

Moog VP of Engineering Steve Dunnington takes a break from troubleshooting circuits to answer some questions about Mavis and the instrument design process.

STEVE  
TAKES A  
BREAK!

Tell us a bit about the history behind this synthesizer.

Mavis is mostly built on classic Moog circuits, with a novel wavefolder design that has a secret hidden feature. ; ) The basic philosophy behind Mavis was to develop an instrument with awesome sound, utility, simplicity, and patchability in mind to maximize its potential for creative musical uses and to expand the sonic vocabulary of Moog Music instruments.

What is your favorite thing about Mavis? Is that even a fair question?

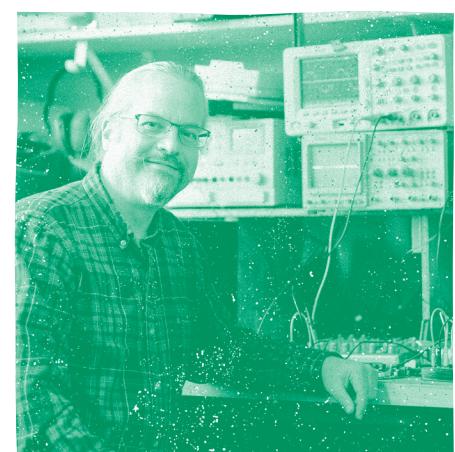
You can produce some monstrous sounds with this synthesizer. My favorite example is controlling the LFO with the keyboard CV, mixing the LFO triangle with the VCO sawtooth, and applying that to the wavefolder.

What excites you most about the instrument design process?

When the hardware is prototyped and power is applied for the first time – as circuits are tested and listened to – the collaboration between designers and musicians comes alive! I never tire of that moment.

Which instrument(s) do you believe complement Mavis best in an expanded modular setup?

The sky is the limit, but my favorite so far is Mother-32. I enjoy sending the Mavis VCO to the Mother-32 external audio input, blending the Mother-32 and Mavis signals, then sending it all back to Mavis's wavefolder with heavily filtered audio using lots of resonance. It's very fun to combine the two in creative ways.



