

bartolini

TC1, TC2, TC3 and TC4 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.

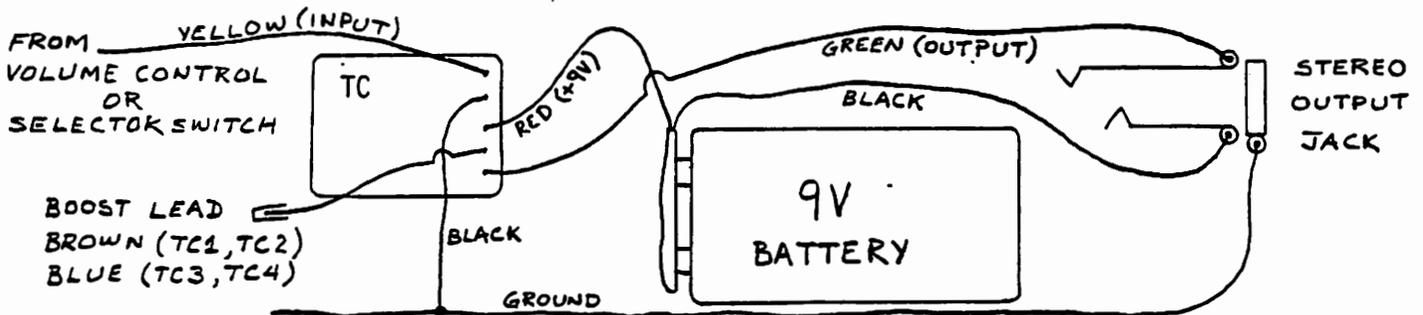
All TC preamps can be used in the unboosted mode to provide equal amplification of all audio frequencies. The boosted modes allow tonal changes ranging from simple treble boost to a midrange spectrum shaping specifically designed to overdrive amplifiers to their best distortion sounds.

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 these preamplifiers.

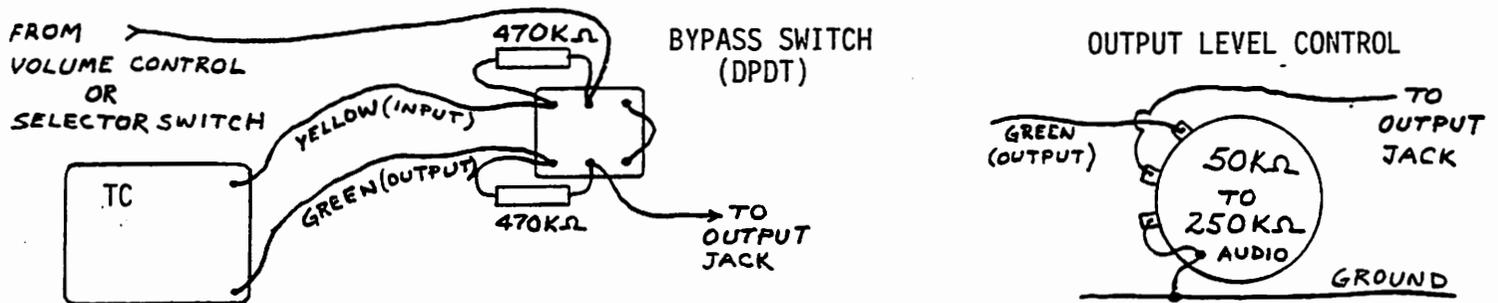
USING THE TC PREAMPS WITHOUT BOOST

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.

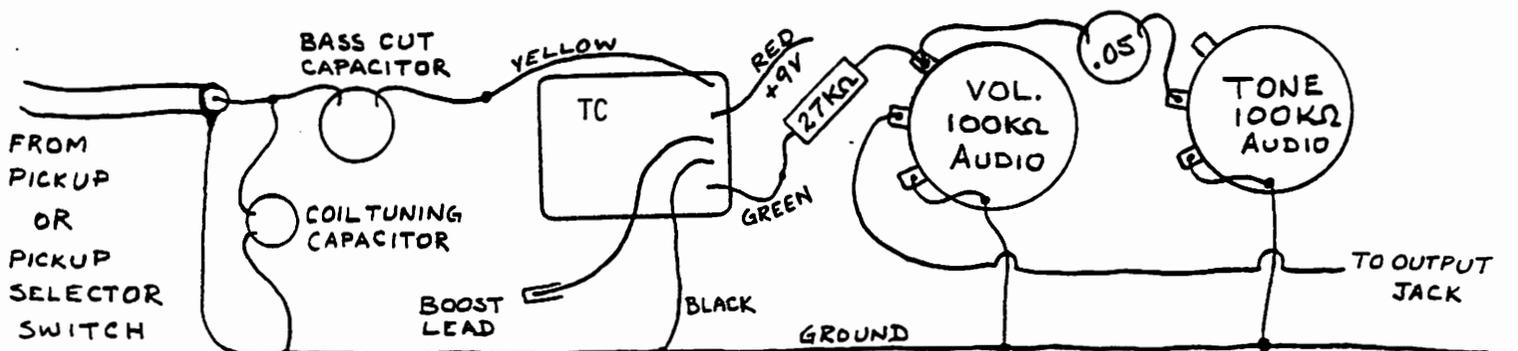
Preamp bypass switch or output level control options can be wired as follows:



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).

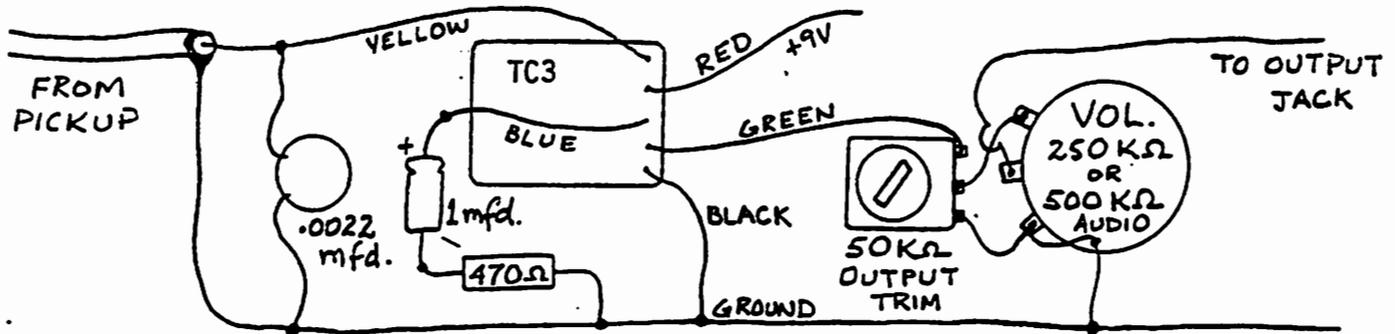
Coil tuning capacitors will range from 200 pf. to .003 mfd. (the higher the capacitor value the larger the midrange enhancement at the expense of the upper treble frequencies).

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

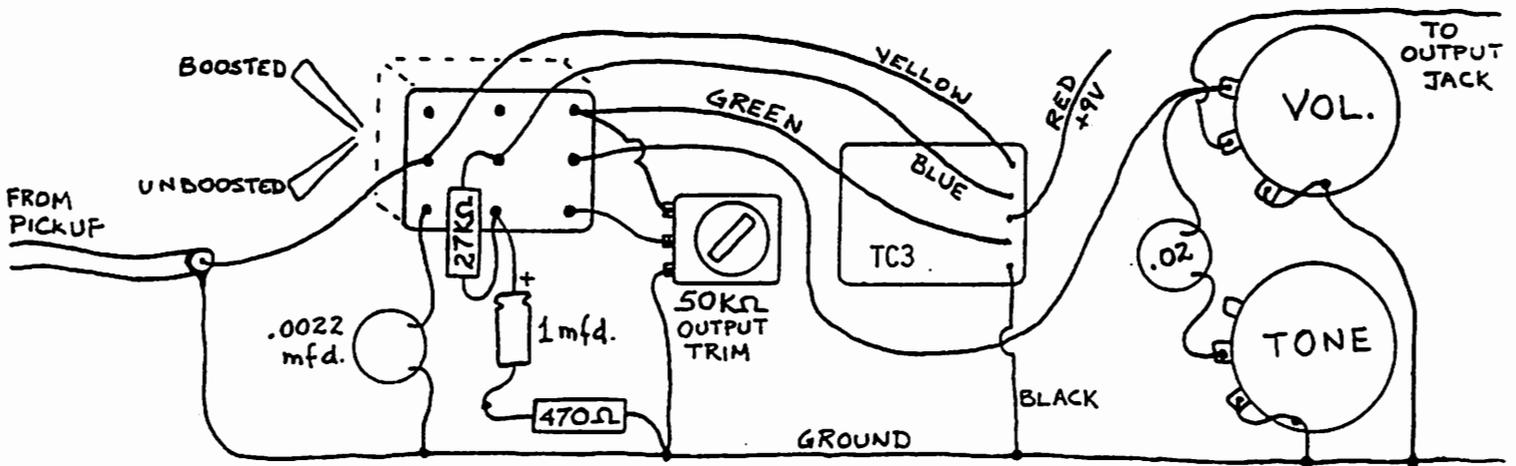
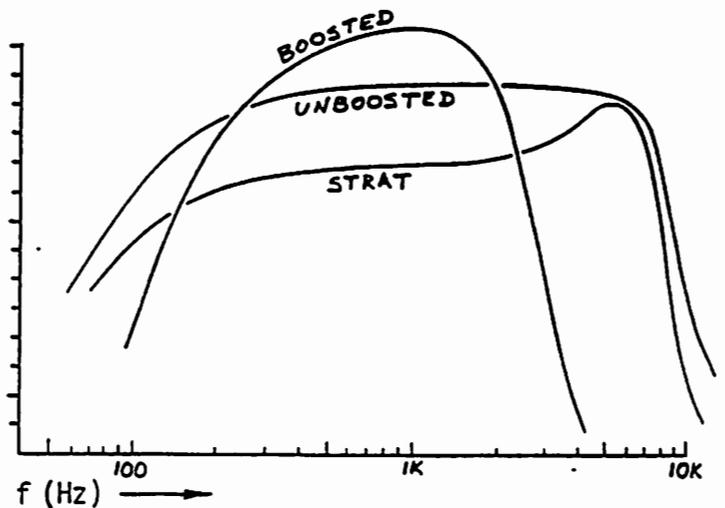


