

Using The Kludge 511 Germanium Microphone Preamplifier

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1 Introduction

Thank you for purchasing the Kludge 511 preamplifier. This device consists of a transformer input stage, a gain stage made with germanium transistors, and a modern integrated balanced output circuit with plenty of headroom, on a standard API 500-series board.

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.

Like any microphone preamplifier, it is a simple box with balanced input and adjustable gain, but the coloration of the germanium transistor stage makes it an interesting and useful tool for getting a smooth sound that fits well into a mix.

Although the device has plenty of headroom, it can be operated at high levels where the signal is heavily limited. Because the limiting is soft and clean, the effect is a pleasant one instead of a nasty buzzing distortion. This is a characteristic of the germanium input stage.

2 History

General Electric came out with a method for manufacturing transistors called the “alloy method” back in 1963, bonding three pieces of different germanium alloys together into one unit. This was superseded in 1965 by the more effective diffusion method (which was itself superseded a few years later). At that time, the Soviet Union set up a factory manufacturing copies of what was then the state of the art transistor, and that factory continued operating until the fall of the USSR. While western companies moved to more and more advanced transistor designs, the factory in Novgorod continued making small incremental advances to improve a design that had been abandoned elsewhere.

In many ways the later production Russian transistors are of higher quality than germanium parts made in the West, since the major Western semiconductor manufacturers abandoned the process very early while the Russians continued to improve things. So these are like having 1950s designs manufactured with 1990s technology.

The circuit design is not a copy of any classic design, but is designed specifically to get the best possible performance out of those transistors. It is not a modern design with constant-current stages and heavy linearization, but it’s also not a crude 1960s open-loop design. It is a hybrid between the two that we built because it gave us the sound and performance that we wanted in the studio.

3 Controls

There are only two controls on the device: a gain control and a switch to turn phantom power on and off. Turning the gain knob from left to right increases the gain of the front end circuit. Turning the switch to the right turns phantom power on, turning it to the left turns phantom power off. Because of the large filter capacitor, it may take a couple seconds for a change to become evident.

4 Microphone Inputs

This preamplifier presents a load of approximately 400 ohms to the microphone which is sufficient to provide excellent loading for most dynamic and all condenser microphones. The phantom power is derived entirely from the host rack after appropriate filtering, so if your rack meets the 48V phantom power specification, the microphone input will as well.

You may find that the top end is not as detailed as you might like when using some older ribbon microphones which are designed for high impedance loads. Then again, you might find that lack of detail to be useful to calm harsher signal sources. If every preamp was appropriate for every mike and every application, we wouldn't need to have so many different kinds.

There is no instrument input. We suggest that if you want to connect an instrument directly to this preamp that you use any one of a number of excellent active DI boxes. Some preamplifiers have an unbalanced input for instruments which bypasses the input transformer, but with the germanium front end the input impedance is too low for this to be practical.

5 Why Limiting?

The dominant feature of this preamp is that you can limit the top of waveforms while laying down tracks. The effect is printed into the track, nobody can undo it. If you get it right in tracking, you'll have a dense track that pops out in a mix because the peaks have been reduced so the average level can be turned up. If you overdo it, you can't go back, so practice a bit and see. You'll be surprised how aggressive you can be on tracks that will fit into a mix later on. Even if you have some audible distortion on a vocal, it will be less audible when the vocal becomes part of a dense mix.

6 Line Inputs

Some people like to run line level signals into preamplifiers as an effect, and you can do this with the Kludge 511 if you follow some simple precautions. First, make sure phantom power is turned off. Most electronics don't like having phantom power applied to their outputs. Secondly, check again to make sure phantom power really is turned off.

Thirdly, if you are sending an unbalanced signal into it, make sure that it is done through a cable where the unused signal pin is tied to ground. If you apply signal to pin 2 or to pin 3 of an electronically-balanced input on a modern preamp, it will operate, but with a transformer-balanced input like the 511 uses, the unused signal pin needs to be tied to ground. Many cables will do this, but some will not.

Rane Application Note 110 is a good reference for correct unbalanced-to-balanced cabling. Don't be afraid to unscrew your XLR connectors and look inside. 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.

7 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 very free from induced noise. 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.

8 Repair and Maintenance

The Kludge 511 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.

9 End Note

This device meets the API 500 module series specification dated 8/28/2006 and should function perfectly in any API-compatible rack or console.

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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