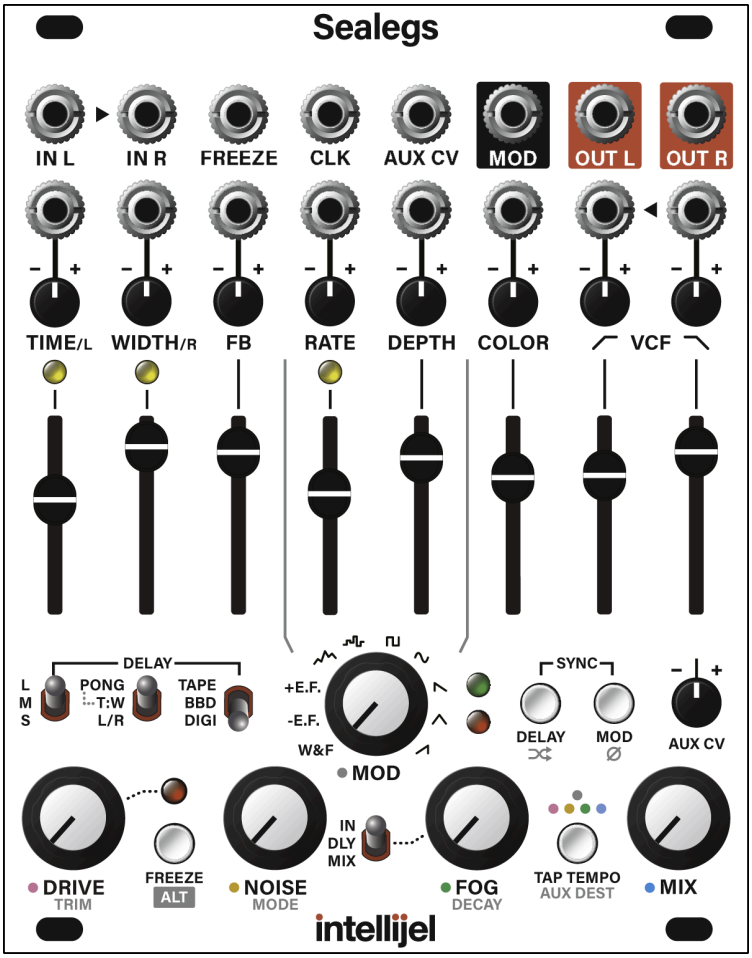
intellijel

Sealegs

Multi-Modeled Stereo Character Delay with Reverb



Manual (English)
Firmware: 1.2
Revision: 2024.06.13

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COMPLIANCE

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.

Changes or modifications not expressly approved by Intellijel Designs, Inc. could void the user's authority to operate the equipment.

Any digital equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

This device meets the requirements of the following standards and directives:

EMC: 2014/30/EU
EN55032:2015 ; EN55103-2:2009 (EN55024) ; EN61000-3-2 ; EN61000-3-3

Low Voltage: 2014/35/EU
EN 60065:2002+A1:2006+A11:2008+A2:2010+A12:2011

RoHS2: 2011/65/EU

WEEE: 2012/19/EU

INSTALLATION

Intellijel Eurorack modules are designed to be used with a Eurorack-compatible case and power supply. We recommend you use Intellijel cases and power supplies.

Before installing a new module in your case, you must ensure your power supply has a free power header and sufficient available capacity to power the module:

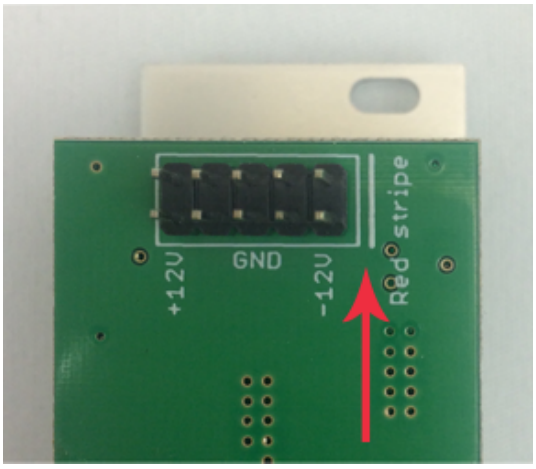
- Sum up the specified +12V current draw for all modules, including the new one. Do the same for the -12 V and +5V current draw. The current draw will be specified in the manufacturer's technical specifications for each module.
- Compare each of the sums to specifications for your case's power supply.
- Only proceed with installation if none of the values exceeds the power supply's specifications. Otherwise you must remove modules to free up capacity or upgrade your power supply.

You will also need to ensure your case has enough free space (hp) to fit the new module. To prevent screws or other debris from falling into the case and shorting any electrical contacts, do not leave gaps between adjacent modules, and cover all unused areas with blank panels. Similarly, do not use open frames or any other enclosure that exposes the backside of any module or the power distribution board.

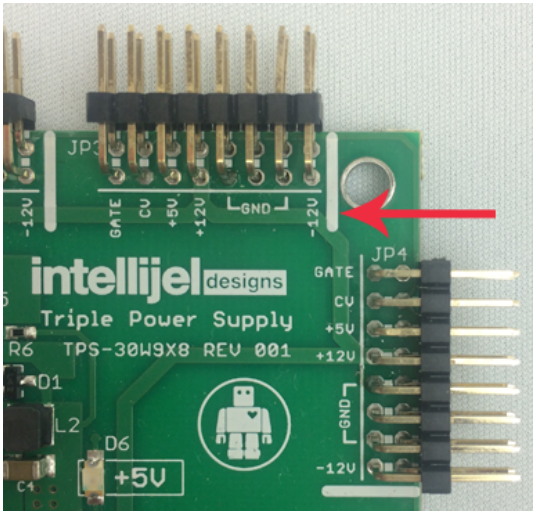
You can use a tool like ModularGrid to assist in your planning. Failure to adequately power your modules may result in damage to your modules or power supply. If you are unsure, please contact us before proceeding.

Installing Your Module

When installing or removing a module, always turn off the power to the case and disconnect the power cable. Failure to do so may result in serious injury or equipment damage.

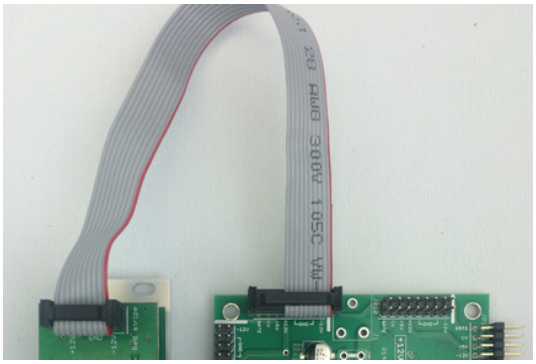


Ensure the 10-pin connector on the power cable is connected correctly to the module before proceeding. The red stripe on the cable must line up with the -12V pins on the module's power connector. The pins are indicated with the label -12V, a white stripe next to the connector, the words "red stripe", or some combination of those indicators. Some modules have shrouded headers to prevent accidental reversal.



Most modules will come with the cable already connected, but it is good to double check the orientation. Be aware that some modules may have headers that serve other purposes so ensure the cable is connected to the correct one.

The other end of the cable, with a 16-pin connector, connects to the power bus board of your Eurorack case. Ensure the red stripe on the cable lines up with the -12V pins on the bus board. On Intellijel power supplies the pins are labelled with "-12V" and/or a thick white stripe, while others have shrouded headers to prevent accidental reversal:



If you're using another manufacturer's power supply, check their documentation for instructions.

Before reconnecting power and turning on your modular system, double check that the ribbon cable is fully seated on both ends and that all the pins are correctly aligned. If the pins are misaligned in any direction or the ribbon is backwards you can cause damage to your module, power supply, or other modules.

After you have confirmed all the connections, you can reconnect the power cable and turn on your modular system. You should immediately check that all your modules have powered on and are functioning correctly. If you notice any anomalies, turn your system off right away and check your cabling again for mistakes.

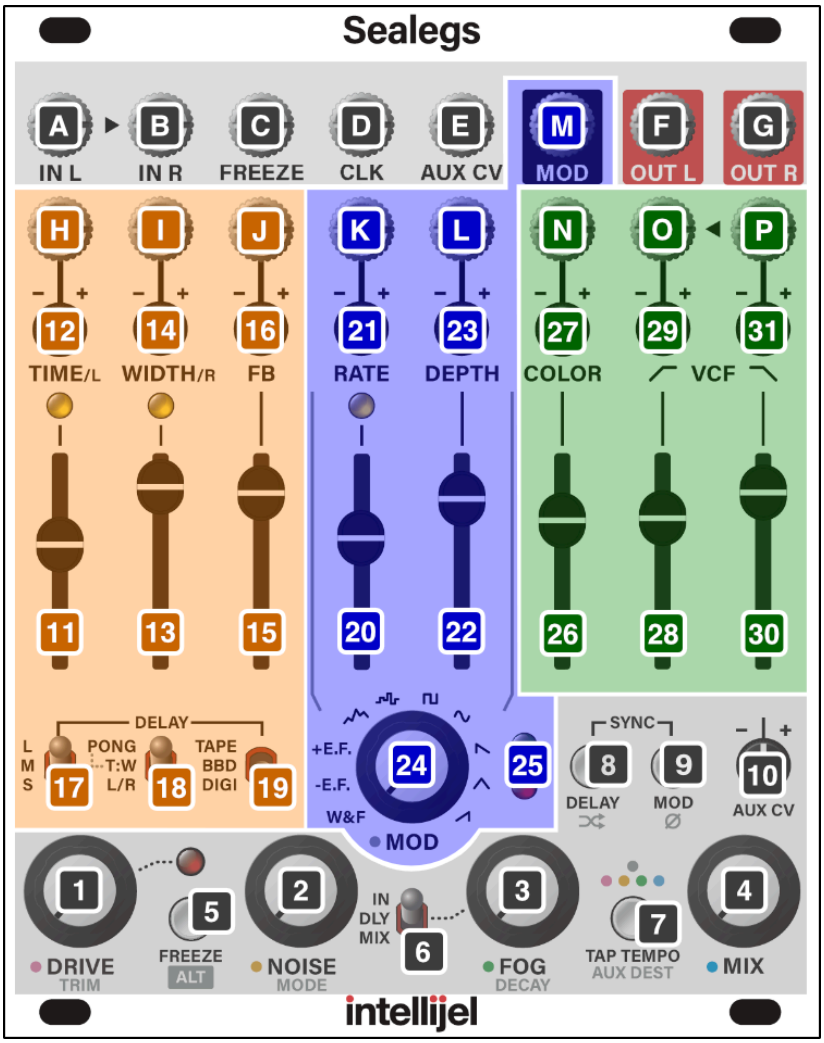
OVERVIEW

Our design goal for Sealegs was to create the warmest, most musical and organic delay module possible — something that would sweeten and enhance any audio one chose to feed into it.

