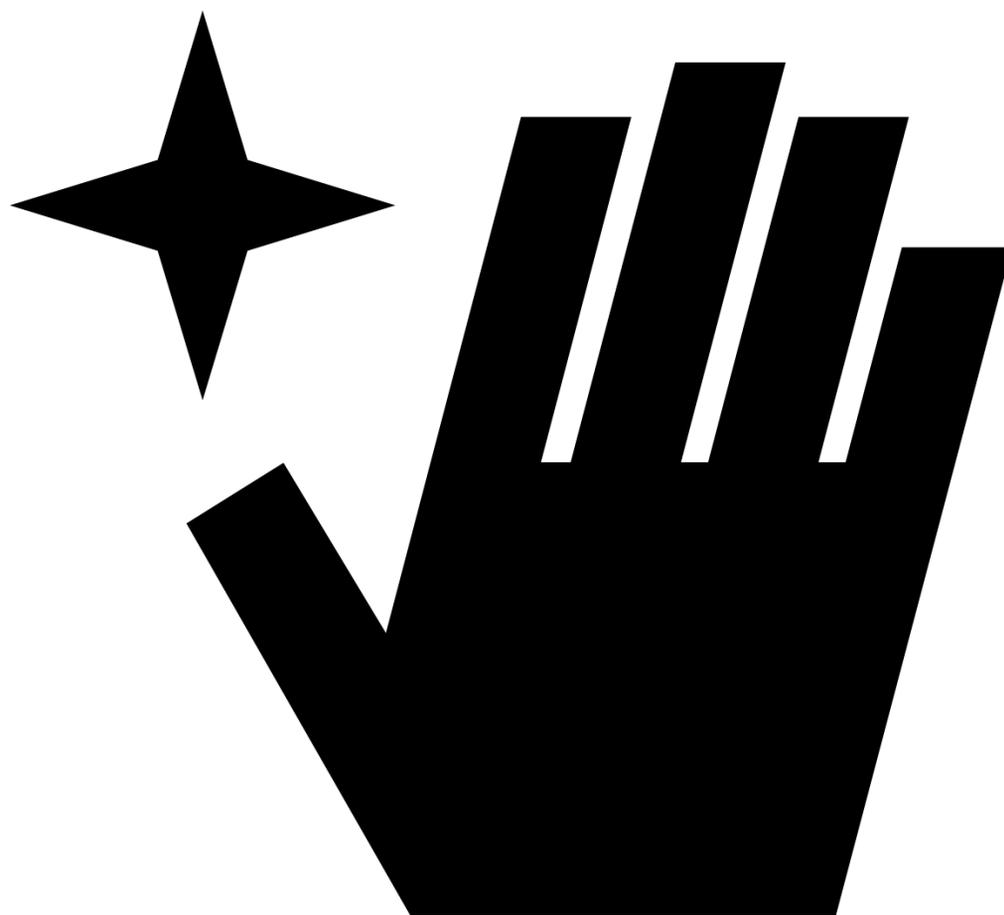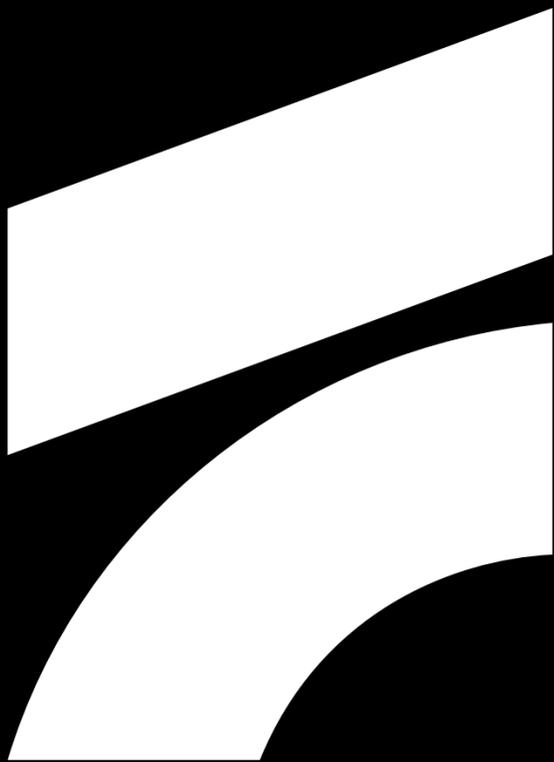Chiral

Holographic Synthesizer

Chiral is an MPE-enabled Max for Live device inspired by the culture and methodology pioneered by early electronic performance instruments.

