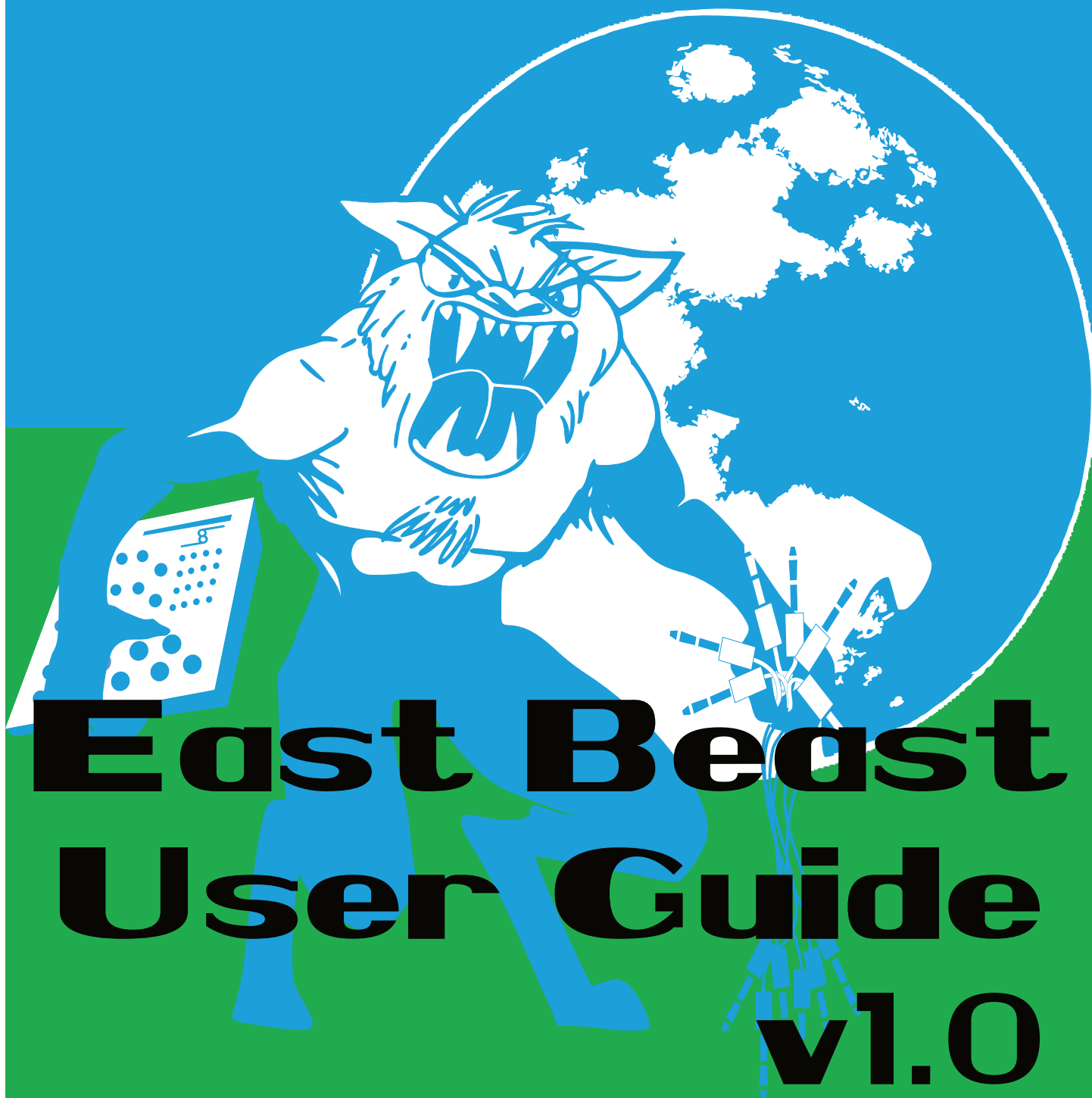


cre8audio™



East Beast is a trademark of Cre8audio LLC. Copyright © Cre8audio LLC. 2022

Thank You!

Thank you for purchasing the Cre8audio East Beast. Your investment in our ideas help support innovative synthesizer design!

Good analog sounds better. Good analog adds a dimension to a sound that can be felt as much as heard, but good analog does not have to be complex. A single analog oscillator full of depth and character passing through a warm, sweet filter can be all it takes to get you there. The East Beast is a direct path to that sound.

I love the East Beast for how immediate it is and how it welcomes both new and veteran artists to modular analog synthesis with a sense of humor and without pretense. Please use this synthesizer as a launch pad for experimentation and fun in the search for your sound because that's exactly what we at Pittsburgh, and our friends at Cre8audio designed it for.

Analog is important,
Richard Nicol
Founder | Product Designer
Pittsburgh Modular Synthesizers



1.1 Important Power Information

Read Instructions:

Please read the Cre8audio East Beast Synthesizer User Guide completely before use and retain for future reference.



- Only use the DC power adapter provided by Cre8audio with the East Beast. Using an incorrect power adapter can cause permanent damage to the East Beast and the power adapter.
- The East Beast is an electronic device. Exposure to water will cause the East Beast circuitry to short circuit and may cause permanent damage.
- Do not attempt to modify the East Beast. Tampering with the circuitry may cause permanent damage.
- Do not place heavy objects on the East Beast. The user interface is mounted on a PCB that can be damaged if stressed by excessive weight.
- Do not attempt to repair the East Beast. Please contact Cre8audio regarding malfunctions of any kind.
- Cre8audio is not responsible for any damage or loss caused by improper use of the East Beast.
- Do not taunt the East Beast.

IMPORTANT Eurorack Ribbon Cable Power Information:

The Cre8audio East Beast Synthesizer is a Eurorack format synthesizer module. The module can be installed, rearranged, removed, and replaced in any compatible Eurorack case from Cre8audio, Pittsburgh Modular, or other manufacturers.

The Cre8audio East Beast Synthesizer uses a standard 16 pin Eurorack ribbon cable to connect the module to a bipolar +/-12v power supply. Please pay very close attention to the orientation of the ribbon cable when adding and removing modules. The stripe on the ribbon cable marks -12 volt power. This stripe needs to line up with the -12 volt pins on the power supply and the -12 volt pins on the module. The Cre8audio East Beast Synthesizer includes reverse polarity protection so it will not be damaged when plugged in incorrectly; however, as a general rule, failure to match up the pins correctly can result in damage to one or all the modules in a case. On Cre8audio and Pittsburgh Modular cases the positive and negative voltages are clearly labeled. On the Cre8audio East Beast Synthesizer module, the power header is clearly labeled and keyed to ensure a safe and proper connection.

