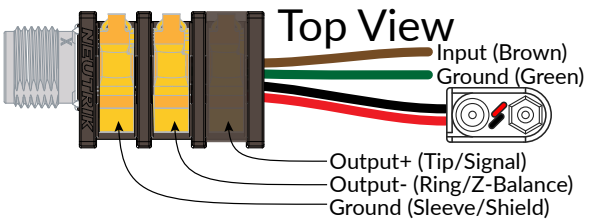
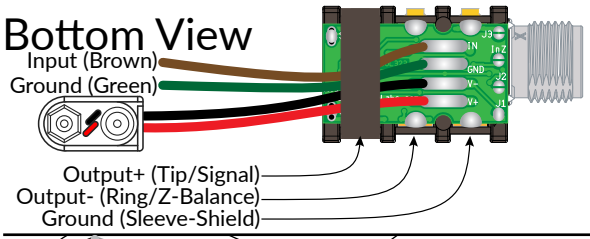
# Ai1 (All-in-one jack)

Installation Guide. The Redeemer Ai1 upgrades and replaced the output jack on most instruments.



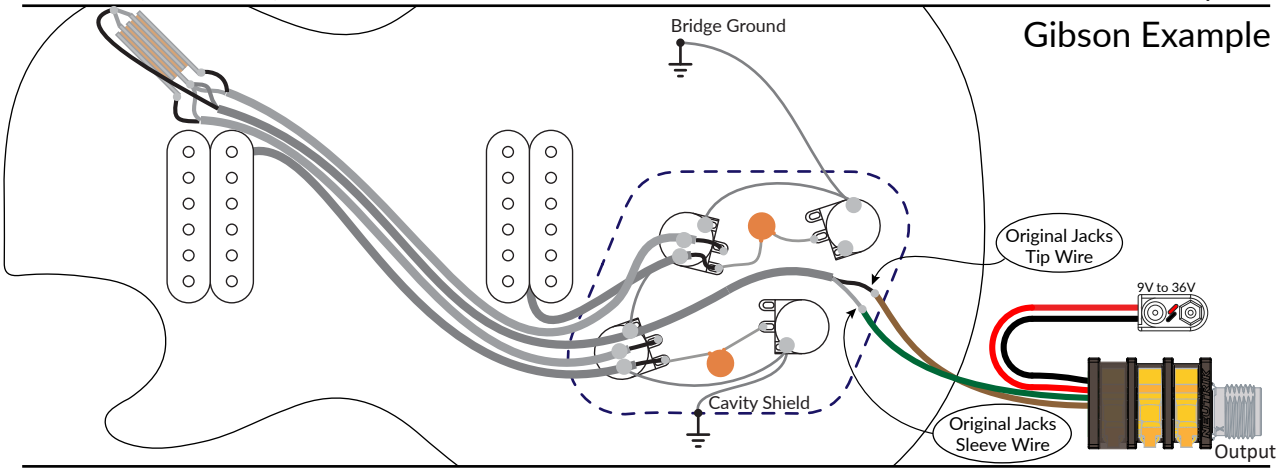




The Redeemer Ai1 is a professional quality, pristine audio buffer, which has been optimized for use with electric guitar, bass guitar and other instruments with magnetic, active or piezo pick-ups.

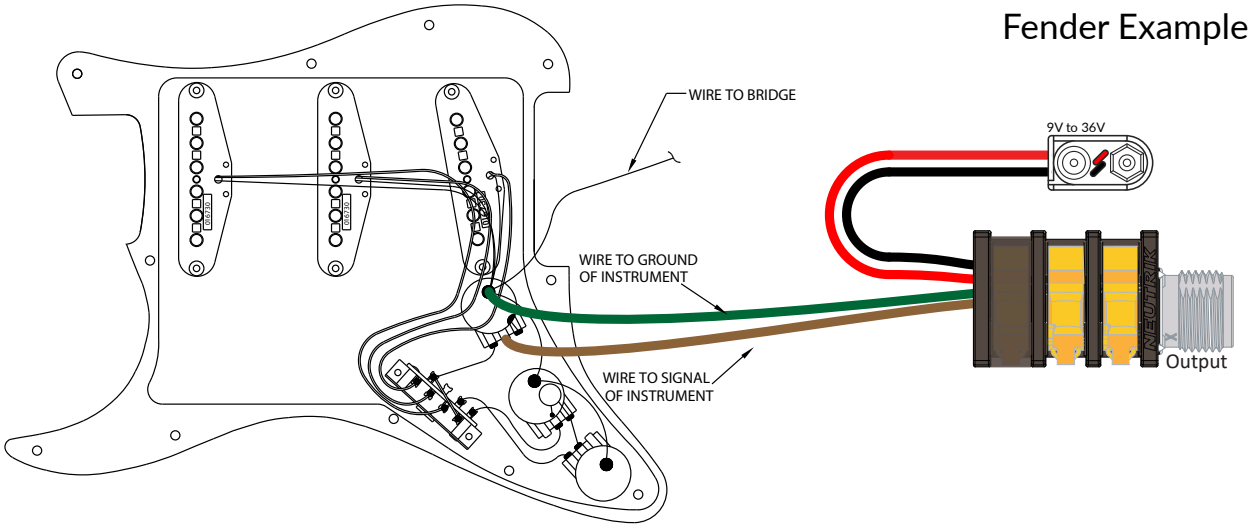
**For most instruments, simply replace the old output jack with the Ai1 jack. Connect the Ai1's brown wire to the signal wire, and the green wire to ground.**