As such, great care has gone into modeling the most characterful sonic characteristics of three different types of delays circuits (tape; bucket brigade, and digital). A plethora of onboard controls enable you to dial in exactly the sound you want, with synced or un-synced delays times (for both left and right channels); a built in modulator with 7 crossfading waveshapes, a Wow & Flutter emulation, and an envelope follower; plus dedicated low- and high-pass filters; built-in hiss & crackle noises; per-model color controls; a spacious reverb; and a re-configurable signal flow through the unit. In addition, attenuverted modulation inputs abound — ensuring the delay ebbs and flows with your musical needs.

FRONT PANEL OVERVIEW

As seen here, the Sealegs panel comprises four basic areas:



- GREY : **GLOBAL**

  Input jacks and drive settings; output jacks and mix settings; freeze functions; noise and fog controls; sync options; and an assignable Auxiliary CV.

- ORANGE: **DELAY**

  Delay-specific features, including the delay model; delay times; feedback and width controls; and stereo routing options.

- BLUE : **MOD**

  This area comprises a built-in, syncable modulation source with numerous waveshapes. It's internally routed to the Delay Time (via the DEPTH slider), and is also available (sans DEPTH) at the dedicated MOD output jack.

- GREEN : **CHARACTER**

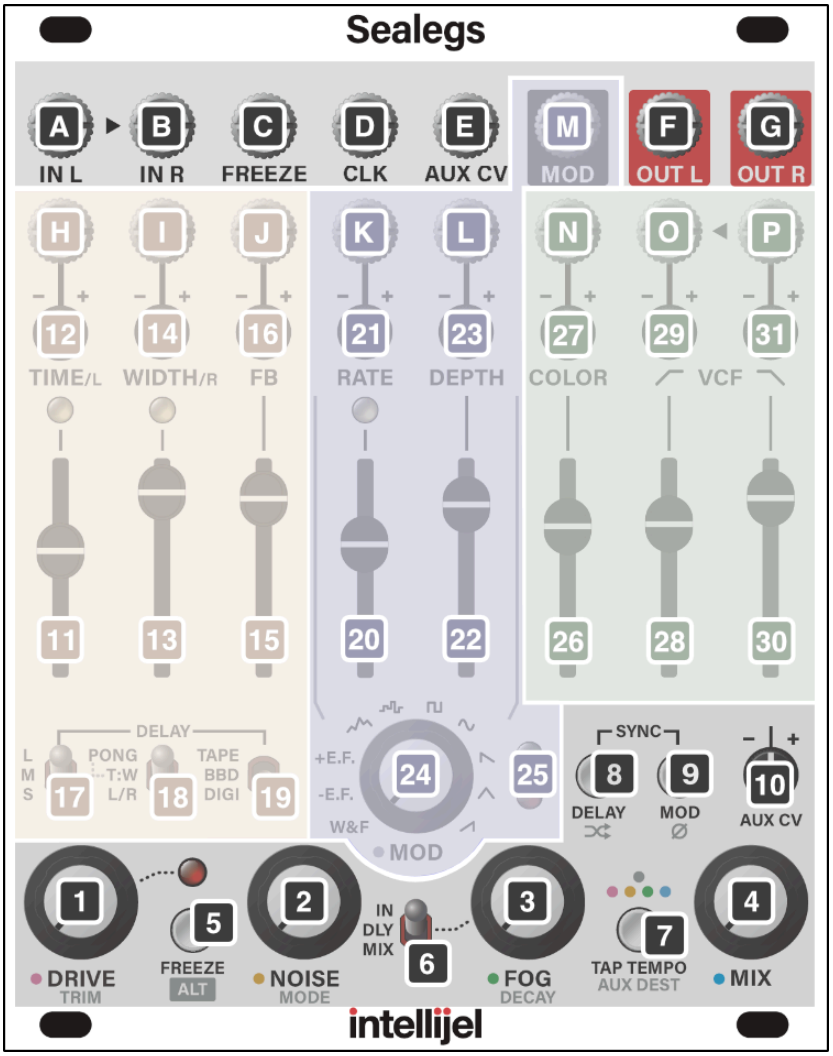
  This section consists of a dedicated COLOR parameter that's uniquely tuned to each of Sealegs' three delay models (TAPE, BBD and DIGI), plus Low Pass and High Pass filters, which sit inside the feedback loop (unless frozen), enabling frequency response characteristics that change over time.

The following sections describe each block and its various jacks and controls in detail.

FRONT PANEL : GLOBAL FUNCTIONS

Sealegs' global functions consist of its input jacks and drive settings; output jacks and mix settings; freeze functions; noise and fog controls; sync options; and an assignable Auxiliary CV.

Global Controls



[1] **DRIVE** knob : The knob has both a "standard" and an ALT function.

- STANDARD : Operates as a combination input level and overdrive control. When fully counterclockwise, the input level is fully attenuated, and nothing feeds into Sealegs. At noon, the input is at unity gain (meaning the delay is fed with a signal level equal to that of the input). Clockwise from noon, the DRIVE knob will either add additional gain (if the input was below 5V) or it will begin to overdrive the delay (once the 5V threshold is reached).

  Associated with the DRIVE knob is the DRIVE LED, which (in STANDARD operation) turns red to indicate overdrive is engaged.

  *NOTE: By default, Sealegs taps its DRY signal after the overdrive circuit, so you can also use Sealegs as a drive-only module with the **MIX** [4] knob turned fully counterclockwise. However, you can change the position of the DRIVE circuit by holding down the **ALT** [5] button while toggling the **FOG/DRIVE position** [6] switch. See the description of that switch for more information.*

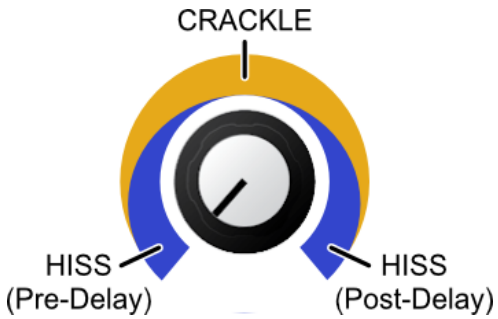
- ALT : While holding down the **ALT** [5] button, this knob operates as an input trim control — adjusting the input into the drive circuit, itself. At noon (default), the trim is 1x; When fully CCW, the signal is trimmed by half; When fully CW, the input is boosted by 2.5x. This allows you to set the input gain staging for optimum performance.

  Also, the DRIVE LED functions differently when the **ALT** [5] button is held down — reflecting the trimmed, pre-drive input level (rather than the actual amount of overdrive).

  To set the input trim, hold down the **ALT** [5] button and turn the DRIVE knob while monitoring the LED. Optimize the signal-to-noise ratio by setting this **ALT** DRIVE level such that only the loudest peaks are just shy of lighting the **ALT** DRIVE LED.

[2] **NOISE** knob: This knob has both a “standard” and an ALT function.

- STANDARD : Varies the amount of noise injected into the signal path.
- ALT : While holding down the **ALT** [5] button, turning this knob changes the **NOISE MODE**. Fully counterclockwise, the noise consists of hiss introduced prior to the delay section. As you turn the knob clockwise, you introduce crackle into the pre-delay noise signal, which achieves full percentage at noon, before declining past noon as post-delay hiss is introduced.



[3] **FOG** knob : This knob has both a “standard” and an ALT function.

- STANDARD : Controls the level of the built-in fog (reverb). The reverb can be inserted at different parts of the signal chain, using the **FOG POSITION** [6] switch.
- ALT : Holding the **ALT** [5] button, while turning this knob varies the **FOG DECAY** time.

[4] **MIX** level : Sets the wet/dry mix. When fully counterclockwise, only the dry input signal is sent to the **OUT L** [F] and **OUT R** [G] jacks. When fully clockwise only the wet (affected) signal is sent to the outputs. Settings in between contain a mix of dry and wet signals.

[5] **FREEZE / ALT** button : When tapped, this button toggles the delay freeze on and off. When lit **cyan**, the delay buffer is frozen (no additional data is written to it) and loops continuously until unfrozen.

When held down, it functions as an **ALT** button, allowing access to the secondary (grey) parameters demarcated on several buttons and knobs.

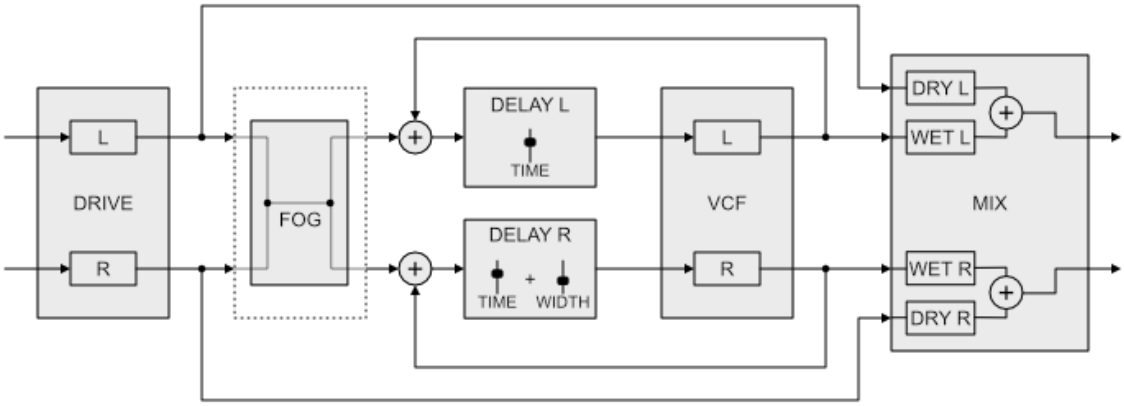
NOTE 1: When Sealegs is frozen, the VCF circuit moves outside the feedback loop, where it affects only the delay's output signal.