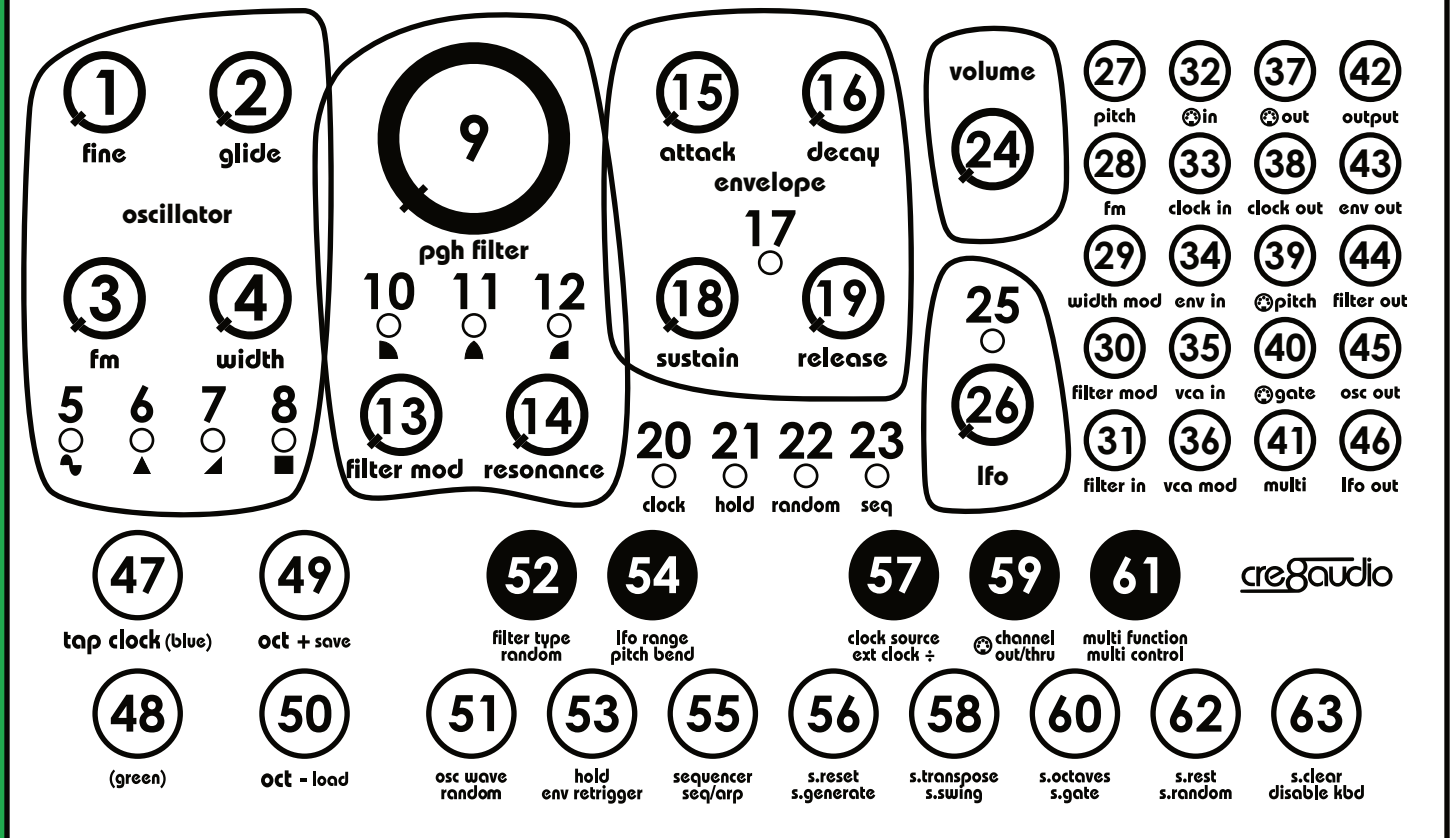
Do NOT remove the Cre8audio East Beast Synthesizer module from any case while it is plugged in.

Do NOT unplug power ribbon cables from the Cre8audio East Beast Synthesizer or case while the case is plugged in.



2 User Interface

East Beast



East Beast

- | | | |
|----------------------------|------------------------------|-----------------------------|
| 1. Osc. Fine Tune Knob | 24. Volume Knob | 47. Tap Clock (blue) Button |
| 2. Osc. Pitch Glide Knob | 25. LFO LED | 48. Edit (green) Button |
| 3. Osc. FM Knob | 26. LFO Rate Knob | 49. Octave Up Button |
| 4. Osc. Pulse Width Knob | 27. Osc. Pitch In Jack | 50. Octave Down Button |
| 5. Osc. Sine LED | 28. Osc. FM In Jack | 51. C1 Note Button |
| 6. Osc. Triangle LED | 29. Osc. Pulse Width In Jack | 52. C# Note Button |
| 7. Osc. Saw LED | 30. Filter Mod In Jack | 53. D Note Button |
| 8. Osc. Pulse LED | 31. Filter Audio In Jack | 54. D# Note Button |
| 9. Filter Cutoff Knob | 32. MIDI In Jack | 55. E Note Button |
| 10. Filter Low Pass LED | 33. Clock In Jack | 56. F Note Button |
| 11. Filter Band Pass LED | 34. Envelope In Jack | 57. F# Note Button |
| 12. Filter High Pass LED | 35. VCA Audio In Jack | 58. G Note Button |
| 13. Filter Cutoff Mod Knob | 36. VCA Mod In Jack | 59. G# Note Button |
| 14. Filter Resonance Knob | 37. MIDI Out Jack | 60. A Note Button |
| 15. Envelope Attack Knob | 38. Clock Out Jack | 61. A# Note Button |
| 16. Envelope Decay Knob | 39. MIDI Pitch Out Jack | 62. B Note Button |
| 17. Envelope LED | 40. MIDI Gate Out Jack | 63. C2 Note Button |
| 18. Envelope Sustain Knob | 41. Multi-Tool Out Jack | |
| 19. Envelope Release Knob | 42. Main Output Jack | |
| 20. Display Clock LED | 43. Envelope Out Jack | |
| 21. Display Hold LED | 44. Filter Out Jack | |
| 22. Display Random LED | 45. Osc. Out Jack | |
| 23. Display Sequence LED | 46. LFO Out Jack | |

3 East Beast Overview

3.1 Overview:

The Cre8audio East Beast Synthesizer combines the functionality of 6 individual modular synthesizer modules behind a single panel. Connect different functions using patch cables to create complex sounds and textures.

