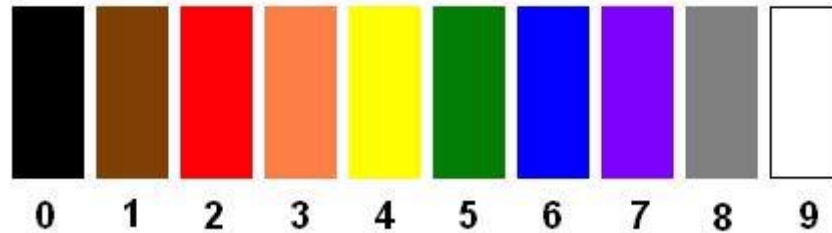


# **B.Y.O.C. Confidence Booster Kit Instructions**

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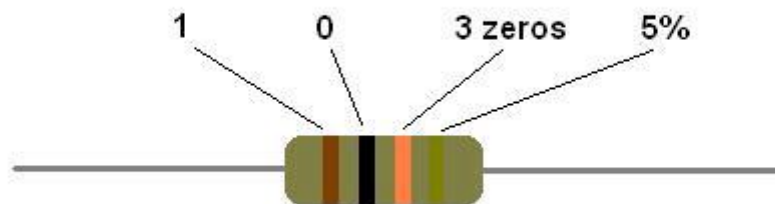
# Reading resistor and capacitor codes

## Resistor Color Codes



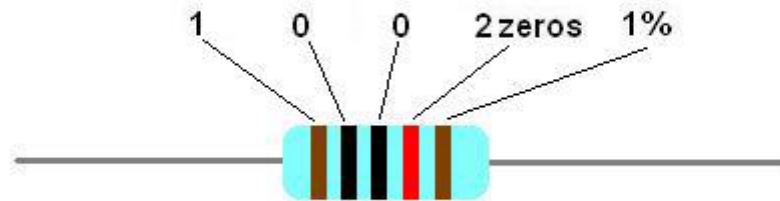
When reading 4 band resistor code, you take the first 2 bands at face value. The 3rd band tells you how many zeros to add to the end. And the 4th band tells you the tolerance of the resistor. What is tolerance? Tolerance means how close the component will likely be to its intended value. So a 10k resistor with a 5% tolerance could actually be anywhere between 9.5K - 10.5k. Whereas a 10k resistor with a 1% tolerance will be anywhere between 9.9k and 10.1k. The lower the tolerance the more accurate the component will be. With resistors, a BROWN band = 1%, a GOLD band = 5%. There are also Silver = 10% and red = 2%, but you will rarely see those this day and age. The only time you are likely to see 10% is if you are working with vintage electronics and 2% just aren't used often.

### 10k 5% Carbon Film Resistor



5 band resistor code isn't really much different from 4 band. The first 3 bands are taken at face value. The 4th band tells you how many zeros to add to the end. And the 5th band will tell you the tolerance. You are likely to only see 5 band code on 1% resistors. This is because they are more precise and their advertised values will sometimes go out 2 decimal places, so they need the extra band.

## 10k 1% Metal Film Resistor



## Capacitor values and codes

In the world of capacitors, you will most commonly run into two units of measurement - MicroFarads and PicoFarads. There is a third unit - NanoFarads. This was a common unit 25+ years ago. It is losing popularity, but you will run into it occasionally.

The symbol for Microfarads is “ $\mu\text{F}$ ”. This is actually a Greek “M”. So you will also see “uF” or “mF” as the symbol for microfarads since many text editors don't have a proper  $\mu$ . From here on out, and in all other BYOC documents, you'll see microfarads referred to as uf.

The symbol for NanoFarads is nF, and the symbol for PicoFarads is pF. Microfarads is the largest unit, nanofarads is the second largest, and picofarads is the smallest.

$$1\text{uf} = 1000\text{nf} = 1000000\text{pf}$$

$$1\text{pf} = .001\text{nf} = .000001\text{mf}$$

From the equations above, you can see that when converting from a larger unit to a smaller unit, you simply move the decimal point 3 places to the right for each unit of measurement you step down to.

When converting from a smaller unit to a larger unit you simply move the decimal point 3 places to the left for each unit of measurement you step up to.

Capacitor codes:

Large value capacitors will usually be in aluminum electrolytic form, medium values in film and small values in ceramic disc. There are other types of capacitors like silver-mica which is usually only associated with very small values. And tantalum capacitors which can cover a very broad range of values.

