
H910

User Guide

Eventide[®]

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H910 Single Harmonizer®



H910 Dual Harmonizer®



1.1 About This Product

Thank you for your purchase of the Eventide H910 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 H910 Harmonizer®, as well as a Dual H910 version, which recreates the popular technique of running two H910 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.

Production Dates: 1975 – 1984

The Eventide Clockworks H910 Harmonizer® was the world's first harmonizer - and one of the first commercially-available digital audio products. It offered built-in delay, manual adjustment of +/- 1 octave and even had an "Anti-Feedback" mode which helped to eliminate feedback between a mic and speaker by constantly "riding" room modes.

The plug-in captures all the realism of the original, including its "glitching" as it modifies the pitch. The original HK940 keyboard option is included and augmented with modern MIDI control that allows you to "play" the desired pitch using MIDI notes or bend it via pitch wheel. Simply assign the connected controller to the H910's MIDI channel (see: "Working with the Harmonizer®" for more detail.). The H910 plug-in also includes additional Mixer and Envelope Follower sections which allow you to utilize the second delay output and control voltage input options that were available in the original hardware H910.

2.1 H910 Harmonizer® Controls

Main H910 Panel



LINE When the LINE control is IN the LED is on and the unit is actively processing audio; when it is OUT the LED is off and the unit is bypassed and passes audio directly from input to output.

INPUT LEVEL The input LED will light at -0.5 dBFS. (Note that the Limit Indicator is "after" the INPUT LEVEL and FEEDBACK controls, so it will illuminate when internal clipping is about to occur due to excessive input level or feedback.) Adjust the INPUT LEVEL so that the Limit Indicator flashes only on input peaks.

PITCH CONTROL SELECT

The four switches in this group allow you to select whether the pitch change is set by the manual knob (MAN), the anti-feedback oscillator (A-F), the HK941 keyboard and MIDI (KYBD), or the Envelope Follower (ENV).

- **MAN** - This switch activates the MANUAL control knob. When fully counterclockwise, the output pitch is decreased by 1 octave (ratio=.5). When centered, the ratio is unity. When fully clockwise, the output pitch is increased by 1 octave (ratio=2). Intermediate settings produce fractional octave ratios with the changes "band-spread" around unity.
- **A-F** - This switch activates the ANTI-FEEDBACK knob, allowing you to add small amounts of an up-and-down frequency shift to the output signal. This serves to decrease the effect of room resonance peaks on the signal which ultimately return to the microphone. Note that higher settings will make the effect more audible, so care should be taken to find a setting which provides adequate feedback reduction with minimal audience/performer disturbance.
- **KYBD** - When selected, pitch ratio is determined by the HK941 keyboard below, or by receipt of MIDI Note On and Pitch Bend messages (see "Working with the Harmonizer®" for more detail).
- **ENV** - When selected, pitch ratio is determined by the ENVELOPE FOLLOWER. The pitch ratio is nominally 1.0, but when input signal is applied it will modulate toward the setting of the MANUAL knob as determined by the ATTACK, RELEASE, and SENSITIVITY knobs.

PITCH RATIO

The display shows the numerical pitch ratio. (See also 'Pitch Ratio Readouts for Various Musical Relationships'.) 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.

- DELAY** Allow you to insert additional delays before the output. When in DELAY ONLY mode, select delay times in 7.5 ms increments to a maximum of 112.5 ms. (7.5+15+30+60). When in pitch mode only the right two buttons are active for 30 ms each, allowing for up to 60 ms of additional delay (30+30).
- OUTPUT 2 DELAY TIME** The OUTPUT 2 delay buttons control the amount of delay time for the second output. This second delay tap is fed from the same input as the first, and it also allows you to mix another delay into the wet output using the mixer section in the second panel.
- FEEDBACK** Used to determine the decay time of the output delay. Clockwise rotation increases decay time until feedback reaches unity, at which point the system will begin to oscillate.
- POWER** When the POWER button is IN the unit is powered up and operational, and when it is OUT the unit is powered off and the plug-in bypasses.