The East Beast signal path is divided into two types of signals: audio signals and control voltages. The audio signal is the sound that is produced. The audio signal path starts at an oscillator or other sound source. The audio signal is then patched through other functions used to shape the sound such as a filter or VCA.

Control voltages (CV) manipulate the audio signal in several different ways. Gates are represented by a high (5 volts) or low (0 volts) control voltage. A gate can be generated using a pulse or square wave from an oscillator or modulation source, or by using the MIDI gate or clock output. A gate can be shaped using the Envelope to control the attack, decay, sustain, and release of the gate. The modified gate signal can then be sent to any Modulation CV input on the East Beast.

A second use for control voltages is as a modulation source. For example, a control voltage from the MIDI pitch output patched into the Filter Mod input on the filter module controls the cutoff frequency of the filter based on the midi note received. The LFO provides a separate low frequency oscillator that makes a perfect control voltage modulation source. Audio rate modulation signals also make a great CV source for oscillator FM (frequency modulation).

Any output can be patched into any input. Some patching may not result in musical or interesting results but experimentation with the patch points is always encouraged.

3.2 Panel Labeling Conventions:

The Cre8audio East Beast uses several simple labeling conventions to make the user interface and signal flow easy to understand.

- Each main function is contained within a white outline.
- Input jacks are labeled with blue.
- Output jacks are labeled with white.
- **Green** functions are accessed by holding down the **[Edit (Green) Button]**.
- **Blue** functions are accessed by holding down the **[Tap Clock (Blue) Button]**.

3.3 Manual Labeling Conventions:

Within the manual, user interface buttons, knobs, and jacks are in bold and marked with brackets **[]**. For example, **[Clock LED]** refers to the LED labeled clock in the display section.

The East Beast uses a simple 4-bit display to visualize selected modes. The 4-bit display is shown in the manual with a graphic showing a set of 4 LED status indicators. ● represents a lit LED. ○ represents an unlit LED.



3 East Beast Overview

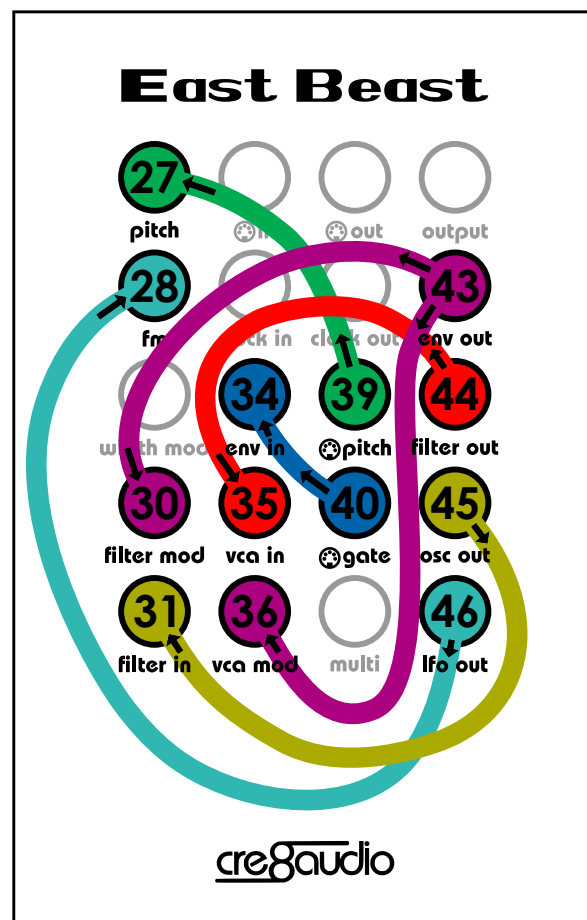
3.4 Internal Patching:

The East Beast utilizes internal patching to create a single oscillator synth voice that does not require patch cables to play. To modify the internal patch or to create something completely new, all of the internal routing can be bypassed using patch cables. This allows total patching freedom without the constraints of a fixed voice architecture.

Plugging a patch cable into an internally patched input jack will override any internal patching. Most internal connections are made using switched jacks. A switched jack allows the internal signal path to be disabled when a patch cable is inserted. A simple example would be the pitch input of the oscillator. Internally, the pitch output of the midi section is wired to the switched jack input of the oscillator. When a patch cable is plugged into the pitch input of the oscillator, that patch cable breaks the connection to the midi pitch output and replaces it with the signal from the inserted patch cable.

3.5 Internal Patching Diagram:

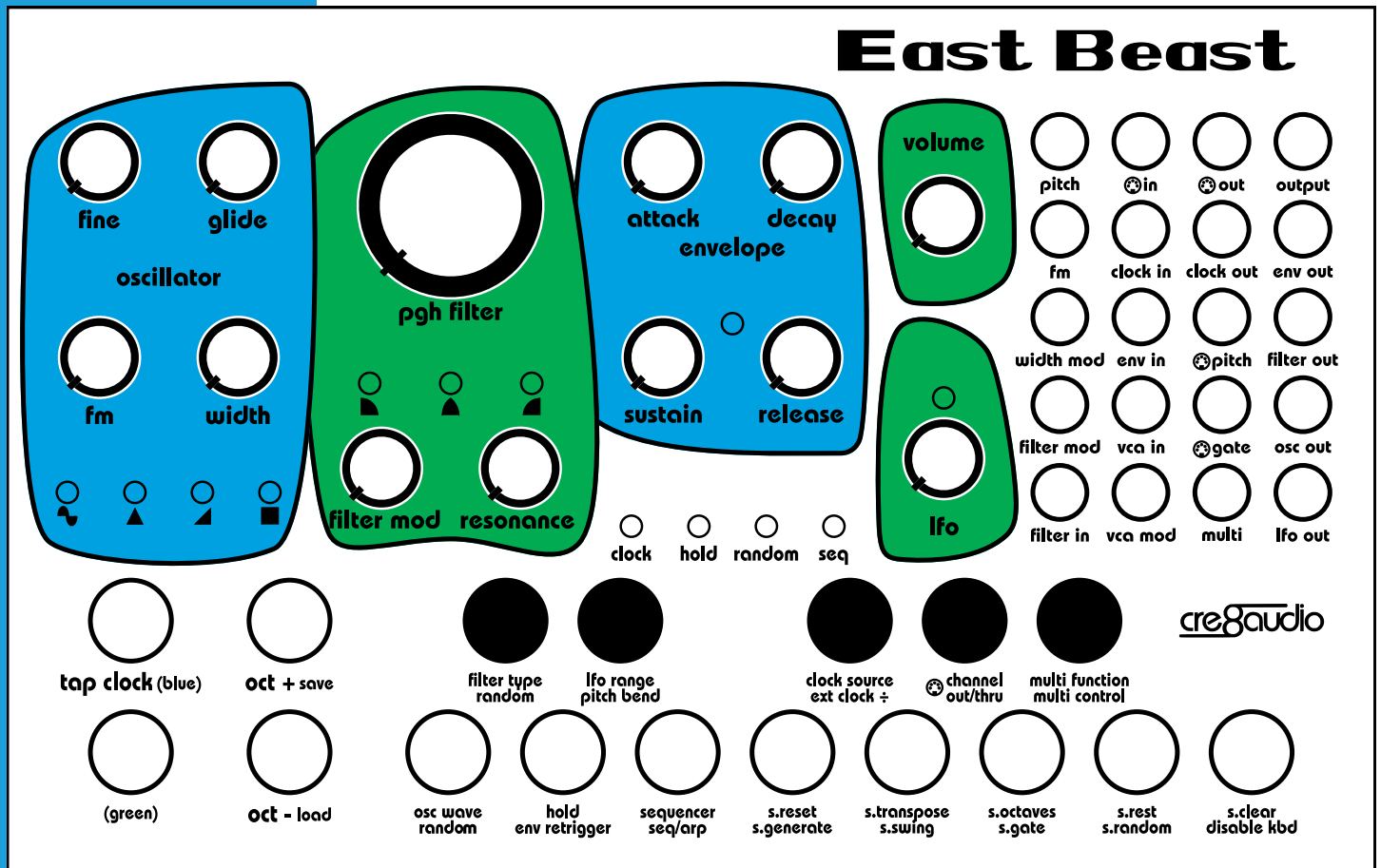
The diagram below shows the pre-patched audio and CV signals. Each signal is patched with a unique color for clarity.



