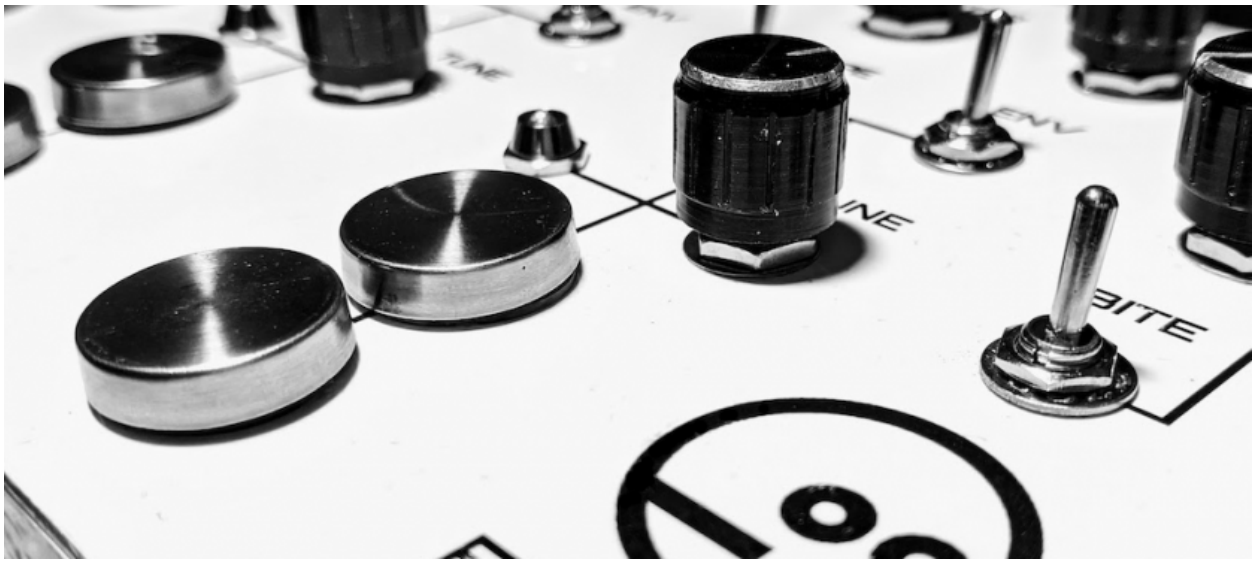
ELMYRA v1.3

by neutral labs

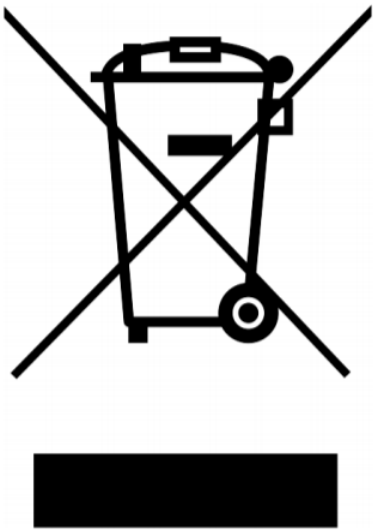


Manual

Hello, owner.

Congratulations on building, buying or stealing the mighty Elmyra. You may not know it, but this device will change your life forever, if it hasn’t already. For the best possible experience, please read this manual carefully to the end. Actually, there might be one of those hidden clauses in there, where you win a prize because you’re the first person reading it. I’m not saying there is, but you won’t know unless you read it, right?

Disposal



For private households: This symbol (figure on the right) on the product(s) and/or accompanying documents means that used electrical and electronic equipment (WEEE) should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product(s) to designated collection points where it will be accepted free of charge. Alternatively, in some countries, you may be able to return your products to your local retailer upon purchase of an equivalent new product. Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point.
Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

For professional users in the European Union: If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.

For disposal in countries outside of the European Union: This symbol is only valid in the European Union (EU). If you wish to discard this product please contact your local authorities or dealer and ask for the correct method of disposal.

Please think of our planet! Repair, resale or upcycling are always better than final disposal.

