USER MANUAL

MATRIX**BRUTE**
ANALOG SYNTHESIZER

ARTURIA®
YOUR EXPERIENCE·YOUR SOUND

Special Thanks

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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.
- 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.

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 Dr. Bob Moog ladder filter, and our own analog effects section, give you a wealth of tools and amazing sonic character to build your own sounds up.

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

We are proud and thrilled to bring you this iconic synthesizer. It is the fusion of the programable analog synthesizer wants and dreams of our entire development team.
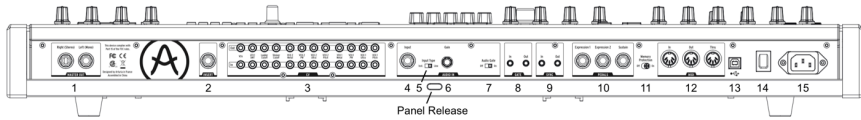
Be sure to visit the www.arturia.com website and check for the latest firmware, download the MIDI Control Center and check out the tutorials and FAQs. Get ready to explore synthesis in a whole new way.

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 = 68kΩ. Instrument = 1.1MegΩ

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 syncronize 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 to correct the polarity of any of them. These pedals are converted to MIDI, so they appear in the MIDI Out datastream. 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), 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
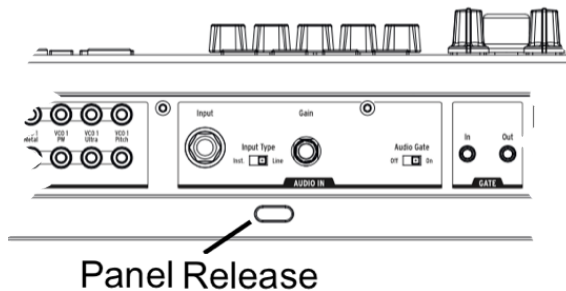
Panel Release

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.
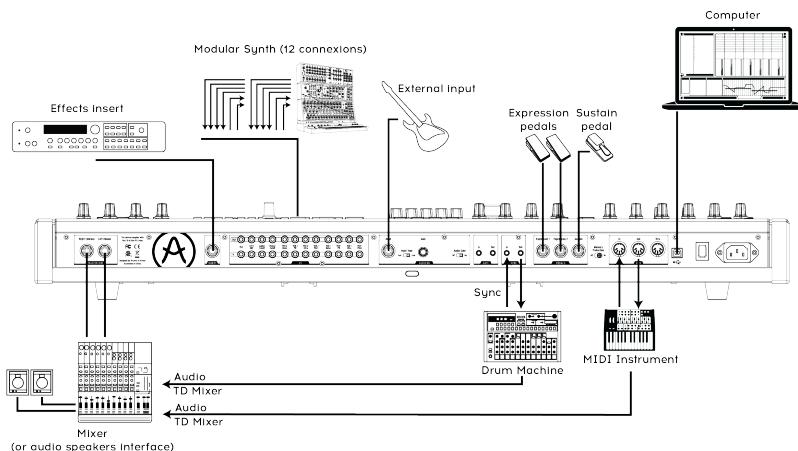
Back View

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.)

> **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.
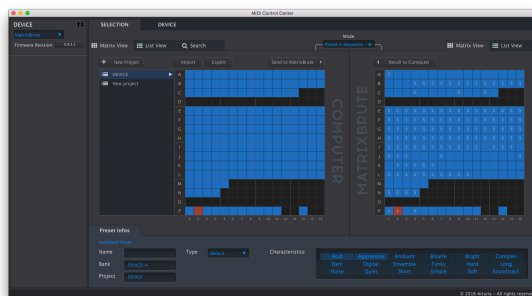
MIDI CC

Then go to 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.48].

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.
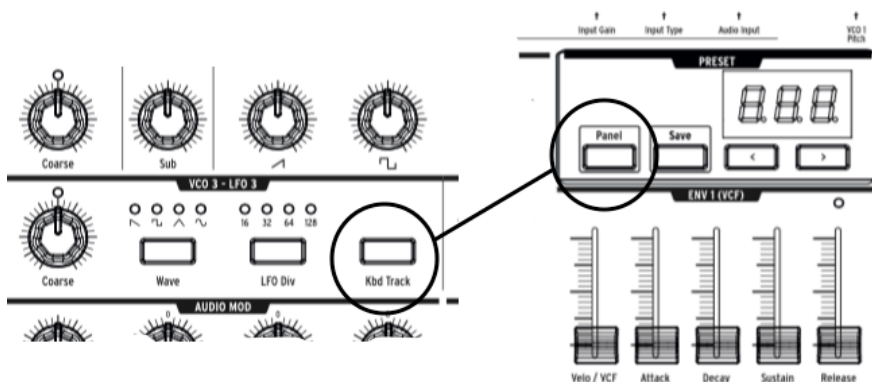
Part of the beauty of analog synths like the MatrixBrute is that the components in the analog circuits are temperature sensitive, giving them a slightly random character. It also takes a while for the voltage to stabilize when you first turn the synth on; the warmer the temperature, the shorter the time 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
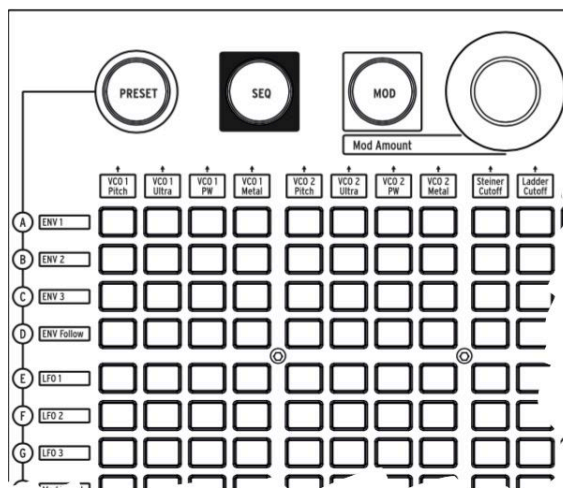
Press PRESET, and the button will turn purple.
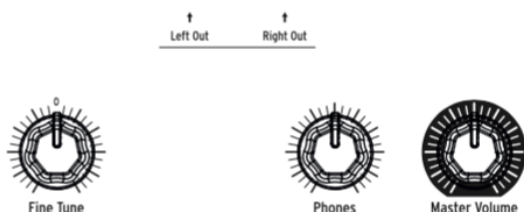
Push a button to load a Patch so you can play the instrument. Adjust the output and/or headphone levels, and fine-tune the pitch.

