



P930

LUNAR LANDER

User Guide

Version 1.0

Preface

P930 Lunar Lander elevates all the qualities we love about plate reverb and delay while providing you unparalleled control, shaping and enhancing power over audio signals. The true measure of a reverb unit lies not in its standalone sound but in its ability to blend seamlessly into a mix; becoming an integral part of the audio landscape. From the outset, P930 embodies this harmonizing philosophy, delivering a blend of intuitiveness and precision that allows you to effortlessly place effects in ways that were previously unimagined.

P930 captures the distinctive sound of plate reverb and BBD analog delay, while its expanded controls unlock previously unattainable sonic possibilities. Equipped with a triple P42 Saturation engine across its BBD, reverb, and output modules, the P930 features adjustable bandwidth control for both the BBD and reverb modules. The delay module includes a Ping Pong algorithm for isolated channels. Users can configure the BBD and reverb modules in series or parallel, with flexible ducking circuits, adjustable noise, and multiple wet/dry blend options that enhance its capabilities. Unlike typical effects used in full wet mode, P930 is also effective as an insert effect on individual tracks.

Pulsar Modular audio plugins have a steeper learning curve than others due to their extensive features and rich sonic palette. Our designs aim to provide tools that become both essential and enduring parts of your studio arsenal; the P930 is no exception.

As you delve into Lunar Lander, you'll find that it navigates time and space with ease, settling into your music to create an ideal soundscape that flows naturally from the source material. If you're uncertain about needing another reverb or delay plugin, let P930 Lunar Lander demonstrate its value with flawless performance time and time again (and again, and again,...)

Ziad Sidawi
Audio Equipment Designer & CEO
Pulsar Novation LTD

History

All things in nature are characterized, shaped, affected and brought to life by energy, frequency and vibration. Much like the vibrations of our beating hearts that resonate within us, natural repeating patterns pulse and echo all around us, and present with us in every moment, at every turn.

One of the most innovative methods for recreating naturally decaying repetitions was developed in 1969 at Philips Research Labs in the Netherlands: the whimsically named Bucket Brigade Device (BBD), inspired by the vivid imagery of individuals passing buckets of water along a line to extinguish a fire.

The BBD is a sophisticated device that uses a series of capacitors to pass an analog signal down a line, step by step, governed by a discrete clock cycle. Each repetition becomes darker and quieter, mimicking natural decay.