Specifications

Dimensions: 230 mm x 170 mm x 85 mm
Weight: 690 g
Supply voltage: 5 V (USB)
Current draw (max.): 180 mA

Audio output: mono (TS) 6.35 mm (1/4 “) phone jack

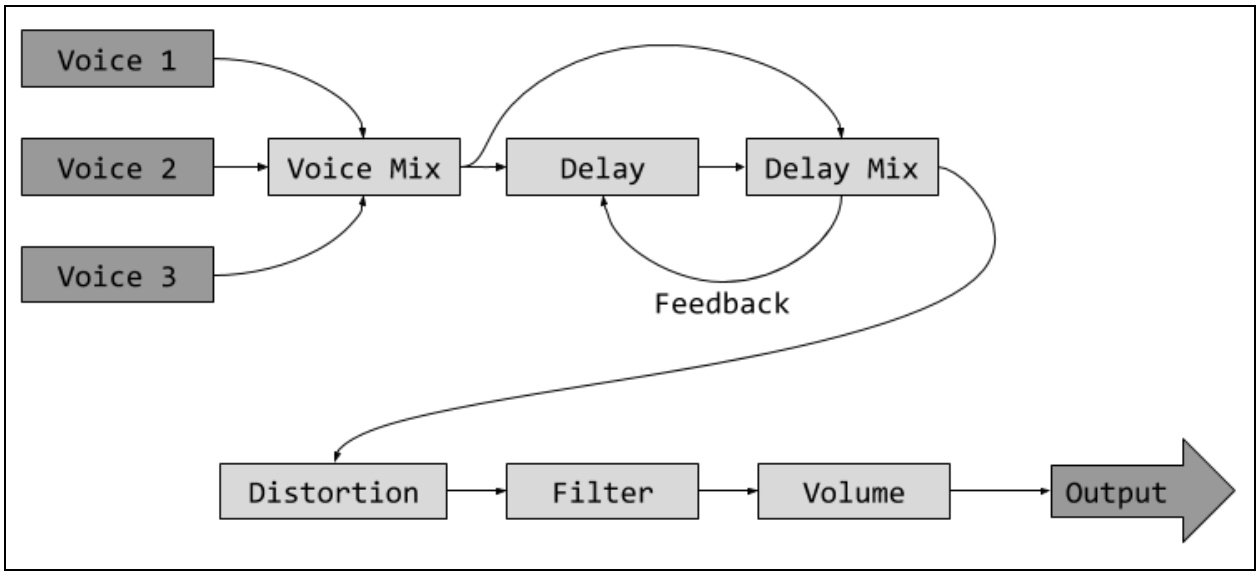
Connecting Elmyra

Elmyra comes with a USB power cord that has a USB A connector on one end and a 5.5 x 2.1 mm DC barrel plug on the other end (ring is negative, tip is positive). It operates on 5 V of DC voltage and can conveniently be powered by any mobile phone charger, USB hub, laptop or even by a USB power bank on the go.

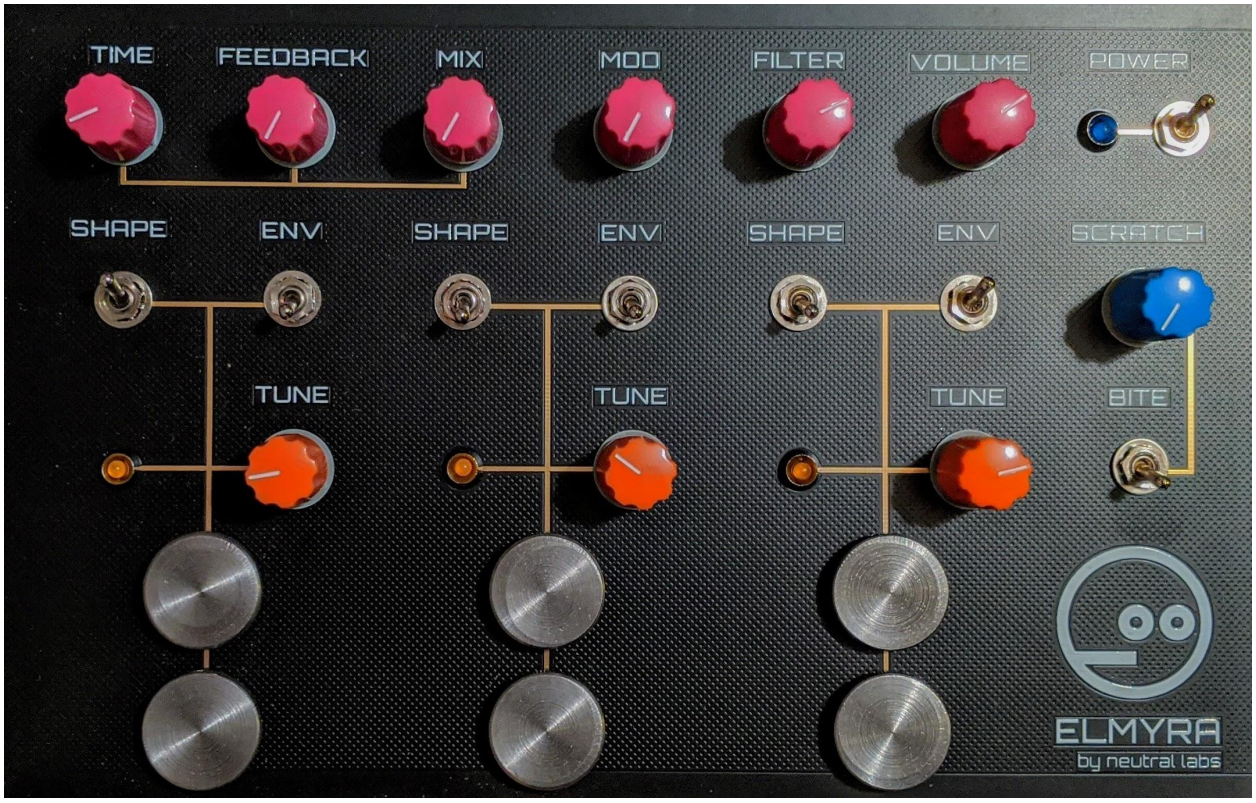
The audio output uses a standard 6.3 mm (¼ inch) mono (TS) jack. Plug it straight into your mixer, audio interface, effects unit or powered speakers.

