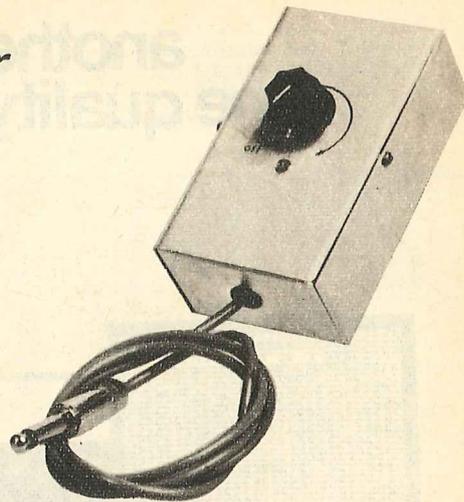


# Treble Boost Preamplifier For Your Guitar

Following the numerous requests from readers for such a unit, we are presenting a treble boost preamplifier for use with electric guitars. Being self contained and independent of any external power supply the unit may be used with any guitar amplifier system to provide up to 26dB boost at 3KHz with reference to 300Hz.

By Anthony Leo



In a "pop" music group, more often than not, the balance of instruments is given over to electric guitars. Essentially, there are two distinct types used, bass and rhythm, with the latter played either as a simple rhythm accompaniment or featured as a lead instrument.

As a lead instrument playing melody, it is usual to expect that a rhythm guitar will be provided with more than normal treble emphasis. Indeed there seems to be no limit to the amount of treble boost required by some lead guitarists. Nevertheless, a discreet application of treble boost is desirable as a highlight for the melody section and to add interest generally.

Quite often the required boost is within range of the amplifier's normal tone controls together with local tone controls on the guitar. However, the controls associated with the guitar are purely passive networks providing limited bass and treble cut only. As such, when used, they tend to reduce the effective guitar output and diminish, to some extent, the average level of sound.

Usually, reduced guitar output can be accommodated by increasing amplifier gain. But a situation will probably arise, perhaps with a borrowed amplifier or new guitar, where the system lacks sufficient treble boost and/or adequate gain with full bass cut. And, inevitably there will be an occasion when a large amount of boost is required for some special effect; more than can be provided by both the amplifier and guitar tone controls together.

Apart from fitting an external treble preamp, which is the topic of this article, it may be possible with some guitar amplifiers to make a slight modification to add a limited amount of treble boost. The technique was used in the Playmaster 117 (60 watt) guitar amplifier described in the July, 1967 issue, and consists of adding a treble pass network to the feedback circuit.

However, we stress that modification to amplifiers should not be made unless the reader is reasonably confident and that, further, only a limited amount of boost may be obtained in this way. In essence, the modification enables the negative feedback to be reduced, via a suitable switch, at treble

frequencies, so increasing the amplifier's gain.

In most valve amplifiers the feedback network is fairly simple, consisting of a series resistor from the output-transformer secondary back to a cathode resistor in one of the stages. A simple series RC network to shunt the cathode resistor will then provide the required treble boost. The network in the Playmaster 117 amplifier may be taken as an example of the technique, but suitable values may have to be found on an experimental basis to suit the particular amplifier concerned.

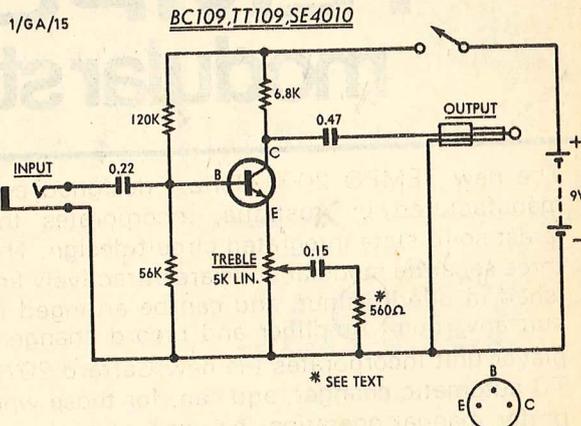
Nevertheless, it would be unwise to aim for more than about 6 or 8dB by this means. As even the better amplifiers do not have any more than about 16db of negative feedback in the main loop, reductions of more than the suggested amount could result in stability and distortion problems.

jective impression of "twice as loud". (This is well worth keeping in mind when comparing the power output specifications of various amplifiers.) From this it can be appreciated that the 20dB of boost provided by this treble boost amplifier will produce an audible increase of approximately four times. This is quite a large amount, when compared with a typical domestic amplifier which may provide around to 12 to 16dB available boost at 10KHz.

The externally fitted treble boost preamplifier described here will, as we said, provide 20dB boost at 3KHz with reference to 300Hz. However, with a minor alteration an extra 6dB can be obtained, making the total boost 26dB.

The preamplifier is quite simple in both construction and operation, consisting of a single transistor stage with a facility for adjusting the amount of treble boost. A lead from the guitar

A circuit diagram for the boost pre-amplifier. Note that the omission of the 560 ohm resistor will provide extra boost making a total of 26dB.



**TREBLE BOOST PREAMPLIFIER FOR GUITARS**

Just to put all these dBs in perspective, for those who may not be proficient in their use, we most often use them to relate changes in voltage or power to actual loudness changes as heard by the ear. About the smallest perceptible change for a healthy ear is 3dB, any smaller change would not be heard. However, the smallest significant change in sound level is around 6dB; a voltage change of two times, or a power change of four times. However, it takes a change of 10dB (10 times the power) to produce a sub-

plugs into the preamp's input jack, while an output lead from the preamp connects to the guitar amplifier. An on/off switch is incorporated in the boost control for greatest convenience.

Continuous control of treble boost is provided by a 5K linear potentiometer incorporated in the circuit as shown. Its function in providing the large amount of treble is quite simple.

At bass frequencies the potentiometer, which is in the transistor emitter circuit, introduces a large amount of degenerative feedback maintaining a