

FBB 44 Balance Buddy

General Description

The Rane FBB 44 Balance Buddy is a handy professional-grade tool used to convert and provide isolation for those annoying unbalanced -10dBV level RCA outputs up to balanced +4dBu professional 3-pin (XLR-type) inputs—and vice-versa. Two channels each way, or a stereo pair each way (however you prefer to think about it). The FBB 44 converts one pair from -10dBV to +4dBu and another pair from +4dBu to -10dBV simultaneously. There are two female and two male XLR-type connectors, and four RCA jacks.

Signal-to-noise performance is perfectly preserved using the FBB 44, since it uses only passive transformers to convert signal levels. It adds no additional noise whatsoever. Use of professional quality nickel core (“80” Ni) transformers guarantee low distortion, wide bandwidth and high signal handling capability.

The FBB 44’s isolation transformers provide a quick and affordable answer to all jobs requiring signal level conversion and output balancing.

Features

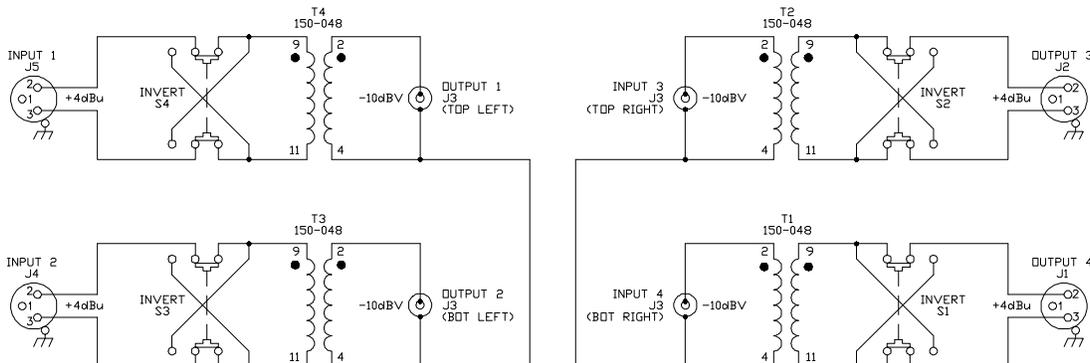
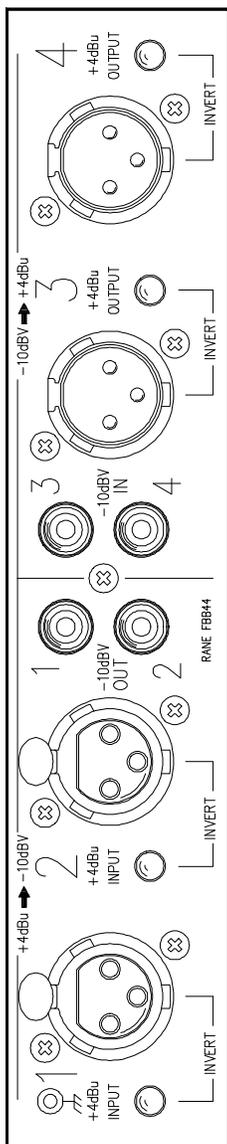
- **2 CH’s: -10dBV TO +4dBu CONVERSION**
- **2 CH’s: +4dBu TO -10dBV CONVERSION**
- **NICKEL CORE “80” Ni TRANSFORMERS**
- **WIDE BANDWIDTH**
- **LOW DISTORTION**
- **+24dBu MAX LEVELS**
- **RCA & 3-PIN (XLR-TYPE) JACKS**
- **FLEX HR CHASSIS**

Parameter	Specification	Limit	Units	Conditions/Comments
Transformer Construction	Nickel Core Bobbin Wound			Grade “80” Ni
Turns Ratio	1:3.89			-10dBV (316mV): +4dBu (1.23V)
Maximum Levels	(In or Out)			
.....-10dBV	+12.2 (40-20kHz); +6.7 (20Hz)	0.5dB	dBu	1% THD Point
.....+4dBu	+24 (40-20kHz); +18.5 (20Hz)	0.5dB	dBu	1% THD Point
Input Impedance	(Load Impedances As Shown)			
.....-10dBV	1k	5 %	Ohms	Load Impedance 15k Ohms
.....+4dBu	15k	5 %	Ohms	Load Impedance 1k Ohms
Insertion Loss	0.5	0.1	dB	With Recommended Load Impedance
DC Resistance	47.5/200	10%	Ohms	-10dBV/+4dBu
Frequency Response	20-20kHz	0.2	dB	+4dBu In/Out
Bandwidth	90kHz	-3	dB	Half Power Frequency
THD + Noise	less than .04 (40-20kHz)	.01	%	+4dBu In/Out
Shipping Weights	6 lb			(2.8 kg)
All specifications apply both directions, unless noted.				0dBu=0.775 volts; 0dBV=1.0 volts

BALANCE BUDDY

Rear Panel

Block Diagram



Application Information

Conversion Ratio

The casual observer would think to convert -10dBV to +4dBu you would need 14dB of gain. The casual observer would be wrong. You only need 12dB of gain. The reason is not only do you change levels, you also change *reference levels*—from dBV to dBu. The first (dBV) references everything to 1.0 volt, while the second (dBu) references everything to 0.775 volts (this comes from the old *power* reference of 0dBm, which equaled 1mW into 600 ohms, which equaled .775 volts).

Driving Impedances

Some people wrongly feel you cannot use a transformer to convert between -10dBV and +4dBu because of low impedances. This is not a problem as long as you use them to

interconnect equipment with *at least 15k ohms input impedance*. Since most professional products have input impedances of 20k ohms or greater (50k and 100k ohms are not uncommon), this should never be difficult. A 15k ohm load winds up looking like 1k ohm to the equipment with the -10dBV output (due to transformer action). This may seem excessively low, but is not in practice. The maximum transformer output level of +24dBu occurs with an input level of +10dBV, which equals 3.16 volts. And 3.16 volts driving 1k ohms only requires 3.16 milliamps. A very modest requirement for any -10dBV equipment to deliver.

Wiring

The FBB 44 follows AES/ANSI/IEC standards of pin 2 positive and pin 3 negative. *To insure complete isolation of all channels, pin 1 has no internal connection*, but the case (shell) is connected to chassis ground. (See schematic diagram.) Note the shields (commons) of the RCA jacks are tied for the Inputs and the Outputs but not to each other. This allows ground isolation of stereo Input and Output pairs.

Polarity

A positive signal applied to pin 2 of the 3-pin connectors causes a positive signal to appear on the tip of the associated RCA jacks, and vice-versa. For situations where this does not agree with the equipment being interconnected, the INVERT switch reverses polarity.

Mounting

The FBB 44 is packaged in a standard Rane Flex chassis which is compatible with all HR products and accessories. When used with other Flex products, the FBB 44 may be mounted in the FVR 10 Vertical Rack. Alternatively, choose one of the horizontal mounting kits to mount one or two units side-by-side into a standard 19" rack.

Chassis Grounding

A tapped hole and a 6-32 screw is provided for chassis grounding purposes. Good practice dictates earth-grounding the FBB 44. If the grounding integrity of the rack screws is in doubt, then run a wire from this screw to a known good ground.