

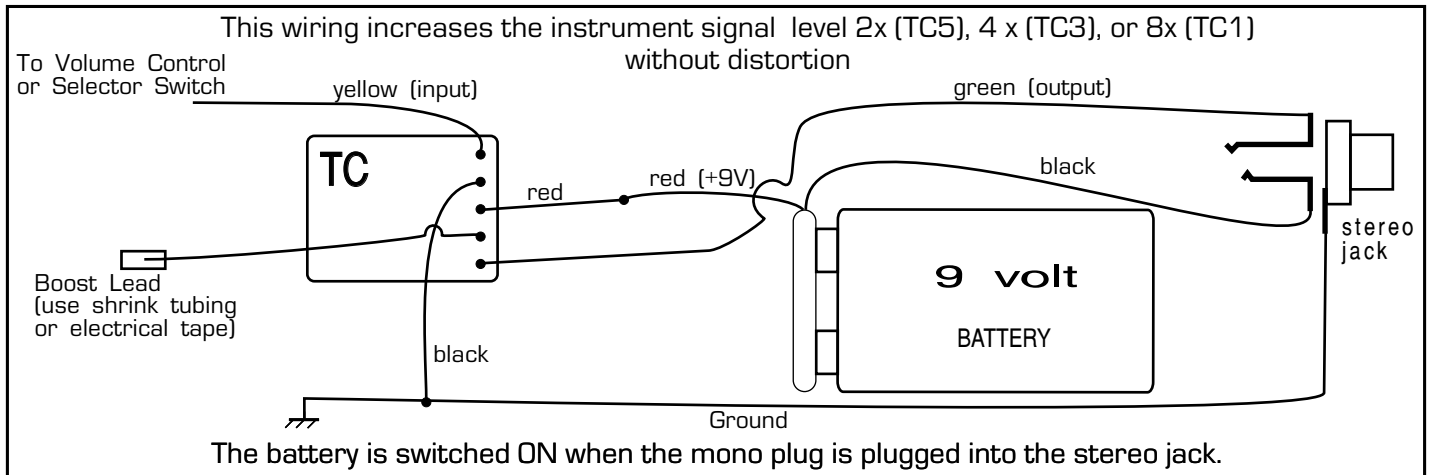
The TC series preamplifiers are designed to improve the performance of electric instruments by increasing the signal level, modifying tonal quality with a wide range of options and decreasing the treble losses in the cable.

All TC preamps can be used in the unboosted mode to provide equal amplification of all audio frequencies. The boosted modes allow tonal changes ranging from simple treble boost to a midrange spectrum shaping specifically designed to overdrive amplifiers to their best distortion sounds.

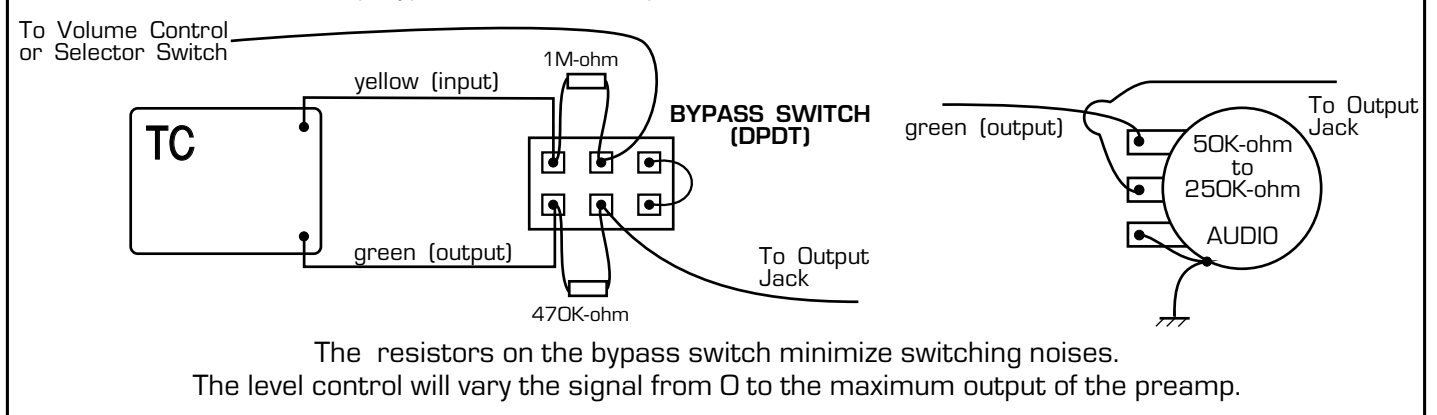
These preamplifiers are hand made from discrete components (no I.C.'s) for very low noise levels, outstanding distortion characteristics, and very long battery life. They are rugged, reliable, easy to install, and in most cases do not require modifications to the instrument. Although we recommend shielding the control cavity for optimum performance, the internal shielding of these preamps will provide very low hum levels even in unshielded installations.