> 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 O3 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.)

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.
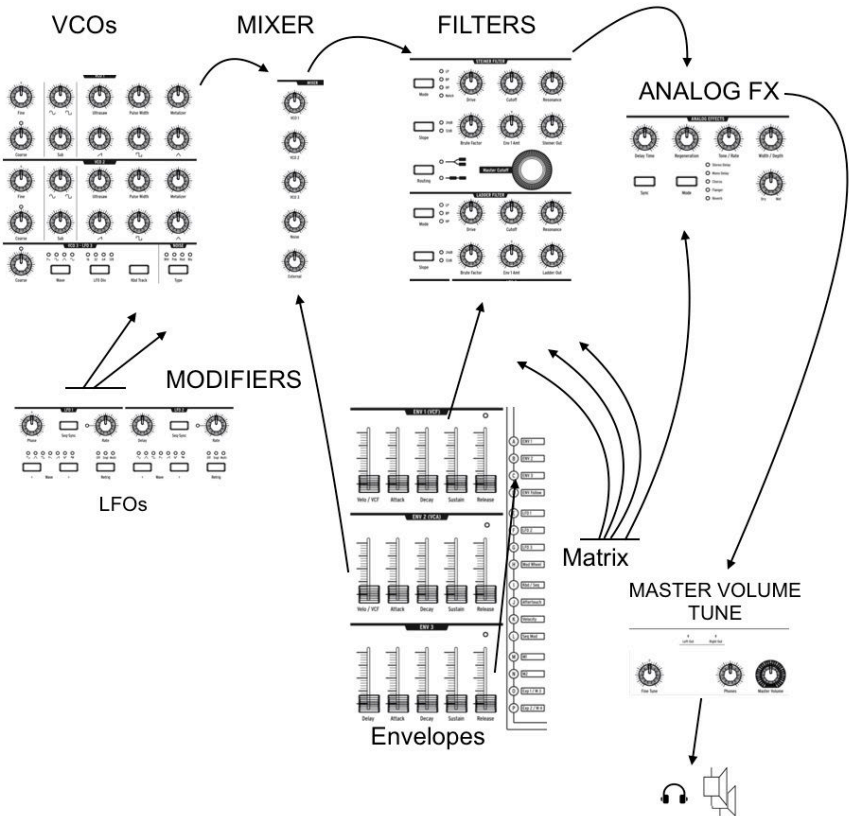
The basic signal flow is simple:

- VCO (voltage-controlled oscillators) [p.19] generate various kinds of waveforms.

- VCF (voltage-controlled filters) [p.30] 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
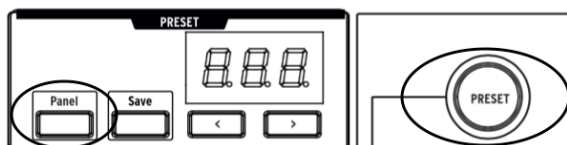
To create your own sound from scratch, begin by initializing a preset. This will create a simple sound with no modulation routings that will allow you to quickly build up your sound. To do the initialization: **Panel + Preset**.

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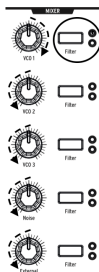
Turn **VCO 1** up all the way, everything else all the way down in the mixer. These are all the waveforms available for processing, and we're only working with VCO 1.

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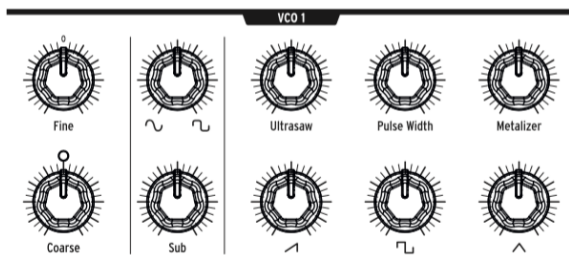
Now that you're hearing VCO 1 on its own, move the **Coarse** knob to hear what it sounds like at different pitches.

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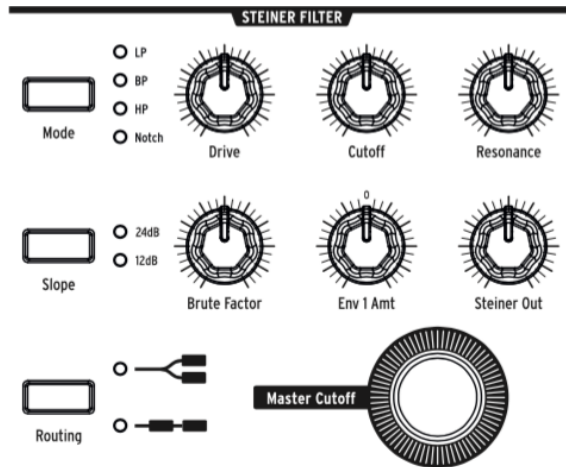
Now to shape the sound's timbre with VCF 1.

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
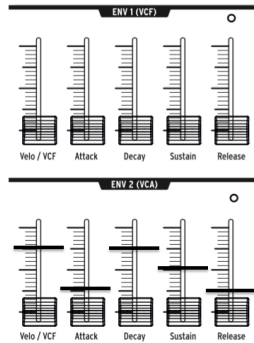
Envelopes shape voltage levels over time while you're triggering a note on the keyboard. While it can be routed to additional places in the MOD Matrix (see below), ENV 2 is always hardwired to control the MatrixBrute's VCAs. VCA stands for voltage-controlled amplifiers, which means all the sound sources 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. ENV 1 is hardwired to the two filters' Cutoffs. It works the same way, so you can experiment with its effect.

