

**USER MANUAL**

**\_MATRIXBRUTE**

**ARTURIA**

**\_The sound explorers**

# Special Thanks

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**Product version: 2.0.0**

**Revision date: 25 July 2023**

# Thank you for purchasing the Arturia MatrixBrute!

This manual covers the features and operation of Arturia's **MatrixBrute**.

In this package you will find:

- One MatrixBrute analog synthesizer, with a serial number on the bottom. You will need this information in order to register your MatrixBrute online.
- A handy "Cheat Sheet" card that lists many of the front panel shortcuts
- One IEC AC power cord.

**Be sure to register your MatrixBrute as soon as possible!** There is a sticker on the bottom panel that contains the serial number of your unit. This is required during the online registration process. You may want to record these elsewhere or take a photo of the sticker in case it becomes damaged.

Registering your MatrixBrute provides the following benefits:

- It enables you to download the MatrixBrute user manual and the latest version of the MIDI Control Center software
- It allows you to receive special offers restricted to MatrixBrute owners.

## Special Message Section

### Specifications Subject to Change:

The information contained in this manual is believed to be correct at the time of printing. However, Arturia reserves the right to change or modify any of the specifications without notice or obligation to update the hardware that has been purchased.

### IMPORTANT:

The product and its software, when used in combination with an amplifier, headphones or speakers, may be able to produce sound levels that could cause permanent hearing loss. DO NOT operate for long periods of time at a high level or at a level that is uncomfortable.

If you encounter any hearing loss or ringing in the ears, you should consult an audiologist.

### NOTICE:

Service charges incurred due to a lack of knowledge relating to how a function or feature works (when the product is operating as designed) are not covered by the manufacturer's warranty, and are therefore the owner's responsibility. Please study this manual carefully and consult your dealer before requesting service.

### Precautions include, but are not limited to, the following:

1. Read and understand all the instructions.
2. Always follow the instructions on the instrument.
3. Before cleaning the instrument, always remove the USB cable. When cleaning, use a soft and dry cloth. Do not use gasoline, alcohol, acetone, turpentine or any other organic solutions; do not use a liquid cleaner, spray or cloth that's too wet.
4. Do not use the instrument near water or moisture, such as a bathtub, sink, swimming pool or similar place.
5. Do not place the instrument in an unstable position where it might accidentally fall over.
6. Do not place heavy objects on the instrument. Do not block openings or vents of the instrument; these locations are used for air circulation to prevent the instrument from overheating. Do not place the instrument near a heat vent at any location with poor air circulation.
7. Do not open or insert anything into the instrument that may cause a fire or electrical shock.
8. Do not spill any kind of liquid onto the instrument.
9. Always take the instrument to a qualified service center. You will invalidate your warranty if you open and remove the cover, and improper assembly may cause electrical shock or other malfunctions.

**10.** Do not use the instrument with thunder and lightning present; otherwise it may cause long distance electrical shock.

**11.** Do not expose the instrument to hot sunlight.

**12.** Do not use the instrument when there is a gas leak nearby.

**13.** Arturia is not responsible for any damage or data loss caused by improper operation of the instrument.

**14.** The apparatus shall be connected to a mains socket outlet with a protective earthing connection.

**15.** The mains plug is used as the disconnect device, The socket-outlet shall be installed near the equipment and shall be easily accessible.



*The symbol indicates AC voltage*



*Warning : pay attention to not smash your fingers or any parts of your body when setting the height of the control panel.*

# Introduction

## **Congratulations on your purchase of the Arturia MatrixBrute!**

The MatrixBrute is designed to be a supremely powerful, modern analog classic synthesizer.

The roots of this product stem from the greatest synthesizers of all time, all enhanced with Arturia's own modern touch and character. The now famous 'Brute' style oscillators, paired with the classic sounds of both the Steiner-Parker filter and a famous 24dB/Octave ladder filter, plus our own analog effects section, give you a wealth of tools and amazing sonic character to build sounds that are uniquely yours.

The center point of the MatrixBrute is the impressive Matrix Modulation, from which the name is derived. This matrix allows you to take control and route modulation sources in a nearly endless number of ways. Couple this with the performance features of the sequencer, arpeggiator, assignable macro knobs, and the vast CV connectivity and you have a product that will be the center piece in your studio or stage setup.

We are proud and thrilled to bring you this iconic synthesizer. It is the realization of the highest analog synthesizer dreams of our entire development team.

Be sure to visit the [www.arturia.com](http://www.arturia.com) website and check for the latest firmware, download the MIDI Control Center and check out the tutorials and FAQs. Get ready to explore synthesis in a whole new way.

Musically yours,

**The Arturia team**

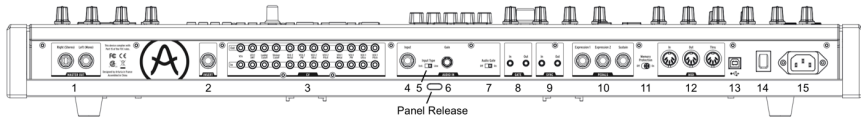
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# 1. CONNECTIONS



Back View

Panel Release latch - Push, then use the hinged prop inside the case to set the control panel at the most convenient angle. You can also leave the panel flat.

**1. Master Out** - 1/4" unbalanced +4dBu stereo line-level outputs, intended to go to an amp and speakers, or to an audio interface or mixer. For mono use the left channel only.

**2. Insert Send/Return** - +4dBu 1/4" TRS jack for sending the output of the synth (mono) to an external processor and back in. This goes before the Master Out in the signal path. It requires an insert cable, wired: Tip = Send, Ring = Return, Sleeve = Ground.

**3. CV Ins/Outs** - 3.5mm control voltage outputs and inputs for being controlled/controlling by modular synthesizers. 12 parameters are available (VCA, LFO 1 Amount, Ladder Filter Cutoff, Steiner Filter Cutoff, VCO 2 Metal, Pulse Width, Ultra, Pitch; VCO 1 Metal, Pulse Width, Ultra, Pitch). The CV inputs are tolerant to +/-15V

**4. Input** - External input. Run external instruments through the MatrixBrute's synthesis engine.

**5. Input Type (Inst/Line)** - For external instrument, use Instrument level for Hi-Z sources like an electric guitar or bass; use Line level for sources such as another electronic instrument, mixer output. This is an unbalanced input. Line = 68k $\Omega$ . Instrument = 1.1Meg $\Omega$

**6. Gain** - Level control for external instrument input, used in conjunction with the Gate (#7). Line Gain = 0 -> 20dB. Instrument Gain = 0 -> 40dB

**7. Audio Gate (Off/On)** - A gate extractor that allows you to use external audio signals, like a guitar, to trigger the envelope generators. The Gain control (#6) adjusts the level of the instrument relative to this threshold.

**8. Gate In/Out** - Receives/sends a voltage trigger, usually to/from another analog synthesizer. Use it to trigger the MatrixBrute from another source, such as an analog drum machine.

**9. Sync In/Out** - This allows you to synchronize the MatrixBrute with devices that support the DIN 24 sync standard.

**10. Expression 1, 2; Sustain** - Pedal inputs. Expression 1 and 2 are for continuously variable expression pedals (sometimes called volume pedals), Sustain is for a momentary on/off pedal (i.e. a sustain pedal).

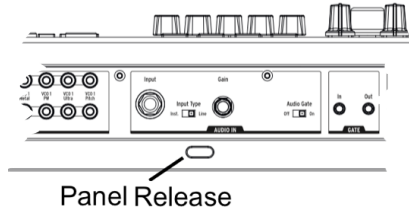
Some manufacturers reverse the polarity of their pedals; download the MIDI Control Center software from [www.arturia.com](http://www.arturia.com) to correct the polarity of any of them. These pedals are converted to MIDI, so they appear in the MIDI Out data stream. Expression pedal wiring is Tip = pot center tap; Ring = 3.3V; Sleeve = Gnd

**11. Memory Protection On/Off** - When On, prevents the MatrixBrute's patch Preset and sequencer Pattern memories from being overwritten.

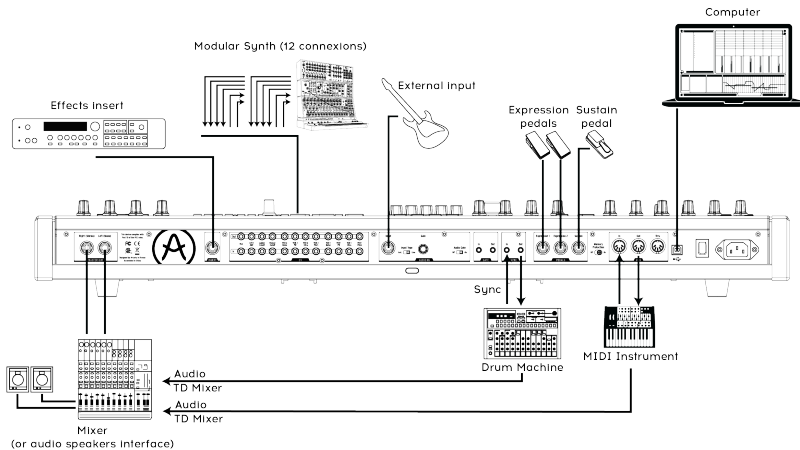
**12. MIDI In/Out/Thru** - Standard 5-pin DIN jacks. Connect to MIDI interfaces and other equipment.

- 13. USB** - USB B jack for connecting MatrixBrute to a Mac or PC (which normally have USB A connections; the cable is often called a "printer cable.") This lets you use Arturia's MIDI Control Center software (available from [www.arturia.com](http://www.arturia.com)), and it also sends/receives MIDI - no additional MIDI interface is required.
- 14. Power switch** - Turn the instrument on and off.
- 15. AC jack** 100-240Vac, 50-60Hz, 45W

## 2. GETTING STARTED WITH MATRIXBRUTE



With the MatrixBrute on a solid playing surface, push the **Panel Release** latch and use the hinged prop inside to set the control panel at the most convenient angle (or just leave it flat if that works better). Take care when lifting on the MatrixBrute panel as it could cause the support to fall. Pay attention to secure it properly with the hinged prop before releasing it. Pay attention to not smash your fingers or hands when handling.

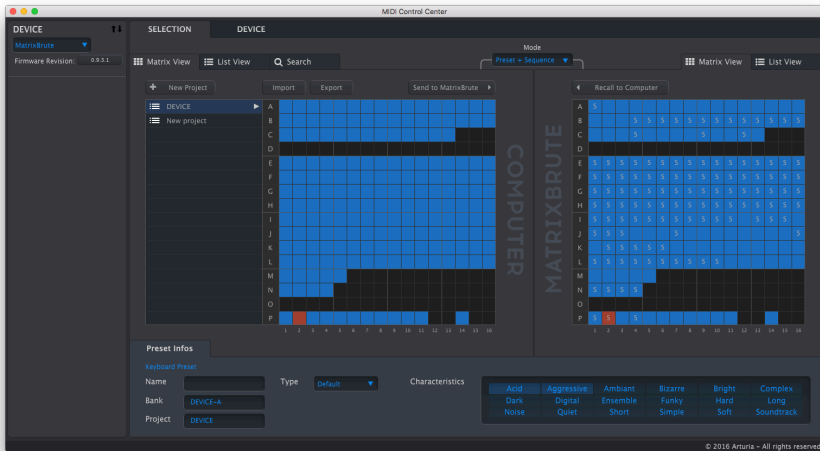


### Back View

In order to hear the instrument, connect cables from the Master Out to your amp and speakers. Use the left output for mono, i.e. if you're only using one cable. (You can also just use headphones - the jack is on the left side of the front edge, by the wheels.)

**i Register and update first:** MatrixBrute is designed so it can work stand-alone, but it also brings some very useful features to a computer environment.

Please use a USB-B to USB-A cable to connect it to a Mac or PC when you first get it.



*The MIDI Control Center*

Then go to [www.arturia.com](http://www.arturia.com) and download the MIDI Control Center software for Mac and PC. Arturia is constantly improving our instruments, so we ask that you update to the latest firmware (which you do through this program).

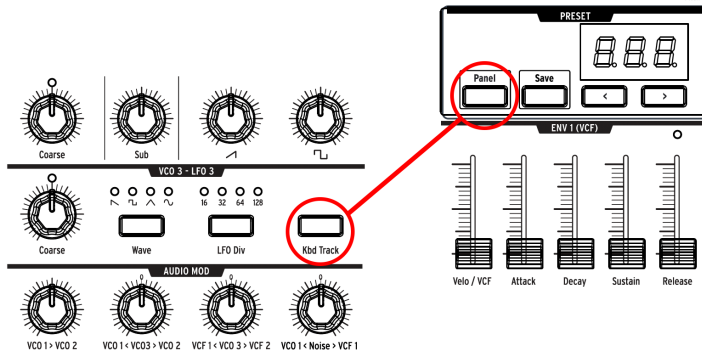
MIDI Control Center is a librarian for presets and sequences, and it's used to configure the instrument's MIDI settings.

**MIDI:** In addition to the keyboard, almost all the knobs and sliders send and respond to MIDI, so you can record and edit them in a DAW. This also makes the instrument useful as a hands-on controller for other instruments. MIDI can go in and out the USB port, the 5-pin DIN ports, both, or neither.

For details about which MIDI Continuous Controllers each fader and knob sends/receives, please [see the section on MIDI \[p.49\]](#).

## 2.1. Auto-Tuning MatrixBrute

**Kbd Track + Panel** auto-tunes the instrument. You'll need to do that once in a while, more often before it warms up.



Part of the beauty of analog synths like the MatrixBrute is that the components in the analog circuits are temperature sensitive, giving them a slightly random character. It also takes a while for the voltage to stabilize when you first turn the synth on; the warmer the temperature, the shorter the time it takes, but you'll still need to auto-tune the instrument from time to time.

Hold down **Kbd Track** and **Panel** to initiate the auto-tuning process.

## 2.2. Understanding Digitally-Controlled Analog

*Summary: The knobs and sliders don't necessarily reflect the underlying settings. There are some different behavior settings in the MIDI Control Center software, but in the default mode you must sweep the knob past its actual setting to "hook" it.*

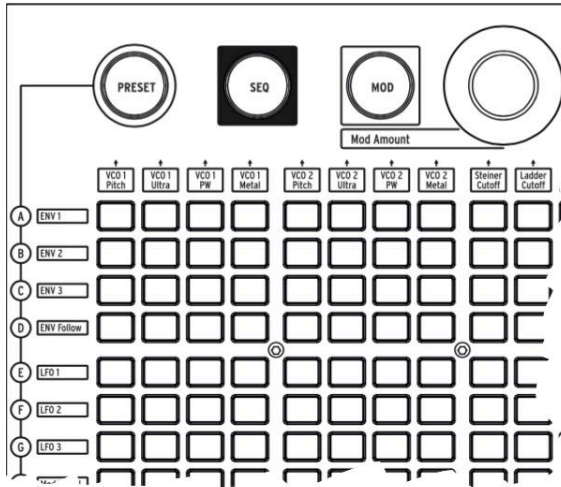
Unlike early analog synths, MatrixBrute has the advantage of digital control over its analog circuitry. It's the best of both worlds: the warmth and hands-on control of real analog, with the ability to save and recall patches and settings - to say nothing of the Matrix (electronic patchbay), MIDI, and other modern conveniences.

