickups together. Simply use the "pan" pot in mono mode to determine how much of each signal is in the mix.
- **Two guitars in one:** A stereo mode is available at the push of a button for sonic adventurers. Send your X-Bridge and magnetic signals to two different channels or amps for the ultimate in control and sound shaping possibilities (for instance, add distortion to your magnetics while keeping the X-Bridge signal clean for a more acoustic sound).

- **Onboard phase control:** The phase relationship of the X-Bridge and the magnetic pickups is an important factor in the quality of the mixed sound. Under your pickguard on the Ctrl-X circuit board is a tiny switch that controls the phase of the X-Bridge pickup. This should have been set by the professional who installed your Ctrl-X, but feel free to experiment.

- **Ctrl-X provides an all-discrete, class A preamp for the X-Bridge signal:** Feel free to send this noiseless, user-friendly signal directly to a PA or amp without losing the rich tonal qualities of the X-Bridge.

**Mono and stereo modes:**

There are two ways to use Ctrl-X, by selecting mono or stereo mode. This function is controlled by the new push-button switch located next to the five-way switch on the face of the guitar. When the button is pushed in, mono mode is activated; when the button is out, you are in stereo mode.

The five-way switch is not affected by the Ctrl-X in any way; it will continue to function with the magnetic pickups as it always has. It will also have no effect when you are using the X-Bridge alone.

**Mono mode:** Use this mode when you just want to plug in and go. Use a standard 1/4" guitar cable with the push-button switch in the "in" position. The new three-position toggle switch determines whether you hear magnetics only, a blend of magnetics and X-Bridge, or the X-Bridge only.

With the toggle switch in the "magnetics only" position (up and towards the neck), the volume knob functions as usual, but all magnetic tone functions are combined on the bottom tone knob. The center knob will have no function with the toggle switch in this position. With the exception of this center knob, your guitar should sound and function as it always has (before the X-Bridge was installed).

With the toggle switch in the down position, the magnetics are shut off and the volume knob now controls the X-Bridge volume. The two "tone" knobs have no function. You will hear only the X-Bridge with the toggle switch in the "down" position.

With the toggle switch in the center position, you can mix the X-Bridge with the passive magnetic pickups. The volume knob becomes a master volume and will now control the output of the blend. The center tone knob becomes a "pan" or mix pot. Rotating this knob completely clockwise will isolate the active X-Bridge pickup; rotating the knob completely counterclockwise will isolate the passive magnetics. Use this control to determine the ratio of X-Bridge to magnetics in the overall sound. The bottom tone knob controls the tone for the magnetic pickups only.

**Stereo mode:** In stereo mode, with the push-button in the "out" position, the magnetics and X-Bridge signals are completely separated from each other. You'll need to use a stereo Y-cable to access them. The magnetic pickup signal is on the tip channel of the stereo jack, and the X-Bridge signal is on the ring channel. The X-Bridge signal from Ctrl-X is active and can be sent directly to a PA without losing the lows and richness the X-Bridge provides. You can send the two signals to separate amp channels, volume pedals, effects, EQs or even two different amps. This setup will give you the most control and flexibility to customize your sound. We recommend that you do not plug both signals into a single channel of a combo amp.

If you happen to bump the push-button switch while playing in stereo mode (accidentally switching the guitar to mono mode), you may be in for a surprise, depending on where the controls are set. Remember, the controls are different in mono and stereo modes.

With the toggle switch in the up or "magnetics only" position, the volume knob controls the volume and the lower tone knob controls the magnetic tone. The center knob has no function.

With the toggle switch in the down or "X-Bridge" position, the center knob becomes the volume control for the X-Bridge and the other two knobs have no function.

With the toggle switch in the center position, the volume pot controls the magnetic pickup volume, the center knob becomes the X-Bridge volume, and the lower tone knob controls the tone for the magnetics.