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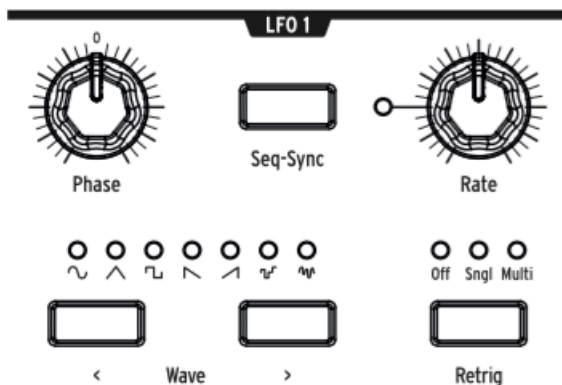
You'll also need to set LFO 1's **Phase** and **Rate** knobs where they're audible, so try 12 o'clock as a starting point (as usual, after sweeping them to catch their actual voltage positions).

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 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.
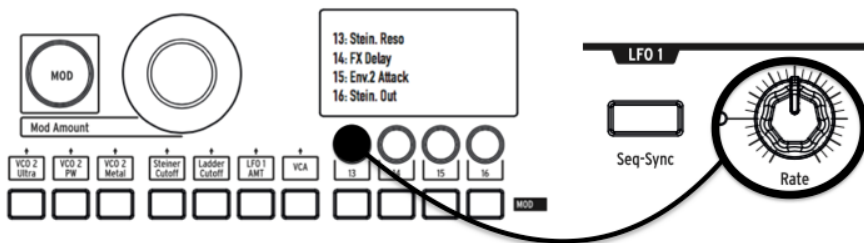
- Hold down button **13**, then wiggle **LFO 1 Rate** a little. The LCD display will darken and lighten, and LFO 1 Rate will appear in its display to indicate that it's assigned.
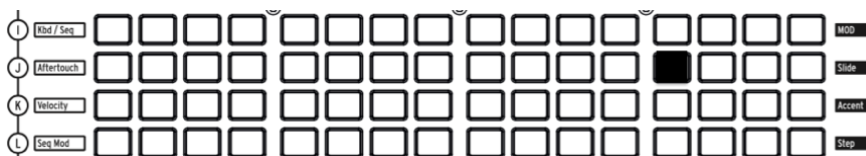
- Now touch the button at the intersection of Aftertouch (J) and 13. Set its MOD Amount to + 99.

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
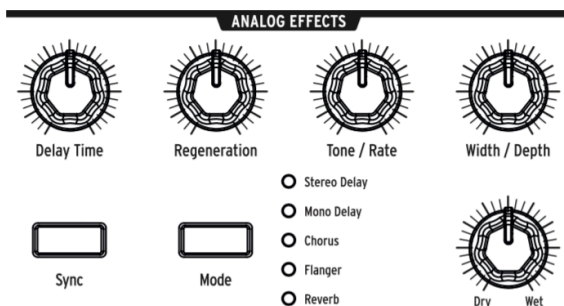
The operation instructions cover the MatrixBrute's Analog Effects [p.34] in detail, but just to "finish" the sound and bring this module to your attention, turn the Wet/Dry knob up a little to add some space. Use the Mode button to try other effects.

4. OPERATION

4.1. Master Controls
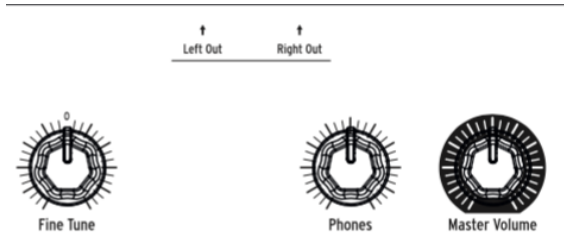
These controls are always active.

- **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 ± 1 semitone from the knob's center detent.

4.2. Utility Commands

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.

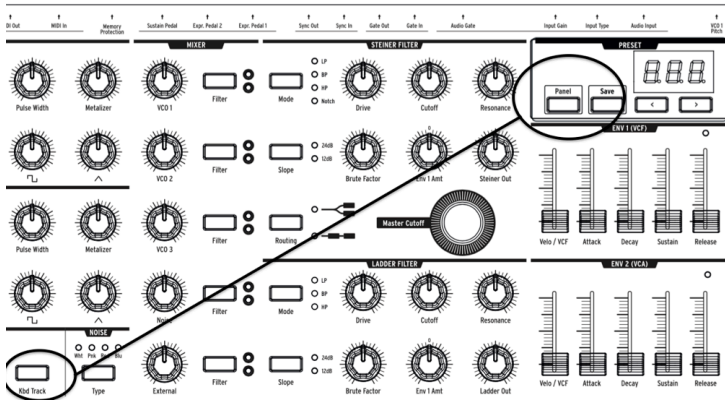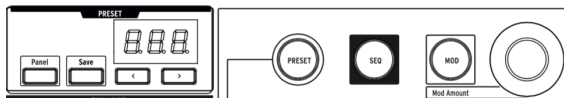- **Panel + PRESET** - Resets the current preset to an initialized voice (without saving it and overwriting the preset). This is a good starting point for working with MatrixBrute.

- **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 giving you a clean slate to start building on. To undo this, simply recall your last preset.
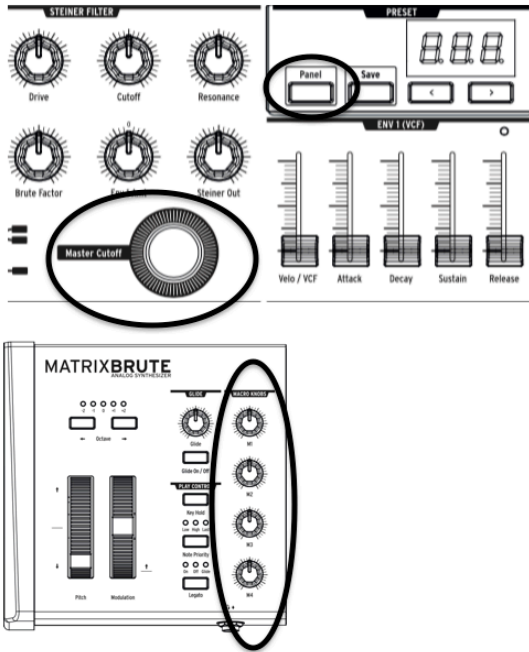
- **Panel + [Macro knobs, Master Cutoff, MOD Amount]** - Resets the 360° knob's value to 0.

