Tube Effects Loop Builders Guide

For the sole personal use of Trinity Amps Customers.

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www.trinityamps.com

Thank You

Thank you for purchasing your kit from Trinity Amps. We truly hope that you enjoy building it and that it will be enjoyed for many years. If you have any questions please do not hesitate to contact us and. Please be sure to check the package contents in case there are any missing items.

We are always looking for feedback from our Customers on our products. We have checked the build instructions over thoroughly and are confident in our product. However, mistakes do happen so our advice is that as you connect each wire and part according to the layout, cross-check against the schematic. If you find any inconsistencies, or have any concerns, please let us know. Do not hesitate to contact us! We want this build to be successful for you!

We're confident that you will like our product and our support and when you're completed, we'd appreciate your comments posted on any of the internet forums such as thegearpage.net, 18watt.com, AX84.com or trinityamps.com. You will find some extra business cards in the package. Please keep one and pass the rest around.

We know you have a choice in suppliers and do appreciate your business. If there is any other product we can provide to you or your associates, please get in touch and we will be happy to discuss requirements.

Sincerely,

Stephen Cohrs,

Trinity Amps

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Contents

WARNING

Please Read this Information Carefully

The projects described in these pages utilize **POTENTIALLY FATAL HIGH VOLTAGES.** If you are in any way unfamiliar with high voltage circuits or are uncomfortable working around high voltages, **PLEASE DO NOT RISK YOUR LIFE BY BUILDING THEM.** Seek help from a competent technician before building any unfamiliar electronics circuit. While efforts are made to ensure accuracy of these circuits, no guarantee is provided, of any kind!

USE AT YOUR OWN RISK: **TRINITY AMPS EXPRESSLY DISCLAIM ALL LIABILITY FOR INJURY OR PROPERTY DAMAGE RESULTING FROM THIS INFORMATION! ALL INFORMATION IS PROVIDED 'AS-IS' AND WITHOUT WARRANTY OF ANY KIND.**

REMEMBER: NEVER OPERATE YOUR AMP WITHOUT A LOAD. YOU WILL RUIN YOUR OUTPUT TRANSFORMER!

VERSION CONTROL

Version	Date	Change
1.0	28April20	FIRST RELEASE

TUBE EFFECTS LOOP

This is a 6N17B sub-miniature dual-triode vacuum tube-based series FX loop. It employs high voltage, has zero-loss, is built on a PCB and includes an optional true-bypass switch.

This all tube FX loop add-on module can be fitted to virtually any guitar tube amplifier.

The FX loop is optimized for insertion between preamp and driver stages, the low noise, non-clipping, analog effects loop utilizes a 6N17B sub-miniature dual-triode vacuum tube. It is designed with a cathode-follower send stage and a return gain stage both of which can be adjusted. The mounting requirements are simple (Power, Ground, Signal In, Signal Out, 2 heater wires) and it is held in place by chassis mounting the ¼" jacks.

Power drain on the B+ is minimal and the unit features a voltage regulator to minimize noise and simplify installation. This eliminated the need for a voltage dropping resistor. Similarly, heater current draw is minimal. The 2 internal trim (level) pots that can be accessed directly through the jacks (no chassis removal) or internally by using a small flat-bladed screwdriver.

The PCB footprint is small (3 holes), yet both the send and return levels can be adjusted for nearly any loop requirement. Low cost stomp boxes and pedals work just as well as thousand-dollar rackmount effect units.

The Send is configured as non-interrupt, so it can be used as a Preamp/Slave Line Out. When no connection is made, the unit accurately passes signal but there is also an optional panel mounted true bypass switch.

This FX loop kit makes inserting any effect or pedal, less intrusive to the tone of your OSD.

FX LOOP INSTALLATION

Installing this module will require you to work with high voltage. Previous experience with tubes and/or tube amplifiers is mandatory. It's recommended to have the module installed by an amp technician.

COMPLETE THE Fx BOARD

The Fx board has an option to determine the spacing of the SEND and RETURN jacks. They can be spaced 1 inch or 1-1/2 inch apart. It may depend on whether you plan to install the optional BYPASS SWITCH or not.