A very common capacitor value is 0.1uF. You will most likely see this in film form. You will most likely see a code on the capacitor that reads something like “104K”. This is similar to 4 band resistor code. The letter at the end tells you the capacitor's

tolerance. K= 10% J= 5%. The “104” portion of the code tells you the actual value. Even though the capacitor is listed as 0.1microfarad , the code is actually in picofarads. The “1” and the “0” are taken at face value. The “4” tells us how many zeros to put on the end. So the value of the capacitor in picofarads is 100,000pf. Or 100nf. Or 0.1uf.

With smaller values like 47pf for example, you will likely be dealing with ceramic disc capacitors. The code on a 47pf cap would read “470”. This is 47 at face value with 0 zeros on the end. 47 picofarads. Where as a 470pf cap would read “471” - 47 at face value with 1 zero on the end. 470picofarads. It can get a little confusing at times.

Larger value capacitors, particularly aluminum electrolytics are pretty straight forward. If you have a 100uf aluminum electrolytic cap, most of the time they will just say “100μ” right out.

## Parts Checklist for The Confidence Booster Kit

**Resistors:** 5% carbon film have a light brown body and 4 band color coding. 1% metal film have a light blue body and 5 band color coding. You kit may come with one or both types.

- 1 - **360ohm** (orange/blue/brown/gold) or (orange/blue/black/black/brown)  
or 390ohm (orange/white/brown/brown) or (orange/white/black/black/brown)
- 1 - **10k** (brown/black/orange/gold) or (brown/black/black/red/brown)
- 1 - **100k** (brown/black/yellow/gold) or (brown/black/black/orange/brown)
- 1 - **1M** (brown/black/green/gold) or (brown/black/black/yellow/brown)
- 2 - **2M2** (red/red/green/gold) or (red/red/black/yellow/brown)

### Capacitors:

**3 - 0.1uf film.** These may be green or red in color. The code on the may consist of various alpha-numeric characters, but in the center of the code will be the numbers “104”. So for example your cap may read “2P104K”. The outside characters refer to model and tolerance. The inner “104” is the important code that tells you the capacitor's value is 0.1microfarads.

**1 - 100uf aluminum electrolytic.** Your kit may actually come with anything from 1uf - 220uf. The aluminum electrolytic capacitor will be shaped like a can. It will have one lead that is longer. This is the positive lead. The shorter lead is the negative lead and there will also be a stripe of some sort of marking on the negative side.

### Transistor:

**1 - 2N5088.** Your kit may actually come with a 2N3904, MPSA18, or any other NPN silicon transistor with an EBC pinout.

### Diodes:

**1 - 1N4001** (black with silver stripe)

### IC:

**1 - 4558 dual op amp.**

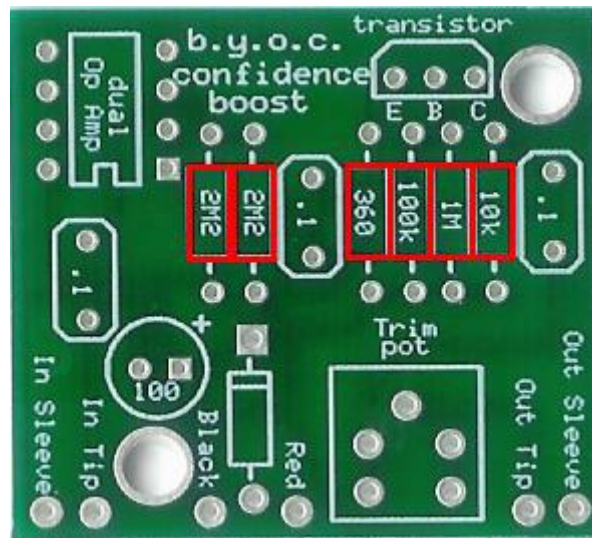
### Potentiometers:

**1 - 100k trimpot.** Your kit may come with anything from 10k - 500k.

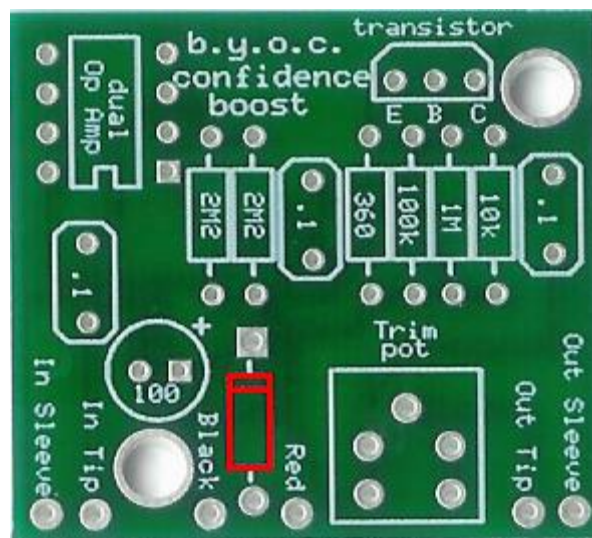
### Hardware:

- 1 - confidence booster circuit board
- 1 - ¼” mono jack
- 1 - battery snap
- hook-up wire

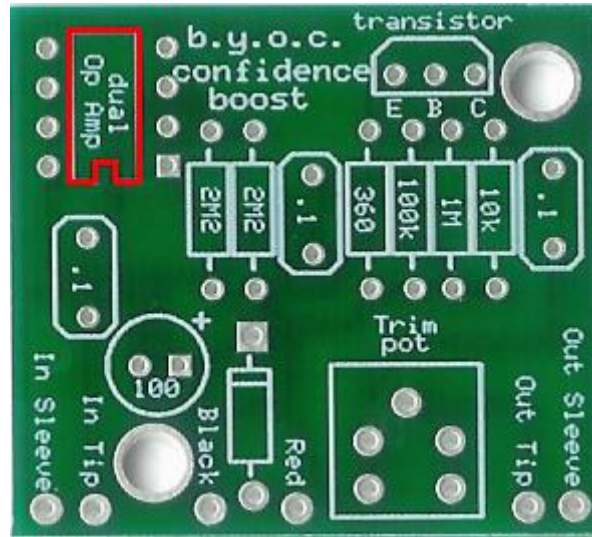
## Populating the Circuit Board



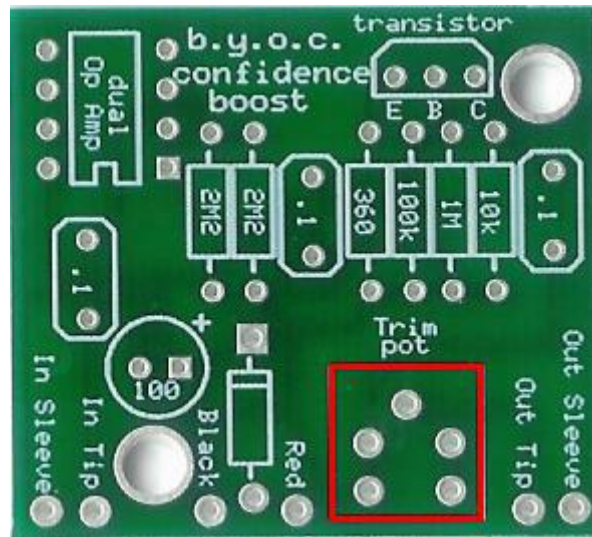
Step 1: Add the resistors. You want to add the components with the lowest profile first so that when you flip the PCB over to solder, the components don't fall out. Resistors are not polarized(polarized means it has a positive and negative end) so you can insert them into the board either way.



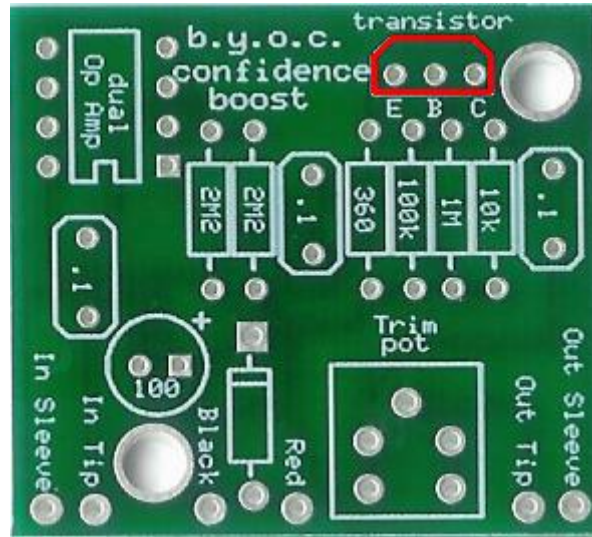
Step 2. Add the diode. The end with the stripe on it is called the cathode. This end goes into the square solder pade and stripe on the diode and stripe on the layout should match up. The other end of the diode is called the anode.