- **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 that the preset value. A positive value means that it is higher than the preset value.

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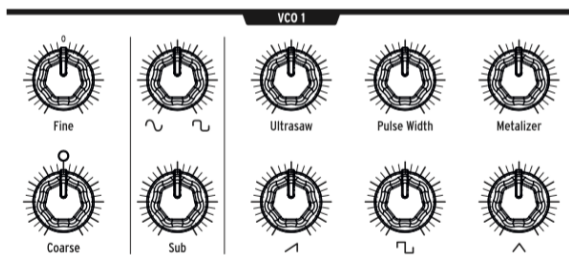
The only difference between these two VCOs is that VCO 1 can be routed into VCO 2 to modulate it (this is called *frequency modulation*, or FM). Both VCOs operate the same way.

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

Coarse adjusts the pitch ± 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 ± 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 wavefom between a pure sinewave to the left and a clipped one, which sounds buzzier, 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
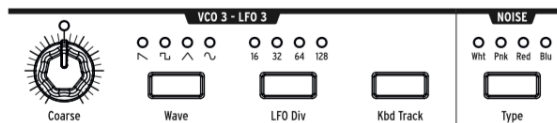
VCO 3 is a multifunction oscillator, designed to be used as a sound source or as a modulation source. The Noise oscillator is next to it, and it can also be used as a modulation source.

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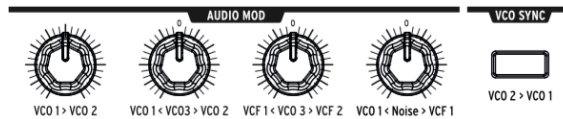
In addition to making sounds, the VCOs can modulate other VCOs and the two VCFs (Voltage-Controlled Filters). These will create more character and add harmonics to the sound of the modulation destination.

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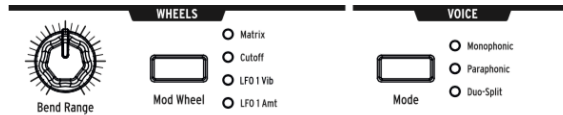
There are 3 VOICE modes that are available on the MatrixBrute. These modes allow you to play the synth in ways beyond the standard monophonic way.

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.

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 pressing **MODE** button while 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 pressing **MODE** button and use the Octave <- -> buttons to transpose it.
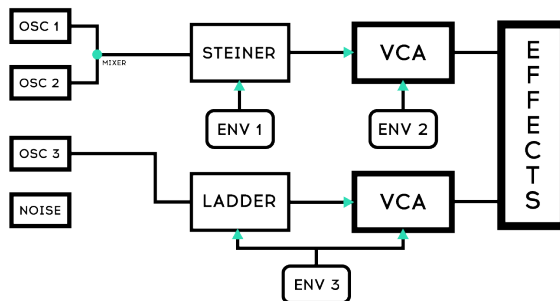
DEFAULT IN DUO SPLIT

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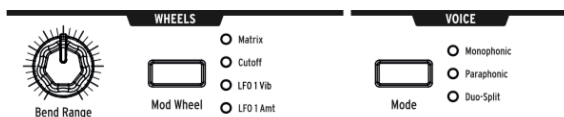
As on most keyboards, the MatrixBrute's pitch wheel springs back to the center position (no pitch shift), while the mod wheel is continuous.

- **Bend Range** sets how far the pitch wheel bends up or down, up to a maximum of ± 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
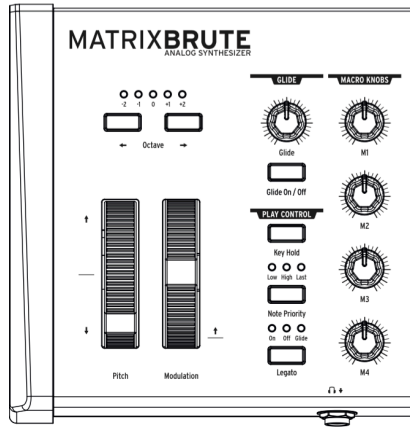
- **Pitch and Modulation wheels** - Please refer to the previous section (WHEELS) to set the pitch bend range and Modulation wheel assignment.

- **Octave <- ->** - Transposes the entire 49-key keyboard ± 1 or 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 two seconds when it's all the way up.

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.22].

- **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 the playing a notes while a note is held, will not trigger then envelopes. If the GLIDE is active, then playing legato will both prevent the envelope from triggering as well as gliding from one pitch to the next.

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
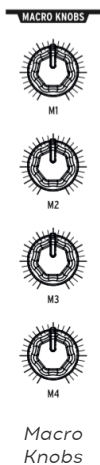
*Macro
Knobs*

M1, M2, M3, and M4 knobs are modulation sources that appear the MOD Matrix (see Mode Matrix Section [p.37]) 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, 3, 4 in order).
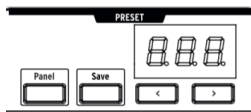
4.9.O.1. Resetting Macro's to O

Press **Panel + [M1 - M4]** to reset the MACRO knob to O.

4.10. Mixer
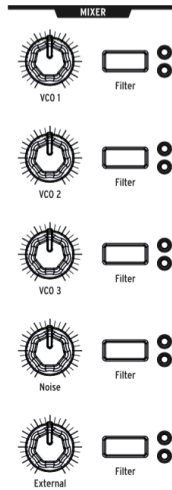
Mixer Knobs

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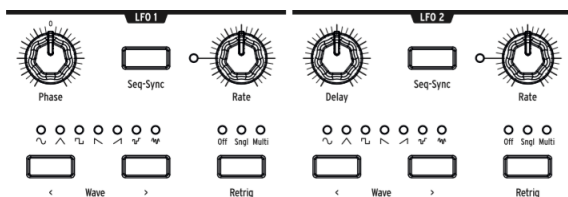
The two LFOs (low frequency oscillators) are modulators that can be routed to add movement to pretty much any parameter on the MatrixBrute. LFO waveforms are near or below the bottom threshold of our hearing, ranging from about one cycle every 18 seconds up to 100Hz. They're useful for creating all kinds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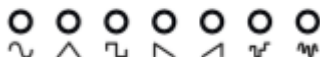
Seven waveforms are available, from left to right: sine, triangle, square, reverse sawtooth, sawtooth, S&H, and low frequency random.