You need to decide on the spacing and then locate and solder in place, the supplied, loose jack and trim pot. The locations are printed on the Fx PCB.

INSTALLING THE OPTIONAL BYPASS SWITCH

When the cables are unplugged, and the PCB is powered, the Fx loop is bypassed, but some amps have bypass switching options so you can easily compare the Effect in and out of circuit. So a DPDT switch is provided.

Desolder and remove 2 PCB jumpers in the area of the IN / OUT PCB pads.

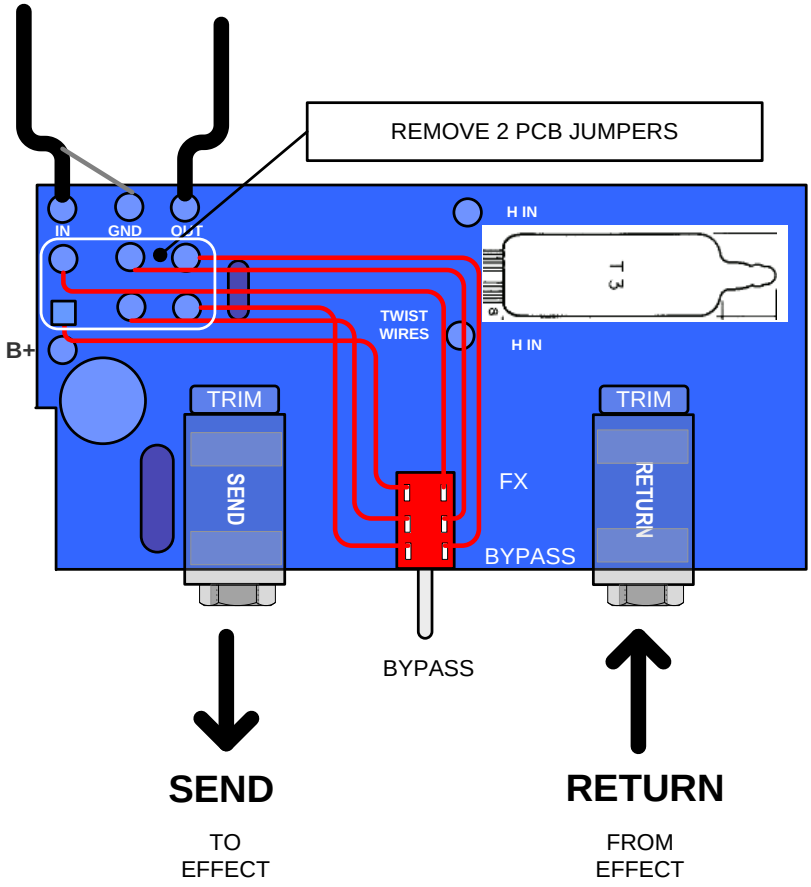
Prepare 6 - 26 ga wires about 6" long to reach BYPASS switch chassis mounting hole on chassis.

Connect each wire to the matching switch lug.

Twist the wires together by rotating the DPDT toggle switch to form a bundle

Test with the amp off, that in BYPASS mode, there is continuity between the MV centre lug and PI input on eyelet board.

Make sure to orient the switch so that the BYPASS chassis labels match the correct toggle position (down) and install the switch.