4 Individual Modules

4.1 Panel Layout:

The East Beast can be organized into 6 independent Modules. Oscillator, filter, envelope, VCA, LFO, and button keyboard. Each module controls one or more functions and can operate on its own or can be patched into any other module within the East Beast or other Eurorack format modules.



5 Oscillator Module

5.1 Oscillator Overview:

The Oscillator is a wide range, fully analog, VCA saw core waveform generator designed by Pittsburgh Modular. Linear frequency modulation (FM) ranging from subtle to extreme is available using the **[Osc. FM In Jack]** and **[Osc. FM Knob]**. Linear FM modulation the frequency of the oscillator equally in both positive and negative directions. This allows for a larger range of frequency modulation before losing pitch tracking. Custom internal wave shaping provides a selection of four geometric waveforms (sine, triangle, saw, and pulse) along with pitched noise. Select a waveform using **[Green Edit Mode : Note Button C1]**. Select a random waveform for each note using **[Blue Edit Mode : Note Button C1]**.

The pulse wave can be modulated using the **[Osc. Pulse Width In Jack]** and **[Osc. Pulse Width Knob]**. The width of the pulse wave is modulated from 50% with no modulation to 1% with full modulation. The **[Osc. Pulse Width Knob]** manually sets the pulse width when no modulation source is present.

Combination waves are available that mix two waveforms to create different shapes. Please note, these waveforms have a larger amplitude than the individual waveforms and may cause overdrive in the filter and/or VCA. Pitched noise is generated by randomly switching between the four geometric waveforms rapidly. A perfect choice for percussive sounds.

5.2 Oscillator Controls, Inputs, and Outputs:

[Osc. Fine Tune Knob] - Fine tune frequency control. Used to tune the oscillator to a precise frequency with a range of +/- 1.5 semitones.

[Osc. Pitch In Jack] - One volt per octave pitch tracking input. Used to control the pitch of the oscillator with a keyboard controller, sequencer, or other calibrated voltage source.

[Osc. Pitch Glide Knob] - Portamento control creates smooth transitions between notes. Turning the knob to the right increases the length of time it takes to glide from one note to another.

[Osc. FM In Jack] - Linear FM input jack used for frequency modulation.

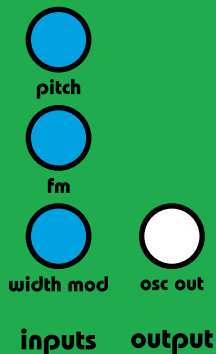
[Osc. FM Knob] - FM input level control sets the amount of signal allowed to pass from the FM input to the oscillator core.

[Osc. Pulse Width In Jack] - Pulse width modulation input. Controls the width of the pulse wave from 50% (Square Wave) to 0% (positive CV) or 100% (negative CV).

[Osc. Pulse Width Knob] - Dual function knob. When nothing is patched into the **[Osc. Pulse Width In Jack]**, the knob manually controls the width of the pulse wave from 50% to 1%. If a cable is patched into the **[Osc. Pulse Width In Jack]**, the knob sets the amount of signal allowed to pass from the pulse width input to the pulse wave shaper.

[Waveform LEDs] - LEDs show the currently selected waveform(s). Sine, triangle, saw, pulse.

[Osc. Out Jack] - Outputs selected waveform(s).



6 PGH Filter Module

6.1 PGH Filter Overview:

The PGH Filter module is a voltage controlled, analog, state variable filter. State variable topology offers several filter output responses, highpass, lowpass, and bandpass. Select a filter response using **[Green Edit Mode : Note Button C#]**. Select a random response for each note using **[Blue Edit Mode : Note Button C#]**. Each response produces a very smooth and natural sounding sweep. The filter has defined sound of Pittsburgh Modular from the moment it was introduced. A distinct sound that has been tweaked to perfection. It offers a warm, organic sweep through the full frequency range. The lowpass filter is gummy and relaxed while the highpass is clean and defined. The goal was to produce a filter that did not have a sweet spot; where the every turn of the frequency knob produced something interesting.

6.2 Filter Controls, Inputs, and Outputs:

[Filter Cutoff Knob] - Filter cutoff frequency control knob.

[Filter Mode LEDs] - LEDs show the currently selected filter response(s).

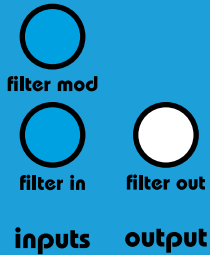
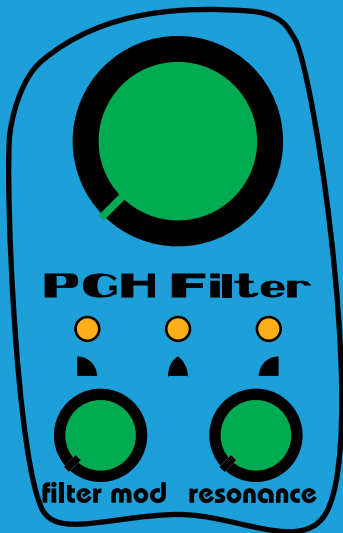
[Filter Mod In Jack] - Cutoff frequency modulation CV input jack.

