

CIR-KIT

BREADBOARD BUNDLE

MINI FUZZ BUILD GUIDE

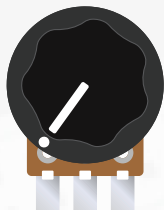


DIY

BY COPPERSOUND PEDALS

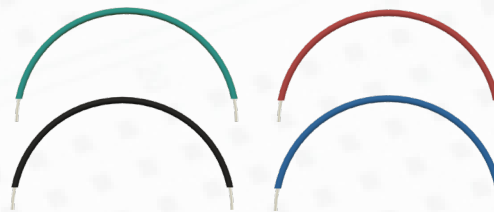
INCLUDED COMPONENTS

POTENTIOMETER



A100K
x1

PRECUT WIRE



1.5" Red, Black, Green, Blue
x40

RESISTORS & DIODES



Resistors
(various)
x2



Diode
1n4001
x1



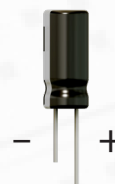
Diode
1n4148
x1



Transistor
2n5088
x1



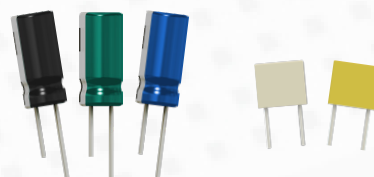
Film Caps
(various)
x3



Electrolytics
(various)
x1

COMPONENT COLOR AND VALUE VARIATIONS

Some components in your kit may be a slightly different in color from the breadboard step shown. This is normal.



REFERENCE

Resistors limit/control electrical current.

Diodes direct current flow in one direction, often used for clipping (distortion).

Transistors used to amplify signals.

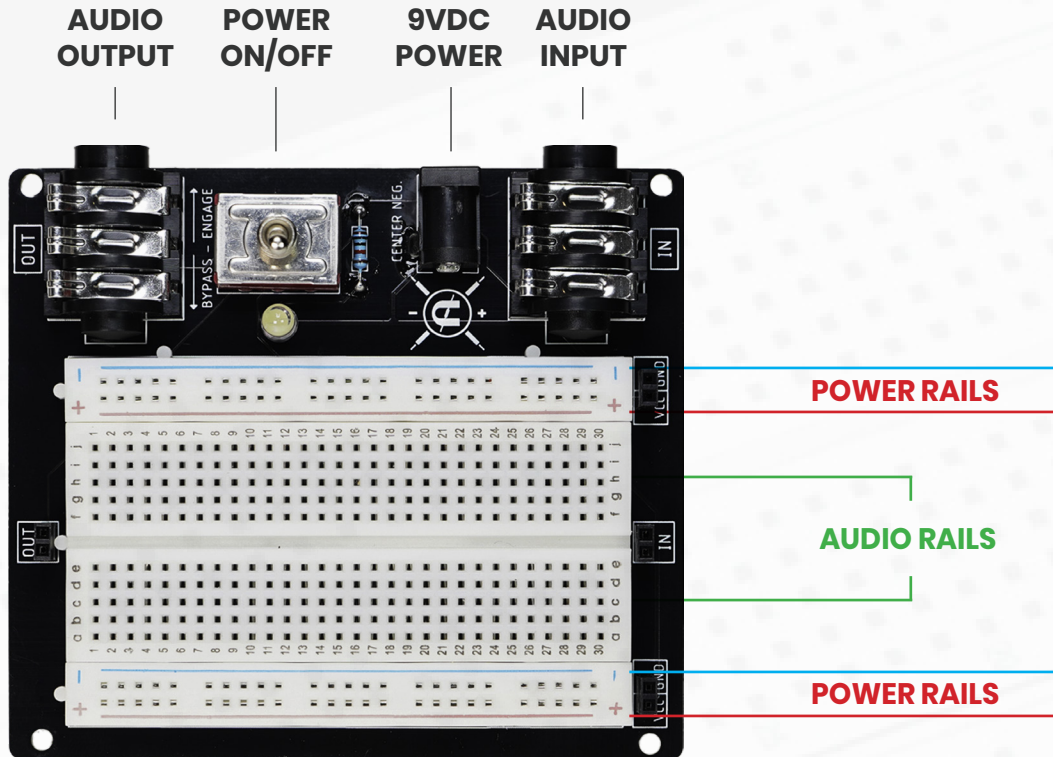
Film Caps used to shape EQ and tone.