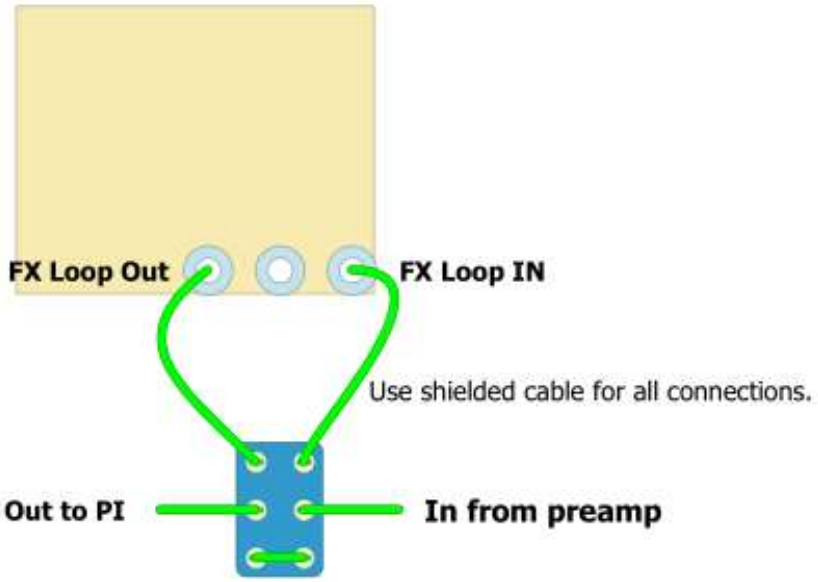


INSTALLING THE OPTIONAL BYPASS SWITCH (alternate)

When the cables are unplugged, and the PCB is powered, the Fx loop is bypassed, but some amps have bypass switching options so you can easily compare the Effect in and out of circuit. So a DPDT switch is provided.

Connect the INPUT coaxial lead to a middle switch lug. Connect the OUTPUT coaxial lead to the other middle switch lug . Solder a jumper across the top two switch lugs. Connect a coaxial cable from the lower two lugs to reach the FX IN/OUT PCB . Connect the two OUTPUT shields together at switch or FX end. Solder the two IN cable to the FX board. Solder the OUT coax cable to the board as well as the shield to GROUND.

Make sure to orient the switch so that the BYPASS chassis labels match the correct toggle position (down) and install the switch. Test with the amp off, that in BYPASS mode, there is continuity between the MV centre lug and PI input on eyelet board.



INSTALLING THE FX LOOP

The installation requires you to connect an Input, OUTPUT, GROUND, HIGH VOLTAGE (B+) and HEATER VOLTAGE. Use shielded wire for IN and OUT connections. The Fx board should be inserted between the preamp and phase inverter. Typically, just before a PI input.

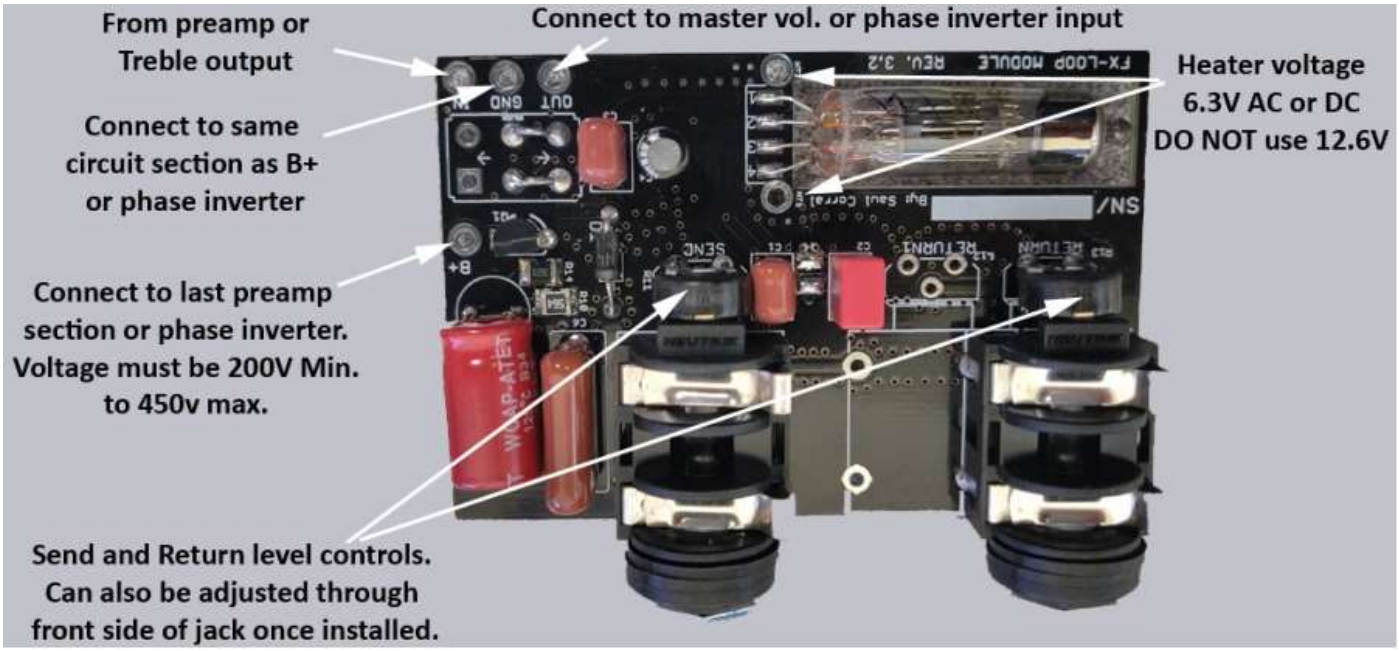
Ensure that that the proximity of the Vacuum tube to components is no less than 1/4" . At that distance, the temperature of the component will reach a safe 40 degrees C which is less than half the typical temperature allowed.

