

H949TM **User Guide**

Eventide[®]

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Chapter 1

Introduction

Figure 1.1: H949 Single Harmonizer



Figure 1.2: H949 Dual Harmonizer



1.1 About This Product

Thank you for your purchase of the Eventide H949 Harmonizer plug-in. The product recreated in this plug-in was among the first introduced by Eventide, and among the world's first commercially available professional recording products. For over 40 years, innovative products like these have made Eventide an industry leader, and we are extremely proud that they continue to be in demand today. This package includes a stunning recreation of the H949 Harmonize, as well as a Dual H949 version, which recreates the popular technique of running two H949 units in parallel to create lush doubling and other interesting effects. We'll get into more depth on the product soon but, before you forget, please take a few minutes to register online. This helps us keep you informed of any important software updates, and any special offers that may only be available to registered users. If you find the need to get more information from us than this manual can provide, please visit our support forum available via our website (<http://www.eventideaudio.com>).

Chapter 2

Registration, Activation, and Installation

Eventide uses PACE's [ilok.com](http://www.ilok.com) licensing system, with or without an iLok hardware dongle, to license our plug-in products. Each license provides two activations which can reside on either your computer or on an iLok license dongle. Once you've purchased your plug-in, you'll need to register it on Eventide's website, activate your license, and install the plug-in on to your computer.

2.1 Registering Your Plug-in

When you purchase an Eventide Native plug-in, you'll receive a Serial Number and License Key. The Serial Number will be two letters followed by 6 numbers. If you have an individual H949 Harmonizer license, the Serial Number will start with H4 (i.e. H4-#####). If you purchased a group license, the Serial Number will be in the same format, but correspond to that group license (e.g. AX-##### for Anthology X). The License Key will be 3 sets of 4 characters, a letter or a number, each; like XXXX-XXXX-XXXX.

Once you've received these codes, you can register your plug-in on the Eventide website. To do so, please log in to <http://www.eventideaudio.com>, navigate to My Account in the top right corner, and select Register a New Product. Then, fill out the form by selecting Native Plug-in (VST, AU, AAX) in the Product Category field, select H949 Harmonizer or the applicable group license in the Product list, and enter your Serial Number, License Key, and iLok.com account name. If you don't yet have an iLok.com account, you can create one for free at <http://www.ilok.com>. Once you've done so, press Register.

Once you've entered this information and pressed the Register button, Eventide will send the applicable plug-in license to your [ilok.com](http://www.ilok.com) account, which you will need to activate to your computer or iLok dongle.

2.2 Activating Your License

To activate and manage your plug-in licenses you'll need to install PACE's iLok License Manager software which you can download from <http://www.ilok.com>. If you don't have this software installed, please download and install it now.

Once you have installed and launched iLok License Manager you should be able to log in to your account by clicking the large Sign In button in the upper left hand corner of the application. Once you have, you should be able to see available licenses by choosing the Available tab at the top of the iLok License Manager application. If you have successfully registered your plugin, your H949 Harmonizer Native license will be available in this list. Please activate this license by dragging it to either your computer or iLok dongle listed on the left. When you do so, you will be asked to confirm the activation, and you will be able to see it by clicking on the location you have chosen. At this point your license is activated.

2.3 Installing Your Plug-In

You should have been given a link to the Eventide Native plug-in installer when you purchased your plug-in, but if you haven't, you can find downloads for all of Eventide's Native Plug-Ins at <http://https://www.eventideaudio.com/products/plugins>. Please download and launch the correct installer for your system.

Once you've launched the plug-in installer, it will take you through several pages of options. We have tried to choose defaults for these options which will best serve the majority of users, but it is worth a minute to make sure you understand these options before clicking through to the next page. Once you have followed through the installer, your plug-ins and presets should be in your chosen locations, and you can hit finish to end the installer application.

At this point, you should be ready to use your Eventide H949 Harmonizer Plug-In.

2.4 Moving or Removing an Activation

If at any point, you decide to move your plug-in activation, you can do so in iLok license manager. To move an activation between an iLok dongle and your computer, simply plug in the iLok, locate the license in its current location, and drag it to its new location. To deactivate a license, find it in its location, right click on it, and choose deactivate.

Remember that each Eventide Native Plug-In License comes with two activations, which can be used on either a computer or iLok dongle, meaning you can use H910 in two locations at the same time.

2.5 Navigating the Plug-Ins

The H949 Harmonizer panel is designed with graphic knobs and buttons that resemble the controls on the original units – but we've enhanced them for intuitive mouse control. Knobs are easily adjusted with either an up-and-down or a left-and-right motion of the mouse. Click on any knob you want to adjust, then drag upward, or to the right, to increase the setting, and downward, or to the left, to decrease it. (It is not necessary to try to move the mouse in a circular motion to "turn" the knobs.) While a knob is selected, the value of the parameter will appear in the center of the knob graphic.

