TC 1-6

Preamp	Input Impedance	Input Wire Color	Output Wire Color	Boost Wire Color	Unboosted Gain
TC1 & TC2	300 K-ohm	Yellow	Green	Brown	8x (18 dB)
TC3 & TC4	400 K-ohm	Yellow	Green	Blue	4x (12 dB)
TC5 & TC6	500 K-ohm	Yellow	Green	Grey	2x (6 dB)
TC3Z	1.5 M-ohm	White	Grey	Blue	4x (12 dB)
TC5Z	1.5 M-ohm	White	Grey	Purple	2x (6 dB)

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TC1 - TC6 PREAMPS

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

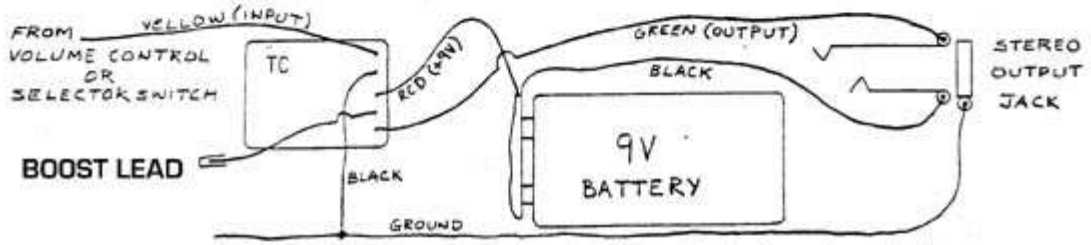
All TC preamps can be used in the unboosted mode to provide equal amplification of all audio frequencies. The boosted modes allow tonal changes ranging from simple treble boost to a midrange spectrum shaping specifically designed to overdrive amplifiers to their best distortion sounds.

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 and 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 the these preamplifiers.

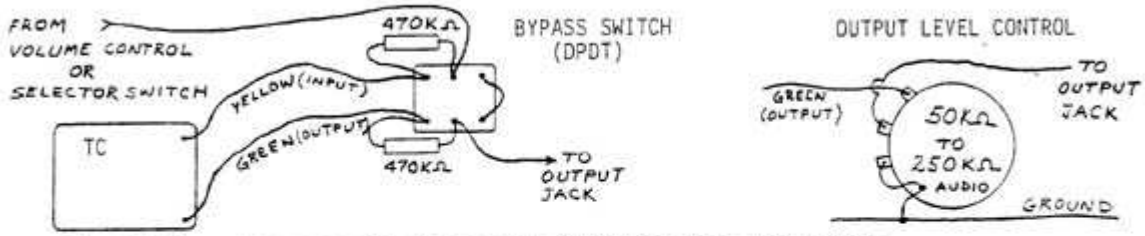
USING THE TC PREAMPS WITHOUT BOOST

This wiring increases the instrument signal level 4 times (TC3) or 8 times (TC1) without distortion.



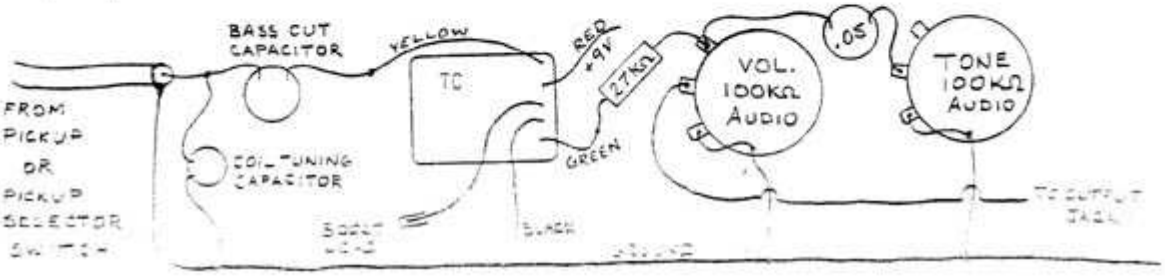
The battery is switched on when a mono plug is plugged into the stereo jack.

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



The 470 KΩ resistors on the bypass switch minimize switching noises.
The level control will vary the signal from 0 to the maximum output of the preamp.

