H9 Algorithm Guide

Contents

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 40 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 wireless remote control. That's H9 Control: Our free Bluetooth iOS app for iPhone/iPad. If you're doing lots of tweaking or creating presets, we urge you to use your iPhone/iPad.

Note that the H9 does not support TimeFactor's LOOPER 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.

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
PreDelay – [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
Hi 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 amount of diffusion 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 'sprionginess'. 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

Dual Reverb - [DUAL]

Combines two different high quality studio reverbs (A and B) with independent controls for decay, size, pre-delay, and EQ. Control mix between the dual reverbs for rich, dense stereo reverberation, or use this effect to smoothly transition between two entirely different reverb sounds.

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]

?neht siht lla s'tahW
A true reverse reverb followed by a forward reverb with delay and feedback. Set [SIZE] and [FEEDBK] at minimum for a straightforward tempo-sync-able rush-up reverse reverb, use [SIZE] to dial in a second reverb for increased wetness, and add [FEEDBK] around the whole thing for other-worldly ambiance.

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. 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 Level – [E-LVL]: 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]: 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 <15 for some great distortion sounds)
PreDelay – [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
Overdrive Distortion Type – [ODRIVE]: the input level to one of two different types of distortions
Distortion Output Level – [OUTPUT]: the output level of the distortion
Modulation Rate – [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 1-100 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 Shift Level – [PITCH]: controls feedback around the reverberator and therefore the amount of pitch-shifted signal.
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.

Diatonic Shifter – [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 & 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.
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.

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.
PitchA&C/PitchB&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: [MAJOR]-Major, [MINOR]-Minor, [DORIAN]-Dorian, [PHRYGN]-Phrygian, [LYDIAN]-Lydian, [MIXLYD]-Mixolydian, [LOCRN]-Locrian, [HARMIN]-Harmonic Minor, [MELMIN]- Melodic Minor, [WTONE]-Whole Tone, [ENIGMA]-Enigmatic, [NEOPLT]-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/Chromatic Shift – [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 Depth control to set the amount of pitch modulation and the 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.

OK, now try that with some pitch shifting, delay and feedback!

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 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.
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]

Either use an Expression Pedal or H9 Remote.
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.
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.

Octaver is a parallel (dual mono) rather than stereo effect.

Note: 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&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 Mix – [OCT-MX]: Controls the mix of octaves and FUZZ.

Performance Switch – 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:
1) dual 16-step pitch-shift sequencer
2) dual 16-step rhythm sequencer
3) 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 Scale/Speed 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]:
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:

1. All steps are one octave up.
2. All steps are one octave down.
3. All steps are a fifth up.
4. All steps are a fourth down.
5. Unison & one octave down.
6. One octave down, unison, one octave up, two octaves up.
7. Two octaves down, one octave down, unison, one octave up.
8. One octave down, unison, one octave up, 2 octaves up.
9. Unison, one octave up, unison, one octave up.
10. Unison, one octave up, unison, one octave up, etc.
11. Unison and fifth up.
12. One octave down climbing to unison.

13. Unison, fourth down, one octave down, two octaves down, unison, one octave up.
14. Starts at two octaves down, swoops up to unison and at the 13th step jumps up one octave and ends at unison.
15. Mostly up one octave with a short swoop to unison in the middle, back to an octave up and ending by swooping to unison.
16. Starts at unison, swoops down two octaves, makes a couple of jumps up one octave and ends on unison.
17. 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.
18. Four quick jumps up one fifth, swooping back down to unison.
19. Swoops from unison up one octave and does it twice.
20. Swoops from up one octave down to unison and does it twice.
21. Starts at unison steps up one octave and steps back down to unison.
22. Staggers its way from unison to up one octave.
23. Similar to 22.
24. Swoops up from unison to one octave up and does it four times.
25. Jumps between unison and octaves and fifths and fourths up and down.
26. 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↑
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
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]:
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 by the number of LEDs lit in each column. 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 the audio takes the entire step length to fade in, at mid-range the audio is present for the entire step duration, and at maximum the audio is present for only $1/10^{th}$ 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]:
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 - [FL]=FILTER, [FZ]=FUZZ, and [GL]=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 – [RN-FL]=random filters, [RN-FZ]=random fuzz, [RN-GL]=random glitches and [RN-M]=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.