1. INPUT IN Should come from the output of the preamp stage. This may be before or after a Master volume or after the Treble control. Use coaxial cable to connect and connect the shields to the single Fx board ground point. For noise elimination, you should never connect the shield of the cable at both ends. ONE END ONLY.

2. OUTPUT OUT Should go to your master volume if available or directly into the phase inverter input. Use coaxial cable to connect and connect the shields to the single Fx board ground point. Only ground one end of the cables.

3. GROUND GND Should be connected to your phase inverter ground or to the ground point associated to where you took your B+ from. It is also used to ground shielded cable from input and output. Only ground one end of the cables. Ground to same section of circuit you connected your B+ to.

4. HIGH VOLTAGE B+ It's recommended to connect to the same section feeding your phase inverter tube or the last preamp tube. Voltage must be at least 200V up to 450V. The Fx design has a built-in voltage regulator that sets the voltage for the tube and plate voltage for longer tube life. However, before connecting the Fx board, measure and record the B+ voltage you will be using for the Fx board.



5. HEATER VOLTAGE This tube only works with 6.3V AC or DC. Do not use 12.6V! Wires for this voltage are connected to holes on sides of tube. If using 6.3VDC, positive can be on either side.

Connect twisted heater leads from a nearby tube socket. Always keep the leads close to the chassis to eliminate induced hum and noise.

6. INSTALL THE FX BOARD With all the wires connected, remove the nuts from the SEND and RETURN jacks. Fit them through the previously drilled holes in the chassis. Use the fibre washers to set the depth of thread in the hole. Screw on the jack nuts back on to hold the Fx PCB in place. Tighten.

7. HIGH VOLTAGE B+ ADJUSTMENT Turn the amp on and if equipped with a Standby switch, place in Play mode, ensuring that you have an adequate load connected to the speaker jack. Measure the B+ Fx board voltage again, and compare to the previous measurement step 4. If the B+ has dropped more than 10VDC, it could slightly affect the amplifier's tone and dynamics - the more the difference in the original voltage the more affect it will have on tone. If this is the case, changing the B+ second stage dropping resistor to a lower value will allow the B+ to return to its original value. In many amps the resistor(s) are 10K (1-3W) or in a range of 6.8K-22K. Experiment with replacing the resistor with another that has a value that is 2-10K less.

