

Radial JDI Mk3 & Duplex Operators Manual



Congratulations on your purchase of the world's finest direct box- The Radial JDI Mk3 and Radial JDI Duplex!

The Radial JDI Mk3 is the latest version of the highly acclaimed JDI and is without a doubt the finest passive direct box available today. The JDI is very unique in that it does not color or alter the sound of the instrument. This ensures the natural tone and harmonic balance is retained, bringing out the very essence of the instrument.

The JDI Duplex is a 'true' stereo version of the JDI with two totally independent and isolated PC boards. This allows the Duplex to be used with two sources without causing any ground contamination or cross-talk.

Both direct boxes feature the worlds finest transformer, a Jensen JT-DBE for unmatched audio performance, exceptional noise rejection and high signal handling. This makes them ideal for acoustic guitar, bass and keyboards. In fact, just about any audio signal is transformed gracefully without artifact.

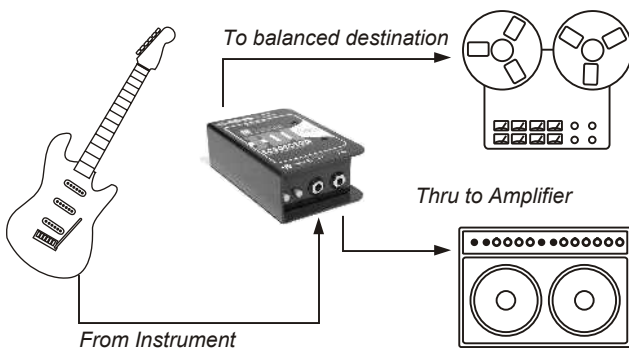
We invite you to read through this manual before using the JDI so that you can maximize it's potential. Please log onto www.radialeng.com for further details and updates. We also invite you to forward any comments, questions or suggestions. We love to hear from you!

Enjoy. _____

Introduction - What is a direct box anyway?

A direct box is a device that converts the high impedance of a guitar, bass or keyboard to a balanced low impedance signal. Balanced signals inherently cancel noise and due to their lower impedance, can travel much further. Balanced signals are the norm in professional recording, broadcast and live sound.

For simplicity, this manual will discuss the JDI Mk3. The Duplex is exactly the same in a two channel configuration.

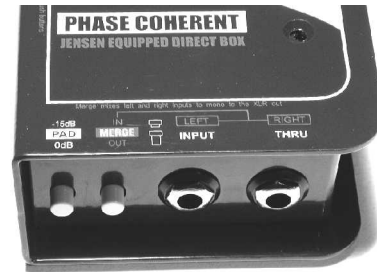


1/4" Inputjacks

The JDI features two 1/4" jacks on the input panel. The left primary input is usually connected from the source instrument. The second right-hand 1/4" connector is usually used as a 'thru' connector to direct the original signal to the instrument amplifier. This is the 'normal' connection for bass guitar.

Merge

A proprietary 'merge' function is provided that turns the 'thru-put' connector into a second input jack. Depressing the merge switch activates a resistive mix circuit to allow 2 input channels to be summed mono at the output jack. This is a great cost-saving feature for live sound when attempting to amplify stereo keyboards or samplers when input channels may be limited.



15dB Pad

Sometimes levels from instruments can be extremely powerful and can potentially overdrive the circuit. Although this is difficult under normal use, a provisional 15dB pad steps down the input to ensure a clean and distortion-free signal is obtained. A typical use would be a headphone output signal from a Walkman.

Parallel Speaker

Although most engineers prefer to mic a guitar speaker cabinet to get the true sound of the amplifier, this may not always be practical. The Mk3 offers a solution! By depressing BOTH the input pad and the speaker pad, a circuit is introduced that will allow a parallel speaker connection to be made. Use the second parallel output from the amplifier head or the parallel jack on the speaker cabinet as the source.

IMPORTANT: You must ensure that the amplifier is connected to it's speaker as the JDI is not designed to handle the load on its own.



XLR Output

The JDI features a balanced output jack that uses a standard XLR connector. This jack is wired to the AES (Audio Engineering Society) standard with pin-1 ground, pin-2 hot and pin-3 cold. Today, pretty much all equipment is manufactured using this standard. Connection is made to the mic-level input of the mixing console or to a standard mic pre-amplifier. The JDI is ideally suited for interface with concert snake systems and splitters where mic and direct box signals are directed to several destinations at the same time such as recording, monitor, broadcast and front-of-house mix positions.

Polarity

A polarity reverse is provided that toggles pin-2 and pin-3 as the 'hot' or positive signal. This provides several operational benefits: Interfacing with older mixing consoles that have pin-3 hot is simply a matter of depressing the polarity reverse. Also, when mic'ing and using a 'direct' signal from the same instrument, one sometimes encounters 'phase' problems. This is sometimes alleviated by reversing one of the source polarities. This same process, while recording,

provides the engineer with an alternative 'tonal pallet' that can provide pleasing results. Although normally one should keep the polarity 'in-phase', experimenting with different settings can lead to some very pleasing results.

Ground-lift

Although the JDI features an isolation transformer that will generally quiet down even the most gruesome noises, a ground lift is provided to isolate input and output grounds from the shell. Normally, when interfacing guitars and basses, lifting the ground (depressing the switch) should not be necessary. Sometimes, when using devices that are AC powered such as keyboards or amplifiers one will encounter additional noise. Trying the ground-lift may sometimes help.

Cool Feature - The no-slip bottom pad is a unique feature that allows the Mk3 and the Duplex to be used just about anywhere without scratching the surface. Another great benefit is that when used with guitar or bass amps that have the handle connected to the chassis, the pad can provide additional electrical isolation! If ever the pad should get damaged from wear and tear, spare pads can be ordered from your dealer.