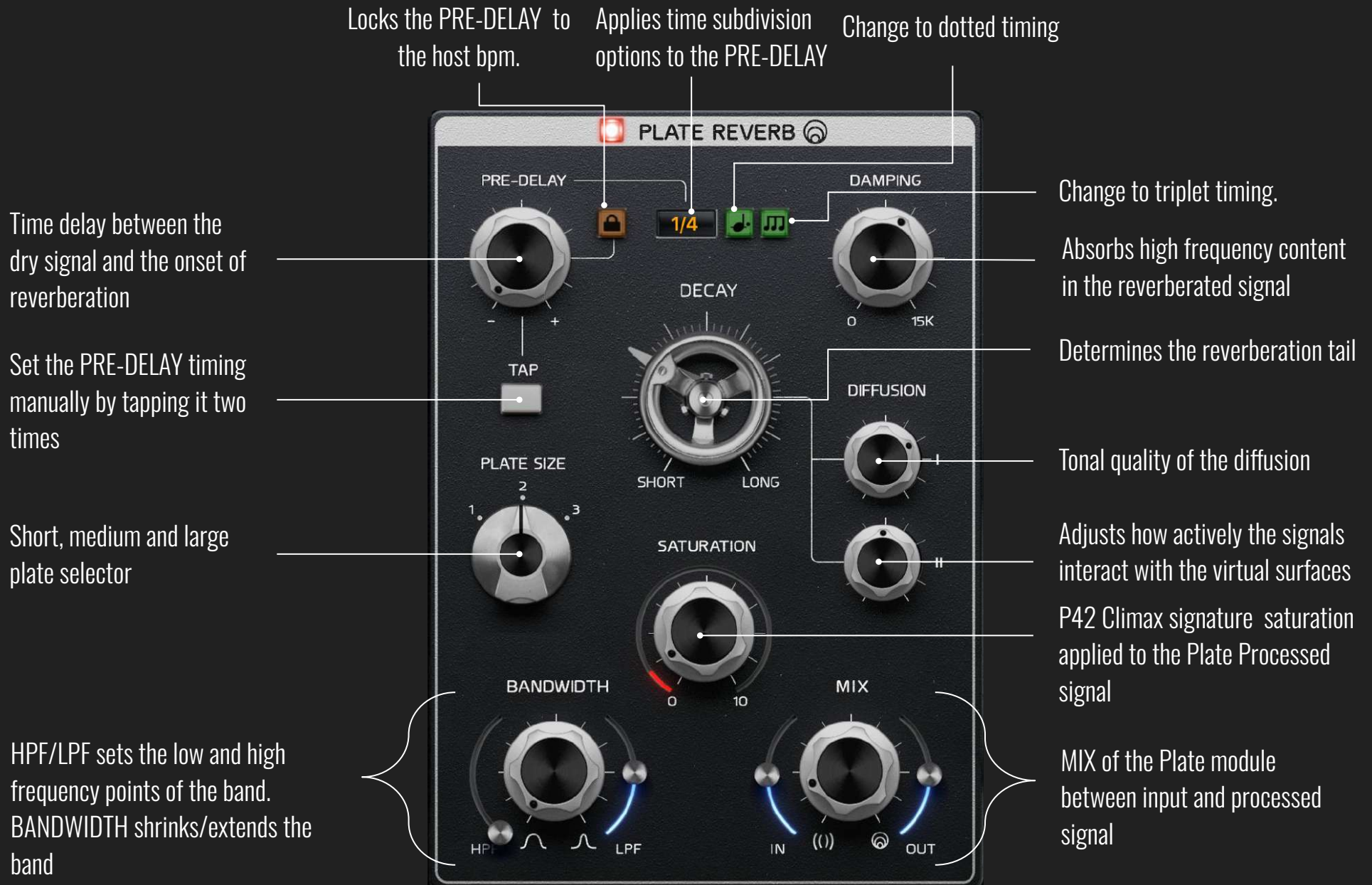


Fire Bucket Brigade by Monroe Historical Society



Meanwhile, prior to 1957, capturing the sound of natural reverberation required recording in a specially designed room, using microphone placement to convey a sense of space while avoiding unwanted frequencies and phase cancellation. In response, the German company EMT developed the EMT 140, an electro-mechanical reverberation device that revolutionized the field. This large vibrating plate-in-a-box became a cornerstone of studio recording until the advent of digital recreations of plate reverbs in the mid-1970s and 1980s.







Clip LED Indicator

Clears and resets the WET buffer.

The DUCK | KCUD | GATE options dynamically adjust the level based on the intensity of the raw dry signal applying to DLY, REV, both (D+R) or to the OUT signal

Threshold, Ratio and Release knobs set the behavior of the DKG circuit

Blends between the RAW and WET signals

Applies saturation to the WET signal

Output gain adjustment for the WET signal

Click to switch between RMS and peak in/out metering



The RESET button clears the internal buffer. This immediately wipes any ongoing WET signal- delay or reverb and resets the buffer.



The Clip Indicator LED lights up red when a signal hits 0 dBFS and is internally clipped.

DUCK | KCUD | GATE | REV

The DKG Circuit (DUCK | KCUD | GATE) is a dynamics processing circuit internally sidechained to the RAW signal and applied to a routable choice: delay (DLY), reverb (REV), combination (D+R) or output signal (OUT).

