CIR-KIT™
BREADBOARD BUNDLE

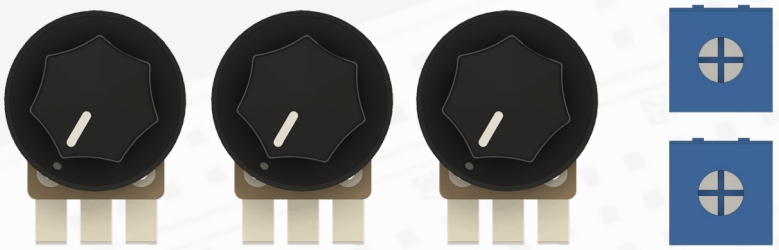
LPB-1
BOOST-A-DRIVE-A-FUZZ
BUILD GUIDE

AS SEEN ON SHORT CIRCUIT

DIY
BY COPPERSOUND PEDALS

INCLUDED COMPONENTS

Potentiometers



B50K
x1

B100K
x1

C5K
x1

50K, 10K
x2

Precut Wire

1.5" Red, Black, Green, Blue
x40

Transistors & Capacitors

Transistors
2n5088
x2

Film Caps
(various)
x6

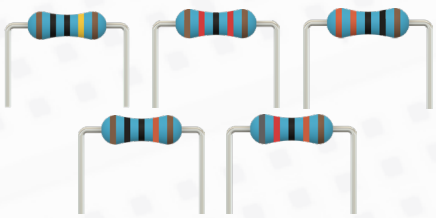
Electrolytic Caps
(various)
x3

Toggle Switch

SPDT
(on-off-on)
x1

VIEW ASSEMBLY VIDEO HERE

Resistors & Diodes

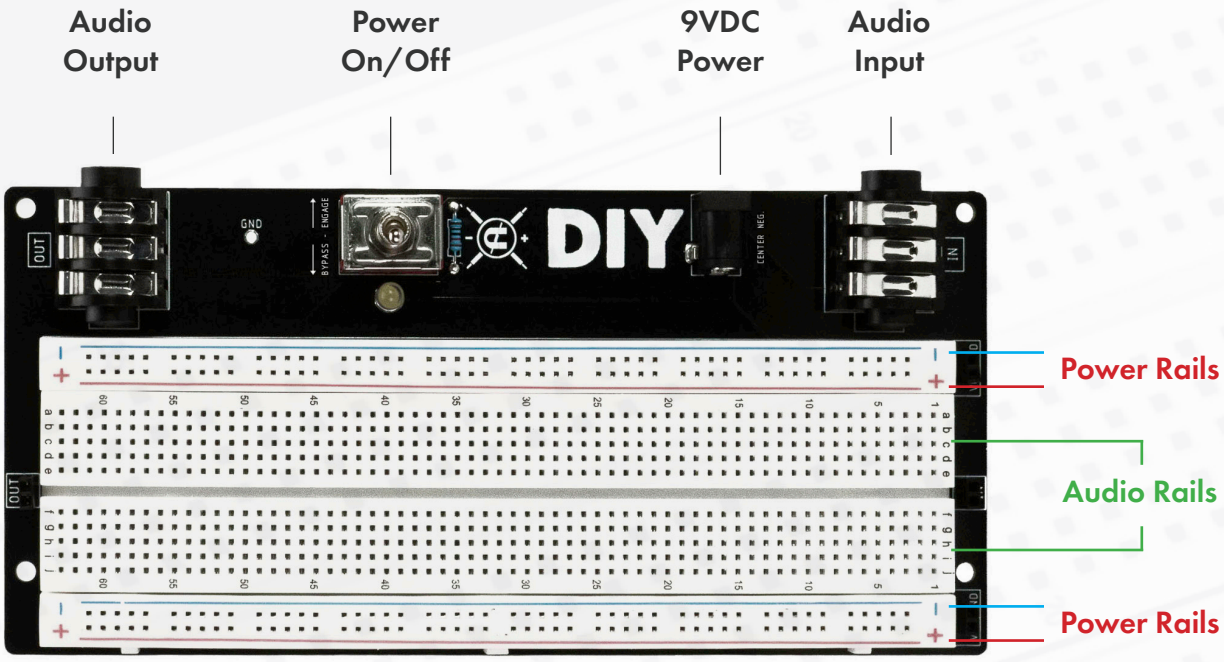


Resistors
(various)
x8

Diodes
D9J
x4

Diode
1n4001
x1

HOW BREADBOARDS FLOW

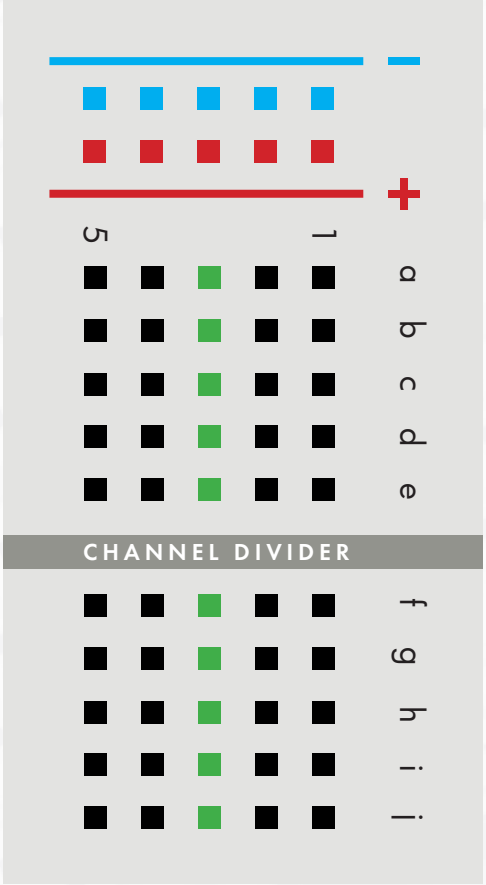


Power rails flow horizontally.

