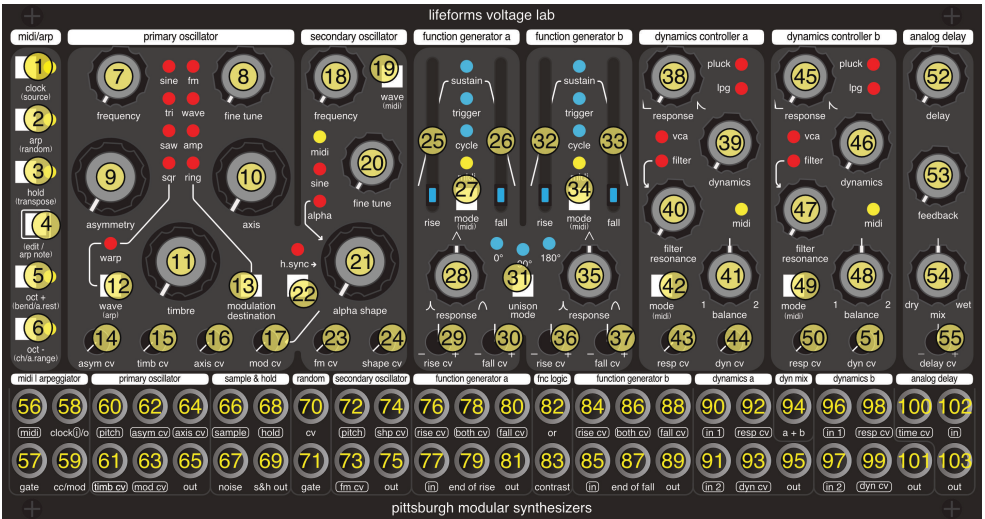


The Voltage Research Laboratory
Encyclopedia [Voltage Lab Patches](#)

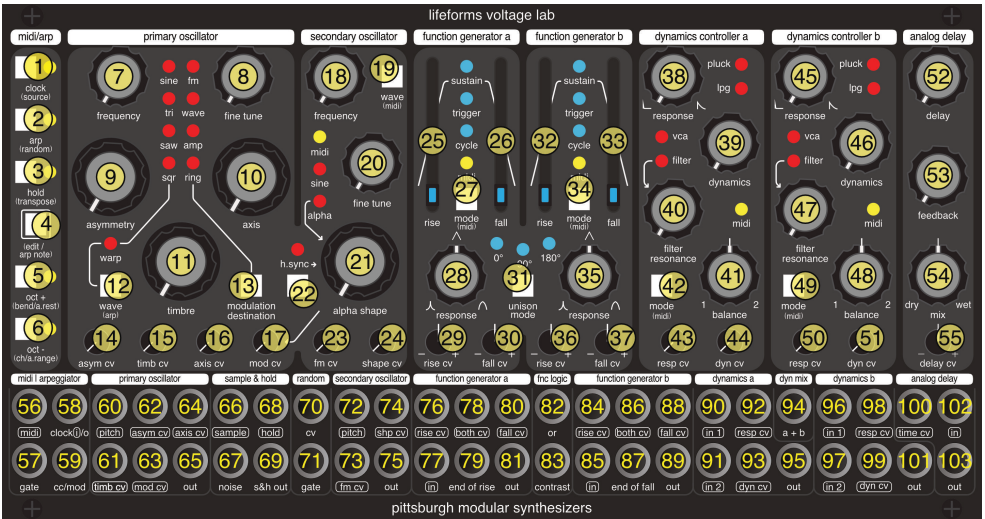
User Interface Controls



1. MIDI Clock Button (Clock Source)
2. MIDI Arpeggiator Button (Random)
3. MIDI Hold Button (Transpose)
4. MIDI Edit Button (Arpeggiator Note)
5. MIDI Octave + Button (Bend/Arp Rest)
6. MIDI Octave - Button (MIDI Ch./Arp Range)
7. Primary Frequency Knob
8. Primary Fine Tune Knob
9. Primary Asymmetry Knob
10. Primary Axis Knob
11. Primary Timbre Knob
12. Primary Wave Button (Arp Division)
13. Primary Modulation Destination Button
14. Primary Asymmetry CV Trimmer
15. Primary Timbre CV Trimmer
16. Primary Axis CV Trimmer
17. Primary Modulation CV Trimmer
18. Secondary Frequency Knob
19. Secondary Wave Button (MIDI Enable)
20. Secondary Fine Tune Knob
21. Secondary Alpha Shape Knob
22. Secondary Hard Sync Button
23. Secondary FM CV Trimmer
24. Secondary Alpha Shape CV Trimmer
25. Function A Rise Slider
26. Function A Fall Slider
27. Function A Mode Button (MIDI Enable)
28. Function A Response Curve Knob

