M0SS-201 User Manual (v1.0)

1. Introduction

The M0SS-201 is the second in the line of M0SS synthesizers. It is a west-coast style mono synth, taking inspiration from designs like the Buchla Easel and the MakeNoise 0-Coast. It serves as a complement to the M0SS-101, our east-coast mono synth.

East Coast Synthesis, pioneered by Bob Moog, typically uses bright waveshapes like saws and squares and then uses a filter to dampen and tame this harmonics; as such it is also known as subtractive synthesis. West Coast Synthesis, developed by Don Buchla and sometimes called additive synthesis, does the opposite. Starting with mellow waveshapes like sine and triangle, it adds harmonics through things like frequency modulation and wave folding.

The other part of the legacy of Don Buchla is his focus on modular synthesis. While Moog did develop modular synthesizers, he found wide-spread success selling keyboard synthesizers to musicians, like the famous Minimoog Model D used by Herbie Hancock. Buchla stayed in the modular realm, and so west-coast patches are often characterized by interesting and unusual modulators, as well as generative and experimental sounds.

This aspect of west-coast synthesis was very important to us, and proved an interesting challenge. Typical west-coast synths feature a huge array of patch points, which is simply not possible for such a small form-factor. Additionally, we wanted to provide the widest array of possible sounds, so choosing the set of modulators was an interesting challenge.

We settled on the following feature set:

- A modulation oscillator able to go from LFO to audio rate, with triangle, square, and sawtooth waveshapes
- An audio oscillator that can take indexable through-zero FM from the modulation oscillator, with sine and triangle waveshapes
- Flexible modulator routing that can create self-playing patches
- A random voltage generator with memory, allowing everything from white noise to melodies to be created
- An attack-release envelope with three modes (AR, ASR, and looping AR)
- A five-stage parallel wavefolder based on the original Buchla design, with harmonics control
- A single-pole low-pass gate
- An up to 1.5 second delay with feedback filtering and saturation
- An extensive modulation matrix, with three sources and twelve destinations

We hope that this device allows you to generate never-before heard sounds, and inspires you to experiment and explore.

Andrew March and Lucas Henry

1.1. Connections

The M0SS-201 is powered by a standard DC barrel jack, often used for guitar pedals. It takes 9V center negative power, provided at the port at the top. It draws ~200 mA, plus whatever power is drawn by a connected USB MIDI controller.

Audio out is standard mono balanced line level 1/4”.

There are two options for MIDI in: TRS type A located on the side of the panel, or USB host. The M0SS-201 will power an external controller through its USB MIDI host, allowing minimal cabling.

The M0SS-201 also includes MIDI TRS type A through on the right side of the case, allowing device daisy-chaining. Note that this is software bypass not true bypass, so it will introduce slight latency, and will not work if the device is powered off.

1.2. Extra Resources

Ultrapalace Youtube Channel: https://www.youtube.com/@ultrapalace

M0SS Discord Server: https://discord.gg/SX8BX6Hhq4

Ultrapalace Website: https://www.ultrapalace.com

2. Getting Started

Using a standard guitar pedal power adapter, plug in your M0SS-201. It will boot immediately (there is no power on switch for the device). Connect a MIDI controller either through TRS or USB, and connect the audio out.

By default, the device is set to respond to all MIDI channels (Omni), so simply press a key on your controller and hear the response!

2.1. How to Use the Interface

The M0SS family of products has a unique way of interacting with its parameters, which is what allows us to make the devices so small. Each button on the interface corresponds to a parameter, labelled somewhere around the button. To select the parameter, simply press the button. There are also shift parameters, secondary functions for buttons indicated by labels in smaller text. To access these, hold the **ALT** button before pressing the button you want to select.

Parameters come in three types: Selectors, Faders, and Switches. Modifying these parameters works differently.