Signal reduction behavior based on set THRESHOLD level:

DUCK: When RAW signal exceeds the Threshold (compressor behaviour).

KCUD: When RAW signal falls below the Threshold (downward expander behavior with soft slop).

GATE: When RAW signal falls below the Threshold (downward expander behavior with hard slop).



THRESHOLD sets the RMS level (not peak) from which the DKG circuit is triggered.

RATIO: The amount of applied compression or downward expansion.

RELEASE: It controls the recovery speed/time of compression (Duck) or downward expansion (KCUD and GATE).

Tip: Use P930 as a compressor! Bypass the BBD and PLATE REVERB modules, set the DKG Circuit to DUCK, then set the DKG Routing option to OUT. Blend with the raw signal using the MIX knob to taste. The OUT knob can also be used to increase the compressed signal level if needed. Additionally, the SAT knob can be used to saturate the compressed signal as well!

OUTPUT module receives the WET signal from:

- Series modules workflow (1st module feeds into the 2nd then feeds into the OUTPUT module).
- Parallel workflow (summing the two modules feed into the OUTPUT module).



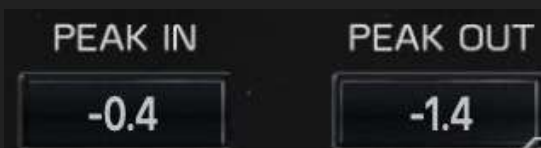
The MIX knob controls the blend of the WET signal and the DRY signal.

Tip: Remember, you can set a mixing rule for blending with the MIX knob. Experiment with the different algorithms, while blending, to get the right feel.



SAT P42 saturation to the signal arriving to the OUTPUT module. It is applied to the WET signal; **it is not applied to the dry signal.**

OUT knob provides a clean output stage for adjusting the final level of the WET signal; **it is not applied to the dry signal.**



Switch between RMS and PEAK IN/OUT metering by clicking on the label or value area.

Note: RMS or PEAK selection is saved within the preset!



LED button to bypass the delay module

Display Clock Rate in beats per minute (bpm) or milliseconds (ms).

Lock 2 DAW synchronizes the CLK RATE with the DAW bpm. When this feature is active, the CLK RATE knob becomes disabled.

The TAP button allows the CLK RATE to be set manually by clicking in rhythm with the desired timing. At least a full measure/bar of clicking is recommended (usually 4 clicks on beat for a 4/4 music).

Tip: Clicking the Lock 2 DAW switch ON/OFF is a quick way to set the CLOCK RATE to the host bpm as a starting point.



Time Subdivision sets the delay time by dividing the Clock Rate speed into musical time intervals. The Clock Rate knob will not change position when you choose different time sub-divisions. So a 500ms Clock Rate at 1/4 will deliver 250ms at 1/8 and 1000ms at 1/2.

Tip: 60 bpm means one beat per second at the default 1/4 time interval- smaller like 1/8 shortens the delay time to 0.5s, while 1/2 increases it to 2s.



The dotted option falls on the off beat producing a syncopated effect. The triplet option results in a swing or shuffle feel.

The L and R trim pots offset the delay signal in the respective channel by a % of the CLK RATE, resulting in widening the stereo image, enhancing depth and texture; while at increased offset creating interesting rhythmic patterns.



TEXTURE amplifies the distortion and grit in the BBD circuit that tend to morph as REGEN feeds back into the delay line. The results range from gorgeous slapback echoes to psychedelic sci-fi effects. TEXTURE can go from clean to warm to grit. **WARNING** The BBD NOISE Slider in the top toolbar adds noise to the BBD circuit. With extreme REGEN and maximum BBD noise and TEXTURE, the signal can be overtaken by the noise and distortion signal producing harsh and crackling sounds as it hits the clipper circuit.



The REGEN knob controls the number of times a portion of the delayed signal is fed back into the beginning of the delay line. Setting this dial to a value of 8 or above will achieve a runaway effect. This effect requires caution because the output level will continue to increase to the point of internal clipping.

Tip: When runaway is occurring, there are two ways to stop it. Click the RESET button will clear the internal buffers and immediately stops it, while turning REGEN down will gradually stop it. Read over the How-To section of this user guide for more information about creating and using a runaway effect.



L+R is a standard stereo PING-PONG delay where the delayed signal is a combined left and right signal that first appears in one channel, and then bounces to the opposite channel, creating a rhythmic back and forth movement. Echoes are blended across the stereo field, creating a spacious and dynamic listening experience.

L|R maintains an isolated left and right channel ping-pong effect that prevents the L signal from ping-ponging to the R and vice-versa. This allows for distinct alternating echo patterns that preserves the original stereo image and provides a cleaner, more controlled effect.

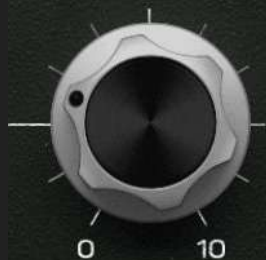
MOD RATE



The MOD RATE knob controls the low-frequency oscillation (LFO) rate applied to the delay line, affecting the speed of change to the resulting pitch change (if MOD DEPTH is not 0). This will create a variety of effects on the delayed signal, ranging from chorusing and vibrato to FM bell-like tones. At frequencies up to 1 Hz, the pitch wobbles slowly, similar to the effect of an LFO in subtractive synthesis. Between 1 Hz and 20 Hz, a vibrato effect is generated. At frequencies above 20 Hz, the LFO itself becomes audible, which results in rough and inharmonic tones.

Note: *Inharmonicity is the degree to which the frequencies of overtones deviate from whole multiples of the fundamental frequency (the harmonic series). When inharmonic tones above 20 Hz share the same frequency as the original signal, the result is a pleasant harmonic signal.*

MOD DEPTH



The Modulation Depth knob controls the LFO amplitude applied to the delay line, affecting the amount of pitch change. If this knob is at zero, the Modulation Rate by itself will not be able to affect the signal.

SATURATION is powered by the P42 Climax circuit. This is module specific, so it is applied only to the BBD processed signal. The delay line exhibits gradually increasing harmonic distortion, peak control, subtle punch and frequency coloration as SATURATION is increased.

BANDWIDTH



BANDWIDTH, HPF and LPF work together to form a single bandpass filter for the module's processed (wet) signal. The HPF and LPF set the filter's endpoints, while the BANDWIDTH knob fine-tunes it, tailoring the effect to sit perfectly in the mix.

Tip: While listening to P930 in the mix, start by setting the HPF to remove boominess, then adjust the LPF to shave high frequencies; complete the process by using the BANDWIDTH to fine-tune the bandpass filter for a smooth fit in the mix.



Polarity Flip inverts the signal prior to the MIX knob. Inverting the polarity can correct delay line phase issues, enhance the intended effect or offer creative possibilities in sound design.



The MIX knob controls the blend of BBD processed and incoming signals.

Incoming signal is defined by the position of BBD when the modules are set in series.

- If BBD is the 1st module, it is the RAW signal.
- If BBD is the 2nd module, it is the signal that leaves the Plate module,.

IN gain slider can be used to “hit” the BBD circuit either hot or soft for more or less character.

OUT gain slider is positioned prior to MIX, allowing the level of the wet signal to be cleanly adjusted before the MIX blending occurs.

Tip: Raising OUT results in the wet signal being louder than the incoming signal, giving a ‘swelling’ sensation after the initial audio hit is encountered. IN and OUT sound different from one another, with IN having more tension and texture to it while OUT being a louder version of the processed sound.



PRE-DELAY is the time between the end of the initial sound and the beginning of the first reflections being audible, hence unmasking the initial attack allowing it to cut through the mix. By adjusting the pre-delay time, you can achieve a balance that enhances spatial characteristics without compromising the clarity and definition of the source sound.

Tip: Instead of a traditional BBD slapback delay, try using the PLATE REVERB for a slapback effect using a SHORT DECA and an audible PRE-DELAY of around 125 ms. Look in the presets for plate-based slapback options to get started!

PRE-DELAY TAP sets the time between the initial sound and the beginning of the first audible first reflection. In use, the first click (TAP) represents the note and the second click (TAP) represents when the reverb should start. This allows you to listen to a source, imagine the pre-delay time you want and then translate it to P930 using two quick consecutive clicks.

Time Subdivision sets the delay time by dividing the Pre-Delay time into musical time intervals.

The PRE-DELAY knob will not change position when you choose different time sub-divisions. So a 20ms Pre-Delay at $\frac{1}{4}$ will deliver 10ms at $\frac{1}{8}$ and 40ms at $\frac{1}{2}$.

Tip: Use time subdivision for musical subdivision of the chosen Pre-Delay time to define the space. Think 0-10 ms for a bedroom, 10–20 ms for medium-sized spaces, and over 20 ms for larger spaces like halls.

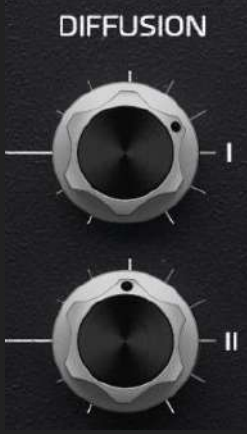
Lock 2 DAW translates the bpm of the DAW session into ms value for the PRE-DELAY. Thereafter, you can use the time subdivision to apply to that value. When this feature is active, the PRE-DELAY knob becomes disabled.



DAMPING emulates the mechanical mechanism used in plate reverbs to absorb high frequency content in the reverberated signal. All frequencies above the chosen frequency are subject to absorption.



DECAY controls the amount of time it takes for the reverberant sound to fade away. This is implemented using a very smooth four stage decay process. The decay time is highly dependent on the selected PLATE SIZE. In addition to DECAY, the audible reverb tail can be heavily influenced by DAMPING. As it is with mechanical hardware, it is critical to experiment with different parameters while listening to and feeling how the audio is affected.



DIFFUSION is the scattering of an audible sound wave. The easiest way to understand diffusion is through an example. Consider the reflection of a click when it hits an irregularly shaped surface. A surface with high diffusion will cause the click to spread into a 'swoosh' of sound. A surface with less diffusion will cause the reflection to have a 'grainy' sound. A surface with low diffusion will cause the reflection to be an obvious series of clicks.

DIFFUSION I controls the tonal quality of the reverb, making it darker at 0 and brighter at 100.

DIFFUSION II maintains the tonal character set by the first but adjusts how actively the signals interact with the virtual surfaces - less active and more enclosed at 0, and more open and expansive at 100.



The PLATE SIZE selector switches between three plate designs (Small, Medium and Large) found in high end early 80's digital effects processors.

Note: When provided with a mono signal, P930 generates a pseudo stereo signal.



SATURATION is powered by the P42 Climax circuit. This is module specific, so it is applied only to the PLATE processed signal.

The saturation routine has a remarkable effect on reverb, imparting a compelling sense of impact and weight as it is increased.



BANDWIDTH, HPF and LPF work together to form a single bandpass filter for the Plate REVERB signal. The HPF and LPF set the filter's endpoints, while the BANDWIDTH knob fine-tunes it, tailoring the effect to sit perfectly in the mix.

Tip: Plate reverb tends to get muddy in the low end, so start by setting the HPF to remove boominess, then adjust the LPF to shave high frequencies or increase the LPF for a more modern sound; complete the process by using the BANDWIDTH to fine-tune the bandpass filter for a smooth fit in the mix.



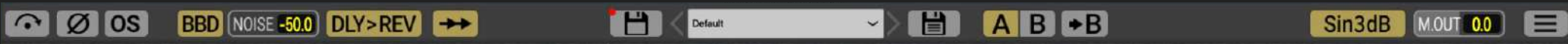
The MIX knob controls the blend of PLATE REVERB processed and incoming signals.

Incoming signal is defined by the position of the Plate when the modules are set in series:

- If PLATE is the 1st module, it is the RAW signal.
- If PLATE is the 2nd module, it is the signal that leaves the BBD module,.

IN gain slider can be used to “hit” the PLATE either hot or soft for more or less character.

OUTgain slider is positioned prior to MIX, allowing the level to be balanced or to overtake the original signal for some swelling rising effects.



Bypass allows the unaffected raw audio signal to pass through without being processed.



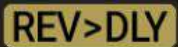
Polarity Flip inverts the audio signal.



Oversampling applies only to the saturation routines and operates at double (x2) the host sample rate.



The BBD NOISE is a characteristic trait of the BBD circuit and applies specifically to the delay line signal. You can switch off the noise.



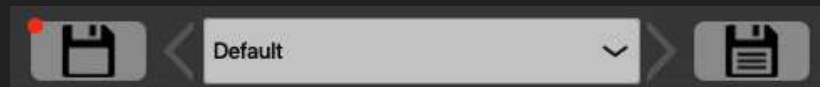
The Module Order Switch flips the order of the modules. Delay into Reverb or vice versa.



This is only applicable when the Routing Switch is set to Series.



The Routing Switch determines whether the signal is processed by the modules in series (one module feeds into the other) or in parallel (the signal is split and feeds each module separately).



Browse, load and save presets using the Preset Browser. Save over the current preset by clicking the left save icon or create a new preset with the right save icon. A red asterisk * will show up next to the left save icon to indicate the preset has been changed from its original parameters.

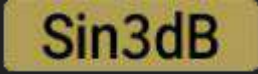
Modified factory presets will be overwritten when updating the software unless the install presets option is deselected. User created presets with different names than the provided preset names will not be replaced or deleted.



A/B allows for temporary storage (not saved within the preset) for quick comparison between A & B (no need to move mouse when flipping between the two). The arrow button allows for copying the active side to the inactive side. You can also load a preset into the temporary storage.



The M.OUT Slider provides a clean output gain stage that can be used to adjust the final level of the combined output signal.



Linear: The dry level is equal to full gain minus the wet level.

- **Balanced:** Proportional mixing between wet and dry.
- **Sin3dB:** Uses a 3 dB equal power sine law to maintain a smooth and consistent loudness regardless of the wet/dry ratio.
- **Sin4.5dB:** Similar to Sin3dB but using a gentler 4.5 dB value, which results in a different balance and tonal characteristic.
- **Sin6dB:** Another variation of the sine mixing rule, using a 6 dB value for an even gentler curve.
- **SR3dB:** Square Root 3dB uses a 3 dB equal power square root law, providing smoother and more consistent loudness compared to the Linear rule.
- **SR4.5dB:** Similar to but using a 4.5 dB value, offering a gentler curve for a different tonal characteristic.



- About
- License Status
- User Guide
- Set Default Size

Options Menu About – Check the version number or demo expiration date.

License Status – Manage your license.

User Guide – Open the user guide.

Set Default Size – This is a global setting. Sets the current GUI window size as the default for new instances.

Modifier keys

CTRL+ALT (Windows) or CMD+OPTION (macOS) +Mouseover:
Temporary bypass the parameter.

- BBD Module
 - Bypass the Left and/or Right Offset screws.
 - Bypass the TEXTURE.
 - Bypass the SATURATION.
 - Bypass the BANDWIDTH.
 - Bypass the MOD DEPTH.
- Plate Module
 - Bypass the PRE-DELAY.
 - Bypass DAMPING.
 - Bypass SATURATION.

SHIFT-Mouseover: temporarily reading view.

- On the Clock Rate knob to flip between bpm and ms.
- On the Subdivision, dotted or triple icon to display the applied division on the clock rate.

SHIFT-Click+Drag: Counter Gain compensation

- Adjusting MIX knob IN or OUT slider to compensate equally with the opposite control.

Enable parameters for automation (Pro Tools only)

Control + command + option (⌘ + ⌥ + ⌘) on macOS or CTRL + ALT + START () on Windows.

Fine adjustment of knobs, sliders and other controls

Hold control (⌘) on macOS or CTRL on Windows, then left click and drag. Alternatively, right click and drag without a key modifier.

Return controls to their default state

Press option (⌥) on macOS or ALT on Windows and left click. Alternatively, double-click without a key modifier.

How-To

- **Rhythmic Patterns:** Experiment with the L&R trim pots in the BBD module while mixing the RAW signal. Add L|R PING-PONG where offset rhythmic patterns remain clean and distinct. Add REGEN to taste and spatial information created by the repeated delays stay beautifully open and expansive due to crossover avoidance.
- **Wider Stereo Field:** BBD+PLATE in series. BBD adjust L and R trim pots and add a bit of MOD RATE and MOD DEPTH (Less than 0.5) add Saturation to taste. On the Plate side, increase DIFFUSION I above 50 and DIFFUSION II at 100 and DAMPING at maximum 15 kHz.
- **Track Insert:** Shape the sonics first. So MIX to 90 % WET to hear the delayed signal in near isolation. Once the desired sound is achieved (including the BANDWIDTH control set), use the MIX knob to set the ideal blend.
- **Dark vs Bright:** A dark delay/reverb will tuck in behind the dry signal giving additional body, while a bright delay/reverb remains up-front for distinct, clear repetitions that remain more prominent and articulate.
- **Modulation:** Sound becomes more interesting when lightly moduled. Use the MOD RATE and MOD Depth to craft the vibrato you are after then choose a short or large time subdivision to either attach or separate the delay from the input signal.
- **Hardware MIDI Controller:** Map P930 parameters to a controller then run wild manipulating multiple knobs at once (where a mouse pointer can not). You will truly enjoy Lunar Lander because it feels, reacts and sounds like a real hardware unit. The sound evolves in your hands, taking you to new places and hearing new sonic possibilities. By the time you finish your exploration, several hours would have passed by!
- **Wipe & Restart:** Reset button clears the processing buffer. It can be used to abruptly stop a runaway delay or a swelling reverb at a particular point to emphasize a transition or drop. Automated the RESET for rhythmic or stutter effect. This flexibility allows for innovative sound design and dynamic manipulation of your audio.

Managing Presets

Basics

If the option to install presets is not de-selected during installation, the installer will overwrite the factory presets. User created presets will remain unaltered. To safeguard any modifications made to factory presets and preserve them during an update, make sure to deselect the install presets option when running the installer. Also, remember to save your own presets with different names using the 'save as' option located to the right of the preset browser.

Backing Up Presets

Presets can be backed up and restored using your operating system file manager. Simply perform a copy/paste of either individual preset files or the full presets folder to a backup location of your choosing. The presets folder can be found in the following locations:

For Windows

'C:\Users\Public\Documents\Pulsar Modular\P930 Lunar Lander\Presets'

For macOS

'/Users/Shared/Pulsar Modular/P930 Lunar Lander/Presets'

Presets by Cryss Synthient

A Clean Wash - wide bandwidth, no saturation, very little modulation, just stereo delay and reverb. More of a clean, modern sound.

Analog Chorus - sweet and simple BBD stereo chorus like the classic pedals.

Analog Chorus Nine - a shorter delay chorus that is smooth and round.

Analog Flange - sweet and simple BBD stereo flange like the classic pedals.