The pictures of these waveforms show exactly how they 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.

- **Wave Selection** < and > scroll left and right through the waveforms.
  LFO 1 and 2 are the same except for one similar parameter (Phase vs. Delay), and you patch them into the signal path at the Matrix. See Matrix Section [p.35].

- **Phase [LFO 1 only]** adjusts where in the LFO's wave cycle it starts relative to the note trigger, either early or late. The knob has center detent position to starts the LFO at the beginning.

- **Delay [LFO 2 only]** delays when 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.40], 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.

4.12. Filters

Steiner Filter (VCF 1) and Ladder Filter (VCF 2)
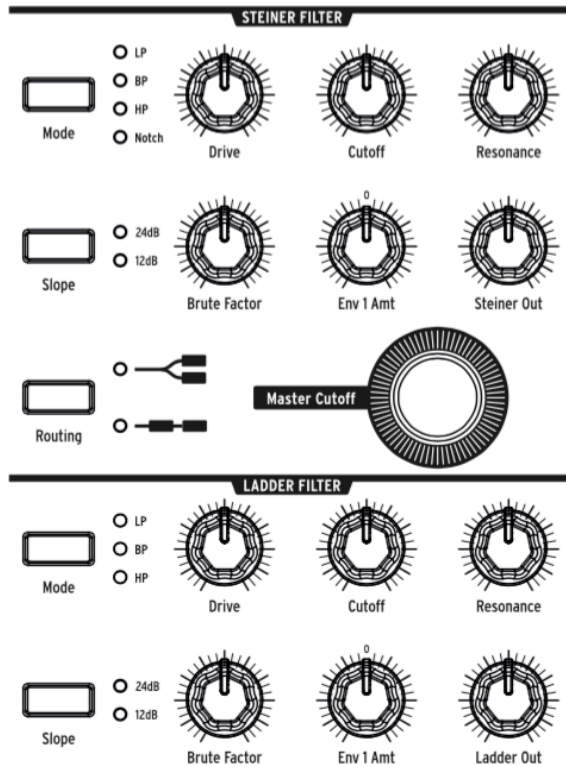
Filters remove frequencies from the sound sources coming from the Mixer see Mixer Section [p.28], and they are a primary component in the subtractive synthesis technique used by the MatrixBrute and all analog synths. Modulating them varies the timbre of the sound over time. With very high Resonance levels 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 level. 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. Maxibrute 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 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. NOTE: 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
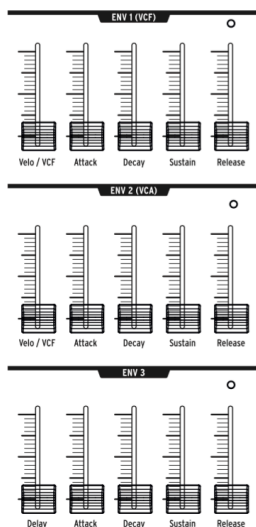
Envelopes are adjustable modulators that shape the voltage over time. MatrixBrute has two 4-stage, ADSR (Attack Decay Sustain Release) envelopes, plus a third one (ENV 3) which adds a Delay phase before the ADSR (this is all explained below). Each envelope has a "gate" LED that show when a gate is receive 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.
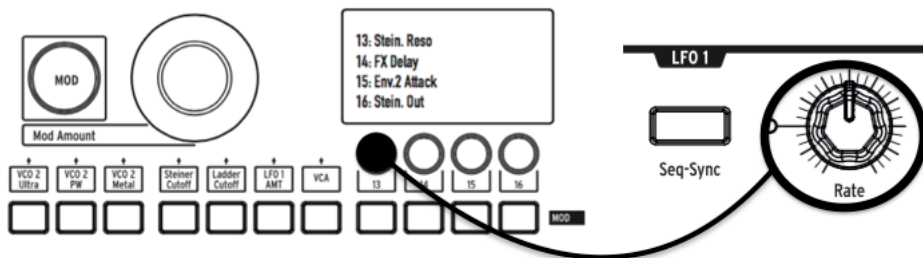
In all three envelopes:

- **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 the signal settles at 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.

- **Velo/VCF and Velo/VCA (ENV 1 and ENV 1 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 2mSec to over 10 Seconds.

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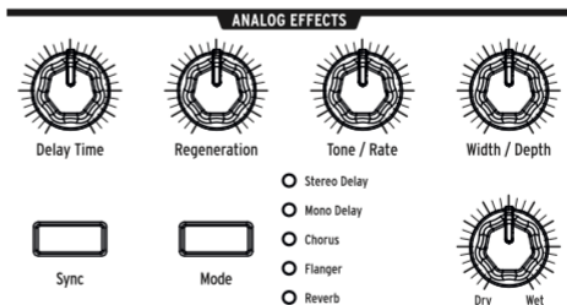
MatrixBrute features Analog Effects with 5 different modes on the output.

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.

- **Flange** 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.

5. THE MATRIX
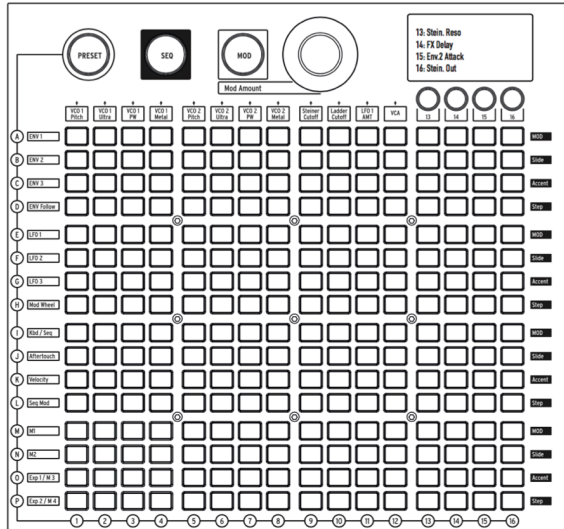
The Matrix is a 16 x 16 (256-button) grid that has three modes.
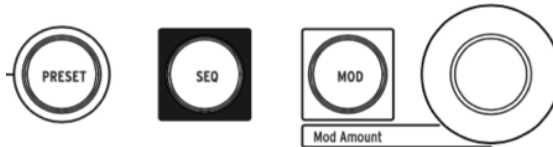
PRESET (pink)**, SEQ** (red)**,** and **MOD** (blue) are big buttons to select the active Matrix mode:

- **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
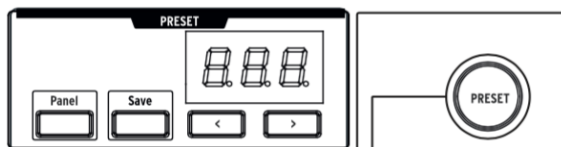
5.1.1. Panel

Panel toggles between the physical and loaded preset positions.