29. Function A Rise CV Trimmer
30. Function A Fall CV Trimmer
31. Function B Unison Mode Button
32. Function B Rise Slider
33. Function B Fall Slider
34. Function B Mode Button (MIDI Enable)
35. Function B Response Curve Knob
36. Function B Rise CV Trimmer
37. Function B Fall CV Trimmer
38. Dynamics A Response Knob
39. Dynamics A Dynamics Knob
40. Dynamics A Filter Resonance Knob
41. Dynamics A Input Balance Knob
42. Dynamics A Mode Button (MIDI Enable)
43. Dynamics A Response CV Trimmer
44. Dynamics A Dynamics CV Trimmer
45. Dynamics B Response Knob
46. Dynamics B Dynamics Knob
47. Dynamics B Filter Resonance Knob
48. Dynamics B Input Balance Knob
49. Dynamics B Mode Button (MIDI Enable)
50. Dynamics B Response CV Trimmer
51. Dynamics B Dynamics CV Trimmer
52. Delay Time Knob
53. Delay Feedback Knob
54. Delay Mix Knob
55. Delay Time CV Trimmer

User Interface Patch Bay



- 56. MIDI Adapter Cable Input Jack
- 57. MIDI Gate Output Jack
- 58. MIDI Clock Input/Output Jack
- 59. MIDI Control Change / Modulation Output Jack
- 60. Primary Pitch Input Jack
- 61. Primary Timbre CV Input Jack
- 62. Primary Asymmetry CV Input Jack
- 63. Primary Modulation CV Input Jack
- 64. Primary Axis CV Input Jack
- 65. Primary Output Jack
- 66. Sample & Hold Sample Input Jack
- 67. Noise Output Jack
- 68. Sample & Hold Hold Input Jack
- 69. Sample & Hold Output Jack
- 70. Random CV Output Jack
- 71. Random Gate Output Jack
- 72. Secondary Pitch Input Jack
- 73. Secondary FM CV Input Jack
- 74. Secondary Alpha Shape CV Input Jack
- 75. Secondary Output Jack
- 76. Function A Rise CV Input Jack
- 77. Function A Input Jack
- 78. Function A Both Rise and Fall CV Input Jack
- 79. Function A End Of Rise Gate Output Jack
- 80. Function A Fall CV Input Jack
- 81. Function A Output Jack
- 82. Function Logic Mixer Or Output Jack
- 83. Function Logic Mixer Contrast Output Jack
- 84. Function B Rise CV Input Jack
- 85. Function B Input Jack
- 86. Function B Both Rise and Fall CV Input Jack
- 87. Function B End Of Rise Gate Output Jack
- 88. Function B Fall CV Input Jack
- 89. Function B Output Jack
- 90. Dynamics A Input 1 Jack
- 91. Dynamics A Input 2 Jack

- 92. Dynamics A Response CV Input Jack
- 93. Dynamics A Dynamics CV Input Jack
- 94. Dynamics Mix Output Jack
- 95. Dynamics A Output Jack
- 96. Dynamics B Input 1 Jack
- 97. Dynamics B Input 2 Jack
- 98. Dynamics B Response CV Input Jack
- 99. Dynamics B Dynamics CV Input Jack
- 100. Delay Time CV Input Jack
- 101. Dynamics B Output Jack
- 102. Delay Input Jack
- 103. Delay Output Jack

Bass Guitar



Patch Description

Bass guitar emulation patch recreates the sound of an electric bass guitar. This patch can also be used to emulate an electric guitar. To aid in the electric guitar illusion, try running the output of the synthesizer through a few guitar pedals and a guitar amp. The guitar illusion starts to fade as the notes move further up the scale but this patch easily showcases the unique sound of the Warp circuit.

Patch Notes

Adjusting the PRIMARY TIMBRE KNOB (11) has a strong effect on the patch. PRIMARY ASYMMETRY KNOB (9) and PRIMARY AXIS KNOB (10) alter the tone of the sound.