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

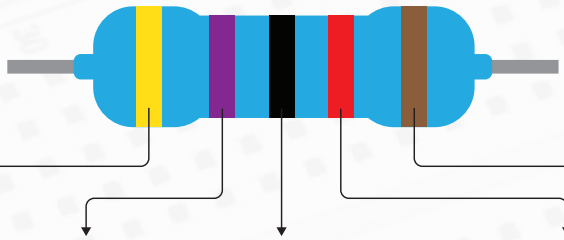
Audio rails flow vertically.

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



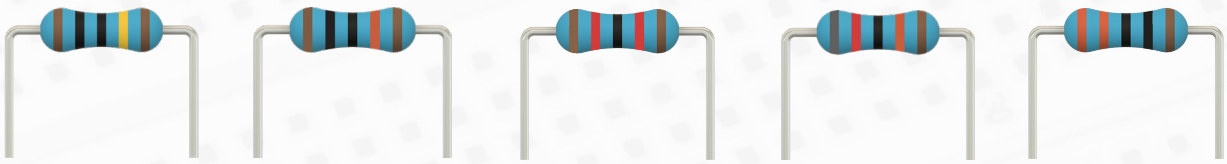
READING RESISTORS

Reading resistors may seem intimidating, but it's a very important aspect 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.



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%

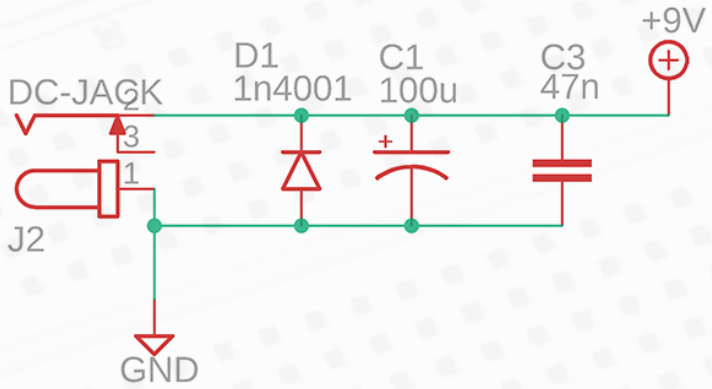
Shown below are the resistors and values that we'll be using in this build.



1M 100K 12K 820K 330

STEP ONE | 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.