[Filter Cutoff Mod Knob] - Cutoff frequency CV input level control. When using filter modulation, the **[Filter Cutoff Knob]** becomes the offset control and the **[Filter Cutoff Mod Knob]** sets the amount of CV manipulating the filter cutoff.

[Filter Resonance Knob] - Resonance control knob. Increasing the Resonance (or Quality Factor) Amplifies a Narrow Band of Frequencies around the Filter Cutoff Frequency. State Variable Filter Topology Allows for Near Infinite Resonance Without Falling Into Self-Oscillation.

[Filter In Jack] - Filter audio input jack

[Filter Out Jack] - Filter audio output jack



7 Envelope Module

7.1 Envelope Overview:

The Envelope module is a four stage ADSR envelope generator that smooths the shape of the incoming gates and triggers to produce a more expressive instrument. The Envelope output can be used to control the amplitude of an oscillator, the cutoff frequency of a filter or any other function on a module that accepts control voltages.

The Envelope is designed to be snappy and percussive. Small adjustments to the **[Attack Knob]** will reduce this effect and smooth out the sharp attack.

The incoming gate or trigger signal passes through each of the four stages to output an envelope. When the ADSR module receives a gate or trigger signal, the attack determines the amount of time needed for the envelope generator to reach the peak output voltage and move on to the decay stage. Decay sets the amount of time needed to transition to the level set by the sustain knob. The sustain level is maintained as long as the incoming gate remains on or high. Once the incoming gate goes low or off, the release knob sets the time needed to close the envelope and return the Envelope output to 0 volts.

Envelope outputs 0-10 volts.

7.2 Envelope Controls, Inputs, and Outputs:

[Attack Knob] - Envelope attack time control. Sets the amount of time needed for the envelope output to reach the maximum level.

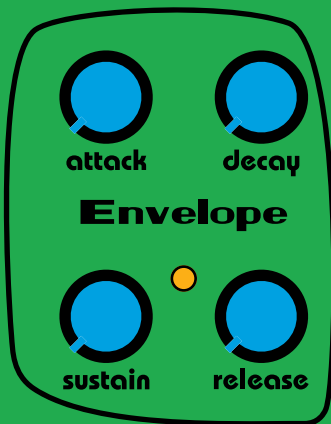
[Decay Knob] - Decay time control. Sets the amount of time needed for the envelope output level to transition to the selected sustain level after the attack stage has completed.

[Sustain Knob] - Sustain level control. Sets the voltage level of the envelope once the decay stage has completed. Sustain is active until the **[Envelope In Jack]** signal turns off.

[Release Knob] - Release time control. Sets the amount of time needed for the envelope output level to return to zero once the **[Envelope In Jack]** turns off.

[Envelope In Jack] - Envelope gate input jack

[Envelope Out Jack] - Envelope CV output jack



8 VCA Module

8.1 VCA Overview:

The VCA is a high quality linear voltage controlled amplifier. Used to attenuate an audio or cv signal using voltage control. In the East Beast, the VCA is the last stage of the synth voice signal chain and controlled with the output of the Envelope to musically shape the volume of the synthesizer voice.

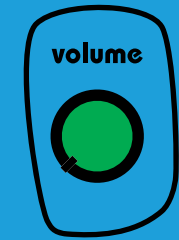
8.2 VCA Controls, Inputs, and Outputs:

[Volume Knob] - VCA level CV input control.

[VCA Mod In Jack] - VCA level CV input.

[VCA Audio In Jack] - Audio signal input.

[Main Output] - Audio signal output. 3.5mm TRS Jack works with mono line or dual mono headphone output.



vca in



vca mod



output

inputs

output

9 LFO Module

9.1 LFO Overview:

The LFO module is a dual range, low frequency oscillator with a +/- 5 volt triangle wave output. Perfect for long sweeps or audio rate frequency modulation. Select between high and low range using **[Green Edit Mode : Note Button D#]**.

9.2 LFO Ranges:

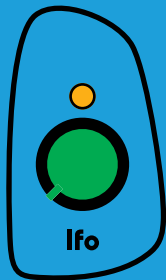
High: 2 Hz to 500 Hz

Low: 41 seconds to 5 Hz

9.3 LFO Controls and Outputs:

[LFO Rate Knob] - Coarse frequency control. Used to set the speed of the LFO.

[LFO Out Jack] - Triangle wave output.



lfo out

output



East Beast

10 Controller

10.1 Controller Overview:

The button controller built into the East Beast is much more than just a one octave keyboard. It includes a MIDI to CV converter, tap tempo clock source, octave shifting, a 32 step sequencer and arpeggiator with pattern saving, and a multi-function modulation tool with a clock sync'd lfo, decay envelope, and random voltage generator.

10.2 4-bit Display:

While modifying controller settings, most selections are visualized using the 4-bit display. This display is made up of 4 LEDs. Clock, hold, random, and sequence. The display shows relevant information when an edit mode selection has been made. After a few seconds, the display returns the LEDs to their main function. The 4-bit display is shown in the manual with a graphic showing a set of 4 LED status indicators. ● represents a lit LED. ○ represents an unlit led.

IMPORTANT!!!

10.3 Edit Mode 1 and Edit Mode 2:

Each key on the controller has 2 additional edit functions, a **(Green)** function and a **(Blue)** function. Accessing these additional functions is simple. To access the **(Green)** function, press and hold **[Edit (Green) Button]** to enable Green Edit Mode options then press the desired function button. To access the **(Blue)** function, press and hold **[Tap Clock (Blue) Button]** to enable Blue Edit Mode options then press the desired function button.

10.4 MIDI to CV:

Ten octave MIDI to CV converter translates midi notes 0-119 into analog 0-10 volt, 1 volt per octave pitch information. Adjustable settings include pitch bend range, envelope retrigger, gate hold, and MIDI out or thru.

MIDI Channel:

MIDI channel can be set using **[Green Edit Mode : Note Button G#]**. Press once to check current channel. Press again to advance through channels 1-16 and omni. 4-bit display shows active MIDI channel in 4 bit binary! 4-bit display blinks for omni.

Pitch Bend Range:

Pitch Bend Range can be set using **[Blue Edit Mode : Note Button D#]**. Press once to check current setting. Press again to advance through the options.