When in this mode, the positions of the knobs determine the sound. This is the mode to use if you are looking to get 1:1 feedback of parameters and the sound you are editing.

> **IMPORTANT**: 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; B O3 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. Saving a preset

To save the Panel or edited Preset in an internal location:

Press **Save** + [**desired bank/channel location**], using the Matrix buttons or < and > buttons.

5.2. MOD mode
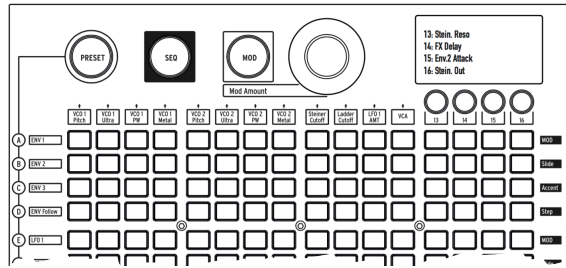
The **MOD**ulation Matrix is an electronic patchbay that routes all the MatrixBrute's modulation sources to any or all possible destinations. Think of this as a grid of patch cords, each with an attenuator that allows for positive or negative modulation. Every parameter that it would make sense to modulate - 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 13 - 16 are freely assignable.

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 O to all 16 destinations for each modulation source, and each destination parameter can be modulated by O to 16 sources.
   - Modulation "patch points" light up blue when they're not the current selection.

2. Set a positive or negative modulation amount (± 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.
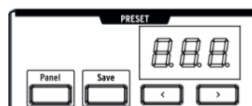
Also, the exact modulation amount is shown in the numeric display in the Preset area.

5.2.3. User assignable destinations

To assign a parameter to destinations 13 - 16:
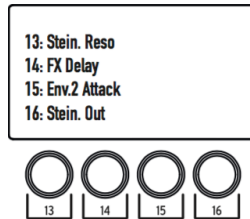
Hold [**13, 14, 15, or 16**] button while moving the desired knob or slider on the front panel. The parameter will appear in the LCD display as shown above.

You can also assign a modulation amount in the matrix itself as a modulation destination by pressing and holding the [**13, 14, 15, or 16**] button and pressing a button in the modulation grid.

For instance:

If you wanted to have the mod wheel adjust the amount of modulation between the LFO2 and the Metalizer of VCO1, you would first route the LFO2 to the Metalizer of VCO1 by pressing the F4 button. Then you would select F4 as a modulation destination by pressing the [13 for example] button and the F4 button. Now you would choose MOD Wheel to F4 by pressing the H13 button and using the encoder to turn up this value.

#	MOD source list	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 corresponding 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.
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 the Expression pedal and the M 3 or 4 are summed before being routed to the matrix

5.3. SEQ Mode
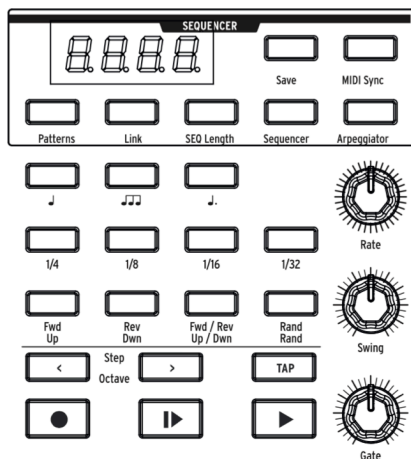
MatrixBrute's 64-step sequencer has two modes: Sequencer and Arpeggiator.

5.3.1. Sequencer Mode

In Sequencer mode, you can record/program and play Patterns in "step" time, meaning one note at a time. Patterns can be Linked to a corresponding preset so that they are stored with Presets, or stored and recalled on their own. Play or step through patterns forward, backward, forward then backward, 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.).

When step recording, the user can enter rests for each step by pressing the TAP button.

When the sequencer is being used as a modulation source and routed in the Matrix, each step can send (or not send) modulation. Dial in the tempo, tap it, or sync it to incoming MIDI clock. Slide one step into the next one. Steps respond to key velocity, and you can enter accents manually.

In **Arpeggiator** mode the notes you hold down are stepped through in a variety of orders, and repeated in higher octaves.
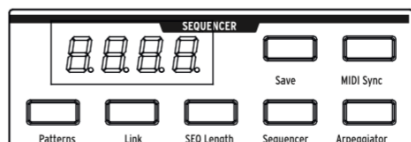
Press **Sequencer** to enter Sequencer mode.

Loading and saving sequencer Patterns:

- **Patterns** - You can load and play different sequences, or pattern, by holding the PATTERNS buttons and choosing from any of the 256 sequences. The banks are rows A - P on the left, and presets within each bank are in columns 1-16. To load, say, Pattern B3, go two rows down and three columns across; the B3 red light shows you which sequence is loaded.

- **Link** - you can link a sequence to your preset sound. When saving your preset, enable the LINK button to store them together.