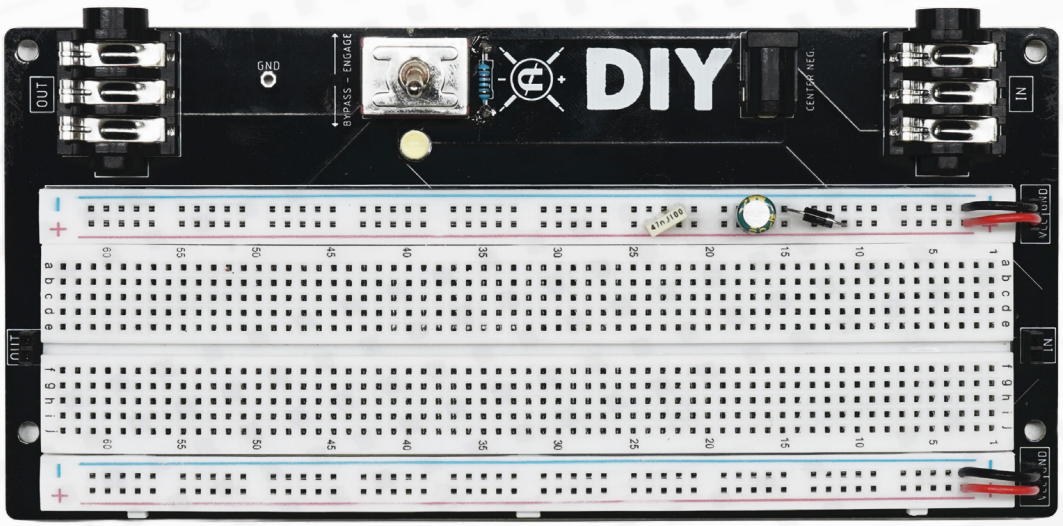
1.5″ Red
x2

1.5″ Black
x2

1n4001
x1

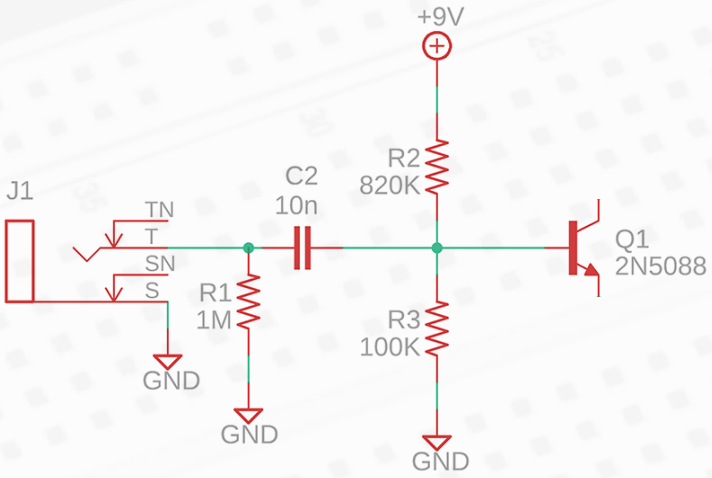
100u
x1

47n
x1

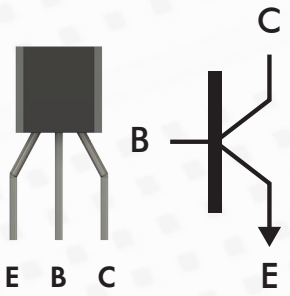


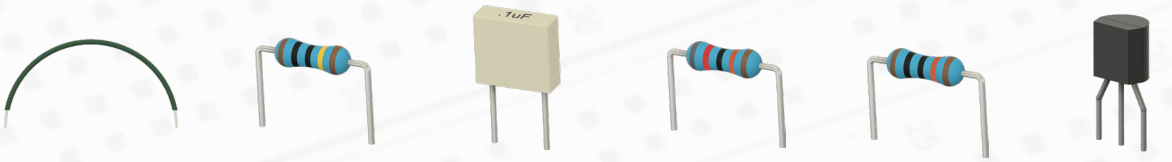
STEP TWO | INPUT

The input capacitor blocks AC while setting the amount of lows allowed into the circuit, and the pull-down resistor (R1) prevents popping from the switch. R2 and R3 set the BIAS voltage at the BASE of the transistor.

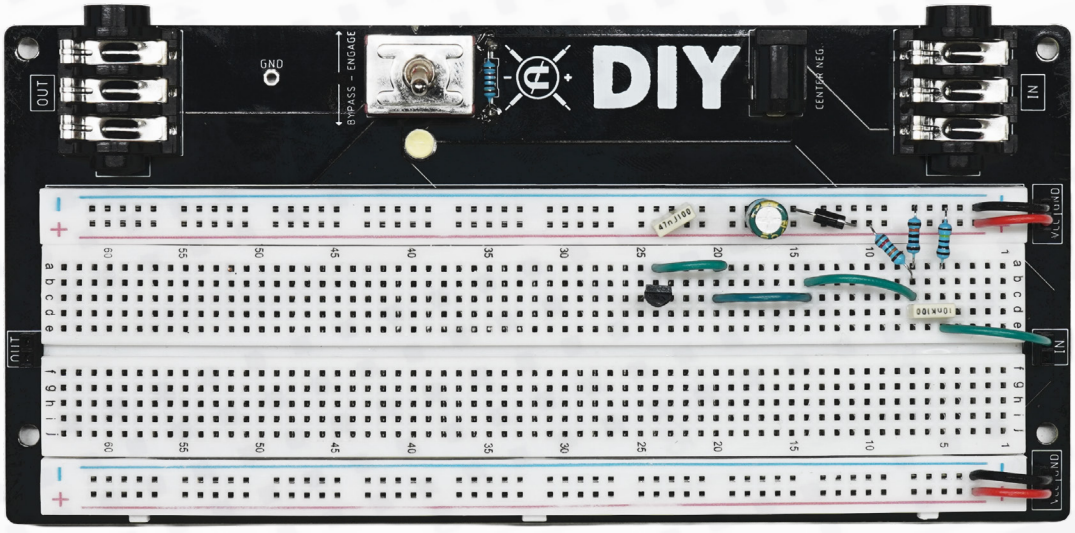


TRANSISTOR PINOUT



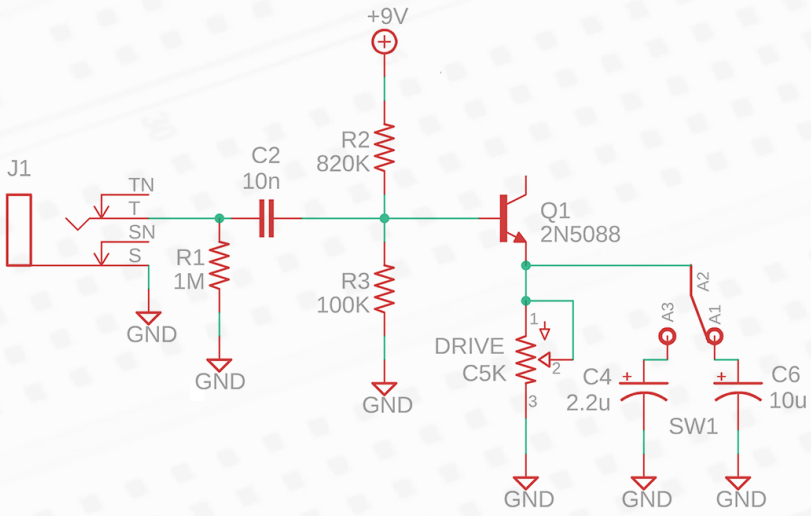


1.5″ Green	1M	10n	820K	100K	2n5088
x4	x1	x1	x1	x1	x1



STEP THREE | GAIN SECTION

The drive knob adjusts the gain amount of the transistor (Q1). The three-way toggle switch chooses between three different types of bass and gain combinations. Click here to view the SPDT assembly video. **Note: The circuit will function WITHOUT the toggle switch, however, there will only be one hardwired combination of bass and gain.*