- 2 Semitones 4-bit display: ●●○○
- 5 Semitones 4-bit display: ●●●●○
- 7 Semitones 4-bit display: ●●●●●
- 12 Semitones (octave) 4-bit display: ●●○○●●



East Beast

10 Controller (continued)

10.4 MIDI to CV (continued):

Envelope Retrigger:

Envelope Retrigger can be set using **[Blue Edit Mode : Note Button D]**. With envelope retrigger enabled, the MIDI to CV converter generates a gate for each new MIDI Note On message regardless if a note is currently being held. When disabled, a gate is generated only when there are no active notes.

- Enabled 4-bit display: ● ○ ● ●
- Disabled 4-bit display: ● ● ● ○

Gate Hold:

Gate Hold can be set using **[Green Edit Mode : Note Button D]**. When Hold is enabled, the MIDI to CV converter ignores note off messages and keeps the gate high (5 volts). This is a great way to create drones and soundscapes. **[Display Hold LED]** is lit when gate hold is enabled.

MIDI Out / Thru Mode:

MIDI Out or Thru Mode can be assigned to the **[MIDI Out Jack]** using **[Blue Edit Mode : Note Button G#]**. When MIDI out mode is selected, onboard button keyboard, sequencer, and internal tap tempo clock output to **[MIDI OUT JACK]**. No **[MIDI In Jack]** information is sent to **[MIDI OUT JACK]** in MIDI Out is mode. When MIDI thru is selected, only **[MIDI In Jack]** information is passed to the **[MIDI OUT JACK]**.

- MIDI Out 4-bit display: ● ● ● ○
- MIDI Thru 4-bit display: ● ○ ● ●

10.5 Clock:

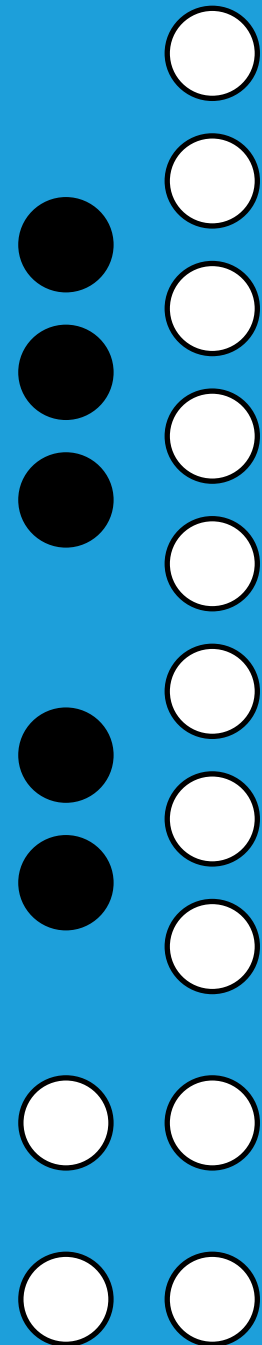
Clock is used for sequencer / arpeggiator timing. When the sequencer / arpeggiator is active, the clock is sent to the **[Clock Out Jack]** as 10ms triggers. The **[MIDI Out Jack]** sends MIDI clock regardless of the sequencer / arpeggiator status but outputs MIDI clock start and stop messages when the sequencer / arpeggiator is turned on or off.

Clock Source:

The clock source can be internal tap-tempo, external MIDI, external gate, or an internal random clock. Internal tempo is set by tapping the **[Tap Clock (blue) Button]**. Tap-tempo is determined based on the timing of the most recent 2 or 3 taps. The tap-tempo counter resets after 3 seconds without a tap tempo button press. Internal random clock is based on the tap-tempo but randomly adds or subtracts up to 90% of the clock rate per step. The random clock is very sloppy and will not sync properly with anything.

Clock source can be set using **[Green Edit Mode : Note Button F#]**. Press once to check current setting. Press again to advance through the clock options.

- Internal Tap-Tempo Clock 4-bit display: ● ● ○ ○
- External MIDI Clock 4-bit display: ● ● ● ○
- External Gate Clock 4-bit display: ● ○ ● ●
- Internal Random Clock 4-bit display: ● ○ ○ ●



10 Controller (continued)

10.5 Clock (continued):

External Clock Divider:

The external clock divider allows the East Beast to run a division of the external MIDI or external gate clock. An external clock source must be selected to modify the external clock division.

External clock division can be set using **[Blue Edit Mode : Note Button F#]**. Press once to check current setting. Press again to advance through the clock divider options.

- $\div 1$ 4-bit display: 
- $\div 2$ 4-bit display: 
- $\div 3$ 4-bit display: 
- $\div 4$ 4-bit display: 

10.5 Keyboard Controller:

The integrated one octave keyboard controller is used to play the East Beast, program the sequencer / arpeggiator, and modify settings within the instrument. The keyboard consists of octave up and octave down buttons, a 13 key C to C piano style keyboard, tap tempo, and edit buttons. Using the **[Octave Up Button]** and **[Octave Down Button]**, the keyboard has a 9 octave range outputting MIDI notes 0-107. Analog pitch is sent to the **[MIDI Pitch Out Jack]** and the analog gate is sent to the **[MIDI Gate Out Jack]**. If the **[MIDI Out Jack]** is in MIDI out Mode, MIDI note on and note off information is set to the **[MIDI Out Jack]**.

10.6 Sequencer and Arpeggiator:

East Beast includes an easy to use 32 step sequencer / arpeggiator. The only difference between the sequencer and arpeggiator mode is how notes are added to the pattern. A sequence can be started in sequencer mode and finished in arpeggiator mode or vice versa.

Enable Sequencer / Arpeggiator Mode:

Turn on the sequencer / arpeggiator using **[Green Edit Mode : Note Button E]**. If sequencer mode is enabled, the **[Display Sequence LED]** will turn on solid. If arpeggiator mode is enabled, the **[Display Sequence LED]** will blink. If a note pattern is in memory, it will begin playing from the first step as soon as the sequencer / arpeggiator is turned on and will stop immediately when it is turned off.

The **[Clock Out Jack]** outputs a clock signal only when the sequencer / arpeggiator is turned on.

Switch Between Sequencer and Arpeggiator Modes:

Switch between sequencer and arpeggiator modes using **[Blue Edit Mode : Note Button E]**. If sequencer mode is enabled, the **[Display Sequence LED]** will turn on solid. If arpeggiator mode is enabled, the **[Display Sequence LED]** will blink. Sequencer / arpeggiator mode must be active to switch between the modes. Switching between sequencer and arpeggiator does not stop, reset, or clear the currently playing note pattern.



10 Controller (continued)

10.6 Sequencer and Arpeggiator (continued):

Sequencer Mode Note Input:

Notes are added to a pattern by pressing a note button, receiving an external MIDI note, or a combination of the two. The note pattern will begin looping as soon as the first note is entered. A rest note can be added to the note pattern with **[Green Edit Mode : Note Button B]**. Clear a note pattern using **[Green Edit Mode : Note Button C2]**.

