
Memory Lane 2

Analog delay with tap tempo and dual independent delay times

User Manual
v1.00 • May 2, 2008

Introduction

Thank you for purchasing a Diamond Memory Lane 2! This pedal represents a major evolution in analog delay. Building on the original Memory Lane, this new version offers the same high quality analog sound with new features, improved performance and lower noise.

Each Memory Lane 2 uses two Panasonic/Matsushita MN3005 4096-stage bucket brigade devices. These devices have been used in several well-known analog delays over the years, and when coupled with an NE570 compandor to reduce noise from the total 8192 sample and hold stages, produce a very warm echo signal.

The Diamond Memory Lane 2 is a sophisticated analog delay device with many interesting features and capabilities. Please take a few minutes and read through this short user manual – at a minimum skim ahead to the ‘Operation’ section for some important operational notes before plugging everything in and getting started.

A few words about normal operation-

The ongoing appeal of bucket brigade delay devices can be partly attributed to their somewhat lo-fi sound quality. Two things in particular contribute to this as a result of using slow clock rates to achieve longer delay times: high-frequency rolloff and noise in the delay path.

The high frequency rolloff is a combination of both the capacitive signal loss as the signal is passed bucket-to-bucket, and the analog low-pass anti-aliasing and reconstruction filters required to minimize aliasing (distortion artifacts) from the bucket brigades. Each element of the bucket brigade contributes a small amount of noise to the delayed signal as it is passed on. With 8192 elements in our chain necessary to achieve the 1/2 second plus of delay, that results in a small amount of noise at the output. The NE570 compandor does a lot to minimize the audibility of that noise, but it can become more noticeable as the delay time is increased to its max. This sometimes results in audible noise pumping after individual notes as the NE570 does its job.

Remember to protect your hearing and wear appropriate hearing protection when playing loud...

Design Features

- 550 ms approx analog delay time using 2 NOS MN3005's running at 15V
- two independent, footswitchable delay times (DLY₁/DLY₂)
- tap tempo footswitch control of analog delay time
- footswitchable modulation with depth and speed controls
- switchable dotted 8th note mode for rhythmic delay effects
- tilt EQ in provides control over frequency spectrum of repeats (from increasingly dark repeats to flat to increasingly bright repeats)
- 'kill-dry' delay only output for amplifiers with parallel effect loops
- inserting cable into delay only output jack automatically removes delay signal from mix output giving separate direct only and delay only outputs
- true bypass operation for mix/direct output
- pristine signal paths using premium opamps, polypropylene caps and metal film resistors
- expression pedal input to control feedback level
- expression pedal input to control delay time (Delay₁)
- ability to use standard 1/4" stereo to two 1/4" mono insert cable in expression pedal input to insert an effect or chain of effects into the feedback loop (can also be used to insert a standard volume pedal as feedback control)
- LED flashes provide visual feedback of delay time (Delay₁ & Delay₂)
- self-oscillating feedback path with ability to shape via feedback EQ in realtime with user selectable sensitivity
- internally regulated 15V operation for lower noise and increased headroom
- rugged genuine Hammond aluminum diecast enclosure
- DC power supply included

Operation

Using the Provided 18-24V Power Supply

The Memory Lane 2 ships with an 18 or 24VDC wallmount adapter with standard P5/9.5mm plug with positive center pin. The Memory Lane 2 internally regulates this to 5, 12 and 15V for different portions of the circuit, so any 18 to 24 VDC supply with 200 mA or more available current will work. There is no sound difference between using 18V or 24V as the voltage is internally regulated to 15V. Note that power supplies providing less than 18V will not adequately power the Memory Lane 2.

It is important to highlight that the Memory Lane 2 requires a positive center pin – most commercial pedalboard power supplies that have 18V available are negative center pin. An inexpensive cable to power the Memory Lane 2 from most popular pedal power supplies is available from www.diamondpedals.com.