Potentiometers (Pots) Control parameters by changing electrical resistance.

Electrolytic Caps polarized (- +), used for power filtering and coupling signals.

Op-Amp (Operational Amplifier) used as an amplifier, buffer, or a summing stage.

BREADBOARD SIGNAL FLOW

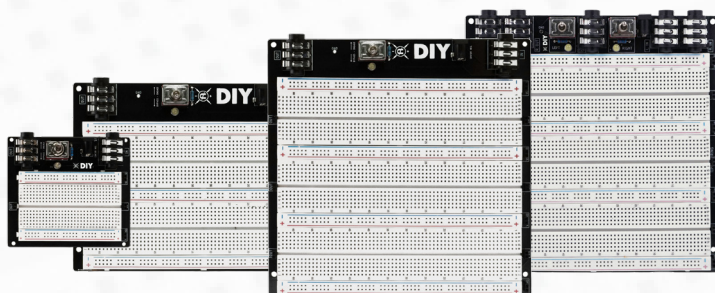


POWER RAILS FLOW HORIZONTAL

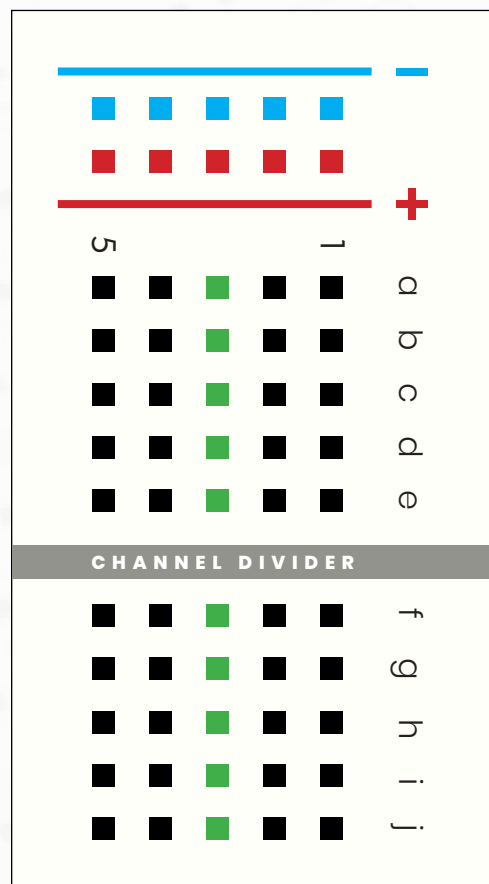
The **negative** rail will connect to the pin header marked GND, and the **positive** rail will connect to the pin header marked VCC.

AUDIO RAILS FLOW VERTICAL

Channels a-e are connected, and channels f-j are connected.

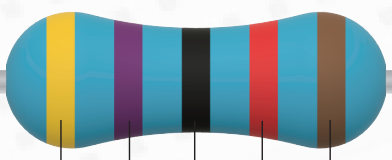


Check out our other [DIY Breadboards](#)



READING RESISTORS

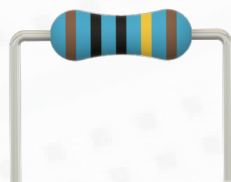
Reading resistors may seem intimidating, but it's a crucial part of breadboarding and is actually very easy! To determine the resistor value, follow the table and colors below. To ensure you are reading the correct value, keep in mind that the tolerance band is always found on the far right.



(47K)

COLOR	1ST BAND	2ND BAND	3RD BAND	DECIMAL MULTIPLIER		TOLERANCE	
BLACK	0	0	0	1	1		
BROWN	1	1	1	10	10	±	1%
RED	2	2	2	100	100	±	2%
ORANGE	3	3	3	1K	1,000		
YELLOW	4	4	4	10K	10,000		
GREEN	5	5	5	100K	100,000		
BLUE	6	6	6	1M	1,000,000		
VIOLET	7	7	7	10M	10,000,000		
GRAY	8	8	8		100,000,000		
WHITE	9	9	9		1,000,000,000		
GOLD					0.1	±	5%

Shown below are the resistors and values used in this build.