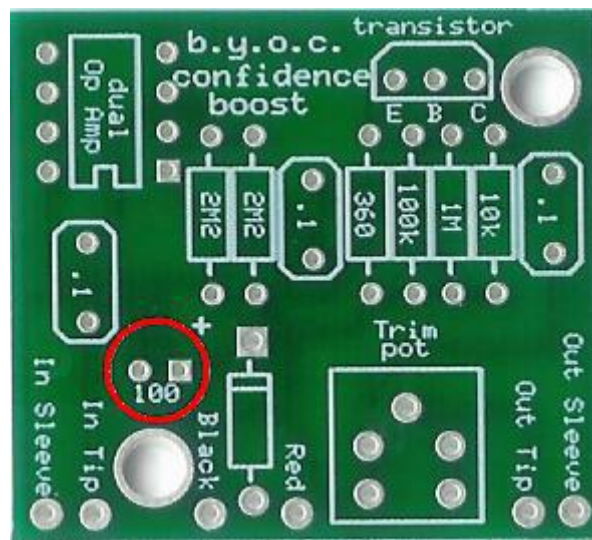
Step3: Add the op amp. Op amps come with two markers to help you determine how to orientate the component. The first is a notch in one end of the chip. If your chip has a notch on one end, insert it into the PCB so that it matches up with the notch in the layout. The other marker is a dot in one corner. This dot denotes pin # 1 of the chip. Pin 1 goes into the square soldering pad. Occasionally you will run into chips that have both the notch and dot markers. In this case, always use the notch as the primary marker.



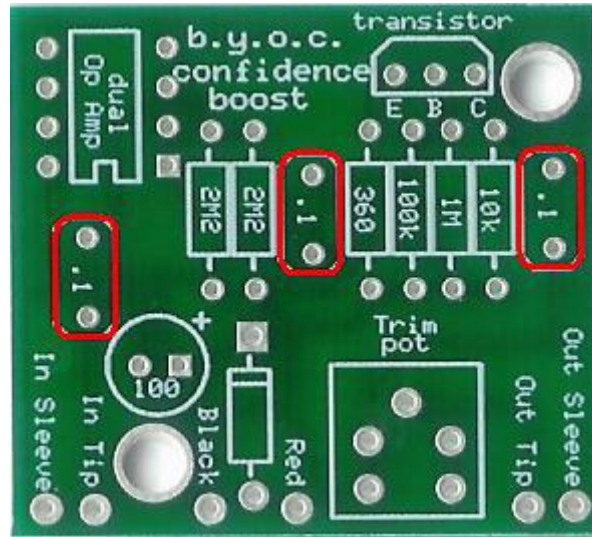
Step 4: Add the trimpot. The trimpot will have 3 leads. The PCB has eyelets for 5 leads. This is so that the PCB can accept a variety of pinout styles. There will only be one what the the trimpot can fit into the PCB.



Step 5: Add the transistor. Match the curved side of the transistor up with the curve side of the layout. A TO-92 package transistor such as the 2N5088 will have 3 leads - the emitter, base, and collector. They are marked on the PCB with E, B, and C.



Step 6: Add the aluminum electrolytic capacitor. Your kit may come with a value between 1uf and 220uf. Aluminum electrolytic capacitors are polarized. The longer lead goes in the square solder pad.