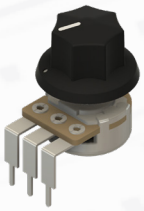


1.5" Black x2

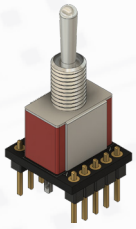
1.5" Blue x3

2.2u x1

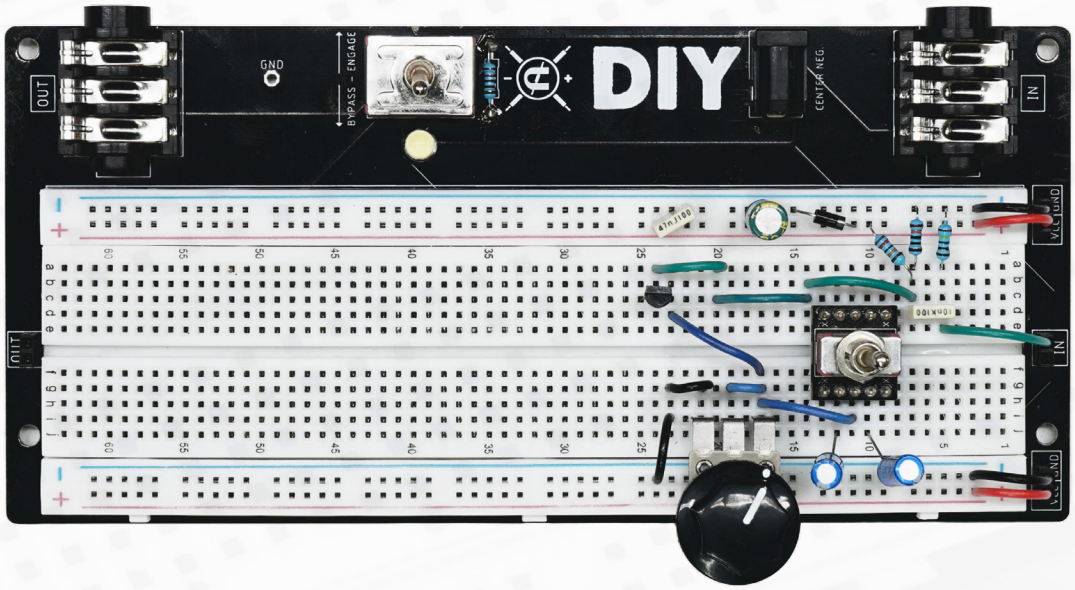
10u x1



C5K x1

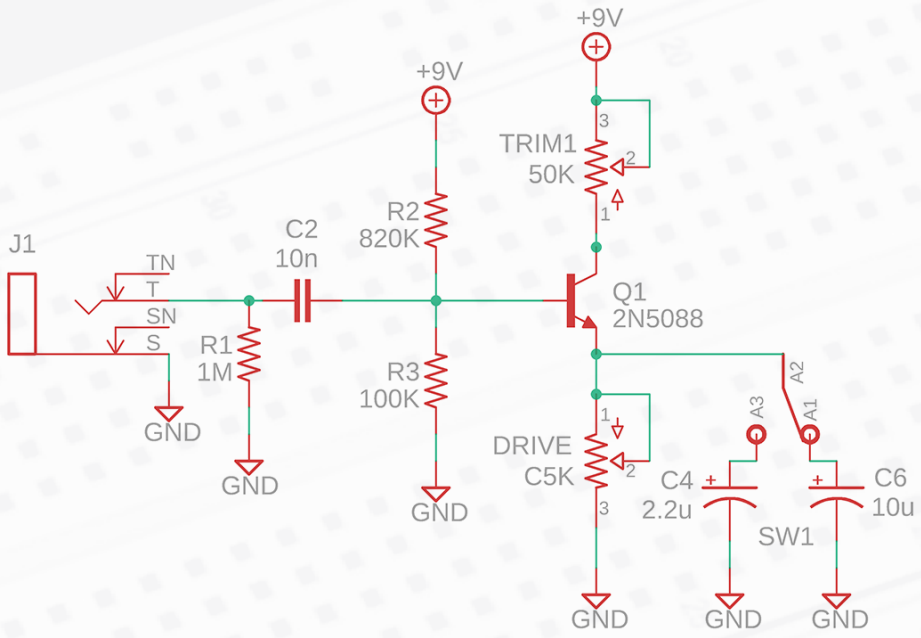


SPDT x1

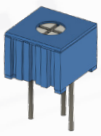


STEP FOUR | STAGE 1 BIASING

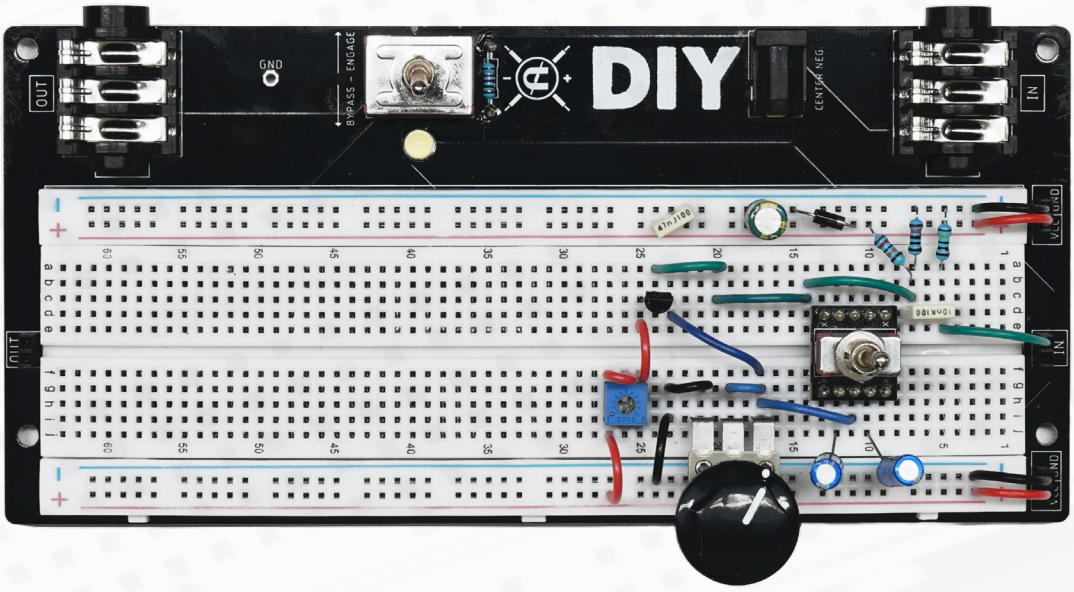
The trim pot sets the 4.5 volt BIAS at the collector of the transistor. Set