



Ornament Kit: Santa

mas-effects.com/holiday



I hope you have a ton of fun building this ornament, and that it brings some extra holiday cheer to you and everyone around you.

If you have any questions or run into any problems, visit our MAS Effects subreddit:

[reddit.com/r/maseffects](https://www.reddit.com/r/maseffects)

This is where you'll get the quickest help. You can also email me directly (mark@mas-effects.com) or post to various DIY pedal groups online (visit mas-effects.com/holiday-instructions/ for a list), but these may take a bit longer.

Happy Holidays!

Overview

This ornament doubles as a tremolo "pedal" for your guitar, bass, synths, etc.

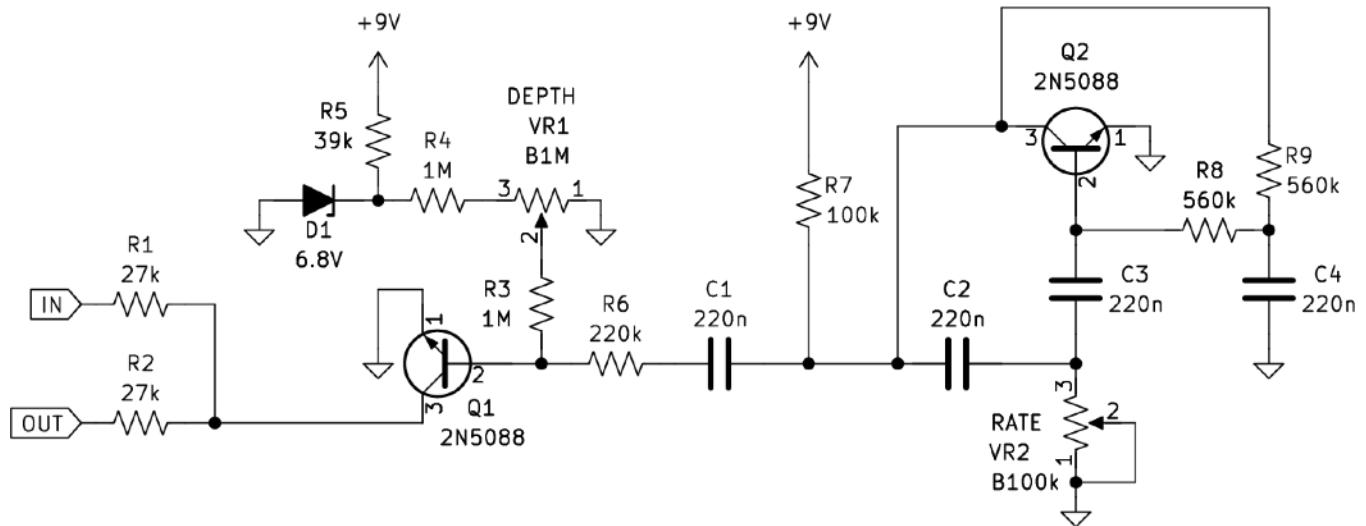
It uses a Jordan Vico Vibe circuit with 2 silicon transistors.

Power is drawn when a mono instrument cable is plugged into the input jack. **Leaving your guitar plugged into this will drain the battery!**

