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H9 - Algorithms and Their Parameters

Algorithms are the basis for all of H9's Presets. Each algorithm employs a unique signal processing structure to achieve its effect and each algorithm has a unique set of control parameters associated with it. The H9 can be loaded with over 50 algorithms taken from Eventide's family of stompboxes as well as some algorithms created specifically for the H9.

Algorithm and parameter names have been customized to accommodate the H9's six character display. In this document, displayed characters on the stompboxes 6 character LED display are indicated in brackets [XXXXXX]. The algorithms are grouped by stompbox lineage: Space, PitchFactor, ModFactor and TimeFactor plus algorithms new for the H9.

One of the purposes of this document is to help users create and tweak presets. If you do a lot of that sort of thing, you'll find the H9, with its one knob, six character display and a few switches, a bit restrictive. From the start, the H9 was designed with the intent of pairing it with a rich remote control app. That's H9 Control: Our free app for iPhone/iPad, Android, macOS and Windows. H9 Control can connect via Bluetooth or USB to your H9. If you're doing lots of tweaking or creating presets, we urge you to try out H9 Control as it can greatly simplify the process of creating and managing presets.

All algorithms have a Performance Switch which gives you the ability to instantly change the sound of the effect using a MIDI CC, Auxiliary Switch or H9 Control. The function of the Performance Switch depends on the algorithm. In H9 Control the Performance Switch is the middle button at the bottom of an algorithm's control interface.

Most time-based parameters, such as delay, change their displayed values as Tempo mode is turned On or Off. When Tempo is On, the parameter is a note value, such as 1/4 note, that is a tempo-synced division of the beats per minute (BPM). When Tempo is Off, the parameter is either (a) time in seconds or milliseconds or (b) frequency in Hz.

In some cases changing one parameter may affect the displayed values of other parameters. For example the Chorus algorithm has four types, Liquid Chorus, Organic, Shimmer and Classic, and switching between the different chorus types affects the functions of the other parameters. There is more information about the relationships between various parameters in the documentation for each algorithm.

Space Algorithms

Space's basic algorithms are designed to simulate the sound of real-world enclosures and devices – halls, rooms, plates, springs. Other algorithms are designed to creatively combine reverb effects with other signal processing functions such as tremolo, modulation, distortion, pitch change, resonance and reversal to create unique effects well beyond the confines of simple reverb.

Performance Switch/HOTSWITCH
Each algorithm supports a Performance Switch function which gives you the ability to instantly change the sound of the effect using a MIDI CC, Auxiliary Switch or using H9 Control. For Space algorithms the Performance Switch can be programmed to instantly switch between two sets of parameters. This HOTSWITCH allows you to switch between the normal Preset parameter values and a programmed, alternate set of parameter values. It's like having two Presets in one!

The HOTSWITCH is programmed using H9 Control. Press and hold the GUI's middle 'footswitch' until the ring flashes. With the ring flashing, adjust any combination of parameters to their 'alternate' value. When you find a setting that you like remember to save the preset or you will lose your new HOTSWITCH setting.

Some reverb parameters, typically decay parameters, can have values of Infinity or Freeze. Infinity is infinite sustain/reverb, which builds up over time, it continues to layer your input through the reverb. Freeze is like Infinity, but it doesn't build up. Freeze takes whatever is currently in the buffer, and holds it (no new input). You can latch or unlatch the Infinity and Freeze features with an Aux switch, HotSwitch, expression pedal or over MIDI.

Hall - [HALL]

Hall simulates the sound of large enclosed spaces. Hall offers flexible control of a 3-band crossover reverb network. There are independent decay controls for the low and high band, as well as independent level controls for low, mid, and high band. This is the go-to algorithm for beautiful realistic spaces or for reverb sounds just beyond the boundary of realism.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal
Decay	[DECAY]	master decay in seconds or note-based in Tempo Mode
Size	[SIZE]	hall size
Pre Delay	[PREDLY]	pre-delay in milliseconds or note-based in Tempo Mode

Low Band Reverb Level	[LO-LVL]	boost/cut of LOW reverb with cut-off at 300 Hz, -100 effectively cuts all of the low band reverb
High Band Reverb Level	[HI-LVL]	boost/cut of HIGH reverb with cut-off at 1500 Hz, -100 effectively cuts all of the high band reverb
Low Band Decay	[LO-DCY]	decay of LOW reverb, scales the [DECAY] time
High Band Decay	[HI-DCY]	decay of HIGH reverb, scales the [DECAY] time
Modulation Level	[MODLVL]	increases random modulation of reverb tails
Mid Band Reverb Level	[MIDLVL]	boost/cut of MID reverb (between 300 and 1500 Hz), -100 effectively cuts all of the mid band reverb

Room - [ROOM]

Room is designed to dial in realistic room sounds from vocal booths to small halls. The controls allow for precision tweaking of early reflections, late reverb, and EQ. Room is the workhorse algorithm for placing a sound in a realistic space or adding that subtle fattening that isn't immediately noticed but is always immediately missed.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal
Decay	[DECAY]	decay in seconds or note-based in Tempo Mode
Size	[SIZE]	room size
PreDelay	[PREDLY]	pre-delay in milliseconds or note-based in Tempo Mode
Low Band Shelving	[LO-LVL]	post reverb shelving boost/cut of low frequencies with cut-off at 350 Hz
High Band Shelving	[HI-LVL]	post reverb shelving boost/cut of high frequencies with cutoff at [HIFREQ]
Early/Late Reflection Levels	[REFLEX]	Control the levels of the early and late reflections.

Diffusion	[DFSION]	adjusts diffusion amount which affects reverb build up and tail density
Modulation Level	[MODLVL]	adds random modulation of both diffusors and late reverb tail
High Band Cutoff Frequency	[HIFREQ]	Control the corner frequency of [HI-LVL]. No affect if [HI-LVL] is set to 0.

Plate - [PLATE]

Plate simulates the sound of early analog-mechanical reverbs. This algorithm allows for long reverb times that won't take over your sound. Be sure to play with the [LO-DAMP] and [HI-DAMP] knobs to explore the full palette of tonal variations.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal
Decay	[DECAY]	decay in seconds or note-based in Tempo Mode
Size	[SIZE]	plate size
PreDelay	[PREDLY]	pre-delay in milliseconds or note-based in Tempo Mode
Low Band Damping	[LO-DMP]	Sets the damping frequency for the low end
High Band Damping	[HI-DMP]	Sets the damping frequency for the high end
Transducer Distance/ Spread	[DSTNCE]	sets room/transducer distance from source/plate driver
Diffusion	[DFSION]	adjusts diffusion amount which affects reverb build up and tail density
Modulation Level	[MODLVL]	mixes in random modulation in reverb tail
Tone Control	[TONE]	a pre-reverberator tone control, left is darker, right is brighter

Spring - [SPRING]

Spring models the sound and character of the popular artificial reverbs found in guitar amplifiers. It also goes a step further by allowing access to physical parameter controls not readily available in a real spring tank.

By tweaking these parameters, the Spring algorithm can create faithful representations of real springs or push the physical boundaries to achieve new distinctive sounds. Pay extra attention to the [TNSION] and [NUMSPR] knobs to control the amount of 'springiness'. For good measure, we've also included a tube amp style tremolo at the reverb input.

Mix	[MIX]	wet/dry between reverb and tremolo dry signal
Decay	[DECAY]	decay in seconds or note-based in Tempo Mode
Tension	[TNSION]	Controls spring tension
Number of Springs	[NUMSPR]	number of springs in the 'tank,' mixes in 1 to 3 springs
Low Band Damping	[LO-DMP]	Sets the damping frequency for the low end
High Band Damping	[HI-DMP]	Sets the damping frequency for the high end
Tremolo Intensity	[TRMOLO]	input tremolo intensity or depth (tremolo is pre-reverb)
Tremolo Rate	[TRM-RT]	input tremolo rate in Hz or note-based in Tempo Mode
Modulation Level	[MODLVL]	mixes in modulation for a nice chorusing effect
Resonance	[RESNCE]	metallic resonance at the [HI-DMP] frequency

DualVerb - [DUAL]

DualVerb combines two different high quality studio reverbs (A and B) with independent controls for decay, size, pre-delay, and EQ. Mix between both for rich, dense stereo reverberation, or use this effect to smoothly transition between two entirely different reverb sounds. [INF] and [FREEZE] are available on both decay knobs (Xnob for B-decay). During [FREEZE] the A/B

mixer on [VRBMIX] is post for the frozen reverb – normally it is pre. This allows for a plethora of options to freeze one of the reverbs, or both, and a mix of the two.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal
Reverb A Decay	[A-DCY]	decay for reverb A in seconds or note-based in Tempo Mode
Size	[SIZE]	adjusts the size of both reverbs A and B to give many different size combos with one knob
Reverb A PreDelay	[A-PDLY]	pre-delay for reverb A in milliseconds or note-based in Tempo Mode
Reverb A Tone Control	[A-TONE]	Tone control for reverb A
Reverb B Tone Control	[B-TONE]	Tone for reverb B
Reverb B Decay	[B-DCY]	decay for reverb B in seconds or note-based in Tempo Mode
Reverb B PreDelay	[B-PDLY]	pre-delay for reverb B in milliseconds or note-based in Tempo Mode
Reverb A/ Reverb B Mix	[VRBMIX]	mixer for A and B reverbs, in stereo this mixes stereo channels, set at extreme results in dual mono reverbs (A on left, B on right)
Resonance	[RESNCE]	Resonance mixer for A and B Tone controls. Affects the sound unless [A-TONE] and [B-TONE] are both set to 0.

Reverse Reverb - [REVRVB]

A true reverse reverb followed by a forward reverb with delay and feedback. Turn [SIZE] and [FEEDBACK] all the way down for a straightforward tempo-sync-able rush-up reverse reverb, use [SIZE] to dial in a second reverb for increased wetness, and add [FEEDBACK] around the whole thing for other-worldly ambiance. [INF] and [FREEZE] are available on the [SIZE] knob and affects the forward reverb only.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal

Decay	[DECAY]	reverse decay in milliseconds or note-based in Tempo Mode (also the delay amount for [LATE])
Size	[SIZE]	mixes in a standard reverb that is post reverse section for bigger sounds
Feedback	[FEEDBK]	amount of delay feedback around reverse reverb (delay amount is DECAY amount)
Low Band Shelving Level	[LO-LVL]	shelving boost/cut of low frequencies
High Band Shelving Level	[HI-LVL]	shelving boost/cut of high frequencies
Late Dry Signal Level	[LATE]	adjusts amount of dry signal that occurs directly after the reverse build up
Diffusion	[DIFFUS]	diffusion in the reverse build-up: set to zero for a mechanical stutter
Modulation Level	[MODLVL]	MicroPitch detuning modulation at the input
Contour	[CONTUR]	increase the span between low and high crossover frequencies for the [LO-LVL] and [HI-LVL]. Affects the sound unless [LO-LVL] and [HI-LVL] are both set to 0.

ModEchoVerb - [MODEKO]

ModEchoVerb is based on a popular reverb structure from the Eventide H8000 that brought about such presets as "Echo Space of God" and "Glorious Flange Canyon." It feeds the output of an infinite reverb into an infinite feedback delay and slathers on an extra helping of modulation. The modulation choices are H3000-type swept verb, flanging, or chorusing. ModEchoVerb is incredibly versatile and can be used as a standalone reverb, delay, chorus/flanger, or any combination of the three. [INF] and [FREEZE] are available on the [DECAY] knob. During [FREEZE] the signal is rerouted to allow for parallel modulation/delay over the frozen section. Have fun.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal

Decay	[DECAY]	decay in seconds or note based in tempo mode. All the way right [INF] gives an infinite reverb/sustain
Size	[SIZE]	from normal Hall type room sizes to huge canyon sounds with echoes
Echo	[ECHO]	post reverb delay time in milliseconds or note-based in tempo mode
Low Band Shelving Level	[LO-LVL]	post reverb shelving boost/cut of low frequencies with cut-off at 350 Hz
High Band Shelving Level	[HI-LVL]	post reverb shelving boost/cut of high frequencies with cutoff at 2000 Hz
Echo Feedback	[E-FDBK]	feedback amount around the post reverb echo
Modulation Rate	[M-RATE]	the modulation rate
Modulation Type and Depth	[FX-MIX]	select modulation type and depth: swept reverb [SWEEP], flanging [FLNGMX] or chorus [CHORMX].
Echo Tone	[E-TONE]	Tone control in the feedback loop of the echoes

BlackHole - [BKHOLE]

Larger than the Hall or Room, BlackHole is an Eventide H8000 classic capable of cathedral-type spaces to out-of-this-world soundscapes. This H9 edition of BlackHole has two decay modes (forward and inverse) and feedback around the entire reverb structure that extends the Blackhole sound from huge to infinite. The standard [SIZE] and [GRVITY] sounds are epic, but try [PREDLY] and [FEEDBK] to take the algorithm to the next level. Try not to get sucked in.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal
'Gravity' Mode Select	[INVGRV]/ [GRVITY]	[INVGRV]: Inverse decay mode of a really big reverb. [GRVITY]: regular decay mode of a really big reverb
Size	[SIZE]	size of the reverb

Delay	[PREDLY]	pre-delay time in milliseconds or note-based in tempo mode
Low Band Shelving Level	[LO-LVL]	post reverb shelving boost/cut of low frequencies with cut-off at 350 Hz
High Band Shelving Level	[HI-LVL]	post reverb shelving boost/cut of high frequencies with cutoff at 2000 Hz
Modulation Depth	[M-DPTH]	the modulation depth
Modulation Rate	[M-RATE]	the modulation rate
Feedback	[FEEDBK]	feedback around the entire reverb structure for even larger sounds
Resonance	[RESNCE]	resonance of the two shelving filters. Affects sound unless [LO-LVL] and [HI-LVL] are both set to 0

MangledVerb - [MANGLD]

While the H9 can produce many beautiful sounds, we recognize the universe is a chaotic and often violent place, so in the spirit of the yin and yang of it all, we included MangledVerb from the Eventide Eclipse. Technically, MangledVerb feeds a non-standard stereo reverb into distortion, but sonically it can range from the light friction of a bow scraping a cello string to the mayhem of a caged beast being poked with a red hot flounder. Judicious use of the [WOBBLE] and [ODRIVE] is approved, and try small [SIZE] and short [DECAY] for some surprising sounds.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal
Decay	[DECAY]	arbitrary 1-100 decay (less decay will also take away reverb attack)
Size	[SIZE]	size of the reverb (try less than 15 for some great distortion sounds)
Pre Delay	[PREDLY]	pre-delay time in milliseconds or note-based in tempo mode
Low Band Level	[LO-LVL]	pre-distortion boost/cut of low frequencies

High Band Level	[HI-LVL]	pre-distortion boost/cut of high frequencies
Softclip/ Overdrive Type	[ODRIVE]	the input level to one of two different types of distortions
Distortion Output Level	[OUTPUT]	the output level of the distortion
Wobble	[WOBBLE]	a modulation rate that does some spooky detuning
Mid Band Level	[MIDLVL]	pre-distortion boost/cut of mid frequencies

TremoloVerb - [TREMLO]

TremoloVerb is a celestially large reverb cut back down to Earth size by an aggressive tremolo. Use the Sine, Triangle, Peak, Ramp, or Square waves to create a rhythmic ambience; Random and Sample/Hold to create a convulsing cloud; Envelope or ADSR to control the reverb with your playing; or the Expression Pedal to control it with your foot.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal
Decay	[DECAY]	decay in seconds or note-based in Tempo Mode
Size	[SIZE]	room size of reverb
PreDelay	[PREDLY]	pre-delay time in milliseconds or note-based in tempo mode
Low Band Shelving Level	[LO-LVL]	post reverb shelving boost/cut of low frequencies with cut-off at 350 Hz
High Band Shelving Level	[HI-LVL]	post reverb shelving boost/cut of high frequencies with cutoff at [HIFREQ]
Tremolo Shape	[SHAPE]	tremolo shape: [SINE], [TRIANG], [PEAK], [RANDOM], [RAMP], [SQUARE], [SMPHLD] (sample/hold), [ENVLOP], [ADSR], or [EXPDL] (Expression Pedal)
Tremolo Speed	[SPEED]	tremolo speed in Hz, sensitivity, or note-based in tempo mode

Tremolo Depth/Mono or Stereo	[MNDPTH], [STDPTH]	tremolo depth, in stereo mode you have the option to have mono depth (same on both channels) or stereo depth (tremolo is 90 degrees out of phase)
High Band Cutoff Frequency	[HIFREQ]	the high corner frequency of [HI-LVL]. Affects the sound unless [HI-LVL] is set to 0

DynaVerb - [DYNAVB]

DynaVerb couples an Eventide Eclipse reverb with a model of the Eventide Omnipressor® to create an adaptable dynamics reverb. The Omnipressor is capable of all types of dynamics processing from gating, expansion, compression, limiting, and even its signature "dynamic reversal," where loud signals are squashed, but quiet signals are amplified. In DynaVerb, the Omnipressor can dynamically control the output of a reverberator based on, either the input signal for maximum control, the reverb output for incredible chaos, or any mixture of the two. As an added bonus DynaVerb can also be used as a standalone Omnipressor by setting [DECAY] to zero.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal
Decay	[DECAY]	decay in seconds or note-based in Tempo Mode, when decay is 0, this effect can be used as a standalone Omnipressor or gate
Size	[SIZE]	room size of reverb
Attack Time	[ATTACK]	attack time of Omnipressor/gate in seconds
Low Band Shelving Level	[LO-LVL]	post reverb shelving boost/cut of low frequencies with cut-off at 350 Hz
High Band Shelving Level	[HI-LVL]	post reverb shelving boost/cut of high frequencies with cutoff at 2000 Hz
Compression/ Expansion Ratio	[ORATIO]	ratio control for the Omnipressor from traditional Gated sound, to expansion, then compression, then limiting and infinite ducking, then to negative ratios which result in dynamic reversal.