1M



220K

UNDERSTANDING BOX CAPS CAPACITANCE VALUE

NUMERALS ONLY



223K100

FACE VALUE

FACE VALUE

10's MULTIPLIER

223 = 22000pico (p)

OR 22nano (nF)

OR .022micro (μ F)

ALPHA-NUMERICAL



47n K 100

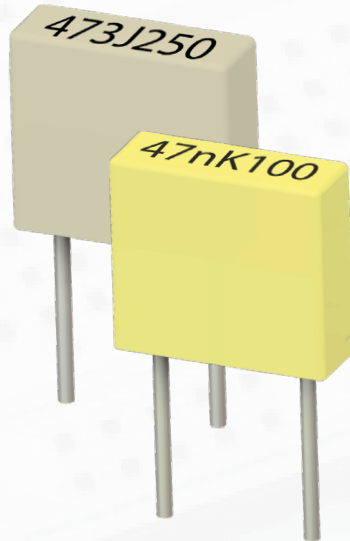
CAPACITANCE

TOLERANCE %

VOLTAGE MAX

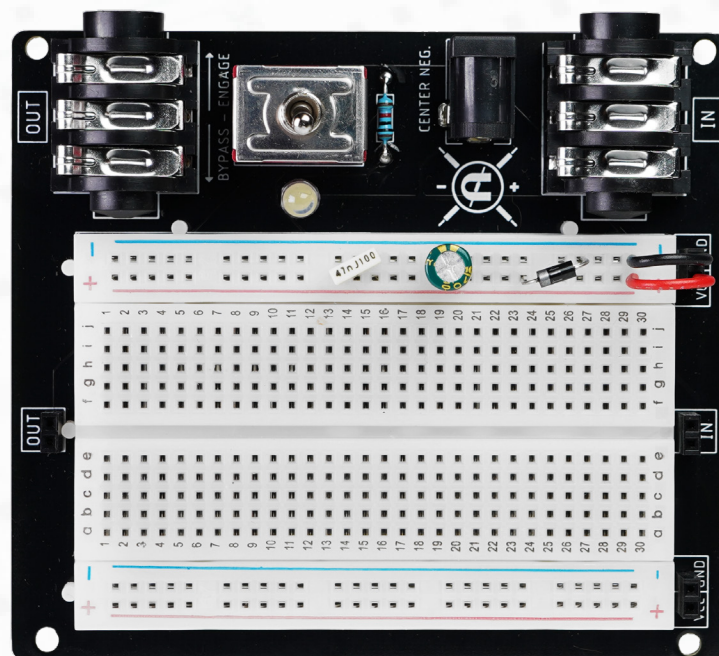
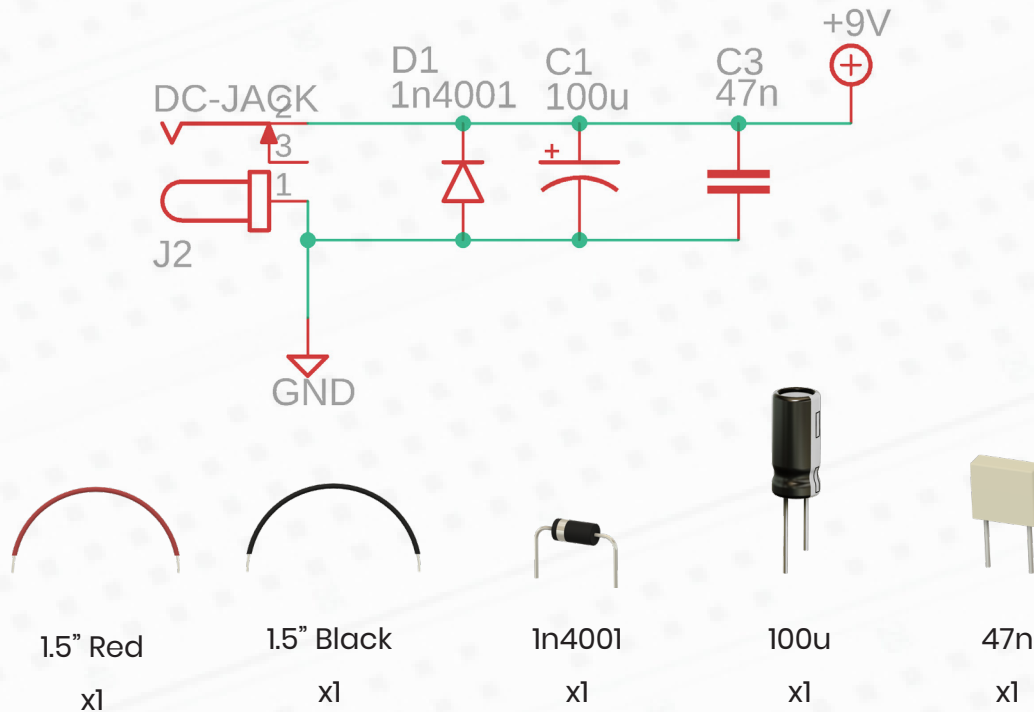
HOW YOUR CAP MAY LOOK