An ideology we share today is the disinterest in replicating acoustic & familiar sounds or to conform to expectations of what a synthesizer should sound like.

Through atypical methods of sound-shaping and a vast routing matrix, Chiral embodies a similar unconforming, exploratory attitude and is built to encourage the same in you. At each point along the path, Chiral's parameters have been tuned to bend beyond & navigate outside of typical synthesis boundaries.

Chiral   MPE

AM
0.00 %   Panel   Matrix   Tone   Dirt   Volume   Space

Freq   Voices   0.00 %

                MPE   100 %   0.00 %   75.0 %   Gravity
0.00
                Slope   8.00   Amp Envelope
Fbk   25.0 %
Sync   Size   Bend   Fold   Noise
                Angle   0.00 %   Trail

0.   Mode   Free   Atk   Dec   Sus   Rel
0.00 %   × 1   0.00 % 0.00 % 0.00 %   0.25   25.0   75.0   100   50

1 × Phaseshaping Oscillator
1 × Amplitude Modulator
1 × ADSR Envelope
1 × Variable Slope Generator
1 × Contouring Tone Filter
1 × Celestial Space Reverb
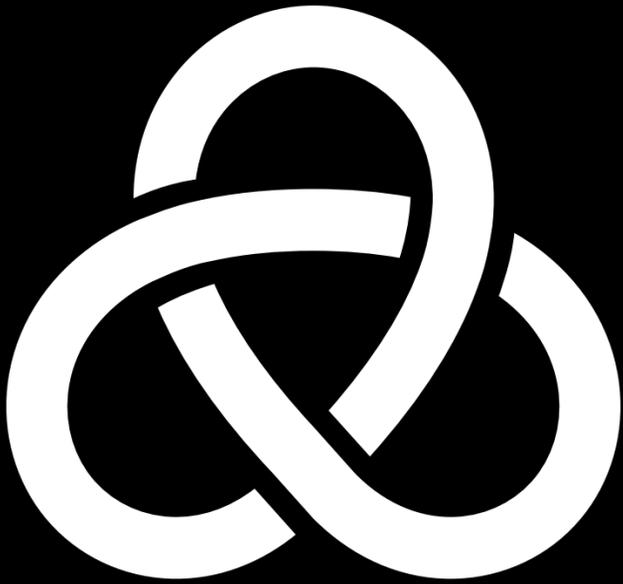1 × Crunchy Dirt Saturator

Up to 16 voice polyphony

with

MPE compatibility (Live 11),
a vast Modulation Matrix,
Single Cycle Waveform export
& a CPU-friendly demeanor.

Requires Ableton Live 10.1 or above

Phaseshaping Oscillator

The core of Chiral operates through the unconventional contortion of a sine wave, known as phaseshaping. Through the built-in three-dimensional oscilloscope, the twisting of your waveform is displayed holographically, reminiscent of a Moebius strip. If you think about the sinewave shape as a diagonal line, what phaseshaping does is to disrupt that linear trajectory in various ways which introduce different timbres.

On the left-hand side of the device you will see an elliptical projection of the waveform with the timbral controls underneath. The waveform view will reflect any changes made to the oscillator itself using the timbral controls and serves as an abstract indicator of the core timbre.

Bend

Bend will compress the wave forwards, essentially shrinking its size, much like pulse width modulation but smoother. This results in a sharper, almost sawtooth-like, timbre.

Fold

The Fold parameter introduces symmetrical two-stage wavefolding. To achieve symmetry, the waveform is first mirrored onto itself, which at 50% will sound a lot like a hollow squarewave. After the mirroring, the wavefolding takes effect.

Noise

The Noise parameter does what it says - it adds noise to the oscillator. It however does this musically, following the cyclical nature of the oscillator itself.

Sync

This parameter repeats the waveform shape inside of the length of a single cycle. Increasing this value will start repeating the same sinewave repeatedly within the same time period of one sinewave at the frequency of the note.

Typically, this will introduce some rough edges since the repeated waves could end on a non-zero value. To mitigate this, the Sync in Chiral is "Windowed", so when Sync is increased, the oscillator has an amplitude envelope known as a Hanning Window applied to it. It essentially smooths out the edges of the waveform.