NOTE 2: Since TAPE and BBD modes emulate an analog style freeze (that is, cutting the input to the delay and locking feedback at 100%), they will absorb modulation and time changes into the frozen audio path. Specifically, each mode responds to freezing as follows:

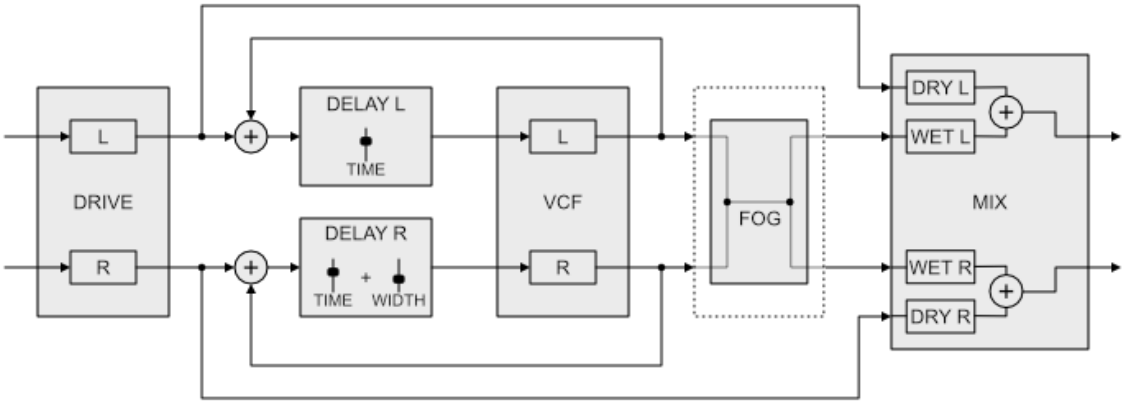
- *BBD: When frozen, you may find accumulating signal/frequency loss by nature of emulating an analog BBD with limited sample rate — especially at longer times.*
- *TAPE: When frozen, TAPE mode will hold the freeze much better, while slowly saturating the audio as a tape delay would.*
- *DIGITAL: Digital mode actually freezes the audio buffer, and will maintain its content indefinitely, and it will not be modified by modulation or time changes.*

[6] **FOG/DRIVE POSITION** switch : This switch has both a “standard” and an ALT function,

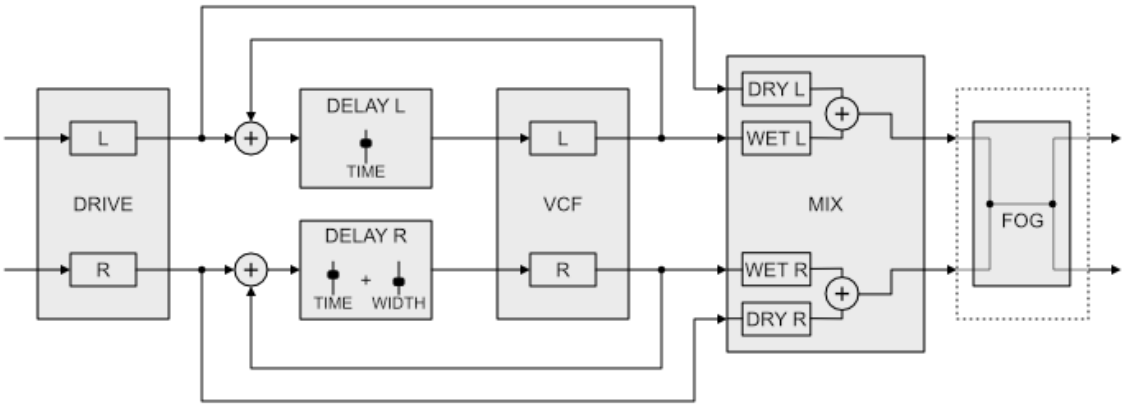
- STANDARD : The switch selects where, in the signal path, the FOG circuit is inserted:
  - IN (top) : Fog is positioned after the input drive, but before the signal is sent into the delay circuit. The following illustration depicts this Fog location with the **STEREO CONFIG** **[18]** switch in the middle position, and the **CROSS FB** **[8]** feature turned off.



  - DLY (mid) : Fog is positioned after the delay circuit, but before the MIX, meaning it affects only the wet signal. The following illustration depicts this Fog location with the **STEREO CONFIG** **[18]** switch in the middle position, and the **CROSS FB** **[8]** feature turned off.



- MIX (bottom) : Fog is positioned at the very end of the signal chain, post MIX — meaning it affects both the wet and the dry signals. The following illustration depicts the Fog location with the **STEREO CONFIG** [18] switch in the middle position, and the **CROSS FB** [8] feature turned off.



- ALT : While holding down the **ALT** [5] button, the switch selects where, in the signal path, the DRIVE circuit is inserted:
  - IN (top) : (Default) Sealegs taps the DRY signal *after* the overdrive circuit, so you can also use Sealegs as a drive-only module with the **MIX** [4] knob turned fully counterclockwise.
  - DLY (mid) : DRIVE is positioned after the delay circuit, but before the MIX, meaning it affects only the wet signal. As with the IN position, the signal is cut when the DRIVE knob is at zero. If FOG Position is set to IN, then DRIVE will be fed INTO the FOG before it's passed to the delay. This position is great for "Send" style Dub FX, since your dry signal will just be passed through (unaffected) to the Dry Side of Wet/Dry balance.
  - MIX (bottom) : DRIVE is positioned at the very end of the signal chain, post MIX — meaning it affects both the wet and the dry signals. It's also positioned POST-FOG, when the FOG position is also set to the MIX position. This mode is different in that it has a minimum level, and can not be closed like a VCA.
  - *NOTE 1: When selecting a position for DRIVE, the current state of the FOG position will be maintained until the switch is moved without the ALT button held down.*
  - *NOTE 2: DRIVE position will be stored in the settings, and will be reloaded the next time the module is booted.*

[7] **TAP TEMPO / AUX DEST** button : This button has both a “standard” and an ALT function.

- STANDARD : This button works as a tap tempo button for the DELAY TIME and MOD rate settings. Tap the button repeatedly to set a tempo. Tap Tempo is ignored unless the delay time or mod rate is being synchronized (i.e., either the **DELAY SYNC** [8] or **MOD SYNC** [9] buttons are lit), and nothing it patched into the **CLK** [D] input.
    - When **MOD SYNC** is on, and using an external clock: Pressing **TAP TEMPO** will reset phase of the MOD LFO on the next external clock pulse.
    - When **MOD SYNC** is on, and using **TAP TEMPO** to set the rate: Pressing **TAP TEMPO** will reset phase of the MOD LFO immediately.
- ALT : While holding down the ALT [5] button, press this button repeatedly to cycle through destination options for the **AUX CV IN** [E]. There are five destination options as indicated by button color and panel graphics. Specifically:

  Magenta (single flash): A signal patched into the **AUX CV IN** [E] jack controls the **DRIVE** [1] at a depth set by the **AUX CV attenuverter** [10].

  Yellow (2x flashes): A signal patched into the **AUX CV IN** [E] jack controls the **NOISE** [2] at a depth set by the **AUX CV attenuverter** [10].

  White (3x flashes): A signal patched into the **AUX CV IN** [E] jack varies the **MOD** [24] waveforms at a depth set by the **AUX CV attenuverter** [10].

  Green (4x flashes): A signal patched into the **AUX CV IN** [E] jack controls the **FOG** [3] at a depth set by the **AUX CV attenuverter** [10].

  Blue (5x flashes): A signal patched into the **AUX CV IN** [E] jack controls the **MIX** [4] at a depth set by the **AUX CV attenuverter** [10].

[8] **DELAY SYNC / FB CROSS** button : This button has both a “standard” and an ALT function.

- STANDARD : Press this button to turn DELAY SYNC on/off. When the button is lit (orange), the DELAY TIME is synchronized to either an incoming clock (patched into the **CLOCK IN** [D] jack) or to a tempo tapped on the **TEMPO** [7] button. See the discussion of the **TIME RANGE** [11] slider, later in this manual, to learn about various clock division/multiplication settings.
- ALT : While holding down the ALT [5] button, press this button to turn Crossed Feedback on and off. The button is lit (blue) when the ALT [5] button is held down, and the feedback is crossed — which means the feedback from the left delay is fed into the input of the right delay, and vice versa. How, exactly, the feedback gets crossed depends upon the position of the **STEREO MODE** [18] switch, and is thus described in more detail in that section of the manual.

Additionally, you can clear the current delay buffer by long-pressing the DELAY SYNC button for >1 second.

[9] **MOD SYNC / MOD PHASE** button : This button has both a “standard” and an ALT function.

- STANDARD : Press this button to turn MOD SYNC on/off. When the button is lit (orange), the **MOD RATE** [20] is synchronized to either an incoming clock (patched into the **CLOCK IN** [D] jack); or to a tempo tapped on the **TEMPO** [7] button. See the discussion of the **MOD RATE** [20] slider, later in this manual, to learn how it divides/multiplies the clock. *NOTE: MOD RATE synchronization occurs only on the oscillating MOD waveshapes. Neither Wow & Flutter nor the Envelope Followers synchronize to clock.*
- ALT : While holding down the ALT [5] button, press this button to turn phase-inversion of the internal MOD WAVE on/off. The button is lit (blue) when the ALT [5] button is held down, and the MOD PHASE is inverted. This only phase-inverts the internal MOD WAVE that affects the right channel’s delay time. MOD phase inversion has no effect on the left-channel’s internal MOD, nor does it affect the dedicated **MOD** [M] output.

[10] **AUX CV** attenuverter : Scales the amount (and polarity) of the voltage sent into the **AUX CV IN** [E] jack. The full range of the control voltage is used when the knob is fully clockwise, and the voltage is attenuated as you rotate the knob counter-clockwise toward noon (straight up). At the noon (straight up) position, the incoming CV is fully attenuated, meaning it has no effect on the AUX CV DESTINATION (as set by holding the ALT [5] button and repeatedly pressing the **AUX DEST** [7] button). Turning the knob counterclockwise from the noon position inverts the incoming CV (positive voltages become negative, and vice-versa), with the voltage level steadily increasing until the full (but inverted) range is reached when the knob is fully counter-clockwise.

Global I/O Jacks

[A] **IN L** : Left channel input for the signal you want processed through Sealegs.

If you're processing a mono signal, then use this jack as the mono input, and leave **IN R** [B] unpatched.

[B] **IN R** : Right channel input for the stereo signal you want processed through Sealegs.

If nothing is patched into this jack, then the mono signal that's patched into **IN L** [A] is normalled to it.

[C] **FREEZE IN** : A high gate patched into this jack enables the **FREEZE** [5] function, while a low gate unfreezes it.

[D] **CLK IN** : If the **DELAY SYNC** [8] and/or the **MOD SYNC** [9] buttons are lit, then this is the clock source to which the **TIME/L** [11] and **MOD RATE** [20] sliders will sync. You must patch a clock into the CLK IN jack in order for sync to work.