The 50K trim pot allows matching of the guitar output level to the amplifier input characteristics for best distortion.

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 250K Ω or 500K Ω audio pots. The 27K Ω resistor minimizes switching noise.



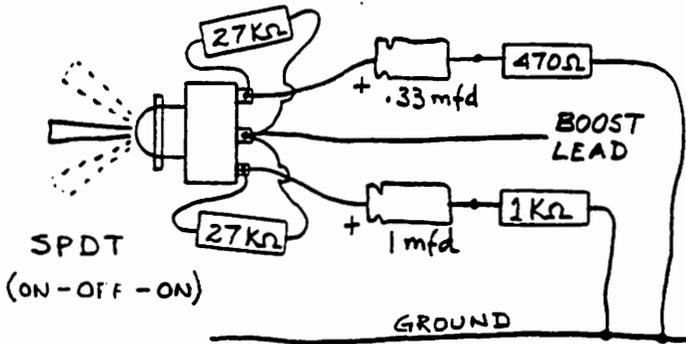
3 POSITION BOOST SWITCH

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 K Ω resistors minimize switching noises. In the center position the preamp is not boosted.

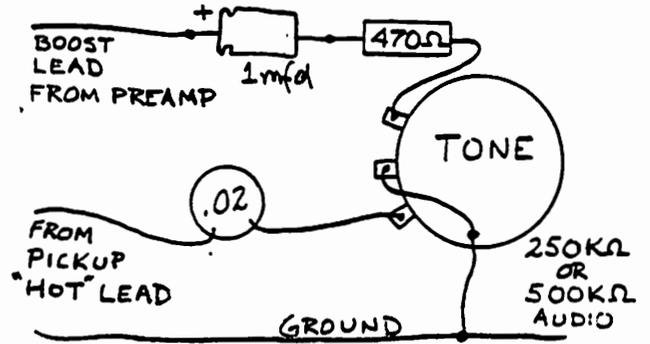
TONE CONTROL BOOST - Thanks to Ed Reynolds, Soundsmiths, Chicago, IL