The Ai1 is also ideal for buffering effects pedals and adding direct outputs to mixers or other audio devices. The input impedance is customizable. It is also possible to add either a variable or preset amount of boost. Contact us for information on these advanced topics.

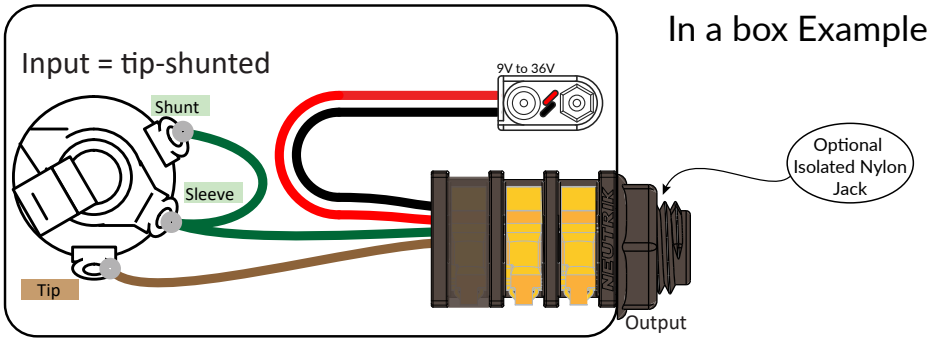
## Gibson Example




## Fender Example

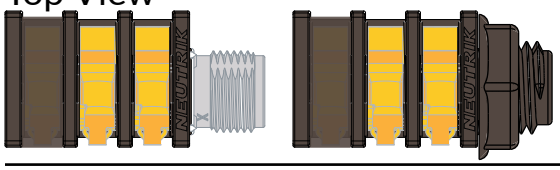



## In a box Example



# Ai1 Advanced Options

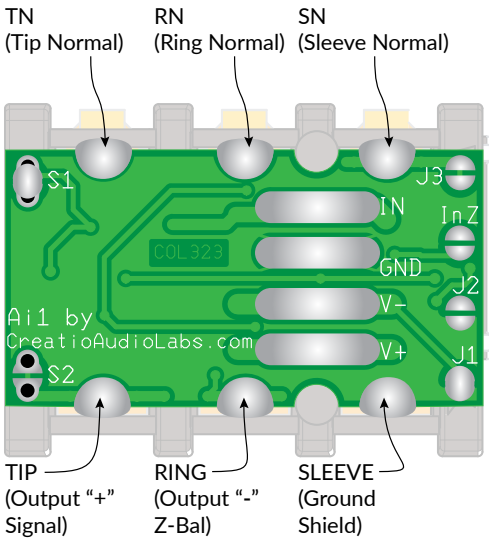
## Top View



### Metal vs. Nylon Jack

The Metal Jack fits in place of most guitar jacks. If it is installed in a panel or project box, the ground will be connected to the metalwork. If this is not desired, the Nylon Jack option should be selected.