Because of that, the instrument's knobs and sliders aren't actually controlling voltages directly, they are knobs that instruct the digital circuitry how to control the analog voltages. So the positions you see on the panel don't necessarily reflect where they're really set, for example after you load a Preset sound.

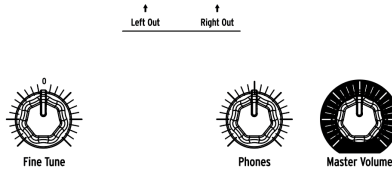
The MIDI Control Center software has three modes. In Hook mode you must sweep the knob until it catches its actual position before it has any effect. Jump mode means the voltage jumps to the knob position as soon as you move it; and Scaled mode scales the range of the knob based on the stored value and the physical distance to either extreme.

The Panel button mentioned above will bypass the current preset and give you a sound that is based on the actual positions of the knobs and sliders.

## 2.3. Load a Preset, Play, and Adjust the Output Level



Press PRESET, and the button will turn purple.



Push a button to load a Patch so you can play the instrument. Adjust the output and/or headphone levels, and fine-tune the pitch (if needed).

**i** Be sure the Panel button mentioned above isn't lit, or you won't be listening to the Preset.

MatrixBrute stores 16 banks of 16 Presets (total 256). The banks are rows A - P on the left, Presets within each bank are in columns 1-16. To select, say, patch B3, go two rows down and three columns across; B 03 will appear in the numeric display.

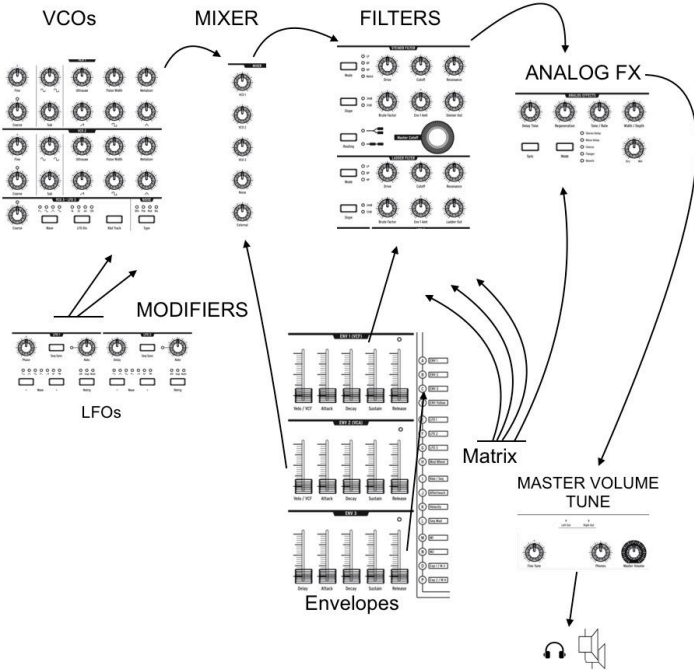
(The Matrix is also used for the 64-step pattern sequencer/arpeggiator, and when you push MOD it becomes the electronic patchbay.)

## 3. GUIDED TOUR

The following walkthrough will give you a solid foundation for the MatrixBrute. After this you'll have a good understanding of what you're doing when you create and shape sounds.

### 3.1. Subtractive synthesis overview

MatrixBrute is an analog subtractive synthesizer. Subtractive synthesis starts by generating basic waveforms, and then you remove what you don't want to sculpt the timbre you're after. MatrixBrute can also use external sounds as basic waveforms, and then process them through its engines.



The basic signal flow is simple:

- **VCO (voltage-controlled oscillators)** [p.18] generate various kinds of waveforms.
- **VCF (voltage-controlled filters)** [p.29] shape the harmonic content, but they can also self-oscillate to become sound sources.
- An extensive list of modifiers, identified by a charcoal-colored background, move the other parameters around over time in various ways. In some cases, modulators can control other modulators.

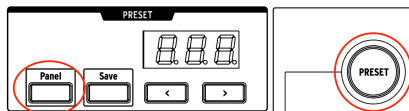
- One of the main features in the MatrixBrute is... its Matrix (hence the name). This is an electronic modulation-routing patchbay, so everything that could be a source can be routed to any and all possible destination parameters. Some modulation sources you move physically, such as the modulation wheel; others can either run freely or lock to the internal sequencer's clock. Or they can lock to MIDI.

Triggers from the 4-octave keyboard and the sequencer/arpeggiator - as well as incoming MIDI notes - could also be considered modifiers when they're doing more than just playing notes.

The final module in the MatrixBrute's audio path is an analog effects section, and the output levels and master tuning are separate from the synthesis engine.

Throughout an analog synthesizer, frequencies are controlled by voltage. MatrixBrute uses 1V per octave, so for example from C3 to C4 is a 1V increase, and from C3 to F#3 is a 0.5V increase.

### 3.2. Initializing a Preset



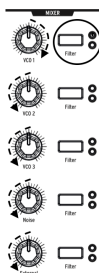
To create your own sound from scratch, begin by initializing a preset. This will create a simple sound with no modulation routings that will allow you to quickly build up your sound. To do the initialization: Hold **Panel** and then press **Preset**.

### 3.3. Hands On

MatrixBrute has more than one of every type of module, but it's only necessary to go through one of each for this bird's-eye view. So we'll just use one VCO, one VCF, one LFO, one envelope.

#### 3.3.1. VCO 1

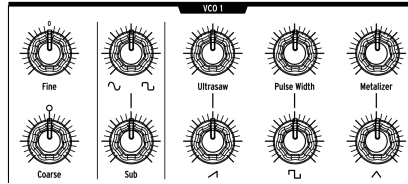
Play the keyboard, and you'll hear a buzzy sound. If you don't, hold Panel and then press Preset to [initialize the sound \[p.10\]](#).





Turn **VCO 1** up all the way, everything else all the way down in the mixer. These are all the waveforms available for processing, and we're only working with VCO 1.

Keep pressing VCO 1's **Filter** button until it's only routed to the red one, the Steiner filter. Oscillators must be routed to a filter to be audible.



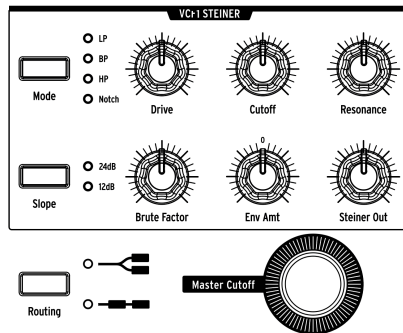
Now that you're hearing VCO 1 on its own, move the **Coarse** knob to hear what it sounds like at different pitches.

There are four different waveforms in this VCO - a Sub oscillator that sounds an octave below the other three. Each wave generator has a level knob on the bottom row and an enhancer for it on the top.

Turn all four down, then bring each one in one at a time so you can hear the different waveforms. Try the enhancers to hear their effects on the waveforms.

For now, leave everything at 12 o'clock. It doesn't matter that this isn't a great sound.

### 3.3.2. VCF 1



Now to shape the sound's timbre with VCF 1.

Sweep the **Master Cutoff** knob while playing. (VCF 1's Cutoff knob has the same effect when you're only listening to one filter; the Master controls both together.)

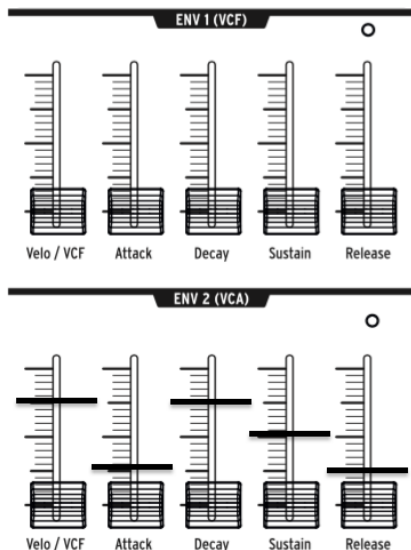
With the initialized setting, the filter is set to lowpass, meaning it removes high frequencies. Cutoff selects the *corner frequency*, which is where it starts operating. This has a radical effect on the timbre of the sound.

Notice that there's no sound when you turn the way down (because you're blocking all the frequencies from passing). You'd think the VCO, the sound waveform generator, would be what turn the sound on and off - and it does - but sounds can also be controlled by opening up a filter.

Bring up the **Brute Factor** knob, and experiment it, and with **Drive**. It's not necessary to point out that you're adding some real testosterone to the sound. The **Resonance** control adds more brightness. You can leave VCF 1 set where it sounds good.

The sound in its present state is just on/off, which is what you want for, say, organ sounds. We'll adjust that next.

### 3.3.3. ENV 2



Envelopes shape voltage levels over time while you're triggering a note on the keyboard. While it can be routed to additional places in the MOD Matrix (see below), ENV 2 is always hardwired to control the MatrixBrute's VCAs. VCA stands for voltage-controlled amplifiers, which means all the sound sources that appear in the Mixer, i.e. the VCOs and/or any external signals plugged into the back of the instrument.

- Start by raising ENV 2's **Attack** slider all the way up and down to "catch" the fader's actual position. Play the keyboard while gradually raising it. This has the effect of fading in the note. A quarter of the way seems like a reasonable setting.
- The middle two stages of the envelope, **Decay** and **Sustain**, are set to one-size-fits-all settings in the initialized patch we started from. Attack is how long it takes the voltage to fade in to its initial level. From there, Decay sets how long it takes to glide to its Sustain level.
- Now for the **Release** stage of this 4-stage envelope (Attack/Decay/Sustain/Release, or ADSR). This sets how fast the note fades out when you release the key. Again, a quarter of the way up might be a reasonable setting.
- Notice how every note plays at the same volume, no matter how hard you play the keyboard? The **Velo/VCA** fader lets you dial in how responsive the envelope is to keyboard *velocity*, which is what electronic keyboards use to determine how hard you intended to play.

When the slider is all the way down, every note plays at full volume; all the way up, and you have to slam the keyboard to get it to speak up. See whether you like three quarters of the way up.

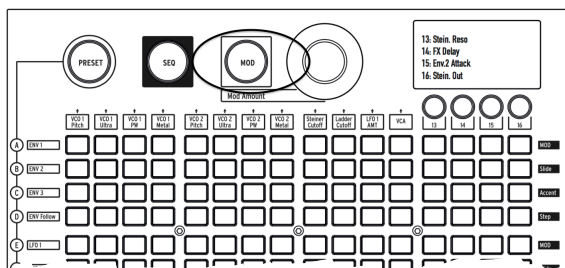
The MatrixBrute has two other Envelopes, which are described in [this section \[p.31\]](#). But here's a quick summary:

- ENV 1 is hardwired to the two filters' Cutoffs. It works the same as ENV 2, so you can experiment with its settings as described above. Note that each filter has a knob labeled "Env Amt", which must be set to a non-zero value so ENV 2 can affect that filter.
- ENV 3 is available as a modulation source in the MOD Matrix; it has no direct effect on the patch.

### 3.3.4. LFO/Aftertouch/Matrix

Next, how to route modulation sources in the Matrix, including the LFOs.

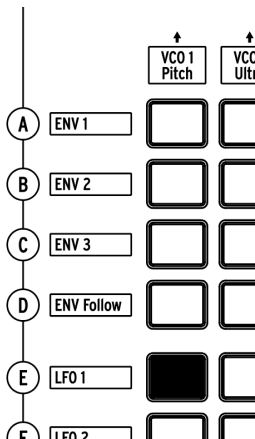
Low Frequency Oscillators (LFOs) are periodic waveforms just like VCOs, only they're very low - which by definition means they're very slow. Rather than being used as sound sources, LFOs 1 & 2 are used as modifiers to add movement to other parameters. (However, VCO3 is intended to be used as both a sound source and a modifier.)



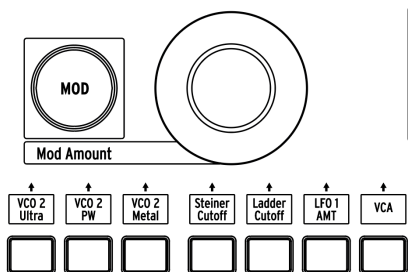
Press the **MOD** button. The Matrix becomes an electronic patchbay.

We're going to route LFO 1 to VCO1's pitch. Depending on the settings, this can create anything from a vibrato effect, to subtle movement, to some really crazy stuff.

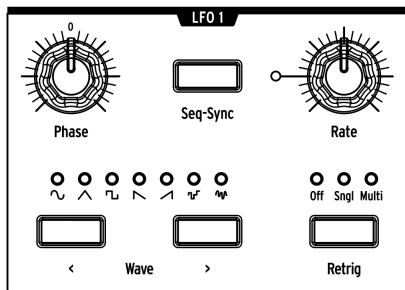
Like all modifiers (other than the hardwired envelopes), LFO 1 has to be routed before it does anything. Modulation sources are on the rows on the left of the Matrix, destinations are columns across the top.



LFO 1 is five rows down, VCO 1 Pitch is the first column, so simply push the button where the two intersect. The button lights purple, indicating it's the one that's selected; if you click on another button to select additional modulation routings, it'll turn blue to show it's been assigned.



LFO 1 still won't modulate the pitch until you dial in a **MOD Amount**. Try + or -13, a fairly radical pitch modulation, so you can hear the effect.



You'll also need to set LFO 1's **Phase** and **Rate** knobs where they're audible, so try 12 o'clock as a starting point (as usual, after sweeping them to catch their actual voltage positions).

The pitch should oscillate up and down when you play.

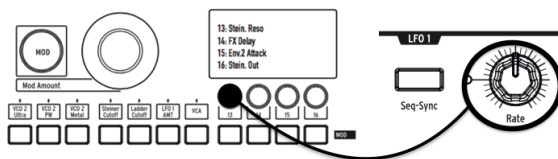
Increase the **MOD Amount** to + or - 64, and it'll sound sci-fi. This is a good setting to experiment with the **Wave** buttons to understand what they do.

MatrixBrute's LFOs have a choice of seven LFO waveforms, and you may be surprised to see that they sound just like they look. Some of the same waveforms are available in the VCOs, where they go by much faster, so this is a good way to get a handle on how they sound.

Now set the **MOD Amount** back to about 13, a vibrato effect.

The MatrixBrute's keys are pressure-sensitive. This is called Aftertouch, a controller source when you push down the keys after the note has sounded. We're going to use Aftertouch to increase LFO 1's rate a lot to bring in some reedy growl.

Aftertouch is next to the letter J, but LFO 1's rate isn't one of the 12 hardwired modulation destinations. Columns 13 - 16 are user-assignable to pretty much any parameter on the instrument.



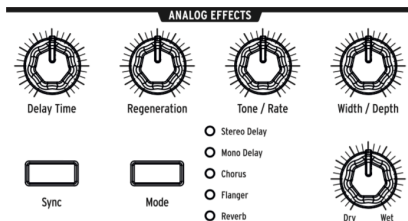
- Hold down button **13**, then wiggle **LFO 1 Rate** a little. The LCD display will darken and lighten, and LFO 1 Rate will appear in its display to indicate that it's assigned.