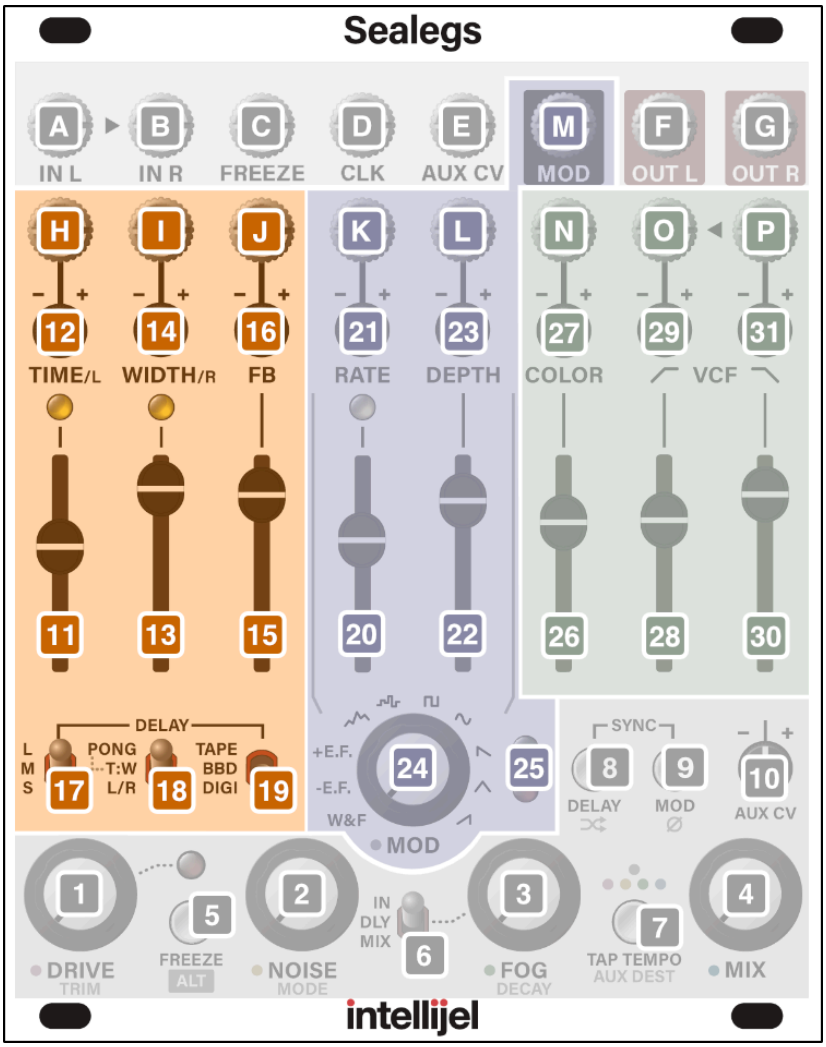
[E] **AUX CV IN :** Control voltage input with an assignable destination (using the ALT [5] + **AUX DEST** [7] buttons), plus a dedicated **AUX CV** [10] attenuverter.

[F] **OUT L** : Left channel audio output.

[G] **OUT R** : Right channel audio output.

FRONT PANEL : DELAY FUNCTIONS

Delay Function Controls



[11] **TIME/L slider** : Sets the length of time that an incoming signal is delayed before being passed through to the output. Shorter delay times are at the bottom of the slider, and longer delay times are at the top.

The range of available delay times depends on the position of the **TIME RANGE** **[17]** switch. Delay times can be freely set, or synchronized (via the **DELAY SYNC** **[8]** button) to either a clock signal patched into the **CLK** **[D]** jack or a tempo tapped on the **TAP TEMPO** **[7]** button.

When sync'd, the DELAY TIME slider selects standard, dotted, and triplet note divisions in sync with the clock. The value of those note divisions depends on the setting of the **TIME RANGE** **[17]** switch.

When un-sync'd, and free-running, the slider works over a range of 3.125 ms - 93.75 ms; 50 ms - 1.5 s; or 200 ms - 6 s, as set with the **TIME RANGE** **[17]** switch.

When the **STEREO CONFIG** **[18]** switch is set to either PONG or T:W, the TIME/L slider sets the primary delay time, while the **WIDTH/R** **[13]** slider sets the time offset for the second delay channel. When the **STEREO CONFIG** **[18]** switch is set to L/R, the TIME/L slider directly sets the delay time for whichever delay is routed to the LEFT, while **WIDTH/R** **[13]** slider directly sets the delay time for whichever delay is routed to the RIGHT.

[12] **TIME CV attenuverter** : Scales the amount (and polarity) of the voltage sent into the **TIME CV** **[H]** jack. The full range of the control voltage is used when the knob is fully clockwise, and the voltage is attenuated as you rotate the knob counter-clockwise toward noon (straight up). At the noon (straight up) position, the incoming CV is fully attenuated, meaning it has no effect on the current DELAY TIME. Turning the knob counterclockwise from the noon position inverts the incoming CV (positive voltages become negative, and vice-versa), with the voltage level steadily increasing until the full (but inverted) range is reached when the knob is fully counter-clockwise.

[13] **WIDTH/R slider** : Sets a delay time for the second delay channel. Depending on the position of the **STEREO CONFIG** **[18]** button, the WIDTH/R will either add an offset to the primary delay time (as set with the **TIME/L** **[10]** slider), or set the right channel's delay time directly. Specifically:

- When the **STEREO CONFIG** **[18]** switch is set to either PONG or T:W, the WIDTH/R slider adds an offset to the primary delay time (as set with the **TIME/L** **[10]** slider). When the WIDTH/R slider is at the bottom, the offset is 0%, meaning there is no additional delay time added to the second delay channel. When the WIDTH/R slider is at the top, the second delay is 33% longer than the primary delay. Settings between the two extremes offset the delays between 0% and 33%.

- When the **STEREO CONFIG** **[18]** switch is set to L/R, the WIDTH/R slider sets the right channel delay time directly. In this configuration, the WIDTH/R slider sets the right channel delay time exactly like the **TIME/L** **[10]** slider sets the left channel delay time, and is also affected by the **TIME RANGE** **[17]** switch.

[14] **WIDTH CV attenuverter** : Scales the amount (and polarity) of the voltage sent into the **WIDTH CV** **[I]** jack. The full range of the control voltage is used when the knob is fully clockwise, and the voltage is attenuated as you rotate the knob counter-clockwise toward noon (straight up). At the noon (straight up) position, the incoming CV is fully attenuated, meaning it has no effect on the current WIDTH setting. Turning the knob counterclockwise from the noon position inverts the incoming CV (positive voltages become negative, and vice-versa), with the voltage level steadily increasing until the full (but inverted) range is reached when the knob is fully counter-clockwise.

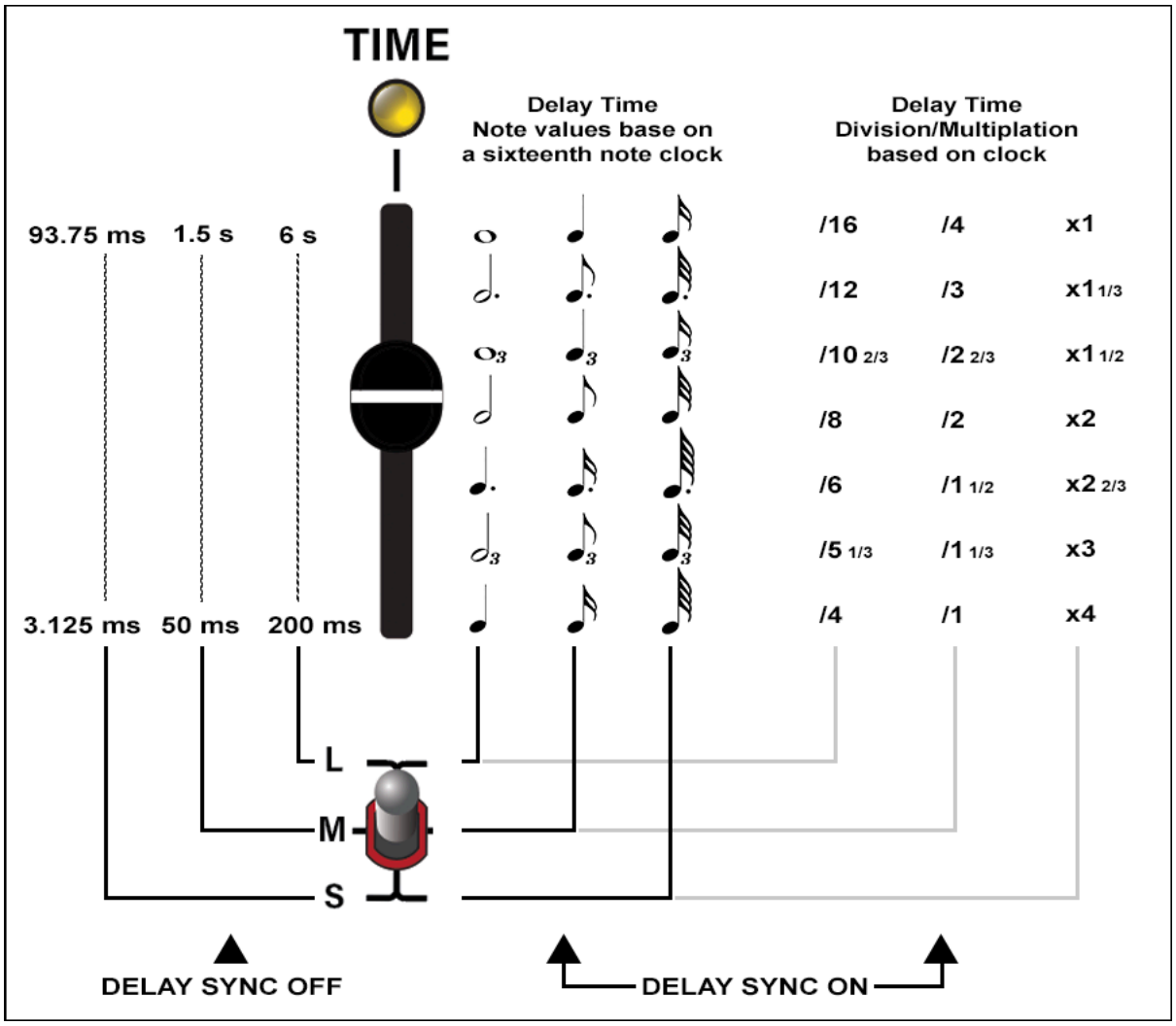
[15] **FB slider** : Sets how much of the delayed signal is fed back into the input, creating repeating echoes. In general, feeding back really short delay times (<20ms or so) creates flange-like effects; delays up to around 50ms create chorus or doubling effect, and delays longer than around 50-60ms create discrete echoes, patterns or (at longer times) looping effects.

The feedback slider goes up to 160%, meaning it's possible to create runaway feedback effects, where the volume increases over time.

[16] **FB CV attenuverter** : Scales the amount (and polarity) of the voltage sent into the **FB CV IN** **[J]** jack. The full range of the control voltage is used when the knob is fully clockwise, and the voltage is attenuated as you rotate the knob counter-clockwise toward noon (straight up). At the noon (straight up) position, the incoming CV is fully attenuated, meaning it has no effect on the current FEEDBACK amount. Turning the knob counterclockwise from the noon position inverts the incoming CV (positive voltages become negative, and vice-versa), with the voltage level steadily increasing until the full (but inverted) range is reached when the knob is fully counter-clockwise.

[17] **TIME RANGE switch** : Governs the **TIME/L** **[11]** slider's overall value range (and the **WIDTH/R** **[13]** slider's if the **STEREO CONFIG** **[18]** switch is set to L/R).

The range options are different depending on whether or not the DELAY TIME is being sync'd to a clock, as shown in the illustration below.