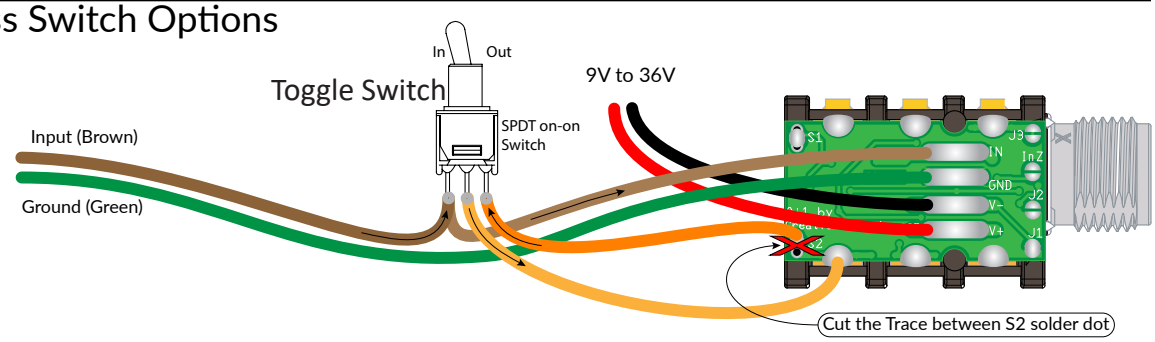
## Bottom View

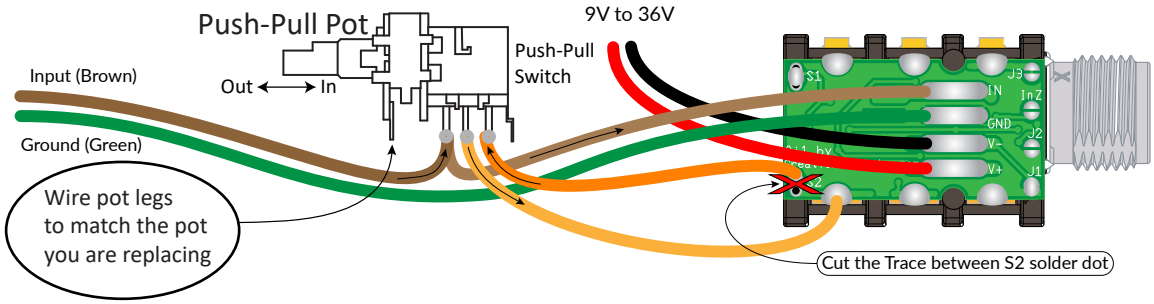



### Connections and Solder Dot Options

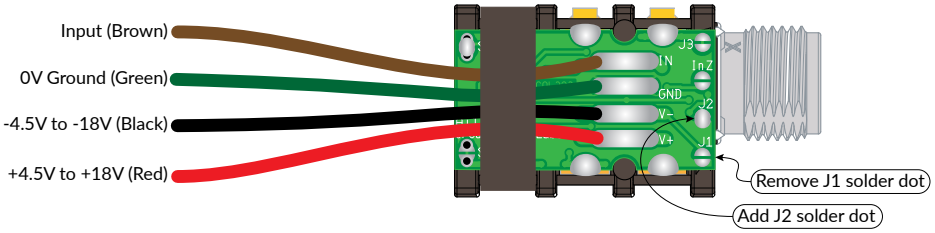
**IN**.....Audio Signal Input connects to this pad.
**GND**.....Audio Signal Ground connects to this pad.
**V-**.....0 Volts or Negative Voltage connects to this pad.
**V+**.....Positive Voltage connects to this pad.
**TIP**.....Buffered Audio Signal Output is always here.
**TN**.....Tip Normal passes signal from TIP if jack is unplugged.
**RING**.....Impedance Balanced: matched with TIP.
**RN**.....Ring Normal passes from RING if jack is unplugged.
**SLEEVE**..Connected to Audio Signal Ground.
**SN**.....Sleeve Normal switches power off if jack is unplugged.
**InZ**.....Default: Open = Ultra High Z, Closed = 1Mohm.
**S1**.....Default: Closed = Unity, Open = 6dBu boost.
**S2**..... Default: Closed, see Bypass Option.
**J1/J2**.....Default: J1 Closed/J2 Open, see BiPolar Power Option.
**J3**.....Default: Closed = sleep enabled, Open = always "on"

## Bypass Switch Options




## Bipolar Power Supply Option



# Ai1 User's Guide

**The Ai1 is the culmination of two decades of refinement. Extremely transparent, low noise, low distortion, tight phase and maximum headroom in the smallest possible package. Low power operation (typically 4mA) can accomodate battery power when installed inside an instrument. In battery mode the circuit goes to "sleep" when unplugged (drawing less than 0.3uA).**

## Battery Powered Install (Default for musical instrument pickup, guitar, bass or piezo)

The Ai1circuit can be installed with batteries inside a musical instrument, such as an electric guitar or bass, to provide a direct output, compatible with all unbalanced amplifiers and FX pedals as well as balanced PA systems, recording studio mixers and digital converters. In Class A or Battery mode, the Ai1 goes to "sleep" whenever it senses the jack is unplugged. In the unlikely event of a dead or disconnected battery the Ai1 continues to pass a weakened, unboosted signal. So, you will never be completely stranded without a battery.

