

WAVEFORM

M A G A Z I N E



DIY PROJECT: GATEWAY OSCILLOSCOPE BUILD GUIDE

Bill of Materials:

- 1 x JYETech DS0138 mini oscilloscope w/acrylic case
- 1 x Gateway Oscilloscope faceplate
- 1 x power PCB
- 4 x 20mm m2 screws/nuts
- 2 x mono audio jacks
- 1 x 10 pin shrouded header
- 2 x 1N5819 Diode
- 2 x 10uf 50v x 2
- 1 x 100uf 35v
- 1 x 0.1 uf 50v ceramic
- 1 x L7805CV power regulator
- wire

DIY: GATEWAY OSCILLOSCOPE

BY ELLISON WOLF



PART OF THE FUN OF A MODULAR RIG IS THE WAY IT LOOKS. It's why many among us either petition manufacturers to make alternative faceplates for our favorite modules, pay another vendor to supply us with them, or just make them ourselves. While a new faceplate is nice, I argue that there is nothing more fun to look at in a modular rig than the actual soundwaves being manipulated. Having an oscilloscope in your rack is a great way to see what's going on and learn more about synthesis, and with that in mind, this issue's DIY project is an inexpensive Eurorack oscilloscope that we're calling the "Gateway Oscilloscope." We named it so because once you realize how valuable an oscilloscope is to have in your rack, you'll probably want to add another, more powerful one that offers more features than this project.

There are many benefits to getting a much more feature rich oscilloscope, such as the Mordax DATA, Dave Jones Design O'Tool Plus, VPME Zeroscope, etc., and I actually have a couple in my rack. I use the Gateway to see my main [mono] output, and the others to compare/contrast waveforms, to use as a Spectrum analyzer, to tune oscillators, and other useful functions.

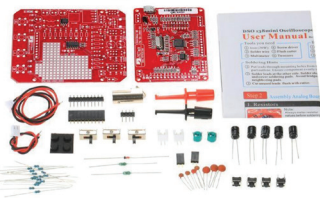
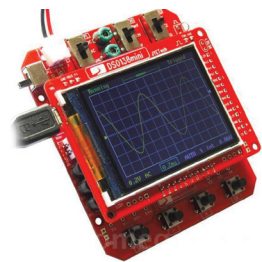


Fig. 1

To build this project you need to purchase a DSO138 mini, by JYE Tech,[Fig. 1]. Make sure to get one with the protective acrylic case [FIG. 2] as we need the buttons from the case for our project, and the case is good to have in case [pun intended] you want to pop the oscilloscope out of your

rig and use it as an external unit later on. [If anyone knows where to source these exact buttons, please contact us.] You can find the DSO138 mini at your favorite [or not] online retailer. There is more than one version of the DSO 138 mini being sold at this time [revisions H and J], and our kit will work with both. The kit comes with the SMD parts pre-soldered and the rest of the through-hole parts in kit form. It's not a difficult build, and there are



Fig. 2



Fig. 3 Don't need these!

a few parts that need not be installed [Fig. 3], so follow the instructions included with the DSO kit to get the oscilloscope put together. Once all of the parts are soldered in and your oscilloscope is finished, you can mate the top and bottom part by pushing the pins into the correct female header. You can test it out by powering via USB as detailed in the manual that comes with the kit. Once your build is verified, we will populate the Waveform supplied power PCB. This allows you to take the +12v from your

Eurorack power and drop it down to 5v, which is the maximum voltage recommended for the DSO138 mini to operate. Install the 2 x diodes and the .1uf capaci-

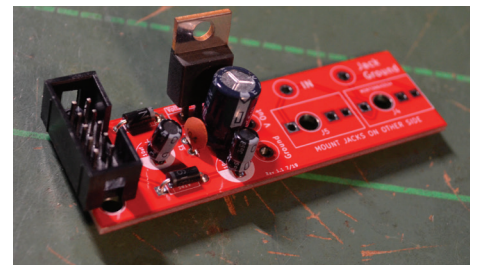


Fig. 4

tor first, then the double pin header, voltage regulator, and electrolytic capacitors [Fig. 4]. There is a gap on the PCB where the outline of the pin header is, and that needs to match up with the gap/cutout in the header itself when being soldered in. Make sure that the voltage regulator is 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 board, as seen in Fig. 4 as well. Also, pay attention to the polarity of the electrolytics, as the negative on 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.



Fig. 5

Next, we will flip the PCB to the other side and mount the jacks. It should read “Mount Jacks This Side” [Fig. 5]. Solder the jacks in place, making sure they lay flat on the circuit board. We can now attach the power PCB to the faceplate by securing the jacks in through their proper holes and screwing the knurled nuts on.

Take the supplied wire and cut into 4 equal lengths and strip and tin all ends for each of the

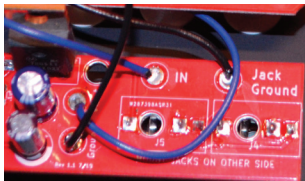


Fig. 6

[now] 4 wires. On the power PCB, solder one wire into the “Ground”, and another wire into the “Jack Ground”. Now solder one wire into the “IN”, and another wire into “V Out” [Fig. 6]. Set the slider switches at the top of the DSO138 to DC, 1V, and X2.

Now let’s start putting this thing together.