Arpeggiator Mode Note Input:

Notes are added to a pattern in the order they are played by pressing and holding a series of note buttons or external MIDI notes. The note pattern will begin looping as soon as the first note is entered. The pattern will continue to loop and additional notes can be added to the pattern until a note button is unpressed or external MIDI note off message is received. Once a note button is unpressed or external MIDI note off message is received the pattern will immediately be cleared unless hold mode is active.

Switching to arpeggiator mode enables hold mode by default. Hold mode can be enabled / disabled using **[Green Edit Mode : Note Button D]**. If hold mode is active, when a note button is unpressed or external MIDI note off message is received the pattern will continue to loop until a new note button is pressed or external MIDI note on message is received. Once a new note button is pressed or external MIDI note on message is received the current pattern is immediately cleared and a new pattern is started using the new note button or external MIDI note. While hold mode is active, a note pattern can be cleared by disabling hold mode or using the note pattern clear function with **[Green Edit Mode : Note Button C2]**.

Save / Load:

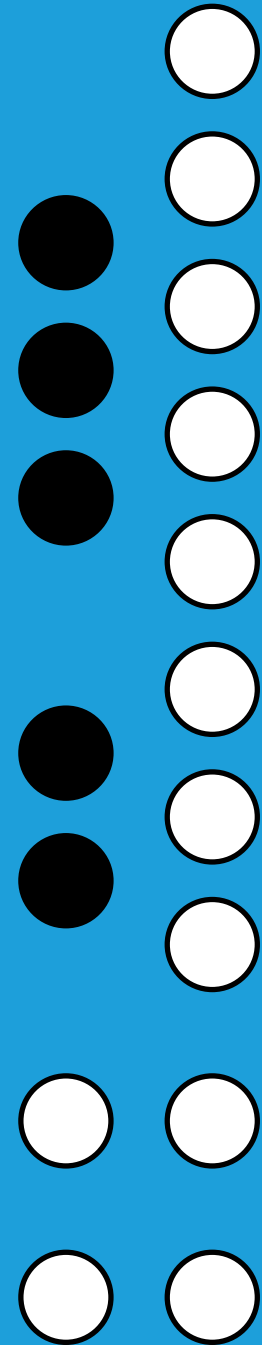
East Beast can save up to 13 note patterns. Patterns can be saved and loaded while sequencer / arpeggiator mode is active.

Load a Pattern:

Press and hold **[Green Edit Mode : Octave Down Button]** and then press a **[Note Button C1-C2]**. The selected sequence will begin after the last step of the active sequence.

Save a Pattern:

Press and hold **[Green Edit Mode : Octave Down Up]** and then press a **[Note Button C1-C2]**. The active sequence will be saved in this location.



10 Controller (continued)

10.6 Sequencer and Arpeggiator (continued):

Swing:

Swing adds a natural feel to a rhythm by delaying every other note a small amount. Swing is applied to the active sequence / arpeggiator and **[Clock Out Jack]**. Swing can be set using **[Blue Edit Mode : Note Button G]**. Press once to check current setting. Press again to advance through the available options.

- 50% (off) 4-bit display: ●●○○
- 54.5% 4-bit display: ●●●○
- 59% 4-bit display: ●○●○
- 63% 4-bit display: ●○●●
- 67% 4-bit display: ●○●○
- 72% 4-bit display: ●●●●

Gate Length:

Gate length sets the amount of time the **[MIDI Gate Out Jack]** remains high (5 volts). Gate length can be set using **[Blue Edit Mode : Note Button A]**. Press once to check current setting. Press again to advance through the available options.

- 10ms 4-bit display: ●●○○
- 30ms 4-bit display: ●●●○
- 40% of step length 4-bit display: ●○●○
- 70% of step length 4-bit display: ●○●●
- 90% of step length 4-bit display: ●○●○

Transpose:

Enable the transpose function with **[Green Edit Mode : Note Button G]**. Transpose mode can only be enabled when the sequencer / arpeggiator is active. The transpose function allows a note button or incoming midi note to transpose the active arpeggiated sequence. The sequence is transposed based on the first note of the active note pattern. Use the **[Octave Up Button]** and **[Octave Down Button]**, to shift octaves.

- Enabled 4-bit display: ●●●○
- Disabled 4-bit display: ●○●●

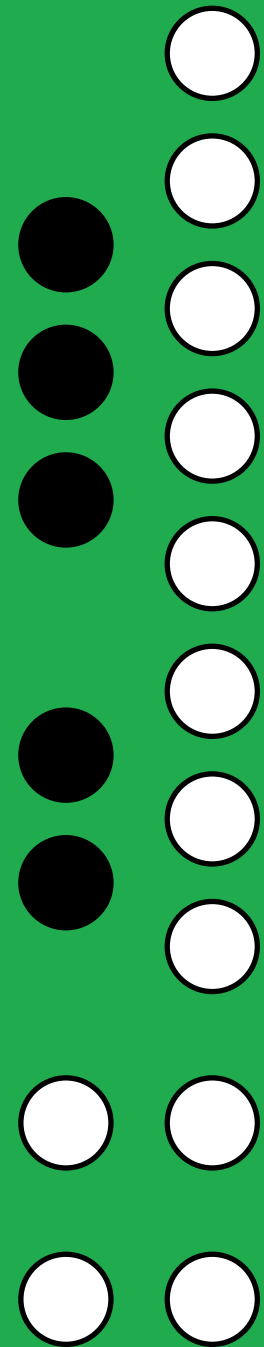
Additional Octaves:

The range function sets the number of octaves the active note pattern will cycle through. The range can be set to 1, 2, or 3 octaves. Set the range by pressing **[Green Edit Mode : Note Button A]**. Press once to check current setting. Press again to advance through the available options.

- 0 additional octaves 4-bit display: ●●○○
- 1 additional octave 4-bit display: ●●●○
- 2 additional octaves 4-bit display: ●○●○

As Played vs. Random Direction:

The sequencer / arpeggiator plays notes in the order they are added to the note pattern. This is called "as played". Random mode can only be enabled when the sequencer / arpeggiator is active. Randomize the active note pattern by pressing **[Blue Edit Mode : Note Button B]**. When active, the **[Display Random LED]** will turn on solid. The random function will randomly jump between the notes of the active note pattern.



10 Controller (continued)

10.6 Sequencer and Arpeggiator (continued):

Random Note Pattern Generator:

Let's all pretend this is not confusing at all and makes sense when using it. Create a randomized note pattern (1-32 steps) with or without rests and pattern morphing. The random pattern generator can only be used when the sequencer / arpeggiator is active. Press **[Blue Edit Mode : Note Button F]** once to create a random pattern. Press again while the 4-bit display is blinking to create a random pattern with a 19% chance of a rest per note. Press a third time while the 4-bit display is blinking to enable pattern morphing with a 10% chance of note changes.