When the DELAY TIME is *NOT* sync'd (i.e., the **DELAY SYNC** [8] button is *not* lit), the switch offers the following range options:

- LONG (top) : DELAY TIME slider operates from 200 ms - 6 s
- MED (middle) : DELAY TIME slider operates from 50 ms - 1.5 s
- SHORT (bottom) : DELAY TIME slider operates from 3.125 ms - 93.75 ms

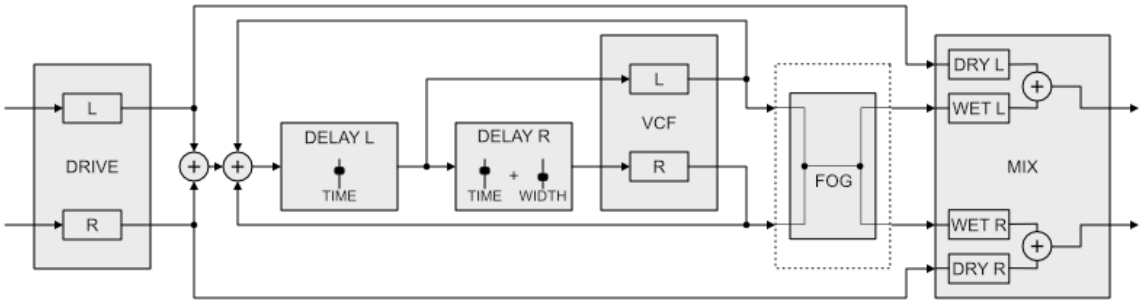
When the DELAY *is* sync'd (i.e., the **DELAY SYNC** [8] button *is* lit), the switch offers the following range options:

- LONG (top) : The DELAY TIME slider sets the range of available metric values from a quarter note to a whole note (based on an incoming CLOCK of a sixteenth note). For the more mathematically minded, this results in a range of delay times that repeat from ¼ the rate of the incoming clock to 1/16 the rate, meaning longer delay times.
- MED (middle) : The DELAY TIME slider sets the range of available metric values from a sixteenth note to a quarter note (based on an incoming CLOCK of a sixteenth note). This results in a range of delay times that repeat from the clock's rate up to ¼ of the clock's rate (so 4 clocks per repeat).
- SHORT (bottom) : The DELAY TIME slider sets the range of available metric values from a sixty-fourth note to a sixteenth note (based on an incoming CLOCK of a sixteenth note). This results in a range of delay times that repeat from 4 times the rate of the incoming clock (in other words, faster delays) up to the clock rate.

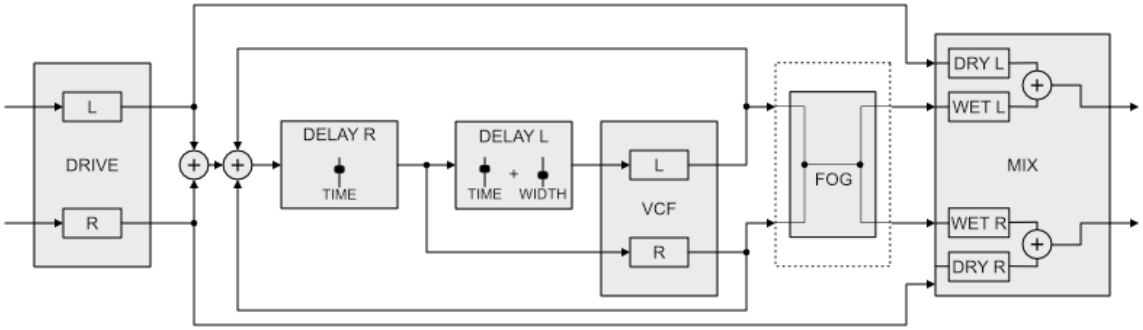
[18] STEREO CONFIG switch : This switch positions Sealegs' dual delay lines into one of three different stereo configurations:

- **PONG** (top) : The Left and Right inputs are summed to mono and sent into the delay loop, which positions the two delays in series. The first delay time is set by the **TIME/L [11]** slider, while the second delay time is the sum of the **TIME/L [11]** value and an additional offset (0% - 33%) set by the **WIDTH/R [13]** slider.

  Below, we see the PONG routing with the **FOG POSITION [6]** switch in the middle (Post Delay) position, and the **ALT FB CROSS [8]** setting in its default (off) state.



If **ALT FB CROSS [8]** is enabled, then crossing the feedback reverses the order of the delays, with the left delay following the right in the serial chain:

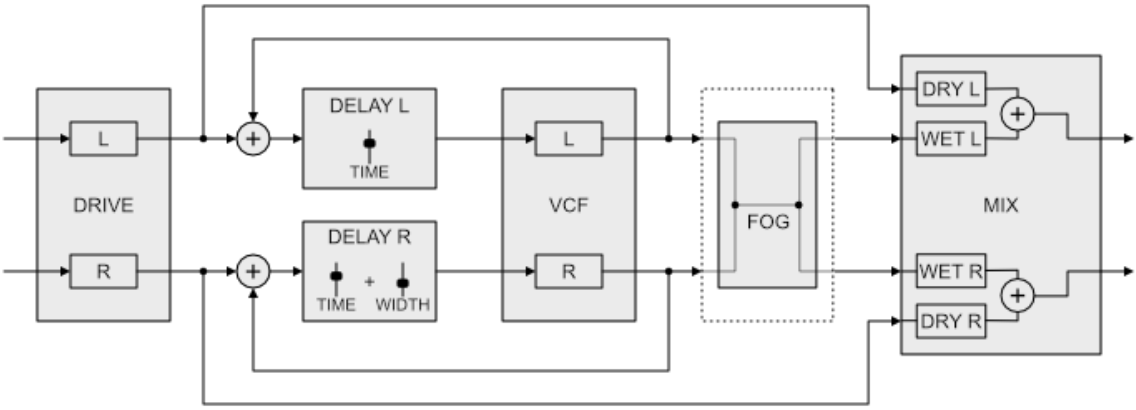


- **T:W** (middle) : In this configuration, the delay lines are in parallel, with the left input feeding the left delay line and the right input feeding the right delay line.

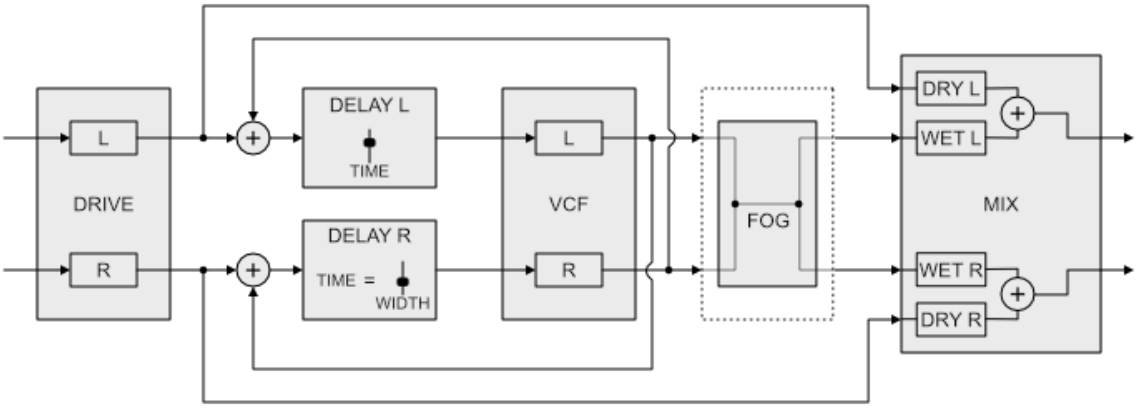
  The left delay time is set by the **TIME/L** **[11]** slider (in congress with the **TIME RANGE** **[17]** switch).

  The right delay time is set by the **WIDTH/R** **[13]** slider, which offsets the time set by the left delay. When the **WIDTH/R** **[13]** slider is at the bottom, the offset is 0%, meaning there is no additional delay time added to the right delay. When the **WIDTH/R** **[13]** slider is at the top, the right delay is 33% longer than the left delay. Settings between the two extremes offset the delays between 0% and 33%.

  Below, we see the T:W routing with the **FOG POSITION** **[6]** switch in the middle (Post Delay) position, and the **ALT** **FB CROSS** **[8]** setting in its default (off) state.



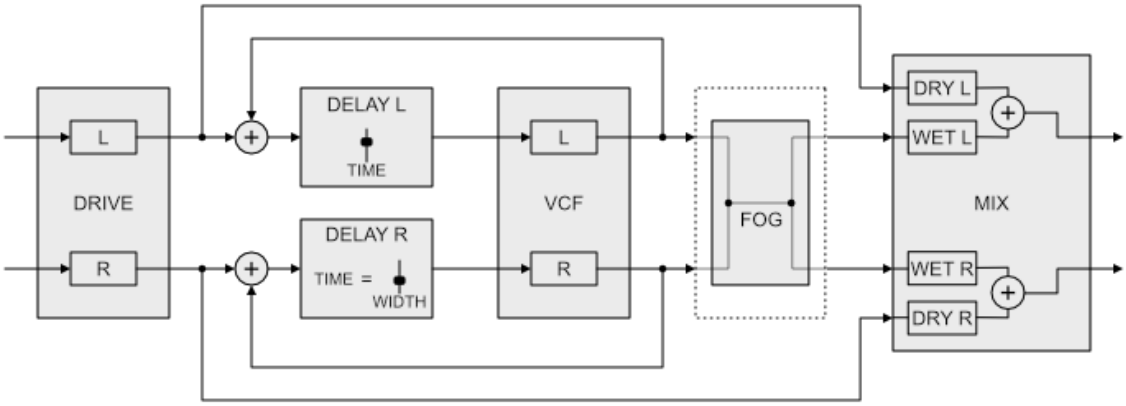
  If **ALT** **FB CROSS** **[8]** is enabled, then crossing the feedback sends the output of the Right delay back into the Left input, and vice versa, creating the following routing:



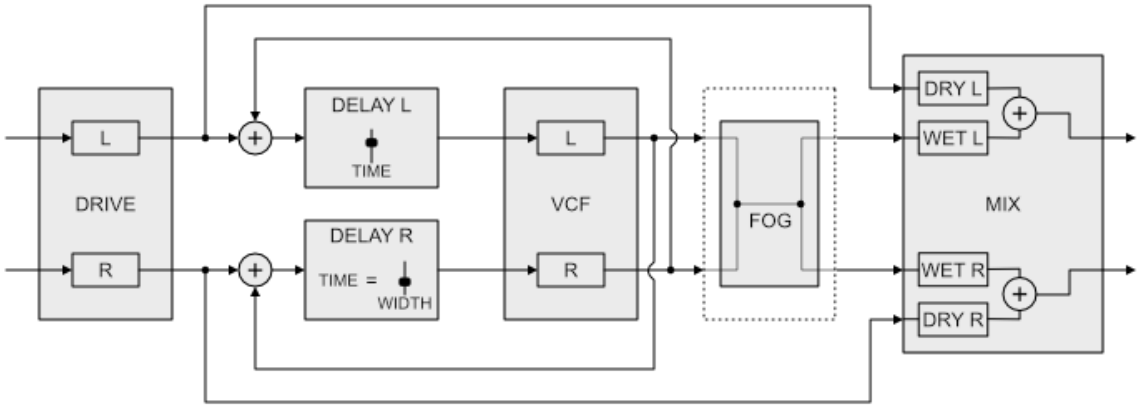
- **L/R** (bottom) : This configuration is similar to the T:W, except it allows you to set the left and right delay times independently.