this with a multimeter and small screwdriver, or simply fine-tune this with your ear. [Click here to learn how to read voltages on our DIY Breadboards.]



1.5" Red
x3

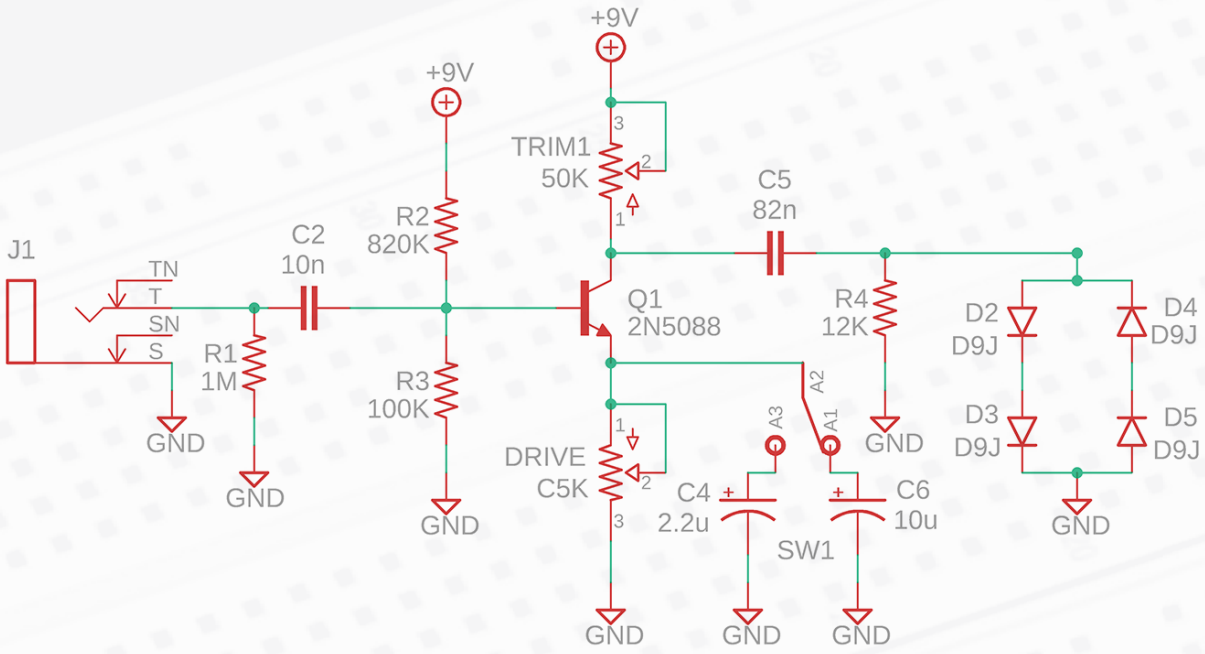


50K
x1



STEP FIVE | HIGH PASS FILTERING AND CLIPPING

C5 and R4 form a high pass filter to roll off some of the low end content. The diode network sets the clipping level and overall characteristics of the gain.

