General Description

The Rane BB 22 Balance Buddy is a handy professional-grade tool used to provide isolation for and convert unbalanced -10 dBV consumer level RCA outputs up to balanced +4 dBu professional XLR inputs. The BB 22 converts one pair from -10 dBV to +4 dBu. There are two male XLR connectors and two RCA jacks.

Unbalanced lines should always be kept ***under*** 10 feet (3 meters) to prevent undesirable effects such as hum and noise. The BB 22 allows conversion to balanced lines that can be run across a studio or a house without loss of signal quality. For instance, a BB 22 may be mounted to the back of a jukebox converting its unbalanced outputs to balanced lines, feeding an amplifier in another room.

Signal-to-noise performance is perfectly preserved using the BB 22, 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 level handling capability.

The BB 22's isolation transformers provide a quick and affordable answer to most jobs requiring signal level conversion and output balancing.

Features

- 2 Channels of -10 dBV (RCA) to +4 dBu (XLR) Conversion
- Nickel Core "80" Ni Transformers
- Wide Bandwidth - Low Distortion
- +24 dBu Maximum Levels

Parameter	Specification	Limit	Units	Conditions/Comments
Transformer Construction	Nickel Core Bobbin Wound			Grade "80" Ni
Turns Ratio	1:3.89			-10 dBV (316 mV): +4 dBu (1.23 V)
Maximum Levels				
.....-10 dBV In	+10 (40 Hz-20 kHz); +4.5 (20 Hz)	0.5dB	dBV	1% THD point
.....+4 dBu Out	+24 (40 Hz-20 kHz); +18.5 (20 Hz)	0.5dB	dBu	1% THD point
Input Impedance	(Load Impedances as Shown)			
.....-10 dBV	1k	5 %	Ω	Load impedance 15k Ω
Insertion Loss	0.5	0.1	dB	With recommended load impedance
DC Resistance	47.5 / 200	10%	Ω	-10 dBV / +4 dBu
Frequency Response	20-20 kHz	±2	dB	+4 dBu out; recom. load impedance
THD + Noise	less than .05 (40 Hz-20 kHz)	max	%	+4 dBu out
Unit: Conformity	CE, FCC			Exempt
Unit: Construction	All Steel			
.....Size	1.65"H x 5.1"W x 4.25"D			(4.2 cm x 13 cm x 10.8 cm)
.....Weight	1 lb			(.45 kg)
Shipping: Size	3.6" x 11.75" x 7.2"			(9.5 cm x 30 cm x 18 cm)
.....Weight	2 lb			(.9 kg)
All specifications apply both directions, unless noted.				

WEAR PARTS: This product contains no wear parts.

Application Information

Conversion Ratio

The casual observer would think to convert -10 dBV to +4 dBu, you would need 14 dB of gain. The casual observer would be wrong. You only need 12 dB 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 0 dBm, which equaled 1mW into 600 Ω, which equaled .775 volts).

Driving Impedances

Some people wrongly feel you cannot use a transformer to convert between -10 dBV and +4 dBu 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 20 kΩ or greater (50k and 100 kΩ are not uncommon), this should never be difficult. A 15 kΩ load winds up looking like 1 kΩ to the equipment with the -10 dBV output (due to transformer action). This may seem excessively low, but is not in practice. The maximum transformer output level of +24 dBu occurs with an input level of +10 dBV, which equals 3.16 volts. And 3.16 volts driving 1 kΩ only requires 3.16 milliamps, which is a very modest requirement for any -10 dBV equipment to deliver.

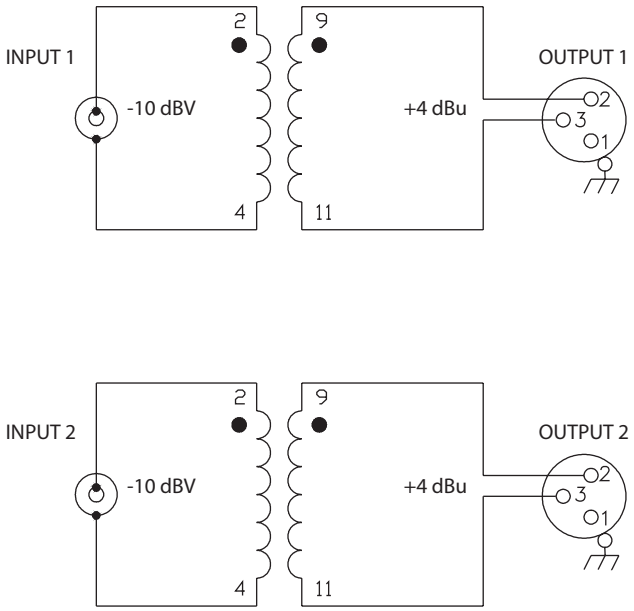
Wiring

The BB 22 follows AES/ANSI/IEC standards of pin 2 positive and pin 3 negative. Note the shields (commons) of the RCA jacks are not tied together. This provides better ground isolation of the unbalanced units. A positive signal applied to the tip of the RCA jack causes a positive signal to appear on pin 2 of the XLR, and vice-versa if signal direction is reversed.

Signal Direction

Signal can be converted through the channels either direction. The only problem arises in the gender of the XLR connector. The solution requires same-sex XLR adaptors or special cables.

Block Diagram



Dimensions