Release Time	[RELEAS]	release time for the Omnipressor/gate in seconds
Threshhold	[THRESH]	threshold for the Omnipressor/gate
Sidechain	[SCHAIN]	the mixer to sidechain input (gain control signal). When set to minimum, the gain curve is derived from the input only. At maximum, it is a feedback dynamics unit with gain derived from the reverb output. In OMNIMODE, this simply lets you fade between a feedforward (FF) and feedback (FB) compressor/expander/gate/etc.

Shimmer - [SHIMMR]

We don't have proof, but we're pretty sure this is what the guitars sound like in heaven. Set the [A-PCH] and [B-PCH] to just above and below 1200c, turn the [DELAY] all the way down, and everything else all the way up. Oh, and remember to walk toward the light.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal
Decay	[DECAY]	arbitrary 0-100 decay (less decay will also take away reverb attack)
Size	[SIZE]	size of the reverb
Delay	[DELAY]	post reverb and pre pitch-shift delay time in milliseconds or note-based in tempo mode
Low Band Decay	[LO-DCY]	amount of post reverb and pitch-shifter low band signal (this is in the feedback path)
High Band Decay	[HI-DCY]	amount of post reverb and pitch-shifter high band signal (this is in the feedback path)
Pitch Shift A	[PICH-A]	Pitch-shifter A pitch in cents (500c=P4th, 700c=P5th, 1200c=1 Octave, 1900=1 Octave+P5, 2400=2 Octaves)
Pitch Shift B	[PICH-B]	Pitch-shifter B pitch in cents (500c=P4th, 700c=P5th, 1200c=1 Octave, 1900=1 Octave+P5, 2400=2 Octaves)

Pitch Decay	[PITCH]	The PITCH-DECAY knob controls the amount of pitch shifting in the reverb tail. It increases from 0 to 100. Beyond 100 are two FREEZE modes. PITCH FREEZE locks out the pitch shifters, but feeds the reverb, allowing you to freeze the Shimmer pitch climb at opportune times. PITCH+VERB FREEZE freezes everything (pitch and reverb) for dry soloing on top of the frozen reverb.
Mid Band Decay	[MIDDCY]	amount of post reverb and pitch-shifter mid band signal (this is in the feedback path)

PitchFactor Algorithms

Ten distinctive pitch-based algorithms – Diatonic, Quadravox, HarModulator, Micro-Pitch, H910/H949, PitchFlex, Octaver, Crystals, HarPeggiator, and Synthonizer.

Performance Switch
The action of the Performance Switch depends on which PitchFactor algorithm is currently running. The Performance Switch can be activated by MIDI CC, Auxiliary Switch or by using H9 Control.

Pitch-based parameters, such as pitch shift, are in cents. One cent is 1/100th of a semitone interval. Positive values make the pitch go up, and Negative values make the pitch go down. For example, "500" cents is a Perfect 4th up and "-500" cents is a Perfect 4th down. Some common values are: 700 cents = Perfect 5th, 1200 cents = 1 Octave, 1900 cents = 1 Octave + Perfect 5th, and 2400 cents = 2 Octaves.

Diatonic - [DTONIC]

Diatonic pitch shifters track the notes that you're playing and shift the pitch by the selected harmonic interval based on the Key and Scale that you've selected.

Diatonic Shifter features twin independently-controlled pitch changers (A and B) with independent delays and feedback. Diatonic tracks the notes that you're playing and automatically adjusts the amount of pitch shift so that the resultant note is in-key. Use the PitchA/B control knobs to set each pitch interval. Use the Control Knobs to select the key, scale and interval.

Using H9 Control (or if you've connected an AUX Switch), you can use Learn mode to set the key. See SYSTEM Mode section of the H9 User Guide for details on setting up an AUX Switch.

Note: Due to the limitations of Diatonic Pitch Shifting, the pitch tracking algorithm is monophonic and works best on single, isolated notes, and octaves.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Pitch A/ Pitch B Mix	[PICHMX]	Controls the ratio of the level of Pitch A to Pitch B.Note: The A/B mix is set before the feedback delays so that feedback can continue on A or B and not be affected by new audio when the Pitch Mix control is turned completely to the opposite channel. This allows you to create a mini 'looper' effect.
Pitch Shift A	[PICH-A]	Selects the harmonic interval (pitch shift) for Pitch A

Pitch Shift B	[PICH-B]	Selects the harmonic interval (pitch shift) for Pitch B
Delay A	[DLY-A]	Controls the amount of time delay of the A pitch shifted output. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value.
Delay B	[DLY-B]	Controls the amount of time delay of the B pitch shifted output. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value.
Key	[KEY]	Selects the key.
Scale	[SCALE]	Selects the scale. The supported scales are: [MAJ]-Major, [min]-Minor, [DOR]-Dorian, [PHRG]-Phrygian, [LYD]-Lydian, [MLYD]-Mixolydian, [LOC]-Locrian, [Hmin]-Harmonic Minor, [Mmin]- Melodic Minor, [Wton]-Whole Tone, [ENIG]-Enigmatic, [NPLT]-Neapolitan, [HUNG]-Hungarian.
Feedback A	[FBK-A]	Controls level of voice A Feedback. The feedback delay length is the length of either Delay A or Delay B, whichever is longer, to make sure both voices fade out simultaneously.
Feedback B	[FBK-B]	Controls level of voice B Feedback. The feedback delay length is the length of either Delay A or Delay B, whichever is longer, to make sure both voices fade out simultaneously.

Performance Switch / LEARN MODE - Press and hold the Learn switch while playing a note and the H9 will set the key to that note.

Quadravox - [QUADVX]

Quadravox is similar to Diatonic but delivers up to four pitch shifted voices (A, B, C, D) instead of two. You can select the interval of each voice independently. You can also turn OFF any of the voices.

NOTE: It's possible to select OFF for all four voices. If you do, and the Mix knob is set 100% Wet, there will be no output signal.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Pitch A and C/Pitch B and D Mix	[PICHMX]	Controls the ratio of level Pitch A+C to Pitch B+D. With the knob set full counter-clockwise, PitchA + PitchC are set to equal level. Full clock-wise, sets Pitch B + Pitch D to equal levels. The ratio of level of Pitch A to Pitch C and of Pitch B to Pitch D are fixed at equal levels and cannot be changed.
Pitch Shift A	[PICH-A]	Selects the harmonic interval (pitch shift) for Pitch A. Set to minimum to turn OFF voice A.
Pitch Shift B	[PICH-B]	Selects the harmonic interval (pitch shift) for Pitch B. Set to minimum to turn OFF voice B.
Delay D	[DLY-D]	QUADRAVOX's delay controls work differently from those in the other effects. Quadravox's four delays are not independently variable. Instead, they are staggered with A having the shortest delay, B longer than A, C longer than B and D the longest. The Delay D control is used to set the last delay. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value.
Delay Grouping	[DLYGRP]	Select the grouping of the four delays (A, B, C, D). The delays can be evenly spaced or spread out.
Key	[KEY]	Selects the key.
Scale	[SCALE]	Selects the scale. The supported scales are: [MAJ]-Major, [min]-Minor, [DOR]-Dorian, [PHRG]-Phrygian, [LYD]-Lydian, [MLYD]-Mixolydian, [LOC]-Locrian, [Hmin]-Harmonic Minor, [Mmin]- Melodic Minor, [Wton]-Whole Tone, [ENIG]-Enigmatic, [NPLT]-Neapolitan, [HUNG]-Hungarian.
Pitch Shift C	[PICH-C]	Selects the harmonic interval (pitch shift) for Pitch C. Set to minimum to turn OFF voice C.
Pitch Shift D	[PICH-D]	Selects the harmonic interval (pitch shift) for Pitch D. Set to minimum to turn OFF voice D.

Performance Switch / LEARN MODE - Press and hold the Learn switch while playing a note and the H9 will set the key to that note.

HarModulator - [HARMNY]

HarModulator combines twin chromatic pitch shifters with modulation to deliver an extremely wide range of effects from the subtle to the insane. Chromatic pitch shifters allow you to set the pitch ratio of each of the voices in semi-tone intervals (12 steps per octave). HarModulator features a six octave range (three up, three down).

To get a sense of how to use the modulation function, it's best to start simply by setting both Pitch A and Pitch B to UNISON, the delays to minimum, and feedback to 0. Now use the Mod Depth control to set the amount of pitch modulation and the Mod Speed control to adjust the modulation rate. Turn selecting different modulation shapes and sources. Note that you can select ENVELOPE as a source and use the dynamics of your playing to drive the modulation.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Pitch A/ Pitch B Mix	[PICHMX]	Controls the ratio of the level of Pitch A to Pitch B.
Pitch Shift A	[PICH-A]	Selects the pitch shift interval in semitone increments from down three octaves to up three octaves.
Pitch Shift B	[PICH-B]	Selects the pitch shift interval in semitone increments from down three octaves to up three octaves.
Delay A	[DLY-A]	Controls the amount of time delay of the A pitch shifted output. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value.
Delay B	[DLY-B]	Controls the amount of time delay of the B pitch shifted output. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value.
Modulation Depth	[M-DPTH]	Controls the amount (or depth) of pitch modulation displayed in cents over a four octave range (two octaves down, two octaves up). Fine control for micro-pitch modulation is available and displayed in cents, ranging from -30 to +30 cents. When the modulation is a positive value the two voices will modulate in sync with each other; when the value is negative they will modulate out of sync.

Modulation Rate	[M-RATE]	Controls the modulation rate. Note: If Envelop is selected as the Mod Shape [SHAPE], then modulation is driven by the amplitude of the audio input and Modulation Rate [M-RATE] becomes a Sensitivity [SENS] control.
Modulation Shape	[SHAPE]	Selects the modulation shape. Select Envelop and your playing will drive the pitch modulation.
Feedback	[FEEDBK]	Controls the amount of feedback for Delays A and B.

Performance Switch / FLEX - Shifts both voices up one octave.

MicroPitch - [MICRO]

Fine-resolution pitch shifter for subtle tone-fattening plus delays for interesting slap back effects.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Pitch A/ Pitch B Mix	[PICHMX]	Controls the ratio of the level of Pitch A to Pitch B.
Pitch Shift Up A	[PICH-A]	Controls the amount of pitch shift up for voice A from Unison to +50 cents.
Pitch Shift Down B	[PICH-B]	Controls the amount of pitch shift down for voice B from Unison to -50 cents.
Delay A	[DLY-A]	Controls the amount of time delay of the A pitch-shifted output. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value.
Delay B	[DLY-B]	Controls the amount of time delay of the B pitch-shifted output. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value.
Modulation Depth	[M-DPTH]	Controls the amount (or depth) of pitch modulation around the current pitch for each voice. A value of 100 represents a bipolar full swing of the modulation from 0 cents to 2x Pitch. Lesser values scale proportionally.

Modulation Rate	[M-RATE]	Controls the modulation rate.
Feedback	[FEEDBK]	Controls the amount of feedback for Delays A and B.
Tone Control	[TONE]	Controls the tone filter.

Performance Switch / FLEX - Doubles the pitch shift amount of both voices.

H910/H949 - [910.949]

This effect emulates the sound and functionality of Eventide's legendary H910 and H949 Harmonizer™ effects units. The H910 Harmonizer was the world's first real-time pro-audio pitch changer and introduced the word "glitching" to the pro-audio vocabulary. The H949 was the world's first de-glitched Harmonizer.

Unlike the Diatonic pitch shifters, pitch shifting is in the feedback loop allowing for arpeggiated repeats.

Note: For the purists in our audience, you may remember that the H910 and H949 were mono in, stereo out devices. In other words, they featured a single pitch shifter with independently adjusted delays. To best emulate these vintage boxes, we recommend that you set either Pitch A or Pitch B to unison (1.00) and use that output for feedback without pitch change. Also note that these recreations offer ten times the maximum delay of the original gear.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Pitch A/ Pitch B Mix	[PICHMX]	Controls the ratio of the level of Pitch A to Pitch B.
Pitch Shift Up A	[PICH-A]	Controls the amount of pitch shift for voice A expressed as a ratio.
Pitch Shift Down B	[PICH-B]	Controls the amount of pitch shift for voice B expressed as a ratio.
Delay A	[DLY-A]	Controls the amount of time delay of the A pitch-shifted output. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value.

Delay B	[DLY-B]	Controls the amount of time delay of the B pitch-shifted output. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value.
Splice Type	[TYPE]	Selects the type of Harmonizer emulated [H910], [H949-1], [H949-2] and [MODERN]. The H949 offered two splicing algorithms. Algorithm 1 created a 'soft' gradual splice. Algorithm 2 analyzed the audio and used an intelligent splicing algorithm that was successful in greatly reducing glitching. You can select each of these algorithms and emulate their classic sounds. Of course, given the many orders of magnitude increase in DSP power since the days of the H910/H949, even greater intelligence can be brought to bear in de-glitching. The [MODERN] pitch shifting algorithm takes advantage of its powerful DSP to further improve de-glitching. Each of these algorithms has a distinct quality and, when combined with various amounts of delay and feedback, offers a broad pallet of pitch-shifting effects
Pitch Coarse/ Fine Control	[P-CNTL]	Selects the type of pitch ratio control for Pitch A and Pitch B knobs. Normal allows continuous control as a pitch ratio. Micro allows for fine adjustments around Unison. Chromatic allows you to select intervals equal to the 12 note per octave scale.
Pitch A Feedback	[FDBK-A]	Controls the amount of feedback for Delay A.
Pitch B Feedback	[FDBK-B]	Controls the amount of feedback for Delay B.

Performance Switch / REPEAT - Press and hold for infinite repeat.

PitchFlex - [PCHFLX]

PitchFlex is designed to be used 'live' with either an Expression Pedal, the on board HotKnob, or the FLEX switch. Using the Heel and Toe controls you can set the pitch shift of two voices at each end of travel of the Expression Pedal. Turning these controls 'OFF' results in no pitch change. The other controls allow you to tailor the 'sweep' by controlling its speed and shape.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.

Pitch A/ Pitch B Mix	[PICHMX]	Controls the ratio of the level of Pitch A to Pitch B.
Set Pitch A with Exp Pedal in Heel Position	[HEEL-A]	Sets pitch shift of voice A in the heel position. When 'OFF' is selected, the voice is muted at the heel position and the pitch is set to unison.
Set Pitch B with Exp Pedal in Heel Position	[HEEL-B]	Sets pitch shift of voice B in the heel position. When 'OFF' is selected, the voice is muted at the heel position and the pitch is set to unison.
Heel-to-toe glissando	[HTGLIS]	These parameters are for use when using an Auxiliary Switch to control the pitch change effect for voices A and B. Sets the time to move from 'heel' to 'toe." In Tempo Mode maximum is ½ note.
Toe-to-heel glissando	[THGLIS]	Parameters for use when using an Auxiliary Switch to control the pitch change effect for voices A and B. The Delay A knob sets the time to move from the virtual 'toe' to the virtual 'heel.' The Delay B knob sets the time to move from 'heel' to 'toe.' In tempo Mode maximum is ½ note.
Low Pass Filter	[LPF]	A low pass filter to 'darken' the effect.
Glissando Shape	[SHAPE]	Controls the 'shape' that the pitch modulation follows when using the Flex Switch. If set to Negative values, the pitch goes slowly towards "Toe" and quickly transitions to "Heel", Positive is the other way around, and 0 means the pitch shifts up and down linearly.
Set Pitch A with Exp Pedal in Toe Position	[TOE-A]	Sets voice A's pitch shift in the toe position. When 'OFF' is selected, the A pitch shifter is disabled at the toe position and toe is treated as unison.
Set Pitch B with Exp Pedal in Toe Position	[TOE-B]	Sets voice B's pitch shift in the toe position. When "OFF" is selected, the B pitch shifter is disabled at the toe position and toe is treated as unison.

Performance Switch / FLEX - Sweep the pitch shift from MIN to MAX of HOTKNOB.

Octaver - [OCTAVE]

Octavers traditionally use analog techniques to track the pitch of the input audio signal and synthesize a signal whose musical tone is an octave lower than the original. Octaver creates a pair of sub-harmonics, one an octave below the note that you're playing and the other two octaves below. It also adds an Octave FUZZ generator. The sub-harmonics can be filtered and the filters modulated by the input audio level.

Note: Octaver is a parallel (dual mono) rather than stereo effect. Tempo cannot be used with this effect.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Sub-Harmonic Mix	[SUB-MX]	Controls mix of 1st and 2nd sub-harmonics (A and B). Note that Inputs 1 and Inputs 2 are not mixed.
Filter Center Frequency A	[CNTR-A]	Controls the center frequency of the resonant filter for A.
Filter Center Frequency B	[CNTR-B]	Controls the center frequency of the resonant filter for B.
Filter Resonance A	[RESN-A]	Controls filter resonance for A. Note: After adjusting the filter's center frequency and resonance, you may want to try modulating the filter.
Filter Resonance B	[RESN-B]	Controls filter resonance for B.
Envelop Filter Shift	[ENVLOP]	Octaver allows your playing to vary the center frequency of the filters. This control adjusts the degree to which the input signal's envelop shifts the filter's center frequency.
Envelop Sensitivity	[SENSE]	Controls the sensitivity of the frequency sweeps to the input signal level.
Distortion	[FUZZ]	Controls the amount of distortion (fuzz).
Octave-Fuzz Mix	[OCT-MX]	Controls the mix of octaves and fuzz.