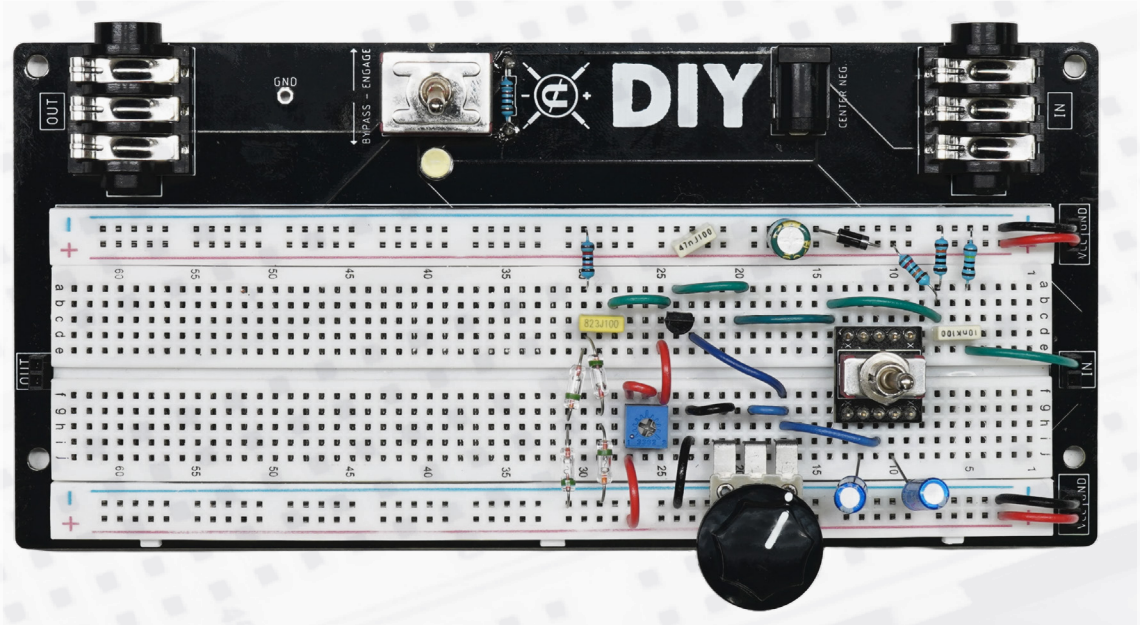


1.5″ Green
x1

82n
x1

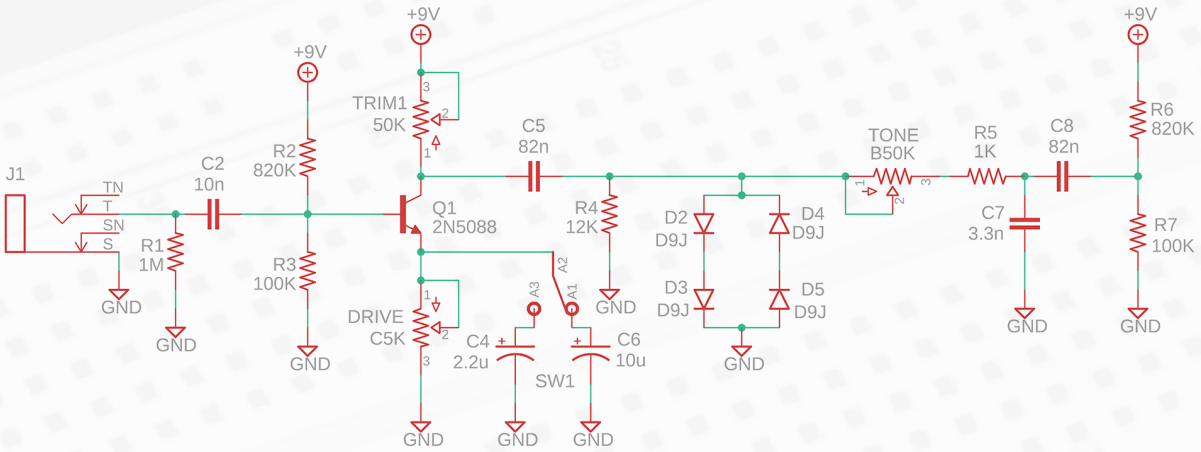
12K
x1

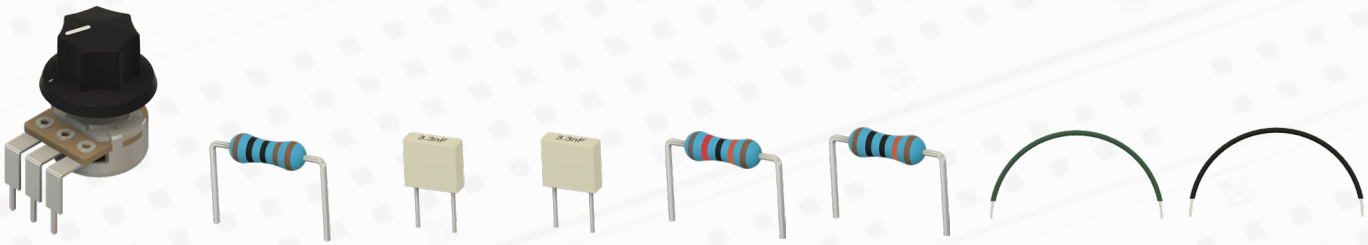
D9J
x4



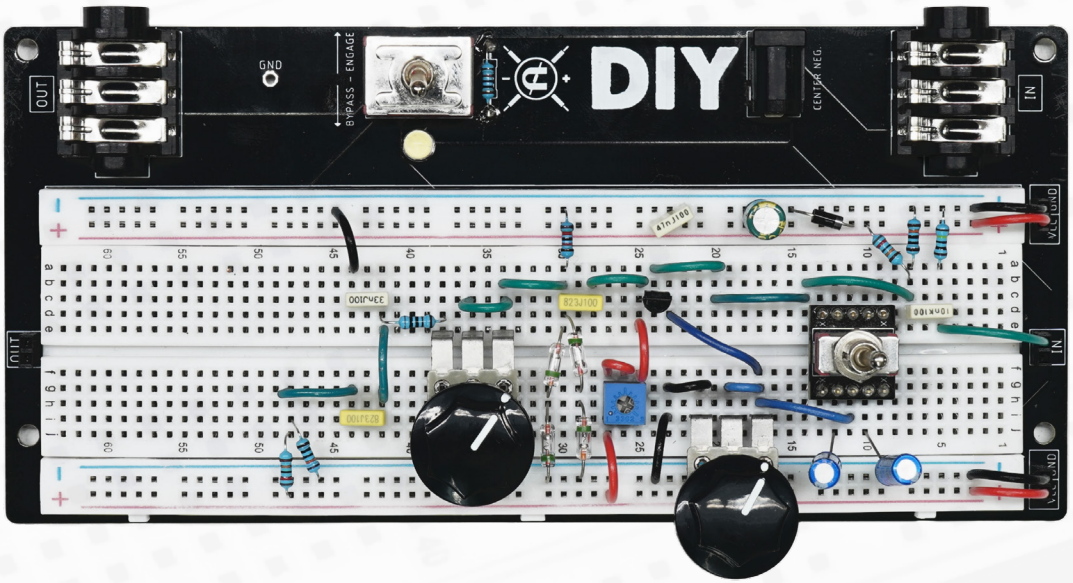
STEP SIX | TONE NETWORK

R5 and C7 form a low pass filter control that works in conjunction with the tone knob. R6 and R7 set the BIAS voltage at the BASE of the transistor.



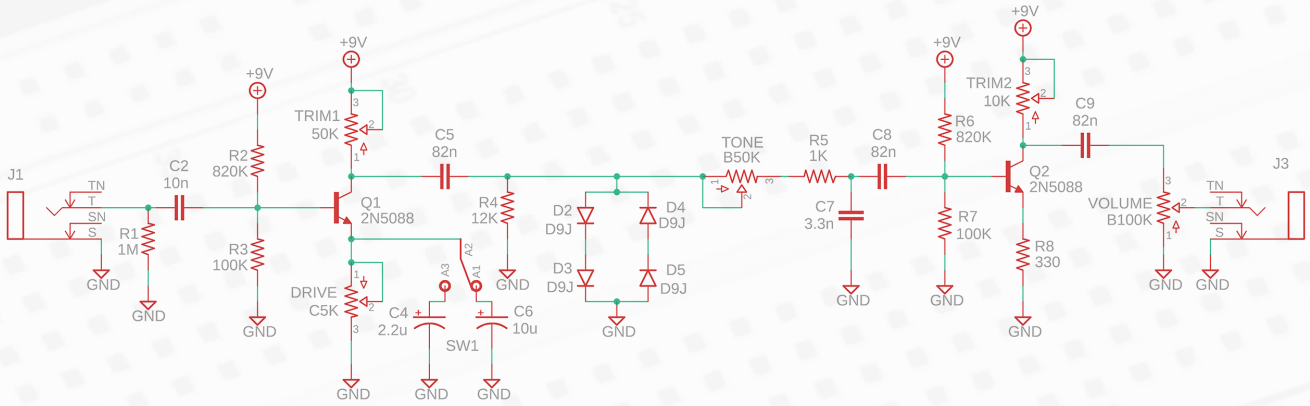


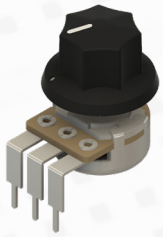
B50K x1 | **1K** x1 | **3.3n** x1 | **82n** x1 | **820K** x1 | **100K** x1 | **1.5″ Green** x4 | **1.5″ Black** x1



STEP SEVEN | STAGE 2 BIASING AND OUTPUT

The trim pot sets the 4.5 volt BIAS at the collector of the transistor. Set this with a multimeter and small flathead screwdriver, or simply fine-tune this with your ear. R8 sets the gain amount of the transistor, while the volume knob acts as an attenuator, setting the overall output volume of the circuit.