Steve Dunnington with a Mavis prototype

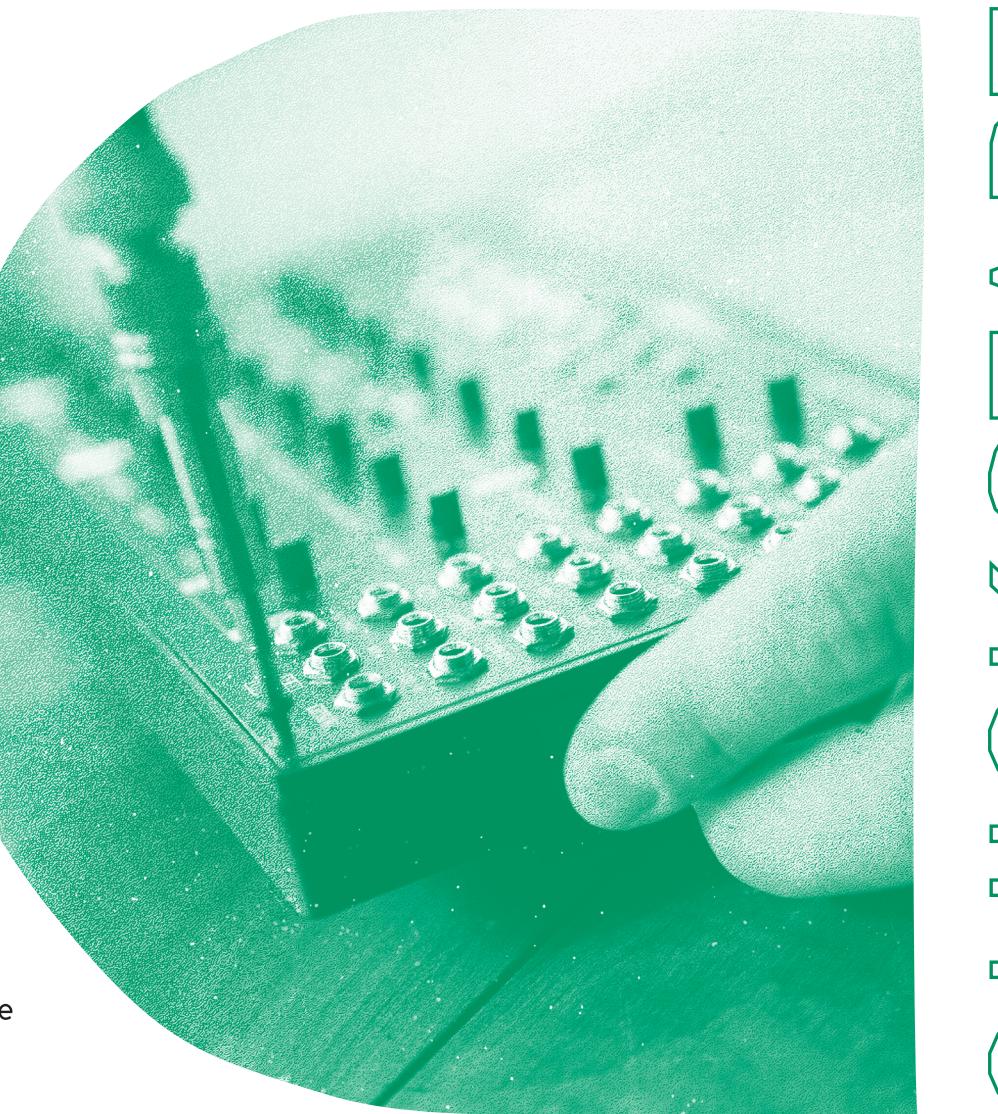
# Meet Mavis.

Your new companion in sonic exploration, this build-it-yourself synthesizer kit is ready to assemble and come to life as a powerful, expressive, patchable analog instrument.

Immerse yourself in the hands-on experience of working with classic Moog circuitry, and allow Mavis to guide your journey through the expansive world of modular synthesis. As you explore, we're excited for you to discover unique sounds, experiment with creative patching techniques, and find joy and inspiration in new musical experiences.

This quickstart guide is designed to empower you as you embark on this new journey in sound—and encourage continuous experimentation as you and Mavis become better acquainted throughout your time together.

Each artist's individual relationship with synthesis is unique. Absolutely no experience with electronic music creation is required to get started. Use Mavis as a standalone instrument, or introduce it as a complement to your interconnected modular setup. Build intricate patches, or keep it simple. Add depth and warmth to live performances and recorded tracks, or create original sounds just for fun. The choices are endless, and the experience is yours to discover.



Mavis is a comprehensive semi-modular analog synthesizer that offers powerful, expressive analog sound. All controls are conveniently organized by module.

## 1 PATCH BAY

Mavis's semi-modular design allows for extended functionality, with its patch bay providing a wealth of modular synthesis tools. In addition to the wavefolder, mixer, and attenuator mentioned in the utilities section, the patch bay is also home to an S+H (Sample+Hold) Generator and a 1-input/2-output multiple. The patch bay also offers numerous patch points for interfacing with other synthesizers and electronic music gear. For descriptions and tips for using each patch point, visit [moogmusic.com/exploremavis](http://moogmusic.com/exploremavis) or scan the QR code on the other side of this guide.

## 2 UTL

The utilities section (UTL) provides parameter control over certain functions available only in the patch bay.

FOLD: Wave-folding is a way of introducing extra harmonics to alter the timbre, often in a more aggressive way.

With the VCO WAVE set to saw (↖), try patching the VCO output jack to the FOLD IN jack and rotating the FOLD knob.