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

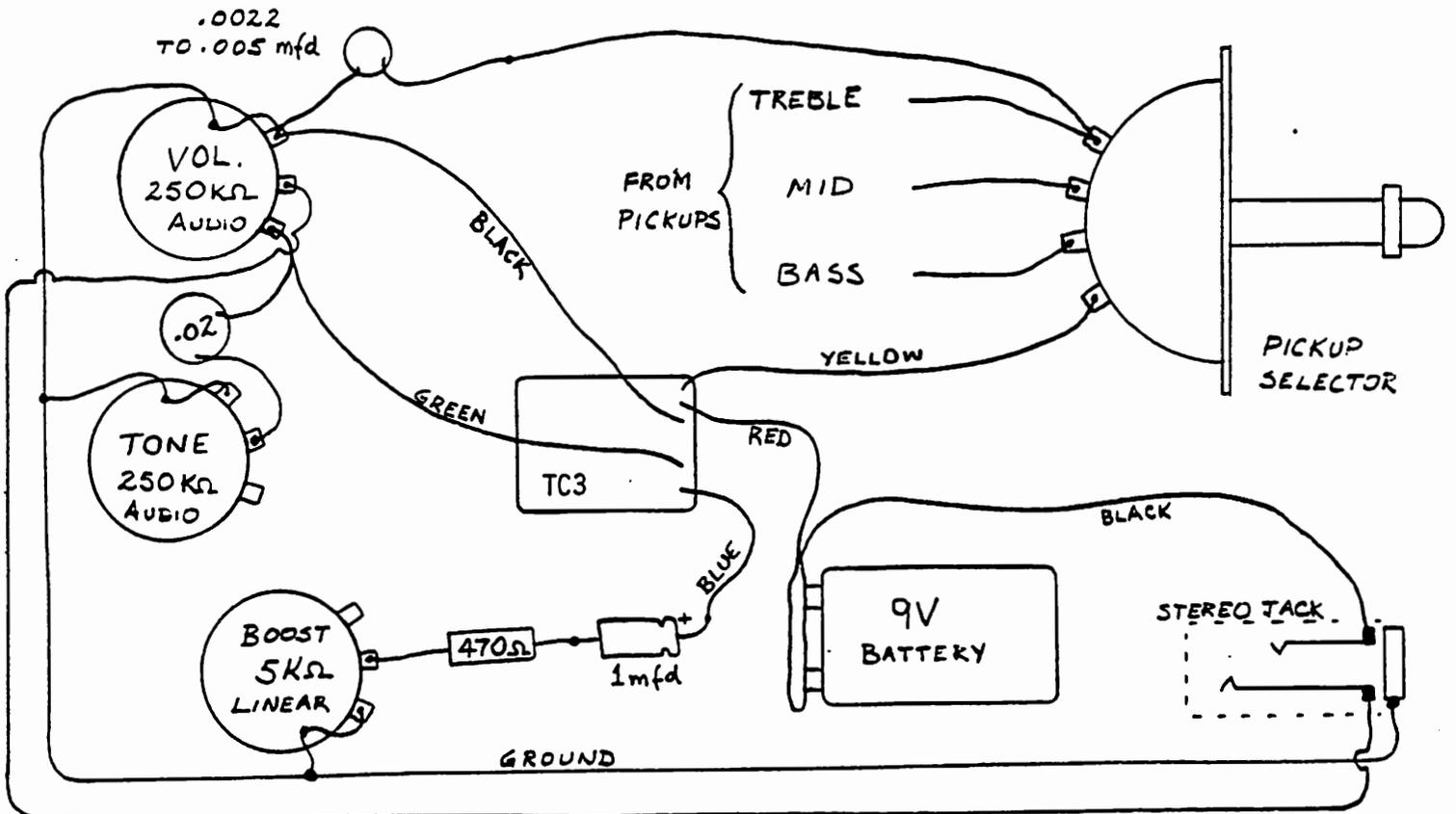


TONE CONTROL BOOST

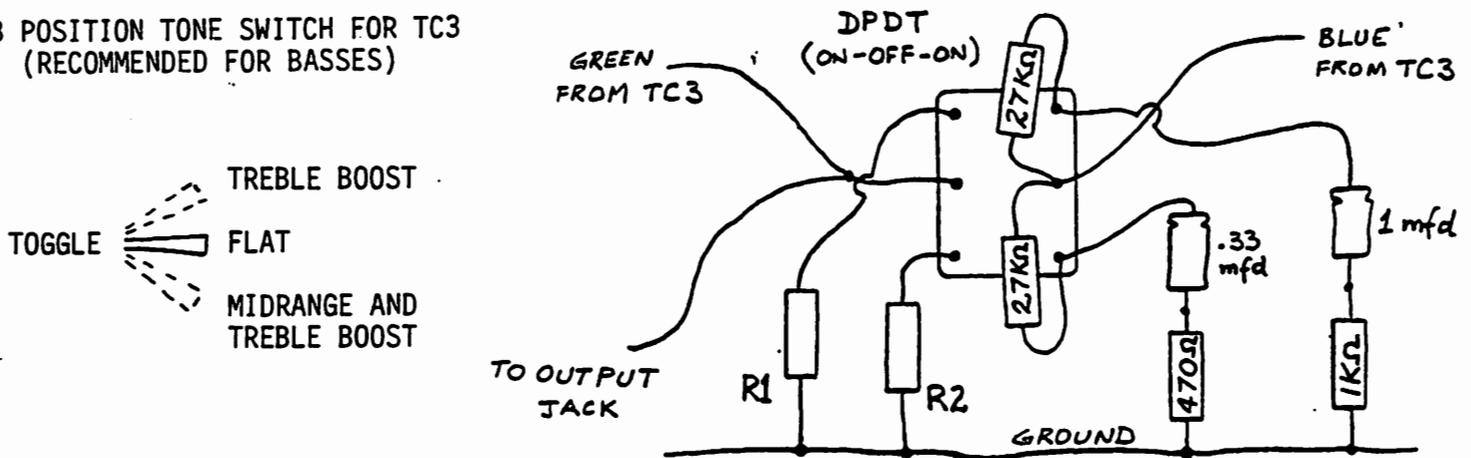


TC3 WITH VARIABLE BOOST IN A STRAT*

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



3 POSITION TONE SWITCH FOR TC3
(RECOMMENDED FOR BASSES)



TREBLE BOOST: .33 mfd + 470Ω boost upper treble approx. 18dB. Resistor R2 attenuates output to match center position (approx. 5KΩ). The upper treble emphasis gives a tense "piano-wire" tone to the instrument.

CENTER: Flat frequency response - full range sound.

MIDRANGE AND TREBLE BOOST 1 mfd + 1KΩ boosts upper midrange & treble approx. 12dB. Resistor R1 attenuates output to match center position (approx. 3KΩ). The midrange enhancement gives a tone quality similar to Fender basses.

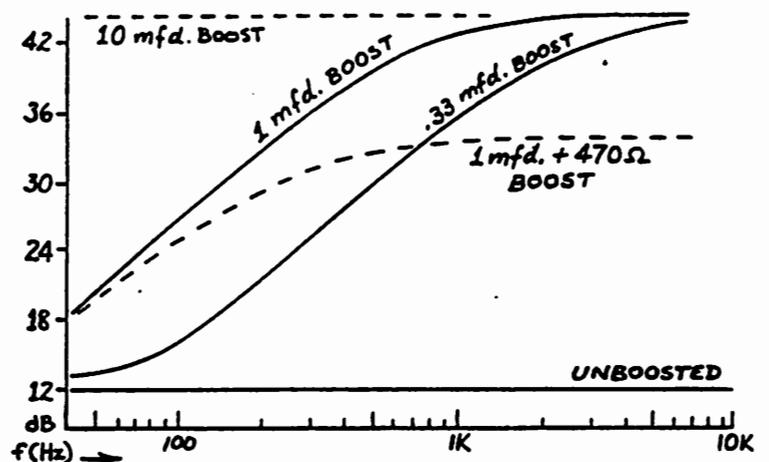
Resistors R1 & R2 will vary depending on the tone quality of the instrument and the kind of strings used. To reduce the amount of boost, replace the 470Ω or 1KΩ resistors with larger values. To lower the frequency at which the boost occurs, replace the capacitors with slightly larger values (try 1.5 mfd and .47mfd for deeper tone).

