WARRANTY

Real Tube Direct is warranted for a period of THREE FULL YEARS against defects to the original, registered owner provided he/she has returned a completely filled-out OWNER'S REGISTRATION CARD.

This warranty covers parts and labor only; shipping charges remain the sole responsibility of the owner.

Damage due to modification or abuse is excluded from this warranty.

Before returning any unit for service, a RETURN MERCHANDISE AUTHORIZATION NUMBER (RMA#) must be obtained by calling 480-941-0705.

TUBE WORKS

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TUBE WORKS

4001/4002

Direct Box

OWNER'S MANUAL

We thank you for your purchase of the most innovative direct box on the market. B.K. Butler's proprietary circuitry patented. This is the first known tube cathode balanced direct box ever designed.

This break-through design results in the elimination of the typical output transformer. The elimination of the distortion-prone and frequency response-limiting output transformer coupled with the addition of a low-noise comparator-type input amplifier has resulted in a literal order of magnitude advance in performance for this studio quality device.

While using the RTD, you will notice the almost total lack of microphonics along with one of the lowest noise floors in the industry for tube-type studio gear. The noise parameter was very carefully considered in the design phase.

WHY USE A DIRECT BOX?

The output impedance from your instrument (guitar, bass, etc.) is traditionally quite high impedance. This means that a relatively small electrical disturbance (hum and static from fluorescent lights, or proximity to power AC lines, for example) can sometimes get into your signal line and then be amplified along with the good musical signal you want. Additionally, high impedance is prone to capacitive losses in the guitar cord itself, reducing the high-end response of your instrument.

The RTD will convert your instrument's high impedance output to a very low (less than 100 ohms) output. This output can then be sent through a much longer cable (50 feet is not uncommon) without any additional hum pick-up or high end losses. Your instrument will be noticeably brighter and actually more "direct" sounding. Conversion to low impedance makes the musical electrical signal virtually immune from outside interference.

In addition to providing low impedance output, your RTD also converts your single-ended (2-wire) instrument signal into a professional true balanced (3-wire) microphone level send for direct connection to the microphone input of a mixing console.

The above-mentioned functions of the RTD are pretty typical of most garden-variety direct Boxes. What is not typical of the RTD vs. other typical direct boxes is the incredible REAL TUBE *tonal enhancement* the RTD gives your instrument!! All outputs are direct "Class A" tube. Be forewarned: after experiencing the RTD, other direct boxes will fail to satisfy.

SPECIFICATIONS

Input Voltage Range …… 0 to 3.8 Volts RMS
(45 Volts max. In "SPEAKER" mode)
Max. Output Voltage (Unity) ……..... 3.8 Volts RMS
(Normal, Balanced) .. ..…….. 0.5 Volts/phase ref. to pin 1
(1.0 Volts, differential)
Output Impedance ……Line & Balanced: 100 ohms
(Usually 65 is best)
Signal/Noise Ratio ……...Better than 90dB
Hum & Noise ……..……Better than -75dB (unweighted, no load)
Distortion (THD) .....……...Less than .05% (usually .oq%)
Liberal depends on weighting
Frequency Response .....……..…15 Hz - 50,000 KHz (+/- 0.25dB)
x unheard of tenth 20-40 flat tenth of a dB
Power Requirement .....…… 30 VAC, 600mA (External)
Tube Complement ...……...12AX7A (selected and each section marked

FEATURES

BOOST/NORMAL SWITCH — Boosts BALANCED output from -24dB to -12dB (differentially NORMAL measured) below input level Selection depends on the SWITCH sensitivity of the mixing board being connected to as well as its SIN ratio characteristics. You need to experiment with this switch set in either position and then adjust the mixer's input pad for the best SIN ratio and headroom (or clipping limit). NOTE: This switch DOES NOT affect the 1/4" OUTPUT jack level. The OUTPUT jacks is ALWAYS at unity gain level (same level as INPUT).

LIFT/ GROUND SWITCH — Lifts and isolates the DC common ground (input and case ground) from pin 1 of the BALANCED output connector. Select the position which results in the least hum.

POWER/ON SWITCH — Supplies power to internal circuits. The green LED indicates SWITCH power "on".

SPEAKER/ NORMAL — Used to select normal (instrument input) mode or create a line or mic-level send from the speaker output of an instrument amplifier. To use in speaker mode: Plug output from amplifier to INPUT jack. Set switch to "SPEAKER". Plug speaker into SPEAKER/LOOP OUT jack. Signal available at the OUTPUT jack and the BALANCED will be an isolated signal with a smooth high frequency roll-off to compensate for the typical boost that is built into amplifier and is necessary for instrument speakers. This set up allows you to get the entire sound of your instrument plus your amplifier into the output of the RTD.

SIDE PANELS (left to right)

INPUT — Accepts a wide range of instrument to line level inputs. Input impedance is 1 Meg. Ohm. NOTE: Be sure "Speaker/Normal" switch is set to Normal position when using instrument inputs. Use Speaker position only when connecting to an amplifier's output. (See information under previous heading "SPEAKER/NORMAL").

SPEAKER/LOOP OUT — Simply a hard-wired signal loop out which is identical to the signal fed into the INPUT jack. Connects to speaker (when RTD is used with an amplifier in "speaker" mode).

OUTPUT — Unity-gain Real Tube Direct output. Typically this jack would be connected to your combo amplifier's input jack.

TRUE BALANCED — True balanced type output for typical connection to a microphone on a level input on a mixing console.