Performance Switch / NONE - Unused

Crystals - [CRYSTL]

Crystals is a classic Eventide effect – twin reverse pitch changers, with independently adjustable delays and feedback with added reverb.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Pitch A/ Pitch B Mix	[PICHMX]	Controls the ratio of the level of Pitch A to Pitch B
Pitch Shift A	[PICH-A]	Controls the amount of pitch shift for A in cents (1 cent = 1/100th of a semitone).
Pitch Shift B	[PICH-B]	Controls the amount of pitch shift for B in cents (1 cent = 1/100th of a semitone).
Reverse Delay Buffer A	[RDLY-A]	Controls the length of the reverse time buffer for A. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value.
Reverse Delay Buffer B	[RDLY-B]	Controls the length of the reverse time buffer for B. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value.
Reverb Mix Level	[VRB-MX]	Selects the Reverb Mix level.
Reverb Decay Rate	[VRB-DC]	Selects the Reverb Decay rate.
Feedback A	[FBK-A]	Controls level of Feedback A.
Feedback B	[FBK-B]	Controls level of Feedback B.

Performance Switch / FLEX - Shifts both voices up one octave.

HarPeggiator - [HARPEG]

HarPeggiator creates dual 16-step arpeggios that combine three elements:

- dual 16-step pitch-shift sequencer
- dual 16-step rhythm sequencer
- dual 16-step effect sequencer

HarPeggiator lets you choose from a list of pre-programmed sequences for pitch, rhythm and effect and using the many possible combinations gives you quite a bit of creative control. That writ, it's important to understand the underlying concepts or you're likely to spend quite some time scratching your head.

First off, we suggest that you experiment with only one voice (e.g. A) and the pitch sequence only. To do so, turn OFF the rhythm and effect controls. This is important because, by definition, for many rhythms not every step in the sequence is played. For example, you could select a rhythm that divides the 16 steps into four bars of quarter notes and only sounds the first step (note) of each bar. As a result, although the pitch sequence is 16 steps long, only four notes will sound. Also, use the Length control to set an appropriate length for each step so that you can clearly hear the pitch at each step.

Note: If MIDI clock and Tempo are both set to ON, the sequencer will not progress through the steps until a MIDI clock signal is applied.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Arpeggiator A/Arpeggiator B Mix	[ARP-MX]	Controls the ratio of arpeggiator A to arpeggiator B.
Pitch Sequence A	[SQNC-A]	See the description for Pitch Sequence B.
Pitch Sequence B	[SQNC-B]	These controls select one of 27 pitch sequences for A/B. The pitch sequences are selectable presets numbered from [01] to [26] plus random [RANDOM]. Set to minimum [ARPOFF] to turn off the pitch effect. For the majority of pitch sequences each step is a fixed pitch however the H9 has the ability to glide the pitch within any step and this feature is used in several of the sequences. The last sequence [RANDOM] is a random sequence of pitches. When selecting pitch sequences, it is best to first turn OFF both Rhythm and FX sequences so that the pitch sequence is unaffected by these parameters. As always, your ears are the best judge of what works. The first several pitch sequences are fairly straightforward. Here's a general description of each of these sequences: • All steps are one octave up. • All steps are one octave down.

- All steps are a fifth up.
- All steps are a fourth down.
- Unison and one octave down.
- One octave down, unison, one octave up, two octaves up.
- Two octaves down, one octave down, unison, one octave up.
- One octave down, unison, one octave up, 2 octaves up.
- Unison, one octave up, unison, one octave up.
- Unison, one octave up, unison, one octave up, etc.
- Unison and fifth up.
- One octave down climbing to unison.
- Unison, fourth down, one octave down, two octaves down, unison, one octave up.
- Starts at two octaves down, swoops up to unison and at the 13th step jumps up one octave and ends at unison.
- Mostly up one octave with a short swoop to unison in the middle, back to an octave up and ending by swooping to unison.
- Starts at unison, swoops down two octaves, makes a couple of jumps up one octave and ends on unison.
- Starts at unison, swoops down one octave, jumps back to unison, brief jump up one octave, brief jump to up a fifth and ends on unison.
- Four quick jumps up one fifth, swooping back down to unison.
- Swoops from unison up one octave and does it twice.
- Swoops from up one octave down to unison and does it twice.
- Starts at unison steps up one octave and steps back down to unison.
- Staggers its way from unison to up one octave.
- Similar to 22.
- Swoops up from unison to one octave up and does it four times.
- Jumps between unison and octaves and fifths and fourths up and down.
- Similar to 25.

For those who find the above description less than satisfying the following tables may help. In these tables, the 26 sequences are labeled at the column heads and, for each sequence, the 16 steps are listed vertically. Pitch sequences

marked with an asterisk glide the pitch within a step in the sequence and an arrow indicates the step in the sequence that glides and the direction of the glide.

Intervals are indicated as 1oct = one octave, 2oct = 2 octaves, M2 = major second, m2 = minor second, M3 = major third, m3 = minor third, P4 = perfect fourth, d5 = diminished fifth, P5 = perfect fifth, M6 = major sixth, m6 = minor sixth, M7 = major seventh, m7 =minor seventh.

Pitch Sequences 1 - 7

	1	2	3	4	5	6	7
1	+1oct	-1oct	+P5	-P4	unison	-1oct	-2oct
2	+1oct	-1oct	+P5	-P4	unison	-1oct	-2oct
3	+1oct	-1oct	+P5	-P4	unison	-1oct	-2oct
4	+1oct	-1oct	+P5	-P4	-1oct	-1oct	-2oct
5	+1oct	-1oct	+P5	-P4	unison	Unison	-1oct
6	+1oct	-1oct	+P5	-P4	unison	Unison	-1oct
7	+1oct	-1oct	+P5	-P4	unison	Unison	-1oct
8	+1oct	-1oct	+P5	-P4	-1oct	Unison	-1oct
9	+1oct	-1oct	+P5	-P4	unison	+1oct	unison
10	+1oct	-1oct	+P5	-P4	unison	+1oct	unison
11	+1oct	-1oct	+P5	-P4	unison	+1oct	unison
12	+1oct	-1oct	+P5	-P4	-1oct	+1oct	unison
13	+1oct	-1oct	+P5	-P4	unison	+2oct	+1oct
14	+1oct	-1oct	+P5	-P4	unison	+2oct	+1oct
15	+1oct	-1oct	+P5	-P4	unison	+2oct	+1oct
16	+1oct	-1oct	+P5	-P4	unison	+2oct	+1oct

Pitch Sequences 8 – 14

	8	9	10*	11	12*	13*	14*
1	-1oct	Unison	unison	unison	-1oct ↑	unison	-2oct ↑↓
2	unison	Unison	+1oct	unison	-m7 ↑	-P4 ↓	-1oct ↑
3	+1oct	+1oct	+1oct	unison	-m6 ↑	-1oct ↓	-P5 ↑

	8	9	10*	11	12*	13*	14*
4	+2oct	+1oct	unison	unison	-P5 ↑	-2oct	-m3 ↑
5	-1oct	+1oct	unison ↑	unison	-P4 ↑	Unison	unison
6	unison	+1oct	+1oct	unison	-m3 ↑	Unison	unison
7	+1oct	+1oct	unison	unison	-M2 ↑	Unison	unison
8	+2oct	Unison	+1oct	unison	-m2 ↑	Unison	unison
9	-1oct	Unison	+1oct	unison	unison	Unison	unison
10	unison	Unison	unison	unison	unison	Unison	unison
11	+1oct	+1oct	+1oct	unison	unison	Unison	unison
12	+2oct	+1oct	+1oct	+P5	unison	Unison	unison
13	-1oct	+1oct	unison	unison	unison	+1oct	-1oct ↑
14	unison	Unison	+1oct	+P5	unison	Unison	unison
15	+1oct	Unison	+1oct	unison	unison	Unison	unison
16	+2oct	Unison	+1oct	unison	unison	Unison	unison

Pitch Sequences 17 - 21

	15*	16*	17*	18*	19	20	21
1	+1oct	unison ↓	unison ↓	+P5 ↓	unison	+1oct	unison
2	+1oct	-m2 ↓	-d5 ↓	unison	+M2	+M7	+M2
3	+1oct	-M3 ↓	-1oct	unison	+M3	+M6	+m3
4	+1oct	-M6 ↓	-1oct	unison	+P4	+P5	+M3
5	+1oct	-P4oct ↓	unison	+P5 ↓	+P5	+P4	+P4
6	+1oct	-2oct	unison	unison	+M6	+M3	+P5
7	+1oct	unison	unison	unison	+M7	+M2	+M6
8	+1oct ↓	unison	unison	unison	+1oct	Unison	+M7
9	+1oct	+1oct	+1oct	+P5 ↓	unison	+1oct	+1oct
10	+1oct	unison	+P5 ↓	unison	+M2	+M7	+M7
11	+1oct	unison	unison	unison	+M3	+M6	+M6
12	+1oct	+1oct	unison	unison	+P4	+P5	+P5
13	+1oct	unison	unison	+P5 ↓	+P5	+P4	+P4

	15*	16*	17*	18*	19	20	21
14	+1oct ↓	unison	unison	unison	+M6	+M3	+M3
15	+m6 ↓	unison	unison	unison	+M7	+M2	+m3
16	+M3 ↓	unison	unison	unison	+1oct	Unison	+M2

Pitch Sequences 22 - 26

	22	23	24*	25	26*
1	unison	unison	unison ↑	unison	-1oct
2	unison	unison	+P4	-1oct	Unison
3	+M2	+m3	+P5	unison	+P5
4	unison	unison	+1oct	+1oct	+P4
5	+M3	+P4	+m3	unison	-1oct
6	unison	unison	+P4	-P5	+1oct
7	+P4	+P4	+P5	unison	-P4
8	unison	+d5	+1oct	+P5	-P5
9	+P5	+P5	+m6 ↑	unison	Unison
10	unison	unison	+P4	-P4	-1oct
11	+M6	+P5	+P5	unison	Unison
12	unison	unison	+1oct	+P4	+P5
13	+M7	+m7	+m7	unison	+P4
14	unison	unison	+P4	-m3	Unison
15	+1oct	+1oct	+P5	unison	Unison
16	unison	unison	+1oct	+m3	-2oct ↑

Rhythm A	[RYTH-A]	See the description for Rhythm B.
Rhythm B	[RYTH-B]	These controls select the rhythm/groove sequence for A/B. The rhythm sequences are a set of 21 selectable presets. The level of the signal at each step is graphically represented in the Harpeggiator algorithm's custom UI in H9 Control on desktops/tablets. Set the control to minimum to [GRVOFF] to turn off the rhythm sequence. The pitch sequences are numbered from [01] to [20] and [RANDOM] for the random rhythm. With the rhythm sequence turned OFF, all sixteen steps of the sequence are played at full amplitude.

Dynamics (Attack/ Release Time)	[DYNAM]	Sets attack and release time for the dynamics of the Rhythm and Effects. When set to minimum (-10), the audio takes the entire step length to fade in; at mid-range (0), the audio is present for the entire step duration; and at maximum (10), the audio is present for only 1/10th of the step's duration. Note: This control has no effect when both Rhythm and Effect knobs are set to OFF.
Step Length	[LENGTH]	With Tempo OFF, sets the length of each of the 16 steps in mSec. With Tempo ON, sets the length of each step relative to the tap tempo (length of note e.g. whole, quarter, etc.).
Effect A	[FX-A]	See the description for Effect B.
Effect B	[FX-B]	HarPeggiator lets you apply a sequence of filter, fuzz and/or glitch effects to each note of the 16-step sequence. The effect sequences are a set of 25 selectable presets. The effects are indicated by effect type - [FILT]=FILTER, [FUZZ]=FUZZ, and [GLT]=Glitch. [ALL] indicates that the preset uses all three effect types. There are five filter effects, five fuzz effects and five glitch effects to choose from. Or, you can select one of four different types of random effect sequences – [RNFL]=random filters, [RNFZ]=random fuzz, [RNGL]=random glitches and [RNM]=random combination of filters, fuzz and glitches. Set [FX:OFF] to turn Off effects for all steps in the sequence.

Performance Switch / RESTART - Restarts the sequence from the beginning.

Synthonizer - [SYNTH]

Synthonizer tracks the pitch of the note that you're playing and generates a synthesized tone at the same pitch. Voice A is an additive synthesizer useful for creating organ or Theremin-style sounds; Voice B is a subtractive synthesizer for creating classic analog-style synth sounds.

Note: Tempo cannot be used with this effect.

Note: Synthonizer is Mono In only. Use Input 1. Input 2 is disabled.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.

Voice A/ Voice B Mix	[VOX-MX]	Controls the ratio of the two synthesized voices A and B.
Waveform Mix	[WVE-MX]	Controls the mix of the various added waveforms to control the tone and perceived pitch of voice A.
Octave Blend	[OCTVES]	Controls the blend between unison, 1 octave down, and 1 octave up synth voices to control the tone and perceived pitch of voice B.
Attack Time Voice A	[ATTK-A]	Controls the attack time for synthesized Voice A.
Attack Time Voice B	[ATTK-B]	Controls the attack time for the filter on synthesized voice B.
Reverb Level	[VRBLVL]	Sets the reverb level.
Reverb Decay Time	[VRBDCY]	Sets the reverb decay time.
Waveshape Voice A	[SHAPE]	Selects voice A waveshape – Sine [SIN], Triangle [TRI], Sawtooth [SW], Organ1 [OR1], Organ2 [OR2].
Filter Sweep Voice B	[SWEEP]	Controls the sweepable filter on voice B. Values from 0-50 sweep a low-pass filter, values greater than 50 sweep a high pass filter.

Performance Switch / FLEX - Shifts both voices up one octave.

TimeFactor Algorithms

Digital Delay - [DIGDLY]

Twin 3 second delays with independent delay time and feedback controls.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Delay Mix	[DLYMIX]	Controls the relative level of the twin delays, Delay A and Delay B. The H9 has circuitry that detects which input/output jacks are being used and adjusts the routing of signals through the Effects algorithm accordingly. Dly Mix's mixing behavior depends on whether you're using mono or stereo outputs. For Mono Out, with [DLYMIX] = A10+B0, output 1 will have only Delay A's contribution. With [DLYMIX] = A10+B10, Output 1 has an equal amount of Delay A and Delay B. With [DLYMIX] = A0+B10, Output 1 will have only Delay B's contribution. For Stereo output, with [DLYMIX] = A10+B0, BOTH outputs will have only Delay A's contribution. With [DLYMIX] = A10+B10, Delay A goes to Output 1 only and Delay B goes to Output 2 only. With [DLYMIX] = A0+B10, BOTH outputs will have only Delay B's contribution.
Delay A	[DLY-A]	Sets delay time for Delay A output B from 0 to 3000 ms (milliseconds). With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value - changing this from 0 to a whole note in common note increments.
Delay B	[DLY-B]	Same as A.
Feedback A	[FBK-A]	Controls level of Feedback A, the number of repeats.
Feedback B	[FBK-B]	Same as A.
Crossfade	[XFADE]	When delays change, performs a crossfade function to prevent abrupt changes that could result in glitching or clicking. [XFADE] sets the speed of the crossfade. Small values result in fast crossfades, larger values more gradual crossfades. Crossfade rates vary from 2 ms to 200 ms.

Modulation Depth	[DEPTH]	Selects the amount of delay modulation (0=OFF, 10=MAX).
Modulation Speed	[SPEED]	Sets the delay modulation rate (0-5Hz).
Filter	[FILTER]	A low pass/high cut filter variable from 0 (no filtering) to 100 (extreme hi cut) to change the tone of your delay repeats.

Vintage Delay - [VNTAGE]

Simulates the sound of analog and digital delays from days gone by. To simulate a range of delay devices from the past, a 'BITS' parameter simulates the effect of primitive analog-to-digital converters. Anyone remember when it was a 10 bit world? The delays can be modulated to achieve chorusing or more extreme effects. A filter parameter controls the tone of the delayed signals.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Delay Mix	[DLYMIX]	Controls the relative level of the twin delays, Delay A and Delay B. The H9 has circuitry that detects which input/output jacks are being used and adjusts the routing of signals through the Effects algorithm accordingly. Dly Mix's mixing behavior depends on whether you're using mono or stereo outputs. For Mono Out, with [DLYMIX] = 0, output 1 will have only Delay A's contribution. With [DLYMIX] = 50%, Output 1 has an equal amount of Delay A and Delay B. With [DLYMIX] =100, Output 1 will have only Delay B's contribution. For Stereo output, with [DLYMIX] = 0, BOTH outputs will have only Delay A's contribution. With [DLYMIX] = 50, Delay A goes to Output 1 only and Delay B goes to Output 2 only. With [DLYMIX] = 100%, BOTH outputs will have only Delay B's contribution.
Delay A	[DLY-A]	Sets delay time for Delay A output B from 0 to 3000 ms (milliseconds). With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value - changing this from 0 to a whole note in common note increments.
Delay B	[DLY-B]	Same as A.

Feedback A	[FBK-A]	Controls level of Feedback A, the number of repeats.
Feedback B	[FBK-B]	Same as A.
Bits	[BITS]	Selects the number of bits of resolution. Early digital delays used analog to digital converters with limited resolution. Theory predicts that each bit equals 6 dB of resolution; so that an 8 bit converter would deliver, at best, a mere 48 dB of dynamic range. VintageDelay simulates the effects of limited resolution - the sound of nasty digital noise from years gone by.
Modulation Depth	[DEPTH]	Selects the amount of delay modulation (0=OFF, 10=MAX).
Modulation Speed	[SPEED]	Sets the delay modulation rate (0-5Hz).
Filter	[FILTER]	Controls the filter to simulate the tone of band-limited old school delays.