- Now touch the button at the intersection of Aftertouch (J) and 13. Set its MOD Amount to + 99.

Play a fairly low note, then press the key more to bring in aftertouch, and you'll hear LFO 1 adding some soft growl.

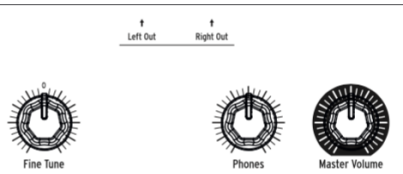
### 3.3.5. Analog Effects Section



The operation instructions cover the MatrixBrute's [Analog Effects \[p.33\]](#) in detail, but just to "finish" the sound and bring this module to your attention, turn the Wet/Dry knob up a little to add some space. Use the Mode button to try other effects.

## 4. OPERATION

### 4.1. Master Controls



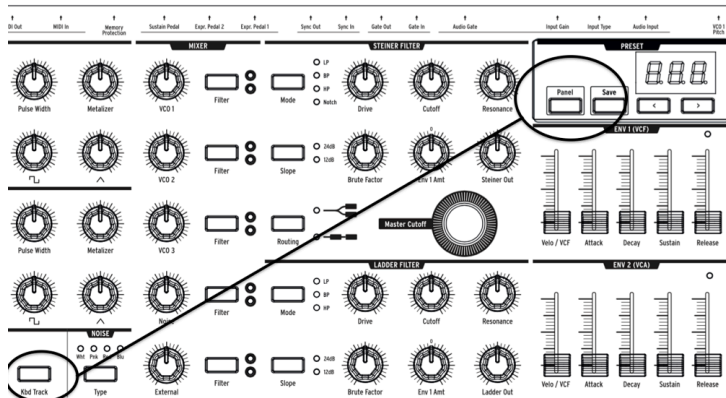
These controls are always active.

- **Master Volume** - The synthesizer itself will not distort with the level all the way up; the control is only to avoid overloading the next step in the chain (mixer, audio interface, amp...).
- **Phones** - The headphone level is independent of the Master Volume.
- **Fine Tune** - Global tuning  $\pm 1$  semitone from the knob's center detent.

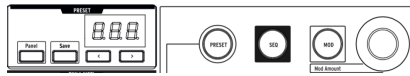
### 4.2. Utility Commands

#### 4.2.1. Panel and...

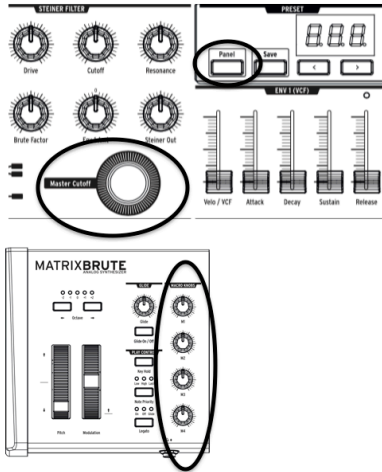
Pressing **Panel** plus another button invokes the following "hidden" commands.



- **Panel + Kbd Track** - Auto-tunes the instrument. Because voltages drift over time - which is part of the character of analog synths - it's necessary to tune the instrument occasionally, more frequently while it's first warming up.



- **Panel + PRESET** - Resets the current preset to an initialized voice (without saving it and overwriting the preset). This is a good starting point for working with MatrixBrute.
- **Panel + MOD** - Clears the Matrix (which is the electronic patchbay) of all modulation routings. This will not affect the current sound in memory unless you SAVE the preset.
- **Panel + SEQ** - Resets the current pattern in the sequencer so you can start with a clean slate. To undo this, simply recall your last preset.



- **Panel + [Macro knobs, Master Cutoff, MOD Amount]** - Resets the 360° knob's value to 0.

#### 4.2.2. Other combinations

- **PRESET + [Knobs, Sliders]** - Shows the offset between the preset value and the current position of the Knob or Slider on the Preset display. A negative value on the display means that the Knob or Slider position is lower than the preset value. A positive value means that it is higher than the preset value.
- **TAP + Rate knob** - Adjusts the tempo in whole numbers. If TAP is not held the tempo is adjusted in decimal increments when the Rate knob is turned.

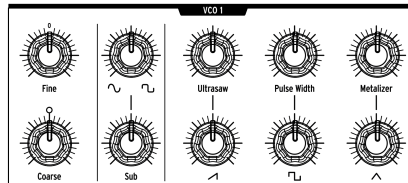
### 4.3. VCOs

Unless you bring in external instruments for processing, the raw soundwaves for the MatrixBrute are generated by its three Voltage-Controlled Oscillators (VCOs). A fourth oscillator produces random noise waveforms.

VCOs 1 and 2 are exponential, like the ones on the most famous original synthesizers. That gives them a musical, slightly unpredictable character, because the pitch drifts a little over time. You may have to auto-tune the instrument every once in a while (hold down Panel and Keyboard Track).

VCO 3 is a multi-function oscillator. It can be used as a sound source and as an extra modulator, and its pitch is more stable due to its being linear.

#### 4.3.1. VCOs 1 and 2



The only difference between these two VCOs is that VCO 1 can be routed into VCO 2 to modulate it (this is called *frequency modulation*, or FM). Both VCOs operate the same way.

The controls are laid out so the top knob refines the more fundamental setting of the knob below it.

*Coarse* adjusts the pitch  $\pm 2$  octaves in semitone steps. The light comes on when it is centered, when you're up or down one octave, and when you reach two octaves.

*Fine* adjusts the pitch continuously up to  $\pm 1$  semitone.

#### 4.3.2. Sub oscillator

The sub oscillator is combined with the mixable waveforms (discussed next), an octave below them.

*Sub* adjusts the level.



The *waveform selection* knob above it sweeps the sub waveform between a pure sinewave to the left and a clipped one, which sounds buzzy, to the right.



### 4.3.3. Mixable waveforms

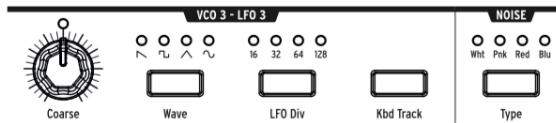


There are three primary waveforms in VCOs 1 and 2 - sawtooth, square, and triangle. Subjectively, sawtooth sounds the richest, square sounds more hollow, and triangle sounds like a flute.

Each waveform knob has a signal enhancer above it. These make the waveform more complex by combining slightly random, slightly time-shifted versions of it.

- **Ultrasaw** enhances the sawtooth wave by combining two slightly time-shifted copies of it, resulting in a brighter, edgier sound.
- **Pulse Width** varies the lengths of the flat tops and bottoms of the square pulses - the width - so it's sometimes a rectangle rather than a square, making the sound more complex.
- **Metalizer** adds a hard edge to the triangle wave. The Metalizer is a type of wave folder that adds harmonics to the original triangle wave.

### 4.3.4. VCO 3 - LFO 3



VCO 3 is a multifunction oscillator, designed to be used as a sound source or as a modulation source. The Noise oscillator is next to it, and it can also be used as a modulation source.

- **Coarse** adjusts the pitch  $\pm 2$  octaves in semitone steps. The light comes on when it's centered, when you're up or down one octave, and when you reach two octaves.
- **Wave** selects the waveform. Repeated button pushes go (from left to right) between a reverse sawtooth, square, triangle, and sine wave. Each sounds successively less buzzy, until you get to the pure sine wave.
- **LFO Div** divides the frequency by up to four (16, 32, 64, 128) when it's being used as a modulator. This determines the LFO speed.
- **Kbd Track**, an on/off toggle. This will cause VCO 3 to follow the pitch of the keyboard. It will also cause LFO 3 to speed up as you play up the keyboard.

### 4.3.5. Noise Generator

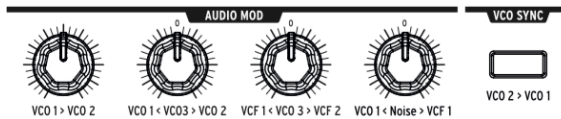


The definition of noise is a random waveform, so it's unpitched. The MatrixBrute offers four noise types, and the difference is in their frequency spectrum.

As a practical description, blue noise has the most energy in the high frequencies and least in the low ones, then white sounds a little lower, followed by pink, and finally red sounds the lowest. Noise can be an important component of a sound, adding some grit, or it can be used to modulate another wave.

Noise Type selects the four types successively, and each one has an appropriately colored light.

### 4.4. Audio Mod



In addition to making sounds, the VCOs can modulate other VCOs and the two VCFs (Voltage-Controlled Filters). These will create more character and add harmonics to the sound of the modulation destination.

When the VCOs modulate other VCOs, it's called Frequency Modulation - FM.

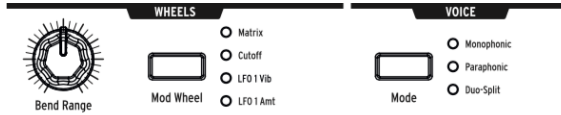
- **VCO 1 > VCO 2** adjusts how much VCO 1 modulates VCO 2.
- **VCO 1 < VCO 3 > VCO 2** lets VCO 3 modulate VCO 1 or 2. It modulates neither when the knob hits its center detent.
- **VCF 1 < VCO 3 > VCF 2** lets VCO 3 modulate VCF 1 or 2. It modulates neither filter when the knob is in its center detent.
- **VCO 1 < Noise > VCF 1** lets the Noise oscillator modulate VCO 1 or VCF 1. Again, it does neither when the knob is centered in the detent.

For the bi-polar knobs to be used in the modulation matrix, you will need to turn the knob in the direction of the item that you want to be modulated. There is a small dead zone on either side of the center detent that will allow you to have no modulation but still allow the knob position to be sensed.

### 4.5. VCO Sync

**VCO 2 > VCO 1** causes VCO 1 to follow VCO 2's pitch when it's engaged. Turning VCO 1's Coarse knob will allow you to hear the classic harmonic sync sweep sound.

## 4.6. Voice Mode



There are 3 VOICE modes that are available on the MatrixBrute. These modes allow you to play the synth in ways beyond the standard monophonic way.

### 4.6.1. Monophonic

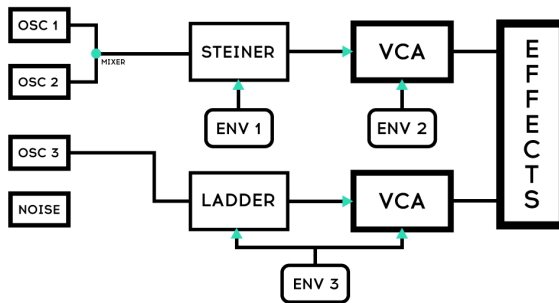
Monophonic is the standard voice mode. In this mode, all the oscillators will play when you press a key (or send MIDI or CV information).

### 4.6.2. Paraphonic

Paraphonic mode allows you to play multiple notes at one time. It splits the three oscillators, one per note played, so that you can play up to 3 notes at once. Paraphonic differs from polyphonic in that all 3 of the oscillators share the same filters and VCA settings.

### 4.6.3. Duo-Split mode

Duo-Split mode allows you to split the keyboard and have 2 completely different sounds played on each half. To accomplish this, we split the voice up as shown in the diagram below.



DEFAULT IN DUO SPLIT

#### 4.6.3.1. Upper part

Signals routed through VCF 1 (the Steiner filter) are controlled by ENV 1 and ENV 2. The pitchbender will only affect this upper part as it is most likely used for playing melodies.

### 4.6.3.2. Lower Part

Signals routed to VCF 2 (the Ladder filter) are controlled by ENV 3, which then controls both the Ladder filter and a hidden VCA.


The Sequencer and Arpeggiator are routed to the lower part, so you can hold a key to play a pattern or arpeggio on the lower part of the keyboard while playing notes on the top part.

### 4.6.3.3. Setting the split point

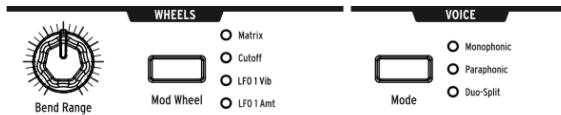
Set the split point by holding the **MODE** button and playing a key. (This is the MODE button in the VOICE panel area, not one of the filter mode buttons.)

### 4.6.3.4. Setting the octave of the lower section

Set the octave of the lower part by holding the **MODE** button and using the Octave <- -> buttons to transpose it.

 Glide can be enabled independently for the upper and lower sections. Details are [here \[p.23\]](#).

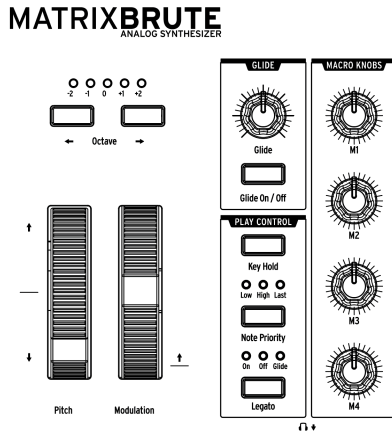
## 4.7. Wheels



As on most keyboards, the MatrixBrute's pitch wheel springs back to the center position (no pitch shift), while the mod wheel is continuous.

- **Bend Range** sets how far the pitch wheel bends up or down, up to a maximum of  $\pm 1$  octave. The center position is up or down a fifth.
- **Mod Wheel** - successive pushes assign the mod wheel to the **Matrix** (where it can be routed to multiple parameters); or to the master filter **Cutoff** frequency; to **LFO 1 Vibrato** rate; or to **LFO 1 amount**.

## 4.8. Keyboard Performance Controls



- **Pitch and Modulation wheels** - Please refer to the previous section (WHEELS) to set the pitch bend range and Modulation wheel assignment.
- **Octave <- ->** - Transposes the entire 49-key keyboard  $\pm 1$  or  $\pm 2$  octaves to extend its range past four octaves. This affects the instrument locally as well as over MIDI.

### 4.8.1. Glide

- **Glide On/Off** - The Glide effect sweeps the pitch from one note to the next. The ON/OFF button enables and disables the glide function.
- **Glide** - This knob sets the glide time from barely perceptible all the way to over five seconds when it's all the way up.

**i**: Glide behavior can be changed globally using the **Rate vs. Time** setting in the MCC or in [Settings mode \[p.55\]](#). The difference is described in [this section \[p.53\]](#).

#### 4.8.1.1. Glide and Duo-Split mode

When the MatrixBrute is in Duo-Split mode, Glide can be enabled independently for the upper and lower sections of the keyboard. (Note that the Glide *time* is not independent for the two parts: this value is shared.) Here's how it works.

The Glide on/off button applies to the upper part by default. To toggle Glide for the lower part, hold the Mode button in the Voice section and press the Glide on/off button. The Glide button LED shows the glide status of the lower part when the Mode button is held, and shows the glide status of the upper part when the Mode button is *not* being held. (Be sure to hold the button for about a second; holding it for less than 700 ms will toggle the Voice Mode.)