  The **TIME/L [11]** slider directly sets the Left delay time, and the **WIDTH/R [13]** slider directly sets the Right delay time. In L/R configuration, the **WIDTH/R [14]** slider is no longer used as a delay time offset (as with PONG or T:W configurations), but is used to set the right channel delay time directly.

  Below, we see the L/R routing with the **FOG POSITION [6]** switch in the middle (Post Delay) position, and the **ALT FB CROSS [8]** setting in its default (off) state.



  If **ALT FB CROSS [8]** is enabled, then crossing the feedback sends the output of the Right delay back into the Left input, and vice versa, creating the following routing:



[19] **MODEL** switch : Sets the delay type used by Sealegs:

- TAPE (top) : Replicates the characteristics of tape-based delays, with the additional **COLOR** **[26]** slider introducing additional tape-related degradations.
- BBD (mid) : Replicates the characteristics of bucket brigade style delays, with the **COLOR** **[26]** slider introducing additional BBD-related sonic anomalies.
- DIGI (bottom) : Replicates the characteristics of a digital delay, with the **COLOR** **[26]** slider introducing additional digital-centric irregularities.

Delay Function Jacks

[H] **TIME/L CV IN** : Control Voltage (CV) input for modulating the DELAY TIME. Positive voltages increase the DELAY TIME above the value currently set with the **TIME/L** **[10]** slider; negative voltages decrease it. You can limit (or even invert) the incoming voltage using the **TIME/L CV Attenuverter** **[11]**.

[I] **WIDTH/R CV IN** : Control Voltage (CV) input for modulating the DELAY WIDTH. Positive voltages increase the WIDTH above the value currently set with the **WIDTH/R** **[13]** slider; negative voltages decrease it. You can limit (or even invert) the incoming voltage using the **WIDTH/R CV Attenuverter** **[14]**.

[J] **FB CV IN** : Control Voltage (CV) input for modulating the DELAY FEEDBACK. Positive voltages increase the DELAY FEEDBACK above the value currently set with the **FB** **[15]** slider; negative voltages decrease it. You can limit (or even invert) the incoming voltage using the **FB CV Attenuverter** **[16]**.

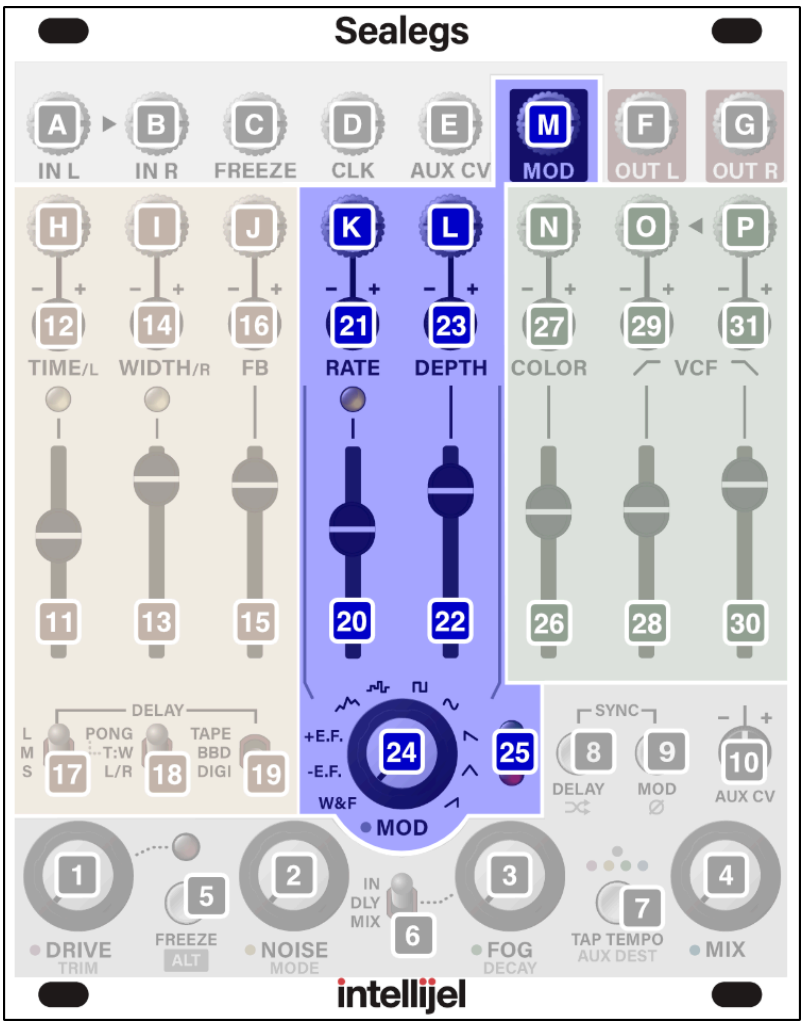
FRONT PANEL : MOD FUNCTIONS

Sealegs features a versatile set of controls for generating complex modulations and additional sonic degradation.

By default, the MOD Wave modulates Sealegs' own **TIME/L** [11] at a rate set by the **MOD RATE** [20] slider, and at an amount set by the **MOD DEPTH** [22] slider. But through use of the dedicated **MOD OUT** [M] jack, it can also be patched into other sections of Sealegs, or even to external modules.

*IMPORTANT: The MOD WAVE is sent to the **MOD OUT** [M] jack at full amplitude, and is not affected by the **MOD DEPTH** [22] slider, which governs only the internal DELAY TIME modulation.*

The following jacks and controls are grouped as MOD parameters.



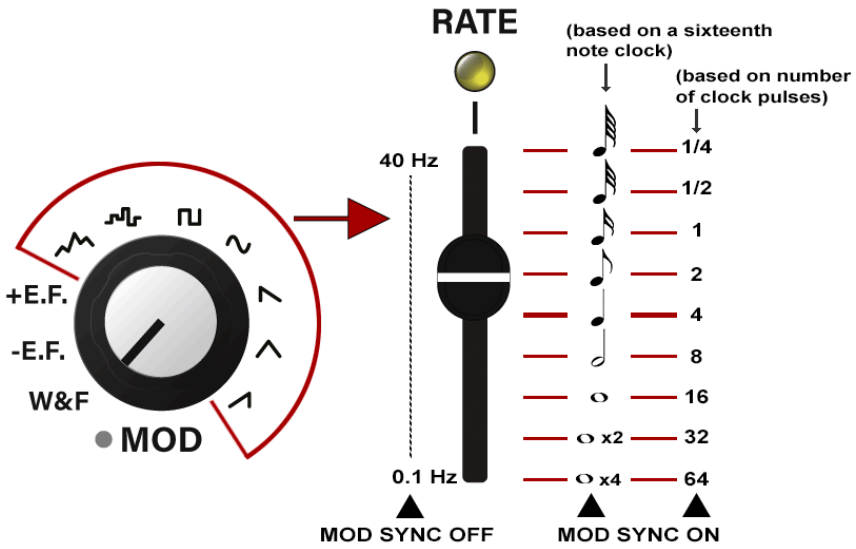
Character Function Controls

[20] **MOD RATE** slider : Sets a modulation rate for the waveform selected with the **MOD** [24] knob. Specifically:

- For the LFV waveform (and every waveform clockwise from it), the slider sets the vacillation/oscillation rate.
- For the envelope followers, the slider sets the envelope's response rate. Lower response rates have the effect of "smoothing" out variations in the envelope, while higher rates make the envelope more closely follow fluctuations in input level, which can result in a "rougher" more pseudorandom type of modulation.
- For the Wow & Flutter setting: increasing the slider basically crossfades between "wow" behavior at the bottom, and "flutter" behavior at the top.

The RATE can be freely set, or synchronized (via the **MOD SYNC** [9] button) to either a clock signal patched into the **CLK** [D] jack or a tempo tapped on the **TAP TEMPO** [7] button.

When sync'd, the MOD RATE slider selects a musically metrical time division. When un-sync'd and free-running, the slider works over a range of 0.1Hz - 40Hz, as shown in the illustration to the right.



NOTE: MOD RATE synchronization occurs only on the oscillating MOD waveshapes. Neither Wow & Flutter nor the Envelope Followers synchronize to clock.

[21] **MOD RATE CV attenuverter** : Scales the amount (and polarity) of the voltage sent into the **MOD RATE CV** [K] jack. The full range of the control voltage is used when the knob is fully clockwise, and the voltage is attenuated as you rotate the knob counter-clockwise toward noon (straight up). At the noon (straight up) position, the incoming CV is fully attenuated, meaning it has no effect on the current MOD RATE. Turning the knob counterclockwise from the noon position inverts the incoming CV (positive voltages become negative, and vice-versa), with the voltage level steadily increasing until the full (but inverted) range is reached when the knob is fully counter-clockwise.

[22] **MOD DEPTH slider** : Sets the extent to which the selected **MOD** [24] waveform modulates Sealegs' Delay Time.

*NOTE : This slider affects only the depth of internal modulation. It does not affect the amplitude of the modulation sent out the **MOD** [M] jack.*

[23] **MOD DEPTH CV attenuverter** : Scales the amount (and polarity) of the voltage sent into the **MOD DEPTH CV** [L] jack. The full range of the control voltage is used when the knob is fully clockwise, and the voltage is attenuated as you rotate the knob counter-clockwise toward noon (straight up). At the noon (straight up) position, the incoming CV is fully attenuated, meaning it has no effect on the current MOD DEPTH. Turning the knob counterclockwise from the noon position inverts the incoming CV (positive voltages become negative, and vice-versa), with the voltage level steadily increasing until the full (but inverted) range is reached when the knob is fully counter-clockwise.

[24] **MOD knob** : Sets the shape of the MOD Waveform, whose rate is controlled by the **MOD RATE [20]** slider. MOD always affects the internal DELAY TIMES at an amount set by the **MOD DEPTH [22]** slider, while the dedicated **MOD OUT [M]** jack allows you to modulate external modules (or even other Sealegs parameters via self patching).

This knob has both a “standard” and an ALT function.

- STANDARD : Turning the MOD knob from fully counterclockwise to fully clockwise, moves through the following wave shapes: The first three waveforms (W&F, EF- and EF+) are “discreet”, while the seven remaining waveforms will all morph into the waveform that follows it on the dial.