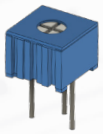
B100K
x1

1.5" Blue
x3

82n
x1

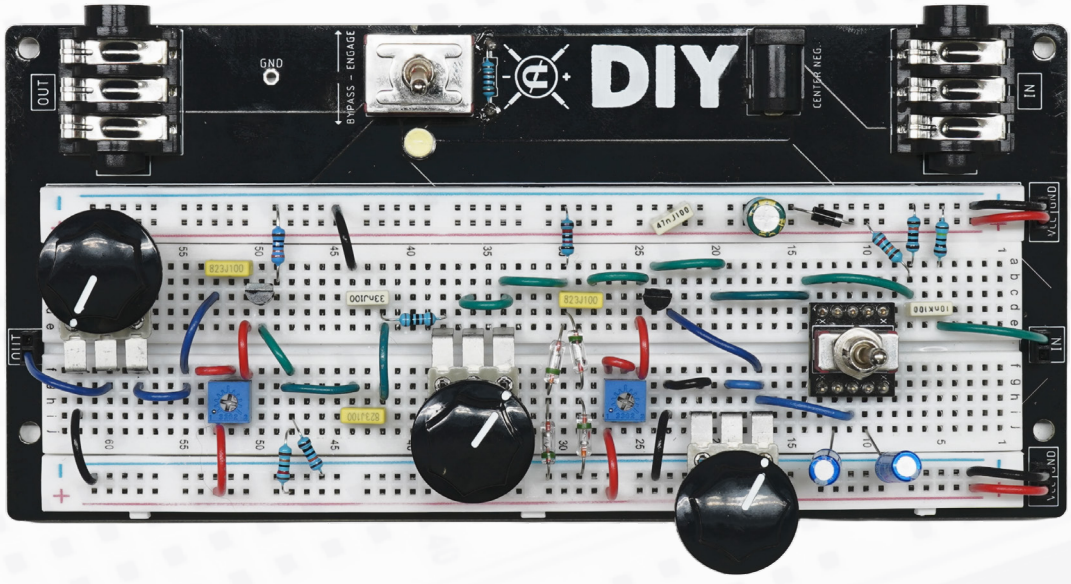
2n5088
x1

1.5" Black
x1

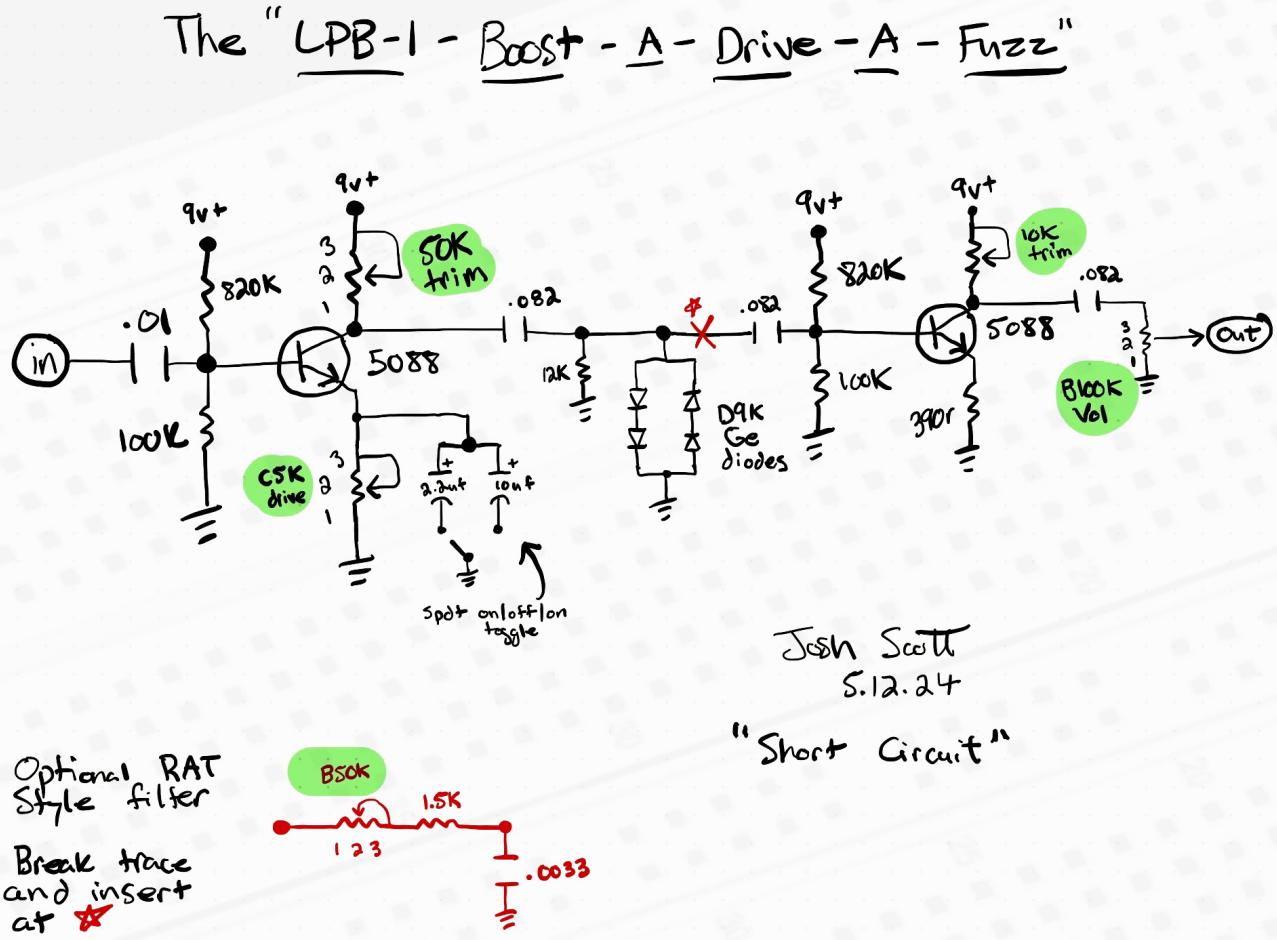


10K
x1

330
x1



JOSH SCOTT'S OG SCHEMATIC



NOTES

Josh's original schematic values for the **D9K** Germanium transistors (STEP FIVE) were substituted for **D9J**, and the **390** resistor (STEP SEVEN) was substituted for a **330**.

AS SEEN ON SHORT CIRCUIT

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

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