Size

The size of this window can be changed, which results in different overtone patterns. A size of 2 will cause a pattern of odd overtones, resembling a square wave. Try combining different Window Sizes with different amounts of Sync.
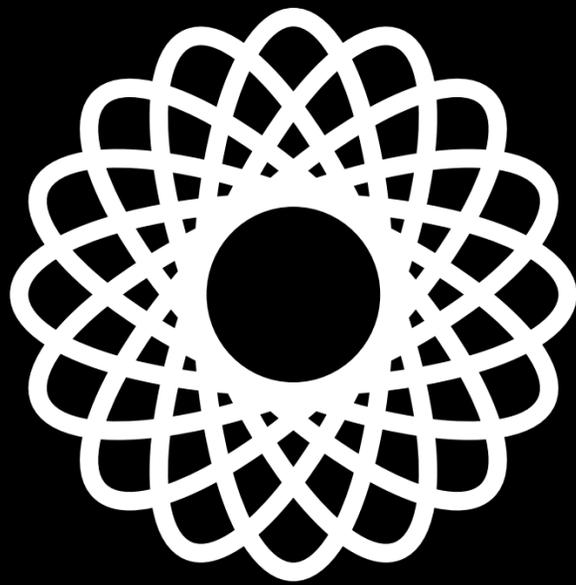
Amplitude Modulator

The Amplitude Modulator is a second oscillator that modulates the volume of the phaseshaping oscillator, typically in audiorate. This can be used to introduce motion in the sound or to introduce sidebands and overtones. AM is a simple but powerful effect that has a wide range of use.

AM Depth

This simply controls the depth of the AM effect.

Frequency

The AM frequency is relative to the frequency of the phaseshaping oscillator - meaning that the value is an offset rather than an absolute frequency and will follow the pitch. At a value of 0, it's the same frequency as the main oscillator and anything above or below is deviating. Increments of 10 are typically more harmonic, and 30% equals a frequency ratio of 2, useful for introducing square-like timbres.

Feedback

The modulating oscillator can modulate itself, known as a feedback connection. By feeding back its own signal, the amplitude modulation will become sharper and more defined and is useful for more harmonically rich modulation.

Amp Envelope

Attack, Decay, Sustain, Release - this corner-stone of synthesis encompasses a wide range of different dynamic expressions, ranging from soft pads to sharp plucks.

Attack

controls the duration of the fade-in of the sound.
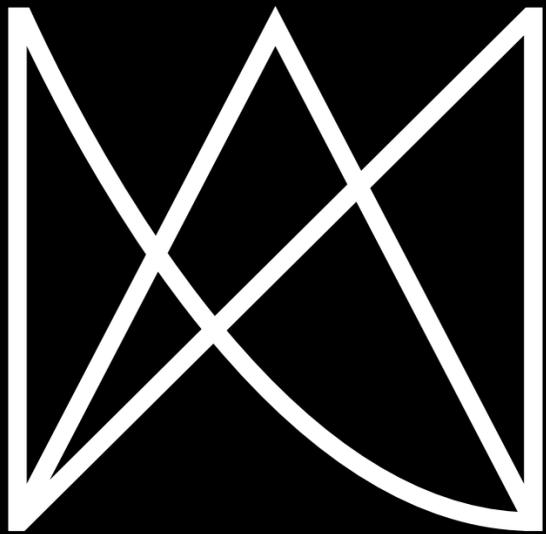
Decay

controls the duration of the time from maximum attack (loudest) to the sustain level.

Sustain

controls the level of the sustain stage, this will be active as long as there is a MIDI note still held.

Release

controls the duration of the fade-out of the sound, from the sustain level to absolute silence.

Slope Generator

This modulation source is a bit more avantgarde than the trusty ADSR. The inspiration for the Slope Generator harkens back to old and, somewhat, affordable modular synth systems that would have a more generic envelope - known as slope - that can fit a wide range of use cases.

Angle

The Angle of the Slope changes the symmetry, with negative values making it more percussive and positive more of a fade-in. At 0, the Slope is perfectly symmetrical and will resemble a triangle wave.

Lin/Exp

Lin/Exp will select between if the shape should be Linear or Exponential, the former being more consistent and the latter more organic.

+/-

This button will select between a Unipolar and Bipolar output of the Slope. Unipolar outputs 0 to 1 and Bipolar -1 to 1. What this means in practice is that Unipolar will only add to values up and down whereas Bipolar will both add and subtract, resulting in symmetric modulation. For something like vibrato you would choose Bipolar, and for an envelope you would go with Unipolar.

Mode

The Slope has several Modes which control how it's triggered and played back:

Free will always keep the Slope running without interruption, looping indefinitely.

Trig will reset the phase of the Slope each time there is a MIDI Note sent to the device, resulting in more consistent modulation.

One will play the shape of the Slope once per MIDI Note and then stop, much like how an envelope behaves.