ONE LVL: The strength, or level, of a control or audio signal connected to the ONE (-5) input jack can be reduced using this knob. The altered signal will be present at both the ONE output jack and the ONE+TWO output jack, where the signal is mixed with a signal applied to the TWO input jack.

Refer to the full digital user's manual for other ways to use this mixer. With nothing patched to the ONE input, a -5V signal is normalled to the input for use as an offset voltage.

ATTENUATOR: The strength, or level, of a control or audio signal connected to the ATTN (+5) input jack can be reduced using this knob. The altered signal will be present at the ATTN output jack.

With nothing patched to the ONE input, a +5V signal is normalled to the input for use as an offset voltage.

## 3 VCO

The Voltage-Controlled Oscillator (VCO) is your primary sound source. The top row of knobs controls the VCO pitch and waveform, and the second row applies modulation to these oscillator parameters.

PITCH: With the lowest KEY pressed, rotate this knob to set the initial pitch, or frequency, of the VCO.

VCO WAVE: Rotate this knob to crossfade between a SAW wave (counterclockwise) and a SQUARE wave (clockwise), thus changing the timbre and harmonic content of your sound.

PULSE WIDTH: Turning this knob changes the width, or duty cycle, of the SQUARE wave, in turn altering its timbre.

VCO MOD MIX: Two modulation sources can add motion to the PITCH and PULSE WIDTH parameters simultaneously. Use this knob to set the balance between these two modulation sources: the EG (counterclockwise) and the LFO (clockwise).

PITCH MOD AMT: Turning this knob specifies how greatly the VCO MOD MIX signal will modulate the PITCH parameter.

PWM AMT: Turning this knob specifies how greatly the VCO MOD MIX signal will modulate the PULSE WIDTH parameter.

## 4 VCF

The Voltage-Controlled Filter (VCF) shapes the timbre and harmonic content of the sound. The top row of knobs controls the VCF cutoff frequency and resonance; the second row applies modulation to the VCF cutoff frequency.

CUTOFF: Use this knob to set the cutoff frequency of the VCF. Frequencies above the cutoff frequency are attenuated by the four-pole Moog ladder filter at a rate of -2dB per octave.

GLIDE: Glide provides a smooth transition from note to note. This knob determines how long it takes to glide from one note to the next.

RESONANCE: Resonance takes a portion of the filter output and routes it back to the filter input, emphasizing the harmonic content occurring at the cutoff frequency. Turn this knob to control the amount of resonance. When set near maximum, RESONANCE can cause the VCF to self-oscillate.

VCF MOD MIX: Two modulation sources can affect the CUTOFF parameter simultaneously. Use the VCF MOD MIX knob to set the balance between these two modulation sources: the EG (counterclockwise) and the LFO (clockwise).

VCF MOD AMT: This bipolar knob determines how greatly the VCF MOD MIX output signal will modulate the CUTOFF parameter. Zero is in the center, with positive values to the right (clockwise) and inverse values to the left (counterclockwise).

## 5 VCA

The Voltage-Controlled Amplifier (VCA) controls the output level and can be set to either a constant output or an envelope-articulated output. The output signal is routed to the □/VCA output jack.

VOLUME: Use this knob to set a comfortable headphone listening level or to provide an adequate signal to an amplifier, mixer, recording device, or other synthesizer modules.

VCA MODE: With this switch in the ON position, Mavis's VCA will stay open, continually allowing signal to pass to the output. In the EG position, the EG will articulate the output of the VCA.

## 6 LFO

One of two onboard modulation sources, the LFO (Low Frequency Oscillator) creates a cyclic, repeating control signal that can be used to modulate other parameters via their corresponding MOD MIX and MOD AMT knobs.

LFO RATE: Rotate this knob to determine how fast the LFO signal repeats. The corresponding red LED will blink to match the current LFO RATE setting.