Some caps may vary slightly in color and reading. For example, a cap that reads **47nK100** is the same as **473J250**. Both variations will work and sound the same in the breadboard. Experiment with different cap values using our [Film Cap Substitution Box](#).



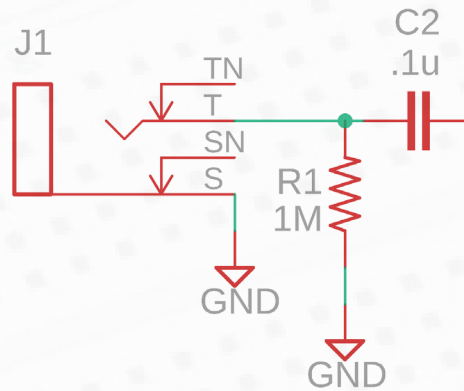
STEP 1 // POWER FILTERING

Power filtering helps to filter unwanted noise from power supplies, while preventing incorrect polarity from damaging the circuit. Ensure that polarized components (diode + electrolytic capacitor) are inserted correctly. In the schematic below, the power shows 9V, whereas the breadboard shows VCC. Please note that for the majority of pedal circuits, these terms are interchangeable.



STEP 2 // INPUT

The input capacitor blocks DC signal, while setting the amount of low frequency audio allowed into the circuit. The pull down resistor prevents popping from the switch.