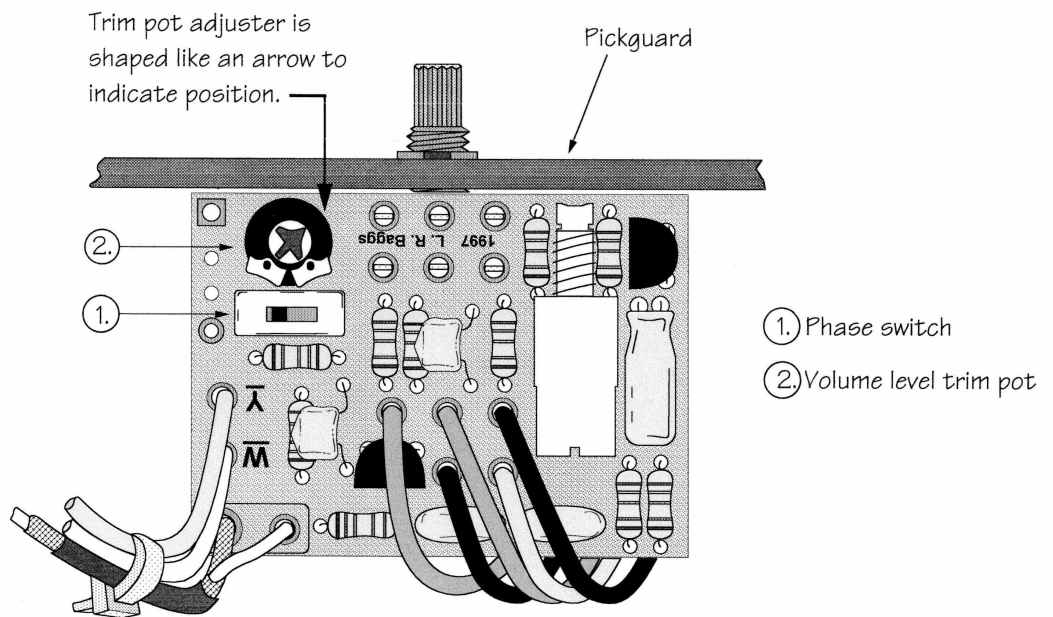
As you may have noticed, there is no EQ control for the X-Bridge; any EQ you want to add should be done outboard of the guitar.

**Phase:**

If you intend to play using only the X-Bridge or the magnetics at any given time, the phase relationship between the two is not important. When playing in Mono mode, where the two signals are mixed together on the guitar, phase may have a big effect in the quality of the mixed sound. The optimum phase for the X-Bridge may be readily confirmed by experimenting with the two positions of the tiny slide switch on the Ctrl-X circuit board under your pickguard.

To change the phase of the X-Bridge, simply remove the pickguard screws around the control cavity and lift the pickguard up enough to have access to the Ctrl-X circuit board. You'll see the tiny slide switch next to where the battery snap is soldered. This is the phase switch. In stereo mode, when using two separate amps there should be no phase conflicts, but be sure to place the speakers as far apart as the Y-cable will allow for the best performance. However, if you plan to send the two signals into two channels of the same amp, please read on.

The only outboard phase conflict you may face is when you are playing in stereo mode using two channels of the same amp. Surprisingly, there is no set standard for phase relationship between adjacent channels in the same amp. In this situation the magnetic and X-Bridge signals may be competing with each other for the same speakers. If the two channels are out of phase with each other, this may result in a weak blended sound. If



this happens you will need to change the phase of the X-Bridge when playing with this setup.

Now, if you find yourself using different outboard equipment and you prefer the one amp/two channels setup, the phase relationship will likely become "chop suey" and you'll probably never be able to detect phase conflicts. However, if you do want phase control each time you play through a different amp, switching phase on the guitar will become a chore. In these instances, we highly recommend our Para D.I. outboard preamp, which has a readily accessible phase switch and five-band EQ.

**Ground loops:** If you are using two amps and hear a hum, chances are you have a ground loop. These should be handled by using standard studio ground loop elimination techniques.

**Trim pot:** Next to the phase switch on the Ctrl-X circuit board is a trim pot. You can use this to control the output level of the magnetics. This should be a control that only needs to be set once, but feel free to experiment. A small screwdriver works well for adjusting this.

**Battery:** Ctrl-X should provide approximately 1000 hours of play time per nine-volt battery. When you start to hear unwanted amounts of distortion on the X-Bridge signal during hard strumming, replace the battery. Even if the battery is totally dead, the stock guitar is always available by flipping the three-way switch to "magnetics only." To change the battery, simply remove the pickguard screws to gain access to the control cavity and replace the single 9V with a new one. Be sure the new battery is secured in its clip and will not rattle around once the pickguard is replaced. To conserve battery life, unplug the guitar when it is not in use. Remember, if the guitar is plugged in, Ctrl-X is on whether you're playing it or not.