- **Save** - Just hold this button and select the bank/preset where you want to save the Pattern. *Turn on* **Link** *to save a Pattern with a Preset.* See Matrix Preset Section [p.35]

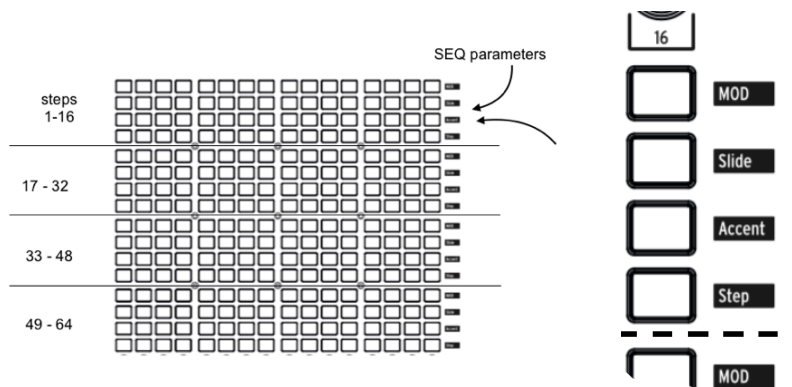- **SEQ Length** To set the sequence length, i.e. the number of steps up to 64 maximum, hold SEQ Length and touch any of the four buttons in the last step to be played. They'll light up, and after that the sequence will cycle back to the beginning when it gets there (assuming you don't stop it first,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

5.3.1.1. Step parameters:

The sequencer's 64 steps are in four 4-button rows of 16.

- **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 the button to turn a programmed/recorded note off. To tie several steps together, hold the first step button and press the last step one. All step buttons but the first are dimmed (darker).

- **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** activate the GLIDE enable button and will allow you to slide from one note to another.

- **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.
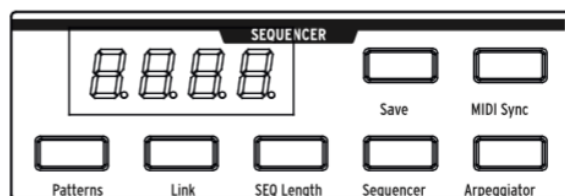
5.3.1.2. Sequencer transport and Pattern recording/programming

- **< 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 independently of whether the transport is moving. When it's moving, your playing is recorded in real time, including Ties and Accents. Turning the Mod knob will overwrite the Seq Mod track from the first step where the knob was turned until the last step of the sequence. If Record is pushed when the transport is stopped, press any of the 64 step buttons and whatever note you play will be recorded on that step. The button turns pink to indicate the current step. You can record over any note(s) in a sequence, and you can turn off individual notes simply by pushing their buttons.

- **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.
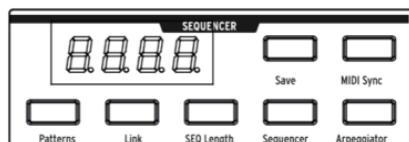
- "**Auto-play**" **feature:** When the Sequencer button is lit, the pattern will start to play, and continue as long you hold a note on the keyboard. **Play from beginning** lights up, and the pattern continues until you release the note. Play the note again, and the pattern starts over from the beginning.

> **NOTE:** The pattern auto-plays its programmed pitches if you play middle C, but it transposes if you play another note (and if you play subsequent notes, it transposes again without stopping, provided you connect the notes closely enough). For that reason, it's a good idea to program/record patterns with C as the base note.

- **Tempo, rate, and playback controls**

> **NOTE:** These apply to both Sequencer and Arpeggiator modes.
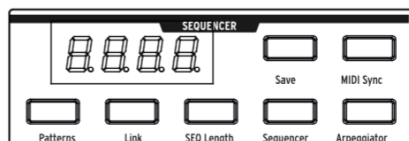
MIDI Sync ignores the internal tempo and locks the Sequencer and Arpeggiator to incoming MIDI clock. Use this if you're using the MatrixBrute with a MIDI sequencer or other MIDI equipment. External Sync may come from three sources: MIDI In, MIDI over USB and Sync port. You can choose the source you wish to use with the MIDI Control Center.
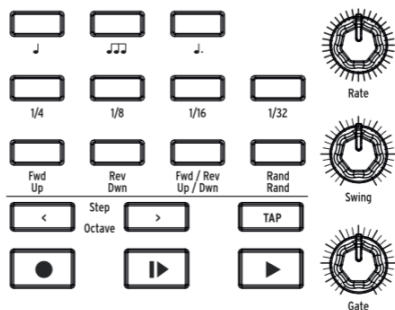
- **Gate** sets the on/off length of each step, on a scale from 1 to 99. At 99, each note trigger is held until the following step.

- **Swing** delays every odd-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.

- **Rate** dials in the sequencer tempo, from 30 to 259.9. The tempo is shown in the display. When sync'd to MIDI, the rate knob will increment in exact divisions of time based on the incoming clock.

- **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 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 do on.

Note value buttons
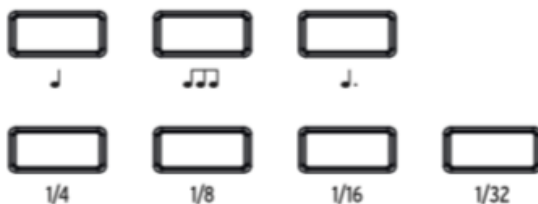
These playback settings determine what note value each step is, relative to the playback tempo. If you're using the MatrixBrute on its own, this will simply change the playback speed in a predictable way. But if you're locking the tempo to MIDI clock, it will change the musical value of each step in 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 an 1/8th note triplet;
- 1/16 + ♩. ...that's going to make each step a dotted 1/16th.

5.3.2. Arpeggiator mode
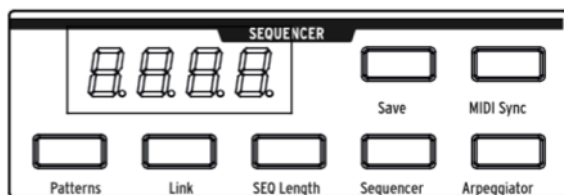
Arpeggiator enters this mode, in which the notes you hold are automatically stepped through one at a time. You can hold down as many keys as your hands or even forearms will cover; each note you hold lights up a red step in the Matrix.
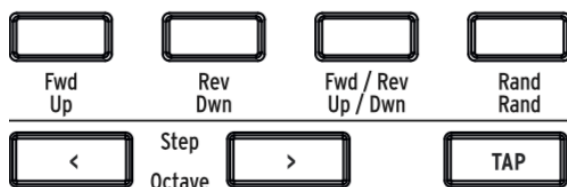
The yellow lettering underneath buttons applies to the arpeggiator.

- **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 three octaves, and **<** subtracts an octave with each push. The setting is shown in the display.