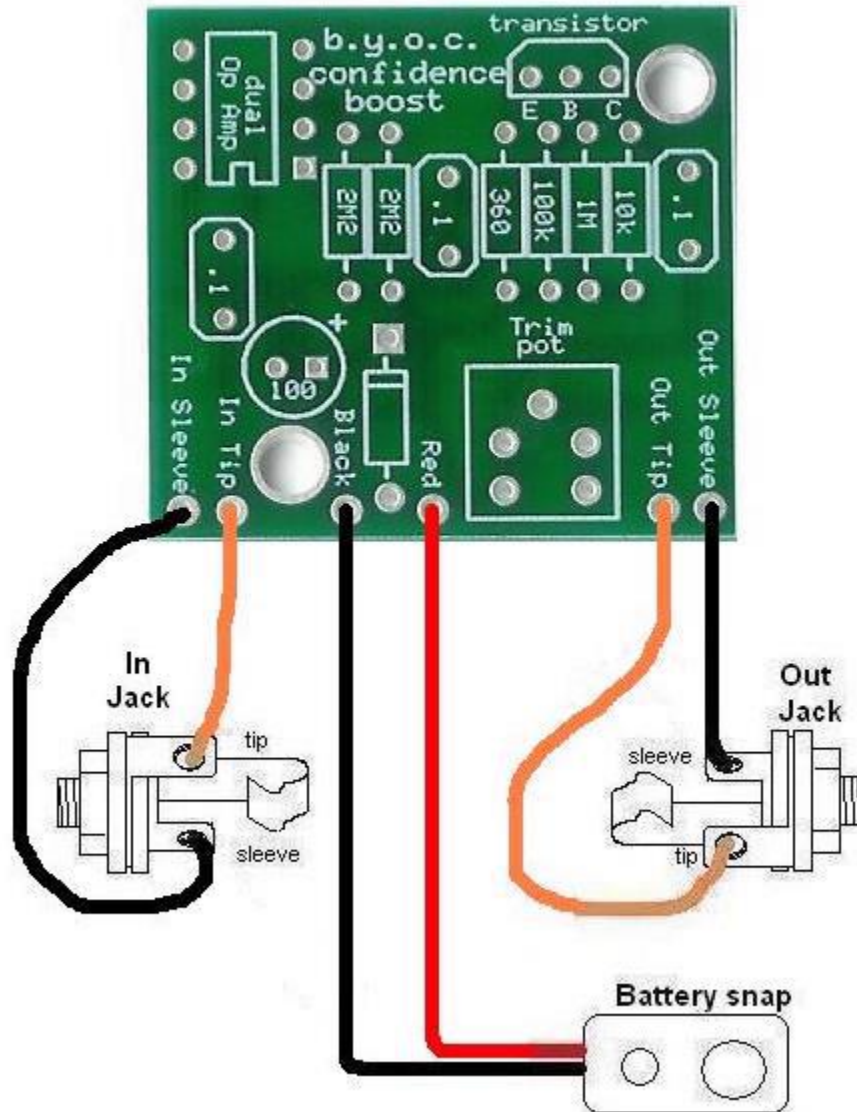
Step 7: Add the film capacitors. These are not polarized and can go in either direction.

Your Confidence Boost kit may come with two mono jacks, two stereo jacks, or one of each. Use the appropriate diagram for the type of jacks that came with your kit. If your