The following examples explore some of the possible uses of these preamps.

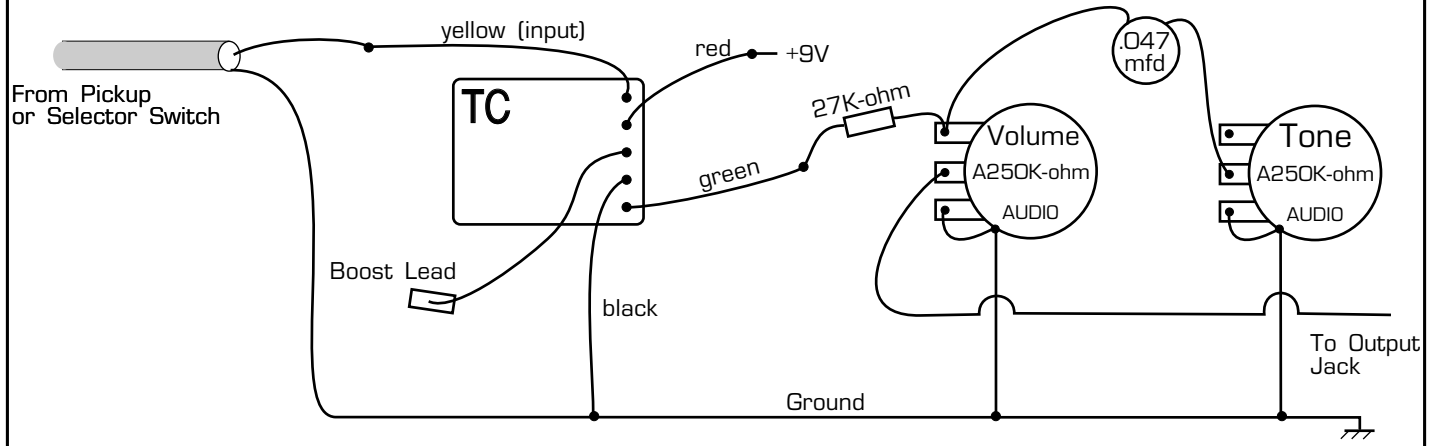
USING THE TC PREAMP WITHOUT BOOST



Preamp bypass switch or output level control can be wired as follows:



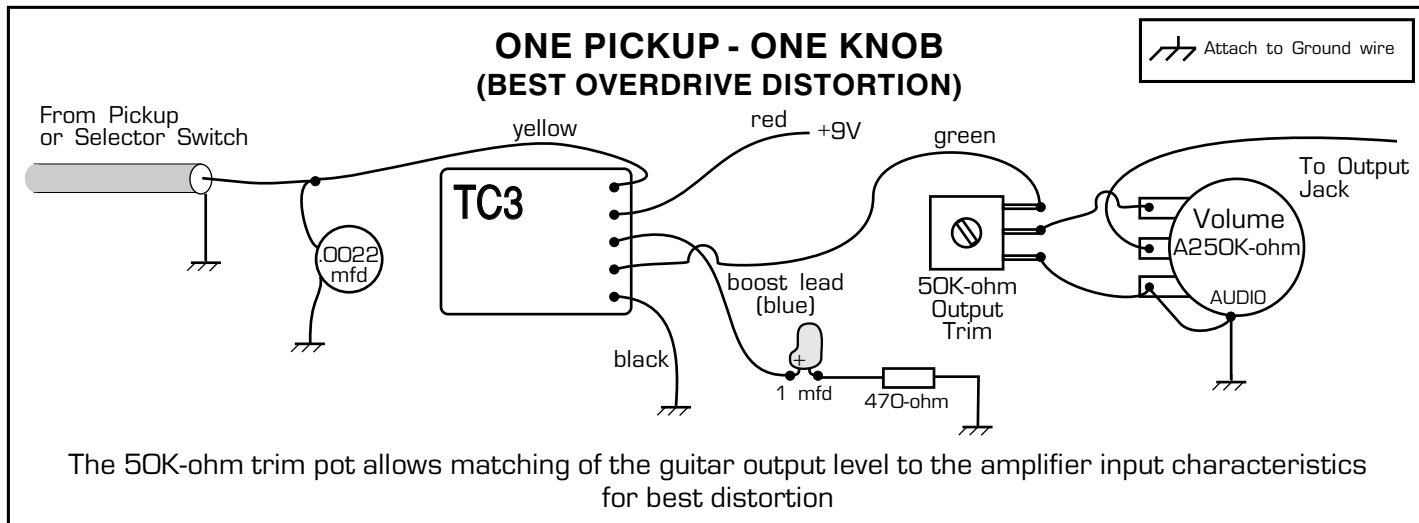
For maximum control of pickup tonality the TC preamplifiers can be used to isolate the pickup from the tone and volume controls.



USING THE TC PREAMP WITH BOOST

Connecting the boost lead to ground through a capacitor increases the gain of the preamp. The gain boost can occur throughout the range of the instrument or only at midrange and treble frequencies depending on the value of the capacitor. A resistor in series with the capacitor can be used to limit the gain boost.

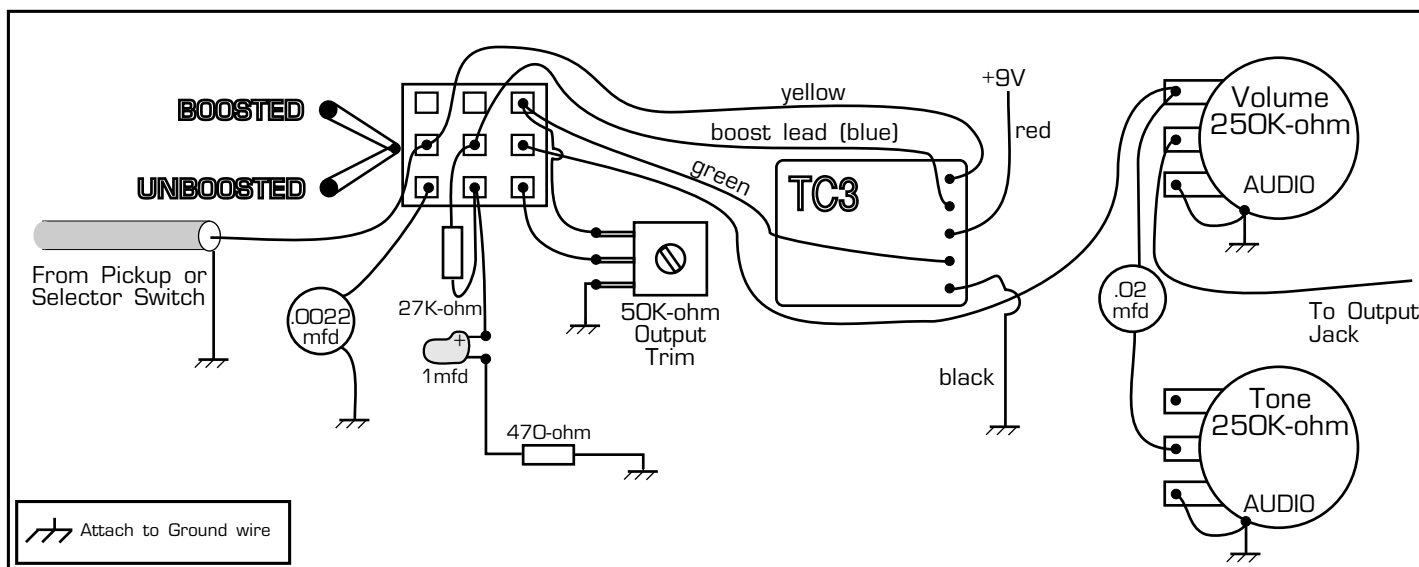
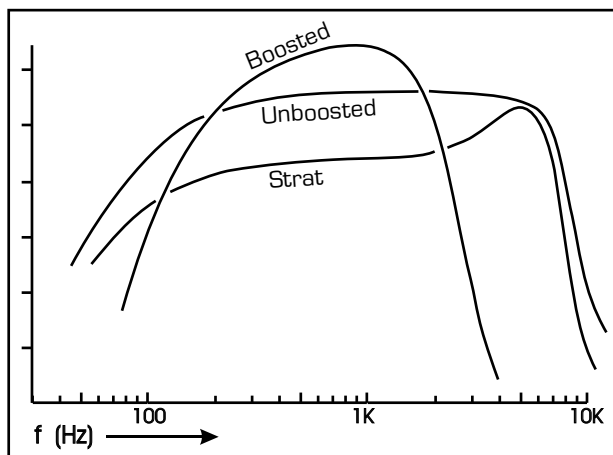
Preamp	Input Impedance	Input Wire Color	Output Wire Color	Boost Wire Color	Unboosted Gain
TC1 & TC2	300K-ohm	Yellow	Green	Brown	8x (18dB)
TC3 & TC4	400K-ohm	Yellow	Green	Blue	4x (12dB)
TC5 & TC6	500K-ohm	Yellow	Green	Grey	2x (6dB)