LFO WAVE: This crossfader knob sets the shape of the LFO waveform. Rotate the knob to the left (counterclockwise) for a TRIANGLE wave, or to the right (clockwise) for a SQUARE wave.

## 7 EG

The second of two onboard modulation sources, the EG (Envelope Generator) creates a one-shot control signal that can be used to modulate other parameters every time a key is pressed. The shape of the EG control signal is derived from the four individual EG parameters.

ATTACK: This parameter controls the amount of time needed for the EG control signal to rise from zero to its maximum level after a key is pressed.

DECAY: This parameter controls the amount of time needed for the EG control signal to fall from its maximum level to the level set by the SUSTAIN parameter.

SUSTAIN: This parameter sets the level the EG control signal will maintain following the ATTACK and DECAY stages, so long as the key is still pressed.

RELEASE: This parameter controls the amount of time needed for the EG control signal to fall from the SUSTAIN level to zero after the key is released.

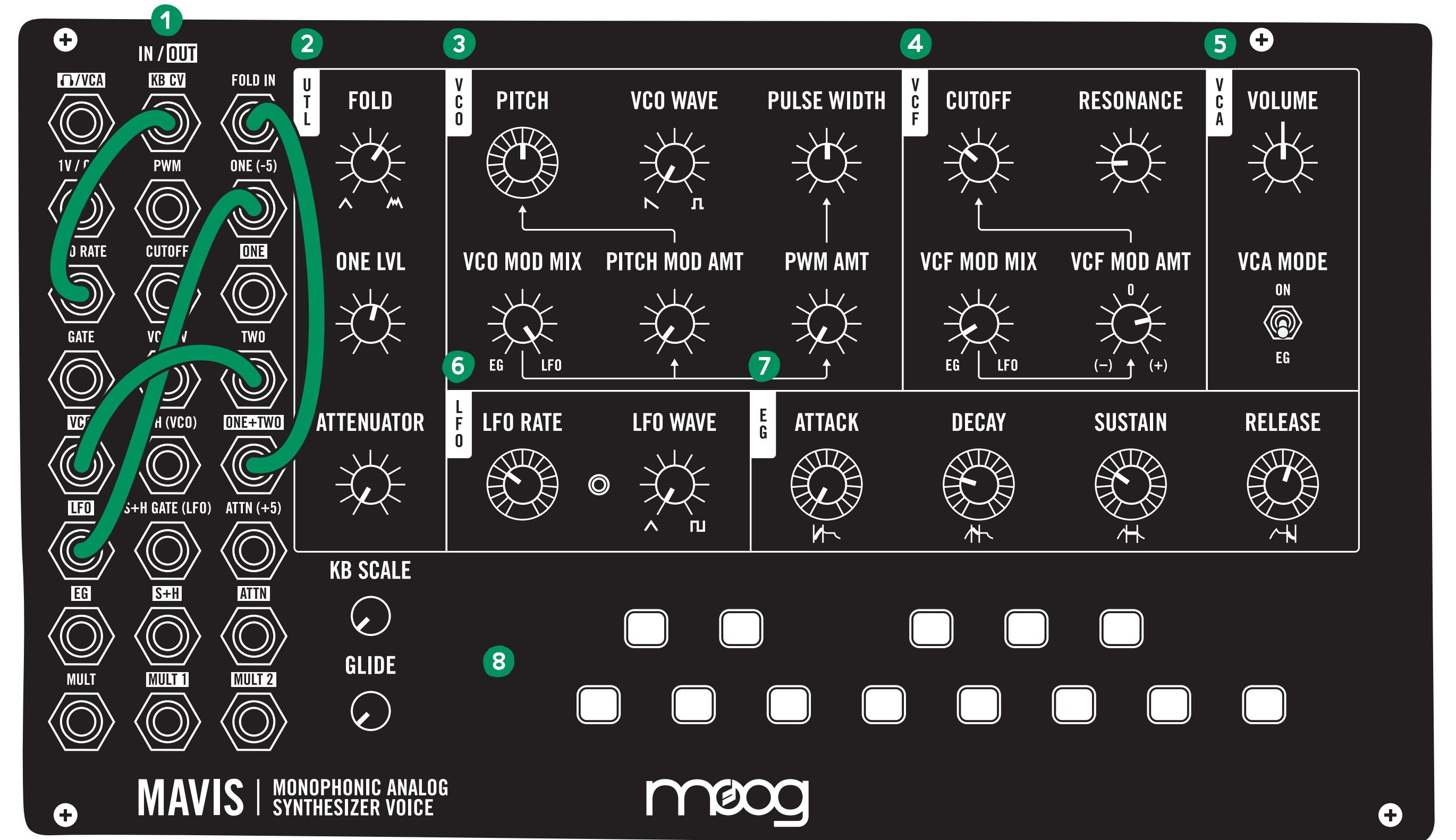
## 8 KEYBOARD

Mavis can be played from an external keyboard, sequencer, or synthesizer connected via the patch bay. The instrument also includes a one-octave button keyboard that is hardwired to the internal synthesizer.

KEYBOARD: The thirteen keys are laid out piano-style, from C to C1. If more than one key is played simultaneously, only the lower key will sound (low-note priority).