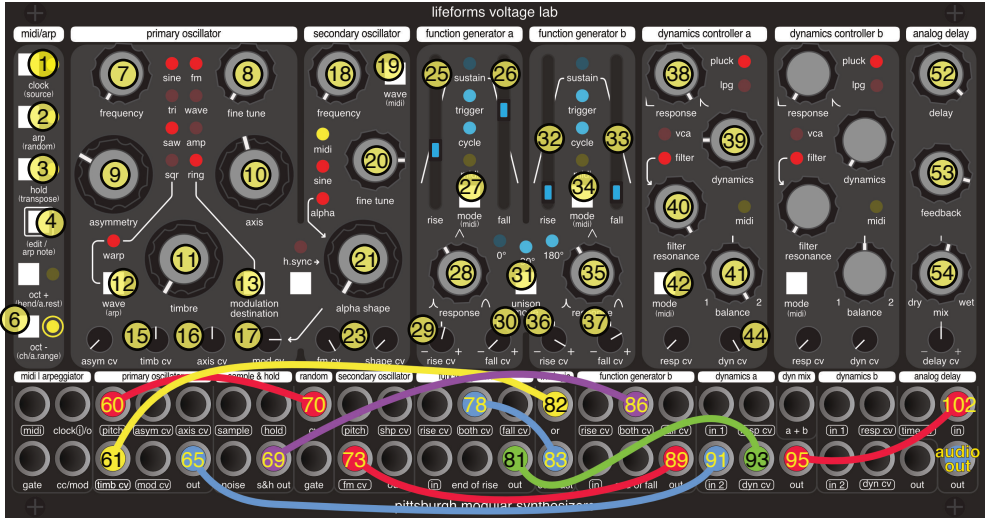
Function Generator A is modulating the PRIMARY TIMBRE KNOB (11) with a slow triangle wave so each note played sounds slightly different.

Adjust the DYNAMICS A RESPONSE KNOB (38) and the DYNAMICS A DYNAMICS CV TRIMMER (44) to modify the decay time of each note. The DYNAMICS A RESPONSE KNOB (38) controls the decay of the pluck. The DYNAMICS A DYNAMICS CV TRIMMER (44) adjusts the amount of sustain.

The output of the Dynamics Controller A can be patched into the Analog Delay to add a chorus or delay effect.

The Dynamics Controller A Response Time can be modulated to vary the length of the notes to create a more realistic performance.

Bird Calls



Patch Description

Dial in anything from natural to very unnatural sounding bird and nature sounds. This patch is a great example of how to utilize all of the random and generative control voltages available to create unpredictable systems. The results can be fragile. Small knob movements can make large changes to the output.

Patch Notes

Tap a tempo using the MIDI CLOCK BUTTON (1) of around 1 beat per second. Generate a randomized arpeggiated sequence by pressing the MIDI ARPEGGIATOR BUTTON (2) to enable arpeggiator mode. Next, press and hold the MIDI EDIT BUTTON (3) then press the MIDI HOLD BUTTON (4). This will generate a random arpeggiated sequence with a random length (1-16 steps) and random pitch values.

Press the MIDI OCTAVE - BUTTON twice to set the arpeggiator range sent to the pitch of the Secondary Oscillator.

Dual Oscillator Synth Voice



Patch Description

Perfect starting point for classic dual oscillator synth sounds with more to teach than it may seem. There are many places to take this patch. The output level of each Dynamics Controller is controlled by a separate Function Generator and both Function Generators are set to Filter Mode. However, Dynamics Controller A is working like a traditional filter and Dynamics Controller B is acting more like a low pass gate or VCA with additional resonance.

Patch Notes

Use the SECONDARY FINE TUNE KNOB (20) to offset the frequency of the oscillators by a 3rd, 5th, or octave to expand the sound.