This feature is tons of fun with Duo-Split patches that have sequencer patterns! The lower part will glide whenever a Slide event happens, as long as Glide has been enabled for the lower part. But remember: the effect may not be audible if the Glide time is too fast.

## 4.8.2. Play Control

**Legato** - Legato allows for playing notes with or without retriggering the envelopes on every key on. The following settings apply to each note sounding in the current voice mode. In Monophonic they apply to the single sound, and in Paraphonic and Duo-Split they apply to the one being played. [See the Voice Mode section \[p.21\]](#).

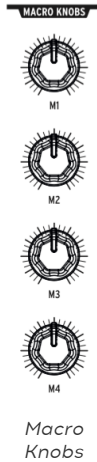
- **On** - This will only retrigger the envelope after all notes have been released. Holding a note while playing the next one, before releasing the first, creates a slur effect. This works for successive notes as well, and its effect is dependent on the envelope settings (because a sound's overall length is relative to the first note you play). If you play staccato, the envelope will trigger on each note played as normal.
- **Off** - Every note played will trigger the envelopes.
- **Glide** - This mode is similar to Legato mode in that playing notes while a note is held will not retrigger the envelopes. If GLIDE is active, then playing legato will both prevent the envelope from retriggering and also glide from one pitch to the next. Note that this setting is not available when the Sequencer button is lit (the one next to SEQ Length).

**Note Priority** - Determines what happens when you play more voices than are available (one in Monophonic voice mode and two in the other voice modes).

- **Low** - The lowest note you're holding keeps sustaining and other notes are cut off;
- **High** - The highest note you're holding keeps sustaining and other notes are cut off;
- **Last** - Held notes are cut off by the new ones you play.

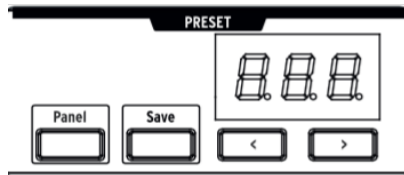
**Key Hold** - Simulates the effect of holding a note forever. It plays the last note you triggered, no matter how much time has passed, and holds it. It does not affect the envelopes so sounds with no sustain will not actually sound beyond the decay time. This is also used to hold an arpeggiation on.

## 4.9. Macro Knobs



**M1, M2, M3, and M4** knobs are modulation sources that appear in the MOD Matrix ( see [Mod Matrix Section \[p.36\]](#) ) on rows M, N, O, and P. They're designed to be convenient performance controls.

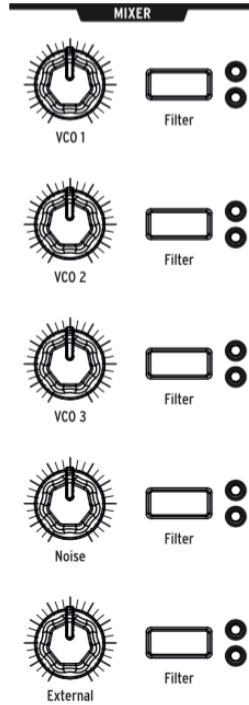
Each MACRO knob can modulate multiple MatrixBrute parameters, and they all send MIDI Continuous Controllers (CC#11, 2, 4, and 3, in that order).



### 4.9.0.1. Resetting Macros to 0

Press **Panel** and turn **[M1 - M4]** to reset each MACRO knob to 0.

## 4.10. Mixer



*Mixer Knobs*

The levels of the MatrixBrute's five potential sound sources - the VCOs, Noise generator, and External input - are set here. Sources must be sent to either or both filters to be heard.

(If you've assigned a source to one of the filters and still hear nothing, the cutoff frequency may be outside its range.)

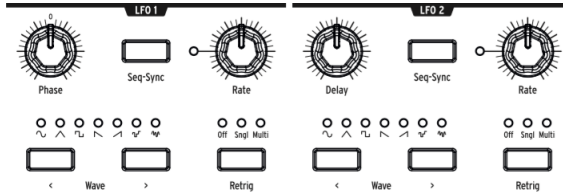
All five inputs to the mixer have the same features:

- **Level** [VCO 1, VCO 2, VCO 3, Noise, External]
- **Filter routing** - Press the button repeatedly to assign the sound source to VCF 1, VCF 2, both, or neither. If the filters are in series, the VCOs can only be assigned to VCF 1 (or turned off).

In Duo-Split mode, the routing here will assign the sound source to either the upper (Steiner) or lower (Ladder) section of the keyboard.



## 4.11. LFOs 1 and 2



The two LFOs (low frequency oscillators) are modulators that can be routed to add movement to pretty much any parameter on the MatrixBrute. LFO waveforms are near or below the bottom threshold of our hearing, ranging from about one cycle every 18 seconds up to 100Hz. They're useful for creating all kinds of sounds, from vibrato to filter sweeps to pitch changes; their effects range from subtle to wild.



Seven preset waveforms are available, from left to right: sine, triangle, square, reverse sawtooth, sawtooth, sample & hold, and low frequency random. The pictures above show exactly how these waveforms behave. For example, the square wave turns on and off abruptly and the triangle ramps up and back down. You can hear this very clearly at slow rates.

There's a custom waveform available that you can draw yourself. More about that in the [Draw an LFO waveform section \[p.28\]](#). First, here's what the LFO buttons do.

- **Wave Selection** < and > scroll left and right through the waveforms. An LED shows the current choice. When all 7 are lit the custom waveform is selected. LFO 1 and 2 are the same except for the first parameter (**Phase** vs. **Delay**), and you patch them into the signal path at the Matrix. [See Matrix Section \[p.34\]](#).
- **Phase [LFO 1 only]** adjusts where the LFO's wave cycle starts relative to the note trigger (early or late). The knob has a center detent position to start the LFO at the beginning.
- **Delay [LFO 2 only]** delays when the LFO starts and also fades it in gradually.
- **Rate** sets the frequency of the LFO. The light to the left of this knob flashes with it (until the setting gets too high and the light remains solid).
- **Seq-Sync** locks the LFO's tempo to the Sequencer ([see Sequencer Section \[p.41\]](#)), which in turn can be synced to various sources.
- **Retrig** cycles through the three choices for how the LFOs respond to note triggers/retriggers:
  - *Off* - The LFO keeps oscillating continuously on its own, independently of whether notes are triggered. This mode simulates a traditional analog LFO.
  - *Single* - The LFO goes through its wave one time only after a note is triggered. This is useful for creating an interesting note attack, among other applications.
  - *Multi* - The LFO starts its cycle over every time you trigger a note.

### 4.11.1. LFO time divisions

The LFO rate can be subdivided into triplet or dotted values. To set the LFO time division value, hold Seq-Sync and press one of the three note value buttons in the Sequencer section (the quarter note, triplet, or dotted icons beneath the Link button). This setting is independent from the Sequencer setting, and is visible whenever the Seq-Sync button is held.

### 4.11.2. Draw an LFO waveform

Press both Wave Selection arrows at the same time to enter LFO Draw mode. All of the LFO waveform LEDs blink three times, and the Preset screen shows "LF1" or "LF2" depending on which LFO is being edited. The Sequencer display says "EDIT".

The matrix buttons reveal the custom LFO waveform. They are also used to define the waveform. Here's how it works.

- Columns 1-16 are the steps in the waveform
- Row H is the zero-crossing point
- Rows A-G are positive values
- Rows I-O are negative values
- Row P decides if the change between the previous and current steps is instant or smoothed
- If a step in Row P is blue the transition is instant. If it is red the transition is smoothed.

For a simple example:

1. Start with an initialized patch (Hold Panel, press Preset)
2. Set up a mod route of LFO1 > Pitch (press MOD, then E1, and set an amount with the knob above the matrix)
3. Enter Draw mode for LFO 1 and make a diagonal line from button A1 to button O16. Use two zero values in the middle for now (H8 and I9).

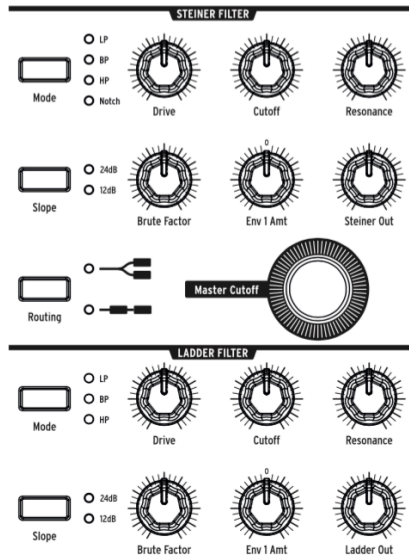
Now look at the matrix: that's a sawtooth wave, right? Not exactly: slow down the LFO 1 Rate, play a key, and listen. Since the row P buttons are all blue, it's actually a stair-stepped sawtooth. Press all of the row P buttons, or every other one, or every third, to smooth out different portions of the waveform. After this, try different values in each column to build different waveforms. There are over 2 quadrillion combinations!

You can also create a complementary LFO waveform for LFO2 by holding its Wave Selection arrows and using the matrix buttons as before. Use the Seq-Sync buttons to lock them both to tempo, use the LFO division feature to alter their rhythmic relationship, route them to other destinations in varying amounts, and don't do the math. Your calculator will melt.

To exit LFO Draw mode, use the Wave Selection arrows or the Preset, SEQ, or MOD buttons.

## 4.12. Filters

### Steiner Filter (VCF 1) and Ladder Filter (VCF 2)



Filters remove frequencies from the sound sources coming from the Mixer (see [Mixer Section \[p.26\]](#)), and they are a primary component in the subtractive synthesis technique used by the MatrixBrute and all analog synths. Modulating them varies the timbre of the sound over time. With very high Resonance levels they can self-oscillate, becoming another sound source.

MatrixBrute features two multimode Voltage-Controlled Filters (VCFs):

- The **Steiner Filter (VCF 1)** was designed by Nyle Steiner in the '70s. It has a unique character that becomes apparent immediately at relatively pronounced settings.
- The **Ladder Filter (VCF 2)** is the other classic filter, a famous standard-bearing design known for its rich, thick sound; unlike the original, this one is gain-compensated to avoid the dip in volume that you find at higher resonance levels. This one also is a multimode filter and has both 12dB per octave and 24dB per octave options. These filters play a big role in the MatrixBrute's character.

Both filters have the same basic parameters, but the Steiner Filter has a couple of additional ones.

The central parameter in a filter is the corner frequency or frequencies where it starts cutting. This is called Cutoff in synths. MatrixBrute has two places to adjust this:

- **Cutoff** sets the corner frequency/frequencies individually for each filter. These are then fed to a combined control:
- **Master Cutoff** is a prominent knob that sweeps both filters' cutoffs together.

The word "multimode" means the filter can adopt different curves, which also change the sound completely.

### Mode selects these curves:

- **LP (Lowpass)** does just that - allow low frequencies to pass while high frequencies are attenuated.
- **BP (Bandpass)** allows a band of frequencies to pass while blocking everything else. Another way to look at it is that the treble and bass are turned down, leaving a midrange band.
- **HP (Highpass)** allows high frequencies to pass while low frequencies are blocked.
- **Notch (Steiner/Parker filter only)** removes a narrow band of frequencies.

The slope of the filter's roll-off changes the sharpness of the sound.

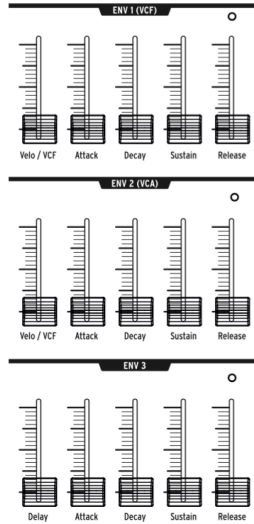
- **Slope** selects either the **12dB** or **24dB** per octave setting. Usually 12dB sounds brighter.
- **Drive** adjusts how hard the signal hits the filter. The higher you set it, the more pleasant distortion you get.
- **Brute Factor™** is Arturia's "secret sauce." It ranges from warming up the low end to creating a monstrous growl when turned up. The exact effect depends on how it's interacting with other settings.
- **Resonance** emphasizes the frequencies at the point of the cutoff, because they're fed back into the circuit. Higher resonance levels can cause the filters to self-oscillate.



The Steiner filter does not track the keyboard well over a wide range by nature. For better pitch-to-octave tracking, using the Ladder filter.

- **Env 1 Amt** sets how much Envelope 1 (the one dedicated to the VCFs) modulates the Cutoff frequency. This control allows for both positive and negative modulation amounts.
- **Routing** chooses between the two filters running in parallel or having VCF 1 feed VCF 2. This unique control allows you to alter the voice path and create a wealth of new sounds.

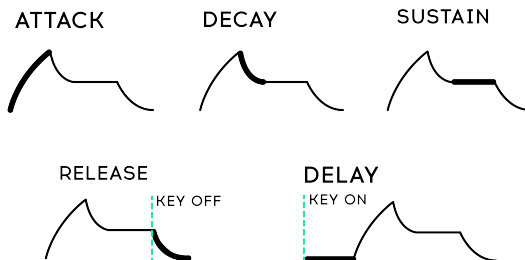
## 4.13. Envelopes



Envelopes are adjustable modulators that shape the voltage over time. MatrixBrute has two 4-stage, ADSR (Attack Decay Sustain Release) envelopes, plus a third one (ENV 3) which adds a Delay phase before the ADSR (this is all explained below). Each envelope has a "gate" LED that shows when a gate is received and will fade out to show when the release stage is still active.

You can add assignments to the envelopes in the Matrix, but by default:

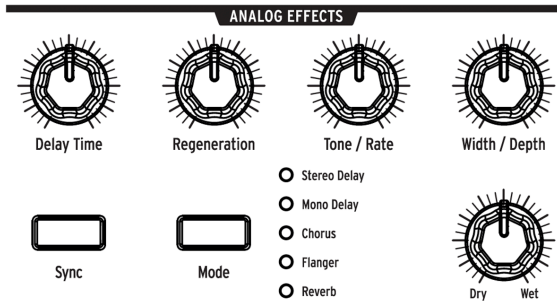
- **ENV 1 (VCF)** is routed to the VCF's Master Cutoff frequency, so you can shape the overall filter sweep;
- **ENV 2 (VCA)** (voltage-controlled amplifier) controls the overall volume level of the sound;
- **ENV 3** is freely assignable in the Matrix.



In all three envelopes:

- **Attack** sets the time, from 2ms to more than 10 seconds, the voltage takes to reach its initial level;
- **Decay** adjusts the time, again from 2ms to more than 10 seconds, it takes the voltage to go from its initial level to the Sustain level;
- **Sustain** is the level where the signal settles after it decays. This level is usually lower than the initial level (hence "decay"), however it can also be the same - in which case the Decay setting has no effect. It can also be all the way down, for example if you're programming percussive sounds.
- **Release** is the time it takes the voltage to fade all the way down after you release the key that's triggering the sound. Its range is from 2ms to more than 10 seconds.
- **Velo/VCF and Velo/VCA (ENV 1 and ENV 2 only)**: You can tune ENV 1's and ENV 2's response to key velocity; i.e., the "louder" you play, the higher the signal voltage. (Unlike pianos, electronic keyboards measure how fast a key travels - its velocity - to determine how loudly you intended to play.)
- **Velo/VCF (ENV 1 only)** This slider offsets the ADSR levels so velocity has no effect when it's all the way down; the higher you raise it, the more velocity is required to reach the maximum filter Cutoff level.
- **Velo/VCA (ENV 2 only)** When this slider's all the way down, the VCOs sound at their maximum level, no matter how hard or softly you play; raise the slider to increase the keyboard velocity response.
- **ENV 3** is slightly different in two ways. First, it doesn't do anything until it's assigned in the Matrix. Second, it runs through its stages independently of keyboard velocity (although you can modulate its stages in the Matrix).
- **Delay (ENV 3 only)** allows you to start ENV3 envelope after the key trigger; all the way down is no delay. The delay time is from 2ms to over 10 seconds.

