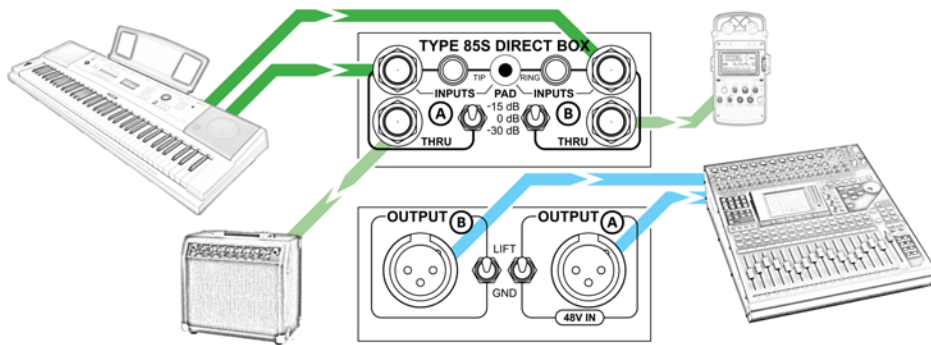


COUNTRYMAN ASSOCIATES INC
TYPE 85S
 STEREO DIRECT BOX

The Type 85S Stereo Direct Box is a two-channel version of the classic Type 85 FET Direct Box. Each channel uses the same FET-based Class A circuit as the Type 85 to connect any high-impedance instrument pickup to a balanced microphone (XLR) input.



Use the rock-solid transformer isolation of the Type 85S to eliminate hum, buzz, and RF interference from your long XLR runs.

Indestructible

Connectors and switches are recessed into a single-piece extruded case with extra thick walls. You can literally drive a truck over the Type 85S without hurting it. Internal electronics are molded in epoxy and fully protected against electrical damage. The input can withstand 220 VAC and static spikes up to 20,000 V.

Battery or Phantom Power

Most mixing consoles provide 48 V phantom power, and the Type 85S will automatically use it. If you don't have phantom power, or if your phantom power is very low, the Type 85S will run for about 130 hours from a single internal 9 V battery. We designed the Type 85S so that you only need to provide phantom to Channel A to power the unit.

Simply Exceptional Sound

Each channel of the Type 85S uses only hand-selected high-quality discrete components woven into a single-ended Class A circuit, much like a classic tube microphone preamp. The Type 85S has an incredibly smooth, sweet sound. Unlike many active DI boxes, the Type 85S can always isolate ground, even when running on phantom power, to help eliminate hum and buzz from ground problems.

Frequency Response:

20 Hz – 20 kHz (+/- 1 dB)

Noise (shorted input, BW = 22 Hz – 20 kHz):

0.63 μ Vrms (-122 dBu)

Power Requirements:

9 V battery or 1.6 mA @ 48 V Phantom

Input Protection: 220 Vrms and 20 kV discharges

Gain Options:

-10 dB (0 dB pad), -25 dB (-15 dB pad)
 -40 dB (-30 dB pad)

RF Low-Pass Filtering: 250 kHz (in), 30 kHz (out)

Maximum Input Level (1% THD):

5 Vpp (0 dB pad)
 28 Vpp (-15 dB pad)
 158 Vpp (-30 dB pad)
 (Equal to 800 Watts into 4 Ohms)

Distortion:

0.018% THD @ 1 kHz and 1 Vpp in
 0.08% IMD 10 kHz/60 Hz 1 Vpp in

Cross-Talk Rejection: >105 dB (20 Hz – 20 kHz)

Input Resistance:

10 M Ω (0 dB pad), 10 k Ω (-15, -30 dB pad)
 20 k Ω (RCA and 1/8" inputs)

Input Capacitance:

160 pF (equal to 2 meters of low-capacitance guitar cable)

Output Polarity: Pin 2 positive (Note that the one-channel Type 85 is Pin 3 positive.)

Dimensions:

2 x 4 x 6.25 in (51 x 102 x 159 mm)

Weight: 31.2 oz (.88 kg)

Type 85S: History and Performance

History of the Type 85 FET Direct Box

In the 1970s, Carl Countryman designed a revolutionary circuit for interfacing unbalanced instrument signals to balanced, mic-level mix board inputs—the first “active” direct box. The circuit allowed artists to isolate their instrument ground from the mixing console ground without loading their instrument, distorting their sound, or adding noise to the signal. This design quickly caught on with big name groups in the US as artists realized that, with this new Countryman box, their audio quality would never be compromised on the way to the mix board. The box evolved over the next few years, until in 1985 it became known as the Type 85 FET Direct Box. Still today, the Type 85 thrives as one of the most popular direct boxes in the world: a true legend of the industry. Now the Type 85 is joined by the Type 85S, a stereo direct box crafted with the same care as the original 85.