SWITCHING FROM BOOSTED TO UNBOOSTED MODE

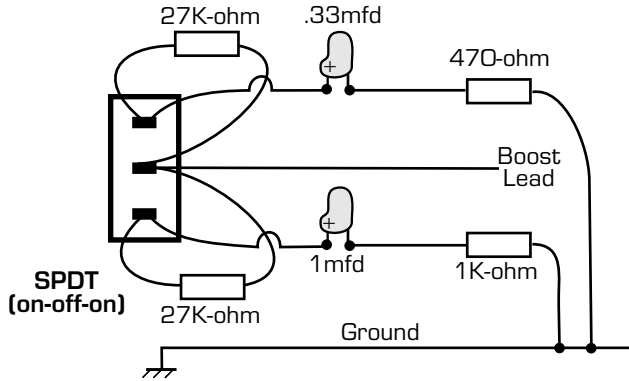
A 3PDT switch is used to switch the coil tuning capacitor, the preamp boost, and output attenuation components.

The frequency response curves show one of our hum-cancelling pickups (Vintage Bridge Pickup) with the TC5 in both modes compared to a Strat®. The Output level in the unboosted mode is 4 times that of the Strat®. The maximum level of the boosted mode is at least twice that of the unboosted mode. The TONE and VOLUME controls can be 250K-ohm or 500K-ohm audio pots. The 27K-ohm resistor minimizes switching noise.



3 POSITION BOOST SWITCH

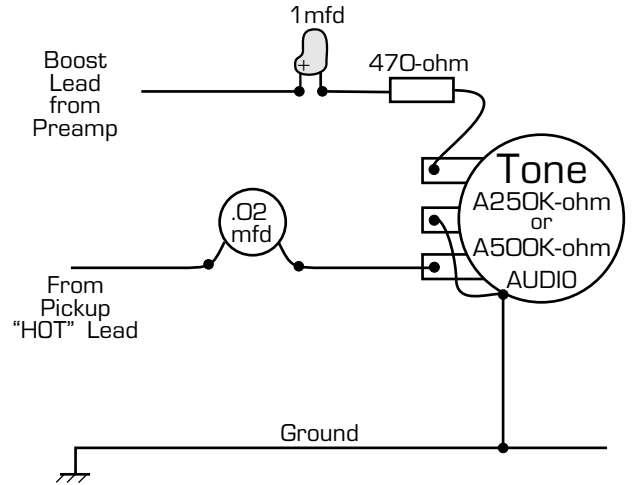
The outside positions of the switch toggle give different amounts of midrange and treble boost (see TC3 response range). The resistors between the capacitors and ground limit the amount of boost. For maximum boost, connect the capacitors directly to ground. The 27K-ohm resistors minimize switching noises. In the center position the preamp is not boosted.