## 4.14. Analog Effects



MatrixBrute features Analog Effects with 5 different modes on the output.

The Analog Effects are all based on classic Bucket Brigade Devices (BBD's). The technical differences between them are a function of the delay times and how or whether they're modulated. Note that all the knobs can be modulation destinations in the Matrix.

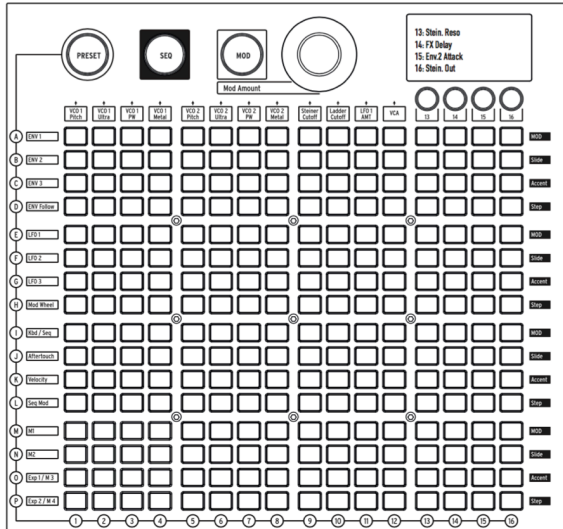
**Mode cycles through the five effects, which are tuned with the five knobs at the top of the Analog Effects section:**

- **Stereo Delay** has two taps (meaning repetitions of the original sound), first left then right. When the Delay Time knob (see below) is at 12 o'clock, the first one is about 100ms and the second about 200ms. The maximum time is about half a second.
- **Mono Delay** is a single tap in the center (i.e. it's equal in both left and right sides).
- **Chorus** is an LFO modulated delay, in the vicinity of 5 to 50ms. It's a rich, thickening sound.
- **Flanger** is a shorter modulated delay, somewhere around .5 to 10ms. Typically, flangers have an "airplane" sound, and unlike choruses the effect often moves in and out.
- **Reverb** is a unique analog space effect, produced by recirculating the delays with varying delay times.

The five effect-modifying parameters:

- **Delay Time** has different ranges in different Modes. Longer delay times are achieved with clockwise turns.
- **Regeneration** is a level control for the amount of the signal that gets fed back into the processor. Things can get wild - in both good and bad ways - if you turn it up.
- **Tone/Rate** This control doubles as a tone or lowpass filter control for the delays, and as a rate control in the Chorus and Flanger modes.
- **Width/Depth** specifies the amount of stereo field in the stereo delay/reverb, and the modulation depth of the LFO in the chorus and flanger.
- **Dry/Wet** adjusts the balance between the dry signal and the effects. At its fully clockwise position the output signal passes entirely through the effects (Wet); when the knob is fully counter-clockwise the signal does not pass through the effects at all (Dry). Intermediate knob positions blend the dry and wet signals in varying amounts.

## 5. THE MATRIX



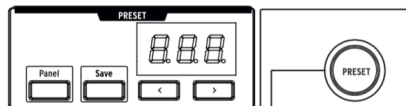
The Matrix is a 16 x 16 (256-button) grid that has three modes.



**PRESET** (pink), **SEQ** (red), and **MOD** (blue) are big buttons to select the active Matrix mode:

- **PRESET**, in which the Matrix is used to save and recall patches in 16 banks (rows A - P) of 16 patches each (columns 1-16). The patches can also include sequences.
- **SEQ**, a 64-step sequencer that also functions as an arpeggiator.
- **MOD**, an electronic patching matrix (hence the name "MatrixBrute") that routes 16 modulation sources (rows A-P) to 16 destinations (columns 1 - 16).

### 5.1. PRESET Mode



#### 5.1.1. Panel

The Panel button toggles between the physical position of the knobs and the edited version of the current preset. When the Panel button is lit the Preset screen shows the letters PNL instead of the preset number.



In Panel mode the position of each knob determines the sound. This is the mode to use if you want 1:1 feedback between the parameters and the sound you are editing: what you see is what you get.



! To hear a preset you've loaded, the Panel button must be off!

### 5.1.2. Recalling internal presets

**To recall one of the 256 internal presets:**

In PRESET mode, simply select its button. The banks are rows A - P on the left, and presets within each bank are columns 1-16. To select, say, patch B3, go two rows down and three columns across; BO3 will appear in the numeric display. Alternatively, use the < and > buttons underneath the numeric display to scroll up and down through the presets.

### 5.1.3. Preset Compare

MatrixBrute has 3 memories available when working with a preset:

- The active preset (i.e., the edit buffer)
- The physical panel settings
- The Compare mode memory

Compare mode allows you to view the stored presets while editing the current preset. This is useful in two ways:

- To compare the edited state of the preset to the unedited (stored) version, or to any other preset
- To preview another preset location before overwriting it with an edited preset.

To enable Compare mode, hold the large Preset button and press a matrix button to select a preset.

The front panel behaves differently in Compare mode:

- The Preset button blinks and the SEQ / MOD buttons are dark
- The Sequencer screen displays COMP
- The Preset screen displays the number of the previewed preset
- Select a different preset to preview by pressing its matrix button
- The blue, flashing matrix button indicates which preset is being previewed
- You can make temporary changes to the previewed preset, but they can't be saved...
- ...because the Save button will only save the preset that was edited before entering Compare mode.

Press Panel or Preset to exit Compare mode. This reloads the previous state of the preset, including any edits that had been made before entering Compare mode.



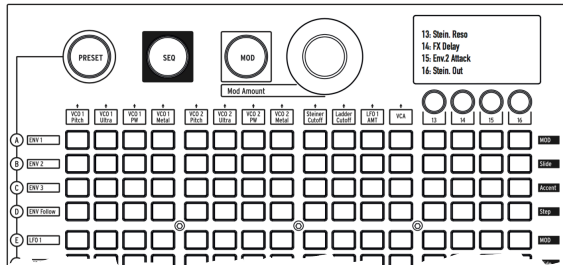
! You cannot enter Settings mode or LFO Draw mode while in Compare mode.

### 5.1.4. Saving a preset

To save the Panel or edited Preset to an internal location, first exit Compare mode. Then press **Save** + [desired bank/channel location], using the Matrix buttons or < and > buttons.

 To audition the target preset location before overwriting it, use the **Preset Compare** method described in the previous section.

## 5.2. MOD Mode



The Modulation Matrix is an electronic patchbay that routes all the MatrixBrute's modulation sources to any or all possible destinations. Think of this as a grid of patch cords, each with an attenuator that allows for positive or negative modulation. Every parameter that it would make sense to modulate - pretty much anything with a knob or fader - can be a destination.

The 16 modulation sources are in rows A - P, and destinations are in columns 1 - 16. Destinations 1 - 12 are hardwired, and buttons 13 - 16 access another 16 assignable destinations (4 banks of 4 destinations each).

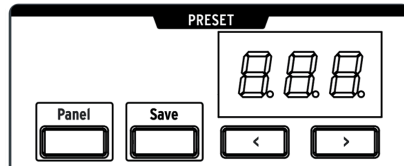
### 5.2.1. Create a modulation path

**To assign a modulation source to a destination parameter:**

1. In MOD mode, select a modulator and a destination by pressing any button in the grid.
  - The current selection lights up pink.
  - You can select from 0 to all 16 destinations for each modulation source, and each destination parameter can be modulated by 0 to 16 sources.
  - Modulation "patch points" light up blue when they're not the current selection.
2. Set a positive or negative modulation amount ( $\pm 99$  steps) for the current selection with the **Mod Amount** knob. This is an offset from the input voltage. Negative values decrease a destination's MOD Amount as the input voltage goes up, positive values increase it. For example, you might want Aftertouch to lower VCO 1's pitch a small amount while increasing VCO 1's Metal a lot.

### 5.2.2. Setting the modulation amount

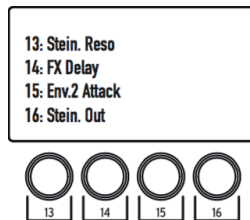
When **MOD Amount** is centered, only the red LED at 12 o'clock is lit. White LEDs in either direction indicate the knob's position when it's off-center; each dot gets progressively brighter when you've moving toward it.



Also, the exact modulation amount is shown in the numeric display in the Preset area.

### 5.2.3. User assignable destinations

MOD mode provides 16 user-definable mod routes, divided into four banks of four routes each. Buttons 13-16 are used to access the four banks. Let's start by learning how to assign a parameter to destinations 13 - 16:



Select the first bank of custom mod routes by pressing button 13 once. Mod routes 13-16 are now available.

Next, hold the **[13, 14, 15, or 16]** button while moving the desired knob or slider on the front panel. The parameter will appear in the OLED display as shown above. You can then assign a modulation source to this destination and set a modulation amount with the **Mod Amount** knob.

Use a similar process to access and edit mod routes 17-20, 21-24, and 25-28:

- Press button 14 once to access mod routes 17-20
- Press button 15 once to access mod routes 21-24
- Press button 16 once to access mod routes 25-28

If you've selected mod routes 17-20, for example, then hold the **[13, 14, 15, or 16]** button while moving the desired parameter control to edit mod routes 17, 18, 19, or 20, respectively.

Here's a chart that may help to visualize the button relationships:

Press this once...	...to access routes...	Then hold...	...to edit this route
Button 13	13-16	13 / 14 / 15 / 16	13 / 14 / 15 / 16
Button 14	17-20	13 / 14 / 15 / 16	17 / 18 / 19 / 20

Press this once...	...to access routes...	Then hold...	...to edit this route
Button 15	21-24	13 / 14 / 15 / 16	21 / 22 / 23 / 24
Button 16	25-28	13 / 14 / 15 / 16	25 / 26 / 27 / 28

### 5.2.4. Modulating a mod route

You can also assign a modulation amount in the Matrix itself as a modulation destination. First select the desired mod bank by pressing of one of the 13-16 buttons (see above), then hold the appropriate **[13, 14, 15, or 16]** button and press a button in the modulation grid.

For instance, if you want the mod wheel to control the amount of modulation between LFO2 and the VCO1 Metalizer:

1. Route LFO2 to the VCO1 Metalizer by pressing the F4 button
2. Hold the **[13]** button (for example) and press the F4 button to select F4 as the destination
3. Route Mod Wheel to F4 by pressing the H13 button
4. Use the encoder to turn up this value.

This method can even assign a custom mod route to modulate the level of another custom mod route. But since the process involves holding down a column button, it isn't possible to make the following assignments:

- Page 1 mod amounts to column 13
- Page 2 mod amounts to column 14
- Page 3 mod amounts to column 15
- Page 4 mod amounts to column 16

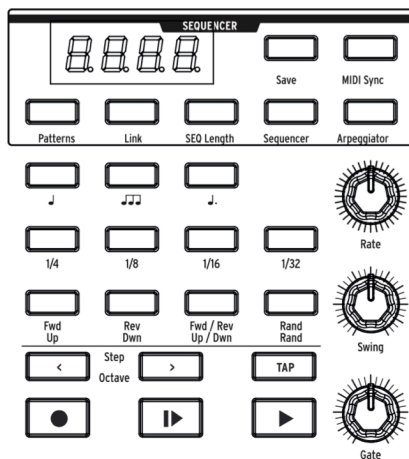
### 5.2.5. Mod source descriptions

#	MOD source	Notes
A	ENV 1	This is the voltage output of the Env 1 generator.
B	ENV 2	This is the voltage output of the Env 2 generator.
C	ENV 3	This is the voltage output of the Env 3 generator.
D	ENV Follow	Generates a control voltage based on the level of the external input.
E	LFO 1	Output from LFO1. This is a bi-polar voltage output (except square wave).
F	LFO 2	Output from LFO2. This is a bi-polar voltage output (except square wave).
G	LFO 3	Output from LFO3. This is a bi-polar voltage output (except square wave).
H	Mod Wheel	Output from the modulation wheel when it is assigned to MATRIX. If the wheel is assigned to the other options, it will not send a signal here.
I	Kbd / Seq	Constant voltage output that corresponds to the key currently held on the keyboard, or the note played by the SEQuencer
J	Aftertouch	The keys are pressure-sensitive when you keep pushing after the note is triggered.

#	MOD source	Notes
K	Velocity	Electronic keyboards measure how fast a key travels to determine how loudly you intended to play.
L	Seq Mod	Mod from the SEQuencer
M	M1	Macro knob M1
N	M2	Macro knob M2
O	Exp 1 / M3	Expression pedal plugged into the rear panel, and Macro knob M3.
P	Exp 2 / M4	Expression pedal plugged into the rear panel, and Macro knob M4.

Note that both Expression pedals and the corresponding M 3 / M4 knobs are summed before being routed to the Matrix.

### 5.3. SEQ Mode



MatrixBrute's 64-step sequencer has two main modes: Sequencer and Arpeggiator. There's also a third, hybrid mode that is unique to this instrument: the Matrix Arpeggiator.

**Sequencer** mode contains 256 sequences (i.e., "patterns"), which can trigger notes, modulation events, or both. Patterns can be linked to Presets or stored and recalled independently.

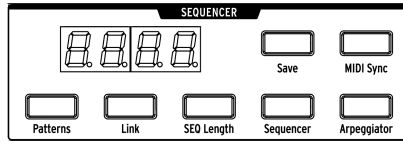
In [Arpeggiator mode \[p.44\]](#) the notes you hold down are stepped through in a variety of orders, and repeated in higher octaves.

[Matrix Arpeggiator mode \[p.45\]](#) lets you construct a 16-step framework that can generate complex arpeggios.

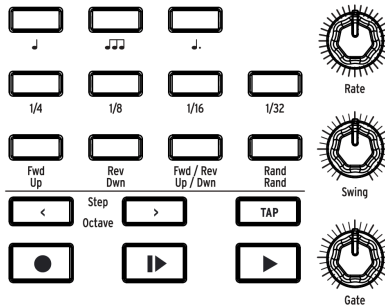
Patterns and arpeggios can run forward, backward, forward then backward, or in random order, and at different note values (e.g. if each step is an 1/8th note, switch it to 1/4 notes to halve the playback speed, etc.). Dial in the tempo, tap it, or sync everything to an incoming USB/MIDI clock.