1. Locate Jumper J1 on the bottom of the Ai1 Jack near the sleeve and verify it has a solder dot.

2. Locate Jumper J2 on the bottom of the Ai1 Jack and verify it does not have a solder dot.

3. Connect your battery's Plus(+) to the Red wire and Minus(-) to the black wire. You can connect batteries in series for more headroom, for example, four 9V batteries connected in series will create 36V. Do not go over 40V maximum!

4. Connect the Green wire to your instrument's Ground (usually the back of one of the pots).

5. Connect the Brown wire to your instrument's Signal (Usually the wiper of the volume pot or the output of the pick-up selector).

Options:

1. Input Impedance - Locate Jumper InZ.
    A. Open, (no solder dot) sets the input impedance to Ultra Hi Z which is greater than 20 megaohms.
    B. Closed, (added solder dot) sets the input impedance to 1 megaohms.
2. Gain Setting - Locate Jumper S1.
    A. Open, (no solder dot) sets the gain to +6dBu.
    B. Closed, (added solder dot) sets the gain to Unity.
    C. With S1 Open, you may add a switch wired across S1. Switch closed = unity, Switch open = +6dBu
3. Bypass Option - Locate Jumper S2 and refer to the Bypass Switch Options diagram in this document.
    A. Normally Closed, (trace between S2 solder dot) connects the Ai1 circuit's output directly to the tip of the jack.
    B. Open, (cut trace between S2 solder dot) allows you to add a switch to connect the input (bypass) or Ai1 circuit's output (buffered).

## Bipolar Powered Install (for retrofitting audio equipment).

Most audio equipment uses a bipolar (plus and minus) power supply. Typically +/-15V to +/-18V. In the bipolar configuration, the Ai1 circuit can operate from +/-2.5V all the way up to +/-20V absolute maximum.

**Caution!!! Installation should only be attempted by an experienced qualified technician! There could be dangerous voltages inside your unit, possibly for days after being turned off and unplugged. Making the wrong connections could damage the Ai1 Circuit, could damage your equipment, or worse, could damage you. Only proceed if you are confident and willing to be responsible for any damages. We are not responsible for problems caused by improper installation**.

1. Remove the solder dot from J1, and add a solder dot to J2 on the bottom of the Ai1 Jack.

2. After physically mounting the jack in a convenient place on the chassis of your audio equipment, simply connect the Green wire to the 0V ground, the Black wire to the negative power supply and the Red wire to the positive power supply (Obviously, with your equpment powered off and unplugged). It is usually not too important where you tap into the power supply voltage, however, it is generally a good idea to find where the power exits the power supply and enters the gear's PCB, to make the connection as near as possible to the power source.

3. Connect the Brown wire to the point in your signal path where you want to tap from. For example, the top of the fader on a mixer for the pre-fade signal, or the wiper of the fader for the post fader signal. The default input impedance of the Ai1 is greater than 20 megaohms, so it will not load down the signal path regardless of where you make this connection.

## Class A Powered Install (for use with a single power supply voltage).

Some audio equipment uses Class A (a single supply) power. Typically +20V to +40V. In the Class A configuration, the Ai1 circuit can operate from +5V all the way up to +40V absolute maximum.

**Warning!!! Read the Caution note above!!!**

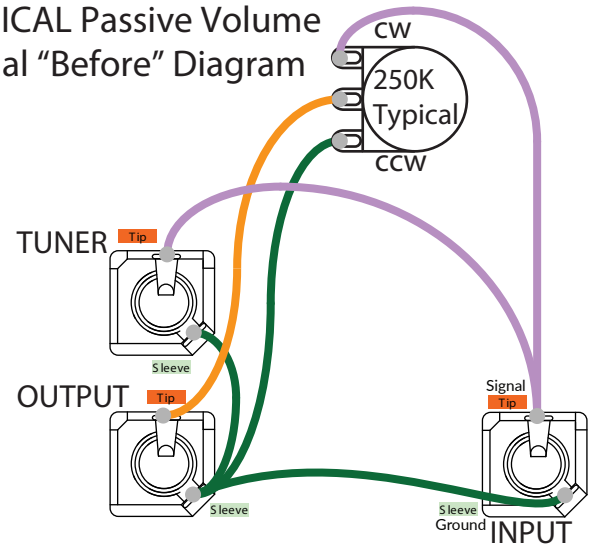
1. Remove any solder dot from J2, and add a solder dot to J1 on the bottom of the Ai1 Jack.