KB SCALE: With this knob rotated fully to the left (counterclockwise), the keyboard will play a single octave of pitches, using the 1V/octave scaling that is standard to most synthesizers. Rotating this knob to the right will increase the scaling, causing the keyboard to cover a wider range of pitches using the same number of keys. This allows you to explore non-traditional keyboard scaling, or dial in a unique response when using the keyboard as a CV source for things other than pitch.

GLIDE: Glide provides a smooth transition from note to note. This knob determines how long it takes to glide from one note to the next.

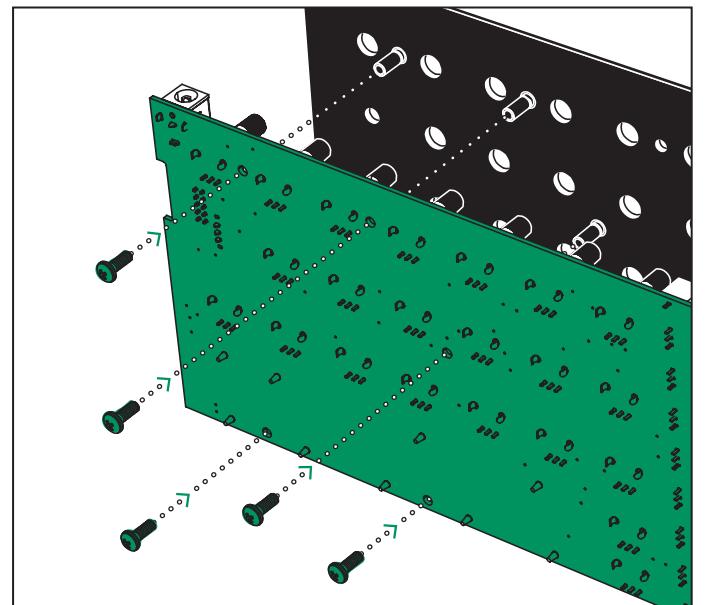


# ASSEMBLY INSTRUCTIONS

## 1 ATTACH THE RUBBER FEET

The square self-adhesive RUBBER FEET should be placed on the corresponding square areas on the bottom side of the CHASSIS. Remove the protective film from each foot, apply, and hold firmly for a few seconds.

## 2 SECURE PCB TO FRONT PANEL



Carefully remove the PRINTED CIRCUIT BOARD (PCB) from the sleeve. Remove the protective film from the FRONT PANEL and gently guide it onto the PCB, taking care that all keys, knobs, jacks, and the VCA switch fit through their respective holes. Using a SCREWDRIVER, carefully secure the PCB to the FRONT PANEL using five of the M3x8 SCREWS. These screws enter from the back of the PCB and attach to threaded stand-offs on the back of the FRONT PANEL.