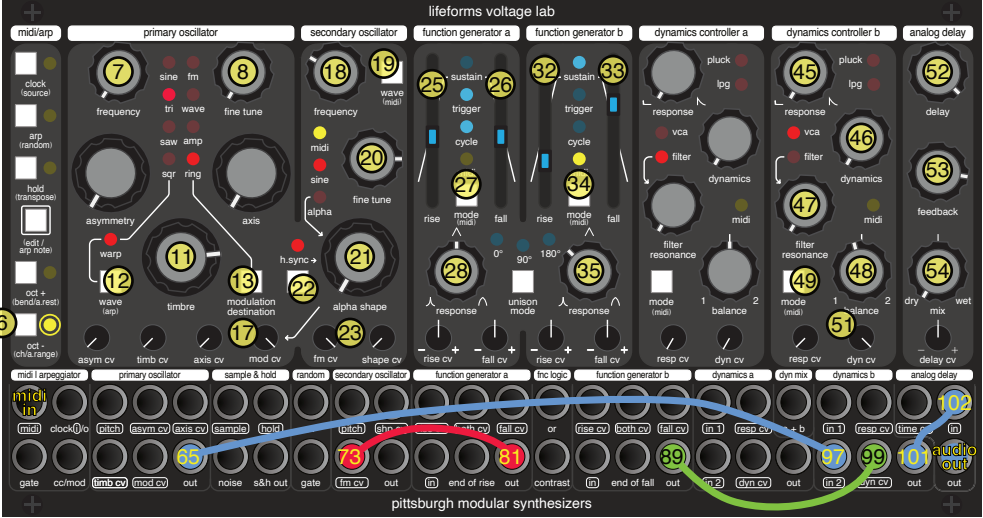
Keeping the DYNAMICS B DYNAMICS KNOB (46) full left (off) ensures that it will filter out the entire audio signal and act as a VCA or low pass gate.

Switch Dynamics Controller B between Filter and VCA modes to hear the difference in the sound and response curve. The response curve of filter mode is more logarithmic and VCA mode is more linear.

Gain staging in a modular synthesizer is important. The DYNAMICS B INPUT BALANCE KNOB (48) is used to attenuate the signal to allow headroom for the additional resonance.

Enable the Ring Modulator by pressing the PRIMARY MODULATION DESTINATION BUTTON (13) until just RING is active and turning the PRIMARY MODULATION CV TRIMMER (17) full right to create a chorus-like effect.

Modulating Lawn Care



Patch Description

For some reason this sound reminds me of working in the yard so... This patch utilizes both ring modulation and hard sync between the oscillators. The Secondary Oscillator is frequency modulated (FM'd) using a cycling Function Generator A. However, because the Secondary Oscillator is hard synced to the Primary Oscillator, the frequency modulation interacts with the hard sync to create a pulse width effect. The timbre of the patch is most interesting at the high and low ends. At the low end it is thick and chunky. At the high end it zippers and breaks apart in interesting ways.

Patch Notes

Experiment with different waveforms by pressing the PRIMARY WAVE BUTTON (12).

Sweep the SECONDARY FREQUENCY KNOB (18) to play with the Hard Sync relationship between the oscillators. The patch sounds the cleanest when the oscillators are tuned to a complimentary frequency such as a 3rd, 5th, or octave.

Voice with Sub Oscillator



Patch Description

Another simple patch showcasing the Primary Oscillator warp circuit and wave folder. The Secondary Oscillator is used as a sub-oscillator an octave below the Primary Oscillator.

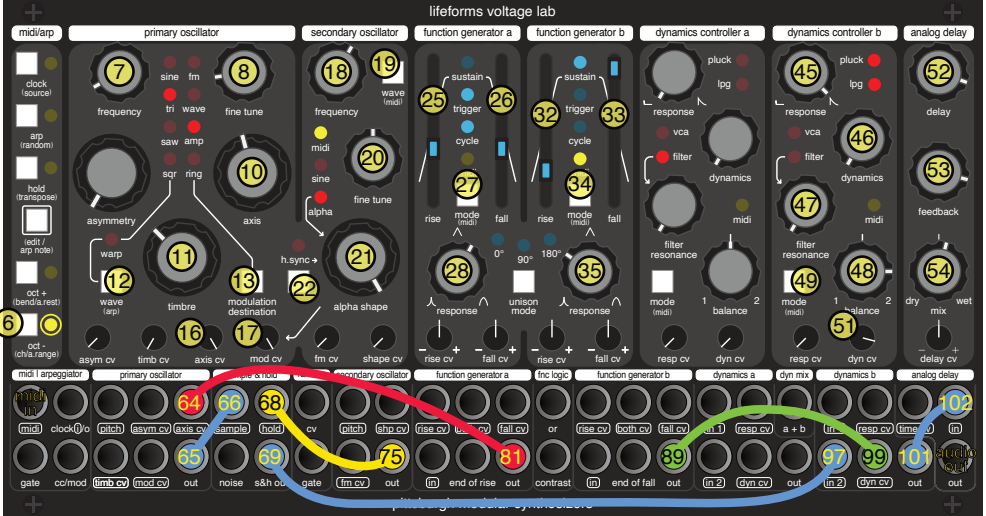
Patch Notes

Tune the Secondary Oscillator 1 or 2 octaves below the Primary Oscillator.