It is also important to note that the standard P5 plug that the Memory Lane 2 power supply uses will also fit into the DC jack on most 9V powered effects. **PLEASE DO NOT PLUG THE MEMORY LANE 2 POWER SUPPLY INTO ANY OTHER EFFECTS, AS IT MAY CAUSE PERMANENT DAMAGE TO THEM.** Diamond Pedals will not be held responsible for damage to pedals as a result of using an improper power supply with the Memory Lane or any other pedal.

Controls

DELAY

This controls the delay time of Delay₁, from approximately 40 ms fully counterclockwise to 550 ms clockwise. This control is inactive when selecting Delay₂. Delay time for Delay₂ is set using the tap footswitch.

EQ

The EQ control is placed before the bucket brigade delay devices, and affects all echoes on both DLY₁ and DLY₂ but NOT the direct signal. The EQ in the Memory Lane 2 is not a typical boost/cut treble control. Instead, a 'tilt' style EQ is used, first introduced in the 1970's by hi-fi manufacturer Quad, and also used in the Diamond Compressor, Diamond Boost-EQ and the original Memory Lane. The goal of this EQ is to provide subtle spectral shifts in the overall frequency balance of the delayed signal, not just a simple dulling or brightening of the treble frequencies. In practice, the Tilt control provides a simple, intuitive tone shaping tool. You can think of the EQ as a spectral 'see-saw' with the balance point fixed at a mid range frequency. With the EQ in the center detent position, the EQ is completely flat. Setting the EQ counterclockwise gives progressively darker repeats, while setting the EQ clockwise gives progressively brighter repeats.

LEVEL

This controls the amount of delayed signal fed back into the input of the delay circuit for both DLY₁ and DLY₂, which in practice controls the number of repeats that are heard. Note that this control can be overridden for DLY₁ using the 'Slap' switch (see details under Slap Mode in this manual).

Set fully counterclockwise, no signal is fed back, so only one echo is heard. At about the mid-point, multiple repeats can be heard depending on the strength of the original signal. Past mid-point, there starts to be sufficient gain for oscillation to begin. The onset of oscillation is also dependent on the delay time (shorter delay times make it easier to begin oscillation) and the EQ (gain in the EQ, particularly when set towards the treble side, can make it easier to begin oscillation), so some adjustment of the Feedback level may be required if the delay time or EQ is changed. Note that in comparison to the original, the Memory Lane 2 requires relatively higher Feedback settings to achieve oscillation. However, we have included an internal switch to activate 'spaceship mode' (see details under Spaceship Mode in this manual) which provides higher gain in the feedback circuit resulting in increased sensitivity.

SPEED

This controls the speed of modulation of the delayed signal, from about 0.1 Hz fully counterclockwise to 10 Hz fully clockwise.

DEPTH

This controls the amount of modulation to be applied to the delayed signal (does not affect the direct signal). Fully counterclockwise, modulation is off - there is a clickable switch in the control that indicates fully off. This rotary switch in the modulation depth control is a master on/off control for modulation for both DLY₁ and DLY₂. When using DLY₁, the MOD/TAP footswitch control allows for turning on and off the modulation 'on the fly'. For DLY₂, modulation is on by default unless the depth control is fully counter clockwise. Also, note that the actual depth of modulation is affected by delay time - for a given modulation depth setting, longer delays will give deeper modulation than shorter delays.

MIX

With output taken only from the mix/direct jack, this adjusts the relative mix between direct and delayed signal. With output taken from the delay only jack, this adjusts the volume of the delayed signal from that output, and does not affect the direct signal level from the mix/direct jack.

Jacks

INPUT

Signal input to the delay, accepts standard mono (2-conductor) 1/4" plugs from guitars, outputs from other effects pedals, or from the send path of an amplifiers FX loop.

DELAY ONLY

Delay signal only output jack, accepts standard 1/4" mono (2-conductor) plugs. Plugging a cable into this jack automatically removes the delay signal from the Mix/Direct output and routes it to this output. This allows either 'killdry' operation for amps with parallel FX loops, or provides a stereo-like experience with two amps when used in conjunction with the direct signal coming from the Mix/Direct jack. The signal level for this output (when a cable is plugged into it) is controlled by the Mix pot.