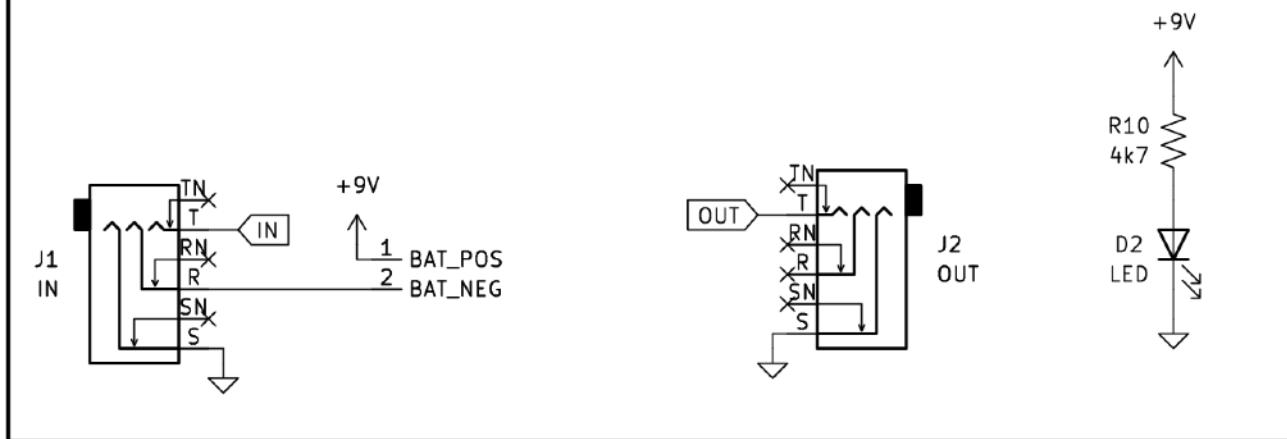
Bill of Materials

QTY	Designator	Part	Note
2	R1, R2	27k	
2	R3, R4	1M	
1	R5	39k	
1	R6	220k	
1	R7	100k	
2	R8, R9	560k	
1	R10	4k7	CLR for LED indicator
4	C1, C2, C3, C4	220n	
1	D1	1N4736	6.8V Zener
1	D2	LED	Power indicator
2	Q1,Q2	2N5088	
1	DEPTH/BIAS	1M trimmer	
1	RATE	B100k gmm potentiometer	
1	BATTERY	9V Battery Cable	
2	IN, OUT	Audio jack	
1		Printed Circuit Board (PCB)	UV Printed, Santa

Schematic



Jacks and Power



Instructions

PREFACE: For Beginners

If you haven't spent much time soldering components to a PCB (printed circuit board) then here are a couple tips to help you ensure success with this project.

Nearly all problems people face when building kits such as this come from either

- A. Placing **components in the wrong spots**, or with the wrong orientation, or
- B. **Bad solder joints**

Placing components correctly:

- * **Leave the components in the sleeve** until you need them. Cut the edge off the sleeve so you can easily pull out components as you need them. Refer to the component identification sheet to see which is which.
- * Read this build instructions document. I will make notes about **polarity and orientation** of diodes, electrolytic capacitors, and transistors. These are very important to follow.
- * Take your time

Getting good solder joints:

- * First and foremost make sure you're confident in your soldering techniques. If in doubt, check out our "[How To Solder](#)" booklet and videos at [masfx.io](#).
- * If possible **practice soldering wires** onto a prototyping or vero board (fiberglass board with holes, and copper pads), or this **practice soldering kit** we offer. The practice kit includes detailed and comprehensive instructions and step-by-step video to help you learn to solder.
- * Watch carefully to recognize when the solder has been pulled up onto the component legs, and spread across the pad of the board. This indicates both the component and the pad were sufficiently heated, and the solder bonded with them.
- * If the solder isn't wicking up against the pad and component within a few seconds: Stop. Wait a few moments. Then try again. Wipe your soldering iron or rotate it against the joint if necessary to get good heat transfer.

SETUP

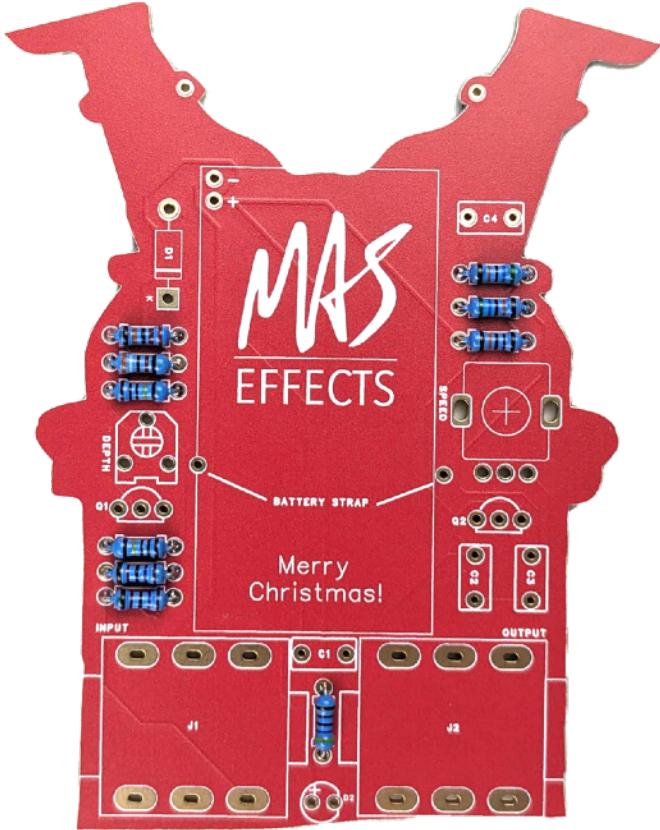
Leave the components in the plastic sleeve until you need them. Cut the edge off the sleeve so you can easily pull them out.