2.1.1. Editing Selectors

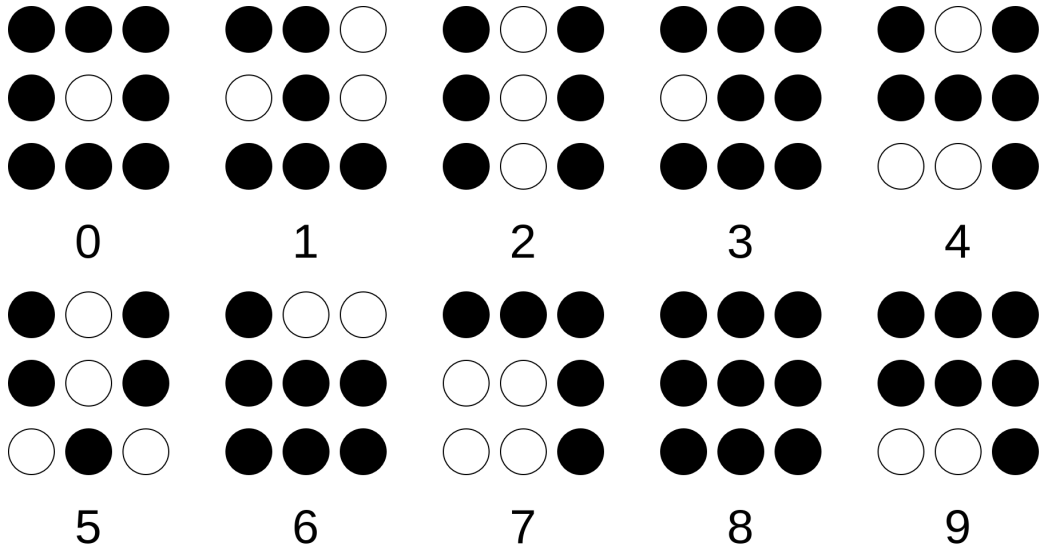
Selectors are indicated by a row of LEDs below the button, each with a label corresponding to the option. Repeated presses of this button will cycle through the available options for this parameter, indicated by the LEDs changing.

2.1.2. Editing Faders

Fader parameters are the equivalent of knobs on most synthesizers, they can take on a range of values. Once a slider parameter is selected, the bottom row of LEDs on the unit will light, indicating the corresponding value. LEDs will light from the left, with all unlit meaning 0 and all lit meaning full. While a slider is selected, simply rotate the single encoder to change its value. Some faders are bipolar, so turning them left from 0 will make the value negative. You can reset a fader to its default setting by pressing **ALT** + **ENCODER**.

2.1.2.1 Numeric Faders

Note that some faders are numeric, and instead will display a representation of that number in the matrix. Each digit occupies a 3x3 grid on the matrix, allowing numbers from 0 to 99 to be displayed. With the exception of 2 and 5, all digits are displayed in their standard arabic numeral form, whereas 2 and 5 use the roman style. These digits are shown below.



2.1.3. Editing Switches

Editing switches works in mostly the same way as Selectors, but these parameters do not have corresponding panel LEDs. Instead of turning on one of their panel LEDs, the bottom row of LEDs will either have the first half on and second half off, or vice versa. This indicates the position of the control. Repeated presses of the button will toggle its value.

2.1.4. MIDI Learn

All of the M0SS synthesizers are fully MIDI compatible, and designed to be used with external controllers. To map an external controller's CC knobs to a parameter in your M0SS unit, follow the steps below.

1. Activate MIDI learn mode by pressing the **LRN** button (**ALT + BIAS**). Once in MIDI learn mode, all LEDs will light orange.
2. Select any parameter by pressing the button (shift parameters are also selectable). The LEDs will light yellow.
3. On your controller, send a MIDI CC (by turning the knob/slider you want to assign). The LEDs will light green.
4. Press **ALT** to exit.

To map aftertouch, hold a note on the keyboard, perform steps 1 and 2, then modulate the aftertouch (change the pressure with which you hold down the note).

To map velocity, perform steps 1 and 2 then press any key on the keyboard.

2.1.5. Preset Save/Load

The M0SS line of synthesizers can store several presets. On the M0SS-201, preset slots are indicated using the LEDs on in the modulation matrix.

To save a preset, follow the steps below.

1. Activate save mode (**ALT + ATT**). Save slots that are available will glow green, while occupied ones will glow orange.
2. Either scroll with the encoder or use the normal matrix button combinations to select a slot. Pressing the encoder will save the current settings to that slot. This can overwrite a slot.

To load a preset, follow the steps below.

1. Activate load mode (**ALT + REL**). The current slot will glow green, while occupied slots will glow orange.
2. In the same manner as for saving, press any occupied slot to load it. Current settings will be lost if not saved.

2.1.6. Reset / Factory Reset

To reset the device (reconnect USB midi devices, recover from a stuck note, clear patch), hold **ALT** and the two mixer buttons (all right beside each other). All lights will flash yellow.

