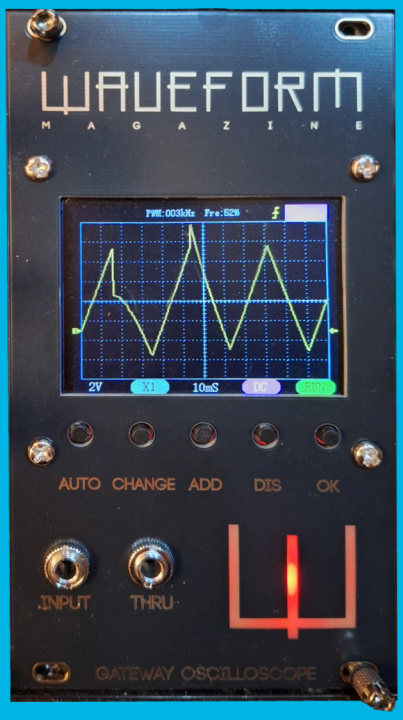
WAVEFORM

MAGAZINE

DIY PROJECT:
GATEWAY OSCILLOSCOPE MKII
BUILD GUIDE



Bill of Materials:

1 x FNIRSI-138 PRO mini oscilloscope (not included in kit)
1 x Waveform Gateway Oscilloscope faceplate
1 x Waveform power PCB
2 x mono audio jacks
1 x 10 pin shrouded header
1 x 1N5819 Diode
1 x 10uf 50v electrolytic capacitor
1 x 100uf 35v electrolytic capacitor
1 x 0.1 uf 50v ceramic capacitor
1 x resistor
1 x +5V voltage regulator
Eurorack cable
wire

DIY: GATEWAY OSCILLOSCOPE MKII

TheMarkIIversionoftheWaveformGatewayOscilloscopeistheperfectbeginnertointermediate module build. The FNIRSI-138 Pro single trace oscilloscope comes fully built, and you have full access to all of its functionality. Also, the three points on the back of the unit where you will solder the connections from the power board are all easily reversible, should you decide to remove it from your rack sometime in the future. You only need to build the Waveform Power PCB, remove a few screws and wire it up and you're good to go.With the lava lamp inspired fade to red light up "W" Waveform logo, the Gateway Oscilloscope looks sleek, too.

There's a lot to learn about how, why, and in what way waves change shape, and having an oscilloscope is an invaluable tool when exploring sound synthesis. While this is an excellent oscilloscope to put in your rack so that you can see your waveforms, there are many benefits to getting a much more feature rich oscilloscope, such as a solid workbench style oscilloscope, or our favorite, the Mordax DATA. I actually have a couple oscilloscopes in my rack, and I use the Gateway to see my main [mono] output, and the DATA to compare/contrast waveforms, to use as a Spectrum analyzer, to tune oscillators, and other useful

Fig. 1

functions. Still, the Gateway is a great entry level oscilloscope, inexpensive and fun to use.

To build this project you need to purchase a FNIRSI-138 PRO digital oscilloscope [Fig. 1]. You don't need the probes or battery options, just the oscilloscope for this project, and this is found at various online retailers.

Once you verify your oscilloscope powers up and works properly, you merely have to populate the Waveform supplied power PCB and wire it to the FNIRSI. This board allows you to take the +12V from your Eurorack power and drop it down to +5V,

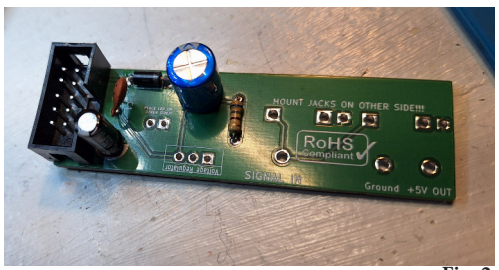


Fig. 2

the voltage needed to power the oscilloscope.