To make use of the Slope, you will need to route it in the Matrix.
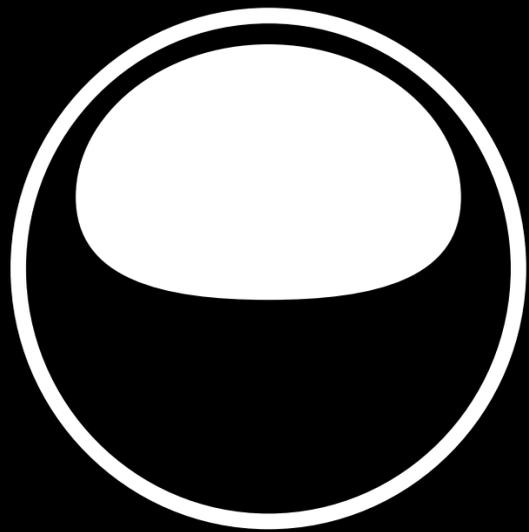
Tonal Controls

Chiral has two tonal controls that greatly affect the sound - Tone and Dirt. Tone is used to tame high frequencies and Dirt to introduce harmonic distortion.

Tone

Tied to the dynamics is the Tone control. This is essentially a filter that attenuates high frequency harmonics of the sound. It reacts to the Amp Envelope, behaving similarly to a Low Pass Gate. If you lower the value, the relation will be more noticeable and at very low values the sound will become much softer.

Dirt

At the end of the signal chain there is a saturation effect called Dirt. This introduces harmonic distortion and will affect the total output of the device, including the Space effect and all voices going through it. This can be used for subtle degradation of the sound, or complete destruction.

Volume

This controls the output volume of the synth voice and will affect how strongly it's sent to the Space effect and subsequently Dirt saturation. Note that if you want to achieve maximum dirtiness, you need to set the Volume to max.
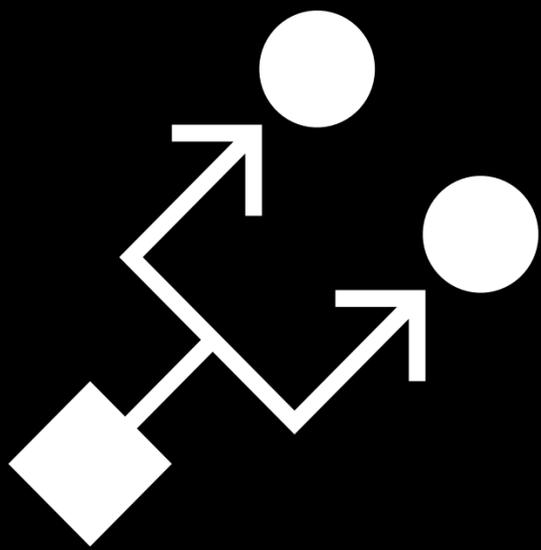
Modulation Matrix

The Modulation Matrix lets you route the sources to most of the parameters of the synth.

This flexible and configurable method of routing modulation lets you shape not only the sound but behaviors as well.
For example, it can be as simple as sending the Slope output to Pitch for a vibrato effect, or as complex as controlling things via MIDI in several layers.

To route any source to any desti-
nation, simply increase the value
of the number box that lines up
with that destination and source.

By clicking the Osc/Voice box
in the upper left corner of the
Matrix, you select between the
Voice destinations and the Oscil-
lator destinations. Voice is corre-
sponding to controls that relate
to anything outside of the core
oscillator functions and vice ver-
sa.

Each destination and source is
polyphonic, meaning they will re-
act and control per voice when
interacted with – which comes
into full play when used with an
MPE controller.
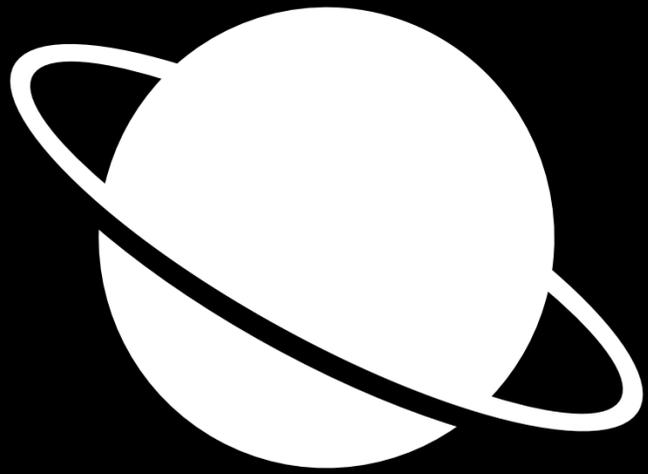
Space Reverb

Is space infinite? We don't know. This effect, while not infinite, generates incredibly vast ambience.