Secondary (HK941) Panel Controls



- MIX** This control sets the overall balance of wet (effected) signal to dry (original) signal.
- MAIN LEVEL** This control sets the level from the H910's main output, which can be set to either shift pitch or output delay only. The main output is also the source for the Feedback buss.
- OUT 2 LEVEL** This control sets the level from the H910's OUTPUT 2, which is delay only. This output is also fed from the feedback from the main output, but it does not feed back into the Feedback buss itself.
- ENVELOPE FOLLOWER ATTACK** When the PITCH CONTROL SELECT is set to ENV this sets the attack time of the Envelope Follower.
- ENVELOPE FOLLOWER RELEASE** When the PITCH CONTROL SELECT is set to ENV this sets the release time of the Envelope Follower.
- ENVELOPE FOLLOWER SENSITIVITY** When the PITCH CONTROL SELECT is set to ENV this sets the Sensitivity of the Envelope Follower.

HK941 KEYBOARD

When the PITCH CONTROL SELECT is set to KYBD the HK941 Keyboard is an automatable keyboard which can be operated by your mouse and which automatically sets the H910 to musical intervals. This two octave keyboard is set up in such a way that the center C key represents a pitch ratio of 1.0, with each key to the right shifting the pitch ratio one further half-step up and each key to the left shifting the pitch ratio one further half-step down. This allows you to use the keyboard to easily transpose the incoming signal up or down by a musical interval related to the center C.

In KYBD mode the H910 plug-in also responds to MIDI Note Number input in the same way, using the MIDI notes centered around middle C. To use this mode you must route MIDI from your MIDI source to the H910 plug-in in your DAW.

HK941 KEYBOARD GLIDE

The GLIDE control sets the rate at which the H910 shifts from one ratio to the next when the PITCH CONTROL SELECT is set to KYBD.

HK941 KEYBOARD HOLD

By default the H910 responds to notes momentarily, which means that the pitch ratio returns to unison (1.0) when no key is pressed. By turning the HOLD mode on, the H910's pitch ratio will stay at the value set by the last pressed key until it gets another update.

2.2 H910 Dual Harmonizer® Controls

The H910 Harmonizer® plug-in comes bundled with the H910 Dual Harmonizer® plug-in, which recreates two H910 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 H910 Dual to create a wide variety of other interesting sounds. The H910 Dual plug-in includes two Main Panels (as described above), and an Expansion Panel with several additional controls.

Expansion Panel Controls



STEREO FEEDBACK

The three buttons in this group allow you to control the feedback routing between the two H910 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.

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 `cvalueLink` 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.

STEREO WIDTH

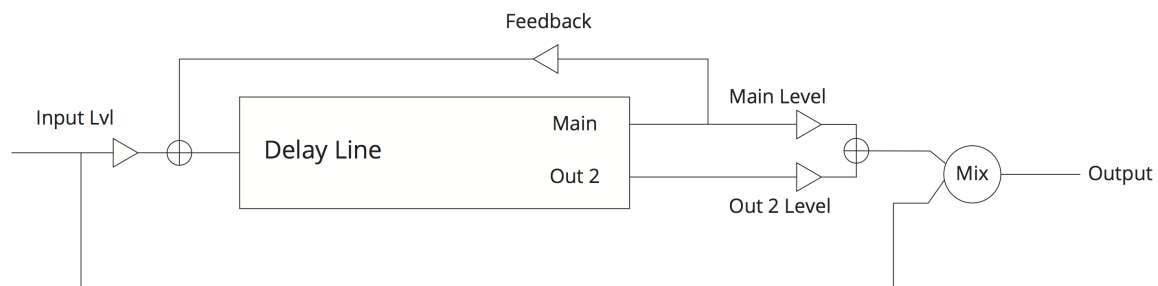
Allows you to control how "wide" the output of the plug-in is, from mono to full stereo.

Mix Controls the total Wet/Dry mix of the H910 Dual plug-in.

OUTPUT Controls the output level H910 Dual plug-in.

