Open.Theremin V3 – Get Ready to Play

Congratulations, this is your Open.Theremin V3, the newest version of a DIY Theremin used by more than 1000 people around the world today. Happy to have you in the community of people exploring the amazing instrument initially conceived by Leon Theremin. This is a modern theremin based on the Arduino UNO micro-controller platform and still using the original principle of heterodyne oscillators.

Follow these instructions to set up your theremin:

This is the content of your Kit:

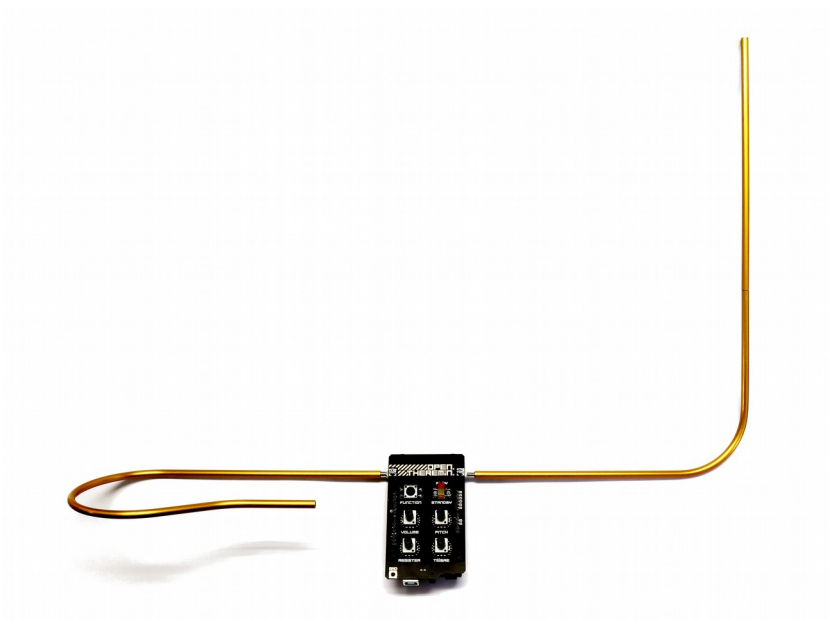Antennas   *Theremin Circuit Board with Arduino*   *Stand / Cables*

1. Connect Antennas to the Open.Theremin

First connect the antennas to the theremin circuit as shown on the picture. The round antenna is the "Volume Antenna" and goes to the left, the straight antenna is the "Pitch Antenna" on the right.

*Volume Antenna*   *Pitch Antenna*

2. Set up the stand

The magic of the theremin is that it is played in the air, without touching. The circuit is very sensitive to capture the motion of you hands. For this the instrument must be set up on a stable stand with the antennas in the air. Any object close to the antennas can influence the sound, just as your hands. Connect the included stand to the screw pad on the back of the theremin and fold open the stand. Put everything on a stable surface.