### 5.3.1. Tempo, rate, and playback controls


**i**  The following descriptions apply to all SEQ modes (Sequencer, Arpeggiator, and Matrix Arpeggiator).



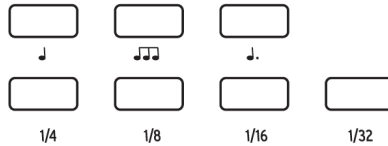
**MIDI Sync** ignores the internal tempo and locks the Sequencer and Arpeggiator to incoming MIDI clock. Use this if you're using the MatrixBrute with a MIDI sequencer or other MIDI equipment. External Sync may come from three sources: MIDI In, MIDI over USB, and the Sync port. You can choose the source you wish to use with the MIDI Control Center or in [Settings mode \[p.55\]](#).



- **Rate** dials in the sequencer tempo, from 30 to 259.9. The tempo is shown in the display. Note that the rate knob is inactive when the MatrixBrute is slaved to an external clock. (MIDI Sync ON)
- **Swing** delays every even-numbered step to create a shuffle rather than a straight pattern. 50% is no swing, 75% is maximum swing. With 8th notes, for example, 50% swing gives you even 8th notes, and the more swing you add, the closer you get to a dotted 8th followed by a 16th note.
- **Gate** sets the on/off length of each step, on a scale from 1 to 99. At 99, each note trigger is held until the following step.
- **Tap** this button to tap in the tempo. The sequencer engine updates with every tap, so you can keep tapping if you need to follow a drifting tempo, and the result is shown in the display. Taps are relative to the current note value (see the following topic), so if you're set to quarter notes, each tap is a quarter note. If you're set to 1/8th note triplets, each tap is one of those, and so on.

**i**  Hold the TAP button and turn the Rate knob to adjust the tempo by whole numbers instead of decimal values. Be careful not to do this while the pattern is looping in Record mode, though: In that scenario, notes are erased when TAP is held.

### 5.3.1.1. Note value buttons



These playback settings determine what note value each step is, relative to the playback tempo. If you're using the MatrixBrute on its own, this will simply change the playback speed in a predictable way. But if you're locking the tempo to MIDI clock, it will change the musical value of each step in the sequencer or arpeggiator.

From left to right, the three buttons with musical notes represent "straight" notes, triplets, and dotted notes. The "fraction" buttons below them determine what value the musical notes are.

Examples:

- 1/4 + ♩ means each step is a quarter note;
- 1/8 + ♩ makes each step an eighth note;
- 1/8 + ♫ will make each step a 1/8th note triplet;
- 1/16 + ♩...that's going to make each step a dotted 1/16th.

### 5.3.2. Sequencer

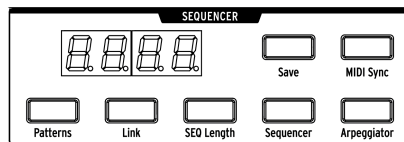
There are two ways to record a pattern in Sequencer mode: real time (i.e., live) and step time (i.e., one note at a time).

Real-time recording remembers two velocity levels (normal or Accent), note duration, legato playing, and activity on the Mod knob. If you turn the Glide button on or off it records that too. You can record in real time and edit the pattern in step time later.

Step-time recording allows you to enter a note, rest, or modulation event on each step. Steps respond to two velocity levels (normal or Accent), and you can enter accents manually. Notes can be tied over multiple steps, and any step can slide into the next one.

The sequencer can be used as a modulation source through Row L of the Matrix. Each step can send a modulation event with a positive or negative value, or send nothing.

**i** ♩: The Legato setting of Glide in the [Play Control section \[p.24\]](#) is not available when the Sequencer button is lit (the one pictured below).



Press the **Sequencer** button to access the Sequencer. The button functions are described below.

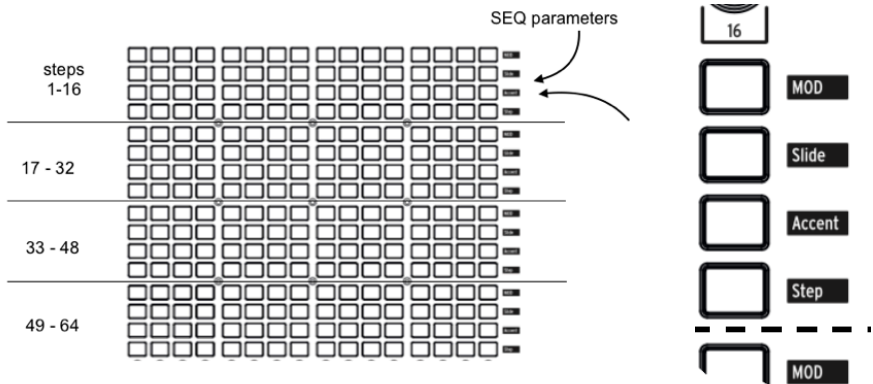
### 5.3.2.1. Load / Link / Save Patterns

- **Patterns** - You can load different patterns by holding the Patterns button and choosing one of the 256 sequences. The banks are rows A - P on the left, and patterns within each bank are in columns 1-16. A red button lets you know which pattern is currently selected. To load pattern B3, for example, go two rows down, three columns across, and press that button.
- **Link** - You can link a sequence to your preset sound. When saving your preset, enable the LINK button to store them together.
- **Save** - Hold this button and select the pattern bank/preset where you want to save the pattern. *Turn on Link to save the pattern with the current Preset. See Matrix Preset Section [p.34].*

### 5.3.2.2. Sequence length

To set the sequence length (i.e. the number of steps up to the maximum of 64), hold SEQ Length and touch any of the four buttons in the last step to be played. They'll light up, and after that the sequence will cycle back to the beginning when it gets there (assuming you don't stop it first, and that it's playing forward rather than backward or random).

### 5.3.2.3. Step parameters



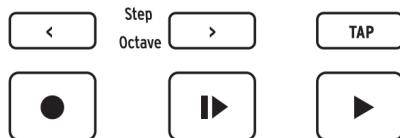
The sequencer's 64 steps are organized into four rows of 16 steps. Each step contains 4 buttons:

- **Step** indicates a trigger on that step (when it's lit red). See the **Record** button below for instructions on how to program patterns, but you can push a step button to turn a programmed/recorded note off. To tie several steps together, hold the first step button and press the last one in the desired range. All step buttons but the first are dimmed (darker). To disable several steps, reverse the order (press the last step first and the first step last). For these and more sequencing tips see [Advanced SEQ Editing \[p.46\]](#).
- **Accent** lights automatically when you enter or record a note at higher velocities, or you can turn it on to create an accent. This is used in conjunction with the Velocity sliders on the ENV 1 (VCF) and ENV 2 (VCA).



- **Slide** activates the Glide On/Off button for that step so the pitch can slide from the previous note into the new note. Note: Adjust the Glide time so the slide can be heard.
- **MOD** toggles modulation on and off for the step. It has to be routed to a parameter in the modulation Matrix to have an effect.

#### 5.3.2.4. Sequencer transport and Pattern recording



- **< and >** locate the transport backward or forward one step (when it's stopped) and trigger the note on the step. (They have a different function in Arpeggiator mode; see below.)
- **Record** - (Lights up red.) This works whether the transport is moving or not. When it's moving, the notes you play are recorded in real time, including Ties and Accents. Mod knob motion is recorded too; more about that [here \[p.43\]](#). Hold TAP to erase events while the pattern is looping. If Record is lit when the transport is stopped, the sequencer is in step-record mode. Each note you play replaces an existing note and advances to the next step. The pink button shows the current step. To replace a specific note, hold one of the 64 step buttons and play a key. The TAP button is used to enter a rest. If you push one of the step buttons it will trigger that step and select it as the current step.
- **Play from beginning** - (Lights up white.) This works under any condition - transport moving or stopped, Record active, etc.
- **Play/stop/continue** - (Lights up green.) This also works under any condition.
- **"Auto-play" feature:** If the small Sequencer button is lit (the one next to SEQ Length), the pattern starts when a key is played. **Play/stop/continue** lights up, and the pattern continues until the note is released. Play another note and the pattern starts over from the beginning. If you play legato notes the pattern will transpose in the middle of playback.

**i** A pattern plays its original pitches when middle C is played, but it is transposed if you start the pattern with a different note. It's easier to know what you'll hear if you record a pattern thinking of C as the root note; for example, if you want to hear an E minor pattern when you play an E, record the pattern in C minor.

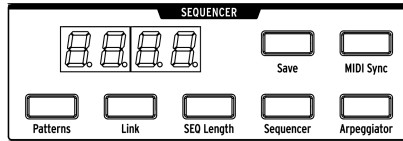
#### 5.3.2.5. Recording Mod knob motion

Mod knob motion can be recorded, which is a great way to animate your patterns.

Here's how it works: During real-time recording the pattern loops indefinitely. When the Mod knob is moved, motion recording begins on that step (which we'll call Step N). Newly recorded MOD steps turn purple. When the motion record loop reaches Step N-1, the record light turns off and the MOD steps that contain a value become red.

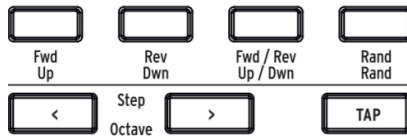
**i** For more details about editing the contents of a pattern, see [Advanced SEQ Editing \[p.46\]](#).

### 5.3.3. Arpeggiator



The **Arpeggiator** button enters this mode, in which the notes you hold are automatically stepped through one at a time. You can hold down as many keys as your hands or even your forearm will cover, up to a maximum of 16; each note you hold lights up a red step in the Matrix.

The arpeggiator responds to key velocity, so individual notes can be more prominent (or less so) depending on how hard the key was played. Of course, the results depend on the Velo slider settings for ENV 1 (VCF) and ENV 2 (VCA).



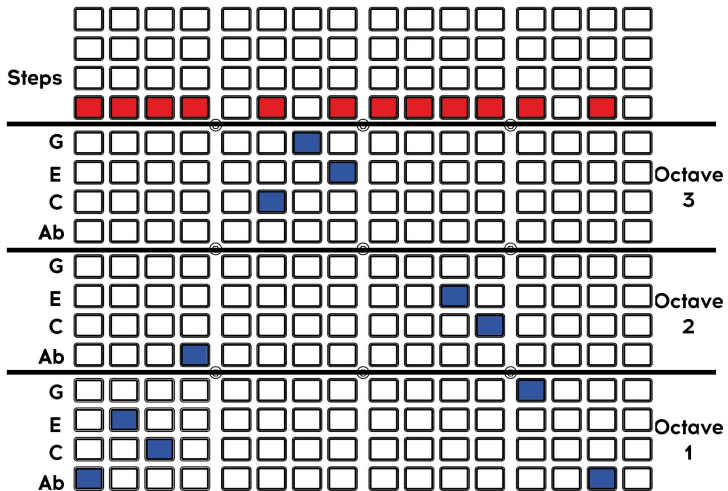
The yellow lettering underneath these buttons applies to the arpeggiator.

- **Up** steps through the notes from lowest to highest and repeats;
- **Dwn** steps through them from highest to lowest and repeats;
- **Up/Down** does just that: play from lowest to highest and back down;
- **Rand** plays the held notes in random order.
- **Octave >** Each push of this button causes the arpeggiator to repeat the up/down or random sequence an additional octave higher, up to four octaves, and **<** subtracts an octave with each push. The setting is shown in the display.

### 5.3.4. Matrix Arpeggiator

Press both Sequencer and Arpeggiator.

This mode lets you hold up to four notes and play them in any order, in the octave you set for each note, for up to 16 steps. You can also vary the rhythm of the arpeggio within those 16 steps.



**i** Some blue buttons were omitted in the graphic to emphasize that a note will not trigger at that step. However, each column always has a blue button lit. This helps you know which note will be added if a red button is enabled for that step.

You can hold down any four notes (or fewer). In the example above, Ab-C-E-G are being arpeggiated in the pattern shown. The blue buttons are used to shift specific notes of the arpeggio up or down within the three octaves.

The red line shows the steps, i.e. the rhythm pattern. Keep in mind that the other sequencer features are also available in this mode (Mod, Slide, Accent, and tied notes).

In addition, you can use "chromatic approach" notes:

- Lower approach note: If you hold the < transport control while pressing a button in the octave section, the note sent is one half step below, and the button turns red instead of blue
- Upper approach note: If you hold the > transport control while pressing a button in the octave section, the note sent is one half step above, and the button turns pink instead of blue.

## 6. ADVANCED SEQ EDITING

### 6.1. Whole-pattern edits

#### 6.1.1. Rotate sequence

Sometimes a good idea ends up in the middle somewhere when recording a pattern. This feature lets you fix that by shifting the contents of a sequence to the left or right.

It also enables you experiment with a groove by seeing how it sounds with a different step on the downbeat. That could unlock a new idea that wouldn't have occurred to you otherwise.

It's easy to do (and fun to watch).

1. Make sure the Record button is not lit. Rotate only works when SEQ is not in Record mode.
2. Hold TAP and press the **Step** < or > button. The step LEDs will rotate one step per button press.

This process moves the steps and all of their properties: Gate, Pitch, Accent, Slide, and Seq Mod events. But it only affects the steps *inside* the sequence length (i.e., the music you hear while the pattern is running). Steps outside of the sequence length are not shifted.



The TAP button is used in Record mode to insert rests or erase notes, so the Rotate feature is only available when Record is Off.

#### 6.1.2. Extend & duplicate SEQ content

This feature can double the length of a pattern in an instant, while also duplicating the contents. For example, a 16-step pattern becomes a 32-step pattern, with the second half pre-filled by musical data from the first 16 steps. Then make a few edits to create variations in each half of the pattern, and suddenly you've made a good idea even better.

**Example 1:** We'll save the details for the next two examples. For instant gratification, start here. If you're already in SEQ mode with an existing pattern (32 steps or shorter), simply hold SEQ Length and press the **Step** > button. Here's what happens:

- The pattern length is doubled
- The Sequence content is duplicated *Note that this overwrites any steps that were outside of the sequence length prior to the operation.*
- The Sequence content is cropped if exceeds 64 steps.

**Example 2:** Let's start from the beginning. Select a preset with a quick attack so the results can be heard immediately. Then press SEQ and follow these steps:

1. Initialize the sequence: hold Panel and press SEQ.
2. Hold the SEQ Length button and press A4 to set the length to 4 steps.
3. Press the Record button to enter step record mode.
4. Play only four keys. For this example we'll use CDEF.

5. Hold SEQ Length and press the **Step >** button. SEQ Length is now 8 steps.
6. Release SEQ Length: Steps 5-8 are lit, which means they contain data.
7. Repeat step 5: SEQ Length is now 16 steps, all of which contain CDEF.
8. Repeat step 5 twice: SEQ Length is now 64 steps (the maximum).
9. Record is still lit. Now press Play and enter different notes with the keyboard.
10. Enable/disable steps, accents, slides, etc., on different steps. Eventually all 64 steps are unique.

**Example 3:** Here's what happens when the Extend method tries to exceed a pattern length of 64 steps. Let's say you started with a 60-step pattern:

- Hold SEQ Length and press the **Step >** button
- The pattern is now 64 steps long with the last step set to step 64.
- Result: Steps 61-64 contain the 4 first steps of the initial sequence.