Turn the PRIMARY TIMBRE CV TRIMMER (15) full left and Turn the PRIMARY TIMBRE KNOB (11) full left to disable the wave folder. Turn the PRIMARY MODULATION CV TRIMMER (13) full right. Use the PRIMARY MODULATION DESTINATION BUTTON (13) to enable Amplitude Modulation (amp) or Ring Modulation (ring). Adjust the SECONDARY ALPHA SHAPE KNOB (21) for additional variations.

A next step could be using the Function Generator A to modulate the Secondary Oscillator Alpha Shape.

Ominous Control



Patch Description

This patch stacks multiple types of modulation and wave shaping together to create a dense, moving voice. The output of the Primary Oscillator is patched through the Sample and Hold then into the Dynamics Controller. The Secondary Oscillator controls the Sample and Hold refresh rate and also the amplitude modulation of the Primary Oscillator. Passing the Primary Oscillator through the Sample and Hold running at audio rates creates aliasing and other artifacts. The amplitude modulation adds another subtle dimension to the sound.

Patch Notes

The Secondary Oscillator and Sample and Hold work together to create an analog bit crushing effect. Adjust the frequency of the Secondary Oscillator to get a feel for the variations available.

Low End Woodwork



Patch Description

Interesting sound created using the Primary Oscillator Saw Wave shaped by the Warp circuit and the Wave Folder. The Primary Oscillator Wave Folder Timbre is modulated by the Secondary Oscillator.

Patch Notes

Adjust the SECONDARY FREQUENCY KNOB (18), DELAY MIX KNOB (54), and DYNAMICS B FILTER RESONANCE KNOB (47) to get a feel for the sonic possibilities of this patch.

Metallic Water



Patch Description

Metallic sounds based around a complex relationship between the Primary Oscillator and the Secondary Oscillator. The Secondary Oscillator is used for FM and Ring Modulation while hard synced to the Primary Oscillator. The dual resonance of the Dynamics Controllers and the feedback of the short delay time add to the effect. The Function Generators are used as modulation sources for the Primary Oscillator wave folder and Dynamics Controller A with Function Generator A also triggering Function Generator B at the end of the rise stage for a little bit of additional complexity.

Patch Notes

Almost every control in this patch can be tweaked to modify the sound. The SECONDARY FREQUENCY KNOB (18), Delay controls, and Function Generator sliders are a good place to start exploring.

VCA Overdrive



Patch Description

Analog overdrive effect created by modulating the Primary Oscillator Amplitude Modulation (amp) modulation destination with the Secondary Oscillator. The Secondary Oscillator is FM'd using the Function Generator Contrast output which is the difference in voltage between the two Function Generators. The overdrive is accented with strong resonance from Dynamics Controller B.

Patch Notes

The SECONDARY FM CV TRIMMER (23) sets the breakup amount of the overdrive.

The SECONDARY FREQUENCY KNOB acts as a tremolo by controlling the frequency of the Amplitude Modulation.

Sources of Random



Patch Description

Not a patch but a showcase of all the available sources of random on the Voltage Lab.

MIDI Arpeggiator

The arpeggiator can generate a random sequence and/or randomize a sequence entered using a MIDI keyboard. The arpeggiator clock division or chance a note will trigger can be assigned. When the note chance is set to 30% or 60% the MIDI CONTROL CHANGE / MODULATION OUTPUT JACK (59) outputs a slewed 0-5V random CV. Details on the MIDI arpeggiator start on page 9 of the Voltage Lab Manual.

Noise and Sample & Hold

A transistor core analog noise source paired with a fully patchable Sample and Hold module. More info available on page 40 of the Voltage Lab Manual.

Random Gate and CV Outputs

Inspired by the random source on the Buchla Music Easel, the complex random generator on the Voltage Lab is a digitally controlled random source generating both gate and CV signals. More info available on page 41 of the Voltage Lab Manual.

Function Generator Logic Outputs

The Function Generator section utilizes two different logical mixing circuits to combine the output of Function Generator A and Function Generator B. More info available on page 32 of the Voltage Lab Manual.



Pittsburgh Modular Synthesizers