This reverb replicates nothing. It creates a completely alien world where any input will resonate far and wide.

Space Depth

This controls the balance between the Dry synth output and the Wet Space effect.

Gravity

This controls the vastness and density of the Space. At very low values it's simply a softened layer of the original sound, but once expanded it spans all the way from orbit to leaving the solar system. At extreme settings, one can hear the granules being stretched as wide as they can, unless there is a long Trail effect.

Trail

This controls the elongated tail of the reverberation. At low values the space will cut off somewhat abruptly, but pushed to extremes it will go on and on. A higher Trail amount will also highlight the high-mid frequencies of the sound and blur the input until it's merely a distant light in the sky.
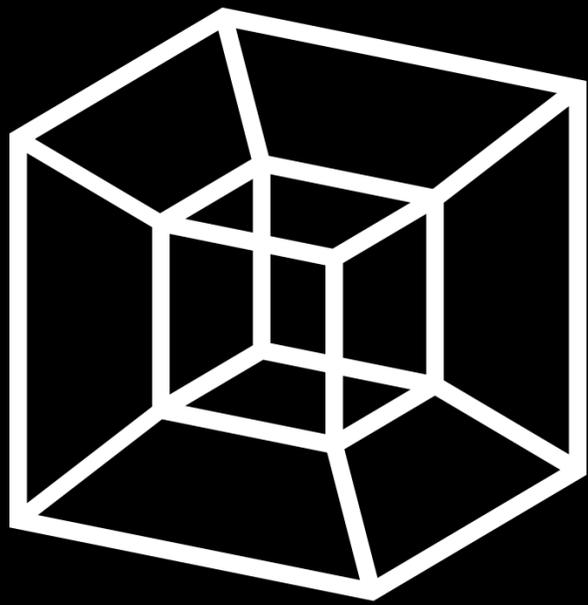
Using MPE

MPE stands for MIDI Polyphonic Expression and is a feature available in Live 11.

This standard allows you to use a compatible controller to adjust the sound per note and is fully mappable inside the Modulation Matrix of Chiral. Instead of a MIDI message applied to a whole chunk of notes that occur at a similar time, MPE acts on each note individually and allows for complex movements and expressive playing, much like a physical instrument would.

Pitch Bend

This typically controls by the left and right movement of your finger on an MPE-controller. It allows for playing with vibrato by moving your finger sideways while playing a note, but can be mapped to anything.
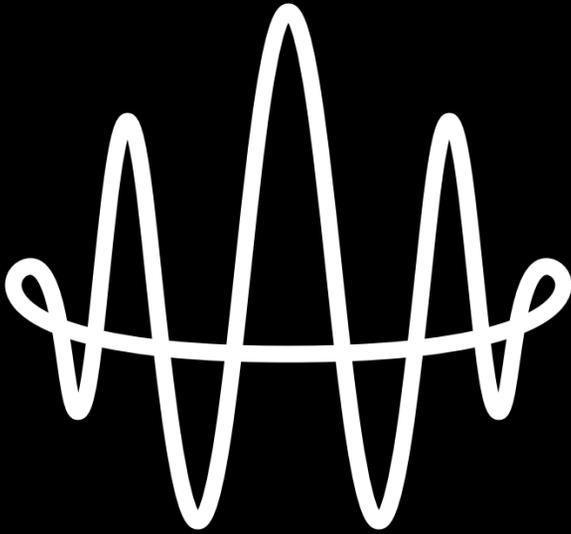
Slide

This typically relates to the up and down movement of your fingers.

Pressure

This usually means aftertouch, or the depth of your finger- how hard you press.

Each of these expression controls are mappable inside for the Modulation Matrix and allows for complex and expressive control over Chiral.

Exporting Waveforms

Chiral can export its oscillator shape to a single cycle waveform in a wave file. This is a type of sample used by many wavetable synthesizers and can be a way to use your sampler as more of a synthesizer.

The idea is to loop one short waveform so that it essentially becomes an oscillator. This technique has been used across many kinds of instruments, from old classic tracker software (writing chip-tunes) to modern wavetable synthesizers.

To export the current oscilla-
tor shape as a waveform, click
the arrow in the upper right of
the waveform window. This will
bring up the Export menu in which
you can either select one of the
preset configurations or enter
whichever format you need.

The current waveshape is then
saved as a .wav file which you can
use in your favorite sampler or
wavetable synthesizer.