USING THE Fx LOOP

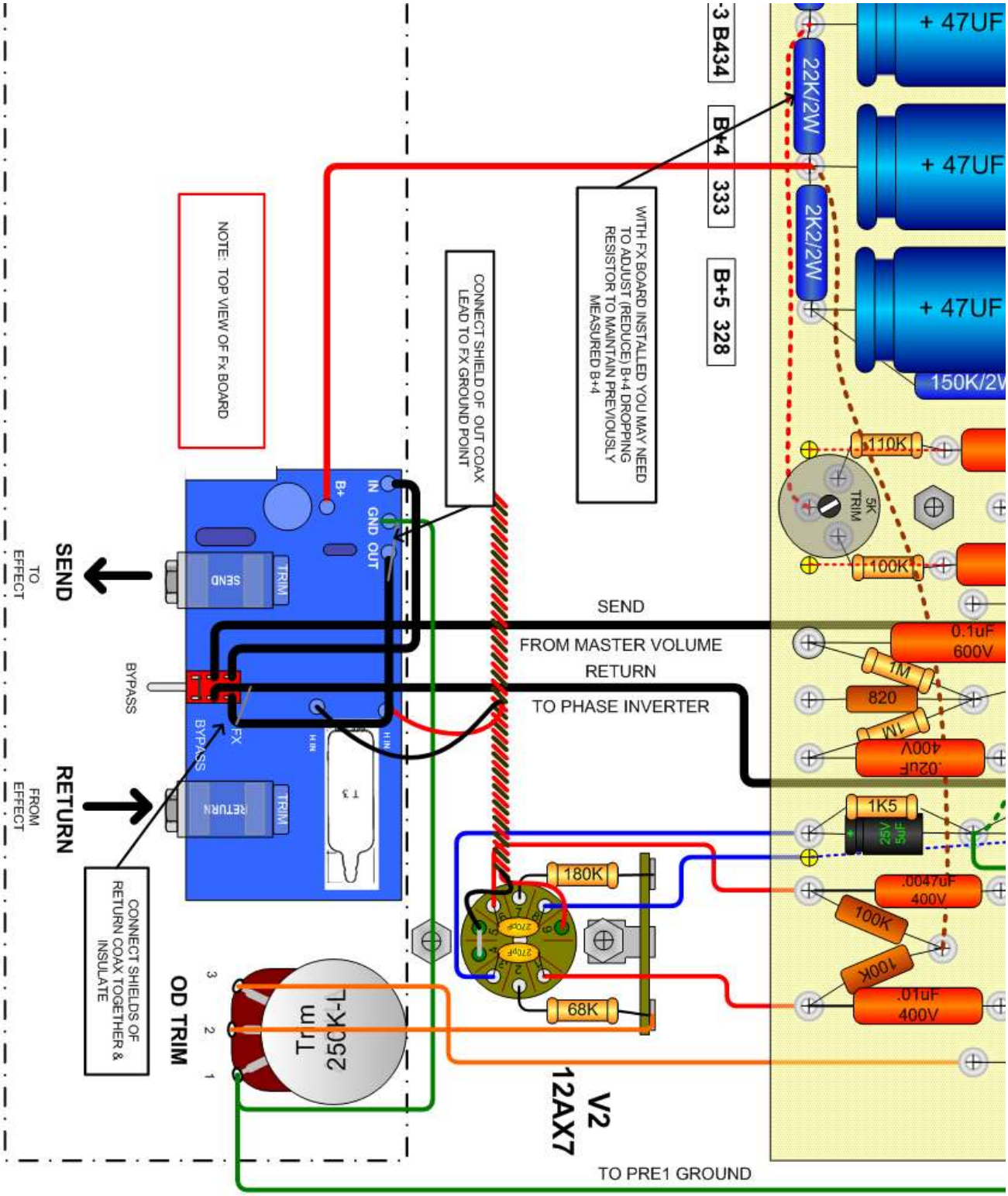
In stock configuration, installing the Fx Loop in active mode will reduce your SEND signal after the buffer (cathode follower) stage of the circuit. On RETURN, the signal is input into a basic triode gain stage that adds gain. Therefore, the Fx Loop can deliver a net signal that is higher. This can be trimmed by using the SEND and RETURN internal trim pots internally or by inserting a small, flat bladed screwdriver through the jack itself. It can also be trimmed via the output potentiometer on your effects rack if you have one, or via the amp's master volume.

Start with both trim pots around 3 o clock (looking at it from the outside) and adjust from there. Keep in mind, the higher the RETURN amplification, the more noise may be injected.