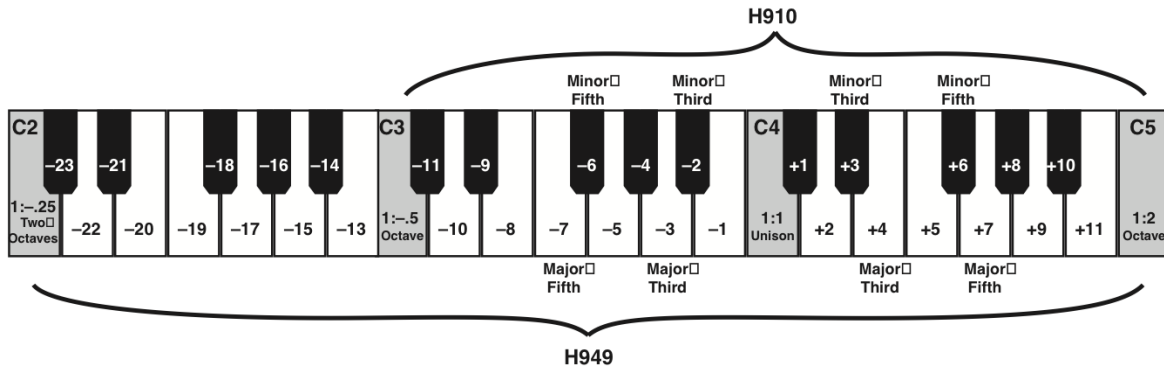
3.1 Signal flow of the H910 Single

The original H910 Harmonizer® had additional inputs and outputs which would have traditionally been attached to external studio gear to work. In order to make this plug-in work well in a DAW environment, we've built some of this external gear, like an envelope follower and a mixer, into the H910 Single plug-in itself. Because of this, the signal flow in the H910 Single can be difficult to understand. Please refer to the following figure if you have any difficulties.



3.2 Playing the Harmonizers with a MIDI Keyboard

A MIDI keyboard set to send MIDI on the H910'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 3.1: 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
.853	.866	.878	.891	-2	+2	1.123	1.139	1.155
.805	.817	.829	.841	-3	+3	1.189	1.207	1.224
.760	.771	.782	.794	-4	+4	1.260	1.278	1.297
.717	.728	.738	.749	-5	+5	1.335	1.354	1.374
.677	.687	.697	.707	-6	+6	1.414	1.435	1.456
.639	.648	.658	.667	-7	+7	1.498	1.520	1.542
.603	.612	.620	.630	-8	+8	1.587	1.611	1.634
.569	.578	.586	.595	-9	+9	1.681	1.706	1.731
.537	.545	.553	.561	-10	+10	1.781	1.808	1.834
.507	.515	.522	.530	-11	+11	1.888	1.915	1.943
.479	.486	.493	.500	Octave	2.000			
.452	.459	.465	.472	-13				
.427	.433	.439	.446	-14				
.403	.407	.414	.420	-15				
.380	.381	.391	.397	-16				
.359	.364	.369	.375	-17				
.339	.344	.349	.354	-18				
.320	.324	.329	.334	-19				
.302	.306	.310	.315	-20				
.285	.289	.293	.297	-21				
.269	.273	.277	.281	-22				
.254	.257	.261	.265	-23				
			.250	Two Octaves				

NOTE

The lowest octave is only available with the H949.

For use with the H910, round each figure to 2 decimal places.

3.3 Preset Bar



Located at the top of the H910 Harmonizer® Plug-In, the Preset Bar lets you load and save presets, along with several other features.

When H910 Harmonizer® is installed, a library of settings is placed into the <user>/Music/Eventide/H910 Harmonizer/Presets folder (Mac) or the <user>/Documents/Eventide/H910 Harmonizer/Presets folder (Windows). These presets have a .tide extension and can be saved or loaded from the H910 Harmonizer® preset bar in any supported DAW.

In many DAWs there is an additional generic preset bar that saves DAW-specific presets to a separate location. We recommend saving your presets using the Eventide preset bar to ensure that your presets will be accessible from any DAW. You can also create sub-folders inside the preset folders, if you wish.

LOAD/SAVE Use these buttons to load and save your presets in .tide format.

COMPARE Click to toggle between two different settings for the plug-in. This is useful for making A/B comparisons.

Mix Lock Pressing this will enable a global mix value that will be the same on every preset that is loaded. This is especially useful on an effect return track where the mix should always be set to 100.

INFO Click this button to open this manual.

SETTINGS Click this button to edit user interface settings for all instances of the plugin.

When “Always show slider values” is checked, slider values will not automatically hide when the mouse is not over them.

We hope you enjoy the H910 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.