STEP 1: Resistors (R1 - R10)

It's typically easiest to populate the circuit board from the shortest to the tallest components. Resistors sit very low to the board so we start with those.

Bend the legs 90 degrees from body of the resistor before trying to place them. Orientation does not matter. Resistors can be inserted in either direction.

Inserting and soldering one or **a few at a time** will be easier than trying to do them all at once.

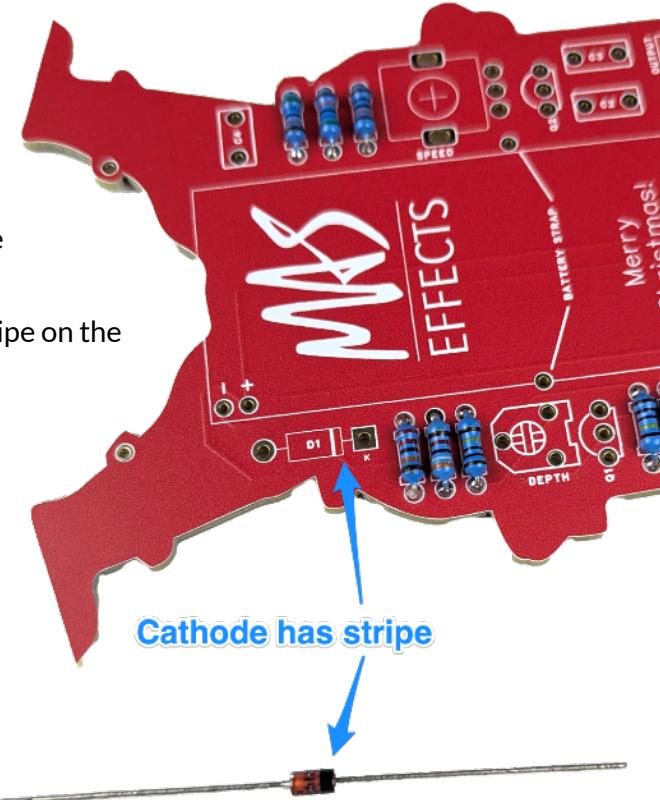


STEP 2: Zener Diode (D1)

Diodes have polarity and **must be oriented correctly**.

The cathode (-) side of both the diode and the PCB are marked with a stripe.

Bend its legs and solder into place with the diode's stripe on the same side as the PCB's stripe.

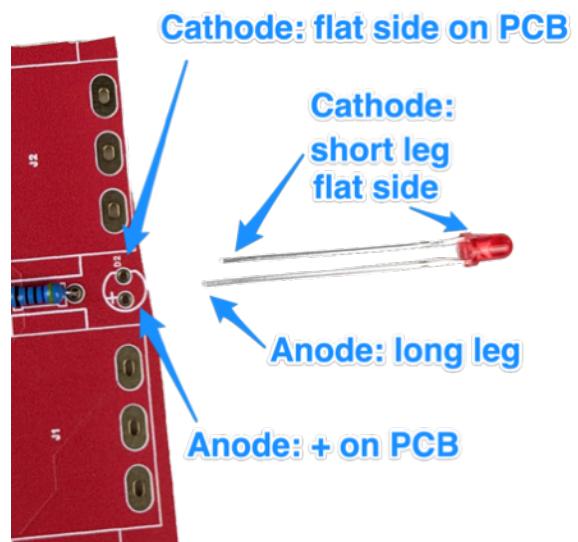


STEP 3: LED (D2)

Light emitting diodes (LEDs) have polarity and **must be oriented correctly**.

The LED's cathode (-) is indicated by a shorter leg and a flat side of the body, and the anode (+) has a longer leg.

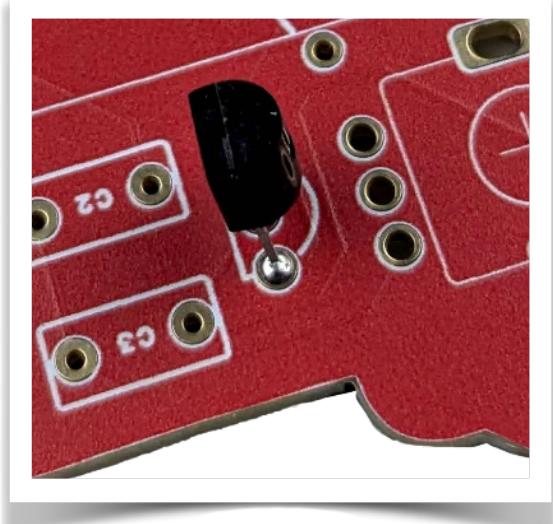
The PCB has a "+" to indicate the anode and a flat side to show the cathode.