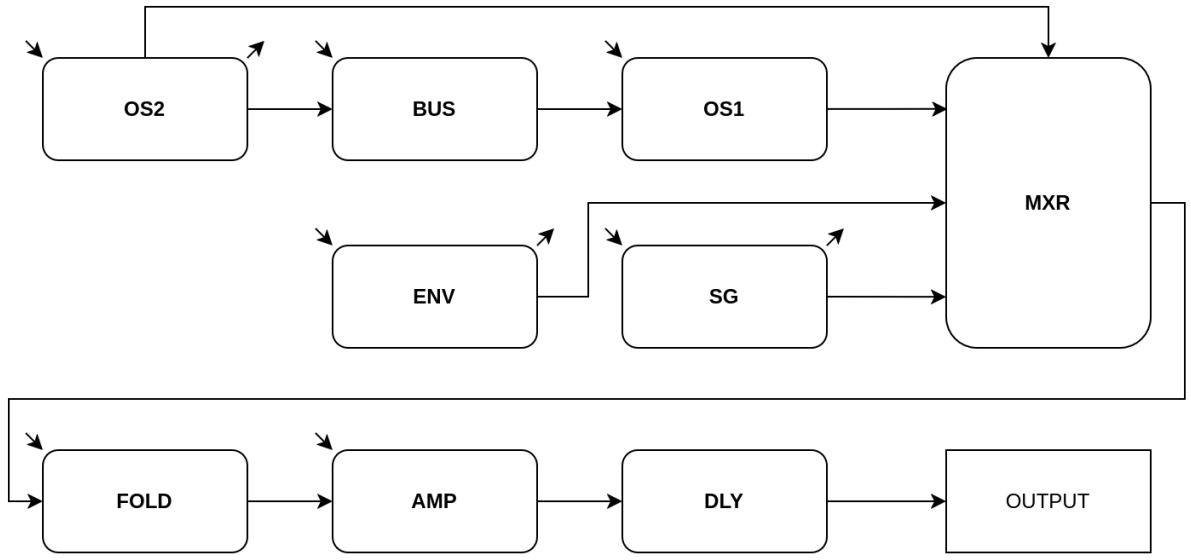
To perform a factory reset, which also clears all patches saved in the device, press the encoder button while performing a normal reset operation. All lights will flash red.

2.1.7. MIDI Channel Select

By default, the M0SS-201 responds to MIDI messages on all 16 channels. To change this behaviour, select **CHN** (**ALT** + **TIMB**). This is a numeric control that ranges from 1 to 17. Settings of 1 to 16 will have the device only respond to that channel, 17 will have it listen on every channel.