5.3.3. Matrix Arpeggiator Mode

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, up to 16 steps. You can also vary the rhythm of the arpeggio up to 16 steps.
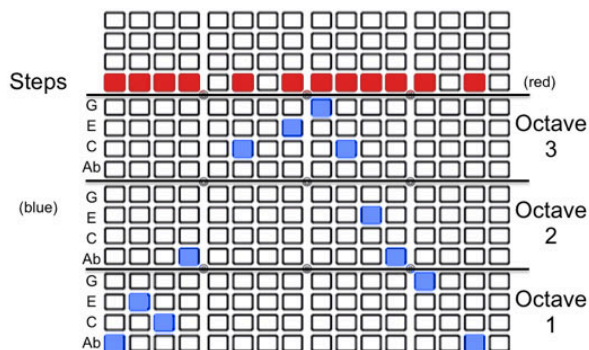
You can hold down any four notes (or fewer), in the example above, Ab-C-E-G are being arpeggiated in the pattern shown, use the blue buttons to shift the specific note of your arpeggio up or down within the three octaves. The red line shows the steps, i.e. the rhythm pattern.

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 purple instead of blue

6. 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 the USB port, the 5-pin DIN ports, both, or neither. All the MIDI settings are in Arturia's MIDI Control Center Mac/PC program, which you download from www.arturia.com. (See below.)

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.

6.1. MIDI Continuous Controller Assignments
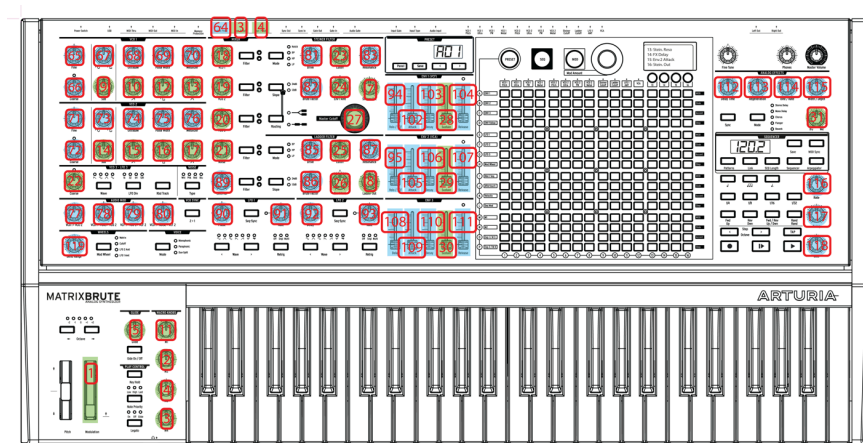
In the graphic above, the numbers superimposed over knobs are all MIDI Continuous Controllers (CC), so for example the Modulation wheel sends/receives MIDI CC#1, and Macro knob 1 to its right sends/receives CC#11 (Expression).

The controls shown in blue, are standard 7 bit MIDI controls. The controls shown in yellow are high resolution 14 bit MIDI controls.

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.

6.2. MIDI Control Center settings

The MIDI settings are all using the MIDI Control Center's **Device** tab. Again, download the software from www.arturia.com.

SELECTION	DEVICE		
Input MIDI Channel	1	Pedal 1 polarity	Normal
Output MIDI Channel	1	Pedal 2 polarity	Normal
MIDI clock source	Sync	Footswitch polarity	Normal
MIDI param send	On	Pot mode	Scaled
MIDI param receive	On	Velocity curve	Lin
MIDI out select	MIDI+USB	Sequencer/Arp Sends Notes	On
Local control	On	Load Sequence Tempo	Always
Program Change Receive	On	Enable 14-bit automation	Off
		Aftertouch Sensitivity	20%

Input MIDI Channels - All, 1-16, none. MaxiBrute sends and receives on one 16-channel MIDI port.

Output MIDI Channel - 1-16. Choose between the 16 MIDI channels to send on.

MIDI clock source - USB, MIDI, Sync. The USB port is the MaxiBrute's built-in MIDI interface, which you connect to a Mac or PC; MIDI is the 5-pin DIN MIDI in.
Use the Sync port to interface with pre-MIDI devices, such as old Korg and Roland drum machines. The following types are supported: 24 pulses per quarter note (Roland DIN).

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.

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.

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.

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.

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.

Pot mode - Because the knobs are 270 pots and not 360 degree 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.

LINEAR   LOG   EXPONENTIAL

Velocity   Velocity   Velocity

Voltage   Voltage   Voltage
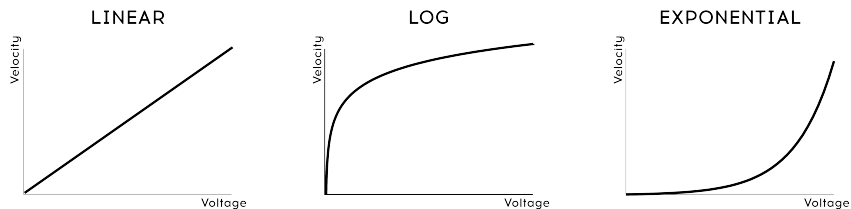
VELOCITY CURVES

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.

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

Enable 14-bit automation - (On/Off) Many of the knobs on the front panel can set to send high resolution 14 bit MIDI data. Some DAWs may not receive this information correctly however. In this case, you can turn off 14 bit automation.

Load sequence tempo - When set on never the tempo setting is global. Changing preset will not update the tempo. If always is selected stored sequence tempo will always be loaded.

Aftertouch sensitivity - Let you adjust the keyboard aftertouch response. Default value is 20% if you need to reach max aftertouch value with less pressure increase this value.

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

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

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

Gate I/O (TS)	
Gate (TS)	O – 5V

Sync (TRS)	
Gate	O – 5V

Audio I/O Label	Jack	Level	Note
Master Out L/R	Mono TS	+4dBu	
Audio In	Mono TS	Line = O-2OdB Inst = O-4OdB	68kΩ 1.1MΩ
Insert	TRS = Tip=Send; Ring = Return; Sleeve = Gnd	+4dBu	

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USA

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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 FFC authorization to use this product in the USA.

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 3OO 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.

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