STEP 4: Transistors (Q1, Q2)

Orientation matters! Insert the transistor so the flat and curved sides of its body align with the drawing on the PCB.

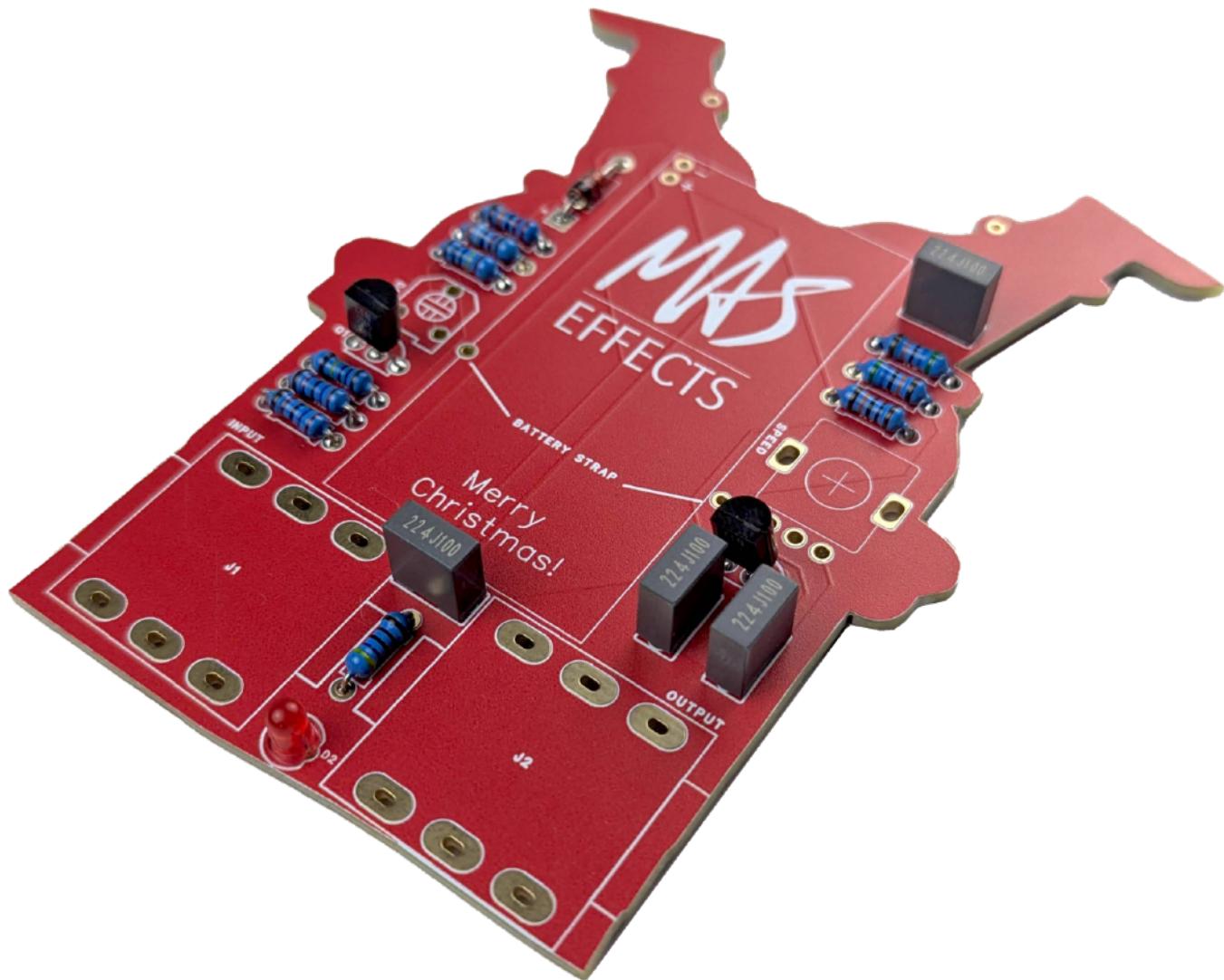
This ensures its leads, which correspond to the Emitter, Base, and Collector (EBC) are inserted in the correct pads.



Your PCB should now look like this.