ELECTRICAL CHARACTERISTICS	TC1 & TC2	TC3 & TC4	
input impedance/output impedance	300 K-ohms/60 K-ohms	500 K-ohms/60 K-ohms	
minimum gain (500 K-ohm load)	8	4	TC2 & TC4 ARE STEREO VERSIONS OF TC1 & TC3.
maximum gain	more than 100	more than 100	
maximum undistorted output	2.5 V	2.5 V	
maximum input for undistorted output	250 mV	500 mV	

Battery drain is 160 microamperes for TC1 & TC3 and 320 microamperes for TC2 & TC4.

The TC1 or TC2 preamps should be used for pickups with very low output level, or when extra unboosted gain is needed.

Some of the amplification characteristics of the TC3 are shown on the graph at right. If the boost lead is not used the gain is 12dB (4 times the input signal). With boost components added the preamplifier can enhance all frequencies (10 mfd), midrange and treble frequencies (1 mfd), or treble frequencies (.33 mfd).



WIRE COLOR CODE: YELLOW : INPUT LEAD - GREEN : OUTPUT LEAD - RED : BATTERY POSITIVE (+9V)
BLACK : CIRCUIT GROUND - BOOST LEAD : BROWN (TC1 & TC2) : BLUE (TC3 & TC4)

CAUTION: If not used, the boost lead should be covered with tape or shrink tubing to prevent grounding.

designed and manufactured by

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