MERCURY X

MANUAL v1b

MORE THAN LOGIC. UNITING ART + ENGINEERING.

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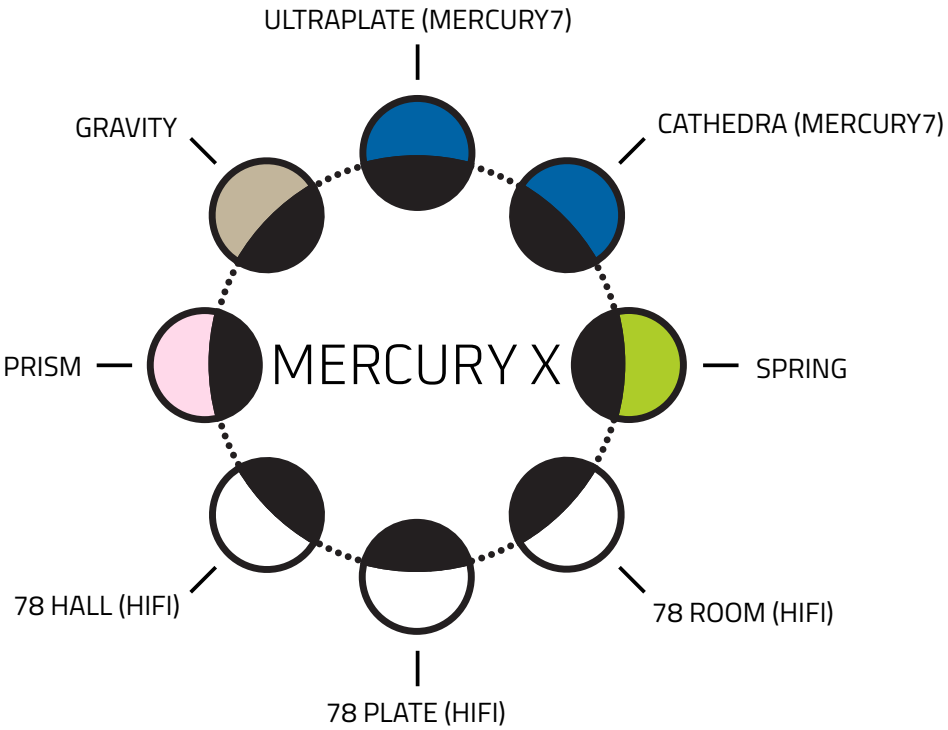
01 - OVERVIEW

MERCURY X IS A MODULAR REVERB SYSTEM WITH PRO AUDIO & STUDIO RACK HERITAGE, ADVANCED PROCESSING, AND HIGH PERFORMANCE SIGNAL PATH.

TRANSCEND TO NEW WORLDS

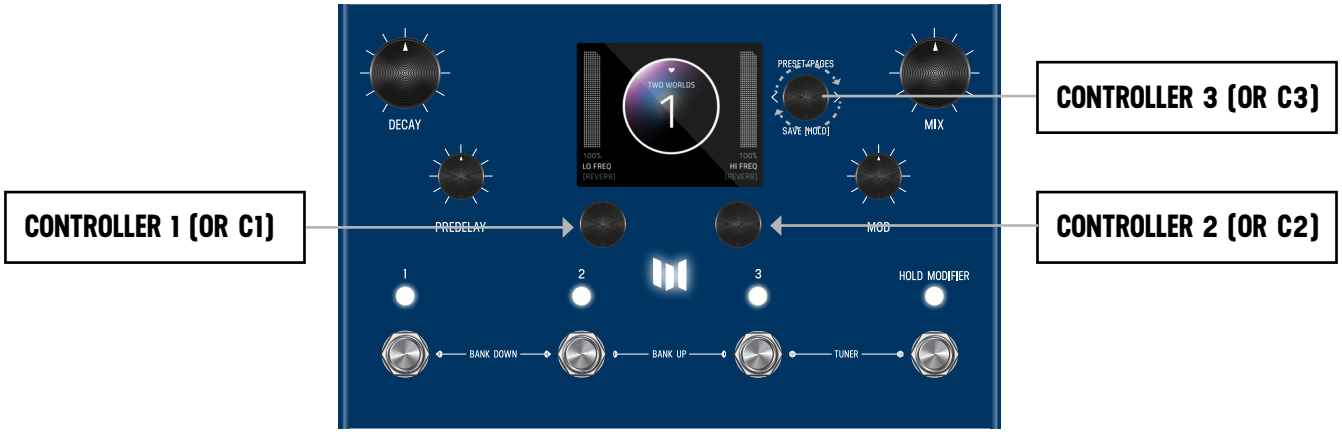
MercuryX takes the heart and soul of Mercury7 and expands it far beyond sci-fi into the highest quality and most flexible studio reverb ever created in a pedal format. All of our passion for pro audio has made it into both the algorithms and hardware performance of this pedal. MercuryX combines 8 custom Meris reverb algorithms and incorporates those into a modular system UI/architecture that we first introduced with the award winning LVX pedal. To make this complex system immediately intuitive to navigate, we again leveraged the simple and easy to use UI first developed for LVX. Exploring the factory presets (and pressing the HOLD MODIFIER) will be your gateway into experiencing the power and flexibility within this instrument. As you discover all of the new ways to create with MercuryX, your own sonic visions will be unveiled.

MercuryX features **8** different reverb structures. **Ultraplate** and **Cathedra** are from Mercury7 and are inspired by the moody sci-fi reverbs featured in Blade Runner. The **78 Room, 78 Plate** and **78 Hall** structures are inspired by the venerable sounds of a studio classic with the decay time controlled by an EQ network. **Spring, Prism**, and **Gravity** are brand new structures unique to MercuryX. See Section 9 for details.



3 MAIN CONTROLLERS: C1, C2, C3

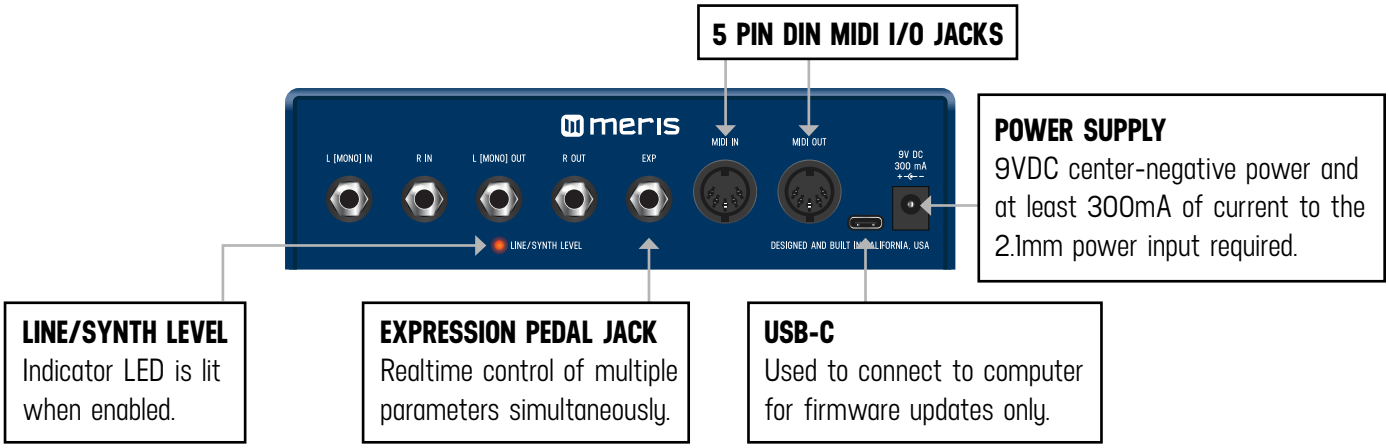
When using MercuryX, 3 knobs are your main navigation controllers: **C1, C2, C3.**
The other four knobs are your top level controls for DECAY, PREDELAY, MOD, and MIX.



7 HIGHLIGHTED FEATURES

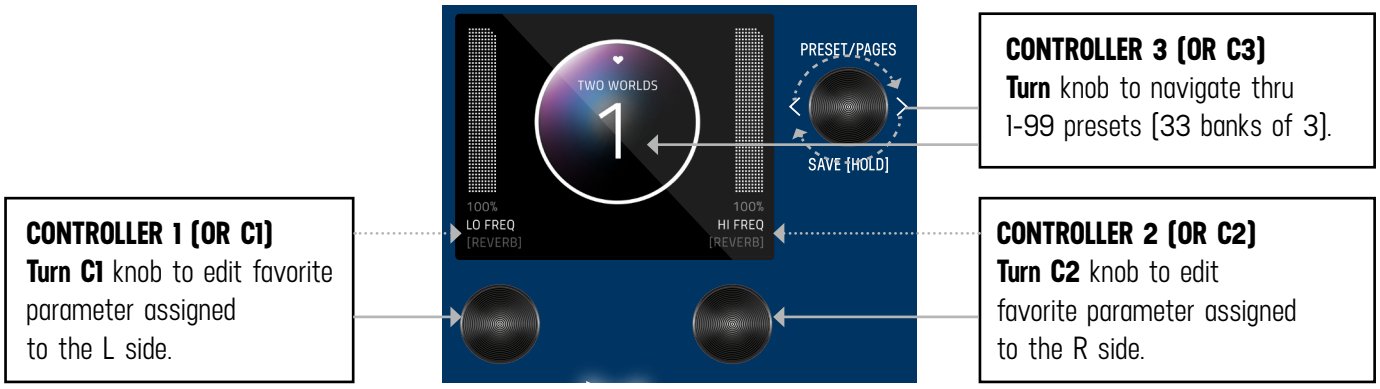
1. MODULAR — STUDIO REVERB
2. EXPRESSIVE — HOLD SWITCH
3. MIDI — IN/OUT
4. 99 — PRESETS
5. ARM — ADVANCED PROCESSOR
6. STEREO — PROCESSING
7. TUNER — PRECISION

BACK PANEL CONNECTIONS



02 - PRESET PAGE (GRAPHIC VIEW)

When you first power up MercuryX, you will enter the Preset Page. By default, MercuryX is shipped in "GRAPHIC VIEW". In GRAPHIC VIEW, 3 knobs are your navigation controllers: **C1, C2, C3.** The Preset Page consists of a preset bubble that contain the name and number. 2 FAVORITE PARAMETERS are controlled by **C1** and **C2** (located directly above the controllers).
(You can assign your favorite parameters per preset, to either the L or R side. Changes of the 2 favorited parameters are located in the SAVE AS PAGE. Details ahead.

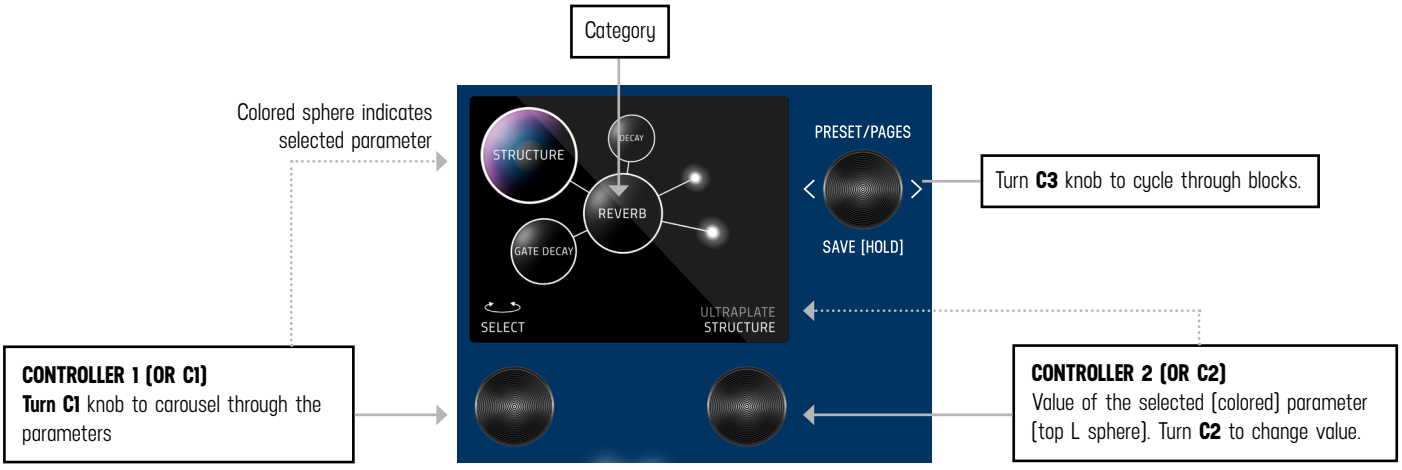


NOTE: GRAPHIC VIEW is designed to focus on 1 block and/or 1 parameter at a time per preset. (You have the option to switch to "TEXT VIEW" in GLOBALS -> EDIT PAGE. Favorite Parameters are also available in TEXT VIEW.

03 - EDITING (EDIT PAGE IN GRAPHIC VIEW)

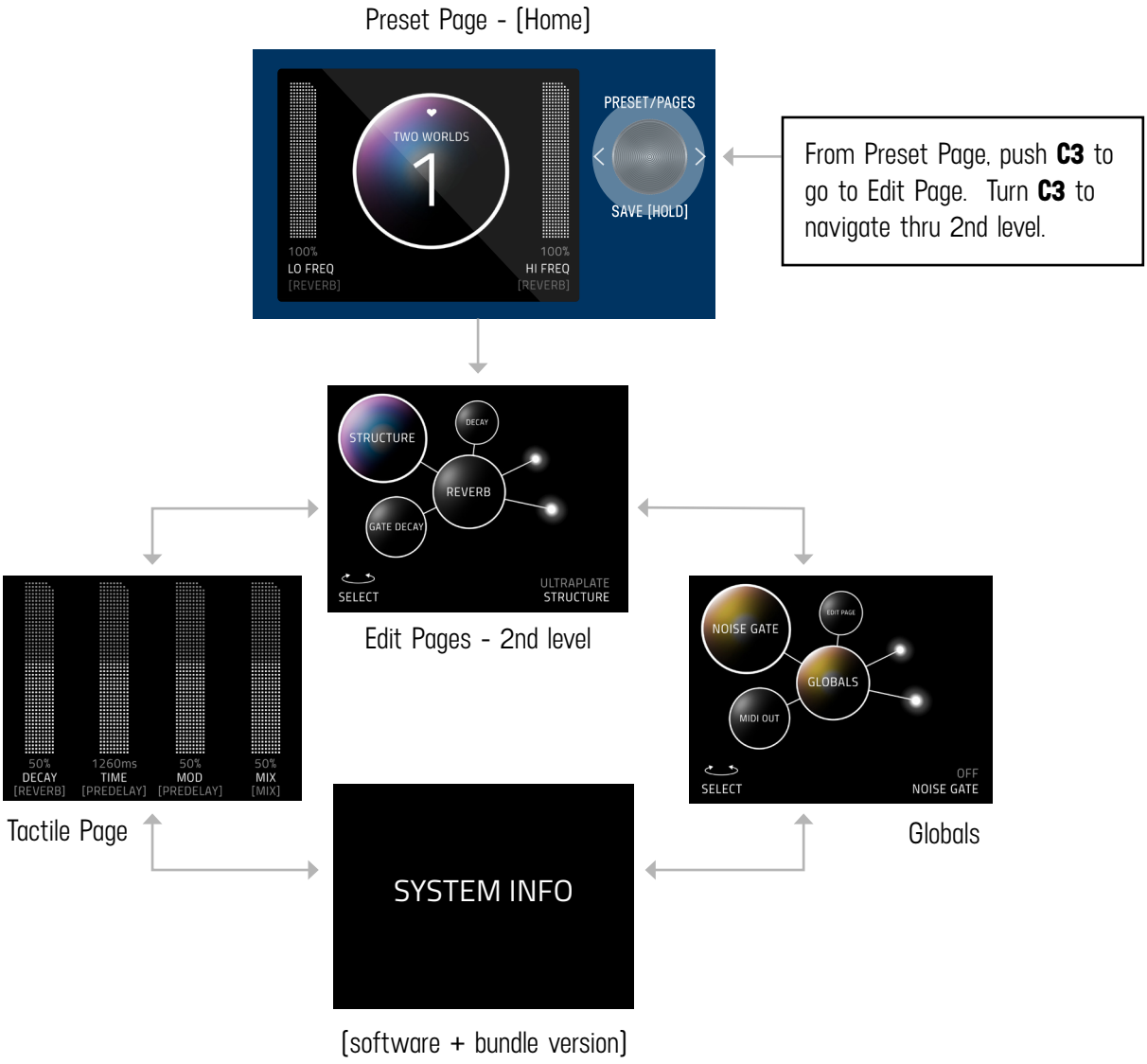
EDIT PAGE

From the PRESET PAGE, push **C3** to enter EDIT PAGES. The EDIT PAGE is where you select categories and change parameters within each preset. The middle bubble is your category. **Turn C3** to cycle through categories. **Turn C1** knob to carousel through the parameters. The colored bubble is your selected parameter within each category. Turn **C2** to edit the selected parameter.



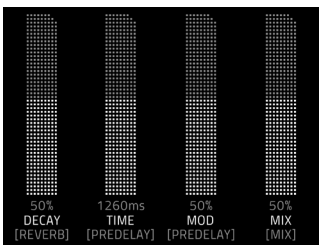
UI MAP - (IN GRAPHIC VIEW)

From the PRESET PAGE (home), push **C3** to navigate into the EDIT PAGES (2nd level). The 2nd level, consists of EDIT PAGES, GLOBALS, SYSTEM INFO and TACTILE PAGE that wrap around when turning **C3**.



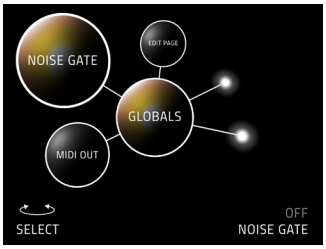
TACTILE PAGE

Turn knobs for DECAY, PREDELAY, MOD or MIX any time while editing, and the Tactile Pop-Up View (for detailed values) will temporarily show. (You can also turn "OFF" or disable the Tactile Pop-Up View in Globals) To have the TACTILE PAGE in persistent view, push **C3** from PRESET PAGE, then turn **C3** L from EDIT PAGE.



GLOBALS

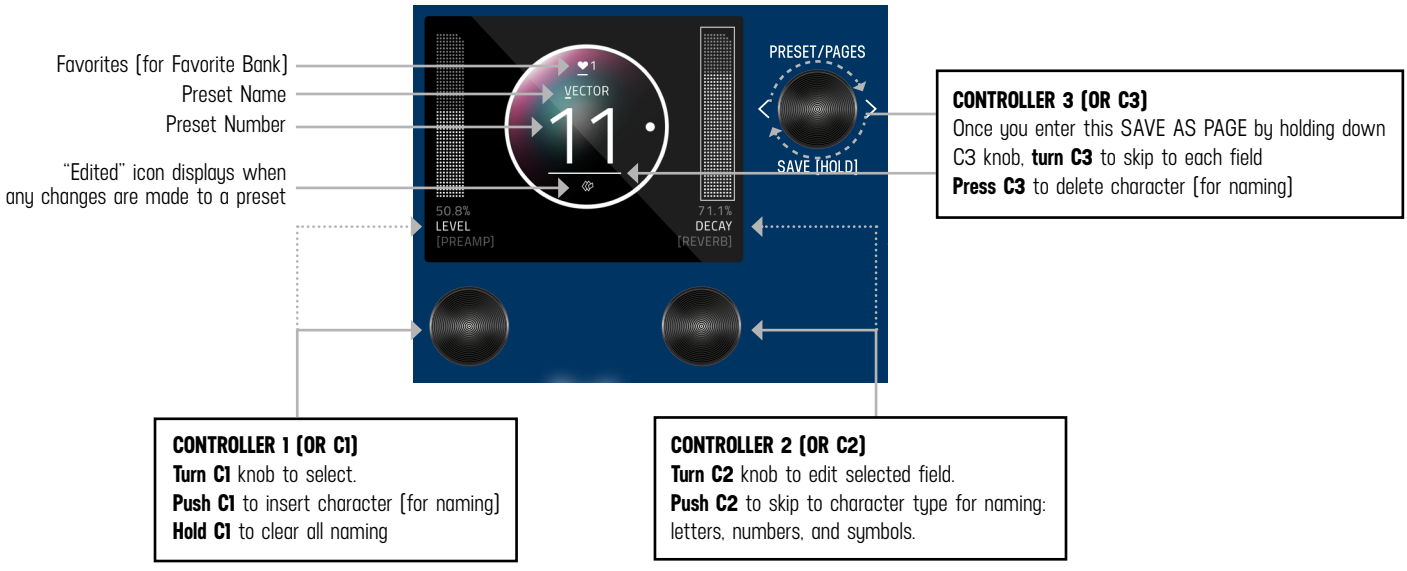
Globals is located at the end of the Edit Page, after you cycle thru all categories. A shortcut to Globals is to start from Edit Page and turn **C3** L. Globals is before System Info. Globals carousels the same way as the Edit Page but will be colorized in solid gold.



04 - SAVING (SAVE AS PAGE IN GRAPHIC VIEW)

SAVE AS PAGE

Once edits are made within a preset, hold down **C3** knob to enter SAVE AS PAGE. Sphere will change color.
You can change the name, change the preset number, select/deselect if this is one of up to 3 favorite presets (for the FAVORITES BANK located before Bank 1) and assign your 2 favorite parameters on either the L or R side of the screen (located directly above **C1** and **C2**).



SELECTING FIELDS

The name edit field will always be selected first when you enter the SAVE AS PAGE. Use **C3** to select fields. You can navigate fields within the bubble and to the L and R parameter. The field selection order when turning **C3** R starting from the name field is: name -> number -> L favorite parameter -> R favorite parameter -> heart (for favorite bank).

2 FAVORITE PARAMETERS (ASSIGNABLE TO EACH PRESET)

2 FAVORITE PARAMETERS can be assigned to each preset. They are located on each side of the preset bubble, directly above **C1** and **C2**. In the SAVE AS PAGE, turn **C3** to select either the L or R field. The field will highlight as an outlined box AND a dot will appear on either side of the preset bubble to indicate which side is selected. Turn **C1** or **C2** to change parameter. HOLD **C3** to save your assigned favorite parameter.

In the EDIT PAGE, if a parameter was assigned as a FAVORITE PARAMETER, a filled in L or R dot will appear to remind which side it was assigned.

Favorite parameters can also be quickly assigned to C1 or C2 in the EDIT PAGE. The methods for quick assign of the favorite parameters are slightly different between Graphic View and Text View. In Graphic View, simply HOLD **C1** to assign the current parameter to C1 or HOLD **C2** to assign the current parameter to C2. In Text View, press and hold either **C1** or **C2** (depending if you want to assign the Left or Right Fav Param), and then turn the parameter up and down in the Edit Page that you would like to assign to the Favorite Parameter.

SAVE PRESET OR CANCEL

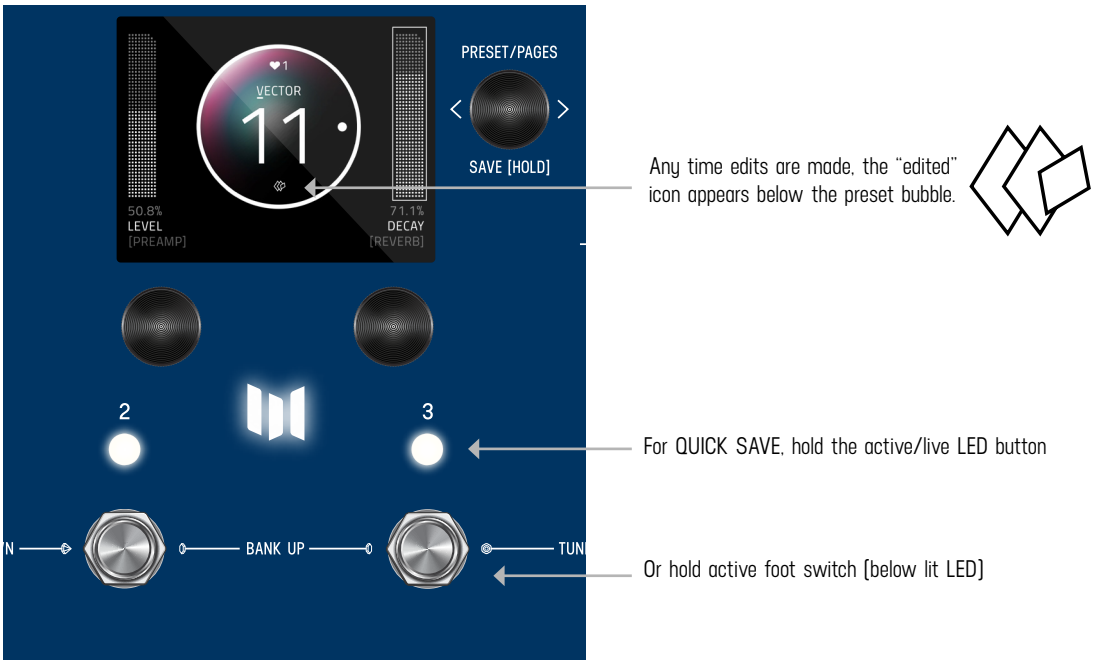
Hold down **C3** knob again to save. Or QUICK SAVE.
To CANCEL a save, press any of the four footswitches. This will exit the SAVE AS PAGE without writing over your preset.
Note: If you cancel, no edits are saved.

COPYING A PRESET

Anytime you assign a Preset to a different Preset Number + Press and Hold **C3** to save, you will automatically duplicate the Preset. If you have exited the Save As Page, Press and Hold down **C3** knob to enter the Save As Page. Turn **C3** to the right to highlight the Preset Number. Change the preset number to the copy destination. [To CANCEL a copy, press any of the four footswitches.] To proceed a copy, Press and Hold **C3** to a save a copy in the new location.

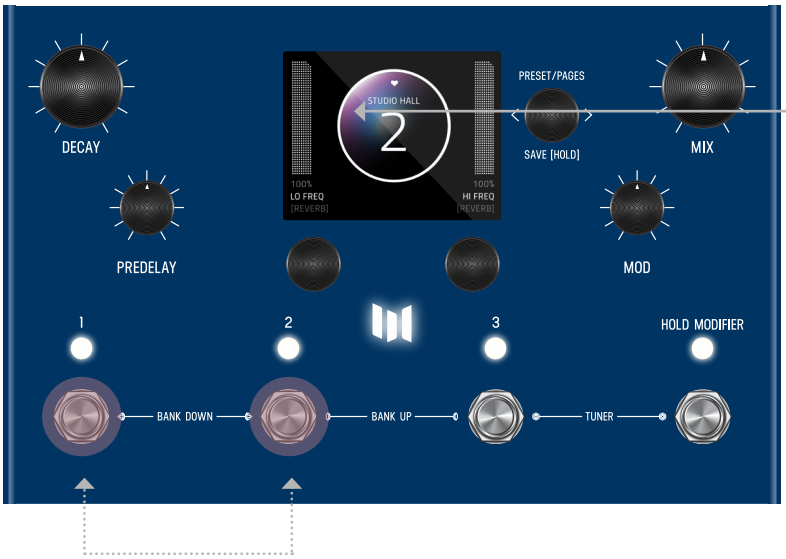
QUICK SAVE

To QUICK SAVE without changing the name or favorite status, hold the active/lit LED button or foot switch directly below. The completed save will return you to the PRESET PAGE and you'll notice the "edited" glyph will have been removed.

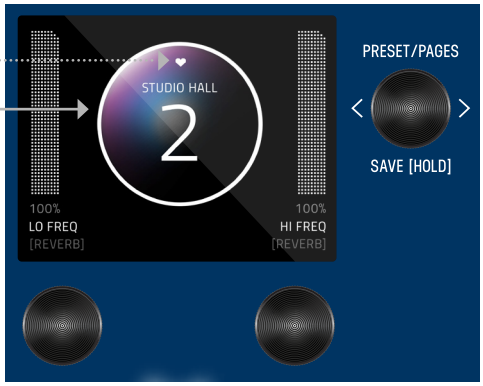


05 - FAVORITES BANK

We created what we call the FAVORITES bank. The purpose of the FAVORITES BANK is to have a shortcut access to your top 3 favorite presets without the need navigate thru banks. The FAVORITES bank is located before bank 1. To jump to the FAVORITES bank, **HOLD 1 + 2** footswitches. While the Favorites Bank is highlighted in the screen, use the 3 footswitches to choose which favorite preset to jump to. To bank up, PRESS **2 + 3** at the same time. To bank down, PRESS **1 + 2** at the same time. A total of 3 presets can be assigned to your FAVORITE BANK within the SAVE AS page.



HOLD **1** + **2** footswitches to jump to **FAVORITES** bank.



Any preset that is favorited, includes a heart in the preset bubble.

06 - MODIFIERS

MercuryX has MODIFIERS which allow automatic control of your knobs. For each Modifier, you can choose which parameter the modifier is automatically controlling, how fast the changes are happening, and how large the changes are.
To get to the Modifiers Edit Page, press **C3** to enter the Edit Pages and turn **C3** to MODIFIERS (named in middle bubble).
The Modifiers of MercuryX are identical to the ones in LVX except for the HOLD MODIFIER.

COMMON MODIFIER PARAMETERS

Speed: This sets how fast the Modifier completes a full cycle. LFO A, LFO B, S&H (a periodic random number generator) and the Sequencer all feature a speed parameter that can be set independently. The Envelope Modifier doesn't have a speed, but instead features Attack and Decay Time which together set how long it takes the envelope to complete its cycle.

Note Division: Links the speed of the Modifier to MercuryX's current delay Time. When Note Division is set, the Modifier's Speed parameter is ignored and the speed is calculated as a note division of the predelay time.

Assign: Each modifier is a self contained module that can automatically adjust a parameter in the MercuryX. To link a modifier to a parameter, use the modifier's ASSIGN parameter. Here you'll find a list of all the available parameters you can link to the modifier including NONE for when you don't want to use the Modifier.

Min & Max: To set how much the Modifier changes the parameter use the Modifer's Min and Mix controls. For the Min and Max controls, the percentage relates to the current position of the parameter you are assigned to, where 100% equates to exactly where the current parameter is set at. Having the Min and Max work as a percentage of the current parameter value allows you to still control a parameter even when it is attached to a modifier. This is really useful if you like the way the modifier is working but want to make general changes on the fly by simply adjusting the parameter directly.

MODIFIER EXAMPLE - CONTROLLING A FILTER

Let's assign the LFO A Modifier to automatically change a filter's frequency. First, turn **C3** to a "BLANK" preset. Next, press **C3** to enter the Edit Pages. Turn **C3** to FILTER Category and change the Type to Ladder. While you are here, change the Location to PRE+DRY, this will put the filter on to the dry path, in front of the delay. Finally let's open up the Filter's Frequency all the way to 15000 Hz. Resonance, Topology, and Spread can be left as is.

Now use **C3** to navigate to the MODIFIERS Edit Page. Here we'll use the first modifier, LFO A, to automatically change the filter. Let's change the LFO A Speed to 2 Hz and the LFO A Assign to FLTR-FREQUENCY. For now, let's leave the other LFO A parameters alone.

Let's strum a few chords and listen to the result. You should hear the filter moving at its own rate and feeding the delay lines. Since the delays and the filters are set to different speeds you can hear how they play against each other rhythmically. To synchronize the filter frequency sweep with the delay time, Let's change LFO A's Note Division to QUARTER. Strum again, and you'll hear that the frequency sweep coincides with the predelay Time.

To fine tune the range of the sweep, let's change the Min and Max parameters of LFO A. For Min and Max, the percentage relates to the current parameter value, where 100% equates exactly to the current position. Since we have the Filter's Frequency is set to the maximum value of 15000 Hz, 100% exactly corresponds to this value and 0% corresponds exactly to the minimum frequency value of 20Hz. Let's set the LFO A Max to 68% for a gentler high frequency and the LFO A Min to 18% for a less dramatic low frequency.

Finally let's explore the different LFO A Shapes available. This control changes the waveshape which determines how the LFO travels from begin to end in its cycle, ranging from the most gentle, Sine Wave, to the most abrupt, Square Wave. Experiment with the different shapes to see how they affect your preset. As an experiment, try setting the LFO A Shape to Ramp Down, the LFO A Note Division to 16th note, and LFO A MIN to 0% for filter with a rhythmic chopping response.

BREAKDOWN OF EACH MODIFIER AND ITS PARAMETERS:

LFO A Modifier - a periodic oscillating signal generator with selectable waveshapes
Parameters: Speed, Note Division, Shape (Ramp Up, Ramp Down, Triangle, Sine, Square, 3 Steps Up, 3 Steps Down, 4 Steps Up, 4 Steps Down), Assign, Minimum, Maximum

LFO B Modifier - a periodic oscillating signal generator with selectable waveshapes
Parameters: Speed, Note Division, Shape (Ramp Up, Ramp Down, Triangle, Sine, Square, 3 Steps Up, 3 Steps Down, 4 Steps Up, 4 Steps Down), Assign, Minimum, Maximum

Envelope Modifier - a note triggered envelope generator. When a note onset or pick attack is detected the envelope begins its travel from the Min to Max value at the Attack Time before then traveling from Max back to Min at the Decay Time. The Linear Shape completes this travel in a straight line and the Exponential Shape completes this travel using curved lines. The Clipped Attack shape holds the envelope value at Max for the Attack Time interval before traveling back to the Min Value at the Decay Time interval. **Tip:** try swapping the Min and Max values to flip the envelope shape.
Parameters: Attack Time, Decay Time, Shape (Linear, Exponential, Clipped Attack), Assign, Minimum, Maximum

Sample & Hold Modifier - a periodic random number generator, a new random number is generated after every cycle (set by Speed or Note Division) is complete. Use this to randomly change a parameter at a fixed interval.
Parameters: Speed, Note Division, Assign, Minimum, Maximum

Sequencer Modifier - plays back a repeating pattern with a new element generated after every cycle (set by Speed or Note Division) is complete. The pattern is created by setting 16 individual steps of equal length. Patterns less than 16 steps can be created turning the step all the way down to its minimum value which is 'Skip'.
Parameters: Speed, Note Division, Assign, Step 1 - 16

Some Modifiers Tips: MercuryX will allow you to assign multiple modifiers to the same parameter for creative control combinations. When the modifiers are assigned to the same parameter the control signals they generate are added together before modifying the parameter. This sum is automatically clipped at 100% when it gets too large.

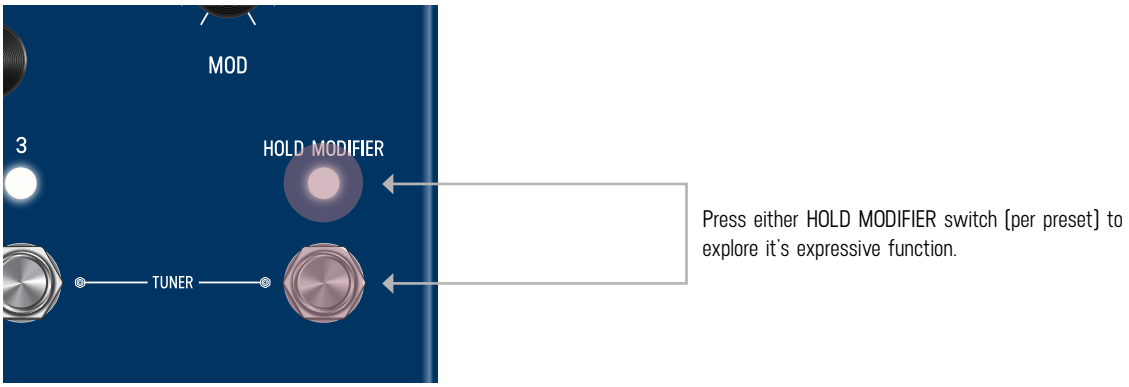
When looking at the Assign parameter for any of the modifiers, MercuryX will only show the parameters for Categories where a processing element has been selected. If the Type is set to None, then that Category will not appear in the list of Assign parameters.

Hold Modifier - a footswitch triggered envelope generator. The Hold Modifier's envelope can be triggered by front panel footswitch, LED switch, or MIDI command. The Hold Modifier can be set to **Momentary, Latching or Tap Tempo** action per preset. The LED switch will light up to indicate when the modifier is active.

When set to Momentary, the envelope travels from the Min to Max value at the attack time while the footswitch is held. When the footswitch is released, the envelope begins to travel back down to the Hold Min at the Decay Time.

When set to Latching, the envelope travels from the Min to Max value at the attack time while the footswitch is pressed. The envelope will stay at the Max value until the next press where it will travel back down to the Min value at the Decay Rate. The Latching mode is perfect for use as an on/off switch when assigned to the Mix parameter of a Category Type.

When set to Tap, the Hold Modifier switch functions as a traditional Tap Tempo switch that controls the predelay time.



07 - EXPRESSION

The rear panel of MercuryX has an EXP jack which allows you to connect an expression pedal for on the fly changes of parameters. MercuryX lets you make 6 expression pedal assignments and for each assignment you can choose which parameter the expression pedal is controlling, and how much the parameter is changed at the minimum and maximum positions of the expression pedal. To get to the Expression Edit Page, press **C3** to enter the Edit Pages and turn **C3** to EXP PEDAL (named in middle bubble).

Expression pedal adjustments affect the parameters only when an expression pedal is connected to the EXP jack on the back of MercuryX. When a physical expression pedal is not connected to MercuryX, all EXP PEDAL assignments with the Source parameter set to EXP will be ignored.

BREAK DOWN OF THE EXPRESSION PEDAL PARAMETERS:

Source A-F: Source sets which signal is used to modify the assigned parameter. By default, Source is connected to EXP (the expression pedal). For most presets, having Source set to EXP is exactly what you want; where simply, the expression pedal modifies the assigned parameter. Setting the Source to something other than EXP is useful when you want a modifier to control a second parameter, see the example labeled 'Using Expression Source' below.

Assign A-F: MercuryX features 6 separate parameter assignments. To link the expression pedal to a parameter, use one of the six expression pedal ASSIGN parameters labeled A through F. Here you'll find a list of all the available parameters you can link to the expression pedal including NONE.

Min & Max A-F: For each of the expression pedal parameter assignments you'll find a corresponding set of Min and Max controls also labeled A through F. Min represents the expression pedal at its minimum position (heel down), and Max represents the expression pedal at its maximum position (toe down). The percentage relates to the current position of the parameter you are assigned to, where 100% equates to exactly where the current parameter is set at. Having the Min and Max work as a percentage of the current parameter value allows you to still control a parameter even when it is attached to an expression pedal. This is really useful if you like the way the expression pedal is working but want to make general changes on the fly by simply adjusting the parameter directly.

Expression Pedal Example - Controlling Pitch
Let's assign the expression pedal to change the pitch of the Poly Chroma processing element.
First, connect your expression pedal to the EXP jack on the back of MercuryX.

Turn **C3** to a BLANK preset. Press **C3** to enter the Edit Pages. Turn **C3** to PITCH Category and change the Type to Poly Chroma. While you are here, change the Location to PRE+DRY, this will put the Poly Chroma on to the dry path, in front of the delay. Also change the Poly Chroma's Pitch parameter to 12 m2, and the Poly Chroma's Mix parameter to 100%.

Turn **C3** to the EXP PEDAL Edit Page. Change the first expression pedal assignment, EXP A Assign, Pitch-Pitch. This is shorthand for the parameter where the first word stands for the Category (here we are targeting the Pitch Category) and the second word stands for the actual parameter name (the Poly Chroma's Pitch). Now, let's change the EXP A Min to 50% and EXP A Max to

100%. Since we currently have the pitch parameter set to 12 m2 [an octave up, and the highest value for this parameter] 100% will equate exactly to 12 m2, and 50% will equate exactly to the middle of the knob range 0 m2, which is zero pitch shift. Since the Min parameter presents heel down and the Max parameter represents toe down on the expression pedal, moving the expression pedal will smoothly move between no pitch shifting and an octave up of pitch shifting. Let's strum a few chords while moving the expression pedal and listen to the result.

Expression Pedal Example - Using Expression Source

Let's create a preset to see how to use the Expression Source parameter to compliment the Modifier section in MercuryX.

Turn C3 to a BLANK preset. Before entering the Edit Pages, turn the front panel Mix knob to zero, doing this will let us listen to anything in the Pre+Dry category with no echoes present.

Press C3 to enter the Edit Pages. **Turn C3** to PITCH Category and change the Type to Lo-Fi. Change the Location to PRE+DRY, this will put the Lo-Fi pitch on to the dry path, in front of the delay. Also change the Lo-Fi's Pitch L and Pitch R parameters to 12 m2, and the Lo-Fi's Mix parameter to 100%.

Let's assign an LFO modifier to Pitch L. **Turn C3** to the MODIFIERS Edit Page. We'll use the first modifier LFO A. Change LFO A Assign to PTCH-PITCH L. For now, let's leave the other LFO A parameters alone. If you take a listen, you'll hear the left side of the pitch changing from -12 to +12 semitones, and the right side will be statically shifted up 12 semitones.

To link Pitch R to the same modifier as Pitch L, we'll use the Expression Source parameter. **Turn C3** to the first EXP PEDAL Edit Page. Set EXP SOURCE A to LFO A and EXP ASSIGN A to PTCH-PITCH R. Let's leave the other EXP A parameters alone. If you take another listen, you'll now hear the pitch on the left and right channels moving together at the same rate since they are both connected to the same modifier. While you are here, try changing EXP A MIN to 100% and EXP A MAX to 0%. Now, if you take a listen you'll hear the Pitch L and Pitch R parameters move opposite to each other but at the same rate since they are both linked to LFO A.

08 - PREDELAY

Traditionally, predelay is used to add a fixed amount of time between the start of your sound and when the reverb tank starts. In the studio (currently), it typically is under 50 milliseconds. Adding predelay is a useful way to de-clutter and add clarity to your sound by allowing your notes to breathe before they are enveloped by the sound of the reverb.

In MercuryX, we expand the concept and use of predelay by replacing a simple short mono delay line with twin 2.54 second delay lines with modulation, selectable types, modulation, filtering, cross-feedback and a special routing position which allows you to put any of the processing elements in the predelay's feedback loop. A unique feature of the MercuryX's predelay is the Dry Blend control, that allows you to feed some signal from before the predelay into the tank.

COMMON DELAY PARAMETERS:

Time - The current delay time. This parameter is linked to the front panel Time knob, has 32 bit resolution, and can be expressed in seconds or BPM by changing the "TEMPO DISP" setting in the Global Edit Pages. The Time parameter can be applied per preset or globally to all presets by changing the "TEMPO SEL" parameter in the Global Edit Pages.

Left Division - This parameter sets the current time subdivision for the Left delay line and is expressed in note values. The division parameter is useful when you want to automatically adjust your Left delay to a specific note value ratio of the Time parameter. In the "BLANK" preset, this parameter defaults to "OFF", which gives you quarter note divisions that match the blinking Tap LED on the front panel.

Right Note Division - This parameter sets the current time subdivision for the Right delay line and is expressed in note values. The division parameter is useful when you want to automatically adjust your Right delay to a specific note value ratio of the Time parameter. In the "BLANK" preset, this parameter defaults to "OFF", which gives you quarter note divisions that match the blinking Tap LED on the front panel.

Half Speed - This sets the current read/write speed for the delay line. When half speed is disabled the delays operate at 48 kHz sampling rate giving you a maximum delay time of 2.54 seconds of stereo delay time; and when half speed is enabled the delays operate at 24 KHz giving you 5.08 seconds of delay time. Try changing the Half Speed parameter while the delays are echoing with a generous amount of feedback to create interesting time and pitch effects.

Feedback - This controls the amount of the delay line's output that is mixed onto the delay line's input. This parameter is linked to the front panel Feedback knob and sets the feedback for both the Left and Right delays.

Crossfeed - This control works with the feedback parameter to set how much of the Left delay output is mixed onto the Right delay input, and how much of the Right delay output is mixed onto the Left delay input. Use this to create interesting cascading delay effects when the Left and Right delays have different settings.

Mod - This parameter sets the amount of modulation to the Left and Right delay lines, and has a different voicing for each Delay Type. This parameter is linked to the front panel Mod knob, and is not connected to the Modulation category. The Mod parameter is useful to quickly dial in some motion to animate your delay lines. For deeper and more complete modulation control, use the Modulation category when you want to enhance your delay lines with even more modulation.

Damping - This parameter reduces the high frequencies in the Left and Right delays. When set to zero, the delays have the full amount of high frequency detail. The Dampening parameter has a different response per Delay Type. For the Digital delay type, the Damping control allows you to darken your repeats. For the BBD delay type, the Damping control alters the filter structure around the bucket brigade clock, with no clock noise preset when color is set to 100%. For the Tape delay type, the Damping control changes the filter structure and ages the tape to allow for darker timbres.

Dry Blend
This parameter controls the amount of dry signal added to the output of the predelay. Dry Blend defaults to 0%, which recreates how a typical predealy works. Dry Blend works especially well with long predelay times and lets some of your dry signal hit the reverb tank before the initial predelay reflection.

09 - REVERB STRUCTURES

Here is a deep dive into the 8 different reverb structures in MercuryX. Each Reverb Structure has Gate controls that can be used to dial in a range of gated reverb effects including the classic percussive gate sound, reverse tail reverb sounds, and slow breathing textures. Similar to the Dry Blend control of the Predelay, each Reverb Structure features a Predelay Blend control that allows you to put some or all of the predelay reflections in parallel with the reverb tank.

Ultraplate - Adapted from Mercury7, Ultraplate is an inspiring and lush plate with a fast build. Use the Ultraplate's flexible decay range to create a wide range of studio textures.
Parameters: Decay, Lo Freq, Hi Freq, Mod Speed, Mod Depth, Pitch, Pitch Mix, Diffusion, Predelay Blend, Gate Attack, Gate Hold, Gate Decay

Cathedra - Adapted from Mercury7, Cathedra is a massive and ethereal algorithm with a slow build. Cathedra is perfect for sci-fi textures and recreating C-beams glittering in the dark near the Tannhauser gate.
Parameters: Decay, Lo Freq, Hi Freq, Mod Speed, Mod Depth, Pitch, Pitch Mix, Diffusion, Predelay Blend, Gate Attack, Gate Hold, Gate Decay

Spring - A flexible algorithm that can be voiced to replicate both the amp based reverb sounds and the classic studio spring tanks featured on early recordings.
Parameters: Dwell, Lo Freq, Hi Freq, Predelay Blend, Gate Attack, Gate Hold, Gate Decay

78 Room - A lively and direct sound. This algorithm is great for transforming static sounding virtual amps into the difficult to capture sound of a great amp live in the room with you. The Room algorithm features a unique infinite mode (Maxed out Decay controls) that interacts with the Tank Mod to provide deep chorused and flanged reflections.
Parameters: Mids, Bass, Treble, Cross, Tank Mod, Diffusion, Predelay Blend, Gate Attack, Gate Hold, Gate Decay

78 Plate - Fast and dense, the 78 Plate algorithm is a good match for beefing up percussion and vocals.
Parameters: Mids, Bass, Treble, Cross, Tank Mod, Diffusion, Predelay Blend, Gate Attack, Gate Hold, Gate Decay

78 Hall - A large hall with a medium build up of reflections. Great for building up ambient walls of sound. The Hall algorithm's extended reflections are a great base for sculpting with the Bass/Mids/Cross controls. Deep rumbling bass caverns and ethereal upper mid emphasized halos of sound are easy to create. Explore the additional sparse mode for the Hall when Diffusion is set Low.
Parameters: Mids, Bass, Treble, Cross, Tank Mod, Diffusion, Predelay Blend, Gate Attack, Gate Hold, Gate Decay

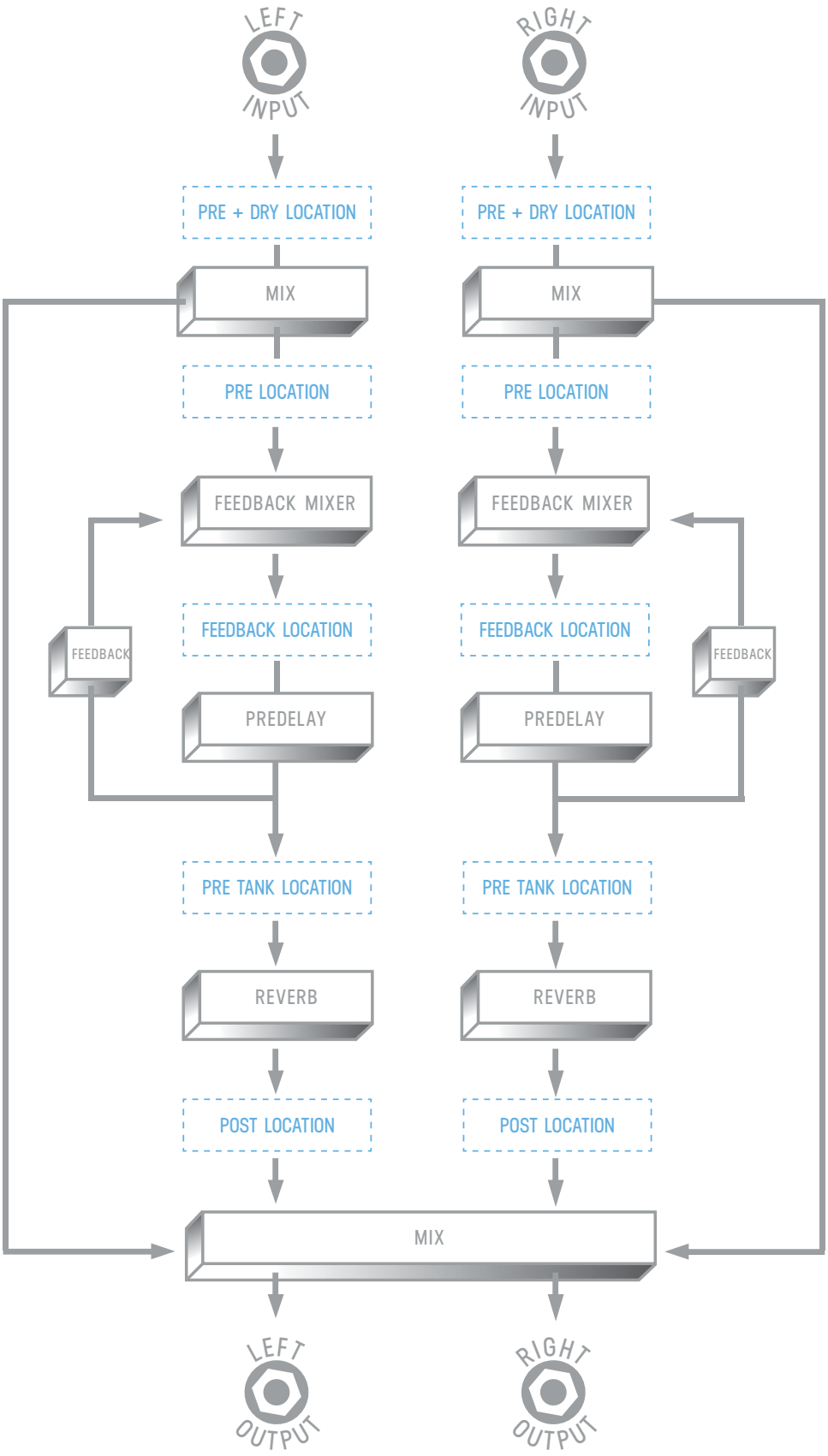
Prism - The Prism Structure is an dual tank that allows you to build your own geometric rooms by specifying the size and distance and reflectivity. Prism features a highly configurable modulation section which allows different modulation phases per side to further increase the stereo image.
Parameters: Decay, Size, Dispersion, Distance, Lo Cut, Hi Cut, Mod Speed, Mod Depth, Mod Phase, Predelay Blend, Gate Attack, Gate Hold, Gate Decay

Gravity - The Gravity Structure works by accelerating individual windows of your signal and stretching them across the horizon. Gravity is great for adding padlike textures beneath to your sound and features an powerful modulation section capable of both gentle and chaotic pitch effects inside of the reverb tank. Gravity's Gain control is crucial to taming the explosive textures contained within.
Parameters: Decay, Tilt EQ, Mod Speed, Mod Depth, Mod Feedback, Gain, Mod, Predelay Blend, Gate Attack, Gate Hold, Gate Decay

10 - CATEGORIES AND ELEMENTS

The processing elements are grouped into categories. The categories are: Dynamics, Preamp, Filter, Pitch, and Modulation.
Important: the Modulation Category is separate from the front panel Mod knob which directly controls the modulations built into the predelay. In MercuryX, the elements can be placed before the delay lines, after the delay lines, in the feedback of the delay lines, as well as in the pre + dry path indicated in light blue. When all categories are in the same location, the processing order from first to last is Dynamics, Preamp, Filter, Pitch, and Modulation.

Visual diagram of the processing elements:



Also shown in the visual diagram is the Mixer for MercuryX. The Mixer is directly connected to the front panel mix knob. To adjust the Dry and Wet Trim levels, use **C3** to enter Edit View and page over to the MIX section. The following is a breakdown of each Category and the processing Elements they contain:

DYNAMICS CATEGORY

Compressor - an upgraded fully adjustable stereo compressor adapted from Enzo. You can use the compressor like an audio microscope to zoom into small details, or set more gently, the compressor can balance the levels of your delay creations.
Parameters: Threshold, Ratio, Gain, Attack, Release, Mix

Compressor Link - The same algorithm as the Compressor, but where the Compressor has separate analysis and processing for left and right, Compressor Link has stereo processing with mono analysis. This is useful post reverb to eliminate any panning changes that stereo analysis would cause.
Parameters: Threshold, Ratio, Gain, Attack, Release, Mix

Swell - A stereo exponential automatic volume swell to remove the attack of your audio. Swell works best in front of the delay lines where it helps create dreamy pads of sounds
Parameters: Attack Time, Gain

Diffusion - Diffusion is a stereo pair of super short multitap delays used to smooth your sound and soften hard edged sounds. The Density control adds progressively more smearing of the audio and the Low Pass Filter cuts highs to further soften your sound. Try using Diffusion in the feedback location of your delays to progressively soften the sound with every repeat.
Parameters: Density, Low Pass Filter

Limiter - Our stereo Limiter hard limits your signal to the Threshold. With a totally different algorithm from the compressor, the Limiter adds immediate and dramatic punch to your sound.
Parameters: Threshold, Gain, Release

Limiter Link - The same algorithm as the Limiter, but where the Limiter has separate analysis and processing for left and right, Limiter Link has stereo processing with mono analysis. This is useful post reverb to eliminate any panning changes that stereo analysis would cause.
Parameters: Threshold, Gain, Release

Freeze
New for MercuryX, the freeze is an instant timelapse effect that infinitely sustains your sound. The Freeze parameter initiate the infinite sustain and works best when controlled by a modifier. The Blank preset has the Hold Modifier switch assigned to the Freeze parameter and is a great springboard for your creations.
Parameters: Freeze, Gain, Mix

PREAMP CATEGORY

Tube - the Tube Preamp provides a mid boost with controllable gain and level. Try pairing the Tube Preamp with the Magnetic Delay type.
Parameters: Parameters: Gain, Level

Transistor - the Transistor Preamp emphasizes high frequencies, perfect for adding clarity to dull audio signals
Parameters: Parameters: Gain, Level
Op-Amp - the Op-Amp Preamp gives you a broadband boost with de-emphasized low end, a good all purpose preamp
Parameters: Parameters: Gain, Level

FILTER CATEGORY

Ladder Filter - our unique stereo ladder filters adapted from the Enzo, use the Frequency parameter to set the center frequency for both the left and right sides of the filter, use the Spread parameter to offset the center frequency on the right side. When the Spread parameter is at zero, both sides of the filter are set to the same frequency.
Parameters: Frequency, Resonance, Topology, Spread

State Variable Filter - also adapted from Enzo, the State Variable filter offers another great flavor of creamy filtering to compliment the Ladder Filter. Like the Ladder Filter, the Spread parameter offsets the right filter frequency.
Parameters: Frequency, Resonance, Topology, Spread

Parametric - the Parametric Filter is a single band parametric EQ. The Parametric Filter is especially useful in the Post Location to balance the overall frequency response of your delay. The Parametric Filter is a shelving filter, and the Gain ranges from -10dB to 10dB which allows for precise boosts and cuts.
Parameters: Frequency, Resonance, Topology, Gain

PITCH CATEGORY

Poly Chroma - our fully polyphonic chromatic pitch shifter. The Poly Chroma sums your stereo channels together and perfectly shifts the audio no matter how complicated the chords.
Parameters: Pitch, Mix

Micro Shift - Micro Shift is a variation of the Lo-Fi Pitch element that allows independent detuning to each side of the stereo spectrum.
Parameters: Pitch Left, Pitch Right, Mix

Lo-Fi - This element is a dual version of the pitch shifter from the Ottobit Jr. The Lo-Fi element uses an early pitch shifting technique that creates modulated low fidelity voices.
Parameters: Pitch Left, Pitch Right, Mix

MODULATION CATEGORY (MODULATE)

79 Chorus - Based on the classic one knob modulation from 1979 famously used by a songwriter from Aberdeen. Here the depth switch of the classic is expanded out to full range knob.
Parameters: Speed, Depth

Vibrato - Classic voiced pitch modulation. Pair the Vibrato with Swell and Cathedra to enter the realm of the sonic visionary from Hull, Quebec.
Parameters: Speed, Depth

Vowel Mod - A modulated filter bank that recreates vowel sounds. There are seven different long and short vowel sounds available, and you can choose two to modulate between. The speed sets the rate of modulation between the two vowels and the resonance shapes how extreme the filters are. The manual control allows you to manually move between the two vowel selections when the speed is set to minimum. This is especially useful when you have Manual assigned to one of the modifiers.
Parameters: Speed, Vowel A, Vowel B, Resonance, Manual

Tremolo - The original modulation effect that you can be voiced anywhere from gentle breathy pulsations to a heavy psychedelic chop. Assign the speed to the Envelope Modifier to animate your sound.
Parameters: Speed, Waveshape, Mix

Hazy - A lofi junkie's sepia toned dream machine. Hazy imparts your sound with the character of old worn out tape machines and more.
Parameters: Decimate, Warble, Age, Lows, Highs, Mix

11 - MIDI CC TABLE

CONTROL CHANGE	MERCURYX CONTROL	RECEIVE VALUE RANGE
CC# 01	MIX	0 TO 127
CC# 02	DRY TRIM	0 TO 127
CC# 03	WET TRIM	0 TO 127
CC# 04	EXPRESSION PEDAL	0 TO 127
CC# 05	PREAMP TYPE	0 TO 25 = OFF 26 TO 51 = VOLUME PEDAL 52 TO 76 = TUBE 77 TO 102 = TRANSISTOR 103 TO 127 = OP-AMP
CC# 06	PREAMP LOCATION	0 TO 25 = PRE + DRY 26 TO 51 = PRE 52 TO 76 = FDBK 77 TO 102 = PRE TANK 103 TO 127 = POST
CC# 07	GAIN/VOLUME PEDAL LEVEL	0 TO 127
CC# 08	BALANCE	0 TO 127
CC# 11	PREAMP LEVEL	0 TO 127
CC# 13	DELAY STRUCTURE	0 TO 63 = STANDARD 64 TO 127 = REVERSE
CC# 14	BYPASS	0 TO 63 = FX BYPASS 64 TO 127 = FX ENABLE
CC# 15	TIME	0 TO 127
CC# 16	TYPE	0 TO 42 = DIGITAL 43 TO 85 = BBD 86 TO 127 = MAGNETIC
CC# 17	LEFT NOTE DIVISION	0 TO 127

CC# 18	RIGHT NOTE DIVISION	0 TO 127
CC# 19	FEEDBACK	0 TO 127
CC# 20	CROSS FEEDBACK	0 TO 127
CC# 21	MODULATION	0 TO 127
CC# 22	DAMPING	0 TO 127
CC# 23	DRY BLEND	0 TO 127
CC# 24	HALF SPEED	0 TO 127
CC# 32	REVERB STRUCTURE	0 TO 15 = ULTRAPLATE 16 TO 31 = CATHEDRA 32 TO 47 = SPRING 48 TO 63 = 78 ROOM 64 TO 79 = 78 PLATE 80 TO 95 = 78 HALL 96 TO 111 = PRISM 112 TO 127 = GRAVITY
CC# 33	REVERB PARAMETER 1	0 TO 127
CC# 34	REVERB PARAMETER 2	0 TO 127
CC# 35	REVERB PARAMETER 3	0 TO 127
CC# 36	REVERB PARAMETER 4	0 TO 127
CC# 37	REVERB PARAMETER 5	0 TO 127
CC# 38	REVERB PARAMETER 6	0 TO 127
CC# 39	REVERB PARAMETER 7	0 TO 127
CC# 40	REVERB PARAMETER 8	0 TO 127
CC# 41	REVERB PARAMETER 9	0 TO 127
CC# 42	PREDELAY BLEND	0 TO 127
CC# 43	GATE ATTACK	0 TO 127
CC# 44	GATE HOLD	0 TO 127

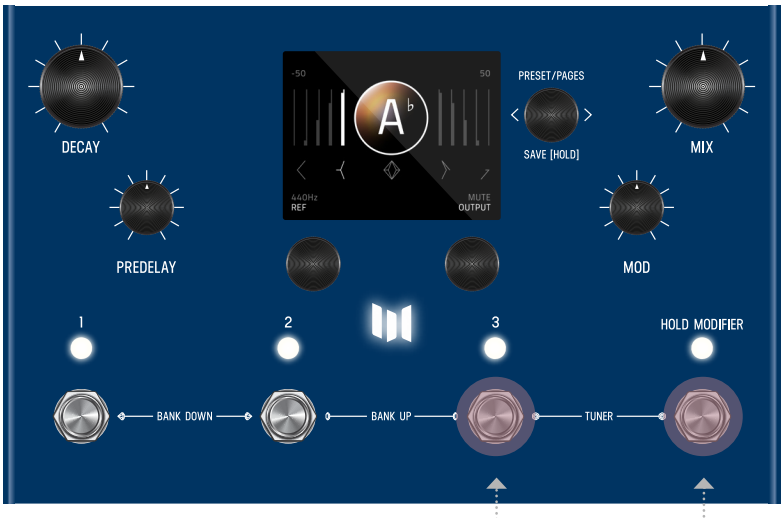
CC# 62	DYNAMICS TYPE	0 TO 15 = OFF 16 TO 31 = COMPRESSOR 32 TO 47 = COMPRESSOR LINK 48 TO 63 = SWELL 64 TO 79 = DIFFUSION 80 TO 95 = LIMITER 96 TO 111 = LIMITER LINK 112 TO 127 = FREEZE
CC# 63	DYNAMICS LOCATION	0 TO 25 = PRE + DRY 26 TO 51 = PRE 52 TO 76 = FEEDBACK 77 TO 102 = PRE TANK 103 TO 127 = POST
CC# 64	DYNAMICS PARAMETER 1	0 TO 127
CC# 65	DYNAMICS PARAMETER 2	0 TO 127
CC# 66	DYNAMICS PARAMETER 3	0 TO 127
CC# 67	DYNAMICS PARAMETER 4	0 TO 127
CC# 68	DYNAMICS PARAMETER 5	0 TO 127
CC# 69	DYNAMICS PARAMETER 6	0 TO 127
CC# 70	PITCH TYPE	0 TO 31 = OFF 32 TO 63 = POLY CHROMA 64 TO 95 = MICRO SHIFT 96 TO 127 = LO-FI
CC# 71	PITCH LOCATION	0 TO 25 = PRE + DRY 26 TO 51 = PRE 52 TO 76 = FEEDBACK 77 TO 102 = PRE TANK 103 TO 127 = POST
CC# 72	PITCH PARAMETER 1	0 TO 127
CC# 73	PITCH PARAMETER 2	0 TO 127
CC# 74	PITCH PARAMETER 3	0 TO 127

CC# 75	PITCH PARAMETER 4	0 TO 127
CC# 76	PITCH PARAMETER 5	0 TO 127
CC# 77	PITCH PARAMETER 6	0 TO 127
CC# 78	FILTER TYPE	0 TO 31 = OFF 32 TO 63 = LADDER 64 TO 95 = STATE VAR 96 TO 127 = PARAMETRIC
CC# 79	FILTER LOCATION	0 TO 25 = PRE + DRY 26 TO 51 = PRE 52 TO 76 = FEEDBACK 77 TO 102 = PRE TANK 103 TO 127 = POST
CC# 80	FILTER PARAMETER 1	0 TO 127
CC# 81	FILTER PARAMETER 2	0 TO 127
CC# 82	FILTER PARAMETER 3	0 TO 127
CC# 83	FILTER PARAMETER 4	0 TO 127
CC# 84	FILTER PARAMETER 5	0 TO 127
CC# 85	FILTER PARAMETER 6	0 TO 127
CC# 86	MOD TYPE	0 TO 21 = OFF 22 TO 42 = 79 CHORUS 43 TO 63 = VIBRATO 64 TO 85 = VOWEL MOD 86 TO 106 = TREMELO 107 TO 127 = HAZY
CC# 87	MOD LOCATION	0 TO 25 = PRE + DRY 26 TO 51 = PRE 52 TO 76 = FEEDBACK 77 TO 102 = PRE TANK 103 TO 127 = POST
CC# 88	MOD PARAMETER 1	0 TO 127
CC# 89	MOD PARAMETER 2	0 TO 127
CC# 90	MOD PARAMETER 3	0 TO 127
CC# 91	MOD PARAMETER 4	0 TO 127

CC# 92	MOD PARAMETER 5	0 TO 127
CC# 93	MOD PARAMETER 6	0 TO 127
CC# 117	TOGGLE TUNER MODE	PRESS = 127
CC# 118	TRIGGER HOLD MODIFIER	PRESS = 127

12 - TUNER

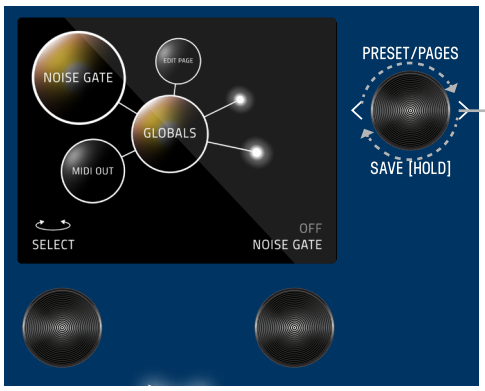
To engage TUNER, HOLD **3** + **HOLD MODIFIER** footswitches. Notes are automatically detected and turn green when accurately tuned. Tuner reference frequency can be adjusted if desired.



HOLD **3** + **TAP** footswitches to engage **TUNER**.

13 - GLOBALS

GLOBALS is located at the end of the EDIT PAGES. To reach the end, continue to turn **C3** knob (clock-wise) and cycle through all categories until you reach GLOBALS. For a shortcut to GLOBALS, it is also behind SYSTEM INFO. See map. Global settings affect all presets and do not change per preset.



CONTROLLER 3 (OR C3)
Turn C3 knob (clock-wise) and cycle thru all categories until you reach GLOBALS.

These settings are universal to the entire MercuryX and do not change with the presets.

- NOISE GATE: Sets the threshold to enable the gate to help with noisy setups
- EDIT PAGE: Text View or Graphic View
- SPILLOVER: With Spillover enabled, echoes from your last preset overlap with your current preset during transitions. [1] [The Spillover needs time to fully decay for the previous preset before it can begin a new spillover for the current preset.]
- DELAY TRAILS: With trails enabled, your echoes will decay naturally when the MercuryX is bypassed
- TAP GLIDE: With glide enabled delay times entered with tap tempo will smoothly transition
- RELAY BYPASS: Buffered Bypass or Relay Bypass [mono input and output only] [2]
- INPUT LEVEL: Instrument or Line/Synth, if clipping occurs in Instrument mode, choose Line/Synth
- KILL DRY: When kill dry is enabled, the MercuryX only passes audio when active. In bypass, the MercuryX is muted. This is useful when working with an external mix control used in some amplifiers, processors, and mixing boards.
- BRIGHTNESS: Sets screen brightness from 0 to 100%
- LOGO LIGHT: Sets logo light brightness from 0 to 100%
- TUNER REFERENCE: Set the tuner reference from 425 Hz to 455 Hz
- TUNER OUT: Mute or Bypass
- TEMPO: Sets the global tempo
- TEMPO DISP: Milliseconds or BPM
- TEMPO SELECT: Select Preset or Global
- TACTILE: Disable the Tactile View Pop Up
- MIDI CHANNEL: 1 through 16, or OMNI
- MIDI OUT: Select MIDI Out or MIDI Thru. When MIDI Thru is enabled, MIDI data received on the MIDI In jack is passed to the MIDI Out jack

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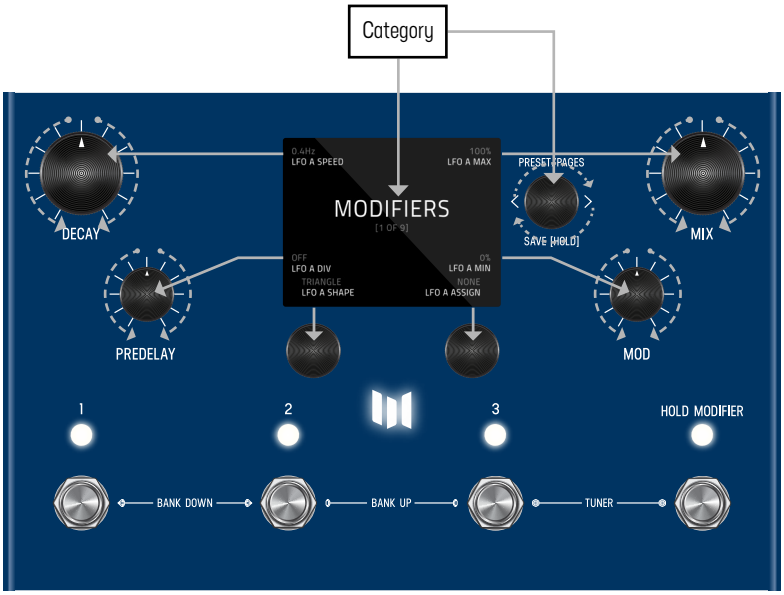
1. MercuryX features a stereo Analog Mix. Analog Mix is always used unless Spillover is Enabled or a processing element is put in the PRE + DRY location.

2. MercuryX features a mono Relay Bypass selectable in the GLOBALS VIEW edit page. Stereo input and output connections necessitate automatically disabling the Relay and switching MercuryX to Analog Buffered Bypass. **NOTE:** Spillover, Trails, and Kill Dry all automatically engage Analog Buffered Bypass if they are selected. This happens transparently in the background in order to always maintain the highest signal integrity.

14 - TEXT VIEW (ALTERNATIVE VIEW OF EDIT PAGE)

The default appearance of the EDIT PAGE is GRAPHIC VIEW, which contain orbiting bubbles that allow for a focused approach to editing. An alternative view of the EDIT PAGE is TEXT VIEW which displays 6 parameters per page. Turn **C3** to cycle through categories. 6 knobs control settings simultaenously. You can change from GRAPHIC VIEW to TEXT VIEW in GLOBALS.
In GLOBALS, turn **C1** to carousel to EDIT PAGE. Turn **C2** and change from GRAPHIC VIEW to TEXT VIEW.



6 SIMULTANEOUS KNOB CONTROL
TEXT VIEW edit page (when set) utilizes 6 knobs to simultaneously control settings. See knobs indicated with grey arrows.

15 - EXPORTING PRESETS

To export a preset from MercuryX, first connect MercuryX's MIDI In and Out jacks to a MIDI Interface on your PC or MAC. Open an app that can record MIDI SysEx. On Mac, we recommend SysEx Librarian. While holding the footswitch for the active preset, quick press the lit LED button above it. The preset will be transmitted as SysEx data from the MercuryX MIDI Out.

16 - FACTORY RESET

To put your MercuryX back to factory fresh condition, press and hold C3 when powering up the MercuryX to enter the Factory Reset View. From the Factory Reset View, **press C1** to start the Factory Reset which resets all presets and globals, or **press C2** to cancel the reset and start the MercuryX normally. **NOTE:** Be sure to back up your custom presets via midi sysex.
Factory reset will erase all user edits to MercuryX factory presets.

17 - FIRMWARE UPDATE

To enter firmware update mode, press and hold footswitch **1 and 3** while powering up MercuryX.
The screen will show a Copy File graphic screen. Connect to your computer via the rear USB C jack. MercuryX will appear on your computer as a USB drive. When updates are available, drag and drop the latest MercuryX firmware image (downloadable from https://www.meris.us/product/mercuryX) from your computer onto MercuryX drive. MercuryX will display a load meter. When the load meter is full and your computer signals that it is done with the copy, eject MercuryX drive before unplugging USB C cable. Power Cycle graphic screen will display. Unplug and replug the power from MercuryX to complete the update.

18 - GLOSSARY

A

Age [Hazy]: Sets the amount of aging typical of a magnetic tape, higher settings provide increasing flutters and hiss.

Attack [Compressor]: The amount of time it takes for the compressor to turn down any input audio that crosses the compressor's threshold. Fast Attack creates a consistent, controlled volume. Long Attack leads to a punchier sound.

Attack Time [Swell]: The length of time for a swell to reach full volume. This time starts when a pick attack (or transient) is detected.

B

Balance [Volume Pedal]: Panning control between left and right channels. -100% results in a fully right channel signal, 100% is fully left.

Bass [78 Room, 78 Plate, 78 Hall]: Sets the reverb decay time below the crossover frequency. [See **Cross** definition]

C

Cross [78 Room, 78 Plate, 78 Hall]: Sets the crossover frequency of the EQ network. It ranges from 0 Hz to 1700 Hz. The Cross control works in conjunction with the Bass and Mids, functioning as a decay time splitter. Everything above the crossover frequency has the decay time set by the Mids control and everything below the crossover frequency has the decay time set by the Bass control.

D

Decimate [Hazy]: Changes the sample rate of the input signal; lower sample rate settings create low resolution audio with overtones similar to ring modulation.

Density [Diffusion]: Adds reflections to the short time delays simulating highly reflective walls in a small space. Use this parameter to soften and smear the your audio

Depth [79 Chorus]: The intensity of modulation. Lower values translate to subtle movement while higher values create strong, detuned effects.

Dispersion [Prism]: Sets the reflectivity and spread pattern of the virtual room. Higher settings result in a thicker sound, at the lowest setting the walls get removed all together.

Distance [Prism]: Sets the distance of the back wall of the virtual room. This can be set to extreme settings for long echoes which become a secondary predelay built right into the tank.

G

Gain [Swell, Tube, Transistor, Op-Amp,]: Adjustment for volume before the Preamp effect.

H

Highs [Hazy]: Shelf EQ cut for high-end frequencies, unity gain at 100%.

L

Level [Volume Pedal, Tube, Transistor, Op-Amp,]: Adjustment for volume after the Preamp.

Lows [Hazy]: Shelf EQ cut for low-end frequencies, unity gain at 100%.

LPF [Diffusion]: Abbreviation for Low Pass Filter. A filter that passes signal below its cutoff frequency, effectively cutting high frequencies.

M

Mids [78 Room, 78 Plate, 78 Hall]: Sets the reverb decay time above the crossover frequency. [See **Cross** definition]

Mix [Compressor, Poly Chroma, Micro Shift, Lo-Fi, '79 Chorus]: Control over the amount of the wet signal mixed with dry, allowing for subtle use.

P

Pitch [Poly Chroma]: Polyphonic pitch adjustment in 20 cent increments [m2 = minor second / half step].

Pitch Left/Right [Micro Shift, Lo-Fi]: Independent, monophonic pitch shifting for left and right channels of a stereo field. This parameter allows for precise control over pitch interval [m2 = minor second / half step].

R

Ratio [Compressor]: Determines the amount of compression applied. Higher ratios result in a more aggressive compression effect. Lower ratios make for subtle compression.

Release [Compressor, Limiter]: When the input volume drops below the Compressor Threshold, Release determines the amount of time for the compression effect to return to neutral. Slow Release creates a smooth, natural compression effect. Fast Release creates a loud, even signal, often described as a "pumping" effect.

Resonance [Ladder, State Variable, Parametric]: Sets the range of frequencies [around the center Frequency, that are allowed to pass through the filter. At lower settings, more frequencies are allowed to pass through the filter, at higher settings less frequencies are allowed through.

S

Speed [79 Chorus, Vibrato, Vowel Mod, Tremolo]: The rate of change in modulation effects. For most effects, .5 hz is a great starting point.

Spread [Ladder, State Variable]: Offsets the parameter on the right side. When the Spread parameter is at zero, both left and right channels of the effect behave the same way.

T

Threshold [Compressor, Limiter]: The amount of volume needed to trigger the Compressor/Limiter effect.

Tilt Eq [Gravity]: Controls the filtering for the reverb tank. Set to noon [0%] for no filtering, set towards minimum for a darker filter, set towards maximum for a brighter filter.

Topology [Ladder, State Variable, Parametric]:

Lowpass A filter that passes signal below its cutoff frequency, effectively cutting high frequencies.
Bandpass: A filter with a selective, narrow bandwidth. This attenuates both high and low end frequencies.
Highpass: A filter that passes signal above its cutoff frequency, effectively cutting low frequencies.

Treble [78 Room, 78 Plate, 78 Hall]: Sets a corner frequency above which the decay rapidly declines.
This has the effect of darkening the reflections by adding absorption to the surfaces of the reverb space.

W

Warble [Hazy]: Sets the depth for slow, tape like, pitch modulations.

Waveshape [Tremolo]: Select the shape the Ring Mod effect follows. The Sine waveshape is smooth and even, while the Square waveshape is abrupt and noticeable.

19- TECHNICAL SPECIFICATIONS

Conversion:	24 bit A/D and D/A
DSP:	32 bit floating point
Sample Rate:	48000 Hz
Input Impedance:	1 Meg Ohm
SNR:	115 dB Typical
Frequency Response:	20Hz-20kHz
Max Input Level:	+9 dBu (instrument level setting)
	+12.5 dBu (line/synth level setting)
Power:	9V DC center-negative, 300mA, 2.1mm jack
Bypass:	Selectable True Bypass (Relay) or Analog Buffered Bypass
Dimensions:	7.25" wide, 4.5" long, 2" tall
Weight:	24 ounces

Federal Communications Commission Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment requires shielded interface cables in order to meet FCC class B limit.
Any unauthorized changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.