TONE CONTROL BOOST

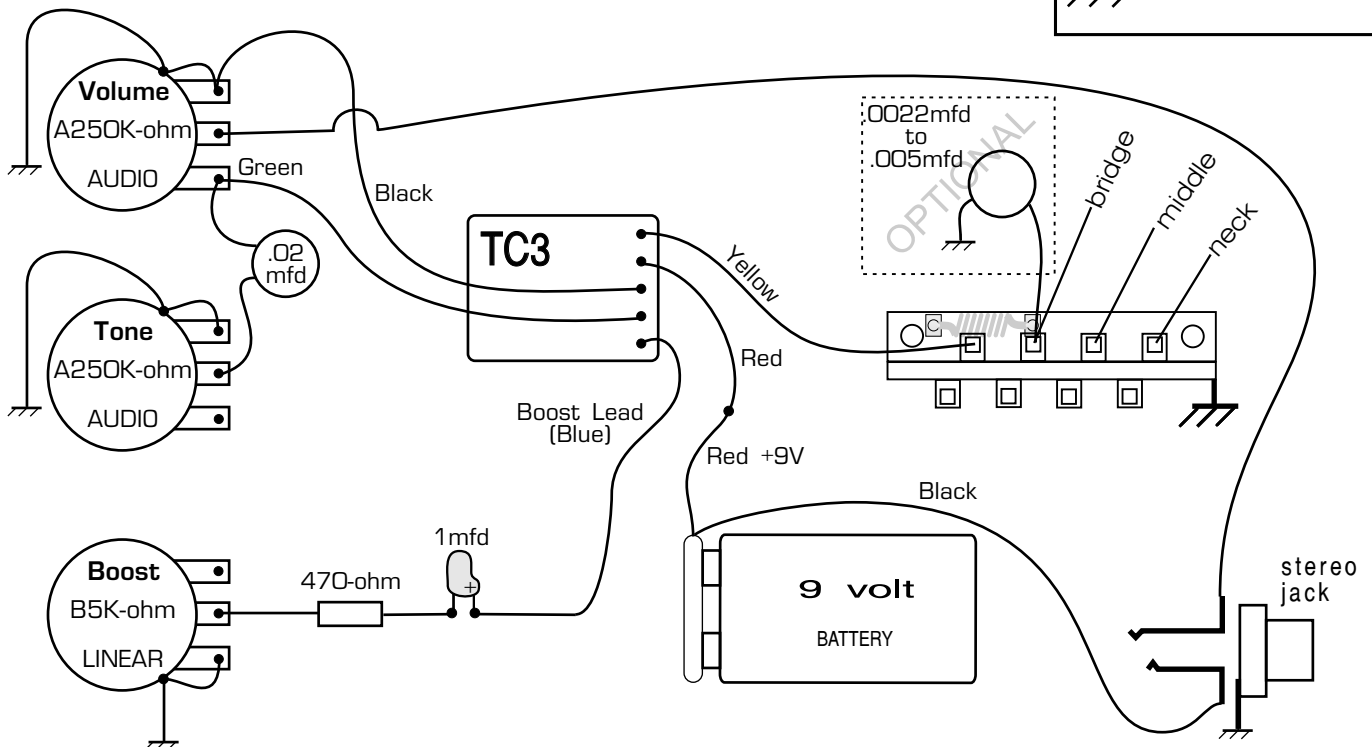
Thanks to Ed Reynolds (Austin, TX)

From "0" to "9" this control behaves like a regular passive tone control. When turned full up, the control puts the preamp in boosted mode. The resistor limits the amount of boost.