First, install the diode and the 0.1uf capacitor, then the double pin header, making sure to place it on the correct side, using the outline as reference. There is a gap on the PCB where the outline of the

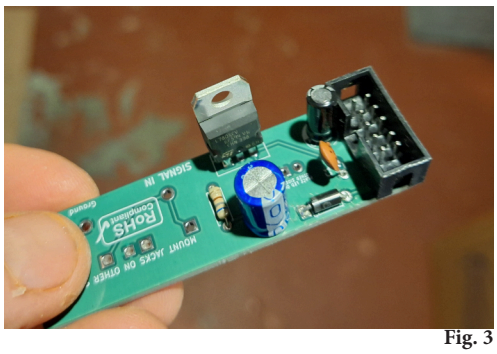


Fig. 3

pin header is, and that needs to match up with the gap/cutout in the header itself when being soldered in. Solder in the lone resistor, and then solder in the electrolytic capacitors and pay attention to the polarity, as the negative terminal of the capacitor is marked with a dash or minus sign running down the side. This side correlates to the white filled portion on the circuit board for the capacitor outline. The opposite side of the cap layout on the PCB is denoted with a "+" sign, and the longer of the capacitor leads goes in this hole.[Fig. 2] Next, solder in the voltage regulator and make sure that it's put in with the writing on the black front plate facing the rest of the components and the back of the regulator facing the edge of the

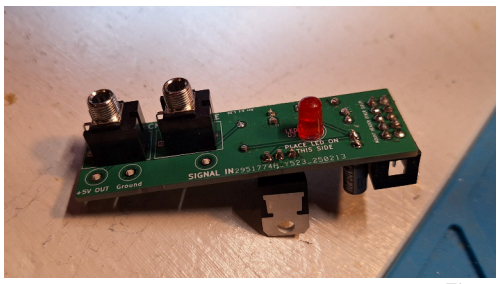


Fig. 4

board. [Fig. 3]

Flip the board over and solder in the LED, making sure it is flush against the PCB with the shorter lead going into the

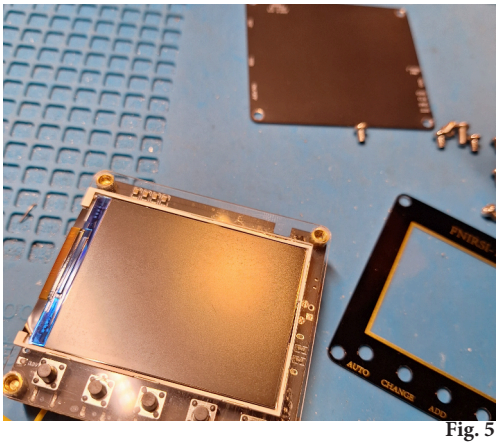


Fig. 5

square pad on the PCB. On the same side that the LED is soldered, place and solder the two jacks onto the PCB. [Fig. 4] We can now attach the power PCB to the faceplate by securing the jacks in through their proper holes and screwing the nuts on.

Once the Power PCB is in place, we can attach the oscilloscope. To secure the FNIRSI to the Gateway faceplate, carefully unscrew the four small screws that hold on the top plate of the oscilloscope and remove the FNIRSI faceplate. [Fig. 5]You can put that away as we no longer need it. Use the recently removed four screws to secure the FNIRSI to the Gateway faceplate. [Fig. 6]Don't over-tighten the screws.

Fig. 6

Next, flip the whole thing over and remove the back plate on the FNIRSI by removing the four screws holding it on. Put the screws and plate somewhere safe, we will need them in a minute.Take one of the supplied wires and solder one end into the "Signal Input" pad on the Power PCB and the other end onto the input connection of the BNC connector on the oscilloscope as shown by the red arrows. [Fig. 6]