Chapter 3

H949 Harmonizer

Production Dates 1977 – 1984

The Eventide Clockworks H949, which debuted shortly after the H910, was the world's first "de-glitched" Harmonizer product - and may even have been the world's first multi-effect audio product. It not only offered 3 octaves of pitch change, but also featured Micro and Random pitch, Delay only, Flange and unique Reverse modes. When used with a tape recorder, it also made time expansion and compression possible for the first time ever. All of the original features and sound are recreated here in the Native Plug-in format. Spend some time with the controls, as you'll find a wide range of sound effects can be created using the few front panel controls. Also, audition the two pitch algorithms provided for the variety of sources you may feed into it.

3.1 H949 Harmonizer Controls

3.1.1 Input Level

This is used to set the optimum operating level for the system. The knob acts as a conventional volume control. Five Level Indicators provide visual cues as to the actual level of the incoming signal. In normal operation, the yellow LED indicates that a low-level signal (-60dBFS) is being applied to the input. The 3 green NORMAL LEDs illuminate in sequence (-12dBFS, -6dBFS, -3dBFS) to indicate a minimal driving signal, and increasing levels within the normal range. The red LIMIT LED lights within 0.5 dB of clipping. Note that all of these indicators are peak-responsive and will light on "peaky" material even if the average signal level is quite low. The ideal setting will drive all of the green LEDs, with no flashes of the red LED. Note that the Level Indicators are "after" the feedbacks, i.e. they measure Input+Main Feedback+Delay Only Feedback, to indicate any digital clipping at the pitch shifter input.

3.1.2 Repeat

This locking pushbutton is used to capture and repeat audio segments. Pressing it captures the last 400 ms of audio and re-circulates it until Repeat is pressed again. In Repeat mode the LEVEL LEDs light in reverse order (with red indicating low-level signals, and yellow indicating clipping). This provides continuing indication of signal level, while reminding you that Repeat mode is active and the actual signal input is being disregarded.

Remember that the signal segment captured when REPEAT is pressed is the current content of memory at the instant the switch is pressed. If you are listening to a delayed output, part or all of the segment heard immediately before pressing REPEAT may be lost. To avoid this, monitor either the input signal or a nondelayed output when attempting to capture precise segments.

3.1.3 Feedback

The Feedback controls route a portion of the output signal back to the input. The output of these controls is mixed with the input signal, but is independent of the gain adjustment provided by INPUT LEVEL.

Gains are normalized so that, with EQ controls approximately centered, the feedback level varies from 0 to 100% (loop gain of unity or "infinite" sustain) as the FEEDBACK LEVEL knob is advanced from OFF to MAX.

- MAIN LEVEL – adjusts the feedback from the system output to the input.
- DLY ONLY – adjusts the level of the Delay Only output delays in the Delay/Reversal modes.
- LOW EQ – adjusts the relative level of bass frequencies present in the feedback mix. When the knob is turned counterclockwise, lows are cut; when turned clockwise, lows are boosted.
- HIGH EQ – adjusts the relative level of high frequencies in the feedback mix, cutting them when the knob is turned counterclockwise, and boosting them when the knob is turned clockwise. When both EQ knobs are centered, the frequency response of the feedback chain is approximately flat.

NOTE: Use caution when adjusting these controls until you are fully familiar with their interaction. They can easily be set to a point where loop gain exceeds unity at various frequencies, and create uncontrolled oscillation.

3.1.4 Pitch Control/Readout

This block of controls is associated primarily with manual/remote control of the output pitch ratio vs. the input signal.

- MANUAL – adjusts the pitch ratio from 2 octaves down to 1 octave up, and also determines the rate of delay change in Flange and Random modes.
- PITCH RATIO – is indicated on a 4-digit display showing the numerical pitch ratio between input and output. Note that, just as in the original unit, when the knob is set between two values, the display will "jitter" between the two. This is visual jitter only, and does not affect the audio.
- MIDI – This switch allows remote control via MIDI. When selected, the pitch ratio will be determined by receipt of MIDI Note On and Pitch Bend messages. (See 'Working with the Harmonizers'.)

3.1.5 Function Select

The FUNCTION button and the 4 switches to its right allow you to select the basic operating modes of the H949. When pressed IN, the 4 switches function as labeled in red below each switch. When the FUNCTION button is OUT, the switches function as labeled in green above the switches. LEDs indicate which switch is selected and show (by lighting red or green) which function is active. The functions controlled by these switches fall into two major groups: Pitch Change effects (activated when the FUNCTION button is IN) and Delay/Reversal effects (activated when the FUNCTION button is OUT). Note the effect in Reverse and Extended modes is most apparent with large delay times.