To shorten a sequence, use the normal SEQ Length + matrix button method (not the < arrow).

## 6.2. Step editing

Step editing is beneficial in two ways: it lets you make precision edits to a real-time recording later, and it offers a completely different approach to composition. The basic functions are:

- Enter a musical passage one step at a time, including rests and tied notes
- Use the Mod Amount knob to edit pitch and Mod values
- Use the step/event buttons to select one or more events for editing, or to toggle them on or off
- Hold a step event button, play a key to enter a note and Accent for that step.

Many of the step editing techniques described on the next two pages also work during real-time recording, but our focus here will be mostly on step editing. For a chart that presents this information another way, see [Step Editing Actions \[p.57\]](#).

### 6.2.1. Enter / edit one step

With Record On and the pattern not playing: Press a step button or the < and > buttons to move through the pattern until the desired step has been reached. (The current step button turns pink when selected so you know where you are in the pattern.) The following edits are possible:

- To enter or replace a note on the current step, play a key. To replace any note, hold its step button and play a key.
- For a slide or an accent, press the related button to toggle it on or off. When a slide is activated it affects the transition *into* the current step. Glide time must be sufficient for the slide to be heard.
- For a mod event, press the related button to toggle it on or off. To set an amount for the current step, turn the Mod Amount knob. Use the **Step <** and **>** buttons to advance the cursor and select a different step, as needed.

With Record Off and the pattern not playing, the methods are the same as with Record On except:

- To enter or replace a note, hold the step button and play a key, or hold the step button and turn the Mod Amount knob. (Both of those methods also edit the note when the pattern is playing, as long as Record is Off.)
- To set a Mod amount for a specific step, first hold its MOD button and then turn the Mod Amount knob. To view the Mod amount for a specific step, use the **Step** < and > buttons to select the step and turn the Mod Amount knob.

### 6.2.2. Enter / edit multiple steps

With Record On and the pattern not playing, the following edits are possible:

- To enter or replace a series of notes, play the desired keys. The cursor advances each time a key is played and selects the next step. Press the TAP button to enter a rest.
- To enable several slide or accent events at one time, hold the first button and then press the second. Be sure to press the buttons from left to right, because reversing the order will disable the selected group of events.
- To enable several Mod events at one time, hold the first button, press and hold the second button, and then turn the Mod Amount knob. All selected steps are assigned the same Mod value (the last one the Mod knob reached while the buttons were held). One idea is to dial in the maximum Mod level you want while holding the buttons, and then fine-tune the values on the other steps to create a gradual increase/decrease. *Remember, if the Mod Amount knob is turned while recording in real time, the sequencer will exit Record mode after one loop.*

With Record Off and the pattern not looping, the results are mostly the same as above. The only difference is what happens with the Step row (i.e., the notes). To tie several steps together, hold the first button and then press the second (left to right). If they're all the same note, you'll hear one long note on playback; if the steps contain different notes, the result is a legato passage. Using this technique with any other row of events will enable the range of selected buttons as a group.

With Record Off and the pattern looping the results are the same as above, with these exceptions:

- Playing the keyboard transposes the pattern
- Turning the Mod Amount knob won't alter the Mod events, even if a Mod button is held.

### 6.2.3. Erase / disable multiple steps

You can disable two or more events at one time by holding the **last** button of the range to be disabled and then pressing the first button (i.e., hold the right one, press the left one). All events between two buttons in the same row will be disabled, including the first and last events. This method works whether a pattern is looping or not (but read the note below!).



ⓘ: This is both a feature and a warning: When looping a pattern with Record On, holding TAP **will erase the notes** and disable all events while TAP is held. Everything else is the same as in the paragraph above: Hold a button on the right, press one on the left, and the buttons within that range are disabled, including the two that were pressed.

## 7. MIDI

In addition to the keyboard, almost all MatrixBrute's knobs, sliders, and wheels send and respond to MIDI, so you can record and edit their movements in a DAW running on a computer. That makes the instrument useful as a hands-on controller for external instruments, not just a master keyboard.

MIDI can go in and out of the USB port, the 5-pin DIN ports, both, or neither. All the MIDI settings are in Arturia's MIDI Control Center application, which you download for Mac or PC from the [Arturia website](#). They are described [here \[p.53\]](#). These settings can also be accessed from the front panel in [Settings mode \[p.55\]](#).

The sequencer and arpeggiator can lock to MIDI clock. They send MIDI notes, so you can record and edit the notes they send in a DAW. Since the LFOs can lock to MIDI and then be patched anywhere, effectively everything on the instrument can be in tempo.

### 7.1. MIDI Continuous Controller Assignments

Pedals Parameters	MIDI CC	Resolution
Sustain Pedal	64	7-bit
Expr. Pedal 2	3	7-bit/14-bit
Expr. Pedal 1	4	7-bit/14-bit

VCO 1 Parameters	MIDI CC	Resolution
Fine	65	7-bit
Coarse	66	7-bit
Waveform Selection	67	7-bit
Sub	9	7-bit/14-bit
Ultrasaw	68	7-bit
Sawtooth	10	7-bit/14-bit
Square	12	7-bit/14-bit
Triangle	13	7-bit/14-bit
Pulse Width	69	7-bit
Metalizer	70	7-bit

VCO 2 Parameters	MIDI CC	Resolution
Fine	71	7-bit
Coarse	72	7-bit
Waveform Selection	73	7-bit
Sub	14	7-bit/14-bit
Ultrasaw	74	7-bit
Sawtooth	15	7-bit/14-bit
Square	16	7-bit/14-bit
Triangle	17	7-bit/14-bit
Pulse Width	75	7-bit
Metalizer	76	7-bit

VCO 3 - LFO 3 Parameters	MIDI CC	Resolution
Coarse	22	7-bit/14-bit

AUDIO MOD Parameters	MIDI CC	Resolution
VCO 1 > VCO 2	77	7-bit
VCO 1 < VCO 3 > VCO 2	78	7-bit
VCF 1 < VCO 3 > VCF 2	79	7-bit
VCO 1 < Noise > VCF 1	80	7-bit

MIXER Parameters	MIDI CC	Resolution
VCO 1	18	7-bit/14-bit
VCO 2	19	7-bit/14-bit
VCO 3	20	7-bit/14-bit
Noise	21	7-bit/14-bit
External	89	7-bit

STEINER Parameters	MIDI CC	Resolution
Drive	81	7-bit
Cutoff	23	7-bit/14-bit
Resonance	83	7-bit
Brute Factor	82	7-bit
Env 1 Amt	24	7-bit/14-bit
Steiner Out	7	7-bit/14-bit
Master Cutoff	27	7-bit/14-bit



LADDER Parameters	MIDI CC	Resolution
Drive	85	7-bit
Brute Factor	86	7-bit
Cutoff	25	7-bit/14-bit
Env 1 Amt	26	7-bit/14-bit
Resonance	87	7-bit
Ladder Out	8	7-bit/14-bit

LFO 1 Parameters	MIDI CC	Resolution
Phase	90	7-bit
Rate	91	7-bit

LFO 2 Parameters	MIDI CC	Resolution
Delay	92	7-bit
Rate	93	7-bit

ENV 1 Parameters	MIDI CC	Resolution
Velo / VCF	94	7-bit
Attack	102	7-bit
Decay	103	7-bit
Sustain	28	7-bit/14-bit
Release	104	7-bit

ENV 2 (VCF) Parameters	MIDI CC	Resolution
Velo / VCF	95	7-bit
Attack	105	7-bit
Decay	106	7-bit
Sustain	29	7-bit/14-bit
Release	107	7-bit

ENV 3 Parameters	MIDI CC	Resolution
Delay	108	7-bit
Attack	109	7-bit
Decay	110	7-bit
Sustain	30	7-bit/14-bit
Release	111	7-bit

<b>ANALOG EFFECTS Parameters</b>	<b>MIDI CC</b>	<b>Resolution</b>
Delay Time	112	7-bit
Regeneration	113	7-bit
Tone / Rate	114	7-bit
Width / Depth	115	7-bit
Dry / Wet	31	7-bit/14-bit

<b>SEQUENCER Parameters</b>	<b>MIDI CC</b>	<b>Resolution</b>
Rate	116	7-bit
Swing	117	7-bit
Gate	118	7-bit

<b>WHEELS Parameters</b>	<b>MIDI CC</b>	<b>Resolution</b>
Modulation	1	7-bit/14-bit
Bend Range	119	7-bit

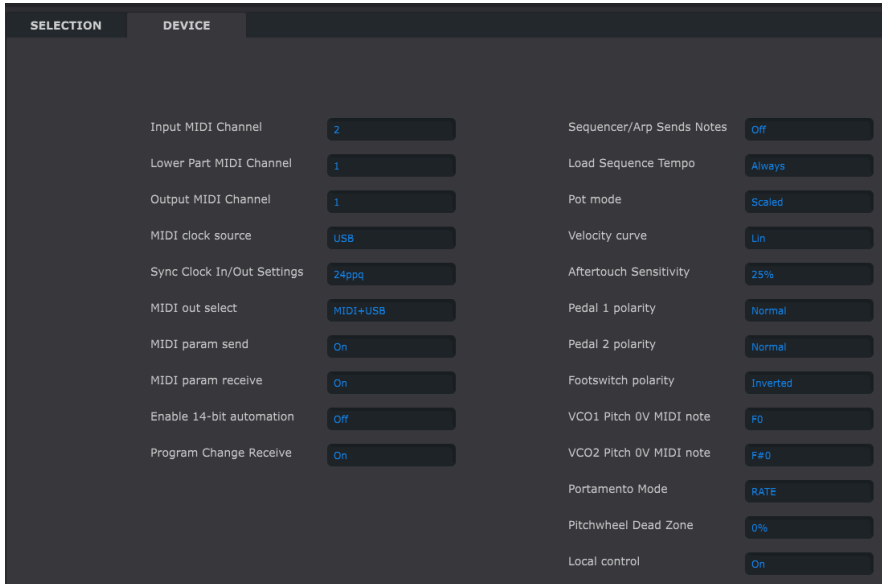
<b>GLIDE Parameters</b>	<b>MIDI CC</b>	<b>Resolution</b>
Glide	5	7-bit/14-bit

<b>MACRO KNOBS Parameters</b>	<b>MIDI CC</b>	<b>Resolution</b>
M1	11	7-bit/14-bit
M2	2	7-bit/14-bit
M3	4	7-bit/14-bit
M4	3	7-bit/14-bit

While the Pitch wheel is unmarked, it is active; pitch isn't a CC in the MIDI protocol - it's a separate command in the protocol. If you connect expression pedals 1 or 2 to the rear panel, they have duplicate CC assignments to Macro knobs 3's and 4's (to the left of the keyboard). The Sustain pedal input in the rear is CC#64, which is standard.

## 7.2. MIDI Control Center settings

The MIDI settings can be set using the MIDI Control Center's **Device** tab. Again, download the software from [www.arturia.com](http://www.arturia.com).



**Input MIDI Channel** - All, 1-16, None. The MatrixBrute receives only on this MIDI Channel when the Lower Part MIDI Channel is set to None.

**Lower Part MIDI Channel** - None, 1-16. This is the MIDI Channel on which the lower half of the MatrixBrute receives when the Voice mode is set to Duo Split.

**Output MIDI Channel** - 1-16. This selects the MIDI transmission channel.

**MIDI clock source** - USB, MIDI, Sync. The USB port is the MatrixBrute's built-in MIDI interface, which you connect to a Mac or PC; MIDI is the 5-pin DIN MIDI in.

**Sync Clock In/Out Settings** - Use the Sync port to interface with pre-MIDI devices, such as old Korg and Roland drum machines. Four types are supported: 1step (Clock), 1pulse (Korg), 24 pulses per quarter note, or ppqn (Roland DIN), and 48 ppqn (Korg and others).

**MIDI out select** - The choices are Off, USB, MIDI, or MIDI + USB. USB has the advantage of connecting directly to a Mac or PC without a MIDI interface, but you can run MIDI cables over longer distances. Also note that if you save a DAW project that used the USB connection, then load it again later, the DAW may get upset if the MatrixBrute isn't connected and turned on; it'll be looking for a MIDI interface it doesn't see.

**MIDI param send and receive** - Turns MIDI from the panel on and off. The keyboard still sends notes when it's off. You might not want the knobs and sliders to trigger or respond to MIDI from another instrument while you're playing.

**Enable 14-bit automation** - On, Off. Many of the knobs on the front panel can send high-resolution 14-bit MIDI data. Some devices and DAWs may not be able to receive this information, though. If you notice a lag in communication or other issues, try disabling 14-bit automation with this parameter.

**Program Change Receive** - MIDI Program Change commands switch Presets. That can be convenient, or you can turn it off to prevent Presets from changing when you don't want them to.

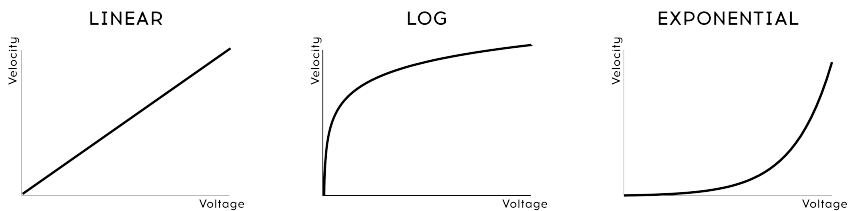
**Sequencer/Arp Sends Notes** - On or Off. The sequencer/arpeggiator can send MIDI notes to trigger other instruments or to be recorded in a DAW.

**Load Sequence Tempo** - Yes, IFP, or No. When set to "No" the tempo setting is global; changing presets will not update the tempo. "If Paused" maintains the current tempo if the preset is changed while the Seq/Arp is running, and updates the tempo if the preset is changed while Seq/Arp is paused. If "Yes" is selected, the stored sequence tempo will always be loaded.

**Pot mode** - Because the knobs are 270° pots and not 360° encoders, they don't necessarily reflect their underlying settings. There are three choices for how they behave when sending MIDI.

- **Jump** means a knob sends the value of its physical position as soon as you move it, regardless of its underlying setting. If the underlying setting is 12, the knob happens to be at 3, and you move it to 4, it will jump to 4. (These are not actual numbers.)
- **Hook** waits until you move a knob past its current setting to "catch" (hook) it before sending anything. This is the default mode.
- **Scaled** increases or decreases the actual setting regardless of where the knob is. So if the actual value is 12 and you move the knob from 3 to 4, the actual value will go to 13. Scaled allows you to increment or decrement the knob value. The drawback is if the knob is at a high or low extreme, you obviously cannot move it further. In this case you need to turn the knob and the value will have to go either negative or positive first.

**Velocity curve** - This lets you adjust the keyboard response to your playing style and preference.



## VELOCITY CURVES

- **Linear** (the default) has an even response across the dynamic range;
- **Log** requires the least amount of force to play louder notes, but it's harder to control the dynamics at lower levels;
- **Exponential** is less jumpy at lower dynamic levels, but it takes more force to reach high dynamic levels.

**Pressure sensitivity** - Lets you adjust the keyboard aftertouch response. The default value is 25%. If you need to reach the maximum aftertouch value with less pressure, increase this value.