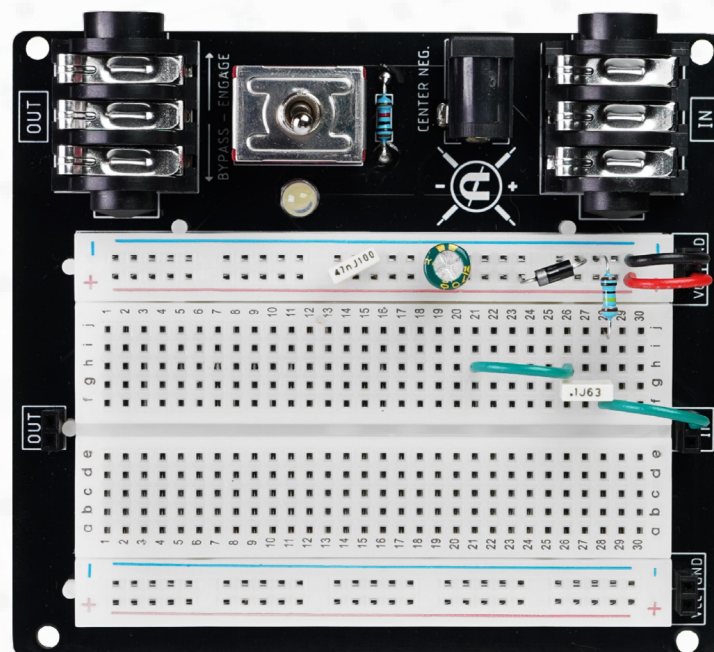
.1u
x1



1M
x1

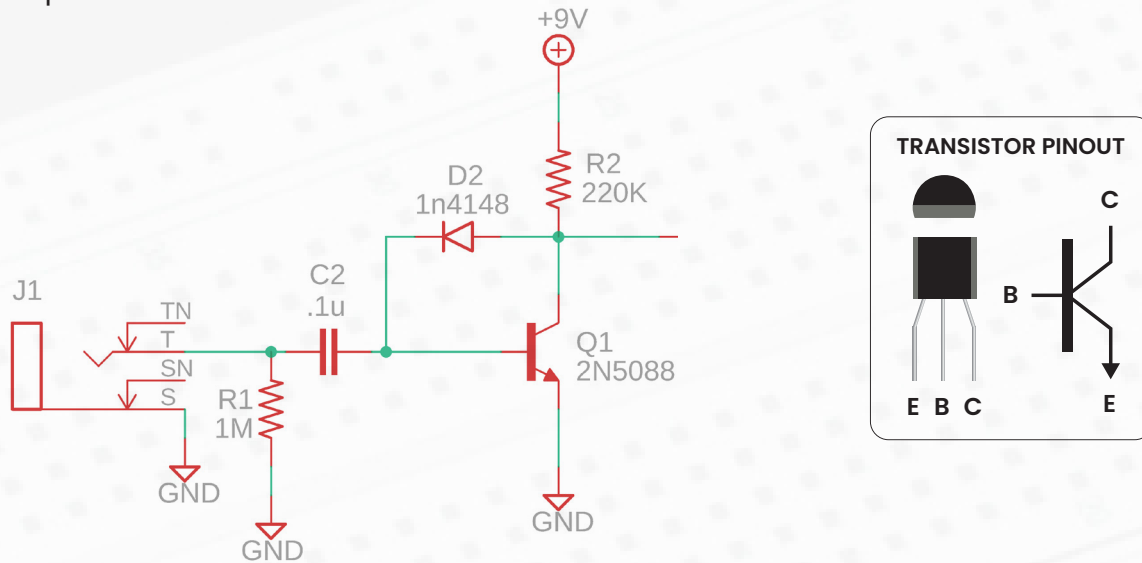


1.5" Green
x2



STEP 3 // GAIN STAGE

Signal enters the transistor and is amplified, based on the value of the 220K BIAS resistor. The diode delivers power to the base (B) of the transistor, while acting as a feedback loop for the distortion.