*Note: A few of the rubber keys may not immediately pass through the front panel. For these remaining keys, simply use the flat end of the included calibration tool to guide them into the correct position.*

## 3 MOUNT ASSEMBLY TO CHASSIS

Place the PCB/PANEL assembly into the CHASSIS. Be sure that the power jack connection on the PCB/PANEL lines up with the power jack port on the CHASSIS. Use the four remaining M3x8 SCREWS to mount the PCB/PANEL assembly to the CHASSIS.

## 4 SECURE PATCH BAY & INSTALL LIGHT PIPE

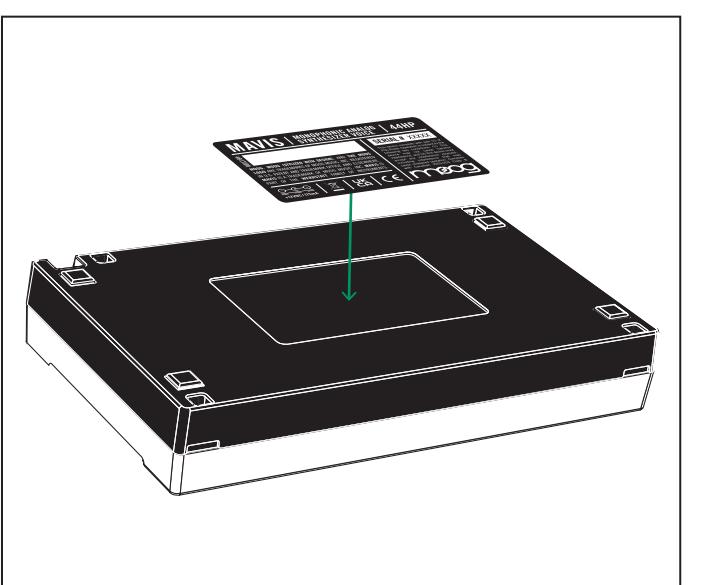
Use the 8mm end of the included HEX NUT DRIVER to secure a HEX NUT to each of the 24 jacks on the patch bay (be careful not to over-torque). This will provide a secure platform for plugging and unplugging patch cables. Next,

there is a clear plastic LIGHT PIPE that carries light from the LFO RATE LED on the PCB to the FRONT PANEL. Insert the tapered end of the LIGHT PIPE into the hole directly to the right of the LFO RATE knob. When inserted correctly, it should sit nearly flush with the FRONT PANEL.

## 5 ATTACH THE LID

Mavis includes a protective LID that keeps dust and debris off of your instrument. Place the LID on top of Mavis when not in use, while in transit, and for the next assembly step.

## 6 APPLY THE SERIAL NUMBER LABEL



Now that you've built your new instrument, it's time to make it official. With the LID on, flip the entire unit upside down and apply the SERIAL NUMBER LABEL to the bottom of the CHASSIS. Don't forget to write your name in the [Built By](#) section.

