

Using The Kludge 510 Transwarmer

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1 Introduction

Thank you for purchasing the Kludge 510 Transwarmer. This simple transformer coupling device is invaluable for smoothing out sounds and for adding a sense of “glue” to a mix foundation. It is hand-assembled in the USA with the finest quality components available today. It was many years of design before we got to the point where we were happy with the design and we hope that you also will be happy with it. It is entirely through-hole construction and primarily built with standardized parts so that should it ever fail, repair should be a fairly simple matter for a trained audio technician. It is not disposable equipment designed to be used and thrown away, but a traditional design intended for a lifetime of use.

2 History

For many years, audio equipment was all transformer coupled and it was not unusual for signals to be passed through dozens of transformers in a simple studio recording chain. Each transformer added some characteristic color to the sound, and when combined the many transformers created much of what today people consider the “tube sound.” The majority of the actual coloration from typical vintage tube gear was actually due to the high ratio transformers used rather than the tube stages themselves.

Working in the modern digital world, we found ourselves occasionally using some of the less expensive and more highly colored transformers of the 1950s in an attempt to get the particular sounds we wanted. We found ourselves frequently coming back to a single transformer originally intended for broadcast applications.

This device is an attempt to capture a more dramatic version of that sound in a convenient and affordable way. It consists of a single audio transformer made with modern techniques using a special core and winding method that was specifically tuned to match the coloration of the transformer that we liked, but then adjusted to magnify that coloration somewhat.

Consequently, this is a new and modern design that is intended to have a specific sound. It is not an attempt to reproduce any specific transformer, not even the one we liked, but to provide a recreation of several transformers in the audio chain in a simple drop-in 500-series module.

There is little more you need to know other than to slide it into a 500-series rack, apply signal to the input, and take signal from the output. It provides a useful coloration that is effective in many mixes. Like all such tools, however, it can be used for evil as well as good so be careful about overusing it on everything.

3 The Termination Switch

Transformers are designed for specific loading and this one is not an exception. Back in the 1960s when everything had transformer inputs and outputs, you could expect all input and output impedances were 600 ohms and everything would work seamlessly.

However, modern electronics tend to have very low impedance outputs driving fairly high impedance inputs. Because of this, we include a termination switch that engages a 600 ohm load resistor on the output. This was a very common feature on devices in the 1970s when people were frequently intermixing old and new style devices.

Put the switch to the left if you are driving the 600 ohm input from a vintage device, or to the right if you are driving a modern high-Z input. If you don't know the actual input impedance of the device, look inside for transformers. If you don't see an input transformer, set the switch to the right.

If you are driving a modern input and you leave the switch to the left, the transformer will be unterminated and will ring slightly. This can be perceived as adding some brightness to the signal. There is nothing wrong with using that as an effect, which is another reason why we make it switchable.

The termination switch is set depending on the *destination* device that you are driving. The source should make no difference on the correct position of the switch.

4 Unbalanced Signals

Like all transformer inputs and outputs, if you are driving an unbalanced signal into this device or driving an unbalanced output, the unused leg of the balanced pair on the 500-rack needs to be tied to ground. Correctly made unbalanced-to-balanced cables do this, for example tying pin 3 of the XLR cable to ground and connecting pin 2 to signal. Rane Application Note 110 is a good reference for correct balanced-to-unbalanced cabling. If the unused pin of the XLR connector is left floating instead of being tied to ground, either no sound will pass at all or there will be a very thin sound with no low frequencies at all. If you experience these and you are using unbalanced lines, check your cables first.

5 Noise

Because of the extremely high common mode rejection of the transformer and the ability of the transformer to reject radio frequency noise, this device is apt to eliminate existing noise problems as a pleasant side effect to its intended purpose. However, because it employs real magnetics, it is sensitive to stray magnetic fields in your rack. If you are encountering noise pickup problems on the lower bands, try moving the unit to another position in the rack, preferably away from the power supply. Every possible attempt has been made in the design to keep the magnetic circuit closed and avoid sensitivity to induced magnetic fields, and you will find this unit to be much less sensitive to such fields than the classic designs of the 1970s. However, only so much can be done for field rejection.

If at all possible, locate this device and all other devices containing transformers or other magnetics away from the rack power supply.

6 A Note On Transformers

This device is entirely passive. It consists of two coils of wire wound around a grain-oriented steel core. Audio signal creates a changing magnetic field in the primary coil which energizes the core and creates a changing magnetic field in the secondary coil. No additional electricity is used (which means that this device does not count against your total power requirements for your 500-series rack).

An external resistor-capacitor network is provided to damp ultrasonic ringing in the transformer. This “zobel network” is specific to this particular transformer construction and is important to making the transformer sound correct.

7 Repair and Maintenance

The Kludge 510 is guaranteed against any failure resulting from defects in manufacture for a period of two years. We expect you will be using this device for far longer than that, however, and we provide depot repair upon request.

Full schematics and all parts are available from the manufacturer upon request to qualified technicians, as is some amount of assistance. Sarcasm is likely to be included with the schematic, however, as the complexity of the device is all within the transformer magnetics.

8 End Note

We are sure that you will be as pleased with this product as we are, and we are delighted to hear any comments about it. Please address correspondence to:

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