Pitch Change Functions (FUNCTION button IN; Red switch labels apply):

- NORM – places the H949 in its normal pitch change mode. Adjusting MANUAL over its full range gives pitch ratios from 0.25 (2 octaves down) to 2.0 (1 octave up).
- EXTEND – permits extension of the length of the audio segment over which pitch change will be effected up to the full extent of the H949 memory (400 ms). The length of the audio segment is determined by the Main Delay setting. Note that Main Output Delay is not available in Extend mode – the buttons are simply used to select the length of the extension.
- uPC (MICRO PITCH CHANGE) – SHARP and FLAT modes operate in a manner similar to normal Pitch Change, except that the range of pitch ratios is restricted to about 1:1.07 (SHARP) and 1:0.93 (FLAT). In these modes, pitch ratio is closest to 1:1 when the MANUAL knob is fully counterclockwise. In SHARP, clockwise rotation increases the pitch, in FLAT, clockwise rotation decreases the pitch.

Delay/Random/Flange/Reverse Functions (FUNCTION button OUT; Green switch labels apply)

- DELAY – These switches allow you to add successive amounts of delay before the main output. Select delay times in 6.25 ms increments to a maximum of 393.75 ms. (6.25+12.5+25+50+100+200).

- **RANDOM** – causes the output delay to vary between its limits of 0-25 ms at a constant rate of change. This simulates the random variations of double-tracking, or of multiple musicians or singers performing simultaneously, without the "mechanical" sound of a fixed delay. The desirable effect of having performers slightly out of tune is automatically achieved due to the fact that the pitch alters slightly as the delay changes, but you can also reduce the degree of pitch change with **MANUAL**.
- **FLANGE** – This switch sets the H949 into automatic flanging mode. Flanging is the effect created by frequency cancellations when a delay signal with a varying delay is added to another, constant, delay signal. The lowest frequency affected is roughly reciprocal of the time delay (0-10 ms), so a 1ms delay causes a cancellation at 1kHz and multiples thereof. In this mode, **MANUAL** controls **SWEEP**, the rate at which the variable delay changes.
- **REVERSE** – causes short signal segments (up to the 400 ms memory capacity of the system) to be played back in time-reversed order. In this mode, the main **DELAY** switches are used to select the length of the reversed segment. Note that in Reverse mode the Main Output Delay is not available – these buttons are used simply to select the reverse segment length.

3.1.6 Algorithm Select

The H949 allows you to select one of two pitch change algorithms in order to support optimal pitch change with a variety of source material. In general, Algorithm 2 is glitch free, but will add varying degrees of coloration to the signal, and is more suitable for extreme pitch ratios. Algorithm 1 may cause glitches with increasing frequency as the pitch ratio deviates from 1:1, and is generally more appropriate for smaller pitch ratios. We recommend experimentation to determine which algorithm is most appropriate for any given program material and pitch ratio. The two algorithms converge in audible effect as pitch ratios approach an octave in either direction, and both will perform identically at these extremes.

3.1.7 Delay Level

This parameter controls the level of the Delay Only Output from the H949 unit.

3.1.8 Mix Level

This parameter sets the overall balance of wet (effected) signal to dry (original) signal.

3.1.9 Main Level

This parameter controls the level of the Main Output (which is the pitch shifted output) from the H949 unit.

3.2 H949 Dual Harmonizer Controls

The H949 Harmonizer plug-in comes bundled with the H949 Dual Harmonizer plug-in, which recreates two H949 units running in parallel, an application that was frequently used in the hardware version to create doubling effects. Of course, you can also use the H949 Dual to create a wide variety of other interesting sounds.

3.2.1 Stereo Feedback

The three buttons in this group allow you to control the feedback routing between the two H949 units. In "Mono" mode, the output from a single unit only feeds back into that unit. In "Stereo" mode, the output from the top unit feeds back into the bottom unit, and vice versa. In "Both" mode, the output of each unit feeds back into both itself and the other unit. An interesting application of these modes is when using feedback combined with pitch shifting, which based on the Pitch Ratios of the bottom and top units, can cause the incoming signal to shift up/down continuously, shift up and then down continuously, or shift away from a Pitch Ratio of 1 in both directions.

3.2.2 Stereo Link

The three buttons in this group allow you to more easily control the plug-in, by linking corresponding controls in the bottom and top units. In "Mono" mode, all controls can be set independently. In "Link" mode, changing a control on one unit will cause the corresponding control on the other unit to follow that change. "Reverse Link" mode behaves much like "Link" mode, but changing the Pitch Ratio on one unit will cause the other unit's Pitch Ratio to move in the opposite direction. This is especially useful for creating stereo detuned and doubling effects.