Tape Echo - [TAPE]

Simulates the hiss, wow and flutter of analog tape delay. The earliest delays were achieved using tape machines - record on one magnetic 'head' and playback a bit later on second magnetic head. Magnetic tape can be driven into its own unique kind of distortion. Tape Echo's saturation control allows you to adjust the amount. The Wow and Flutter control simulates the effect of the tape transport moving the tape in at a less than absolutely smooth, constant rate.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Delay Mix	[DLYMIX]	Controls the relative level of the twin delays, Delay A and Delay B. The H9 has circuitry that detects which input/output jacks are being used and adjusts the routing of signals through the Effects algorithm accordingly. Dly Mix's mixing behavior depends on whether you're using mono or stereo outputs. For Mono Out, with [DLYMIX] = 0, output 1 will have only Delay A's contribution. With [DLYMIX] = 50%, Output 1 has an equal amount of Delay A and Delay B. With [DLYMIX] =100, Output 1 will have only Delay B's contribution. For Stereo output, with [DLYMIX] = 0, BOTH outputs will have only Delay A's contribution. With [DLYMIX] = 50, Delay A goes to Output

		1 only and Delay B goes to Output 2 only. With [DLYMIX] = 100%, BOTH outputs will have only Delay B's contribution.
Delay A	[DLY-A]	Sets delay time for Delay A output B from 0 to 3000 ms (milliseconds). With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value - changing this from 0 to a whole note in common note increments.
Delay B	[DLY-B]	Same as A.
Feedback A	[FBK-A]	Controls level of Feedback A, the number of repeats.
Feedback B	[FBK-B]	Same as A.
Saturation	[SATUR]	Simulates analog tape saturation. Ranges from '0' (none) to '10' (max) for the warm compression and distortion associated with overdriven tape.
Tape Wow	[WOW]	Simulates analog tape Wow. Wow is a term used to describe relatively slowly changing pitch and amplitude modulations caused by problems with the motor or tape transport that causes the tape's motion across the head to vary. A well maintained tape recorder should have no audible Wow. Ranges from '0' (none) to '10' (max).
Tape Flutter	[FLUTTR]	Simulates tape machine Flutter. Like Wow, Flutter is caused when the tape motion across the magnetic heads isn't constant. Flutter is a more rapidly changing variation than Wow. Ranges from 0 (no flutter) to 10 (max flutter).
Filter	[FILTER]	Controls the filter characteristics to simulate tape recorder frequency response. As you increase the filter value, you'll hear a more pronounced tape tone.

Mod Delay - [MODDLY]

Modulated delays – great for creating chorus effects and chorused delays.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Delay Mix	[DLYMIX]	Controls the relative level of the twin delays, Delay A and Delay B. The H9 has circuitry that detects which input/output jacks are being used and adjusts the routing of signals through the Effects algorithm accordingly. Dly Mix's mixing behavior depends on whether you're using mono or stereo outputs. For Mono Out, with [DLYMIX] = 0, output 1 will have only Delay A's contribution. With [DLYMIX] = 50%, Output 1 has an equal amount of Delay A and Delay B. With [DLYMIX] =100, Output 1 will have only Delay B's contribution. For Stereo output, with [DLYMIX] = 0, BOTH outputs will have only Delay A's contribution. With [DLYMIX] = 50, Delay A goes to Output 1 only and Delay B goes to Output 2 only. With [DLYMIX] = 100%, BOTH outputs will have only Delay B's contribution.
Delay A	[DLY-A]	Sets delay time for Delay A output B from 0 to 3000 ms (milliseconds). With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value - changing this from 0 to a whole note in common note increments.
Delay B	[DLY-B]	Same as A.
Feedback A	[FBK-A]	Controls level of Feedback A, the number of repeats.
Feedback B	[FBK-B]	Same as A.
Modulation Wave Shape	[SHAPE]	Selects the modulation wave shape as displayed by the Billboard display. There are two choices for each wave shape. The single waveforms modulate the two delays in phase and the double waveforms modulate the two delays out of phase.
Modulation Depth	[DEPTH]	Selects the amount of delay modulation (0=OFF, 20=MAX).
Modulation Speed	[SPEED]	Sets the delay modulation rate (0-5Hz).
Filter	[FILTER]	A low pass/high cut filter variable from -100 (extreme low cut) to 0 (no filtering) to 100 (extreme high cut).

Ducked Delay - [DUCKER]

The delay levels are dynamically lowered while you're playing and restored to their normal levels when you stop playing.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Delay Mix	[DLYMIX]	Controls the relative level of the twin delays, Delay A and Delay B. The H9 has circuitry that detects which input/output jacks are being used and adjusts the routing of signals through the Effects algorithm accordingly. Dly Mix's mixing behavior depends on whether you're using mono or stereo outputs. For Mono Out, with [DLYMIX] = 0, output 1 will have only Delay A's contribution. With [DLYMIX] = 50%, Output 1 has an equal amount of Delay A and Delay B. With [DLYMIX] =100, Output 1 will have only Delay B's contribution. For Stereo output, with [DLYMIX] = 0, BOTH outputs will have only Delay A's contribution. With [DLYMIX] = 50, Delay A goes to Output 1 only and Delay B goes to Output 2 only. With [DLYMIX] = 100%, BOTH outputs will have only Delay B's contribution.
Delay A	[DLY-A]	Sets delay time for Delay A output from 0 to 3000 ms (milliseconds). With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value - changing this from 0 to a whole note in common note increments.
Delay B	[DLY-B]	Same as A.
Feedback A	[FBK-A]	Controls level of Feedback A, the number of repeats.
Feedback B	[FBK-B]	Same as A.
Ducking Ratio	[RATIO]	Sets the ducking ratio or the degree to which the delay is attenuated.
Threshold	[THRSHD]	Sets the ducking threshold - the audio amplitude - at which ducking kicks in (-36 dB to -66 dB).
Release Time	[RELEAS]	Sets the release time from 500 to 10 msec. With the release time set to short values, the delay will kick in quickly when you stop playing. With the release time set to longer values, the

		delay will stay ducked for a while. Longer release times are useful when you're playing a riff and don't want the delay to kick in between notes.
Filter	[FILTER]	A low pass/high cut filter variable from 0 (no filtering) to 100 (extreme hi cut).

Band Delay - [BNDDLY]

Delays are followed by user selectable modulated filters.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Delay Mix	[DLYMIX]	Controls the relative level of the twin delays, Delay A and Delay B. The H9 has circuitry that detects which input/output jacks are being used and adjusts the routing of signals through the Effects algorithm accordingly. Dly Mix's mixing behavior depends on whether you're using mono or stereo outputs. For Mono Out, with [DLYMIX] = A10+B0, output 1 will have only Delay A's contribution. With [DLYMIX] = A10+B10, Output 1 has an equal amount of Delay A and Delay B. With [DLYMIX] = A0+B10, Output 1 will have only Delay B's contribution. For Stereo output, with [DLYMIX] = A10+B0, BOTH outputs will have only Delay A's contribution. With [DLYMIX] = A10+B10, Delay A goes to Output 1 only and Delay B goes to Output 2 only. With [DLYMIX] = A0+B10, BOTH outputs will have only Delay B's contribution.
Delay A	[DLY-A]	Sets delay time for Delay A from 0 to 3000 ms (milliseconds). With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value - changing this from 0 to a whole note in common note increments.
Delay B	[DLY-B]	Same as A.
Feedback A	[FBK-A]	Controls level of Feedback A, the number of repeats.
Feedback B	[FBK-B]	Same as A.

Resonance	[RESNCE]	Sets the resonance or sharpness of the filter. Varies from 0 (subtle effects) to 10 (dramatic resonance effects).
Modulation Depth	[DEPTH]	Sets the amount that the filter cut-off or center frequencies are modulated/shifted.
Modulation Speed	[SPEED]	Sets the modulation rate for the filter center frequencies (0-5Hz).
Filter	[FILTER]	Select filter type – Low Pass, Band Pass or Hi Pass.

Filter Pong Delay - [FLTDLY]

The dual delays ping pong between the outputs with filter effects added for good measure.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Delay Mix	[DLYMIX]	Controls the relative level of the twin delays, Delay A/Delay B. The H9 has circuitry that detects which input/output jacks are being used and adjusts the routing of signals through the Effects algorithm accordingly. [DLYMIX]'s mixing behavior depends on whether you're using mono or stereo outputs. For Mono Out, with [DLYMIX] = 0, Out 1 will have only Delay A's contribution. With [DLYMIX] = 50%, Out 1 has an equal amount of Delay A and Delay B. With [DLYMIX] =100, Out 1 will have only Delay B's contribution. For Stereo output, with [DLYMIX] = 0, BOTH outputs will have only Delay A's contribution. With [DLYMIX] = 50, Delay A goes to Out 1 only and Delay B goes to Out 2 only. With [DLYMIX] = 100%, BOTH outputs will have only Delay B's contribution.
Delay A	[DLY-A]	Sets delay time for Delay A output from 0 to 3000 mSec. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value - changing this from 0 to a whole note in common note increments.
Delay B	[DLY-B]	Same as A.

Feedback A	[FBK-A]	Controls level of Feedback A, the number of repeats. The FilterPong Effect is created by cross connecting the feedback paths of the twin delays. As a result, only a single feedback control is needed.
Diffusion (Slur)	[SLUR]	Controls the diffusion (SLUR) of the repeats. With low diffusion the repeats are discrete. Increasing diffusion slurs the repeats.
Modulation Wave Shape	[SHAPE]	Selects the 'shape' of the filter modulation.
Modulation Depth	[DEPTH]	Sets the filters' amount of frequency modulation.
Modulation Speed	[SPEED]	Speed multiplier for filter modulation.
Filter	[FILTER]	Controls the mix of dry/filtered signal input to ping-pong delay.

MultiTap - [MULTAP]

10 delay taps with controls for delay time, diffusion, tap levels and tap spacing.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Delay Mix	[DLYMIX]	Controls the relative level of the twin delays, Delay A/Delay B. The H9 has circuitry that detects which input/output jacks are being used and adjusts the routing of signals through the Effects algorithm accordingly. [DLYMIX]'s mixing behavior depends on whether you're using mono or stereo outputs. For Mono Out, with [DLYMIX] = 0, Out 1 will have only Delay A's contribution. With [DLYMIX] = 50%, Out 1 has an equal amount of Delay A and Delay B. With [DLYMIX] =100, Out 1 will have only Delay B's contribution. For Stereo output, with [DLYMIX] = 0, BOTH outputs will have only Delay A's contribution. With [DLYMIX] = 50, Delay A goes to Out 1 only and Delay B goes to Out 2 only. With [DLYMIX] = 100%, BOTH outputs will have only Delay B's contribution.
Delay A	[DLY-A]	Sets delay time for Delay A output B from 0 to 3000 ms (milliseconds). With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat

		value - changing this from 0 to a whole note in common note increments.
Delay B	[DLY-B]	Same as A.
Feedback A	[FBK-A]	Controls level of Feedback A, the number of repeats.
Feedback B	[FBK-B]	Same as A.
Diffusion (Slur)	[SLUR]	Controls the diffusion (SLUR) of the repeats. With low diffusion the repeats are discrete. Increasing diffusion slurs the repeats.
Delay Tap Taper	[TAPER]	Sets the relative level (taper) of the taps. With TAPR = -10, the 1st tap is the quietest and the last tap loudest. With TAPR = 0, all taps are equally loud. With TAPR = 10, the 1st tap is loudest and the last tap quietest.
Delay Tap Spacing	[SPREAD]	Sets the spacing between taps from 0 (spacing increases with increasing delay) to 5 (taps are equally spaced) to 10 (spacing between taps decreases with increasing delay).
Filter	[FILTER]	A tone control filter that reduces high frequencies to darken the ambient sounds that you create.

Reverse - [REVERS]

Reverse audio effects. Audio is broken into segments, are played backwards and spliced. Crossfading at the splice points prevents nasties. XFADE controls the length of the crossfade. Small values result in fast crossfades adding an audible rhythm to the effect. Larger values result in long crossfades and a smoother reverse sound.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Delay Mix	[DLYMIX]	Controls the relative level of the twin delays, Delay A/Delay B. The H9 has circuitry that detects which input/output jacks are being used and adjusts the routing of signals through the Effects algorithm accordingly. [DLYMIX]'s mixing behavior depends on whether you're using mono or stereo outputs. For Mono Out, with [DLYMIX] = 0, Out 1 will have only Delay A's contribution. With [DLYMIX] = 50%, Out 1 has an equal amount of Delay A and Delay B. With [DLYMIX] =100, Out 1 will have

		only Delay B's contribution. For Stereo output, with [DLYMIX] = 0, BOTH outputs will have only Delay A's contribution. With [DLYMIX] = 50, Delay A goes to Out 1 only and Delay B goes to Out 2 only. With [DLYMIX] = 100%, BOTH outputs will have only Delay B's contribution.
Delay A	[DLY-A]	Sets delay time for Delay A output. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value - changing this from 0 to a whole note in common note increments.
Delay B	[DLY-B]	Sets delay time for Delay B output. With Tempo OFF, delay is displayed in mSec. With Tempo ON, delay can be sync'd to the tempo and is displayed as a rhythmic sub-division of the tempo beat value - changing this from 0 to a whole note in common note increments.
Feedback A	[FBK-A]	Controls level of Feedback A, the number of repeats.
Feedback B	[FBK-B]	Same as A.
Crossfade	[XFADE]	In Reverse, the audio segments are read backwards and must be spliced. Crossfades occur at the splice point to prevent abrupt changes that could result in glitching or clicking. [XFADE] sets the rate of the crossfade. Small values result in fast crossfades and a more audible rhythm for the reverse effect, larger values more gradual crossfades and a smoother reverse sound. Crossfade rate (XFADE) is variable from 2 ms to 200 ms.
Modulation Depth	[DEPTH]	Selects the amount of modulation (0=OFF, 10=MAX).
Modulation Speed	[SPEED]	Sets the delay modulation rate (0-5Hz).
Filter	[FILTER]	A low pass/high cut filter variable from 0 (no filtering) to 100 (extreme hi cut).

Looper - [LOOPER]

The Looper provides 12 seconds of mono recording at full audio quality and up to 48 seconds at reduced audio quality. Salient features are: loop recording in seconds or beats, variable speed

scrubbing during playback and dubbing (including reverse playback and dubbing), seamless dubbing, real-time adjustment of the loop starting point and loop length, and fullfeatured MIDICLK sync.

If your H9 is connected to a stereo source, the inputs are automatically summed and the sum is the Looper's input. The Looper's output drives both outputs identically.

Since the Looper runs on both TimeFactor and H9, and the H9 utilizes a Two-Footswitch UI as opposed to the Timefactor's Three-Footswitch UI, the Looper transport controls (Record ● , Play ▶ and Stop ■) have been adapted to run as seamlessly as possible on the H9. The original Timefactor functionality of the Three-Footswitch transport controls is still available via Aux Switch or MIDI CC. Footswitch operation is first discussed in the section 'H9 Looper FootSwitch Operation', followed by 'Looper Control Parameters', 'Tempo Mode and MIDI Clock Sync', and 'MIDI CC and Aux Switch Designations'.

H9 Looper Footswitch Operation

Loading a Looper Preset on H9 will always place the H9 directly into Looper Mode. Looper Mode specifically defines the action of the two Footswitches on the H9. With the Looper algorithm loaded on the H9 (i.e. running a Looper Preset), you can always toggle back to H9 Preset Mode (and vice-a-versa) by pressing and holding the Right Footswitch.

Looper presets can be loaded one of four ways:

- Via H9 Control app
- By toggling through presets with the Right footswitch with H9 in Preset Mode, and using the Left Footswitch to load a Looper Preset
- By hitting the PRESETS button on H9 and turning the Encoder to a Looper Preset for auto-loading
- By hitting the PRESETS button twice and turning the Encoder to auto-load the default Looper Algorithm Preset.

The Looper can be in one of the following states:

- Empty
- Recording
- Playing
- Dubbing
- Stopped

Note: After a Looper Preset is loaded, the H9 will be in Looper mode, and the Looper State will be Empty.

In the H9, the three standard transport controls, Record ●, Play ► and Stop ■, are mapped to the two Footswitches (as described below), the Left Footswitch (LFSW) and the Right Footswitch (RFSW). While in Looper Mode, the Footswitches, LEDs, and Display will have the following actions, listed for each Looper State:

Empty

When the Looper is first loaded, the loop is Empty, the Display shows [EMPTY], the Active LED is not lit, the Tap LED is off for Tempo Mode OFF or blinks at the BPM rate for Tempo Mode ON, and the Footswitches do the following:

- LFSW ● – Press to Start Recording. If autoplay mode is selected [AP:LOOP], loop playback will start when recording reaches the loop end.
- RFSW (no transport function) – Used to tap tempo if Tempo Mode is ON. While Tapping, the Display shows the current BPM, when tapping stops the display reverts to [EMPTY].

Recording

While recording, the Display shows the running record time [R>00.00] or beat count [R>(beats)], the Active LED is flashing, the Tap LED is not lit, and the Footswitches do the following:

- LFSW ► – Press to create Loop End and start Playing from Loop Start. The Play Mode setting determines if the Loop is played once or continuously.
- RFSW ■ – End recording and stop.