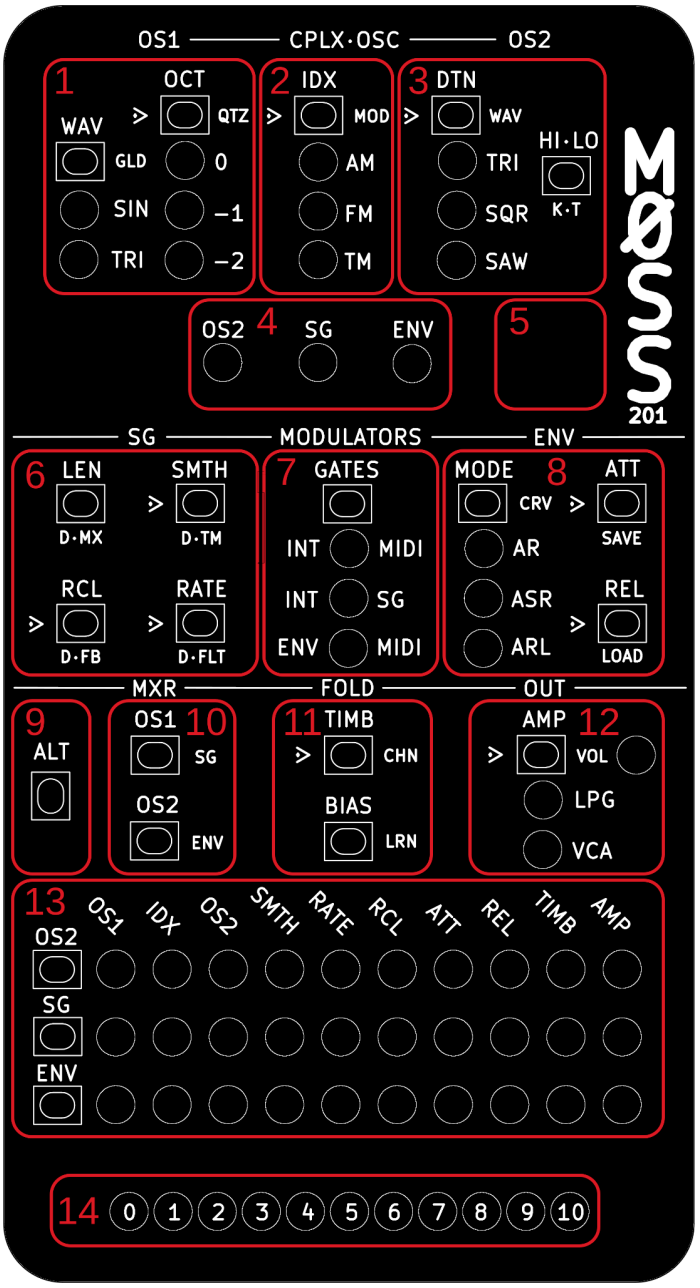
3. General Description

The main audio signal source of the M0SS-201is the primary oscillator, **OS1**. It can generate complex timbres through modulation by **OS2**. It passes through a wavefolder, an amplifier, and finally a delay. The two peripherals **ENV** and **SG** can be routed into the signal chain via the mixer, or left out.



The M0SS-201 also features an extensive modulation matrix. Anywhere a small diagonal arrow points out of a box, that is a modulation source. Anywhere a small diagonal arrow points into a box, that component contains one or more modulation destinations.

3.1. Front Panel Overview



1. The primary oscillator. Main audio source for the M0SS-201.
2. The modulation oscillator. Can operate in high or low frequencies.
3. The modulation bus. Controls the type and amount of modulation the modulation oscillator sends to the primary oscillator.
4. Signal Indicators for the three modulation sources (**OS2**, **SG**, and **ENV**).
5. Encoder. The primary method of interacting with parameters in the synthesizer.
6. Stochastic Generator, the random source in the M0SS-201. The alt functions of these buttons all control aspects of the delay.
7. Trigger source selector for the SG and ENV.
8. AR envelope generator, can operate with sustain or in loop mode.

9. The ALT button. Use to access parameters written in smaller text next to or below buttons.
10. The mixer.
11. The wavefolder.
12. The output amplifier. The output signal indicator is also here.
13. Modulation matrix.
14. Parameter value indicator LEDs.

3.2. Complex Oscillator

In the style of classic west-coast synthesizer modules like the Buchla 259, the core of the M0SS-201 is a complex oscillator. Generally, a complex oscillator features two simple oscillators connected by a modulation bus. This allows complex tones through various modulation types available. The modulation oscillator (labelled **OS2** on the panel) signal is sent into the modulation bus, where the amount and type of modulation is set. This signal is then sent into the primary audio oscillator (labelled **OS1**), and the resulting complex signal is the output.

3.2.1. Primary Oscillator

The primary oscillator **OS1** can output a sine, triangle, or combination signal, set by pressing the **WAV** button.

The pitch range can be offset using the **OCT** control, ranging from 0 to -2 octaves. Smoothing can also be added to the signal using the **GLD** control (**ALT** + **WAV**). The smoothing time ranges from 0 to 400 milliseconds.

The primary oscillator also has a quantizer control **QTZ**, accessed by pressing **ALT** + **OCT**.

3.2.1.1. Pitch Processing

The primary oscillator can receive pitch information from several sources:

1. MIDI note in
2. MIDI pitch bend
3. **OCT** parameter
4. FM through the modulation bus
5. FM through the modulation matrix

Additionally, the pitch information can be modified by both the **GLD** setting and the quantizer (**QTZ**). Some sources are affected by these settings, but some are not. MIDI note in and MIDI pitch bend are not affected by the quantizer, but are affected by **GLD**. **OCT** and FM through the modulation matrix are affected by the quantizer, but not **GLD**. FM through the modulation bus is affected by neither.

A common use for FM through the modulation matrix is to send the Stochastic Generator to the pitch input of **OS2** to randomly create new melodies. By having this path affected by the quantizer, these sequences can always stay in tune, and snap to a scale.

FM through the modulation bus is not affected by quantization or **GLD** because it is often used for audio-rate modulations. Any sort of modification to this signal would greatly affect the tone.

GLD affects only incoming MIDI data because it is meant to be used to add portamento to played performances. If portamento is desired when using the Stochastic Generator to create sequences, the **SMTH** parameter can be used.