Cool Feature - Two stereo signals through the Duplex can be achieved by setting both JDI Duplex channels to merge and then sending both left outputs from your keyboards to channel-1 and right channels to channel-2. The trade off is that you do not get isolated control. The advantage is that you retain stereo at half the cost!

Cool Feature - Try mic'ing the amp and running a direct signal at the same time. This is great for recording. Try reversing the polarity of the direct signal and you will be amazed at how the sound can move from 'front to back' in the mix. Have fun!

Cool Feature - Sending a balanced signal back into the guitar amplifier can be done by using the JDI backwards. Because we are using a transformer, the JDI can receive a signal from the XLR and then send it out from the 1/4" connector. More fun for free!

FAQs

▶ **What is the difference between a passive and an active DI?** Passive direct boxes use a transformer to convert the electrical signals while active direct boxes use an amplifier circuit. Passive boxes have the advantage of providing isolation which can reduce ground hum in systems.

▶ **Why do people use active direct boxes?** Because a good passive direct box requires a good transformer and these are expensive. The Radial JDI uses a Jensen Transformer and these are considered the best in the world. Active boxes can be made for much less money and will generally sound better than a cheap passive box.

▶ **So why not simply buy an active direct box?** Active DI's can be good but they can have several disadvantages: First and foremost, active direct boxes require power. This means that they must either run off batteries, phantom power from the console or use a power source like a 'wall-wart' or AC/DC supply. When the power is low, they distort. This means that for the direct box to work well, you must keep the batteries at full charge which is impractical if not impossible.

▶ **What about phantom power?** Phantom power is a DC supply that comes from the mixing console. The phantom powered direct box draws its power from the console through the balanced mic cable. The problem is that phantom power is rarely sufficient to properly supply the direct box. This 'starves' the amplifier and limits its ability to handle dynamics without distortion. The Radial J48 is a low-

power consumption DI that addresses this problem by ensuring maximum available power is diverted to the signal path so that full dynamics may be enjoyed without distortion.

▶ **Why use an active direct box at all?** Sound. Some active boxes like the Radial JDI have exceptional sound and a frequency response that is well beyond the norm. Furthermore, when using low output devices such as piezo pickups, these require the added 'gain' that an active box can supply. Finally, when using older vintage instruments that have low-output pick-ups, one can encounter a 'loading' effect whereby the pickup is not able to drive both the stage amplifier and the 300 feet of cable to the mix position. An active box will not load down the pickup where the passive box may. The JDI is extremely efficient but being passive, can cause loading on these rare occasions.

▶ **What else should I look for should I decide to go active?** Probably the most important specification to look for is IMD or inter-modulation distortion. The test beats two dissonant tones together to measure the robustness of the circuit design. This is akin to playing two dissonant notes on a piano. Some pianos when well tuned somehow manage to sound good, while others just plain sound bad. This test is rarely done on direct boxes as most fail miserably. Check out the Mix Magazine "Seven for the Road" direct box comparative test and review on our web site at www.radialeng.com for more details on IMD.

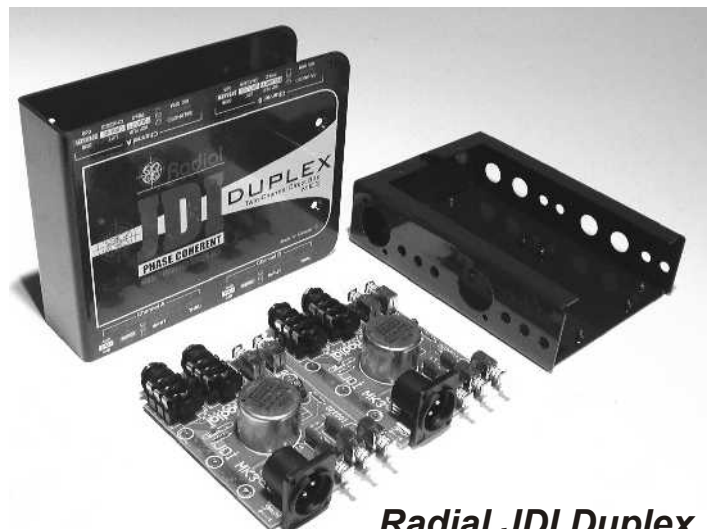
▶ **So I should go active? I'm confused!** No. The decision between active and passive is based on application. If you are using the DI primarily in live situations, we usually recommend the JDI as it is both trouble free and is adaptable to a wide range of applications. Today, most bass guitars have extremely powerful pick-ups or have built-in active circuits. Acoustics are the same. Keyboards have tons of gain. And who dares to use a vintage 1955 Pre-bass live anymore?

▶ **What makes the JDI better than the rest?** A good direct box needs to address several facets to be functional: The sound, the feature-set and construction are all essential parts that make up the whole.

Lets start with the construction. The JDI is in fact two boxes in one. The inner skeleton features a 14-gauge welded construction in which the PC board, circuit, transformer and switches are housed. Lift up the JDI and you know you are dealing with quality. The rigid design ensures that there will not be any stress on the PC board (mil spec 2-sided) and the solder joints will remain intact even after years of use. The outer book-end design provides easy access to the connectors while creating a protective zone for the switches. In the real world of touring, DI boxes are stepped on & abused. Radial DI's must be able to stand-up to the abuse.

As for feature set, we know of no other DI box that offers as many features. This makes the JDI practical in pretty much any application. Finally, the sound. Check out the specifications and you will find that it is extremely linear from 20Hz to 20kHz, it exhibits almost no distortion in the most rigorous and demanding 20Hz region and with virtually zero-phase distortion throughout the audio bandwidth, what you put in - you get out. Nothing added, nothing changed.

▶ Radial - True to the Music



Radial JDI Duplex