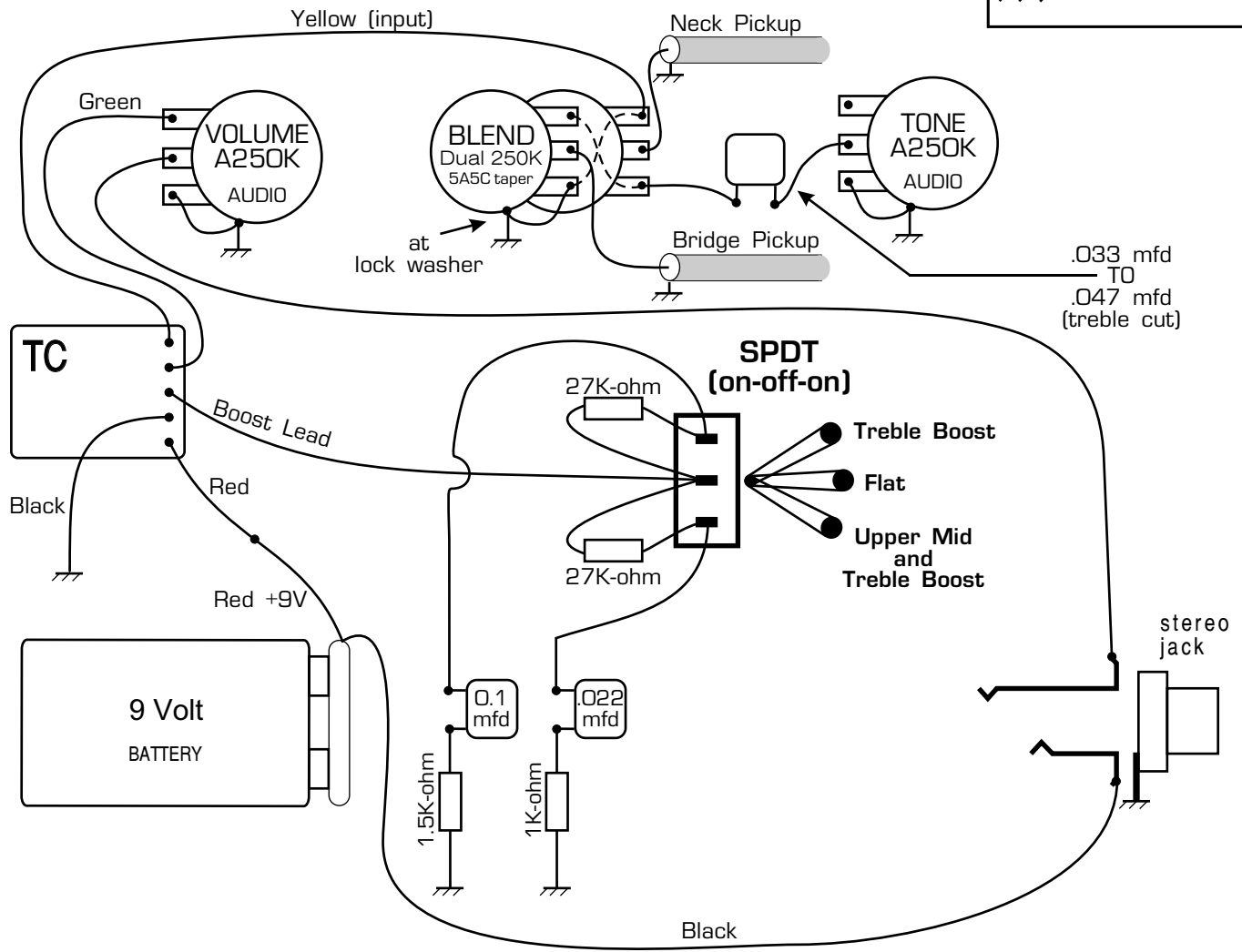
TC3 WITH VARIABLE BOOST IN A STRAT®

The second tone knob is replaced with a 5K-ohm control that controls the amount of boost. The optional capacitor from the bridge pickup to ground enhances midrange frequencies for better overdrive distortion but will diminish "squat" in the #4 ("in between") position.



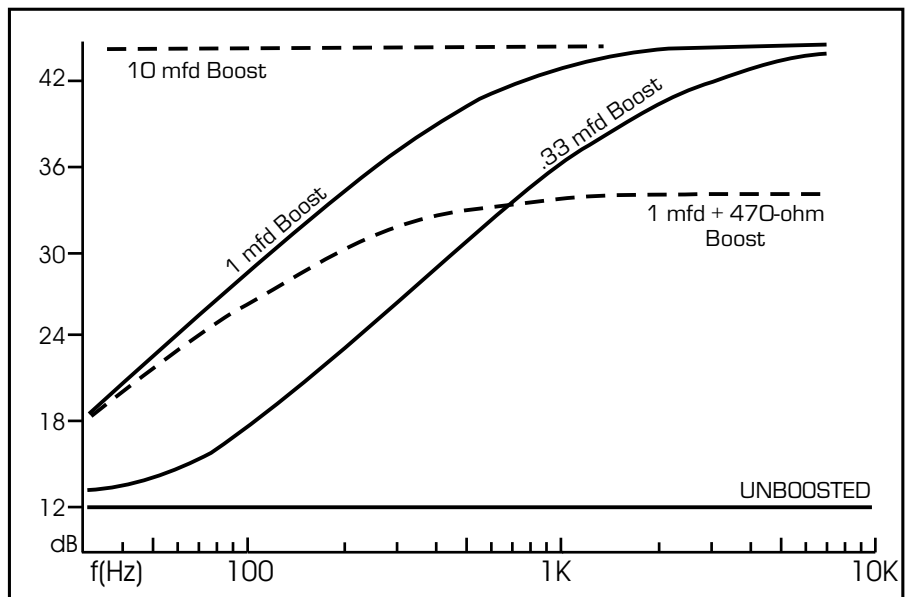
Upper Mid and Treble Boost - 3 Position Switch

 Attach to Ground wire



The 0.1 mfd and 0.022 mfd Capacitors control the frequency of the boost. Larger capacitors boost more of the bass frequencies. A 10 mfd capacitor will boost all frequencies equally (flat boost). The 1.5K-ohm and 1.0K-ohm resistors limit the amount of boost, larger resistor values decrease the boost levels.

The graph shows the behavior of a TC3 for other capacitor and resistor values. When used on the TC3 boost lead a 1.5K-ohm resistor will limit the boost to about 12dB above the unboosted level.



TC1-6 INSTALLATION NOTES

The TC2, TC4, and TC6 preamps are the “stereo” 2-channel versions of TC1, TC3, and TC5. The output impedance of the TC preamps is 60K-ohm. The unboosted gain is measured with a 500K-ohm load. If these preamps are used with 250K-ohm volume controls at the output lead the unboosted gain will be slightly lower (~1dB). If 25K-ohm controls are used at the output lead the unboosted gain will be lowered by 6dB (half the output) without distortion.

The maximum undistorted signal level of all the TC preamps is 2.5 volts r.m.s. The maximum input level for undistorted pickups output (unboosted) is 2.5 volts r.m.s. divided by the unboosted gain. This means 250 to 300 millivolts for the TC1 and TC2 preamps. The TC1 and TC2 should be used only with pickups that have very low output levels, otherwise the pickups will overdrive the input stage of the preamp.

Battery Drain

TC1, TC3, and TC5: 160 microamperes - 4 month of continuous playing (~ 1 year of enthusiastic playing)
TC2, TC4, and TC6: 320 microamperes - 2 month of continuous playing (~ 6 month of enthusiastic playing)

PLEASE NOTE:

-THE WIRE LOCATIONS ON THE DIAGRAMS ARE NOT IN THE SAME ORDER AS THEY ARE ON THE MODULE AND WERE ONLY DRAWN THAT WAY FOR SIMPLICITY. **FOLLOW COLORS, NOT WIRE ORDER.**

- IF NOT USED, THE BOOST LEAD SHOULD BE COVERED WITH ELECTRICAL TAPE OR SHRINK TUBING TO PREVENT GROUNDING. VERY HIGH GAIN, NOISE, AND DISTORTION WILL RESULT IF THE BOOST LEAD IS GROUNDING.

-DO NOT OVERHEAT PINS OR WIRES. USE A LOW WATTAGE (25 WATTS MAXIMUM) OR A THERMOSTATICALLY CONTROLLED SOLDERING IRON AND GOOD QUALITY ELECTRONIC SOLDER. APPLY THE LEAST AMOUNT OF HEAT FOR THE SHORTEST TIME NECESSARY TO MAKE A GOOD CONNECTION.

-AS ALWAYS, WE RECOMMEND TO TAKE YOUR INSTRUMENT TO A GOOD GUITAR REPAIR SHOP. A LIST OF REPAIR SHOPS NEAR YOU CAN BE FOUND ON: **www.bartolini.net**