3.2.1.2. Quantizer

The primary oscillator includes a quantizer (**ALT** + **WAV**), which allows pitch information coming from the modulation matrix to be snapped to the nearest note. The quantizer is a numeric fader control, storing a list of eleven scales. The options are:

1. Chromatic (12 degrees)
2. Major (7 degrees)
3. Natural Minor (7 degrees)
4. Harmonic Minor (7 degrees)
5. Major Pentatonic (5 degrees)
6. Minor Pentatonic (5 degrees)
7. Blues (6 degrees)
8. Whole Tone (6 degrees)
9. Octatonic (8 degrees)
10. Just Intonation Major (7 degrees)
11. Slendro (5 degrees)

3.2.1.3. MIDI Pitch Bend

The range of midi pitch bend in both the up and down direction can be controlled independently. These are accessed using hidden (unlabelled) controls on the device. They are both numeric controls, setting the range of pitch bend in semitones. The pitch bend up amount is accessed with **ALT** + **OS2**, and pitch bend down is accessed with **ALT** + **SG**. These are both the matrix source buttons, located below the alt button.

3.2.2. Modulation Oscillator

The modulation oscillator **OS2** has two settings that allow it to operate in different modes.

The first setting is **HI.LO**, which changes the frequency range of the oscillator. When this switch is set to high, the oscillator is audio rate, suitable for FM tones. When set to low, the oscillator acts as an LFO, useful for control signals. The status of this can be seen in the

colour of its indicator light below the complex oscillator section. Red for audio rate, teal for control rate.

The second setting is **K.T** (**ALT** + **HI.LO**), which toggles key-tracking. When on, the oscillator will stay in tune with incoming MIDI pitch, but will run free when off. This can be useful for creating a drone oscillator when at audio rate, or a simple LFO at control rate.

The frequency of the modulation oscillator can be modified using its **DTN** parameter.

DTN is a modulation destination, labelled **OS1** on the modulation matrix.

The modulation oscillator has three available waveforms: triangle, square, and sawtooth. These are selected by pressing the **WAV** control (**ALT** + **DTN**), which cycles through the waveforms.

3.2.3. Modulation Bus

The modulation bus takes in the modulation oscillator's signal and scales it by an amount called the index (labelled **IDX**). Then depending on the modulation type setting, it will send this scaled value to one of three destinations.

IDX is a modulation destination on the matrix.

The three possible modulation destinations can be toggled through by pressing the **MOD** control (**ALT** + **IDX**). The possible modulation modes are:

- **AM**: bi-polar amplitude modulation (also called ring modulation) applied to the primary oscillator's output signal.
- **FM**: through-zero linear frequency modulation (TZFM) applied to the primary oscillator.
- **TM**: timbre modulation, changing the amount of wavefolding applied after the mixer.

The modulation bus is a special modulation path in the M0SS-201 because of the inclusion of the **IDX** parameter. This allows the amount of modulation to be modulated, something impossible anywhere else on the synth. A typical use case for this would be to use the envelope to modulate **IDX**, allowing sharp FM tones at the start of a note but dying off towards the end. This is a very classic sound for west-coast synthesizers.

3.3. Output Chain

3.3.1. Mixer

The mixer has two buttons, each with a normal and shift function. These four parameters are the levels of each of the four signal sources (**OS1**, **OS2**, **SG**, **ENV**) into the main signal path.

3.3.2. Wavefolder

The wavefolder is, along with the modulation bus, the main way of creating complex timbres in the M0SS-201. It is a classic west-coast synthesis element, and works quite simply.

Whenever the incoming wave crosses a certain threshold, the signal is inverted or ‘folded’ over, creating kinks in the waveform.

The image above shows a sine wave with the fold amount progressively turned up. As you can see, it flattens, then folds back on itself. If the signal is folded enough, it will reach a point where it can be folded over another time! The image above shows a two stage wavefolder, so it can fold the waveform a maximum of two times.

The wavefolder featured on the M0SS-201 has five stages, so it can create up to five folds in the incoming waveform. This can create some complex and sometimes even messy sounds, allowing lots of room for experimentation. This design is based on circuit analysis of the original circuit present in the Buchla 259, designed by Don Buchla himself.

The **TIMB** (timbre) control on the M0SS-201 controls the amount of wavefolding, and it is also a modulation destination in the matrix. Additionally, the **TM** mode on the modulation bus affects this parameter.