Playing

While Playing, the Display shows the running play time [P>00.00] or beat count [P>(beats)], the Active LED is lit, the Tap LED is not lit, and the Footswitches do the following:

- LFSW ● – Start Dubbing at the current Loop time. The Dub Mode setting determines if this switch latches to Dub [LATCH] or press/holds to Dub [PUNCH]. The Dub Mode setting also determines if the new audio is added to or replaces the previously recorded audio.
- RFSW ■ – Stop Playing.

Dubbing

While Dubbing, the Display shows the running time [D>00.00] or beat count [D>(beats)], the Active LED is flashing, the Tap LED is not lit, and the Footswitches do the following:

- LFSW ● – Stop Dubbing while Playing continues. The Dub Mode setting determines how the Loop is overdubbed. If Dub Mode is [PUNCH], press/hold is the only way to get to Dubbing, and releasing the LFSW transitions back to Playing.
- RFSW ■ – End Dubbing and Stop Playing.

Stopped

While Stopped, the Display shows [STOP], the Active LED is not lit, the Tap LED flashes at the BPM rate for Tempo Mode or is lit solid for Non-Tempo Mode, and the Footswitches do the following:

- LFSW ▶ – Start Playing from Loop Start. The Play Mode setting determines if the Loop is played once or continuously.
- RFSW (no transport function)– No action besides going to Preset Mode (press/hold) and Clearing the loop (double tap).

Emptying the Loop

Double tapping the Right Footswitch during the Stopped State will clear the loop, and transition Looper to the Empty State. This is the only way to record a new loop using the H9 Footswitch interface. Alternatives that let you record a new loop from the Stopped state are using H9 Control, or an Aux Switch or MIDI CC programmed for the Looper Record action. Note: Double Tapping to empty also applies to Stop on H9 Control or an Aux Switch assigned to the STP command (See 'MIDI CC and Aux Switch Designations' for more info on Aux Switches).

Preset Mode

Pressing and holding the Right Footswitch, toggles between Looper and Preset Mode. Preset Mode is for loading a new preset. When using the Looper, you should remain in Looper Mode. In Preset Mode, the Footswitches do not operate as Looper transport controls. (Note: normal Tap Mode Functionality of the Right Footswitch is disabled for Looper Presets).

Tuner Access

Pressing and holding both Footswitches puts the H9 in Tuner Mode and leaves Looper Mode. Tuner Mode is only accessible when the Looper state is Empty.

Mix	[MIX]	Mix control between the Dry audio input and Looper playback.

Loop Max-Length	[MAXLEN]	When the Loop is Empty, sets the Maximum allowed Loop Length. Note that audio recording quality is degraded at slower recording speeds (1/2X and 1/4X). The maximum loop length is determined by the setting of the Speed parameter as follows: <table><tr><td>Speed</td><td>(+/-) 2X</td><td>(+/-) 1X</td><td>(+/-) 1/2X</td><td>(+/-) 1/4X</td></tr><tr><td>Max Loop Length</td><td>6 sec</td><td>12 sec</td><td>24 sec</td><td>48 sec</td></tr></table> The negative signs on the speeds above are for automatically starting playback in reverse after recording a new loop. When the Loop contains audio, the Max-Length parameter is disabled.
Loop Play-Start Point	[START]	When a Loop is in memory, this sets the Loop Start Point from 0 ms (or beat 1 for Tempo Mode ON) to Loop Length. The Loop Play-Start Point is automatically set to 0 (or beat 1 for Tempo Mode ON) at the beginning of a new loop. Note that Catchup is always enabled to prevent the Start point from changing abruptly. When the Loop is Empty, this parameter is disabled.
Loop Play-Length	[PLYLEN]	When a Loop is in memory, this sets the Loop Play-Length for playback that begins at the Loop Start Point. In other words, if a 12 second Loop is recorded and the Loop Start Point is set to 2 seconds and the Loop Length is set to 4 seconds, the recorded Loop will play from 2 seconds to 6 seconds into the 12 second Loop. The PlayLength value is automatically reduced in cases where the Play-Start Point moves past the currently set Play-Length. The Loop Play-Length is automatically set to Loop Length at the beginning of new loop. Note that Catchup is always enabled to prevent the end point from changing abruptly. When the Loop is Empty this parameter is disabled.
Loop Decay Rate	[DECAY]	When dubbing you may want the original saved audio to persist as you add new sounds. Of course, indefinitely adding new signals will eventually result in 'mud' (the "Crayola" effect). The Decay Rate control allows the saved audio to fade as you dub new material. The Decay Rate is adjustable from 0% [DCY: 0] to 100% [DCY:100]. When set to 0%, the loop never decays. When set to 100% the previously saved audio decays

		completely each time through the loop when dubbing. In other words, the looped audio is only played once. The Loop Decay Rate control has no effect on normal Playback, only dubbing.
Dubbing Mode	[DUB-MD]	There are four choices that determine the type of dubbing (Add or Replace) and the action of the Footswitch control (Latch or Punch). To Dub, press the ● Footswitch while the loop is playing or recording. The action of the ● Footswitch when dubbing depends on the setting of the Dubbing Mode control. If you want to simply press and release the switch to turn dubbing on and off, set this control to one of the two Latching modes. Dubbing will continue until you press ● (or press record again to turn dubbing off). On the other hand, you may prefer to Dub only while you're pressing and holding the ● Footswitch. To do this, choose one of the two Punch modes. The Dubbing Mode choices are: • [D:LATCH] – ● toggles Dubbing ON/OFF. Dubbed audio is added to the looped audio. • [D:PUNCH] – ● enables Dubbing while the footswitch is held. Dubbed audio is added to the looped audio. • [D:REPL-L] – ● toggles Dubbing ON/OFF. Dubbed audio replaces looped audio. • [D:REPL-P] – ● enables Dubbing while the footswitch is held. Dubbed audio replaces looped audio.
Playback Mode	[PLY-MD]	Playback mode affects three actions of the Looper: the action when Recording reaches Max-Length, the action when Playing reaches the Play-Length, and the action of the ▶ switch (Note: for H9 this ▶ switch functionality is only available via H9 Control, Aux Switch, or MIDI). • [P:ONCE] – Enters STOPPED state when recording reaches Max-Length. During Playback, the audio will Stop when it reaches Play-Length, and ▶at any point initiates playing the loop just one time from the loop's start point • [P:LOOP] – Enters STOPPED state when recording reaches Max-Length. During Playback, the audio loops around to the loop's start point when it reaches

		PlayLength, and ▶at any point initiates playing continuously from the loop's start point. • [AP:LOOP] – When recording reaches the Max-Length, loop begins playing automatically and plays continuously. During Playback, the audio loops around to loop's start point when it reaches Play-Length, and ▶ at any point will initiates playing continuously from the loop's start point. • [AP:RVDIR] – When recording reaches the Max-Length, loop begins playing automatically and plays continuously. During Playback, the audio loops around to loop's start point when it reaches Play-Length, and ▶ at any point can then be used to toggle the playback direction.
Varispeed Resolution	[SP-RES]	When set to [SMOOTH], resolution is 1%. The other Depth control settings allow you to select the Play Speed in musical intervals as follows (a negative value corresponds to Reverse Play, and all resolutions have 0% in the middle for a full Pause): • [OCTAVES] - From three octaves down to one octave up – (+/-) 12.5%, 25%, 50%, 100%, 200% • [OCT+5TH] - Octaves and fifths – (+/-) 12.5%, 25%, 37%, 50%, 75%, 100%, 150%, 200% • [DOM7TH] - Dominant 7th Chord (root, M3rd, 5th, m7th, representing common key modulations) – (+/-) 12.5%, 25%, 32%, 37%, 45%, 50%, 63%, 75%, 89%, 100%, 126%, 150%, 178%, 200% • [CHROMATIC] - Semi tones – (+/-) 12.5%, 25%, 26%, 28%, 30%, 32%, 33%, 35%,37%,40%, 42%, 45%, 47%, 50%, 53%, 56%, 59%, 63%, 67%, 71%, 75%, 79%, 84%, 89%, 94%, 100%, 106%, 112%, 119%, 126%, 133%, 140%, 150%, 159%, 168%, 178%, 189%, 200% Note: During loop recording, Resolution will always return to OCTAVES. This guarantees that the immediate playback speed occurs at the recorded speed.
Varispeed	[SPEED]	When the Loop is Empty, the Speed control lets you select the record speed. A negative speed with Empty causes playback to automatically start in the Reverse direction after the loop is closed, either through a ▶ Play button press or the[AP:LOOP], [AP:RVDIR] settings on the Xnob / Playback Mode. The choices are:

		• [SPD: +/- 2X] – Double speed. At this record speed, the maximum loop length is 6 seconds. • [SPD: +/- 1X] – Normal speed. At this record speed, the maximum loop length is 12 seconds. • [SPD: +/- 1/2] – Half speed. At this record speed, the maximum loop length is 24 seconds. • [SPD: +/-1/4] – Quarter speed. At this record speed, the maximum loop length is 48 seconds. After a loop is recorded, Varispeed controls the speed of Loop playback AND dubbing over the full range of speeds allowing for continuous real-time scrubbing from one octave up in Reverse Play (-200%), to one octave up in Forward Play (200%), with a pause (0%) directly in the middle (knob set to 12 o'clock). Play Speed resolution is dependent on the setting of the Depth/Resolution control.
Filter	[FILTER]	Controls the tone of the looped audio. Tone control filters are placed at both the input and output of the Looper. This allows you to control the tone of the audio that you're recording and then independently control the tone on playback. Turning to the left cuts low frequencies and turning to the right cuts high frequencies. For flat response, set the knob to 12 o'clock.

Tempo Mode and MIDICLK Sync

Tempo Mode allows beat-based recording and playback that stays in sync with your Eventide Stompbox's internal MIDICLK or as a slave to an external MIDICLK. On Timefactor, press the Encoder to toggle the Looper in and out of in and out of Tempo Mode. On H9, simultaneously press the Right Footswitch and the Presets Button to toggle the Looper in and out of Tempo Mode.

MIDICLK Slave mode

To slave off an external MIDICLK you'll need to turn MIDICLK IN to ON in your Eventide Stompbox's system menu under MIDI-> CLK IN-> ON or OFF, and you'll need to connect a viable MIDICLK master to your Eventide Stompbox, either over the MIDI DIN5 input or USB.

While in MIDICLK Slave Mode, the Looper will respond to MIDI Start and Stop commands. These commands are sent by many Drum Machines, Sequencers and DAWs when used as MIDICLK masters. However, you'll need to reference your own device or software manual for specific MIDICLK master mode and start/stop command setup guidance. Looper responds to MIDI Start and Stop commands as follows for each Looper State:

Empty

- MIDI Start – Resets the Looper's internal "beat counter" and causes a ● Record Footswitch press to sync up to the next beat (See the section on Footswitch Quantization below for more info on this).
- MIDI Stop – no action

Recording

- MIDI Start – Stops Recording and starts Loop Playback
- MIDI Stop – Stops Recording and goes to the Stopped State.

Dubbing

- MIDI Start – Ends Dubbing and Starts Playing from Loop Start.
- MIDI Stop – Stops Loop Playback and Dubbing and goes to the Stopped State.

Playing

- MIDI Start – Retriggers to start Playing from Loop Start.
- MIDI Stop – Stops Loop Playback and goes to the Stopped State.

Stopped

- MIDI Start – Starts Loop Playback
- MIDI Stop – no action

Tempo Mode Footswitch Quantization

MIDICLK is made up of a series 24 "ticks" per beat. Tempo Mode quantizes many of the Footswitch actions either to the next MIDI beat or the next MIDI tick. The quantization action of the Footswitches for each Looper State is as follows:

Empty

- ● – Starting a new recording syncs to the next beat ONLY if in MIDICLK Slave mode AFTER having received a MIDI Start command. Otherwise, this begins recording on the next tick.
- ► – No action.
- ■ – Only used for tap tempo.

Recording

- ● – Record to Dub transition quantizes to the next beat.
- ► – Record to Play transition quantizes to the next beat.
- ■ – End recording and stop, quantized to the next beat.

Dubbing

- ● – Dubbing in/out doesn't do any footswitch action quantization.
- ▶ – End Dubbing and Start Playing from Loop Start. This action quantizes to the next tick.
- ■ – End Dubbing and Stop Playing. This action quantizes to the next beat.

Playing
- ● – Start Dubbing, no footswitch quantization.
- ▶ – Start Playing from Loop Start. This action quantizes to the next tick.
- ■ – Stop Playing. This action quantizes to the next beat.

Stopped
- ● – Starting a new recording quantizes to the next beat ONLY if in MIDICLK Slave mode AFTER having received a MIDI Start command. Otherwise, this begins recording on the next tick.
- ▶ – Start Playing from Loop Start. This action quantizes to the next tick.
- ■ – No action.

Control Knob Tempo Mode Sync Features

The following control knobs have enhanced features for Tempo Mode and MIDI sync allowing for perfect MIDICLK beat sync even when they change.

Loop Play-Start Point:
In Tempo Mode, the minimum length of audio that can be played out is 1 beat so, the Play-Start Point will display in beats allowing you start playback from 0 beats up to Loop Length minus 1 beat. For example, if you recorded an 8 beat loop, this will range from 0 to 7 beats.

Changing the Play-Start Point during Playback will apply the next time the Loop comes around and will maintain perfect beat sync with MIDICLK.

Loop Play-Length:
In Tempo Mode, the minimum length of audio that can be played out is 1 beat so, the Play-Length will display in beats allowing playback lengths of 1 beat up to the Loop Length. For example, if you recorded an 8 beat loop, the Play-Length will range from 1 to 8 beats.

Changing the Play-Length during in Playback will apply the next time the Loop comes around and will maintain perfect beat sync with MIDICLK. Of course, new Play-Lengths that don't evenly divide the total Loop Length will cause the loop to "walk" the downbeat, thus creating interesting poly-rhythms against an existing pattern.

Speed / Varispeed:
In Tempo Mode, the Looper always loops about the current Play-Length number of beats in the originally recorded time base, regardless of changes to the Speed. Thus, for slower speeds the loop length will be truncated, and for faster speeds the loop will play through more than

once. For example, if you record an 8 beat loop at 1x, then play out 8 beats at a Speed of 50 (.5x), the Looper will loop beats 1-4. Alternatively, if you choose to play at a speed 150, the loop will complete one full cycle of 8 beats, then a half cycle of 4 beats, and continue to loop this 1.5x pattern against the original time base. Please note that this Speed-based sync feature is temporarily disabled while Dubbing, allowing you to dub through an entire loop, and once you exit Dub mode moving back to Play, this sync feature will resume. This ensures that the Looper always maintains perfect timing with external audio, drum machines, etc. while providing the option to layer expressive pitched and poly-rhythmic patterns or even minutely controlled drifts that always come back on the downbeat.

ModFactor Algorithms

Ten distinct modulation effects – Chorus, Phaser, Q-Wah, Flanger, ModFilter, Rotary, TremoloPan, Vibrato, Undulator, and RingMod. Each of these effects offers a world of possibilities. For example, there are several types of Flangers, Phasers, etc.
These effects use 2 LFO's (Low Frequency Oscillators) to create classic or FM/AM modulated versions of many popular modulation effects. The primary LFO drives the main effect and is controlled by the three parameters, Depth, Speed and Shape. The secondary LFO in turn modulates the Speed and Depth of the primary LFO. The S-Mod knob controls the amount of Frequency Modulation applied to the primary LFO and the D-Mod knob controls the amount of Amplitude Modulation.

With S-Mod/D-Mod turned OFF, high quality renditions of classic modulation effects are created. As the S-Mod/D-Mod knobs are turned up a small amount of movement will be added to the effect to give it a controlled organic feel. Increase the amount of S-Mod/D-Mod for complex and interesting and even extreme modulation effects.
The availability of expression pedal and envelope mod shapes allows the modulation rate to be controlled dynamically by your playing as well.

Chorus - [CHORUS]

Chorus is an effect that is designed to take a single voiced instrument and give it the sound of many instruments playing together. This is achieved through randomly modulating several delay lines to create pitch and timing imperfections and then panning these voices in the stereo field. Four types of chorus effects are supported: Liquid [LIQUID], Organic [ORGNIC], Shimmer [SHIMER] and Classic [CLASIC].

Intensity	[INTENS]	Effect level.
Effect Type	[TYPE]	Select Liquid [LIQUID], Organic [ORGNIC], or Shimmer [SHIMER] or Classic [CLASIC].
Modulation Depth	[DEPTH]	Sets the modulation sweep range from narrow to wide.
Modulation Speed	[SPEED]	Sets the modulation sweep rate. Note: If Envelope or ADSR is selected for the Shape parameter, the modulation is driven by the amplitude of the audio input and the Speed control becomes a Sensitivity control.
Modulation Waveform Shape	[SHAPE]	Selects the shape (or source) of the modulation. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal

		[EXPPDL] can be chosen as a source. When EXP PDL is chosen, the current preset's pedal mapping is ignored.
Feedback/ Delay Offset/Filter	[FEEDBK], [MDO], [FILTER]	Controls feedback for Liquid and Shimmer. For Organic, used to scall a manual delay offset. For Classic, used to control a filter.
Amplitude Modulation	[D-MOD]	Controls the amount of modulation of the Depth parameter. Analogous to AM (Amplitude Modulation).
Frequency Modulation	[S-MOD]	Controls the amount of modulation of the Speed parameter. Analogous to FM (Frequency Modulation).
Secondary LFO Rate	[RATE]	Sets the secondary LFO rate – determines how fast the D-Mod and S-Mod "wiggle" their targets. Ranges from 1/8 to 8X the Speed value. Note: If Envelope or ADSR is selected as the Mod Source, the modulation is driven by the amplitude of the audio input and the [RATE] control becomes a Sensitivity control.
Modulation Source	[MODSRC]	Selects the secondary LFO modulation source. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When [EXPPDL] is chosen, the current preset's pedal mapping is ignored.