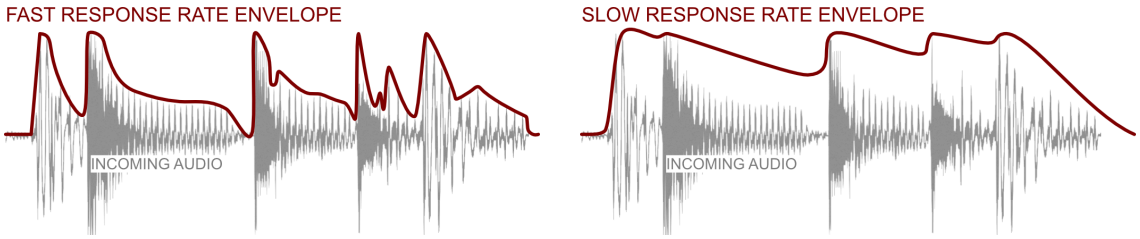
  ➢ **WOW & FLUTTER** : Emulates the characteristics of wow and/or flutter. When the **RATE [20]** slider is low, there is more wow than flutter. Raising the **RATE [20]** slider introduces more flutter into the MOD shape.

  Wow & Flutter is a discreet position on the **MOD** knob — meaning it does not morph into the MOD waveshape that follows it on the dial.

  ➢ **EF -** : Negative Envelope Follower : Generates a negative (inverted) envelope derived from Sealegs’ INPUT signal (**IN L [A]** and **IN R [B]**). The envelope’s response rate is set by the **RATE [20]** slider. Lower response rates of decay have the effect of “smoothing” out variations in the envelope, while higher rates make the envelope more closely follow fluctuations in input level.

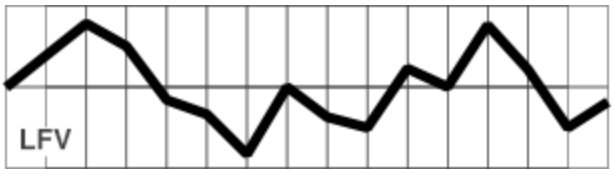
  ‘EF -’ is a discrete setting on the **MOD** knob — meaning it does not morph into the wave shapes on either side of it.

  ➢ **EF +** : Positive Envelope Follower. Generates a positive envelope derived from Sealegs’ INPUT signal (**IN L [A]** and **IN R [B]**). The envelope’s response rate is set by the **RATE [20]** slider. Lower response rates have the effect of “smoothing” out variations in the envelope, while higher rates make the envelope more closely follow fluctuations in input level.

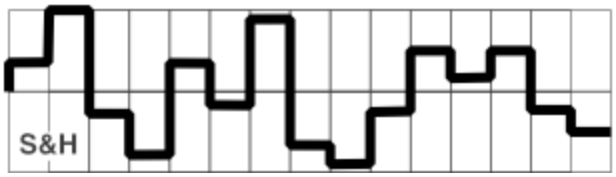


‘EF +’ is a discrete setting on the **MOD** knob — meaning it does not morph into the wave shapes on either side of it.

➢ **LFV 1** : Low Frequency Vacillator. Creates a ±10V meandering, non-repeating vacillation of voltages.



➢ **SAMPLE & HOLD** : Creates a ±10V S&H (sample & hold) waveform.



The S&H waveform will crossfade into a SQUARE wave as you continue to turn the MOD knob clockwise (unless you hold down the ALT [5] button while turning it, in which case turning it will jump to the SQUARE wave, without morphing into it).

➢ **SQUARE** : Creates a ±10V square waveform. The SQUARE wave will crossfade into a SINE wave as you continue to turn the MOD knob clockwise (unless you hold down the ALT [5] button while turning it, in which case turning it will jump to the SINE wave, without morphing into it).

➢ **SINE** : Creates a ±10V sinusoidal waveform. The SINE wave will crossfade into a SAW wave as you continue to turn the MOD knob clockwise (unless you hold down the ALT [5] button while turning it, in which case turning it will jump to the SAW wave, without morphing into it).

➢ **SAW** : Creates a cycling waveform that ramps down from +10V to -10V, then immediately resets back to +10V. The SAW wave will crossfade into a TRIANGLE wave as you continue to turn the MOD knob clockwise (unless you hold down the ALT [5] button while turning it, in which case turning it will jump to the TRIANGLE wave, without morphing into it).

➢ **TRIANGLE** : Creates a cycling waveform that ramps up from -10V to +10V, then ramps back down to -10V. The TRIANGLE wave will crossfade into a RAMP wave as you continue to turn the MOD knob clockwise (unless you hold down the ALT [5] button while turning it, in which case it will jump to the RAMP wave, without morphing into it).

➢ **RAMP** : Creates a cycling waveform that ramps up from -10V to +10V, then immediately resets back to -10V.

- ALT : While holding down the **ALT** [5] button, turn the MOD knob to set the MOD waveform to the indicated waveform. This lets you select any demarcated waveform directly, without selecting any of the crossfaded waveshapes that appear between those waveforms that are capable of crossfading into one another. That is, LFV > S&H > SQ > SINE > SAW > TRI > RAMP all crossfade into one another. Holding **ALT** [5] while turning the MOD knob will select the desired waveform exactly, rather than selecting a crossfaded value between two waveshapes.

[25] **MOD LEDs** : Visual representation of the MOD WAVE. The top (green) LED lights when the wave voltage is positive, and the bottom (red) LED lights when it's negative. The brightness of each LED indicates the relative voltage level.

*NOTE: The LED indicates the full output of the Mod WAVE (as sent out the **MOD OUT** [M] jack), and not the attenuated Mod WAVE (set by **MOD DEPTH** [22] slider, and routed internally to the delay TIME).*

Character Function Jacks

[K] **MOD RATE CV IN** : Control Voltage (CV) input for modulating the MOD RATE. Positive voltages increase the MOD RATE above the value currently set with the **MOD RATE** [20] slider; negative voltages decrease it. You can limit (or even invert) the incoming voltage using the **MOD RATE CV Attenuverter** [21].

[L] **MOD DEPTH CV IN** : Control Voltage (CV) input for modulating the MOD DEPTH. Positive voltages increase the MOD DEPTH above the value currently set with the **MOD DEPTH** [22] slider; negative voltages decrease it. You can limit (or even invert) the incoming voltage using the **MOD DEPTH CV Attenuverter** [23].

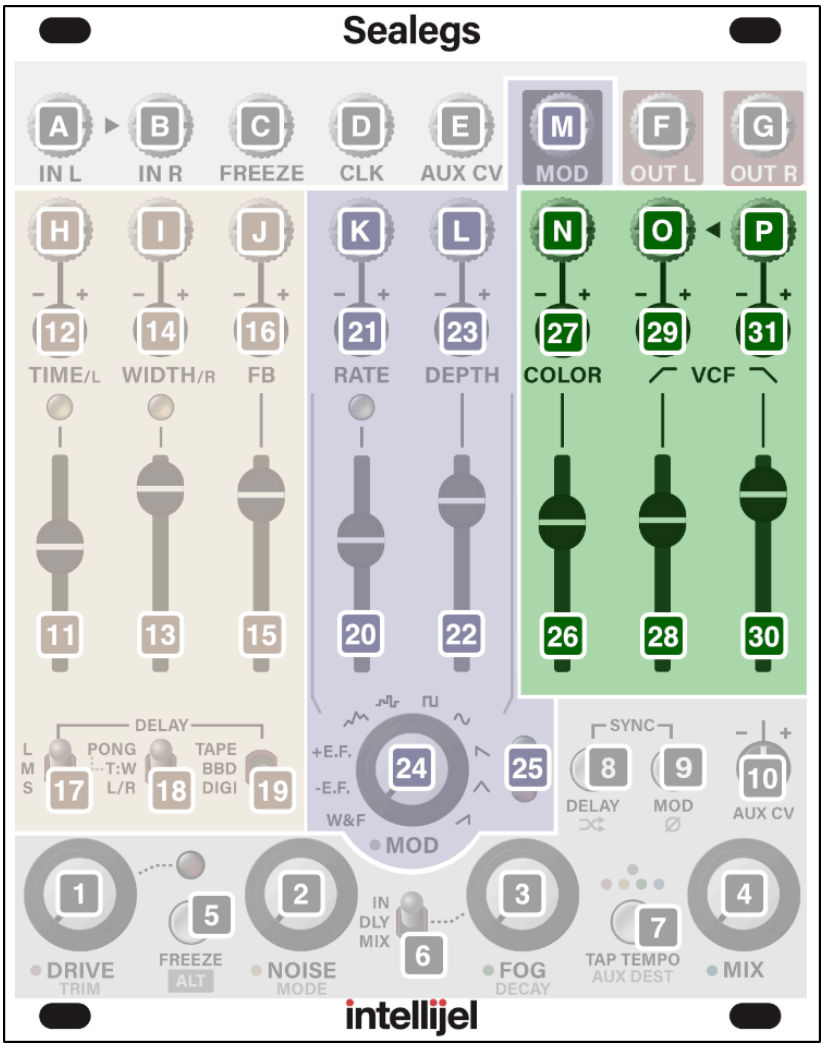
[M] **MOD OUT** : Output of the control voltage (CV) generated by Sealegs' MOD WAVE. The MOD WAVE always affects the internal DELAY TIMES at an amount set by the **MOD DEPTH** [22] slider, while the dedicated MOD OUT jack allows you to modulate external modules (or even other Sealegs parameters via self patching).

*IMPORTANT:The **MOD DEPTH** [22] slider has no effect on the MOD OUT signal, which always outputs at full amplitude.*

FRONT PANEL : CHARACTER FUNCTIONS

Sealeags has additional character controls, in the form of a Model-dependent COLOR control, and both a lowpass and highpass filter that sit in the feedback loop of the delay line.

Placing the filter inside the feedback loop ensures the filtering will become increasingly audible with each pass through the delay line. At its most basic, this lets you create delays that grow darker (or brighter) over time. But, since the cutoff frequencies of both filters can be modulated, all sorts of harmonic variation can be applied to a feedback loop. If Sealegs is currently in **FREEZE** [5] mode, then the filter is moved outside the feedback loop, and is applied to the frozen signal prior to being output.



Character Function Controls

[26] COLOR slider : Adds additional sonic artifacts that relate to the type of delay you select with the **DELAY MODEL** [19] switch.

Specifically:

- **TAPE** mode : Adds tape drag, degradation & dropouts.
- **BBD** mode : Adds "grit" by emulating companded noise, clock instability, and more.
- **DIGI** mode : Adds bit-crushing and sample rate reduction to emulate old-school digital delays. At extreme settings, this can introduce quite a bit of quantization noise to the signal.

[27] **COLOR CV attenuverter** : Scales the amount (and polarity) of the voltage sent into the **COLOR CV [N]** jack. The full range of the control voltage is used when the knob is fully clockwise, and the voltage is attenuated as you rotate the knob counter-clockwise toward noon (straight up). At the noon (straight up) position, the incoming CV is fully attenuated, meaning it has no effect on the current COLOR value. Turning the knob counterclockwise from the noon position inverts the incoming CV (positive voltages become negative, and vice-versa), with the voltage level steadily increasing until the full (but inverted) range is reached when the knob is fully counter-clockwise.