Note that the tone of the wavefolder is affected by the strength of the incoming signal. To reach all five stages of the wavefolder, the incoming signal should be turned all the way up in the mixer.

Another control often included in wavefolders is a symmetry or bias control (labelled **BIAS** on the panel). This adds an offset to the incoming signal, making the folding thresholds different for the top and bottom of the wave. This gives an interesting pulse-width modulation like effect, and also affects the balance of even and odd harmonics in the signal.

> NOTE: **BIAS** is not a destination on the matrix. If you wish to modulate this parameter, simply add whatever modulation source you want in before the wavefolder using the mixer. Even if the modulator is below audio rate (and therefore would not be directly audible), the effect on the audio will still be heard by pushing it into either the top or bottom threshold of the wavefolder.

3.3.3. Amplifier

The amplifier on the M0SS-201 sits after the wavefolder, and has two modes. The first is **VCA**, which is a clean digital amplifier. The input signal is simply scaled by the amount set by **AMP**. The second is labelled **LPG**, for low-pass gate. A low-pass gate is similar to a VCA, but has the property that it will dampen the incoming signal as the amplitude gets lower. This gives a natural ‘pluck’ sound, and is typical of west-coast synthesizers.

Pressing **ALT** + **AMP** activates the volume control **VOL**, which is the master volume for the synthesizer. The indicator LED beside this control shows the output signal of the M0SS-201.

AMP is a modulatable parameter on the matrix, and the default patch has the envelope sent to it. It therefore works like a normal output amplifier, but this is important to note because any modulator can be sent to the **AMP** control instead.

Modulation to the **AMP** control works slightly differently than other destinations in the matrix, because having less than 100% **ENV** to **AMP** modulation would be equivalent to lowering the volume of the synthesizer if it functioned normally.

As such, lowering the **ENV** to **AMP** modulation decreases the effect **ENV** has on **AMP** by increasing the baseline volume threshold. This allows drones to be created by having the amplifier or lowpass gate always a little open. Additionally, because matrix destinations are bipolar, setting **ENV** to **AMP** to be negative creates a ducking effect when the envelope is activated, with the amplifier normally open.

3.3.4. Delay

The delay allows a sense of space and echo to be added to the sound. It sits after the amplifier, and is not modulatable. It has four controls: **D.TM**, **D.FB**, **D.FLT**, and **D.MX**.

D.TM sets the time between the incoming audio and the delayed sound. Very short times can sound almost like a chorus, while longer ones are perceived as an echo. The maximum delay time is 1.5 seconds.

D.FB sets how much of the delayed signal is mixed back in. This can allow for multiple repeats of a signal signal, each decaying in amplitude slightly. Set to 0, there is only one echo audible. At very high amounts, the signal can repeat almost indefinitely. The maximum feedback amount is in fact 105%, which means that each successive delay is louder than the previous one. To prevent clipping, a soft saturator is placed in the feedback path. Some complex and harsh sounds can be created by combining high feedback with changes to the time control.

In addition to the saturator, there is a filter in the feedback path. **D.FLT** controls this, and is a bipolar control. On the negative end of the control, it acts as a lowpass filter which dulls the sound by removing high frequencies. On the positive end, the filter is a highpass, removing

the low frequency elements of the sound and audibly thinning it. More extreme settings of this control in either direction make the effect stronger.

D.MX sets how much of the delayed signal is added into the final output. With the control set to 0, the delay is inaudible. When set to maximum, the main signal is not heard at all, only the delayed repetitions.

3.4. Peripherals

There are two specialty modulation sources on the M0SS-201, and they serve to complement each other and provide a wide array of possibilities for the synthesizer.