**Pedal 1, Pedal 2, Footswitch polarity** - The choices are Normal and Inverted. Some manufacturer's pedals are reversed, so higher is lower and off is on. This corrects for that.

**VCO1, VCO2 Pitch OV MIDI Note** - C-1 to B4. Use this setting when sending Control Voltages to the MatrixBrute so it can scale the incoming voltages and produce the proper pitch. This can be set independently for VCOs 1 and 2, so different types of external devices can be controlling those oscillators.

**Glide modes** - Time or Rate. This determines the behavior of the Glide feature: when set to **Time** the glide will take the same amount of time to arrive at the destination pitch, whether it's a half-step or four octaves. When set to **Rate** the glide will cover intervals at the same rate, so the pitch takes 12 times as long to cover an octave than it does to cover a half-step.

**Pitchwheel Dead Zone** - Five settings: 0, 25, 50, 75, or 100%. These allow adjustment of the center area of the pitch bend wheel, to ensure that the pitch returns to center in all circumstances.

**Local control** - Local off means all the panel controls and the keyboard get sent out over MIDI, but they're disconnected from the MatrixBrute. This is convenient if you're working with a DAW; you'll hear the keyboard and controls on the MatrixBrute when its track is selected and MIDI is being sent back to trigger it, but you won't hear it when DAW tracks assigned to other instruments are selected. You can then play other instruments from the MatrixBrute without it playing along. Also, the MatrixBrute can be playing back MIDI you've recorded while you play other instruments from its keyboard and controls.

### 7.3. Settings mode

It's quicker to use the MIDI Control Center to change these settings because you can see them all at once. But you can change them without a computer attached: simply access Settings mode.

To do this, hold PRESET + SEQ + MOD. The Preset display flashes PAR and the Sequencer display flashes the word EDIT. After 2 seconds the Matrix buttons will reveal the settings, which then can be changed using the Matrix buttons.

- The buttons related to the selected parameter are brighter than the others.
- Available values for the selected parameter are lit blue.
- The current value for the selected parameter is purple.
- Available values for all non-selected parameters are a dim blue.
- The current values for all non-selected parameters are a dim purple.
- The parameters in each row are separated by dark buttons, which are inactive.

Here's what the various rows and lit buttons represent, and which MCC parameters they access:

Row	Buttons	Name on Seq screen	MCC parameter	Settings
A	1-16	Ch.<-	Input MIDI Channel	1-16, Omni, Off [1]
B	1-16	Ch.Lo	Lower Part MIDI Channel	1-16, Off [2]
C	1-16	Ch.>	Output MIDI Channel	1-16 [3]
D	1-4	Ck.Sr.	MIDI clock source	INT, CLK, USB, MIDI
	6-9	Ck.Rt	Sync Clock In/Out Settings	1pps, Korg, 24ppq, 48ppq
	11-14	M.Out	MIDI out select	Off, MIDI, USB, All

Row	Buttons	Name on Seq screen	MCC parameter	Settings
E	1-2	CC.->	MIDI param send	Off, On
	4-5	CC.<-	MIDI param receive	Off, On
	7-8	14.Bt	14-bit automation	Off, On
	10-11	Pr.Ch	Program Change receive	Off, On
F	1-2	SQ.->	Sequencer/Arp sends notes	Off, On
	4-6	S.TPo	Load Sequence Tempo	Yes, If Paused, No
G	1-3	Pot.M	Pot mode	JMP, HK, SCL
	5-7	Velo	Velocity curve	LIN, LOG, EXP
	9-13	P. Sen	Pressure Sensitivity	0, 25, 50, 75, or 100%
H	1-2	Exp.1	Pedal 1 polarity	STD, REV
	4-5	Exp.2	Pedal 2 polarity	STD, REV
	7-8	Sust	Footswitch polarity	STD, REV
I	1-7	OV.O1	VCO1 Pitch OV MIDI Note	C-2, C-1...C3, C4 [4]
J	1-7	OV.O2	VCO2 Pitch OV MIDI Note	C-2, C-1...C3, C4 [4]
K	1-2	Glid	Portamento mode	Time, Rate
	4-8	PB.DZ	Pitchwheel Dead Zone	0, 25, 50, 75, or 100%
L-O	(dark)	-	-	-
P		LocI	Local control	1-2 (On/Off)

[1] Hold one button and press another in the same row to select Omni (all pink) or Off (all blue).

[2] Hold one button and press another in the same row to select Off (all blue).

[3] Use the MIDI Out setting in row D to select Off.

[4] Use the Preset < and > arrows to select intermediate note values.

All parameter descriptions are listed in the [previous section of this chapter \[p.53\]](#).

Here's how to use the buttons:

- The **Sequencer** < and > arrows cycle through the MCC parameters
- The **Preset** < and > arrows edit the value of the selected parameter
- The **Preset display** shows the value of the selected parameter
- The **Sequencer display** shows the selected parameter
- If you know what you want, press the appropriate Matrix button to select the parameter and set its value.

To exit Settings mode, press one of the three large mode buttons (Preset, SEQ, MOD). These settings will be saved and recalled when the MatrixBrute is turned off and back on.

## 8. STEP EDITING ACTIONS

Action	Stop (Rec. ON)	Stop (Rec. OFF)	Play (Rec. ON)	Play (Rec. OFF)
Press a key (Sequencer on)	Set step note + accent + legato (if Legato on)	Start sequencer + transpose	Record real time: note + accent + legato (if Legato on)	Transpose Sequence
Press Step slot	Trigger step	Toggle on/off	Toggle on/off	Toggle on/off
Press Accent slot	Toggle on/off	Toggle on/off	Toggle on/off	Toggle on/off
Press Slide slot	Toggle on/off	Toggle on/off	Toggle on/off	Toggle on/off
Press MOD slot	Toggle on/off	Toggle on/off	Toggle on/off	Toggle on/off
Hold two Step slots (L>R) [1]	-NA-	Tie	Tie	Tie
Hold two Accent slots (L>R)	Enable A>B	Enable A>B	Enable A>B	Enable A>B
Hold two Slide slots (L>R)	Enable A>B	Enable A>B	Enable A>B	Enable A>B
Hold two MOD slots (L>R)	Enable A>B	Enable A>B	Enable A>B	Enable A>B
Hold two Step slots (R>L) [1]	-NA-	Disable A>B	Disable A>B	Disable A>B
Hold two Accent slots (R>L)	Disable A>B	Disable A>B	Disable A>B	Disable A>B
Hold two Slide slots (R>L)	Disable A>B	Disable A>B	Disable A>B	Disable A>B
Hold two MOD slots (R>L)	Disable A>B	Disable A>B	Disable A>B	Disable A>B
Hold one Step slot + press a key	Enable step + set pitch + accent + trigger step	Enable step + set pitch + accent	-NA-	Same as Stop
Hold two Step slots + press a key	Add a single step on last step pressed	Tie note from A to B + set pitch + accent for all steps	-NA-	Same as Stop
Hold one Step slot + turn Mod	Enable step + set pitch	Enable step + set pitch	Same as Stop	Same as Stop

[1] Button hold/press order: L>R = Left to Right; R>L = Right to Left

Action	Stop (Rec. ON)	Stop (Rec. OFF)	Play (Rec. ON)	Play (Rec. OFF)
Hold two Step slots (L>R) + turn Mod	Add a single step on last step pressed	Tie note from A to B + set pitch for all steps	Same as Stop	Same as Stop
Turn MOD knob	Set Seq Mod value of selected step	Show value of selected step (no edit)	Begin Motion record for one loop, then exit Record	-NA-
Hold one MOD slot + turn Mod	Set value	Set value	-NA-	Set value
Hold two MOD slots (L>R) + turn Mod	Enable steps + set identical values from A to B	Enable steps + set identical values from A to B	Enable steps + set identical values from A to B	Enable steps + set identical values from A to B



## 9. SHORTCUT / COMBINATION CHART

Here are some charts that summarize the MatrixBrute shortcuts / button combinations:

### 9.1. Utility shortcuts

Function	Button press combinations	Description
Enter Settings mode	Press Preset + SEQ + MOD	Opens the settings editing menu
Tune oscillators	Hold Panel + press Kbd Track	Locks the synth and initializes oscillator tuning
Reset keyboard octave	Press Octave < + >	Reset keyboard octave to default

### 9.2. Reset commands

Function	Button press combinations	Description
Reset Preset	Hold Panel + press Preset button	Resets Init state ( <i>Simple sawtooth</i> )
Reset Sequence	Hold Panel + press SEQ button	Resets the sequence to a blank pattern
Reset Modulations	Hold Panel + press MOD button	Resets the current preset modulation assignments + amounts
Reset Macros	Hold Panel + turn Macro	Resets the Macro value
Reset Master Cutoff	Hold Panel + turn Master Cutoff	Reset the Master Cutoff value
Reset Mod Amt	Hold Panel + turn Mod Amount	Reset the Mod Amount value

### 9.3. Custom Mod Destination commands

Function	Button press combinations	Description
Change modulation destination page	Single press on a Custom modulation destination button	Selects the corresponding modulation destination page
Assign Custom Modulation destination	Hold Mod Column button + tweak destination control	Assign a modulation column to a custom destination
Assign a modulation amount	Hold Mod Column button + press a modulation slot	Lets you assign a mod amount as a custom modulation destination
Change page while assigning a custom modulation destination	Hold Mod Column button + press another Column button	Lets you change page to reach custom mod amount located on other pages

## 9.4. Compare commands

Function	Button press combinations	Description
Compare a preset	Hold Preset + press a preset slot button	Enables compare mode and loads preset in the compare memory
Show control offset	Hold Preset + turn knob or slider	Shows offset between preset value and current position value of control

## 9.5. LFO shortcuts

Function	Button press combinations	Description
LFO Custom Waveform Editing	Press LFO < + >	Enables the LFO custom waveform editing mode
Change LFO time division	Hold LFO Seq-Sync + press Quarter, Triplet or Dotted	Changes the LFO time division to standard, triplet or dotted

## 9.6. Duo-Split Mode shortcuts

Function	Button press combinations	Description
Set Duo-Split note	Hold Voice Mode + press key	Sets the split note between lower and upper part
Set lower part octave	Hold Voice Mode + press Octave buttons	Adjusts the lower part keyboard range
Enable lower part glide	Hold Voice Mode + press Glide button	Toggles Glide On/Off for the lower part

## 9.7. Sequencer commands

Function	Button press combinations	Description
Change Sequence length	Hold SEQ Length button, press a Step button	Sets the length of the sequence
Rotate Sequence	Hold TAP + press Step < or >	Rotates the contents of a sequence between the first and the last step
Extend & Duplicate SEQ content	Hold SEQ Length + press Step >	Sequence length is doubled and content is duplicated
Adjust BPM ( <i>Whole numbers only</i> )	Hold TAP + turn Rate	Increments / decrements BPM by whole numbers only
Edit a Step Pitch value (with keys)	Hold Seq Step + press a key	Modifies the step note
Edit a Step Pitch value (with Mod Amt knob)	Hold Seq Step + turn Mod Amt knob	Modifies the step note
Add a tied note / Tie steps	Hold two step buttons	Add a tied note between the two held steps
Add tied note + Set pitch	Hold two step buttons + press a key	Adds a tied note + sets pitch value with a key press
Add tied note + Set pitch	Hold two step buttons + turn Mod Amt knob	Adds a tied note + sets pitch value by browsing notes with the Mod Amt knob
Edit Seq step MOD value	Hold Seq Mod step + turn Mod Amt knob	Modifies the step Mod Amt value
Disable multiple steps	Hold two Steps in the same row: first the right step, then the left step	Disables all the steps between the two held steps, including the held steps

## 9.8. Matrix Arpeggiator commands

Function	Button press combinations	Description
Enable Matrix Arpeggiator	Press Sequencer + Arpeggiator	Enables Matrix Arpeggiator mode
Enter lower approach note	Hold Step < + Matrix button	Set the note one half step below the defined note
Enter upper approach note	Hold Step > + Matrix button	Set the note one half step above the defined note

## 10. SPECIFICATIONS

AC Input Specifications	
Voltage	100V - 240V ~
Power	45W
Frequency	50-60 Hz

~ : This symbol indicates AC voltage

Pedal Connections	
Expression(x2)	Tip = Pot center tap ; Ring = 3.3V ; Sleeve = Gnd
Sustain	Normal open

Control Voltages I/O	
VCO1 Pitch	0 - 10V
VCO1 Ultra Saw	+/- 5V
VCO1 Pulse Width	+/- 5V
VCO1 Metalizer	+/- 5V
VCO2 Pitch	0 - 10V
VCO2 Ultra Saw	+/- 5V
VCO2 Pulse Width	+/- 5V
VCO2 Metalizer	+/- 5V
Steiner Cutoff	0 - 10V
Ladder Cutoff	0 - 10V
LFO 1 amount	0 - 10V
VCA	0 - 10V

Gate I/O (TS)	
Gate (TS)	0 - 5V

Sync (TRS)	
Gate	0 - 5V

Audio I/O Label	Jack	Level	Note
Master Out L/R	Mono TS	+4dBu	
Audio In	Mono TS	Line = 0-20dB Inst = 0-40dB	68k $\Omega$ 1.1M $\Omega$
Insert	TRS = Tip=Send; Ring = Return; Sleeve = Gnd	+4dBu	

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## 12. DECLARATION OF CONFORMITY

### USA

#### **Important notice: DO NOT MODIFY THE UNIT!**

This product, when installed as indicate in the instructions contained in this manual, meets FCC requirement. Modifications not expressly approved by Arturia may avoid your authority, granted by the FCC, to use the product.

*IMPORTANT:* When connecting this product to accessories and/or another product, use only high quality shielded cables. Cable (s) supplied with this product **MUST** be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Responsible Party in USA: Zedra, 185 Alewife Brook Parkway, #210, Cambridge, MA 02138, United States T: +1 857 285 5953

Trade Name: ARTURIA, Model Number: MATRIXBRUTE

*NOTE:* This product has been tested and found to comply with the limit for a Class B Digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide a reasonable protection against harmful interference in a residential environment. This equipment generate, use and radiate radio frequency energy and, if not installed and used according to the instructions found in the users manual, may cause interferences harmful to the operation to other electronic devices. Compliance with FCC regulations does not guarantee that interferences will not occur in all the installations. If this product is found to be the source of interferences, witch can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures:

- Relocate either this product or the device that is affected by the interference.
- Use power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter(s).
- In the case of radio or TV interferences, relocate/ reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial cable.
- If these corrective measures do not bring any satisfied results, please the local retailer authorized to distribute this type of product. If you cannot locate the appropriate retailer, please contact Arturia.

The above statements apply **ONLY** to those products distributed in the USA.

### CANADA

This class B digital apparatus meets complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.



## EUROPE



This device has been tested and found to comply with the limits of the European Council Directive on the approximation of the laws of the member states relating to Electromagnetic Compatibility according to 2014/30/EU, and Low Voltage Directive 2014/35/EU.

This product may not work correctly by the influence of electro-static discharge; if it happens, simply restart the product.