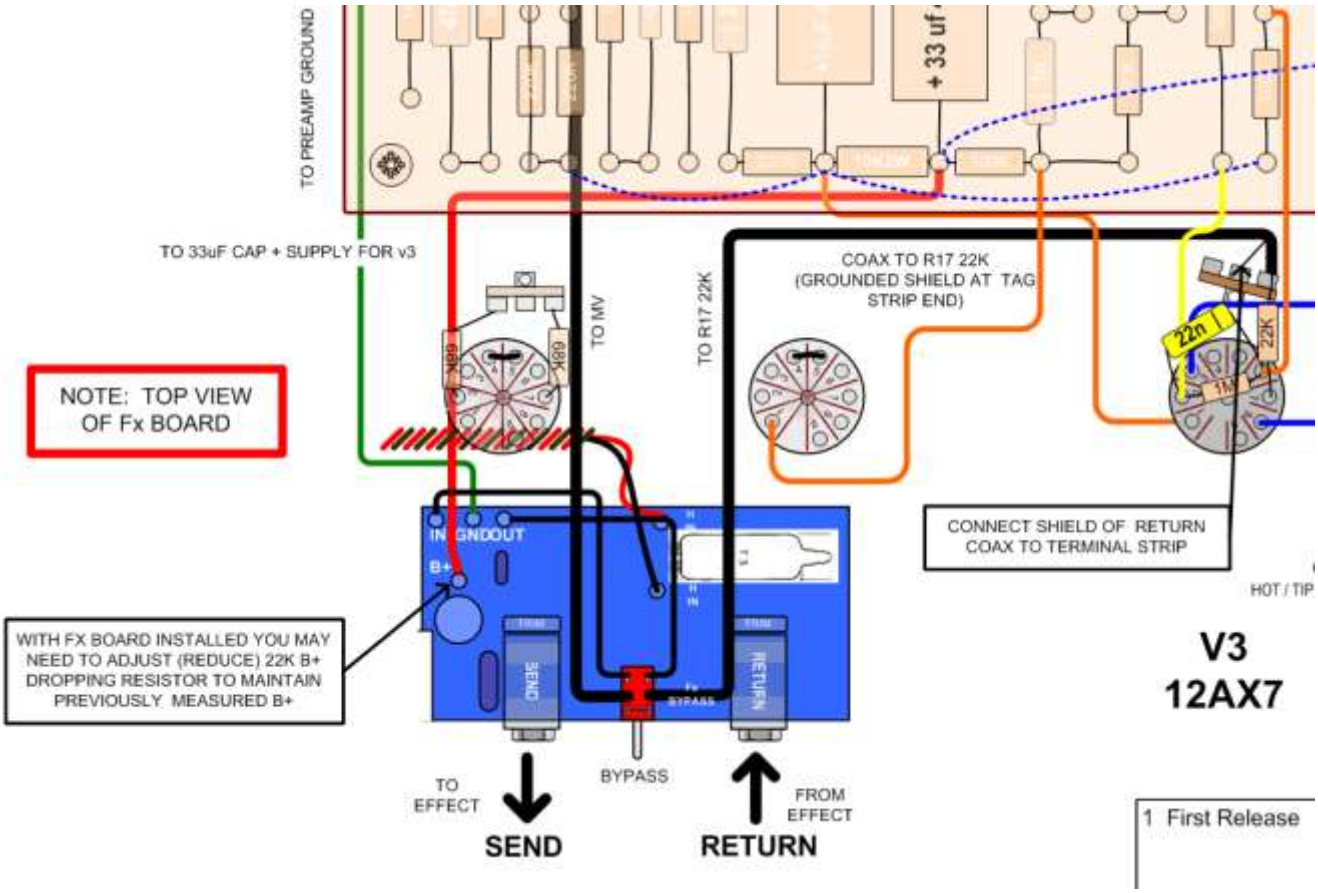
Start with an input signal and then adjust the SEND to high and adjust the RETURN to achieve unity gain or no noticeable volume difference between SEND/RETURN when bypassed or unplugged.

Once the Fx loop is installed and set-up, connect a power cable and speaker cable, then power on the amp. Connect an instrument cable, as well as two patch cables into the SEND and RETURN jacks. Connect them to your effects unit. Put the amp in Play mode if equipped with a Standby switch. You should hear the effect added to the signal when engaged. If there is no effect to the signal, ensure all cables are good, plugged in correctly, and the amp controls are adjusted properly.

OSD TUBE FX INSTALLATION



TRIWATT Tube Fx Installation



TUBE FX TUBE REPLACEMENT

The 6N17B is a military grade miniature vacuum tube and is unlikely to ever require replacement. However, the following guide will help should that occur. Desolder the pins of the tube. Replace as per drawing below.