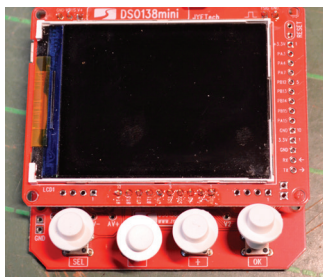


Fig. 7

Lay the DSO138 mini flat, put all of the buttons in their places [Fig. 7], and lay the Waveform faceplate on top. Without moving it, take the screws and insert them in the holes. Each screw should pass through three holes: the faceplate, the top PCB of DSO138, and finally the bottom PCB of the DSO138.

Very carefully, do your best to keep all of this together and screw the nuts on each screw, all the while keeping the buttons in place. Take a small screwdriver, and using your finger to hold the nuts in place, tighten the screws. Be careful not to tighten too much as it will inhibit the buttons on the bottom from being pressed easily. If a button seems to not press correctly, simply loosen the nearest screw a tiny bit.

Turn the whole thing over and solder the “JACK GROUND” wire into the hole as

shown in Fig. 8. I usually put a small blob of solder on the pad first, and then reheat it to place the wire. Solder the “IN” wire into the hole as demonstrated in Fig. 8, and the

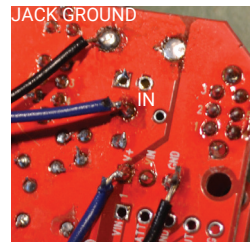


Fig. 8

“GROUND” wire into the “GND” hole on the PCB. Lastly, solder the “VOut” wire into the “V+” pad on the DSO PCB. Move the on/off switch on the left side of the oscilloscope into the “ON” position, and use your snips to clip off the switch end, as once it’s in your rig the switch will be left in the “On” position—since you won’t be turning it on and off—and it could get in the way of other modules since it sticks out a bit. [Fig 9].

Plug in the Eurorack cable, making sure that the red stripe lines up with the -12 on the power pcb, as shown in the photos, and place it into your rig. Turn it on, 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 I would read the manual that came with the DSO138 mini to understand how it functions and how to operate it properly.

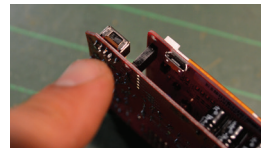
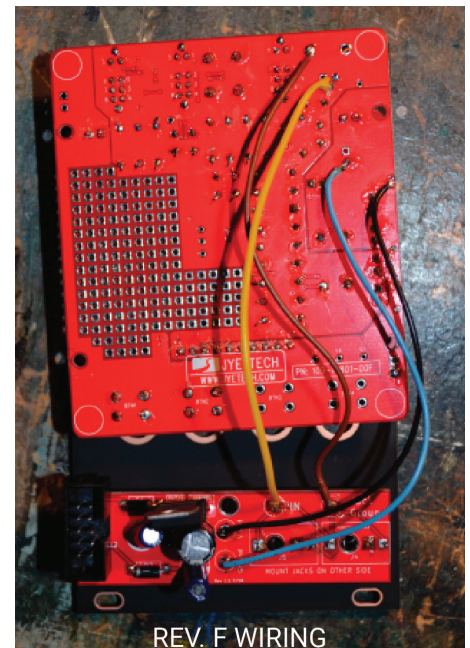
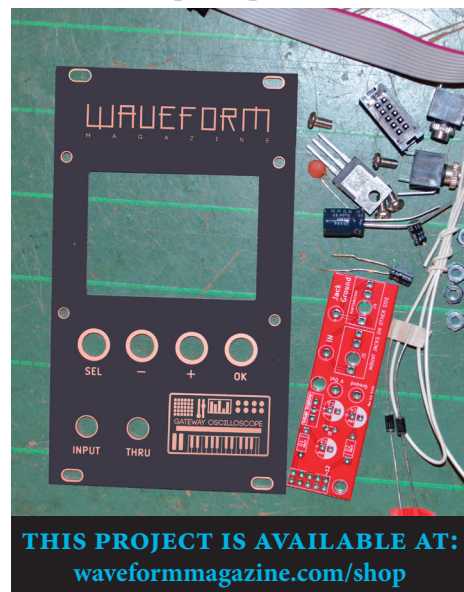
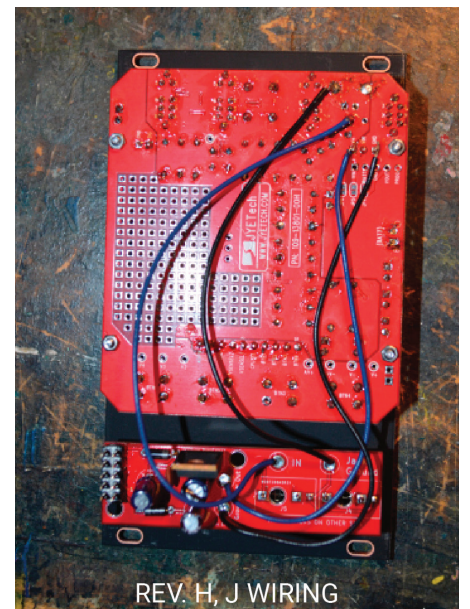


Fig. 9

NOTE: If you have an older version [PCB revisions F or H] of the DSO138 mini with the switches on top, contact us for availability of faceplates. The manufacturer of the DSO138 changes their product at times and we’ll try to update this project accordingly. Visit waveformmagazine.com/shop for updates.



REV. F WIRING



REV. H, J WIRING