Phaser - [PHASER]

Phaser is an effect created by a series of all pass filters (phase shifters). When the output of the filters is mixed with the dry signal sharp notches are created in the frequency spectrum of the output; by modulating the center frequencies of the filters the notches move giving a sense of motion to the effect. Five types of phasing effects are supported Positive [POS], Negative [NEG], Feedback [FEEDBK], Bi-phase [BIPHAZ] and PhaseX0 [PHASX0].

Intensity	[INTENS]	Effect level.
Effect Type	[TYPE]	Select Positive [POSTVE], Negative [NEGTVE], Feedback [FEEDBK], Bi-phase [BIPHAZ] or PhaseX0 [PHASX0]. Negative mixes the forward and feedback signals inverted; Positive mixes the feed forward and feedback signals non-inverted; Feedback is feedback only (no feed forward signal);

		BiPhase is based on the topology of the Mu-Tron Bi-Phase; PhaseX0 is a phase 90 clone (but it also does phase 180 and some others if you check the top right "STAGES" knob)
Modulation Depth	[DEPTH]	Sets the modulation sweep range from narrow to wide.
Modulation Speed	[SPEED]	Sets the modulation sweep rate. Note: If Envelope or ADSR is selected for the Shape parameter, the modulation is driven by the amplitude of the audio input and the Speed control becomes a Sensitivity control.
Modulation Waveform Shape	[SHAPE]	Selects the shape (or source) of the modulation. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When EXP PDL is chosen, the current preset's pedal mapping is ignored.
Stages/ Direction	[STAGES], [FWD-RV]	This control allows you to select the number of digital filters. For [BIPHAZ] selects the sweep direction.
Amplitude Modulation	[D-MOD]	Controls the amount of modulation of the Depth parameter. Analogous to AM (Amplitude Modulation).
Frequency Modulation	[S-MOD]	Controls the amount of modulation of the Speed parameter. Analogous to FM (Frequency Modulation).
Secondary LFO Rate	[RATE]	Sets the secondary LFO rate – determines how fast the D-Mod and S-Mod "wiggle" their targets. Ranges from 1/8 to 8X the Speed value. Note: If Envelope or ADSR is selected as the Mod Source, the modulation is driven by the amplitude of the audio input and the speed modulation control [S-MOD] becomes a Sensitivity control.
Modulation Source	[MODSRC]	Selects the secondary LFO modulation source. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When [EXPPDL] is chosen, the current preset's pedal mapping is ignored.

Q-Wah - [Q-WAH]

The Q-Wah effect simulates a classic wah wah pedal when Shape is set to pedal or an auto wah when set to envelope. Using Depth and/or other wave shapes creates more complex wah sounds. Intensity will increase the Q or "Slinky-ness" of the wah effect. The types of wah-wah effect supported are [QWAH], Vocal Wah [VOXWAH], Bass Wah [BASWAH] and Bass Vocal Wah [BASVOX].

Intensity	[INTENS]	Effect level.
Effect Type	[TYPE]	Select [WAHWAH], [VOXWAH], [BASWAH] or [BASVOX]. The bass types retain the low end as the wah filter climbs to higher frequencies.
Modulation Depth or Vowel Sound	[DEPTH], [VOWEL], [EVOWEL]	In [WAHWAH] and [BASSWAH] types, [DEPTH] sets the modulation sweep range from narrow to wide. In [VOXWAH] and [BASVOX] types, [VOWEL] will determine the vowel sound of the vocal wah, or if [BOTTOM] is set to do a starting vowel, [EVOWEL] will set the ending vowel sound for a talk-box style effect.
Modulation Speed	[SPEED]	Sets the modulation sweep rate. Note: If Envelope or ADSR is selected for the Shape parameter, the modulation is driven by the amplitude of the audio input and the Speed control becomes a Sensitivity control.
Modulation Waveform Shape	[SHAPE]	Selects the shape (or source) of the modulation. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When EXP PDL is chosen, the current preset's pedal mapping is ignored.
Base Frequency or Starting Vowel	[BOTTOM], [SVOWEL]	Select the base frequency in [WAHWAH] and [BASWAH] types. In vocal types this will set the base frequency for a single vowel (first half of knob), or allow you to set the starting vowel for a talk-box style effect (second half of knob).
Amplitude Modulation	[D-MOD]	Controls the amount of modulation of the Depth parameter. Analogous to AM (Amplitude Modulation).
Frequency Modulation	[S-MOD]	Controls the amount of modulation of the Speed parameter. Analogous to FM (Frequency Modulation).

Secondary LFO Rate	[RATE]	Sets the secondary LFO rate – determines how fast the D-Mod and S-Mod "wiggle" their targets. Ranges from 1/8 to 8X the Speed value. Note: If Envelope or ADSR is selected as the Mod Source, the modulation is driven by the amplitude of the audio input and the speed modulation control [S-MOD] becomes a Sensitivity control.
Modulation Source	[MODSRC]	Selects the secondary LFO modulation source. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When [EXPPDL] is chosen, the current preset's pedal mapping is ignored.

Flanger - [FLANGE]

Flanging is similar to Phasing but more intense – deeper more numerous frequency notches. Four types of flanging effects are supported: Positive [POS], Negative [NEG], Jet [JET] and Thru Zero [THRU-0].

Intensity	[INTENS]	Effect level.
Effect Type	[TYPE]	Select Positive [POSTVE], Negative [NEGTVE], Jet [JET] or Thru Zero [THRU-0] flanging. Positive mixes the feed forward and feedback signals non-inverted; Negative mixes the forward and feedback signals inverted; Jet uses a special arrangement that creates a very extreme effect (like a jet taking off); Thru-0 uses two different delay line that flange against each other, so the flange offset goes through 0.
Modulation Depth	[DEPTH]	Sets the modulation sweep range from narrow to wide.
Modulation Speed	[SPEED]	Sets the modulation sweep rate. Note: If Envelope or ADSR is selected for the Shape parameter, the modulation is driven by the amplitude of the audio input and the Speed control becomes a Sensitivity control.
Modulation Waveform Shape	[SHAPE]	Selects the shape (or source) of the modulation. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal

		[EXPPDL] can be chosen as a source. When EXP PDL is chosen, the current preset's pedal mapping is ignored.
Delay Offset	[MDO]	Set Delay offset.
Amplitude Modulation	[D-MOD]	Controls the amount of modulation of the Depth parameter. Analogous to AM (Amplitude Modulation).
Frequency Modulation	[S-MOD]	Controls the amount of modulation of the Speed parameter. Analogous to FM (Frequency Modulation).
Secondary LFO Rate	[RATE]	Sets the secondary LFO rate – determines how fast the D-Mod and S-Mod "wiggle" their targets. Ranges from 1/8 to 8X the Speed value. Note: If Envelope or ADSR is selected as the Mod Source, the modulation is driven by the amplitude of the audio input and the speed modulation control [S-MOD] becomes a Sensitivity control.
Modulation Source	[MODSRC]	Selects the secondary LFO modulation source. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When [EXPPDL] is chosen, the current preset's pedal mapping is ignored.

ModFilter - [M-FLTR]

ModFilter is a set of modulated filters. Intensity controls a combination of base filter frequency and Q, while Depth controls the frequency offset of the left and right channels to create a stereo image. Three types of ModFilter effect are supported Low Pass [LPF], High Pass [HPF], and Band Pass [BPF].

Intensity	[INTENS]	Effect level.
Effect Type	[TYPE]	Select Lowpass [LOPASS], Bandpass [BDPASS] or Highpass [HIPASS] modulated filters.
Modulation Depth	[DEPTH]	Sets the modulation sweep range from narrow to wide.
Modulation Speed	[SPEED]	Sets the modulation sweep rate. Note: If Envelope or ADSR is selected for the Shape parameter, the modulation is driven

		by the amplitude of the audio input and the Speed control becomes a Sensitivity control.
Modulation Waveform Shape	[SHAPE]	Selects the shape (or source) of the modulation. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When EXP PDL is chosen, the current preset's pedal mapping is ignored.
Unused/ Stereo Width	[UNUSED]/ [WIDTH]	In mono out mode, this control is not used. In stereo mode, this control shifts the phase of the right channel's LFO creating a tremolo that will move from left to right in the stereo field. When set to Max, the right channel will be 180 degrees out of phase with the left creating an autopanner.
Amplitude Modulation	[D-MOD]	Controls the amount of modulation of the Depth parameter. Analogous to AM (Amplitude Modulation).
Frequency Modulation	[S-MOD]	Controls the amount of modulation of the Speed parameter. Analogous to FM (Frequency Modulation).
Secondary LFO Rate	[RATE]	Sets the secondary LFO rate – determines how fast the D-Mod and S-Mod "wiggle" their targets. Ranges from 1/8 to 8X the Speed value. Note: If Envelope or ADSR is selected as the Mod Source, the modulation is driven by the amplitude of the audio input and the speed modulation control [S-MOD] becomes a Sensitivity control.
Modulation Source	[MODSRC]	Selects the secondary LFO modulation source. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When [EXPPDL] is chosen, the current preset's pedal mapping is ignored.

Rotary - [ROTARY]

Rotating speaker (Leslie) simulation. Choose cabinet size: Standard [STNDRD] or over-sized [GIANT]. A Leslie is built using a rotating speaker for low and mid-range frequencies and a rotating treble horn for highs. With Rotary you can control the speed of the rotor and horn independently and adjust the mix of the two.

Intensity	[INTENS]	Effect level.
Type	[SIZE]	Select Standard [STDRD] or Giant [GIANT] size cabinets.
Rotor Speed	[RTRSPD]	Sets the rotation speed of the rotor (low frequency) speaker.
Horn Speed	[HRNSPD]	Sets the rotation speed of the horn (high frequency) speaker.
Rotor/Horn Balance	[BALNCE]	Sets the balance between the rotor level and horn level.
Tone Control	[TONE]	Just what you'd expect.
Amplitude Modulation	[D-MOD]	Controls the amount of modulation of the Depth parameter. Analogous to AM (Amplitude Modulation).
Frequency Modulation	[S-MOD]	Controls the amount of modulation of the Speed parameter. Analogous to FM (Frequency Modulation).
Secondary LFO Rate	[RATE]	Sets the secondary LFO rate – determines how fast the D-Mod and S-Mod "wiggle" their targets. Ranges from 1/8 to 8X the Speed value. Note: If Envelope or ADSR is selected as the Mod Source, the modulation is driven by the amplitude of the audio input and the speed modulation control [S-MOD] becomes a Sensitivity control.
Modulation Source	[MODSRC]	Selects the secondary LFO modulation source. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When [EXPPDL] is chosen, the current preset's pedal mapping is ignored.

TremoloPan - [TREMLO]

Tremolo is an effect that is created by modulating the level of the incoming audio with a LFO. With this effect, as you turn WIDTH knob, it will shift the phase of the right channel's LFO creating a tremolo that will move from left to right in the stereo field. When the WIDTH is full clockwise, the right channel will be 180 degrees out of phase with the left creating an autopanner. Both outputs will have to be connected for this to function correctly.

Drive/Edge	[DRIVE], [EDGE]	For [BIAS], Intensity controls the amount of Drive. For high input levels, setting [INTENS] to high levels can cause overload distortion. For [OPTO], Intensity controls input slew rate (Edge) and, depending on the input signal, may only have a subtle effect.
Effect Type	[TYPE]	Select Bias [BIAS] or opto-coupled [OPTO].
Modulation Depth	[DEPTH]	Sets the modulation sweep range from narrow to wide.
Modulation Speed	[SPEED]	Sets the modulation sweep rate. Note: If Envelope or ADSR is selected for the Shape parameter, the modulation is driven by the amplitude of the audio input and the Speed control becomes a Sensitivity control.
Modulation Waveform Shape	[SHAPE]	Selects the shape (or source) of the modulation. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelope [ENVLPE], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When EXP PDL is chosen, the current preset's pedal mapping is ignored.
Mono Spread/ Stereo Width	[SPREAD], [WIDTH]	In mono out mode, this control spreads the tremolo and make the sound more smooth. In stereo mode, this control shifts the phase of the right channel's LFO creating a tremolo that will move from left to right in the stereo field. When set to Max, the right channel will be 180 degrees out of phase with the left creating an autopanner.
Amplitude Modulation	[D-MOD]	Controls the amount of modulation of the Depth parameter. Analogous to AM (Amplitude Modulation).
Frequency Modulation	[S-MOD]	Controls the amount of modulation of the Speed parameter. Analogous to FM (Frequency Modulation).
Secondary LFO Rate	[RATE]	Sets the secondary LFO rate – determines how fast the D-Mod and S-Mod "wiggle" their targets. Ranges from 1/8 to 8X the Speed value. Note: If Envelope or ADSR is selected as the Mod Source, the modulation is driven by the amplitude of the audio input and the speed modulation control [S-MOD] becomes a Sensitivity control.

Modulation Source	[MODSRC]	Selects the secondary LFO modulation source. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When [EXPPDL] is chosen, the current preset's pedal mapping is ignored.

Vibrato - [VIBE]

Vibrato is an effect that simulates the pitch change you get by modulating a guitar string or using a whammy bar. Modulating the rate with an Expression Pedal or envelope will create some insane vibratos. Three types supported – Modern [MODRN], Vintage [VINTG] and Retro [RETRO].

Intensity	[INTENS]	Effect level.
Effect Type	[TYPE]	Select – Modern [MODREN], Vintage [VINTGE] or Retro [RETRO].
Modulation Depth	[DEPTH]	Sets the modulation sweep range from narrow to wide.
Modulation Speed	[SPEED]	Sets the modulation sweep rate. Note: If Envelope or ADSR is selected for the Shape parameter, the modulation is driven by the amplitude of the audio input and the Speed control becomes a Sensitivity control.
Modulation Waveform Shape	[SHAPE]	Selects the shape (or source) of the modulation. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelope [ENVLPE], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When EXP PDL is chosen, the current preset's pedal mapping is ignored.
Unused/ Stereo Width/ Filter Stages	[UNUSED], [WIDTH], [STAGES]	For Modern and Vintage controls the 'width' of stereo panning (stereo mode only). For Retro selects the number of filter stages.
Amplitude Modulation	[D-MOD]	Controls the amount of modulation of the Depth parameter. Analogous to AM (Amplitude Modulation).

Frequency Modulation	[S-MOD]	Controls the amount of modulation of the Speed parameter. Analogous to FM (Frequency Modulation).
Secondary LFO Rate	[RATE]	Sets the secondary LFO rate – determines how fast the D-Mod and S-Mod "wiggle" their targets. Ranges from 1/8 to 8X the Speed value. Note: If Envelope or ADSR is selected as the Mod Source, the modulation is driven by the amplitude of the audio input and the speed modulation control [S-MOD] becomes a Sensitivity control.
Modulation Source	[MODSRC]	Selects the secondary LFO modulation source. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When [EXPPDL] is chosen, the current preset's pedal mapping is ignored.

Undulator - [UNDLTR]

Undulator is a classic Eventide effect that combines two delays, two detuned voices, and a FM modulated tremolo. By turning up the Intensity you can increase the dry/effect ratio.

Intensity	[INTENS]	Effect level.
Effect Type	[TYPE]	Select – Pitch [PITCH] or Feedback [FEEDBK].
Modulation Depth	[DEPTH]	Sets the modulation sweep range from narrow to wide.
Modulation Speed	[SPEED]	Sets the modulation sweep rate. Note: If Envelope or ADSR is selected for the Shape parameter, the modulation is driven by the amplitude of the audio input and the Speed control becomes a Sensitivity control.
Modulation Waveform Shape	[SHAPE]	Selects the shape (or source) of the modulation. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelope [ENVLPE], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When EXP PDL is chosen, the current preset's pedal mapping is ignored.

Pitch Spread/ Feedback	[SPREAD] [FEEDBK]	For Pitch select the spread (de-tuning), for Feedback control the amount of feedback.
Amplitude Modulation	[D-MOD]	Controls the amount of modulation of the Depth parameter. Analogous to AM (Amplitude Modulation).
Frequency Modulation	[S-MOD]	Controls the amount of modulation of the Speed parameter. Analogous to FM (Frequency Modulation).
Secondary LFO Rate	[RATE]	Sets the secondary LFO rate – determines how fast the D-Mod and S-Mod "wiggle" their targets. Ranges from 1/8 to 8X the Speed value. Note: If Envelope or ADSR is selected as the Mod Source, the modulation is driven by the amplitude of the audio input and the speed modulation control [S-MOD] becomes a Sensitivity control.
Modulation Source	[MODSRC]	Selects the secondary LFO modulation source. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When [EXPPDL] is chosen, the current preset's pedal mapping is ignored.

RingMod - [RINGMD]

Ring Modulator is an effect created by multiplying an input signal by an audio frequency waveform; the result is a waveform containing the sums and differences of those frequencies and their partials. This creates a waveform with complex (and usually nonharmonic) bell-like overtones. By using the S-Mod control to modulate this carrier frequency you can create useful and interesting sounds. The D-Mod parameter slightly detunes the right and left voices creating a stereo field. Two modulation types are supported [RING] and [STRING].