CAUTION! Plugging headphones directly into the audio output is not recommended as they present a much lower input impedance which the circuit is not made for. Plainly speaking, in the best case the sound will be very quiet and in the worst case you might damage your Elmyra.

Signal Flow



Front Panel



Elmyra's front panel has 3 sections: The voices (x3), the top row and the scratch/bite distortion circuit.

Feel free to experiment on your own, but in case you want to know exactly which input does what, check the reference below.

Position 1 and position 2 refer to the switch positions, which are up (1) and down (2) if you bought a complete Elmyra. For DIY projects, these may be reversed depending on the wiring, or even left/right. It should be easy to figure out though.

Input	Primary function	Secondary function
SHAPE	Changes the waveform for this voice. Position 1 is "almost sawtooth" and position 2 is "not	Enable chromatic and sequencer modes (see below).

	quite square”.	
ENV	Changes the envelope attack and release length for this voice. Position 1 is long, position 2 is short.	Enable drone mode (see below).
TUNE	Changes the frequency of the voice. This can be either a smooth change, or steps between notes if in chromatic mode.	-
TOUCHPADS	Touch the upper and lower pad at the same time to trigger a voice. Depending on the pressure and other factors, such as the resistance of your skin, the volume is increased or decreased. So account for excessive sweating in case you get emotional while playing Elmyra (a common occurrence).	-
TIME	The delay time of the built-in delay. If the feedback is high, you can tune the delay time to generate new frequencies on top of the ones played by the voices. To facilitate this, the TIME knob is not linear: Its reaction is more sensitive at low values.	The speed of the step sequencer during playback.
FEEDBACK	The amount of feedback for the delay. If your Elmyra won’t stop making noise even after the envelopes have rung out, and for some reason you want it to stop, turn this knob down.	-
MIX	The dry/wet mix for the delay. At 50% setting, you’ll hear both the delay and the original sound at the same volume level. Turned up fully clockwise, you’ll hear only the delay.	-

MOD	When turned up, this introduces a random modulation to the frequency of each voice, but unlike common LFOs this does not vary slowly over time. Rather, a new deviation value is chosen for each cycle of the waveform. The amount of deviation is controlled with this knob. Turned fully counter-clockwise, there is no modulation.	-
FILTER	This is a low-pass filter that takes off some of the high range frequencies when turned down. You might want to leave this knob turned fully up by default and turn down as desired when the harshness introduced by the distortion or excessive filter feedback is too high for your taste.	-
VOLUME	Much to the user's surprise, this knob controls the overall volume of the sound.	It can also be used to conjure up various ethereal entities. The exact mode of operation is left as an exercise to the user.
SCRATCH	This controls Elmyra's nasty distortion. The circuit is built in such a way that a slight amount of distortion is present at all times, even if this is turned down. Turn it up to increase the nastiness.	-
BITE	This switch, when in position 2, will add high overtones and noise to the distortion. If the SCRATCH knob is turned down, it will have no perceivable effect.	-

Drone Mode

Flip any of the ENV switches twice quickly (within 1 second) to put the corresponding voice in drone mode, meaning that it will ring even if you're not touching the touchpads. Another way of doing this is by putting a coin across the touchpads, but be advised that using the ENV switch is the cheaper method.