MIX/DIRECT

This output jack provides two functions: with no cable plugged into the 'Delay Only' jack, the Mix/Direct output provides a mix of the direct and delayed signal, with the delayed signal level set by the Mix pot. With a cable plugged into the 'Delay Only' jack, the Mix/Direct output provides the direct signal only.

FBK EXP (Expression/Insert)

Plugging into this jack disables the feedback level control knob and gives the user external access to the delay's feedback path. This jack accepts a 1/4" TRS plug (tip-ring-sleeve, or sometimes referred to as a stereo 1/4" plug) from either an expression pedal (minimum 100k, linear preferred), or from a standard studio 1/4" TRS to two 1/4" mono plug insert cable used with a standard volume pedal (minimum 100k). When using a volume pedal with an insert cable, the plug labeled 'ring' should be connected to the input of the volume pedal and the plug labeled 'tip' should be plugged into the output of the volume pedal. Using an insert cable also allows the user to chain one or more standard guitar effects into the feedback path. Note: at least one of the pedals inserted into the chain must have a volume control to prevent continuous oscillation. Placing guitar effects in the feedback loop in this manner allows adding effects to the delay only without effecting the dry sound. Experimentation with a variety of effects can yield interesting results- modulation effects work particularly well.

DLY EXP

This jack accepts a 1/4" TRS plug (tip-ring-sleeve, or sometimes referred to as a stereo 1/4" plug). Plugging an expression pedal (or volume pedal along with an insert cable- see above under FBK EXP) allows the user to control the delay time manually.

Switches

ON/OFF

This switches the pedal between bypass and in-circuit operation, with the LED just above the switch lighting red or green to indicate that the audio path through the delay is on, while an unlit LED indicates the delay is bypassed. When in-circuit, the color of the LED also indicates which delay is active. A red LED indicates that DLY₁ is active, a green LED indicates that DLY₂ is active.

DLY₁/DLY₂

This switch allows the user to toggle between two completely independent delay time settings. When the pedal is on, pressing this switch will toggle the ON/OFF LED between red and green:

- DLY₁ (red LED): Delay time is set using DELAY knob or expression pedal).
- DLY₂ (green LED): Delay time is set by tapping the TAP/MOD switch (see below).

TAP/MOD

For DLY₁, this footswitch turns on or off the modulation. A green LED above this switch indicates that modulation is off, a red LED indicates that modulation is on. Note: if the master mod depth control is switched off, toggling the mod footswitch will have no effect on sound and the LED will remain green.

For DLY₂ this footswitch sets delay time, with every 2nd tap on the switch setting a new tempo. This is a bit different than most digital delays, where each tap measures the time from the last tap. On the Memory Lane 2, every tempo tap should be done in two's – the first tap begins a new measure of tempo, the second completes the measure and sets the new tempo. The tempo only changes when the 2nd tap is complete. If time between the 1st and 2nd taps exceeds the maximum delay time, the Memory Lane 2 simply defaults to maximum delay time.

Dotted 8th Note Feature (DLY₂ only)

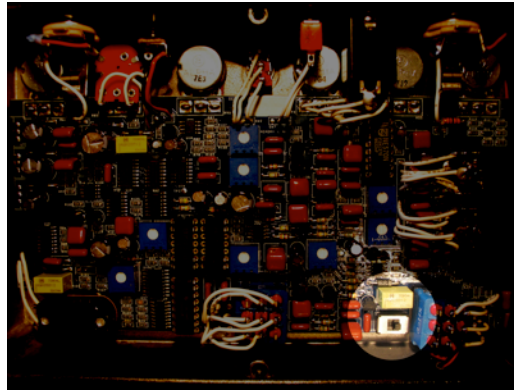
When the Memory Lane 2 is set to DLY₂ and is in dotted 8th mode (switch in up position), tapping quarter notes at the desired tempo will result in echoes which will sound in dotted 8th note rhythm. Note that it is not possible to set the tempo in normal mode and then switch to dotted 8th and have the pedal 'switch' to the new delay time- you have to re-enter the tempo after switching to dotted 8th mode. Please note that due to the available delay time, dotted 8th note rhythms will be in time for tempos of 110BPM or greater only.