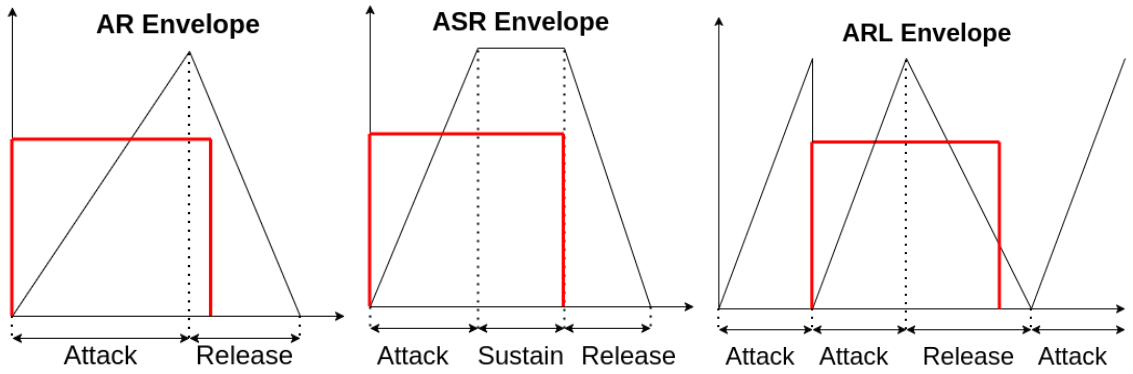
3.4.1. Looping Envelope

Envelopes are a specific kind of signal in synthesizers that are often used to shape sound. They are triggered by some external signal (often a note on/off event) and generate a signal shape based on their parameters. Envelopes have stages, and are classified by what stages they include. One of the most common is an ADSR envelope, which includes an Attack, Decay, Sustain, and Release stage. The envelope included in the 201 is simpler, but much more flexible.

The looping envelope (labelled **ENV** on the panel) has three modes, selected using the **MODE** button. All three modes use two parameters, **ATT** and **REL**. **ATT** sets the time it takes for the envelope to rise from 0 to its maximum value, and **REL** sets the time it takes for the value to fall back to 0.

- **AR**: Attack-Release. The attack stage will play, followed immediately by the release stage.
- **ASR**: Attack-Sustain-Release. The attack stage will play, and the envelope will stay high while the note is held down. When the note is let go, the release stage will play.
- **ARL**: Attack-Release-Loop. Like the **AR** envelope, but when the release stage ends the attack stage will automatically start again. In this mode, the envelope is free-running (starts before a note is played) but it will reset to the start of attack when a note is sent.

The diagram below shows in detail how these three modes behave. The red line shows note on/off, while the black line shows the envelope's behaviour.



Note that the AR and ARL envelopes do not respond to note off, and the ARL envelope starts before a note is played.

The envelope also has a curve control (**ALT** + **MODE**). This is a bipolar control that affects the curvature of the attack and release stages of the envelope. With the control centered at 0, the stages will be linear. Turning it up will make the stage more exponential, while turning it down will make it more logarithmic. This means either the rising amount will either increase or decrease as the stage goes on.

3.4.1.1. Legato Mode

Changing legato mode affects the behaviour of the envelope when pressing a second note while another is already held down. When legato mode is on, this second note will not retrigger the envelope. This means holding down a single note and playing more while the envelope is in AR mode will result in subsequent notes not being heard as the envelope dies down. Legato mode is off by default. To toggle this hidden control, press **ALT** + **GATES**.

3.4.2. Stochastic Generator

The stochastic generator (labelled **SG** on the panel) is a unique peripheral. At its core, it is just a list of values. Every time it receives a trigger it steps through the list and outputs the next value. However, when it steps, it either chooses a new random value to store in that position, or keeps the original one.

LEN controls the length of the array, from 2 up to 32.

RATE controls how often the current value of the array is changed. This speed can go up into audio rate.

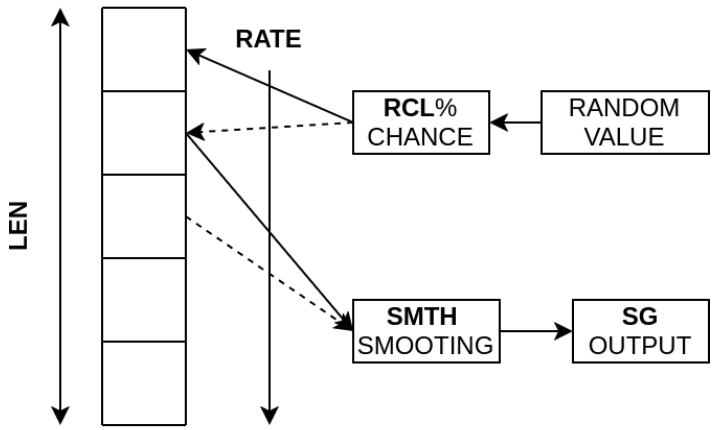
RCL (recall) controls the chance that when the array is progressed, a new random value will be overwritten instead of maintaining the old one. With recall set to 0, the SG will behave like a stepped random source. With recall set to 100, it will repeat the same sequence indefinitely. With recall at middle values, it will output a mutating sequence that will change quicker at lower recall amounts.