What Makes the Type 85 Sound so Smooth?

Most DIs do not handle high signal levels with grace. The Type 85 and Type 85S use only the highest quality, hand-selected discrete components to achieve exceptional performance—even for large signals. The circuit uses a Class A FET amplifier that overloads smoothly in a way that will never sound harsh or brittle. In contrast, numerous other active DIs—except the Type 10 or Type 10S, of course—use old and cheap op amps plagued by poor overload characteristics; most notably, a phenomenon known as *phase inversion*.

Phase inversion is where the op amp output will abruptly transition from one supply to the other when the input gets too close to the negative rail. As you can imagine, such a sharp transition leads to countless non-linear artifacts. In fact, phase inversion will even mask the original fundamental frequency of the source.

We measured the output from the Type 85S and a popular—and more expensive—competitor active DI with a 300 Hz pure tone on the input. We increased the amplitude of the pure tone to 6 Vpp with a typical load such that both boxes were distorting their outputs. The Type 85S output is in black, and the competitor DI output is in red. The differences are striking: while the Type 85S output starts to gently smooth its valley at the bottom end of the sine wave, the competitor DI output clips and exhibits phase inversion.

When the outputs are analyzed in the frequency domain with an FFT (Fast Fourier Transform), the results are remarkable. The Type 85S exhibits normal harmonic distortion, primarily composed of even-order components. On the other hand, for the competitor DI, it is virtually impossible to even locate the original fundamental frequency that was applied to the input. The resulting output is not only harsh and brittle, but sounds nothing like the source.

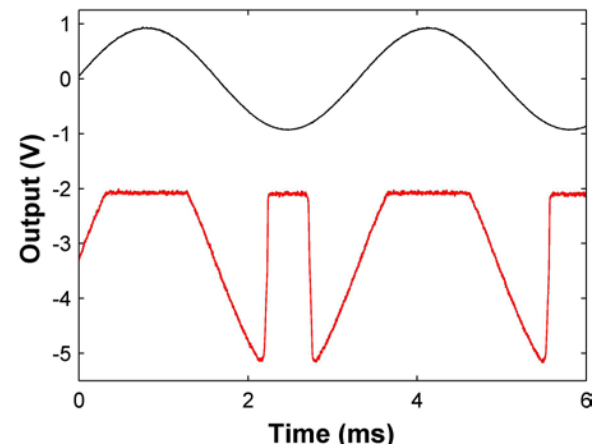
Input Connectors

When you're setting up at a venue and have to deal with all kinds of sources and connectors, you'll still be set with the Type 85S. You also won't need to worry about intermittent connections because of corroded contacts, or connectors getting damaged just because you dropped your box.

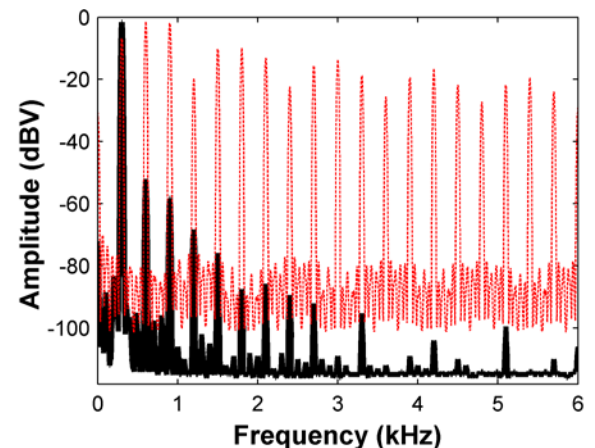
The Type 85S uses only the highest quality connectors. On the input, your connector options include metal-threaded-nose 1/4" jacks, gold-plated super-rugged RCA jacks, and a gold-plated stereo 1/8" jack. We also protect all connectors by recessing them inside an architectural aluminum housing strong enough to support an 18-wheeler.



The Type 85S is so rugged that a truck can run over it. That's why it can withstand years of abuse on the road.



Output of the Type 85S (black) compared to a popular competitor active DI (red) with the same 6 Vpp sine wave at 300 Hz applied to the input—the 85S overloads gracefully while the competitor DI harshly exhibits phase inversion.



FFT plot of the Type 85S (black) and competitor DI (red) outputs. The Type 85S exhibits normal harmonic distortion while for the competitor box the original fundamental frequency is virtually lost in the array of non-linear artifacts.