Voice A/Voice B Mix – [VOX-MX]: Controls the ratio of the two synthesized voices A & 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 [SINE], triangle [TRIANG]) or sawtooth (SAW).
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.

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.

Performance Switch/SLOW/BRAKE

Pressing and releasing the Performance Switch toggles the 'slow' mode on and off. When **Slow** mode is engaged the LFO's will slow down by a predetermined factor simulating the speed change of a Leslie speaker cabinet. Pressing and holding the Performance Switch engages a **Brake** mode for as long as the switch is pressed. **Brake** mode slows the LFOs at a constant rate while the switch is pressed. When the switch is released, **Brake** the LFOs return to their previous rate.

The Performance Switch can be activated by MIDI CC, Auxiliary Switch or by using H9 Control.

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. Three types of chorus effects are supported Liquid Chorus [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 – [FEEDBK], [MDO]. Controls feedback for Liquid and Shimmer. For Organic, used to control a 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.

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. Four 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].
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]. For [POS], [NEG], FEEDBK] 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.
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.
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.

Rotary – [ROTARY]

Rotating speaker (Leslie) simulation. Choose cabinet size: Standard [STNDRD] or over-sized [GIANT].

Intensity –– [INTENS]: Effect level.
Cabinet Size – [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], Envelope [ENVLPE], 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 an LFO. Two types of Tremolo are supported – Bias [BIAS] and opto-coupled [OPTO].

Intensity –- [INTENS]: 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.
Stereo Width – [WIDTH]: 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. Both outputs will have to be connected for this to function correctly.
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], Envelope [ENVLPE], 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.
Stereo Width/Filter Stages – [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], Envelope [ENVLPE], 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], Envelope [ENVLPE], 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. By engaging the **Sync to Tempo/Pitch** feature, the **LFO** rate control displays note values instead of Hz, by selecting the tonic of your scale or something similar you can ensure that the output of this process will be harmonically related to the notes you play. The **Depth** parameter slightly detunes the right and left voices creating a stereo field. Note that the **Mod Rate** knob controls Sensitivity for this effect. Two modulation types are supported [RING] and [STRING].

Intensity –– [INTENS]: Effect level.
Effect Type – [TYPE]: Select [RING] or [STRING].
Modulation Depth - [DEPTH]: Sets 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.
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], Envelope [ENVLPE], 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.

TimeFactor Algorithms

Nine distinct delay Effects – DigitalDelay, VintageDelay, TapeEcho, ModDelay, DuckedDelay, BandDelay, FilterPong, MultiTap, Reverse. Note that TimeFactor features a Looper which is not supported by the H9.

Performance Switch/REPEAT

The Performance Switch can be activated by MIDI CC, Auxiliary Switch or by using H9 Control. The "REPEAT" switch is used to toggle the infinite repeat function ON and OFF. Repeat captures the audio that is currently in the delays. The input to the delay is turned off and the audio in the delay is continuously repeated.

When Repeat is switched ON, [RPT ON] is briefly displayed and when Repeat is switched OFF, [RPT OFF]. The Repeat LED is lit orange to indicate that the sound in the delay is captured and will repeat forever or until power is off.

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] = 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.
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.

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.
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.

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, 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).

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).
ReleaseTime – [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] = 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.
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 – [FDBK]: 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 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.

Mix -– [MIX]: wet/dry mixer, 100% is all wet signal.
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).

H9 Special Algorithms

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 command, Auxiliary Switch or using H9 Control. For H9 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.

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 3 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 2 secs.
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, Note2, Note3, Note4 – [NOTE1][NOTE2][NOTE3][NOTE4]: 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.