Intensity	[INTENS]	Effect level.
Effect Type	[TYPE]	Select [RING] or [STRING].
UN-USED	[UNUSED]	Unused control.
Modulation Speed	[SPEED]	Sets the modulation sweep rate. Note: If Envelope or ADSR is selected for the Shape parameter, the modulation is driven

		by the amplitude of the audio input and the Speed control becomes a Sensitivity control.
Modulation Waveform Shape	[SHAPE]	Selects the shape (or source) of the modulation. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelope [ENVLPE], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When EXP PDL is chosen, the current preset's pedal mapping is ignored.
Tone Control	[TONE]	Just what you'd expect.
Amplitude Modulation	[D-MOD]	Controls the amount of modulation of the Depth parameter. Analogous to AM (Amplitude Modulation).
Frequency Modulation	[S-MOD]	Controls the amount of modulation of the Speed parameter. Analogous to FM (Frequency Modulation).
Secondary LFO Rate	[RATE]	Sets the secondary LFO rate – determines how fast the D-Mod and S-Mod "wiggle" their targets. Ranges from 1/8 to 8X the Speed value. Note: If Envelope or ADSR is selected as the Mod Source, the modulation is driven by the amplitude of the audio input and the speed modulation control [S-MOD] becomes a Sensitivity control.
Modulation Source	[MODSRC]	Selects the secondary LFO modulation source. The choices are: [SINE], TRIANGLE [TRIANG], [PEAK], [RANDOM], [SQUARE], [RAMP], Sample and Hold [SMPHLD], Envelop [ENVLOP], or [ADSR]. In addition, the Expression Pedal [EXPPDL] can be chosen as a source. When [EXPPDL] is chosen, the current preset's pedal mapping is ignored.

H9 Algorithms

UltraTap - [ULTRA.T]

UltraTap is a versatile multi-tap delay-line effect capable of a myriad of sounds from rhythmic delays, to wacky comb filtering, to huge pad-like volume swells, to unique reverbs, and everything in between.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Length	[LENGTH]	Total time over which the taps are spaced in, up to 4 secs of tap time.
#ofTaps	[TAPS]	The number of taps, from 1 to 64.
Predelay	[PREDLY]	The amount of time before the taps start, up to 1 sec.
Spread	[SPREAD]	The rhythmic spacing of the taps. More negative values will group taps towards the beginning, for a "slowing-down" feeling. More positive values will group more taps towards the end for a "speeding-up" delay sound. A zero value will result in constant spacing.
Taper	[TAPER]	Controls the fade of the taps. More negative values will increasingly give a fade-up over the taps, and more positive values will give a fade-down over the taps. A zero value will result in equal gain across all taps.
Tone	[TONE]	A tone control. Negative values will make darker sounding taps, while positive values will make brighter sounding taps.
Slurm	[SLURM]	Juicy tap slurring/smearing and modulation.
Chop	[CHOP]	A pre-tap-machine "chopping' tremolo OR auto-volume processor. The tremolo has several LFO waveform choices: off [OFF], triangle [TRIANG], sawtooth [SAW], ramp [RAMP], square [SQUARE], or sample/hold [SMPHLD]. The auto-volume processor will either do volume swells [SWELL (0-9 input sensitivity control)], or a gating effect, called Trigger, that chops off the end of sounds [TRIG (0-9 input sensitivity control)]. There is also a setting for expression pedal control of the pre-tap-machine volume [EXPDL].

Speed, Rise, or Release	[SPEED], [RISE], [RELEAS]	This knob acts as a multi-function parameter control for the [CHOP] knob. For the LFO waveforms, [SPEED] will change the LFO speed. For [SWELL], [RISE] will adjust the swell rise time, and for [TRIGGR], [RELEAS] sets the amount of time after triggering before the gate kicks in and chokes off the sound.

Resonator - [RESNTR]

Resonator staggers 4 resonant comb filters to create ambient, arpeggiated, or reverberant sounds. Each comb filter can be tuned to ring out when you play the note selected by the respective 'NOTE' knob. This creates dynamic effects that react with more or less intensity based on the harmonic content of the input audio.

Mix	[MIX]	wet/dry mixer, 100% is all wet signal.
Length	[LENGTH]	Total length of the delay line. This length is split into 8 subdivisions on which the comb filters can be staggered.
Rhythm	[RHYTHM]	Represents the rhythm pattern of the comb filters. Each digit indicates the subdivision on which a comb filter is positioned. "1.3.5.7" will sound like even quarter notes since the four comb filters are evenly spaced on the 1st, 3rd, 5th, and 7th subdivisions.
Feedback	[FDBCK]	The feedback level of each of the comb filters. Feedback type 1 [FB1] maintains the pattern set by the rhythm knob, whereas feedback type 2 [FB2] degrades the pattern as it repeats.
Resonance	[RESNCE]	Affects how intensely the comb filters resonate. The comb filters will ring out more intensely as the resonance increases in either the positive or negative direction. Resonance set to 0 will acts as multi-tap delay without any additional resonant tones.
Reverb	[REVERB]	Controls the amount of reverb in the comb filter path.
Note1	[NOTE1]	Tunes the note values that trigger each respective comb filter. When resonance is positive, all integer multiples of this frequency will resonate. When the resonance is negative, only odd multiples of this frequency will resonate. These note values

		also affect the high and low pass filters surrounding each comb filter. When resonance is set to 0, these knobs can still be used to filter the delays.
Note2	[NOTE2]	Same as Note1.
Note3	[NOTE3]	Same as Note1.
Note4	[NOTE4]	Same as Note1.

EQ Compressor - [EQCOMP]

The EQ Compressor algorithm is a multi-featured parametric equalizer coupled with a dynamic, intuitive compressor, offering a premium tone shaping tool for a variety of instrumentation. The EQ section includes two completely parametric bands along with low shelf and high shelf filters for easy manipulation of your tone (be sure to check out the graphical EQ curve in H9 Control). The unique compressor section can be placed before or after the EQ for maximum flexibility with a single control, enabling you to emphasise, harness, and control the parts of your sound you want to shine through a mix. EQ Compressor also features up to 12 dB of boost at the output to push an amp to awesomeness for your soul tearing solos.

Gain 1	[GAIN1]	The gain of the first parametric filter. Provides 12dB of boost or 18dB of attenuation.
Frequency 1	[FREQ1]	The center frequency of the first parametric filter. The frequency ranges from 30Hz to 1500Hz.
Width 1	[WIDTH1]	Controls the bandwidth of the 1st parametric filter. A value of 10 represents a larger bandwidth while a value of 1 represents a narrower bandwidth.
Gain 2	[GAIN2]	The gain for the 2nd parametric filter. Provides 12dB of boost or 18dB of attenuation.
Frequency 2	[FREQ2]	The center frequency of the first parametric band. The frequency ranges from 1000Hz to 9999Hz.
Width 2	[WIDTH2]	Controls the bandwidth of the 2nd parametric filter. A value of 10 represents a larger bandwidth while a value of 1 represents a narrower bandwidth.

Bass	[BASS]	Controls the gain on the Low Frequency Shelving Filter which is centered around 400Hz with a slope of 8dB/Octave. You can boost the lows by 12 dB or cut by 18dB.
Treble	[TREBLE]	The gain on the High Frequency Shelving Filter which is centered around 1800Hz with a slope of 8dB/Octave. You can boost the highs by 12 dB or cut by 18dB.
Compressor	[COMP]	The amount of compression applied to the signal. The values to the left half of the knob will affect the Pre-EQ compression, increasing the amount of compression as you move it counter clockwise. The values to the right half of the knob will affect the Post-EQ compression, increasing the amount of compression as you move it clockwise. The compressor is specially designed to vary the numerous parameters of a typical compressor such as the ratio, attack, release and the makeup gain to keep the overall loudness consistent.
Trim	[TRIM]	Controls the level at the output of the signal path. Provides 12dB of boost or 12dB of attenuation. The algorithm is designed to "gracefully" clip if there is too much gain inside the EQ. The red overload LED on the H9 Pedal will light up in this case.

CrushStation - [CRUSH]

An overdrive/distortion command center with controls that drive your tone anywhere from a creamy saturation to a brutal sonic assault with everything in between. Use Eventide Harmonizer technology to crush some octaves into the mix, or turn up the Sag to bring the whole sound to its knees. An added bonus, CrushStation is a true stereo distortion.

Mix	[MIX]	The clean/dirty mix, all the way left is clean, all the way right is dirty.
Drive	[DRIVE]	The overdrive amount. Ranges from subtle boost/overdrive to full on distortion with Grit and Sustain controls pushing it into fuzz territory.
Compressor/ Sustainer	[SSTAIN]	Compression/Sustain which is Pre (turn left) distortion, or Post (turn Right) distortion. The sustainer is specially designed to vary the numerous parameters of a typical compressor such

		as the ratio, attack, release, and the makeup gain to keep the overall loudness consistent.
Sag	[SAG]	Turn it up to get increasingly sputtery, crushed, and broken sounds. Inspired by power rail sag of poorly designed tube amps and the dead and dying gear of times past.
Octaves	[OCTAVE]	Mixes in/out lower and higher pitch-shifted octaves before the distortion and compression.
Grit	[GRIT]	Adds more low end before the distortion for a gritty chugging sound.
Bass	[BASS]	Cut and boost of the lower frequencies to hollow out the sound or add some thud.
Mids	[MIDS]	Cut and boost of the mid range frequencies (frequency selectable with [MIDFRQ] control) to scoop some muddiness or punch through a mix.
Mids Frequency	[MIDFRQ]	Tunable center frequency of the [MIDS] cut/boost. Similar to a parked wah when boosted up high. Smoothly changes when connected to an expression pedal.
Treble	[TREBLE]	Cut and Boost of the higher frequencies to mellow out the sound or emphasize higher harmonics.

SpaceTime - [SPCTME]

SpaceTime is a multi-effects algorithm combining Modulation, two Delays, and Reverb into one, easy to use effect. Modulation is most similar to a chorus and is the first effect in the signal path. The Delays are based on Eventide's Vintage Delay Algorithm from the TimeFactor pedal and the Reverb section draws from both the Plate Algorithm in Eventide's SPACE pedal, as well as Eventide's ULTRA REVERB Native Plug-in. Unique to SpaceTime is the ability to route the Delays and Reverb in series or parallel after Modulation, further adding to its versatility and creative applications.

MIX	[MIX]	Controls overall algorithm wet/dry balance. 100% is all wet signal.

MOD AMT	[MODAMT]	Adds Modulation to entire signal path. Modulation depth also increases as you go from 0 to 100.
RATE	[RATE]	Adjusts the speed of the LFO controlling the Modulation section of SpaceTime. Continuously adjustable from 0.05Hz to 12.50Hz.
VERB LVL	[VERB]	Adjust the output level of the Reverb and routes the Reverb in Series after the Delays or Parallel with the Delays. The first half of the knob adjusts Series Reverb level from 0 to 100 while the second half of the knob switches to Parallel routing and adjusts Reverb level from 0 to 100. Percussive playing coupled with long Delay times and short Reverb Decay times will showcase parallel routing.
DECAY	[DECAY]	Sets the decay length of the Reverb in seconds or Note Divisions when in Tempo Mode.
COLOR	[COLOR]	Changes the Reverb character from small and dense (set to 0) to large and spacious (set to 100).
DELAY LEVEL	[DLYLVL]	Controls the amount of both Delays in the signal path. Can also be used to set the dry to wet blend of delayed signal sent to the Reverb in the series path. With DLY LVL set less than 50, dry signal and Delayed signal are both sent to the Reverb section. After 50, DLY LVL reduces the dry signal sent to the Reverb allowing only the delay repeats to have Reverb when the control reaches 100.
DELAY A	[DLY-A]	Sets the Delay time for Delay A from 0 to 2500ms when TEMPO is OFF. With TEMPO ON, Delay is sync'ed to the TEMPO BPM and is adjusted in note division increments from No Delay (NO DLY) to a Whole Note (WHOLE) in the most common note divisions.
DELAY B	[DLY-B]	Sets the Delay time for Delay B from 0 to 2500ms when TEMPO is OFF. With TEMPO ON, Delay is sync'ed to the TEMPO BPM and is adjusted in note division increments from No Delay (NO DLY) to a Whole Note (WHOLE) in the most common note divisions.
FEEDBACK	[FDBK]	Adjusts the amount of feedback for both delays and contains two feedback types (F1 and F2). F1 links both delay times to create a rhythmic, repeating pattern where the longer delay

		sets the pattern length. The shorter delay will not repeat again until the longer delay has passed. F2 is a traditional feedback control, where delay times are independent.

Sculpt - [SCULPT]

Multi-band Distortion w/Envelope Follower Control Filters. Carve out your own sound with a dynamic variable blend of hi and lo band distortion channels. Follows your playing style and compliments you with the perfect expression of tunable peaking filters. Perfect for single or dual amp setups, stereo out mode features unique spectral panning effects that spread the hi and lo bands out into the separate channels.

Mix	[MIX]	The clean/dirty mix, all the way left is clean, all the way right is dirty.
Band Mix	[BANDMX]	The mix between the low and high band.
Crossover Frequency	[XOVER]	The crossover frequency where the low band and high band are split.
Low Drive	[LDRIVE]	Overdrive of the low band signal.
High Drive	[HDRIVE]	Overdrive of the high band signal.
Compressor	[COMP]	Compression which is Pre (turn left) distortion, or Post (turn Right) distortion. Turn left to juice up the harmonics in the distortion, or turn right for some sparkly compressor spank. The Sculpt compressor is specially designed to vary the numerous parameters of a typical compressor such as the ratio, attack, release and the makeup gain to keep the overall loudness consistent.
Low Boost	[LOWBST]	Boosts the low end either Pre (turn left) distortion for chuggier low end, or Post (turn Right) distortion for smoother low end.
Filter-Pre	[FLTPRE]	Peaking filter before the distortion. Turning left sweeps a cutting filter up in frequency. Turning right sweeps a boosting filter up in frequency, similar to having a parked wah before the distortion. Smoothly changes when connected to an expression pedal.

Filter-Post	[FLTPST]	Peaking filter after the distortion. Turning left sweeps a cutting filter up in frequency. Turning right sweeps a boosting filter up in frequency, similar to having a parked wah after the distortion. Smoothly changes when connected to an expression pedal.
Envelope Follower	[ENVFLT]	Envelope follower that modulates both [FLTPRE] and [FLTPST] according to this input sensitivity setting. The values of [FLTPRE] and [FLTPST] become the depths that the envelope glides up to. Interesting dynamic changes are achieved when pre and post and set to opposite sweeps, e.g. Pre boost, and Post cut, etc.

PitchFuzz - [PTCFUZ]

PitchFuzz is a multi-effects algorithm combining Fuzz, three Pitch Shifters, and two Delays into one, easy to use effect. Fuzz is the first effect in the signal path. The Fuzz gets its inspiration from classic analog fuzz pedals as well as Eventide's own CrushStation and Sculpt algorithms. The Pitch Shifters come second in the signal path and are based on Eventide's PitchFlex Algorithm from the PitchFactor pedal. The Delay section is last in the signal path and its lineage can be traced back to the Vintage Delay algorithm in TimeFactor. The two Delays can be added to the entire output signal following the Pitch Shifters or added individually to two of of the pitched voices only, creating arpeggiated type effects.

Fuzz	[FUZZ]	Controls the amount of Fuzz/Distortion generated after the input signal. A setting of 0 completely bypasses the Fuzz effect. Use 1 - 50 for a distortion type effect and 51 - 100 for more of a Fuzz type effect.
Fuzz Tone	[FZTONE]	Tone shaper for the fuzz effect.
Pitch Amount	[PEACH]	Controls the level of the three Pitch Shifters. From 0 to 3 Voices. Pitch A: 0 - 1.0, Pitch A + B: 1.0 - 2.0, Pitch A + B + C: 2.0 - 3.0.
Pitch A	[PTCH-A]	Adjust the pitch shift amount of the A voice. Range is +/- 2 octaves with micro pitch shift ability at unison (+/- 25c).
Pitch B	[PTCH-B]	Same as Pitch A.
Pitch C	[PTCH-C]	Same as Pitch A.

Delay Level	[DLYLVL]	Controls the amount of both Delays in the signal path as well as two types of Delay routings (Group Delay and Arp Delay). Starting fully counter-clockwise, Group Delay sends the whole signal including all of the Pitched Voices to both delays. Turning past center activates Arpeggiated Delay Mode. In this mode, only voices B and C are fed to the delays (separately and respectively) allowing the creation of apreggiated type effects. Try this with PITCH AMT set to 3.0.
Delay A	[DLY-A]	Sets the Delay time for Delay A from 0 to 2500ms when TEMPO is OFF. With TEMPO ON, Delay is sync'ed to the TEMPO BPM and is adjusted in note division increments from No Delay (NO DLY) to a Whole Note (WHOLE) in the most common note divisions.
Delay B	[DLY-B]	Same as Delay A.
Feedback	[FDBK]	Adjusts the amount of feedback for both delays and contains two feedback types (F1 and F2). F1 links both delay times to create a rhythmic, repeating pattern where the longer delay sets the pattern length. The shorter delay will not repeat again until the longer delay has passed. F2 is a traditional feedback control, where delay times are independent.

HotSawz - [HOTSAW]

Just like a synth, HotSawz is a musical palette for creating interesting sounds. HotSawz is based around classic subtractive synthesis using saw waves for all oscillators. We're using 6 oscillators that follow a mono pitch tracker. The filter type is low pass.

HotSawz has three modulation sources: LFO, Envelope Follower, and a Gate, as well as four assignable modulation destinations: Filter Cutoff, Volume, Pitch, and Oscillator Depth. Each source can be assigned to any destination at a given time, so multiple sources can modulate the same destination. There are 64 combinations of source to destination assignments.

Mix	[SUBMIX], [S+RMIX], [ALLMIX], [R+UMIX]	Knob has four ranges each 0 - 100. Each range mixes dry and various oscillator combinations. • [SUBMIX] - Mixes in lower octave OSCs only. • [S+RMIX] - Mixes in lower octave and current register OSCs together.