Once a pattern with rests is generated, pressing **[Blue Edit Mode : Note Button F]** will enable / disable pattern morphing without creating a new pattern. Pressing **[Green Edit Mode : Note Button C2]** will clear the pattern and disable pattern morphing.

Pattern Generator 4-bit display:



Pattern Generator with Rests 4-bit display:



Pattern Morphing 4-bit display:







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10 Controller (continued)

10.7 Multi-Function Modulation Generator:

The Multi-Function Tool is a digital voltage generator with four modes controls the **[Multi-Tool Out Jack]**. MIDI CC, triangle LFO, clock sync'd random voltage, or decay envelope. Press **[Green Edit Mode : Note Button A#]**. to cycle between modes. Press once to check current mode. Press again to advance through the available options.












- MIDI CC output 4-bit display: 
- Triangle LFO 4-bit display: 
- Random voltage 4-bit display: 
- Decay envelope 4-bit display: 

MIDI CC Output:

Outputs 0-5 volts based on the selected MIDI CC or modulation wheel. To set the active MIDI CC number, press and hold the **[Edit (green) Button]**. While the **[Edit (green) Button]** is pressed, the MIDI section assigns the active MIDI CC number based on the last incoming MIDI CC message it receives. Simply move a mod wheel or engage an input source on a MIDI controller to assign that MIDI CC number to the **[Multi-Tool Out Jack]**.








Clock Sync'd LFO:

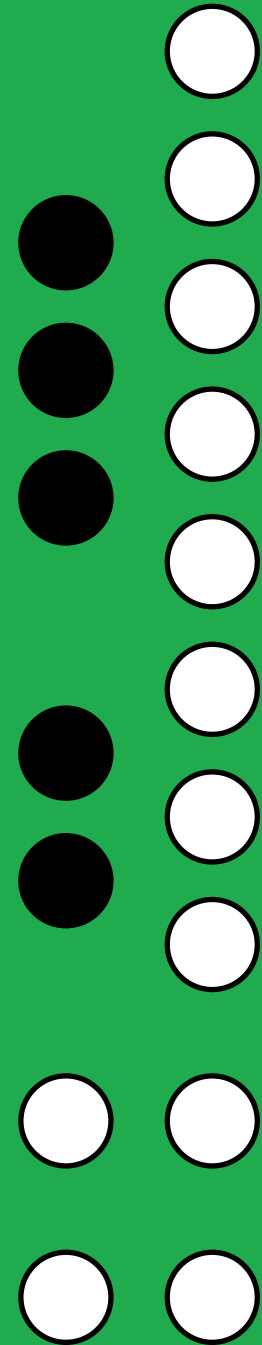
A 0-5 volt triangle wave LFO sync'd to the active clock source. Rate is based on a division or multiplication of the active clock source. Press **[Blue Edit Mode : Note Button A#]** to cycle through clock divisions.

- Divide Clock by 1 4-bit display: 
- Multiply Clock by 2 4-bit display: 
- Multiply Clock by 3 4-bit display: 
- Multiply Clock by 4 4-bit display: 
- Divide Clock by 8 4-bit display: 
- Divide Clock by 7 4-bit display: 
- Divide Clock by 6 4-bit display: 
- Divide Clock by 5 4-bit display: 
- Divide Clock by 4 4-bit display: 
- Divide Clock by 3 4-bit display: 
- Divide Clock by 2 4-bit display: 

Random Voltage:

An unquantized 0-5 volt random voltage. Voltage changes are based on a division or multiplication of the active clock source. Press **[Blue Edit Mode : Note Button A#]** to cycle through clock divisions.

- Divide Clock by 1 4-bit display: 
- Multiply Clock by 2 4-bit display: 
- Multiply Clock by 3 4-bit display: 
- Multiply Clock by 4 4-bit display: 
- Divide Clock by 4 4-bit display: 
- Divide Clock by 3 4-bit display: 
- Divide Clock by 2 4-bit display: 



10 Controller (continued)

10.7 Multi-Function Modulation Generator (continued):

Decay Envelope:

A 0-5 volt exponential decay envelope. Press **[Blue Edit Mode : Note Button A#]** to cycle through decay lengths.

60 ms 4-bit display:	<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
120 ms 4-bit display:	<input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>
240 ms 4-bit display:	<input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
480 ms 4-bit display:	<input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
1000 ms 4-bit display:	<input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
2000 ms 4-bit display:	<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
4000 ms 4-bit display:	<input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>

10.8 Flip Keyboard and Green Functions

The default functionality of **[Note Button C1-C2]** can be set to **[Green Edit Mode]** functions instead of the default C1-C2 MIDI keyboard. Press **[Edit (blue) Button : Note Button C2]** to switch to **[Green Edit Mode]**. When set to **[Green Edit Mode]** the default function of the button is flipped to the Green Edit Mode functionality. The MIDI keyboard is available by pressing and holding the **[Edit (green) Button]** and any note button.



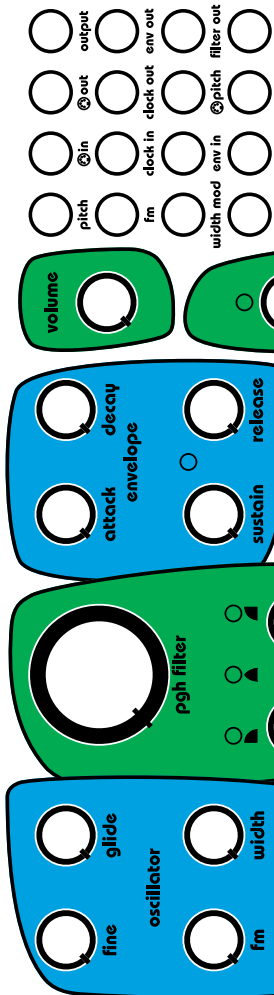
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11 Factory Reset

11.1 All Settings Factory Reset:

Press and hold [**Octave Up Button : Octave Down Button : Note Button C2**] for 5 seconds to reset all modes and functions to the default settings and erase all saved sequences. This action can not be undone.

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12 Eurorack Specs

12.1 Eurorack Specs:

Panel size: 42hp.

Module depth: 25mm.

Power consumption: +12v 213 mA, -12v 151 mA. Does not require +5v. Reversed power polarity protection. Due to the complexity of this module, it requires a significant amount of power. Please use a clean, high quality power source for optimum performance.