## 7 POWER UP & PLAY

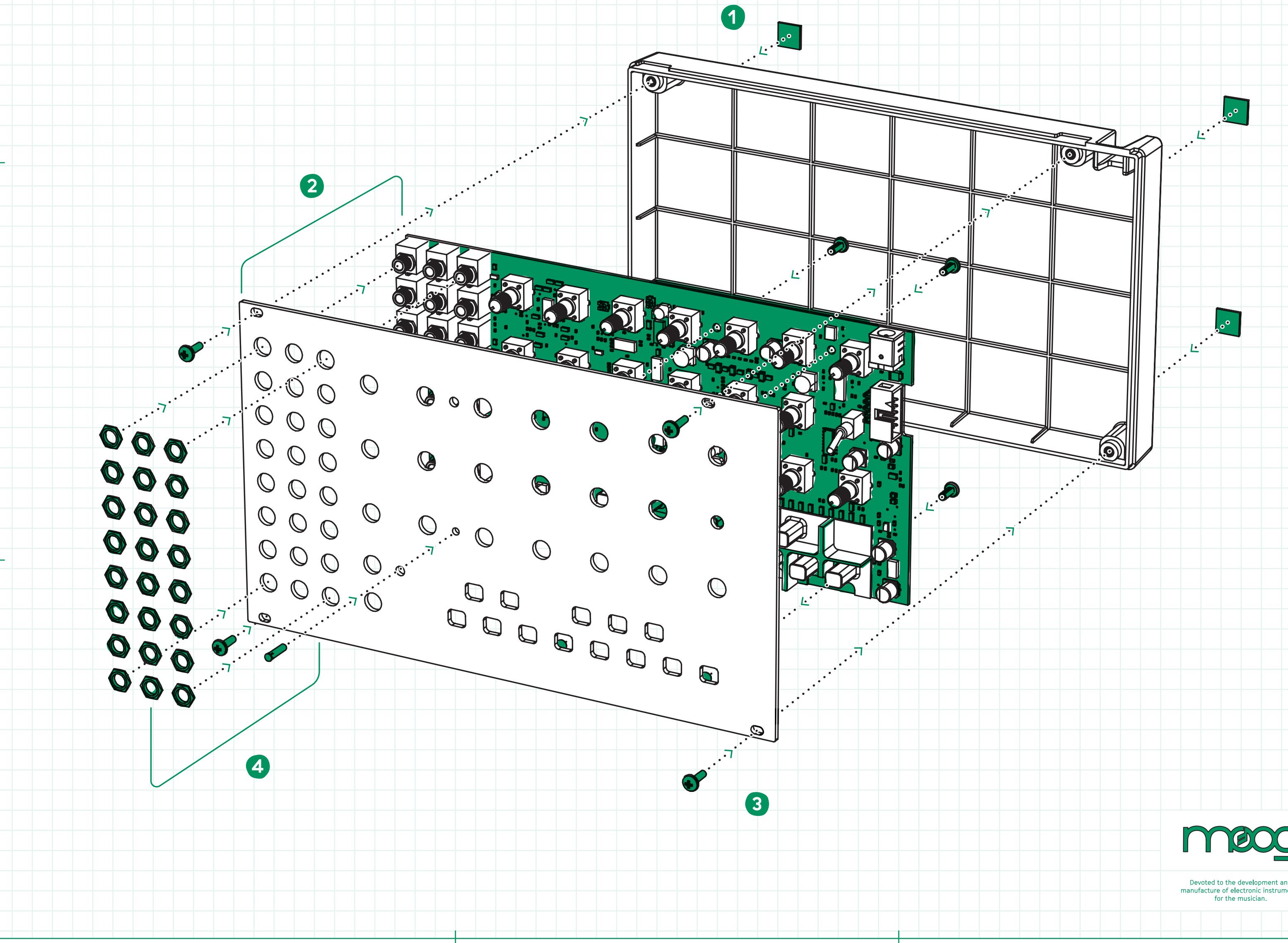
Using the included 12V DC POWER SUPPLY, connect the barrel end to the Mavis power connection jack, and connect the other end to an AC wall outlet (100–240 Volts AC / 50–60 Hz). When the red LFO RATE LED on the front panel lights up, your synthesizer is powered on and you are ready to build your first patch!

## 8 KEEP EXPLORING

Synthesis is a journey, and we're here to support you through it. Scan this QR code to find a wealth of resources, including patches, tips, and instructional videos that will help you get started with Mavis. You can chat with us any time at [moogmusic.com](#).



PARTS FOR ASSEMBLY



**moog**

Devoted to the development and  
manufacture of electronic instruments  
for the musician.