Slap Mode Feature (DLY₁ only)

Engaging the slap mode switch overrides the LEVEL knob setting for DLY₁ effectively setting the Feedback to minimum. This results in a single repeat for DLY₁ while the repeats from DLY₂ continue to be determined by the LEVEL knob setting. This allows for a great 'slapback' setting on DLY₁ and a more ambient, spacious setting on DLY₂.

Spaceship Mode Feature (internal)

The original Memory Lane circuit could easily be set to oscillate for some very cool ‘out of control’ feedback sounds. However, we realize that many players don’t use those types of sounds so we made the Memory Lane 2 less sensitive to oscillation in the default mode. However, for those players who seek out jet fueled, screaming feedback and like ‘playing’ those sounds using the pedal controls in real time, we’ve come up with ‘Spaceship Mode’- a high Feedback sensitivity setting accessed using the internal switch labeled HIGH and LOW. Low is standard mode, high is Spaceship- have fun!



Input Level Jumper (internal)

This internal jumper is factory set to provide optimum signal-to-noise ratios through the delay path (in particular the NE570N compandor chip which was originally designed for relatively quiet telephone signal levels) for typical FX loop and/or humbucker pickup levels. For extremely hot pickups or FX loops, this jumper can be set to its alternate position to pad down levels in the delay path. (See FX Loop Send Levels on the following page)

Setting Up

The Memory Lane 2 can be used in several different effect configurations. With the exception of reverb, delay should probably be the final effect in your effect chain. For channel switching amps, you’ll also probably want to place the delay within the amp’s effect (FX) loop if available. This will properly place the delay after any higher gain distortion stages.

Mono Operation

Standard (no FX loop)

The most basic method of operation for amps without an FX loop is simple – patch the mix/direct output from the Memory Lane 2 into the amp’s guitar input.

Mono with Serial FX Loop

For amps with a serial FX loop, patch the send output from the amp into the input of the Memory Lane 2, then patch the mix/direct output back to the amp’s FX loop receive input.

Mono with Parallel FX Loop

For amps with a parallel FX loop, patch the send output from the amp into the input of the Memory Lane 2, then patch the delay only output back to the amp’s FX loop receive input.

If you’re unsure whether the FX loop is serial or parallel, first try patching for parallel, and if no direct guitar signal is heard, your amp more than likely has a serial FX loop. Repatch for serial and you’re all set.

Stereo Operation

Standard Stereo (no FX loop)

Stereo operation for amps without an FX loop is also simple – simply patch the mix/direct output from the Memory Lane 2 into the first amp’s guitar input, and patch the delay only output into the second amp’s guitar input. With this setup, signal only goes to the second amp when the delay is turned on. The Mix control on the Memory Lane 2 will control the level of delayed signal going to the second amp.

Stereo with Parallel FX Loop

Stereo operation for amps with a parallel FX loop is somewhat reverse to the serial FX loop stereo setup. Patch the FX send output of the main amp into the input of the Memory Lane 2, then patch the delay only output back to that same amp, and the mix/direct output out to the second amp. This setup is cool as both amps get direct signal all the time (you’re essentially slaving the second amp from the first), with the first amp also getting the delayed signal when the Memory Lane 2 is turned on.

Stereo with Serial FX Loop

Stereo operation for amps with a serial FX loop is a touch more involved. Patch the FX send output of the main amp (likely the one with channel switching distortion) into the input of the Memory Lane 2, then patch the mix/direct output back to that same amp, and the delay only output back to another amp (probably one with a clean channel or no channel switching). Like the simple stereo setting above, signal only goes to the second amp when the delay is turned on. Also, with this setup, any tube distortion from the main amp will still be routed through the delay path and out to the second amp.

FX Loop Send Levels

Some amplifiers have variable or switchable FX loop send and/or receive levels. On the send side, simply set the amp’s send level so as not to cause any distortion in the delay path even when strumming hard. If send levels are extremely hot and fixed to one level, there is a small jumper in the Memory Lane 2 that can be set to an alternate position to pad down the input signal as it comes into the delay path. This alternate jumper setting is shown in the picture below:

