

beam splitter

old blood noise endeavors
instruction manual



Beam Splitter is inspired by the sound of a guitar tracked multiple times: a single input turned into three outputs of varying character and time feel. It contains three different takes on overdrive, voiced to work well together. Two of them can be delayed in time, and all three can be run in parallel, whether mono, stereo, or a proprietary system we call trereo.

DRIVES

Drive 1 is a hard-clipping distortion. Of the three drives, it is arguably the heaviest and most compressed. It has three controls:

Gain 1 sets the amount of distortion. As it's turned up, it also affects the voicing of the distortion, rounding off low end and increasing distortion in the mids and highs.

Volume 1 sets the overall output volume.

Tone 1 rolls off the high end as it is turned down. All the way down is a darker distortion, all the way up is full brightness.

Drive 2 is an overdrive with both soft and hard clipping. Of the three drives, it is the lightest and brightest. It has three controls:

Gain 2 sets the amount of overdrive. All the way down, it is almost a clean boost, and all the way up it is a medium overdrive with accentuation of the mids and highs.

Volume 2 sets the overall output volume.

Tone 2 rolls off the high end as it is turned down. All the way down is a darker drive, all the way up is full brightness.

Drive 3 is a transistor overdrive. Of the three drives, it is the most dynamically reactive, with a fuzz-like gain quality. It has three controls:

Gain 3 sets the amount of breakup by attenuating the input volume. All the way down, volume drops and there is minimal clipping. As it's turned up, gain increases and mids and highs are pushed further.

Volume 3 sets the overall output volume.

Tone 3 rolls off the high end as it is turned down. All the way down is a darker drive, all the way up is full brightness.

DELAYS

There are two independent delays with **Time** and **Feedback** controls.

Time sets the delay time, up to 211ms.

Feedback adds feedback to the delay line, creating intense comb filter effects at low Time settings or trailing repeats at high Time settings.

The **Delay Select** pushbutton chooses which drives pass through the left and right delays, with LEDs corresponding to drives 1, 2, and 3. The drive corresponding with the left-most lit up LED passes through the left-most set of delay controls, and the drive corresponding with the right-most lit up LED passes through the right-most set of delay controls. The drive corresponding with the unlit LED does not pass through a delay.

SPLITTING THE BEAM

Deviate sets the amount of random variation in delay time. As it is turned up, frequency and potential intensity of those variations is increased. Each deviation creates a shortening of the delay time, with the max delay time set by each **Time** knob, and different deviations occurring on each. **Deviate** is inspired by the playing inaccuracies of a player recording multiple tracks, and can give the impression of flanging, chorusing, or broken vibrato, depending on your settings.

Spread sets the stereo spread. All the way down, there is no stereo spread. As it's turned up, the left and right delay lines are panned outward, widening the stereo field. NOTE: in **Mono**, or if only one drive section is active, **Spread** will be deactivated.

FOOTSWITCHES

The Three Footswitches have two potential functions:

By default, **On/Off** turns **Beam Splitter** on and off, and the two **Preset** footswitches cycle the onboard presets left and right. The **On/Off** functionality can be momentary or latching: tap to latch the on/off state, hold to momentarily change it and then return to the original state on release.

Alternatively, the three footswitches can individually turn the three drive sections on or off. To assign this function, hold the **On/Off** switch and press **Delay Select**. This will switch from function 1 to function 2, or vice versa.

ROUTING

The **Routing** of **Beam Splitter** can be **Mono**, **Mono-In-Stereo-Out**, **Stereo**, or **Trereo**. To choose routing, hold down the **On/Off** switch and press the **Preset** switch to cycle through options. The preset LEDs will blink to indicate the current setting: **Mono** (right LED), **Mono In Stereo Out** (middle LED), **Stereo** (left LED), or **Trereo** (all LEDs).

In **Mono**, **Beam Splitter** expects you to use TS cables. It receives a mono signal, passes it through all drives in parallel, and sums them together into a mono output.

In **Mono-In-Stereo-Out**, **Beam Splitter** expects you to use a TS cable for input and TRS cable for output. It receives a mono signal, passes it through all three drives in parallel, then sends them out in stereo, with the un-delayed drive being centered and the delayed drives split in stereo according to the **Spread** control. When the pedal is off, the mono input signal is sent to both sides of the stereo output.

In **Stereo**, **Beam Splitter** expects you to use a TRS cable for input and TRS cable for output. It receives a stereo signal, sums that signal to mono, passes that mono signal through all three drives in parallel, then sends them out in stereo, with the un-delayed drive being centered and the delayed drives split in stereo according to the **Spread** control. When the pedal is off, the stereo input signal is maintained at the stereo output.

In **Trereo**, **Beam Splitter** expects you to use a TS cable for input, a TRS cable for stereo wet output, and an additional TS cable plugged into the **Aux** output. It receives a mono signal, passes it through all three drives in parallel, then sends the two delayed drives out on the main stereo output (split according to the **Spread** control), and the un-delayed drive through the **Aux** output. When the pedal is off, the mono input is sent to all outputs.

Additionally, **Beam Splitter** can be true bypass or buffered bypass with trails. To set this, hold down the **Preset** switch for five seconds while assigning the **mono/stereo/trereo** routing. A faster blinking LED indicates trails are on, a slower blink indicates trails are off.

The routing and trails settings will save globally.

EXPRESSION

The **Expression Jack** can be used to externally control any combination of knobs on **Beam Splitter**, using a TRS expression device. To assign the **Expression** control, simply turn a knob or knobs while holding the **On/Off** footswitch. The knob position when you press the footswitch will be the expression heel position, and the knob position when you let go will be the expression toe position. If a knob wasn't moved, expression will not affect it. Expression settings are saved per-preset.

PRESETS

Presets are accessible via the **Preset** switch. Press the switch to cycle through stored presets. The LEDs will indicate whether you are on **Preset 1** (right LED), **Preset 2** (middle), **Preset 3** (left), or live mode (no LED is lit). To save a preset, hold the **Preset** switch for five seconds until the preset LED starts blinking. Cycle through the presets using the switch to choose which slot to save your preset to. If you do not want to save, cycle to live mode (no LED lit). Once you've made your selection, hold the **Preset** switch for five seconds again until the LED stops blinking.

To **Factory Reset** your **Beam Splitter**, hold all three footswitches for 10 seconds until all LEDs begin blinking. At this point, you can cancel the reset by pressing the **On/Off** footswitch. To confirm the reset, press the **Preset** <- footswitch. All LEDs will light, then count upward as all settings and presets are returned to default, then light once more, then return to normal operation. This will delete all user settings and set all presets to their factory state.

Beam Splitter requires 350mA 9V DC center negative power.

FIRMWARE

If a **firmware update** is needed, **Beam Splitter's** USB-C jack is used to interface with the firmware updater at <https://firmware.oldbloodnoise.com>

Firmware Patch Notes:

V1.0A Initial production version



MIDI FUNCTIONS

The **MIDI In** and **Out** jacks are 3.5mm TRS Type A connections. **MIDI In** receives messages for **Beam Splitter** to process. **MIDI Out** sends those messages back out, acting like a MIDI Thru.

By default, **Beam Splitter** is on Channel 1. The Channel can be changed via CC (see below).

To save and load presets, use MIDI PC messages. To load a preset, send the PC value of the preset. To save a preset, use the preset save CC in the table below to initiate saving, then send the PC value where you want to save the preset, then use the preset save CC again. Alternatively, hold the **Preset** switch for five seconds until the preset LED begins blinking, send the PC value where you want to save the preset, then hold the **Preset** switch for five seconds again to save to that location. 127 presets are accessible via PC message. If your device uses PC messages 1-128, 1-127 correspond directly with presets, and 128 puts the pedal in Live mode (no preset, settings match knob positions). If your device uses PC messages 0-127, 0-126 correspond with presets 1-127, and 127 puts the pedal in Live mode.

All of **Beam Splitter's** controls and additional settings can be assigned via MIDI CC messages. See the below table for more.

FUNCTION	CC#	VALUES
Expression	11	0-127
Volume 1	14	0-127
Gain 1	15	0-127
Tone 1	16	0-127
Volume 2	17	0-127
Gain 2	18	0-127
Tone 2	19	0-127
Volume 3	20	0-127
Gain 3	21	0-127
Tone 3	22	0-127
Time 1	23	0-127
Feedback 1	24	0-127
Time 2	25	0-127
Feedback 2	26	0-127
Deviate	27	0-127
Spread	28	0-127
Delay Select	29	Drive 1 Un-Delayed: 0-42 Drive 2 Un-Delayed: 43-85 Drive 3 Un-Delayed: 86-127
Drive 1 On/Off	85	OFF: 0-63 ON: 64-127
Drive 2 On/Off	86	OFF: 0-63 ON: 64-127
Drive 3 On/Off	87	OFF: 0-63 ON: 64-127
All Drives On/Off	88	OFF: 0-63 ON: 64-127
Preset Saving Switch	89	Cancel Save: 0-42 Start Save: 43-85 Confirm Save: 86-127
MIDI Channel	102	1-16
Trails Setting	103	OFF: 0-63 ON: 64-127
Stereo Setting	104	Mono: 0-31 Mono In Stereo Out: 32-63 Stereo: 64-95 Treble: 96-127
Footswitch Mode	106	On/Off and Presets: 0-63 Individual Drive Switching: 64-127