3. Connect the Audio Out

Use the mini jack connector on the bottom of the OpenThermin to connect an amplifier or an active speaker.
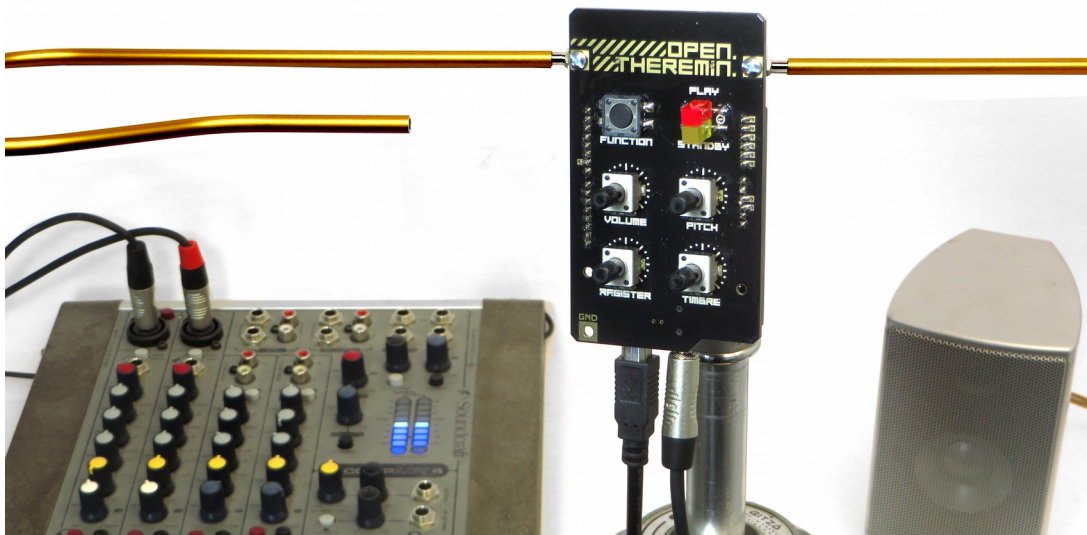
4. Powering and Grounding

The theremin measures smallest variations between the antennas and your hand and translates this into sound. The electric loop with the instrument is closed from your hand through your body, through your shoes through the floor into the ground and from ground back into the instrument. This is why proper grounding of the instrument is important.

Power your theremin through the included USB cable. Plug the USB cable to a USB port on a power adapter (not included, any mobile phone adapter works), a power strip with USB outlet or a computer.

Use any of the following methods to ground your theremin.

a. If the power supply is grounded the theremin is grounded as well. Notice that many USB power adapter and power supplies are not grounded.

b. Use a grounded audio cable. If you connect your theremin to a mixer or amplifier that is grounded, the theremin is grounded through the audio cable.

c. Use the included grounding wire. There is a ground pad (GND) on the open.theremin board where you can attach one end of the grounding wire. Attach the other end of the wire to a

grounded metallic object in your room, like a metallic lamp or a water tube.

5. Auto-calibration of the theremin

For the theremin to adapt to it's environment it needs calibration before playing. The new Open.theremin V3 has an electronic auto calibration built in, it makes calibration very easy. To do so follow these steps:

a. Power the theremin.

b. Now turn the two knobs VOLUME and PITCH to the middle position and the knobs REGISTER and TIMBRE all to the left.

c. Press the FUNCTION button on the theremin shield for about 2 second until you hear a short melody. The yellow LED-light will now start blinking and the theremin does the automatic calibration of the antennas. To not disturb the calibration step away form the theremin and wait until the red LED-light goes back on. The calibration should take about 60 seconds.
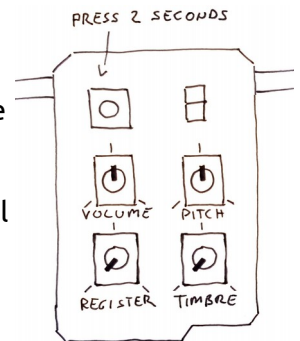
Now your theremin is ready to play.

The calibration values are stored in the Arduino. So you only have to do this procedure once. If however you move your theremin or feel that it is not playing well, you can always repeat the procedure to re-calibrate.

Functionality of the knobs:

The PITCH knob allows you to fine adjust the playing range of the pitch antenna (zero beat). The VOLUME changes the sensitivity of the volume antenna.
For a good introduction on how to tune the theremin see this introduction by Carolina Eyck: https://youtu.be/A48fm1ZEgZU

With the REGISTER knob you can vary the sensitivity of the theremin. Turn it to the right to increase sensitivity. Note that higher sensitivity may come with more noise picked up by the antenna.

The TIMBRE knob allows you to choose from one out of 8 different sound settings.

You can mute your theremin by pressing the FUNCTION button.

For more information, documentation and source code of the open design go to:
www.gaudi.ch/OpenTheremin