Meowsic Cat Piano Line Out

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https://learn.adafruit.com/meowsic-line-out

Last updated on 2023-08-29 04:54:03 PM EDT
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The Meowsic cat piano is amazing, but a bit too quiet. I knew I had to give it a line out so it could be heard meow-meow-meowing far and wide, and enhance the sounds with guitar effects pedals!

This mod is based on the circuit found [here](#), with some adjustments to parts and techniques.

Don't have a Meowsic Cat Piano? That's OK, this can also be a helpful guide for anyone wanting to add a line out to other sound toys.

**Parts**

Meowsic Cat Piano
Made by [B. Toys](#), available at Target and other resellers online.
Panel Mount 1/8” / 3.5mm TRS Audio Jack Connector
What is this TRS bit? Turtle Rock Studios? Transmission Raman...
https://www.adafruit.com/product/3692

Panel Mount 1/8” / 3.5mm Mono Connector
Pipe audio in or out of your project with this very handy panel mount audio jack. It's a mono jack with a disconnect pin so you'll get a ground sleeve pin, a left tip pin and a...
https://www.adafruit.com/product/4361

Panel Mount 100K potentiometer (Breadboard Friendly)
This potentiometer is a two-in-one, good in a breadboard or with a panel. It's a fairly standard linear taper 100K ohm potentiometer, with a grippy shaft. It's smooth and easy...
https://www.adafruit.com/product/1831

Mini Panel Mount SPDT Toggle Switch
This or that, one or the other, perhaps or perhaps not! So hard to make decisions these days without feeling like you're just going back and forth constantly. Deciding whether or...
https://www.adafruit.com/product/3221
Through-Hole Resistors - 100K ohm 5%
1/4W - Pack of 25

ΩMG! You’re not going to be able to resist these handy resistor packs! Well, axially, they do all of the resisting for you! This is a 25 Pack of 100K...
https://www.adafruit.com/product/2787

10uF 50V Electrolytic Capacitors - Pack of 10

We like capacitors so much we made a kids’ show about them. ...
https://www.adafruit.com/product/2195

Anodized Aluminum Machined Knob - Black - 20mm Diameter

These compact and luxurious machined knobs look fantastic and have a nice feel, a perfect way to...
https://www.adafruit.com/product/5527

Adafruit Perma-Proto Mint Tin Size Breadboard PCB

Making a project that will fit into an "Altoids" Mint Tin? Put down that PCB shear and pick up a Perma-Proto in the new exciting minty shape! Customers have asked...
https://www.adafruit.com/product/723
The Modifications

The audio output of the Meowsic PCB runs to the on-board speaker. This project intercepts that signal and brings it down to a suitable level for use with guitar pedals and amps.

This includes adding a 100K Ω potentiometer for signal attenuation, 100K Ω resistor to limit current, and a 10µF capacitor is used to remove the DC offset so the audio signal is centered around 0V.

You'll also add a dual-throw switch that lets you pick between the original on-board speaker and the line output.
Open the Cat Piano

Remove all 21 of the screws from the back of the piano to open it up.

Open the back from the top, being mindful not to pull on the wires that connect the battery box to the board.
Audio Out
You'll intercept the audio output of the Meowsic PCB to run through the switch, attenuator, and output jack you'll be adding.

This red wire running to the speaker is the audio out line, you can desolder this wire from the speaker now.
Ground
You'll solder the ground wire for the added circuit to this center common pin on the Meowsic on/off switch.

Parts Sub-Assemblies

Selector Switch
Solder three wires to the SPDT switch -- you'll connect the common line to the audio output of the Meowsic PCB, one outer leg back to the speaker, and the other leg to the resistor-attenuator-capacitor output circuit.

Optionally, you can use a guitar pedal-style 3PDT stomp switch here, such as this one, seen in the remaining photos in this guide.
Attenuator
It's helpful to have a way to adjust the output level when interfacing with other gear. You'll use a 100KΩ potentiometer as a signal attenuator. You can wire it up as shown, with ground on the left leg, the incoming audio signal (post switch and current limiting resistor) on the right leg, and the attenuated output audio signal on the center wiper leg.
Output Jack
You have a few options for the output jack. A typical guitar pedal/amp setup will use a 1/4" mono jack.

You can also move down to a very similar 1/8" (a.k.a., 3.5mm) mono jack, shown here. Solder the ground wire to the sleeve contact (the shorter one). Solder the signal wire to the tip contact (the longer one).

One other option, if you plan to plug into more typical 3.5mm jacks on powered speakers, is to use a 3.5mm stereo jack with both of the tip and ring legs soldered to the signal wire, and sleeve to ground.
Circuit
You can use a small PermaProto board to make all of the connections and add the 100KΩ resistor and 10µF capacitor to the circuit as shown here and in the Fritzing diagram and schematic.

Note: the two thin black wires in the first photo are unnecessary -- I soldered in both a 1/4" jack and 3.5mm jack, hence the extra connection.

Use an existing screw from the Stop button to mount the board in the case.

Be careful drilling holes in the plastic and please use eye protection.
Assembly
Use a drill and appropriate sized bits (or a hole reamer) to make holes in the Meowsic case for the switch, knob, and jack.
Audio Jack Mounting
Mark and drill a hole for your chosen audio jack.
Potentiometer Mounting

Mark and drill a hole for your potentiometer. You'll also need to make a small secondary hold for the tab that prevents the body of the potentiometer from rotating.

You can find this second hole's position by putting the pot in from the outside and marking the cat's paint with some pressure on the small tab.
Knob
Screw on the potentiometer nut, then add the knob of your choice to the potentiometer shaft.

Here's a look at all the mods in place.

Play!
Plug your guitar cable into the cat, add a pedal or two, and crank that amp. It's cat piano time.