SMTH (smooth) applies smoothing to the output of the SG.

> NOTE: with **RCL** set all the way down, changing **LEN** will have no noticeable effect. The values will remain fully random no matter what.

SMTH, **RATE**, and **RCL** are all matrix destinations.

A diagram showing how the stochastic generator works is shown below.



In the diagram above, the boxes represent the list where values are stored. The read position is always one ahead of the write position, and progresses as controlled by **RATE**. Every step, there is a chance controlled by **RCL** that the value at the write position will be overwritten with a new random value.

3.4.3. Peripherals Trigger Selector

Each of the two peripherals are triggered in some way, either to start an envelope or step to the next value. The Looping Envelope is affected by the MIDI gate signal, and the Stochastic Generator is triggered by its own internal clock (controlled by **RATE**). However, using the **GATE** control, this can be changed.

The **GATE** control has three options, corresponding to the three different ways that the two peripherals can be triggered and interact with each other. The control has labels on either side, representing the trigger source for the **SG** and **ENV** respectively.

- **INT - MIDI**: this is the default mode. The **SG** is triggered internally by its **RATE** control, and **ENV** responds to MIDI gate.
- **INT - SG**: in this mode, both peripherals are clocked by the **SG**'s **RATE** control. The envelope will trigger every time a new value is chosen by the **SG**. This is useful for generative performances.
- **ENV - MIDI**: in this mode, **ENV** is the master. Every time an envelope cycle starts, it triggers the **SG**. This mode can be used to get a new random value every time a note is played.

NOTE: In **ENV - MIDI** mode with the envelope set to **ARL**, repeats of the envelope will also trigger new values at the **SG**. This is taken advantage of on one of the demo videos on the ULTRAPALACE youtube channel, where we make a classic generative patch with randomized note length and pitch, generating odd rhythms.

3.5. Modulation Matrix

The modulation matrix is at the core of the M0SS-201, and takes up a significant amount of space on the panel. It allows virtual patch connections to be made throughout the synthesizer, from any of three sources (**OS2**, **SG**, and **ENV**) to any ten destinations.

To use it, start by pressing one of the source buttons located on the side of the matrix. While holding this, press any of the destination buttons. These are located throughout the synth, and are indicated by the special symbol ⩾. Once both are pressed, this modulation path is selected. Like any other parameter, simply turn the encoder to increase the modulation depth. The corresponding LED will begin to glow on the matrix, with a strength proportional to the modulation depth. Modulation destinations are bipolar, so they can be turned left of 0 to create negative modulation. This is indicated by a red light in the matrix as opposed to the usual teal.

The default patch includes the modulation connection **ENV** to **AMP** to allow normal synthesizer behaviour, but this is completely optional and not hard-wired.

4. Patch Ideas

4.1. SG Craziness

Turn up the stochastic generator in the mixer, turn down the **ENV** to **AMP** control in the matrix to activate drone mode, and then turn **RATE** up until the SG is heard (noise). Tweak the recall control to fade from noise to a pitch. Change **SMTH** to affect the tone of this signal. Try using the SG to modulate itself to get some interesting and unpredictable effects.

4.2. Classic FM

Set the complex oscillator to use FM and make **OS2** track pitch with the midi signal. Turn up **IDX**, then tweak **DTN** and try to find a sweet spot. Set the envelope to **AR** mode and have it modulate **IDX**. Turn up the wavefolder to get some very complex tones.

4.3. Delay Experiments

Turn up the mix of the delay so it is audible, then turn up the feedback to the maximum. (Careful to have your volume low when you do this). Play a note to add a signal into the delay, then try tweaking the time and filter parameters to create some intense tones. Even better to assign these controls to knobs on a midi controller.

4.4. Bouncing Ball

Set the envelope to **ARL**, then **OS2** to low frequency mode. Have **OS2** modulate the release time of the envelope **REL**. Add some wavefolding to make the timbre more interesting, and maybe have the SG affect the pitch of **OS1**.

4.5. The Krell Patch

Set the envelope to **ARL**, then set **GATES** to **ENV-MIDI**. Each loop of the envelope now triggers a new value in the **SG**. Set **SG** to modulate both the envelope **REL** as well as **OS1**. Now every new note has a random pitch and time. Turn on the quantizer by pressing **ALT** + **OCT** and choose a scale you like. Try turning up **SMTH**, this will create a strumming effect as the stochastic generator glides and is quantized. The delay will sound good on this atmospheric and generative patch.