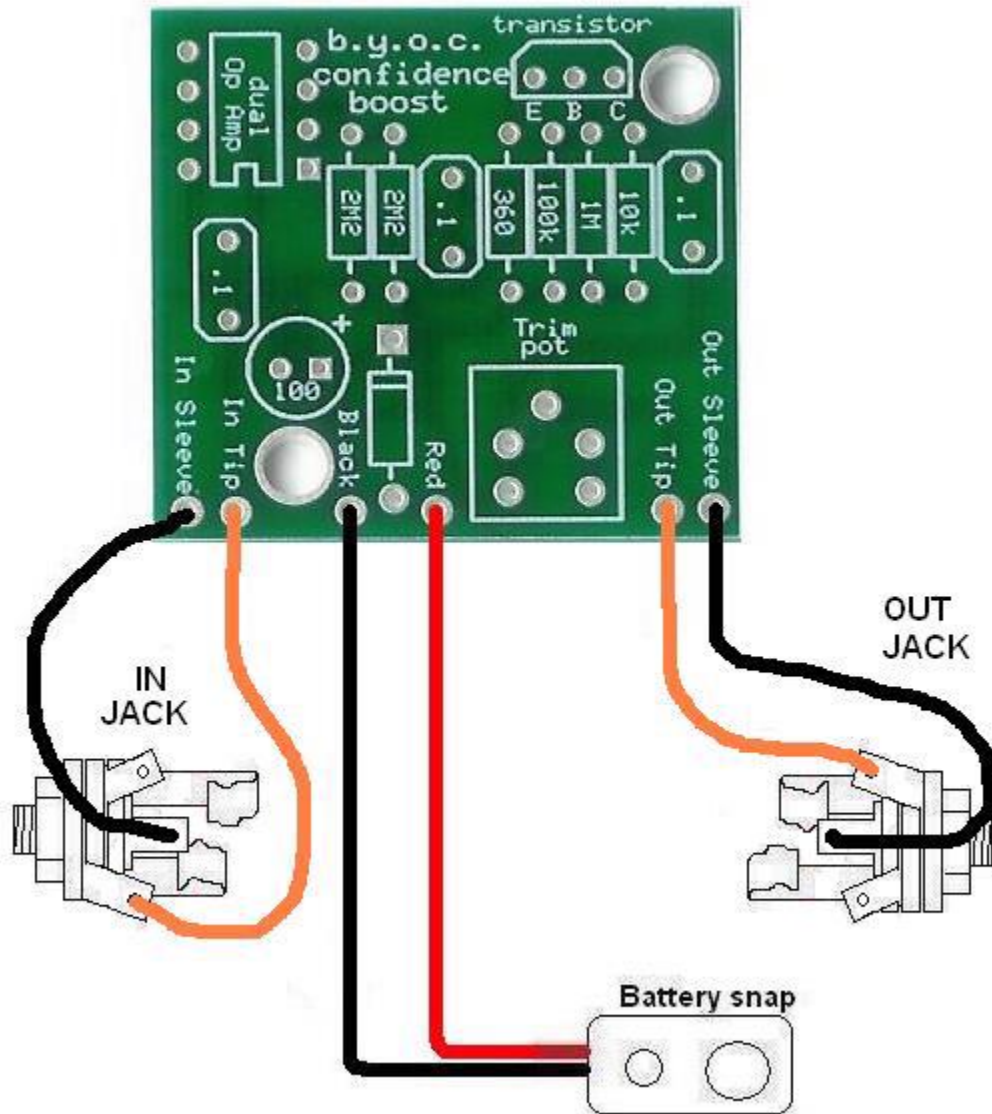


kit came with one of each, then follow one diagram for one of the jacks and the other diagram for the other jack.

# Confidence Boost Wiring with Mono Jacks



# Confidence Boost Wiring with Stereo Jacks

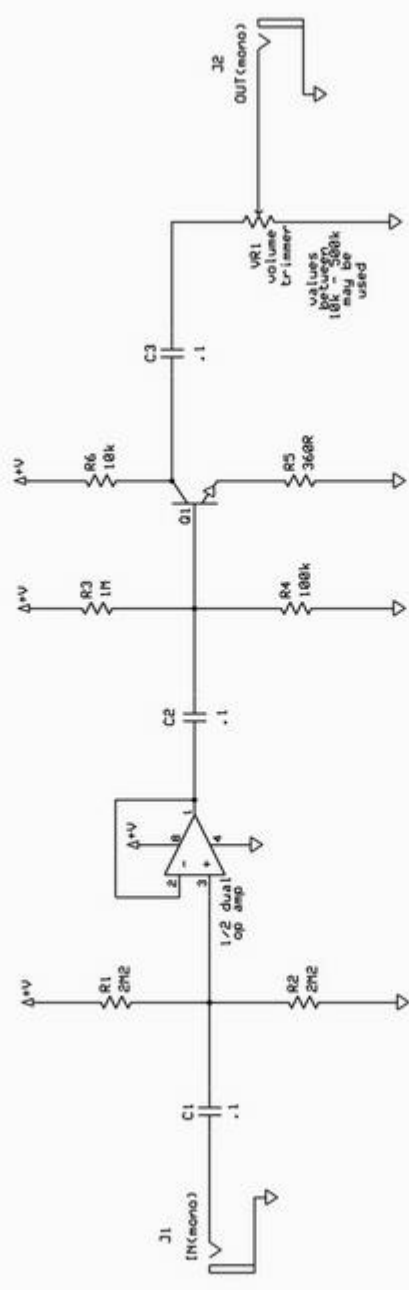


# Pluggin it in

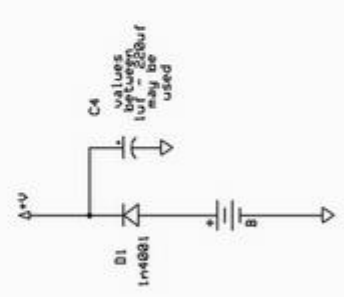
1. Use a fresh 9v battery.
2. Connect the in jack to your guitar and the out jack to your amp.
3. Use a small screw driver or similar tool to turn the trimpot.

What does this pedal do? Nothing special. When you have the trimpot about half way, you shouldn't hear much of anything. The volume levels should be about the same as if you were to plug your guitar directly into the amp. This is commonly referred to as unity gain. When you turn the trimpot down, it should drop in volume, and when you turn the trimpot up, it should increase in volume. Nothing more. Very simple.

We suggest that you visit the BYOC forum [board.buildyourownclone.com](http://board.buildyourownclone.com) if you'd like someone to take a look at your build and give you any pointers on areas for improvement. Also, it's best to ask questions first if there is something you are confused about, and the BYOC forum is the place to do it.



VR1 volume trimmer  
values between 18k - 500k may be used



C4 values between 100nF - 1000nF may be used