220K
x1



1n4148
x1



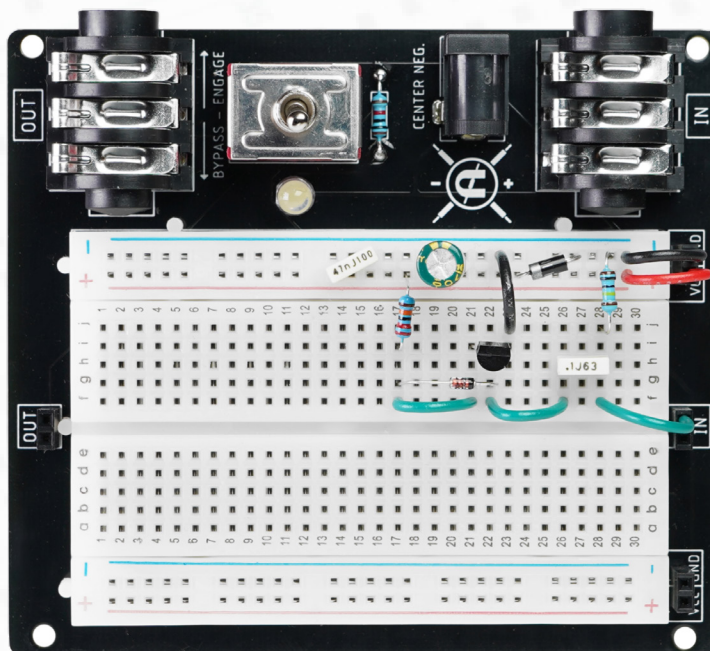
2n5088
x1



1.5" Green
x1

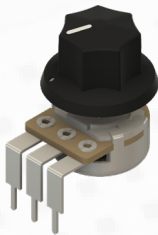
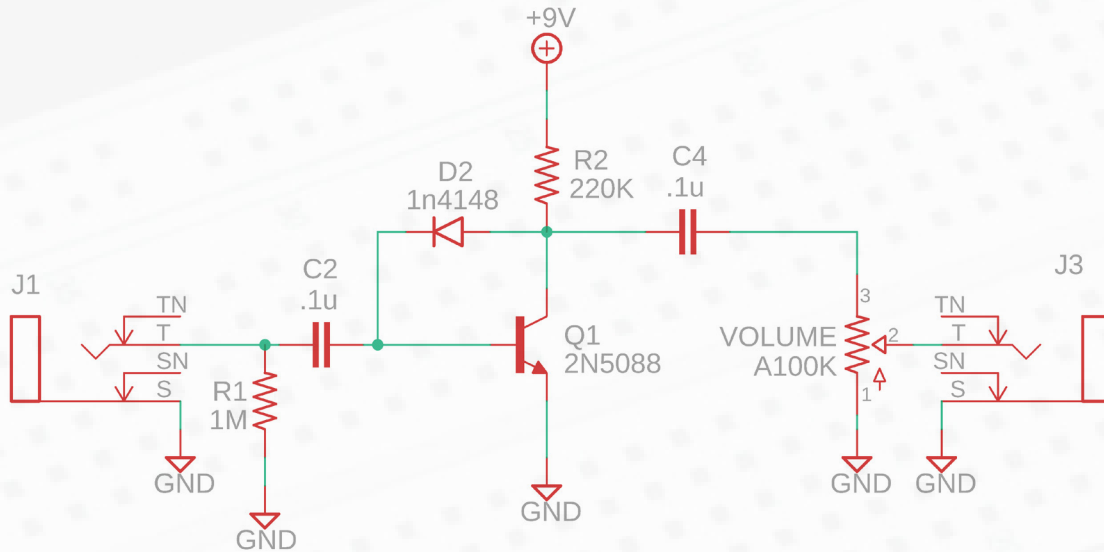


1.5" Black
x1



STEP 4 // OUTPUT

The volume knob acts as an attenuator, setting the output volume of the circuit. The last cap blocks DC from going to the output.



A100K
x1



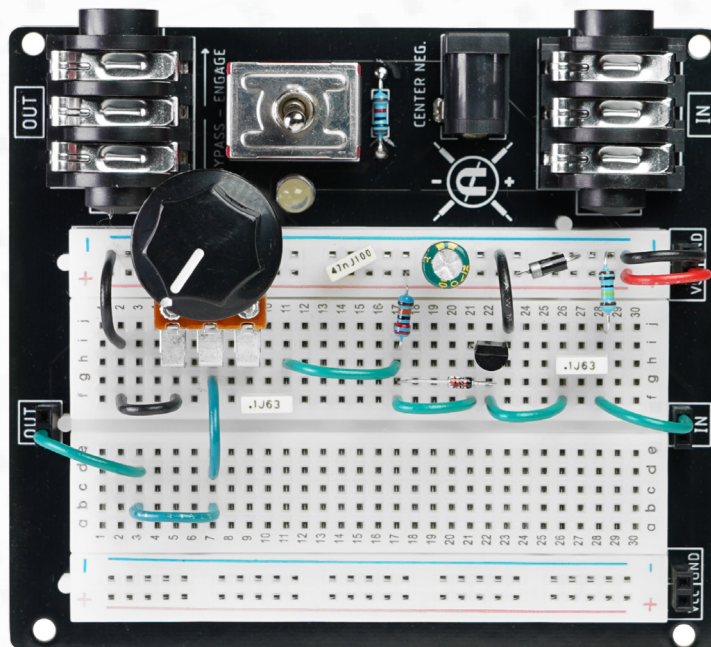
.1u
x1



1.5" Green
x4



1.5" Black
x2



TROUBLESHOOTING

Not getting power to the Power Rails/LED is not turning on when the toggle switch is set to the 'Engage' position.

Check that the proper connections are being made from the "VCC" & "GND" pin headers to the Power Rails. Pay attention to the orientation of Polarized components (Diodes and Electrolytic Capacitors).

Check the polarity of your power supply. Breadboards require "Center negative" polarity (as is with the power supply shipped with the bundle).

Not getting any effect when the toggle switch is set to the Engage position.

Most common issues will pertain to the proper connections being made. This could be as simple as a component being 1 slot away from the correct Audio Rail.

Check that transistors are in the correct orientation, and not flipped around 180 degrees.

Getting effect when toggle switch is set to Engage, but it doesn't sound as expected.

Check that the transistor is in the correct orientation and not flipped around 180 degrees. Check that the resistors are in the correct place and didn't get swapped with a different value. Pay attention to the orientation of Polarized components (Diodes and Electrolytic Capacitors).

Still stuck? Please reach out to us with any questions you have! We're here to help. Email us at: diy@coppersoundpedals.com