2. After physically mounting the jack in a convenient place on the chassis of your audio equipment, simply connect BOTH the Green and Black wires to the 0V ground and the Red wire to the positive power supply (Obviously, with your equpment powered off and unplugged). It is usually not too important where you tap into the power supply voltage, however, it is generally a good idea to find where the power exits the power supply and enters your circuitry, to make the connection as near as possible to the power source.

3. Connect the Brown wire to the point in your signal path where you want to split off from. For example, the top of the fader on a mixer for the pre-fade signal, or the wiper of the fader for the post fader signal. The default input impedance of the Ai1 is greater than 20 megaohms, so it will not load down the signal path regardless of where you make this connection.

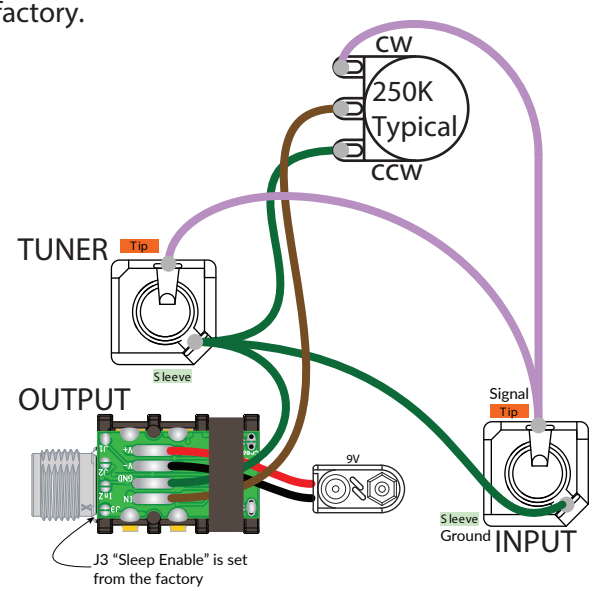
# VOLUME PEDAL - Redeemer Ai1 Buffer Mods

## TYPICAL Passive Volume Pedal "Before" Diagram

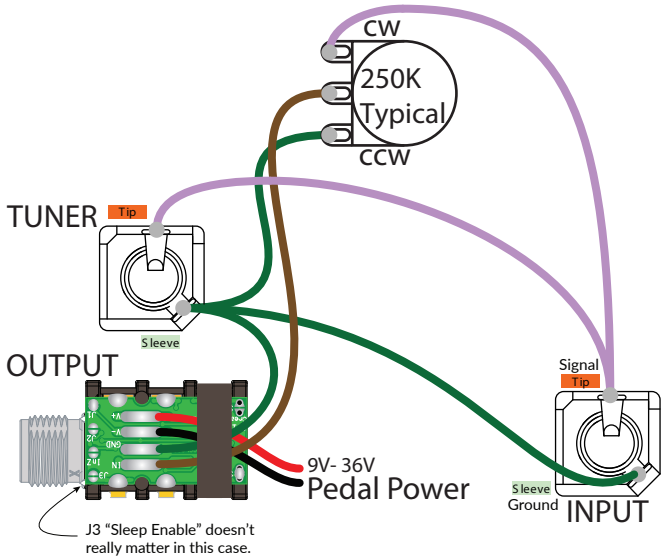



## Ai1 OUTPUT Buffer w/Battery Power

To make sure the battery turns off, remember to unplug the output when not in use to save the battery. J3 "Sleep Enable" is set from the factory.




## Ai1 OUTPUT Buffer w/Pedal Power




A better idea is to use an external pedal power supply. Then you can leave the output jack plugged in and not worry about battery life. ALSO, the Redeemer Ai1 can take up to 36V for maximum headroom. I would want at least enough headroom to handle the loudest pedal in my chain... so, if I had an 18V pedal, I would use at least 18V to power the Ai1 too. J3 "Sleep Enable" could be cut, however, in this case it really doesn't matter.

## Ai1 INPUT and OUTPUT Buffer w/Pedal Power

The pot in the examples above would still load most pick-ups.

One solution is to route the input signal directly to a buffer, then route the buffer output to the pot. This will unload your pick-ups and the buffer lets you use a lower value pot, the lower impedance pot is less prone to picking up noise from nearby electronics.

J3 "Sleep Enable" should be cut on the first buffer stage, so you can unplug the TUNER output without killing the signal.

However, an even better solution would be to install an Ai1 inside the guitar, or in a belt pack as close to the pick-ups as possible for the best possible results.