STEP 5: Non-polarized Capacitors (C1, C2, C3, C4)

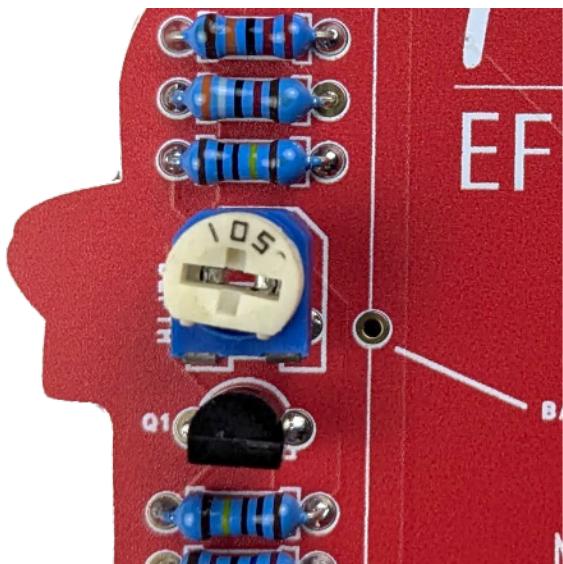
Orientation does not matter for these box film capacitors, so they can be inserted in either direction.



STEP 6: Trim Potentiometer (VR1 - DEPTH)

The DEPTH trimmer acts as a bias which controls how deep the tremolo's volume can cut. Install and solder the 1M trimmer. The code printed on it is 105.

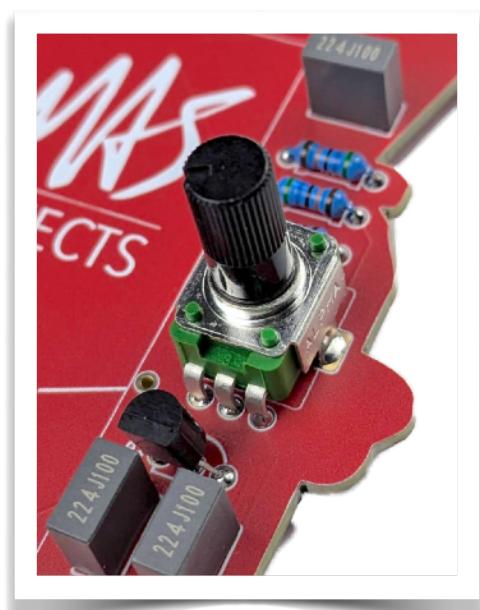
For now you can leave it in the middle and fine-tune it to your taste later.



STEP 7: 9mm Potentiometer (VR2 - SPEED)

Install and solder the SPEED potentiometer.

Your PCB should now look like this:



STEP 8: Battery Clip

Trim the wires of the 9V battery clip to approximately 1 inch or 25mm and strip the insulation. Solder the black wire to the (-) pad and the red wire to the (+) pad.

Save the wires to use for the hanger and battery strap.



STEP 9: Battery Strap

The battery strap wire will help restrain the 9V battery and keep it from dangling.

Use the extra black wire from the battery clip and solder to a pad in the middle marked "Battery Strap."

Holding a 9V battery in place, loosely wrap a wire around it to estimate an appropriate length. Trim, strip, and solder the other end.



STEP 10: Hanger

Use the red wire from the battery clip to create a hanger. Strip insulation from the clipped end and solder both sides to Santa's legs as shown here.



STEP 11: Jacks

Your input and output jacks may or may not come with washers or threaded metal tips. They're optional and you may choose whether or not to install them.

Install and solder the input and output jacks.

TIP: Blue putty - the type for holding posters on walls - is an incredibly useful tool in pedal building, and can help hold the jacks in place while soldering. It's great for holding the PCB to the table while soldering as well.

Alternatively, bend the legs slightly to hold a jack in place while you solder it.

Your ornament should now look like this:



Santa Ornament - Tremolo

STEP 12: (Optional) Clean

You can use an old toothbrush or cloth and rubbing alcohol to remove the soldering flux from the circuit board. Less diluted alcohol, e.g. 91% or 99%, will make the job easier.

STEP 13: Share with friends, family, bandmates

Be sure to take pics and **post online** to share with everyone. And if you know anyone who might appreciate either a kit or a pre-assembled ornament, **send them to mas-effects.com/holiday**.

We'd love to see it too, so post your build to reddit.com/r/maseffects

Happy Holidays!

Problems? Questions?

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or email directly: mark@mas-effects.com