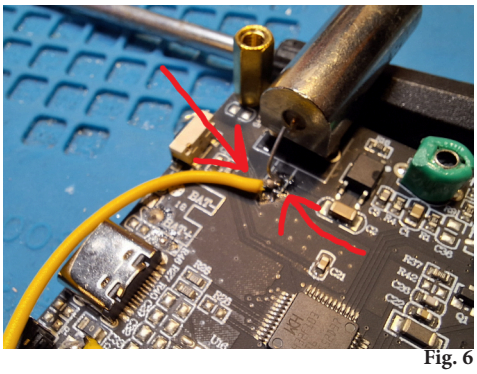
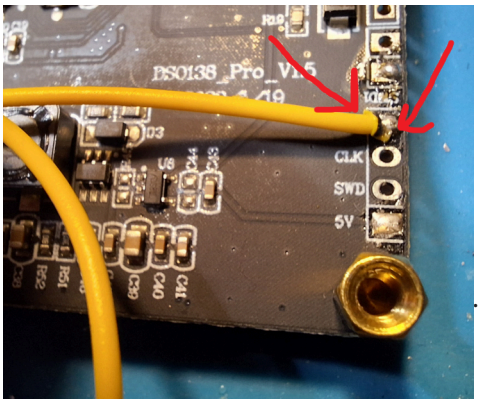


Fig. 6

Next, solder a wire from the "Ground" pad on the Power PCB into the GND pad on the right side of the FNIRSI as shown by the red arrows. [Fig. 7]



. 7

Finally, solder a wire from the +5V Out on the Power PCB to the correct pad on the FNIRSI, located on the bottom left of th PCB nera the ON/OFF switch. This is the trickiest part of the whole procedure, so take your time and make sure that you are soldering this in the right place (see the red arrows) and don't use too much solder. Make the connection nice and clean. Also, be sure not to linger on the pad too long where it might heat up more than necessary.

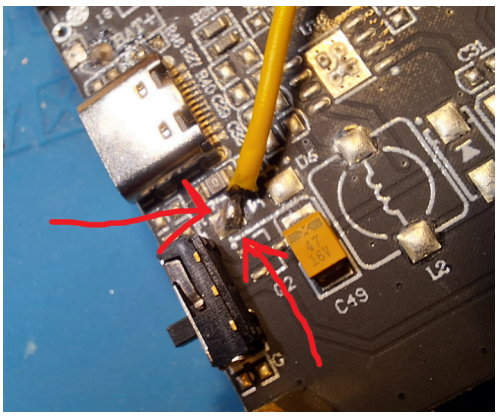
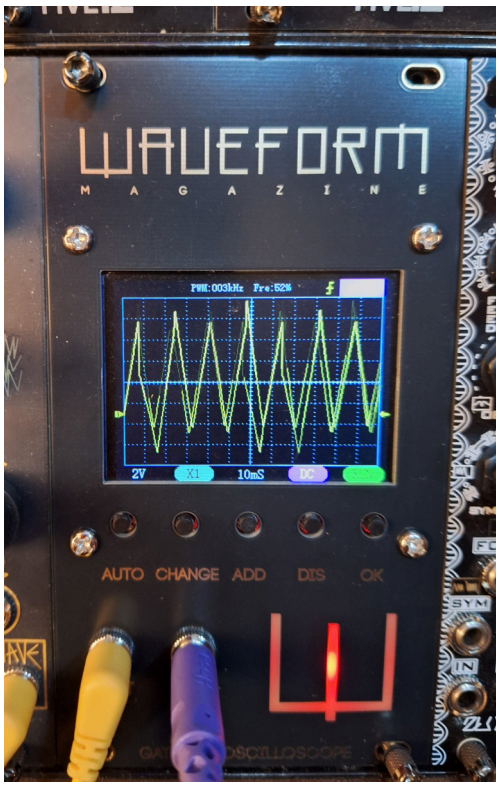


Fig. 8

Fig. 9

Screw the back plate back on the FNIRSI and you're ready to power it up. Plug in the Eurorack cable and place it into your rig. You may have to turn the FNIRSI on via its ON/OFF switch, located on the bottom left side when turned over [see the red circle on Fig. 9]. Patch in a signal and check out that wave! You might need to mess with the settings of the oscilloscope to get it to work optimally, and you can use the manual that came with the FNIRSI for reference. That's it!



this project is available at:
waveformmagazine.com/shop