3.2.3 Stereo Width

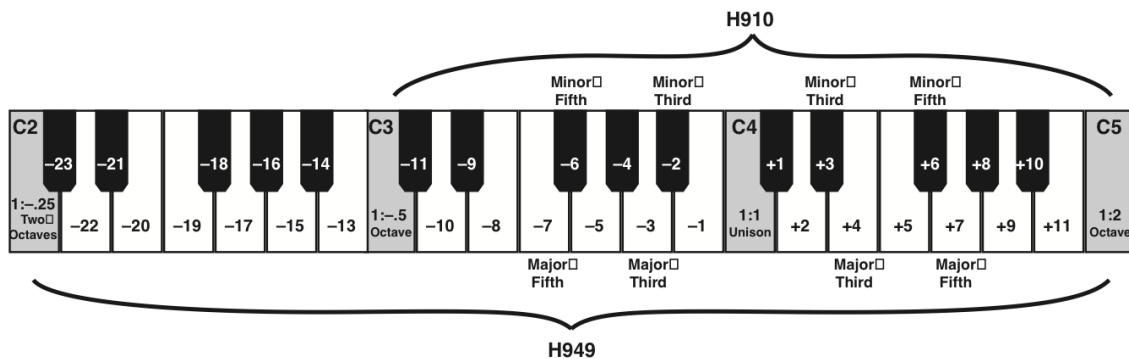
Allows you to control how "wide" the output of the plug-in is, from mono to full stereo.

Chapter 4

Working with the Harmonizer

4.1 Playing the Harmonizers with a MIDI Keyboard

A MIDI keyboard set to send MIDI on the H949's MIDI Channel can be used to control the pitch ratio in discrete musical steps. Middle C on the keyboard will set Unison on the Harmonizers; 1.00 on the display. Playing the E above Middle C will produce a harmony of a Major 3rd. Playing the E-Flat above Middle C will produce a Minor 3rd and so on. Refer to the graphic below and the chart on the following page.



The Harmonizers respond to MIDI Note On and Pitch Bend messages. The bend range covers two octaves, from 0.5 to 2.0. The MIDI response for all plug-ins is OMNI, i.e. messages received on *any* of the 16 channels will be accepted.

Figure 4.1: Pitch Ratio Readouts for Various Musical Relationships

-3/4	-1/2	-1/4	Note	Relationship		Note	+1/4	+1/2	+3/4
.958	.972	.986	1.000	Unison		1.000	1.015	1.029	1.044
.904	.917	.930	.944	-1	+1	1.060	1.075	1.091	1.106
.853	.866	.878	.891	-2	+2	1.123	1.139	1.155	1.172
.805	.817	.829	.841	-3	+3	1.189	1.207	1.224	1.242
.760	.771	.782	.794	-4	+4	1.260	1.278	1.297	1.316
.717	.728	.738	.749	-5	+5	1.335	1.354	1.374	1.394
.677	.687	.697	.707	-6	+6	1.414	1.435	1.456	1.477
.639	.648	.658	.667	-7	+7	1.498	1.520	1.542	1.565
.603	.612	.620	.630	-8	+8	1.587	1.611	1.634	1.658
.569	.578	.586	.595	-9	+9	1.681	1.706	1.731	1.756
.537	.545	.553	.561	-10	+10	1.781	1.808	1.834	1.861
.507	.515	.522	.530	-11	+11	1.888	1.915	1.943	1.971
.479	.486	.493	.500	Octave		2.000			
.452	.459	.465	.472			<p align="center">NOTE</p> <p>The lowest octave is only available with the H949.</p> <p>For use with the H910, round each figure to 2 decimal places.</p>			
.427	.433	.439	.446	-13					
.403	.407	.414	.420	-14					
.380	.381	.391	.397	-15					
.359	.364	.369	.375	-16					
.339	.344	.349	.354	-17					
.320	.324	.329	.334	-18					
.302	.306	.310	.315	-19					
.285	.289	.293	.297	-20					
.269	.273	.277	.281	-21					
.254	.257	.261	.265	-22					
			.250	Two Octaves					

4.2 Saving and Recalling Plug-In settings

When H949 Harmonizer is installed, a library of settings is placed into the <user>/Documents/Eventide/H949/Presets folder. In this folder is a series of .tide files which will show up as options in Eventide's plug-in preset bar. From inside the Eventide H949 Harmonizer you can load or save these settings. We recommend saving your own Clockworks Legacy settings to this folder to ensure that they are available to any instance of the plug-in you're working with. You can also create sub-folders inside the H949 Harmonizer Plug-In Folder if you wish.

4.2.1 Mix Lock

Located at the top next to the preset save/load buttons is a button called "Mix Lock". Pressing this will enable a global mix value that will be the same on every preset that is loaded. Meaning that, with Mix Lock on, setting a mix value of 50% will load every preset with a mix value at 50%.

Chapter 5

Conclusion

We hope you enjoy the Eventide H949 Harmonizer plug-in and put it to good use in all of your mixes. Please be sure to check over Eventide's other Native Plug-In offerings for more unique and interesting effects.