Analog True Vibrato - deep warbling full wet vibrato like the VB-2.

Analog Vibrato - really a faster BBD chorus as there is dry mixed in.

Apocalypse Reverb - long dreamy reverb perfect for a post apocalyptic soundtrack and long synth lines. Add the BBD delay in more spacey movement.

Apocalyptic Landscape - same long dreamy reverb and delay, but run in parallel. Use global MIX and balance delay and reverb by the OUT slider on each module.

Ballad Chorus - slow and deep stereo chorus perfect for synth or guitar.

Barracuda Flange - hit L+R to make stereo and enjoy your high REGEN sweeps.

Celestial Trails - deep expansive ambience...nothing subtle here.

Dancing Arpeggiations - try with your synth arpeggiator, plucked sounds or with bouncy piano. Try different arpeggiator time values for different feel with this preset.

Dark Dirty Echo - the best of the 70/80s BBD delay pedals...swampy!

Deluxe Chorus Echo - every echo is a chorusy BBD memory.

Deluxe Vibrato Echo - every echo is a vibrato-y BBD memory.

Digital Moon - going beyond analog into the brighter/cleaner realms of studio rack space.

Huntington Surf - surf rock spring reverb

Loud Guitar Room - pull the mix back if needed for rhythm, keep up for solos.

Loud Guitar Room + Delay - brash ambience for your solos.

Moonlight - long trailing resonant delays for ambient playing.

Mystery Train Echo - 50s Sun Studios type rockabilly tape slapback with bonus spring-ish reverb.

Purple Lander - that lush Chorus Ensemble sound played in the rain-try the reverb too.

Rotating Breath - Plate feeds the BBD which gently sweeps the breathy echoes around in the stereo field.

Stereo ADT - make your guitar gently weep with artificial double tracking.

Sweet Dreams - let your slow sparse notes drift into euphoria with delay and reverb.

Synthient Stars - tasteful delay and reverb for lead lines.

Talking Lunatic - try a short note and listen for the conversation.

Taped Meanderings - a tape like delay plus plate with multi-stage saturation drifts into the ambient abyss with high feedback and movement.

Temporary Texture - gated FM texture. Turn off GATE for decay and use global MIX to taste.

Tune w/ MOD RATE (G/E) - push some fuzz guitar into this and use MOD RATE and/or CLK RATE and REGEN to tune to notes in your song.

Uninstalling P930 Lunar Lander

For Windows

- VST3: 'C:\Program Files\Common Files\VST3', locate the 'P930 Lunar Lander.vst3' file and delete it.
- AAX: 'C:\Program Files\Common Files\Avid\Audio\Plug-Ins', locate the 'P930 Lunar Lander.aaxplugin' folder and delete it.
- Shared: 'C:\Users\Public\Documents\Pulsar Modular', locate the 'P930 Lunar Lander' folder and delete it. This folder contains the user guide and presets. If no other folders exist under 'Pulsar Modular', this can be deleted as well.

For macOS

- AU: '/Library/Audio/Plug-Ins/Components', locate the 'P930 Lunar Lander.component' file and delete it.
- VST3: '/Library/Audio/Plug-Ins/VST3', locate the 'P930 Lunar Lander.vst3' file and delete it.
- AAX: '/Library/Application Support/Avid/Audio/Plug-Ins', locate the 'P930 Lunar Lander.aaxplugin' folder and delete it.
- Shared: '/Users/Shared/Pulsar Modular', locate the 'P930 Lunar Lander' folder and delete it. This folder contains the user guide and presets. If no other folders exist under 'Pulsar Modular', this can be deleted as well.

Restrictions

The USER may not reverse engineer, disassemble, re-sample, create Impulse Response profiles or re-record, decompile, modify, alter in whole or in part PULSAR NOVATION LTD audio plugins for the intent of renting, leasing, distributing, repackaging (whether for profit or not).

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