		• [ALLMIX] - Mixes in lower octave, current register, and octave above OSCs together. • [R+UMIX] - Removes sub octave OSCs. Mixes in current register and upper OSCs together.
Osc Depth	[OSCDEP]	Mixes in 2nd OSCs for each register and adds detuning. Also spreads the OSCs across the stereo field. Modulation sources assigned to Oscillator Depth are additive.
Cutoff	[CUTOFF]	Controls the cutoff frequency of the low pass filter. Filter is in series with wet signal. Modulation sources assigned to CUTOFF are additive.
Resonance	[RESNCE]	Controls the low pass filter Q.
LFO Speed and Wave Shape	[TRI], [SQUARE], [RAMPDN], [RAMPUP]	Controls LFO's wave shape and speed. Knob has four ranges each 0.1 Hz to 20 Hz or Whole note to 1/16 note divisions. Each range switches the LFO wave shape. • [TRI] - Triangle. • [SQUARE] - Square. • [RAMPDN] - Decaying Ramp. • [RAMPUP] - Rising Ramp.
LFO Amount and Destination	[LFOAMT]	Assigns LFO destination and controls amount of modulation. Knob has four ranges. Each range assigns the LFO to a different destination for modulation. • [CUT] - Assigns LFO to modulate Cutoff frequency. • [VOL] - Assigns LFO to modulate wet output level. • [P] - Assigns LFO to modulate pitch +/-3600 cents. • [DEP] - Assigns LFO to modulate Oscillator Depth.
Gate Attack	[ATTACK]	Gate Attack speed from 0 to 3000ms. When the GATE Sustain/Range knob is set to OFF, ATTACK knob has no effect.
Gate Decay	[DECAY]	Gate Decay speed from 0 to 3000ms. When the GATE Sustain/Range knob is set to OFF, DECAY knob has no effect.
Gate Amount and Destination	[SSTAIN], [RANGE]	Assigns GATE destination and controls amount of either Sustain or Range of the GATE. Knob has four ranges. GATE

		Sustain level occurs after both Attack and Decay of the GATE (There is no release in the GATE). GATE Range (for Pitch as destination) is how far from 0 pitch modulation is allowed to go at the end of GATE attack. • [OFF] - Disconnects the GATE. Attack and Decay control will have no affect on signal. • [CUT] - Assigns the GATE to modulate Cutoff frequency. • [VOL] - Assigns GATE to modulate wet output level. • [P] - Assigns GATE to modulate pitch Range +/-3600 cents. Returns to 0 modulation after GATE Decay. • [DEP] - Assigns GATE to modulate Oscillator Depth.
Envelop Follower and Destination	[ENVLOP]	This Envelop is triggered and drawn by dynamics of input level. This parameter assigns Envelope destination and controls amount of modulation. It has four ranges each 0 - 100. Each range assigns the Envelope to a different destination for modulation. • [CUT] - Assigns the Envelope to modulate Cutoff frequency. • [VOL] - Assigns the Envelope to modulate wet output level. • [P] - Assigns the Envelope to modulate pitch. • [DEP] - Assigns Envelope to modulate Oscillator Depth.

Harmadillo - [HRMDLO]

Harmadillo is a flexible harmonic tremolo, offering everything from soulful lush tremolos to psychedelic mind-bending weirdness.

An ordinary tremolo automatically fades your signal up and down using a low frequency oscillator (LFO). Because your sound is faded down for part of the waveform, the overall sound seems quieter. Many tremolo pedals provide a gain or volume control to help offset this volume loss.

A harmonic tremolo takes a different approach. It splits the signal into low and high frequency bands and then applies the LFO to the low band and an inverted copy of the LFO to the high band. When the low band becomes louder, the high band becomes quieter, and vice versa. This way, the overall volume doesn't drop as much because one part of the sound spectrum is always audible. This also means that the upper harmonics receive a different tremolo than the fundamental, hence the name "harmonic tremolo."

Harmadillo features three ENV (envelope follower) controls that use your picking and playing dynamics to affect the tremolo's rate, depth, and crossover frequency. These controls can make subtle or drastic changes to your sound and add flexibility to the effect. When first getting to know Harmadillo, we recommend setting the ENV controls to 0 so that you can get a feel for the basic controls first. Once you are familiar with those, it will be easier to see how the ENV controls can be used to add expression to your playing.

DEPTH	[DEPTH]	This is the depth of the low and high bands of the tremolo. • At 0, the tremolo will have no effect on the volume of the bands. • At 100, the bands will be completely faded in and out.
RATE	[RATE]	This is the base rate of the tremolo. When Tempo mode is ON, this becomes a multiplier on the tapped BPM value. The ENV RATE control can change the apparent rate, so if the rate that you are hearing is different from the value of the RATE control, try setting the value of ENV RATE to 0.
SHAPE	[SHAPE]	The shape of the tremolo waveform. The same shape is used for both high and low bands. The shapes describe what happens to the low band, since it's usually the main part of your sound; the high band will change in the opposite direction. Options are: • SINE - Sine wave. This shape works well for producing a smooth, subtle tremolo. • FAT SINE - "Fat" sine wave that spends more time near its minimum and maximum values. This waveform sounds similar to SINE, but with slightly more throb. • PHAT SINE - An even "fatter" sine wave that spends even more time at its minimum and maximum values. • TRIANGLE - A linear up/down ramp. Like sine, this is a good shape for smooth, subtle tremolo. • RAMP DN - A downward ramp for the low band, and an upward ramp for the high band. The low band will have a plucked attack while the high band will fade in. • RAMP UP - An upward ramp for the low band, and a downward ramp for the high band. The low band will fade in, while the high band will have a plucked attack. • PULSE X - A pulse wave with selectable duty cycle (X). The low band will stay at its maximum amplitude for X% of the cycle, then jump to its minimum amplitude, set by DEPTH and ENV DEPTH. X values are 25%, 33%, 50%, 66%, and 75%. This shape can be especially interesting

		when paired with a delay pedal whose time is related to Harmadillo's rate.
		• LUMP - The first half of a sine wave. The low band's waveform is rounded at the maximum and pointed at the minimum. This shape is good for making fast, vibey tremolos.
		• RUMP - The second half of a sine wave (RUMP is the inverse of LUMP). The low band's waveform is pointed at the maximum and rounded at the minimum. Like rump, this is a good shape for fast, vibey tremolos.
		• SLOPE X - A curved ramp with continuously adjustable slope from 0 to 100.
		   • X = 0: downward curve for the low band, upwards curve for the high band
		   • X = 50: symmetric curves for low and high (similar to the RUMP shape)
		   • X = 100: upward curve for the low band, downwards curve for the high band

X-OVER	[XOVER]	XOVER (crossover) determines where in the frequency spectrum the low band ends and the high frequency band begins. In practice, each band rolls off around the crossover frequency, so they overlap a bit. The X-OVERLAP control allows you to adjust the amount of overlap; see below. • To mimic an ordinary tremolo, set X-OVER to its maximum value of 12,000 Hz. Most of an electric guitar's sound spectrum is below 6,000 Hz. Any audio above 12,000 Hz (i.e., hardly any sound) will be heard in the high band, and everything else will be heard in the "low" band. Change X-OVER gradually to morph into and out of an ordinary tremolo sound. • The X-OVER control is especially interesting when the SHAPE control is set to an asymmetric shape such as RAMP UP. This means that for each cycle of the tremolo the portion of the signal below the X-OVER value will be faded in and the portion of the signal above the X-OVER value will be faded out. If you start playing a scale below the X-OVER frequency and continue playing above it, the shape of the tremolo will appear to change as you cross over the X-OVER frequency!
X-OVERLAP	[XOVRLP]	The X-OVERLAP control adjusts the amount of overlap between the high and low bands. Negative values will produce

		a cut at the crossover frequency, and positive values will produce a boost at the crossover frequency.
		- To explore the effect of this control set: [X-OVERLAP] to 100 [DEPTH] to 0 [ENV DEPTH] to 0 [DRIVE] to 0 [ENV XOVER] to 0 This removes the tremolo effect so you can hear the filtering. Slowly sweep the X-OVER value from 100 to 3,000 Hz as you play a repeated note, and listen for a boost at the crossover frequency. - Harmonic tremolo effects often have a scoop in the midrange near their crossover. You can emulate this by using negative values for X-OVERLAP. To dial in classic sounds, set ENV-XOVER to 0, set the X-OVER frequency between 400 and 900 Hz, and adjust X-OVERLAP and DEPTH as needed.
DRIVE	[DRIVE]	The DRIVE control adds warmth to the signal by mimicking the behavior of a tube amplifier's harmonic tremolo.
ENV DEPTH	[EVDPTH]	The ENV DEPTH control uses the amplitude envelope of the input to increase or decrease the tremolo's depth. - Positive values increase the depth of the tremolo when you attack a note. The depth will return to the level set by the DEPTH control as the note decays. Additionally, louder notes will have greater depth than softer notes. - Negative values reduce the tremolo when you attack a note, increasing the clarity of your attacks and making sustained notes more expressive over time. Playing louder will reduce the depth of the tremolo, and you can use large negative values to create tremolos that only appear when the input is soft. - The ENV DEPTH control covers a large range, so we recommend starting with values closer to 0, and then adjusting the control as needed.

ENV RATE	[EVRATE]	The ENV RATE control uses the amplitude envelope of the input signal to affect the rate of the tremolo. • With positive values, the tremolo jumps up in frequency when you attack a note and gradually returns to the original rate set by the RATE or tap tempo controls. The harder you play, the longer it will take to return. • Negative values will temporarily reduce the rate of the tremolo when you attack a note, and the rate will return to the value set by the RATE knob or tap tempo as the note decays. With larger negative values and high RATE values, you can use this control to create bouncing-ball tremolo type effects. This is especially effective with the SHAPE control set to PULSE, RAMP DN, RAMP UP, or SLOPE 0 options. • The ENV RATE control covers a large range -- at 100%, it can push the internal LFO rate up to 80 Hz -- so we recommend starting with values closer to 0, and then adjusting the control as needed.
ENV XOVER	[EVXOVR]	The ENV XOVER control uses the amplitude envelope to affect the crossover frequency. • To create a swept filter effect similar to an autowah, set X-OVERLAP to 100, set the X-OVER frequency to 200 Hz, and then increase the amount of the ENV XOVER conrol as necessary. The frequency of the crossover filter will now track the loudness of the input signal. • You can create a single-notch phaser by turning DEPTH to 0, X-OVERLAP to -100, X-OVER to 3500, and then set ENV XOVER to a medium negative value, adjusting to taste. Once you have a sound you like, try slowly turning up the DEPTH control. Try playing long chords with these settings. In addition to the phasing effect, you will now notice that the tremolo also seems to change as a chord dies out. This is because the crossover frequency returns to the high X-OVER value (3500 Hz) as the chord decays. • Try setting SHAPE to an asymmetric waveform (e.g., RAMP DN) to produce waveform morphing effects as the crossover frequency changes.
TONE	[TONE]	A tone control for shaping the high or low end of the output signal. Negative values roll off high frequencies (HICUT), and positive values roll off low frequencies (LOCUT).

TriceraChorus - [TRICER]

TriceraChorus is inspired by the classic tri-choruses and stompbox choruses of the 1970s and early 1980s. These units used bucket brigade delay (BBD) chips to create chorusing. TriceraChorus pairs rich BBD-style trichorusing with another classic effect of the 1980s: Eventide MicroPitch detuning. This effect can be used to thicken the sound, to add static chorusing, and to spread the stereo field by detuning the left and right signals in opposite directions.

TriceraChorus has three chorus voices: Left (L), Center (C), and Right (R). Each voice uses a dedicated LFO to modulate a delay at the frequency set by the RATE knob. The modulated signals for the Left and Right voices are -120 and 120 degrees out of phase relative to the Center modulation signal. The combination of the three modulated delays creates lush chorus sounds.

The DEPTH L / DEPTH C / DEPTH R knobs control the depth of the respective voices. Larger depth values increase the amount of delay modulation, creating greater changes in pitch. When a depth control is set to OFF, that voice is removed from the output, and the volume levels of the other voices will be automatically adjusted to maintain a constant level.

CHORUS MIX	[CHRMIX/ CRLMIX]	Global mix control for chorusing and has two modes, Chorus and Chorale. Chorus and Chorale Mix levels are independent of Detune Mix (see below). • In Chorus Mode (0 - 99 range on left half of the knob), all three chorus channel mixes, Left, Center, and Right are affected together. At 100 (Vibrato), no dry signal is present. In Chorus mode, LFO shapes are triangular from a range of 0 to 75. After 75, the LFO morphs from triangular to sinusoidal at 100. • Chorale Mode (99 - 0 range on right half of the knob) adds two fixed rate LFOs, one slow and one fast, to the primary LFOs creating an effect similar to combining the PRESET and MANUAL modes on the DYTRONICS TriChorus. This increases the complexity of the modulation, producing a richer sound. In Chorale mode, all LFO shapes are sinusoidal througout the range of the control.
RATE	[RATE]	This is the base rate of the chorus modulation, from 0.1 to 20 Hz. When Tempo mode is ON, this becomes a multiplier on the tapped BPM value. The ENV RATE control can change the apparent rate, so if the rate that you are hearing is different

		from the value of the RATE control, try setting the value of ENV RATE to 0.
DEPTH L	[DEPTHL]	Chorus modulation depth of the Left voice, with two options: OFF, 1-100. When Depth L is OFF, the voice is removed from the mix, and the levels of the other voices are automatically adjusted to preserve the wet-dry blend. In mono to stereo routing, if DEPTH R is OFF but DEPTH L is active, the chorused signal will be routed to the left and the dry signal will be routed to the right. This is a classic technique for producing a wider stereo image.
DEPTH C	[DEPTHC]	Chorus modulation depth of the Center voice, with two options: OFF, 1-100. When Depth C is OFF, the voice is removed from the mix, and the levels of the other voices are automatically adjusted to preserve the wet-dry blend.
DEPTH R	[DEPTHR]	Chorus modulation depth of the Right voice, with two options: OFF, 1-100. When Depth R is OFF, the voice is removed from the mix, and the levels of the other voices are automatically adjusted to preserve the wet-dry blend. In mono to stereo routing, if DEPTH L is OFF but DEPTH R is active, the chorused signal will be routed to the right and the dry signal will be routed to the left. This is a classic technique for producing a wider stereo image.
DELAY	[DELAY]	DELAY sets the amount of delay for the chorusing effect; use it to thicken your signal, create a flange, or slap-back sound. • When CHORUS MIX is in Chorus Mode, DELAY sets the minimum delay time for all voices, ranging from 0.39 mS to 200 mS. Short delays can be used to create light flanging. Typical chorus delays range from 1.5-10 mS. You can create a chorused slapback sound by using values between 50 and 100 mS. • When CHORUS MIX is in Chorale Mode, the delay amount for each voice becomes a function of the DELAY setting and the DEPTH level of each voice. In this case, the DELAY becomes a range of possible delay amount for each voice. As you increase the DEPTH of a voice, its delay amount decreases.
DETUNE MIX	[DTNMIX]	Mix control for the Detune section of the algorithm. The Detuners are fed from the stereo output of the Chorus voices.

		DETUNE MIX controls the stereo left and right channels at the same time and is independent of the CHORUS MIX control.
DETUNE	[DETUNE]	Controls both detune amounts for the left and right channels. Range is +/- 40 cents. Left and right channels get opposing amounts of detune (for example -30L/+30R). For enhanced versatility, the channels can be set with different opposing amounts. Left channel is the base detune amount and right channel can be adjusted around an 8 cent opposing window (for example -16L/+12R to -16L/+19R).
ENVELOPE	[ENV]	Controls Amplitude Envelope assignment as well as Envelope Depth. There are two assignable Envelope modulation destinations: • Envelope to Mix [ENVMIX]. Playing dynamics modulate the global Chorus Mix and Detune Mix amounts. Range is -100 to 100. • Negative values decrease the mix levels when you attack a note, and can be used to increase the clarity of your attacks or make sustained notes more expressive over time. Playing louder will reduce the chorusing effect, and you can use large negative values to only allow chorusing when the input is soft. • At zero, the envelope will not affect the chorus or detune mixes. • Positive values increase the internal mix levels for chorus and detune from 0 up to the levels set by the mix knobs when you attack a note. For example, with DETUNE MIX set to 50, CHORUS MIX set to 0, and ENVMIX set to 50, when a note is attacked, the internal detune level will increase to 50, then decay towards 0 with the note. The chorus level, however, will not increase because it is at 0. • Envelope to Rate [EVRATE]. Playing dynamics modulate the speed of the LFO. Range is -100 to 100. • With negative values, the rate of the primary LFOs will be slowed down when you attack a note, gradually returning to the value set by the RATE knob. Larger negative values can be used with faster RATE settings to create a fade-in vibrato effect. • At zero, the envelope will not affect the rate of the LFOs.

		• With positive values, the LFOs increase from the minimum rate towards the value set by the RATE knob when you attack a note.
TONE	[TONE]	A tone control for shaping the high or low end of the output signal. Positive values roll off high frequencies (HICUT), 0 is flat, and negative values roll off low frequencies (LOCUT). Use the LOCUT range to reduce muddiness. Use the HICUT range to roll off high frequencies for a softer sound. The tone control only affects the wet signal path. Changes to the CHORUS MIX knob (or usage of ENVMIX) may change the apparent effect of the TONE control. For example, a setting of HICUT 50 will sound brighter when the CHORUS MIX knob is set at 50 versus when CHORUS MIX is at 100 (Vibrato).