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



When pickup tone in the undistorted range is of the utmost importance, this circuit should be used to allow a wide range of tonal response to be obtained from any pickup by appropriate choice of bass cut and coil tuning capacitors at the input of the preamplifier.

Bass cut capacitors will range from .002 to .02 mfd. (the lower the capacitor value the greater the resulting low frequency attenuation).

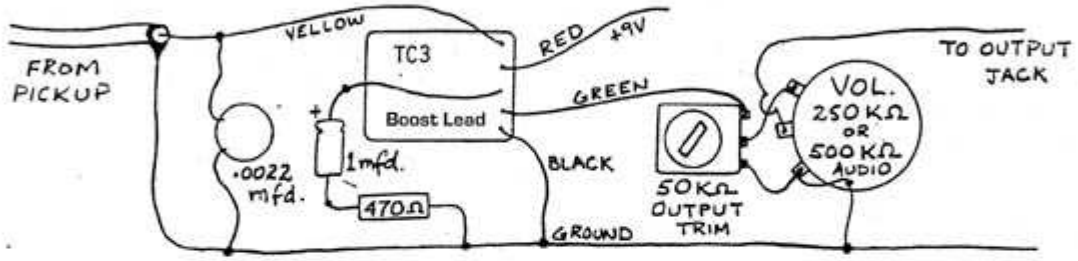
Coil tuning capacitors will range from 200 pf. to .003 mfd. (the higher the capacitor value the larger the midrange enhancement at the expense of the upper treble frequencies).

Output level from this circuit is approximately twice the input level.

USING THE TC PREAMPLIFIERS IN THE BOOSTED MODE

Connecting the boost lead (brown for TC1 & TC2, blue for TC3 & TC4) 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.

ONE PICKUP - ONE KNOB - BEST OVERDRIVE DISTORTION

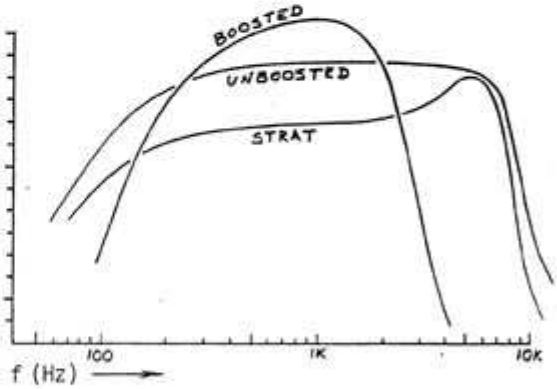


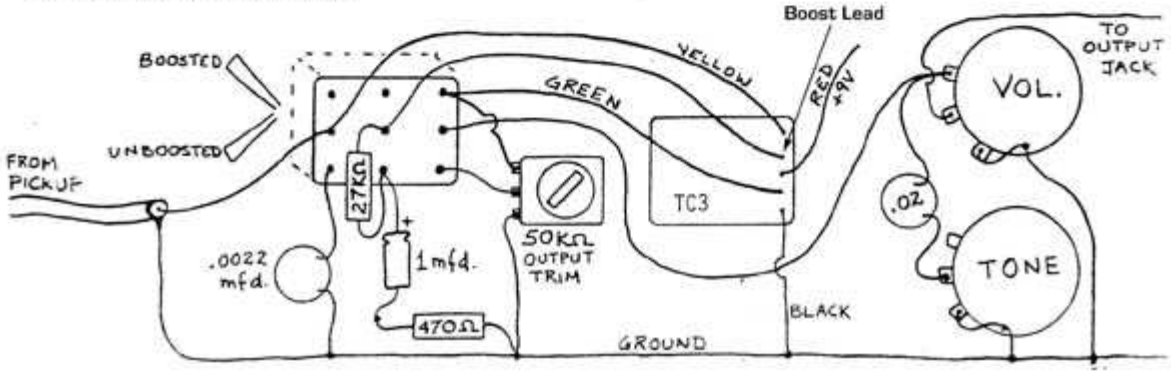
The 50K trim pot allows matching of the guitar output level to the amplifier input characteristics for best distortion.

SWITCHING FROM BOOSTED TO UNBOOSTED MODE

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

The frequency response curves show one of our hum-cancelling pickups (model 1HC) with the TC3 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 250KΩ or 500KΩ audio pots. The 27KΩ resistor minimizes switching noise.





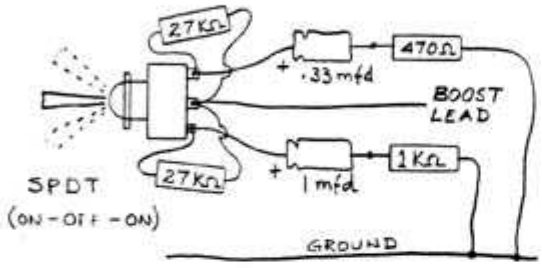
3 POSITION BOOST SWITCH

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

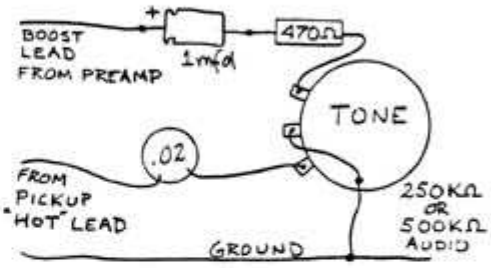
TONE CONTROL BOOST - Thanks to Ed Reynolds, Soundsmiths, Chicago, IL

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

3 POSITION BOOST SWITCH

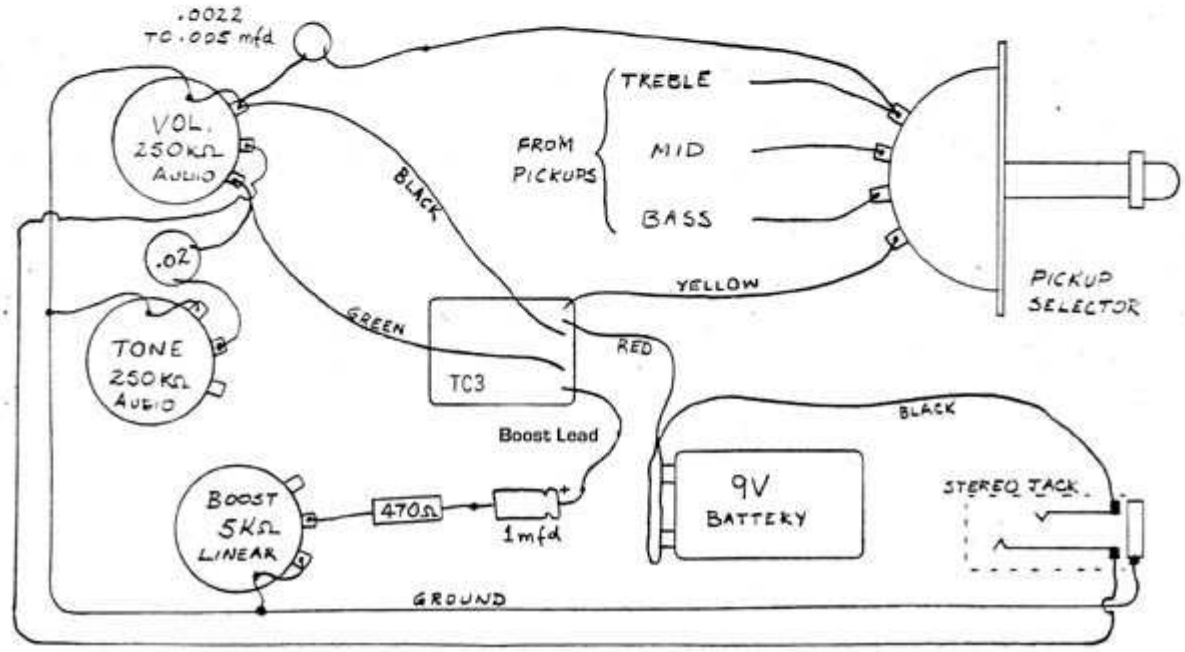


TONE CONTROL BOOST



TC3 WITH VARIABLE BOOST IN A STRAT*

The second tone knob is replaced with a 5 KΩ control that controls the amount of boost. The capacitor from the treble pickup to ground enhances the midrange frequencies for better overdrive distortion.



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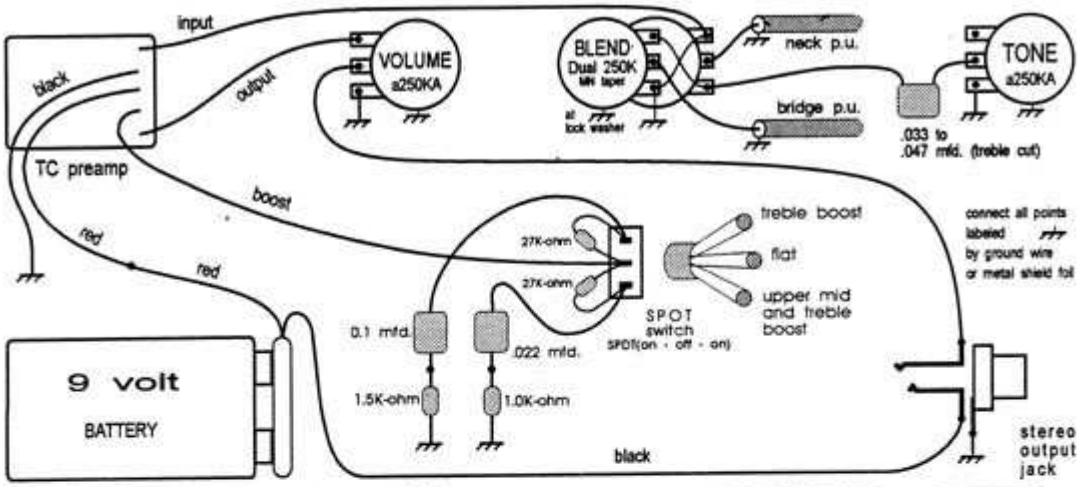
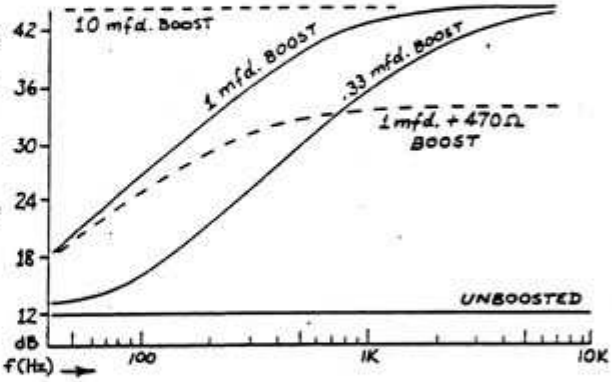
Upper Mid and Treble Boost - 3 position switch



The 0.1mfd. and 0.022mfd. capacitors control the frequency of the boost, larger capacitors boost more of the bass frequencies. A 10mfd. 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.

Caution: If not used, the boost lead should be covered with tape or shrink tubing to prevent grounding. Very high gain, noise and distortion will result if the boost lead is grounded.



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The TC2, TC4 and TC6 preamps are the "stereo" 2-channel versions of the TC1, TC3 and TC5 preamps. The TC3Z and TC5Z preamps are the high input impedance versions of the TC3 and TC5 preamps. The output impedance of all TC preamps is 60 K-ohm. The unboosted gain is measured with a 500 K-ohm load. If these preamps are used with 250 K-ohm volume controls at the output lead the unboosted gain will be slightly lower (~1 dB). If 25 K-ohm controls are used at the output lead the unboosted gain will be lowered by 6 dB (half the output) without distortion. The maximum undistorted signal level of all TC preamps is 2.5 volts r.m.s. The maximum input level for undistorted 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 & TC5 : 160 microamperes TC2, TC4, TC6, TC3Z & TC5Z : 320 microamperes .
This trasnslates to 4 months continuous duty (well over 1 year of very enthusiastic playing) from TC1, TC3 and TC5 preamps and half of that for TC2, TC4, TC6, TC3Z and TC5Z.

BACK