[28] **HIGHPASS FREQ slider** : Sets the highpass filter's cutoff frequency. Frequencies above this level pass through unattenuated. Frequencies above this level are attenuated at a rate of 6db/oct. The higher the slider, the more low frequencies are removed from the signal.

[29] **HIGHPASS FREQ CV attenuverter** : Scales the amount (and polarity) of the voltage sent into the **HIGHPASS FREQ CV [O]** jack. The full range of the control voltage is used when the knob is fully clockwise, and the voltage is attenuated as you rotate the knob counter-clockwise toward noon (straight up). At the noon (straight up) position, the incoming CV is fully attenuated, meaning it has no effect on the current HIGHPASS FREQ. Turning the knob counterclockwise from the noon position inverts the incoming CV (positive voltages become negative, and vice-versa), with the voltage level steadily increasing until the full (but inverted) range is reached when the knob is fully counter-clockwise.

[30] **LOWPASS FREQ slider** : Sets the lowpass filter's cutoff frequency. Frequencies below this level pass through unattenuated. Frequencies above this level are attenuated at a rate of 6db/oct. The lower the slider, the more high frequencies are removed from the signal.

[31] **LOWPASS FREQ CV attenuverter** : Scales the amount (and polarity) of the voltage sent into the **LOWPASS FREQ CV [P]** jack. The full range of the control voltage is used when the knob is fully clockwise, and the voltage is attenuated as you rotate the knob counter-clockwise toward noon (straight up). At the noon (straight up) position, the incoming CV is fully attenuated, meaning it has no effect on the current LOWPASS FREQ. Turning the knob counterclockwise from the noon position inverts the incoming CV (positive voltages become negative, and vice-versa), with the voltage level steadily increasing until the full (but inverted) range is reached when the knob is fully counter-clockwise.

Filter Function Jacks

[N] **COLOR CV In** : Control Voltage (CV) input for modulating the COLOR amount. Positive voltages increase the COLOR value above the value currently set with the **COLOR** **[26]** slider; negative voltages decrease it. You can limit (or even invert) the incoming voltage using the **COLOR CV Attenuverter** **[27]**.

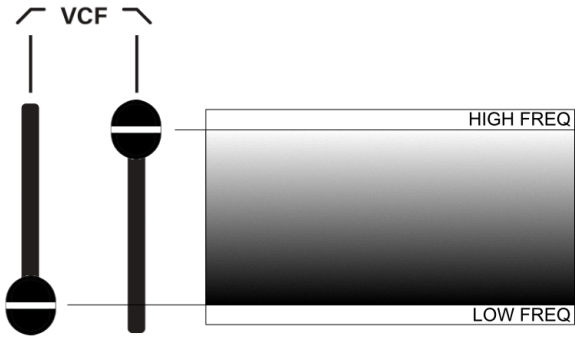
[O] **HIGHPASS FREQ CV In** : Control Voltage (CV) input for modulating the highpass filter's cutoff frequency. Positive voltages increase the cutoff frequency above the value currently set with the **HIGHPASS FREQ** **[28]** slider; negative voltages decrease it. You can limit (or even invert) the incoming voltage using the **HIGHPASS FREQ CV Attenuverter** **[29]**.

[P] **LOWPASS FREQ CV In** : Control Voltage (CV) input for modulating the lowpass filter's cutoff frequency. Positive voltages increase the cutoff frequency above the value currently set with the **LOWPASS FREQ** **[30]** slider; negative voltages decrease it. You can limit (or even invert) the incoming voltage using the **LOWPASS FREQ CV Attenuverter** **[31]**.

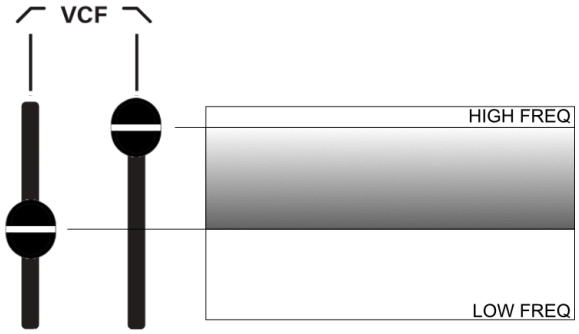
Filter Explanation

The positions of the HIGHPASS and LOWPASS frequency sliders provide a visual representation of the frequency band allowed to pass through the filter.

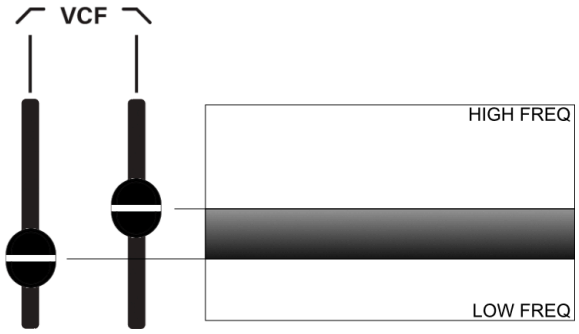
For example, with the **HIGHPASS FREQ** [28] slider at the bottom and the **LOWPASS FREQ** [30] slider at the top, the entire frequency band is allowed to pass through, unfiltered.



Raising the **HIGHPASS FREQ** [28] slider removes low frequency content from the signal.



Lowering the **LOWPASS FREQ** [30] slider removes high frequency content from the signal. As a result, the position of both sliders gives a visual representation of the frequency band passing through the filter.



*NOTE: Because both filters close at 6db/octave, frequencies that exceed the cutoff settings will still pass through, albeit at an attenuated level. Consequently, positioning the **HIGHPASS FREQ** [28] slider above the **LOWPASS FREQ** [30] slider will not result in a total cessation of sound, but rather an attenuated reduction of overall level, centered around the midway point between the two sliders.*

SEND/RETURN MODE

Sealegs has an alternate operation mode meant for when Sealegs is connected to an auxiliary send on a mixer and routings where you do not want the dry signal passing through.

The following is true when Send/Return Mode is enabled:

- DRY signal is NOT passed through to the outputs.
- MIX controls the WET level only.
- All other functions operate the same.

To toggle Send/Return Mode:

1. Remove power to the Sealegs module.
2. Hold down the **DELAY SYNC** button while powering on Sealegs.

   All buttons light RED for a couple seconds when Send/Return Mode is ENABLED.
   All buttons light GREEN for a couple seconds when Send/Return Mode is DISABLED.

FACTORY RESET

To restore Sealegs to its default factory configuration:

3. Remove power to the Sealegs module.
4. Hold down the **FREEZE** button while powering on Sealegs.

   All buttons light yellow for a couple seconds, and the module resets itself to the factory default.

In addition, you can clear any audio currently in the delay buffer by long-pressing (>1 sec) the **DELAY SYNC** button.

FIRMWARE UPDATES

Firmware updates, if available, are contained within the latest *Intellijel Firmware Updater* application, which you can download from the product's page on the Intellijel.com website. The application is available in both Macintosh and Windows formats, and will install firmware into your module over USB. Use the drop-down lists at the top of the application to select the product you wish to update, and the firmware version you want to install. Click the **Instructions** button to read specific instructions for updating your module.

Current Firmware Display

For the first 3 seconds after Sealegs turns on, the colored panel buttons indicate the currently installed firmware. Specifically, firmware versions use a w.x.y.z format, where different front panel buttons indicate the values of W, X, Y, and Z. Specifically:

W.x.y.z (major) = **FREEZE** button
w.**X**.y.z (minor) = **TAP** button
w.x.**Y**.z (patch) = **DELAY SYNC** button
w.x.y.**Z** (tweak) = **MOD SYNC** button

Button color indicates numerical value:

0: BLUE
1: CYAN
2: GREEN
3: YELLOW
4: ORANGE
5: RED
6: MAGENTA
7: PURPLE
8: GREY
9: WHITE

For example, Firmware version 1.3.2.4 would light the buttons as follows:

FREEZE = CYAN (1)
TAP = YELLOW (3)
DELAY SYNC = GREEN (2)
MOD SYNC = ORANGE (4)

Firmware Versions

1.2 (May 13, 2024)

- Tweaks: Gain Staging updates—

    - This update reduces the attenuation on signals passing through Sealegs; as a result, the MIX (wet/dry) control is much more balanced and the overall output of the module is louder, matching closer to your input. Adjust your mixes accordingly.
    - Adjusted Drive processor gain staging in all 3 Drive Positions.
    - Raised threshold on output limiter, reduced pre-attenuation.
- Tweak: Wider "Detent" for setting input trim to 1x (Noon).
- New: Send/Return Mode (Hold DELAY SYNC on boot) —
    - A special mode intended to be used on an Aux Send from a mixer.
    - DRY signal is NOT passed through.
    - MIX controls the WET level only.

1.1 (Nov 22, 2023)

- NEW : DRIVE position switch

  You can now move Sealegs' DRIVE circuit to various positions in the signal chain. Do this by holding down the **ALT** [5] button while toggling the **FOG/DRIVE POSITION** [6] switch to the desired position:

    - IN : DRIVE is at the beginning of the signal chain (as it was with v1.0), and this is the factory default.
    - DLY : DRIVE is only on the Wet side, passed into the Delay. It still functions similarly to the IN position, where the signal is cut when the DRIVE knob is at zero. If FOG Position is set to IN, then DRIVE will be fed INTO the FOG before it's passed to the delay. Great for "Send" style Dub FX, your dry signal will just be passed through (unaffected) to the Dry Side of Wet/Dry balance.
    - MIX : DRIVE is positioned at the very end of the signal chain, post MIX — meaning it affects both the wet and the dry signals. It's also positioned POST-FOG, when the FOG position is also set to the MIX position. This mode is different in that it has a minimum level, and can not be closed like a VCA.

  NOTES:

    - Setting will be saved across boots.
    - If setting the switch to the same position as FOG, you will need to toggle somewhere else, and go back to the position.
- TWEAK : FREEZE is now "clickless" on all modes.

Since TAPE and BBD emulate an analog style freeze (that is, cutting the input to the delay and locking feedback at 100%), they will absorb modulation and time changes into the frozen audio path. Specifically, each mode responds to freezing as follows:

- BBD: When frozen, you may find accumulating signal/frequency loss by nature of emulating an analog BBD with limited sample rate — especially at longer times.
- TAPE: When frozen, TAPE mode will hold the freeze much better, while slowly saturating the audio as a tape delay would.
- DIGITAL: Digital mode actually freezes the audio buffer, and will maintain its content indefinitely, and it will not be modified by modulation or time changes.

1.0 (Aug, 2023)

- Initial release

TECHNICAL SPECIFICATIONS

Width	20 hp
Maximum Depth	29 mm
Current Draw	116 mA @ +12V 10 mA @ -12V