Chromatic Mode

Flip SHAPE switch of voice 1 (on the left) twice quickly to enter chromatic mode. This mode is global and affects all voices. The frequencies selected by the TUNE knobs will now be in steps according to the chromatic scale, based on A4 = 440 Hz. The frequency range will be extended upwards. The MOD knob will still affect the voice frequencies as before.

Sequencer Mode: Recording

Flip SHAPE switch of voice 3 (on the right) twice quickly to enter step recording mode. This will delete any previously recorded sequence!

The sequencer will record the TUNE frequency for each voice per step (only if this voice has its ENV switch in position 2), as well as the setting of the TIME knob for each step. Voices that have their ENV switch in position 1 will not be recorded, which means you can use them to "solo" over your recorded sequence during playback.

Touch the touchpads for voice 1. Make adjustments to the TIME knob and/or TUNE knobs as needed (you can touch the pads for voices 2 or 3 as well to check, or put them into drone mode during recording). When you release the pads for voice 1, the step is saved and you can start over with the next step in the same way. Up to 16 steps can be recorded.

To leave recording mode, flip SHAPE switch 3 twice again, or alternatively enter playback mode directly by flipping SHAPE switch 2 twice.

Sequencer Mode: Playback

Flip the SHAPE switch of voice 2 (in the middle) twice quickly to enter playback mode.

The voices will now play back their recorded TUNE values step by step and the TIME settings will be updated as well with each step. The voices will not be triggered automatically! In order to hear the sequence, you need to put voices into drone mode by flipping their ENV switches twice, or alternatively play them manually via the touchpads.

Only voices that had their ENV switches in position 2 during recording will change their TUNE values, so the other ones can still be played manually during playback.

The TIME knob controls the sequencer speed in this mode.

Exit playback mode by flipping SHAPE switch 2 twice, or alternatively, enter recording mode directly. With some practice, you'll be able to use recording and playback mode on the fly without interrupting your performance.

Firmware Update

In case there is a firmware update available, download it from here:

https://github.com/neutral-labs/elmyra

Open up your Elmyra by removing the 4 screws in the corners of the front panel. Find the micro USB connector on the circuit board inside. Plug a USB A to micro USB B cable, such as is commonly used for charging mobile phones, from your computer into the connector inside

Elmyra's bowels. Be gentle. **Make sure to either unplug the ItsyBitsy M0 Express MCU board from the PCB or leave the power switch in the on (bottom) position while the USB cable is connected!**

Install and open Arduino IDE and configure:

https://learn.adafruit.com/introducing-itsy-bitsy-m0/setup
https://learn.adafruit.com/introducing-itsy-bitsy-m0/using-with-arduino-ide

Load the project into the IDE. Upload the sketch via the arrow button on the top left. Wait until the LED inside stops flashing and there is a message in Arduino IDE that says the upload was successful. Unplug the cable, close Elmyra back up and enjoy the new firmware!

Hints

Elmyra rewards experimentation and playing it may be a very personal experience. Nevertheless, here are some pointers to help you get creative:

- Turn MOD fully down. Adjust TUNE of two or more voices so that they're very close to each other. Play them manually or put them into drone mode. Now change the TUNE values slightly to get a beating effect. Turn MOD up a bit for subtle effects.
- Set ENV time to short, TIME to somewhere over 50% and FEEDBACK between 50 and 75%. Now play short phrases using the touchpads. They will ring out via the delay.
- Set TIME and MOD to a low value and FEEDBACK to maximum. Trigger some voices or put them into drone mode. Now introduce weird timbres by turning up the MOD knob. Also try playing with the TIME value.
- With the SCRATCH knob turned between 50% and 100% up, trigger the BITE switch into position 2 (enabled) in short bursts. This works especially well with external reverb and/or delay units.
- Put Elmyra into chromatic mode, set two or more voices to drone and play some chords!