

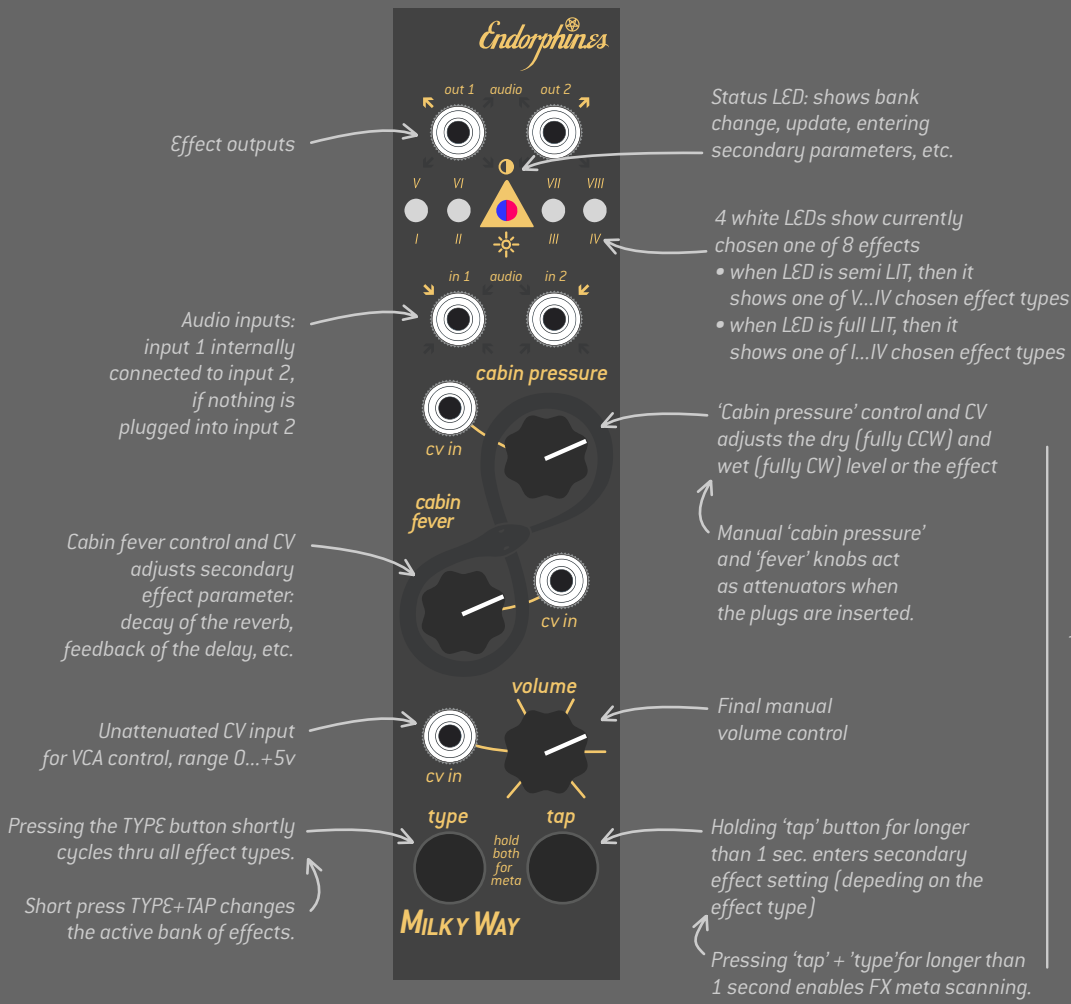


## CHASING THE MILKY WAY

- Simple and effective 6hp stereo effect module
- Comes with 16 types of effects, organized in two banks of 8
- Meta cv effect scanning and VCA
- 48 kHz 16 bit digital audio stereo processing

Depth: 30mm (with plugged ribbon cable)

Power requirements: +12V: 130 mA  
-12V: 25 mA



### RESET THE MODULE

The soft reset that adjusts all parameters to their default values. This also clears all effect memories. Press both 'type' and 'tap' buttons simultaneously and hold for more than 5 seconds. You may hear a short blip and then you will see the effect will be set to the first one.



### WARRANTY

RTFM – be so kind and read the manual. It will provide you with the information you need to fully indulge the module you just purchased – for which we like to thank you.

Enjoy your sound experiences, dear sonic traveller.

Beginning from the product's purchase date a 1-year warranty is guaranteed for each product in case of any manufacturing errors or other functional deficiencies during runtime.

The warranty does not apply in case of:

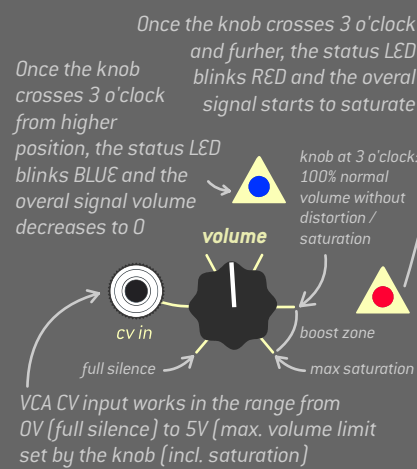
- damage caused by misuse
- mechanical damage arising from careless treatment (dropping, vigorous shaking, mishandling, etc.)
- damage caused by liquids or powders penetrating the device
- heat damage caused by overexposure to sunlight or heating
- electric damage caused by improper connecting

The warranty covers replacement or repair, as decided by us. Please contact us via email for a return authorization before sending anything. Shipping costs of sending a module back for servicing is paid by the customer.

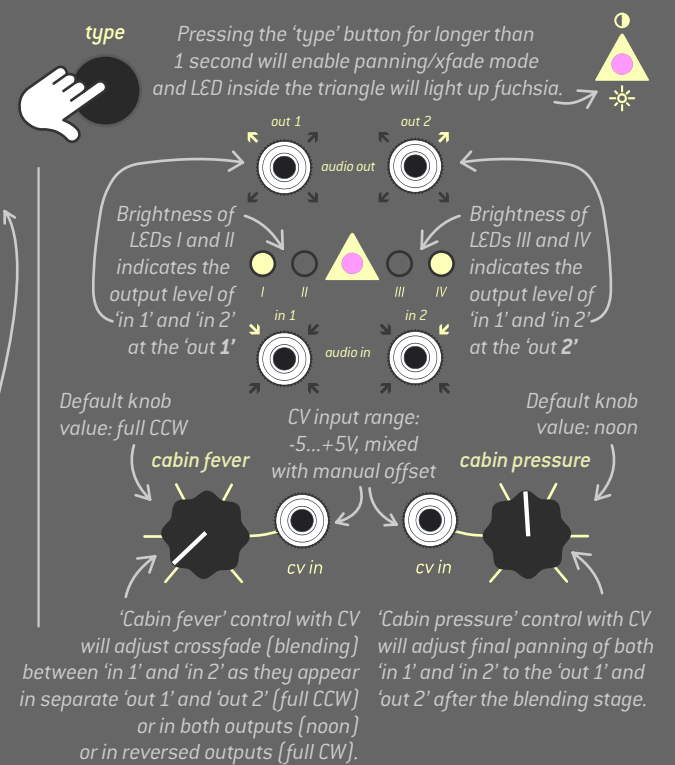
Device complies with all EU regulations concerning RoHS lead-free manufacturing and WEEE disposal

Endorphin.es are made in Barcelona, Spain

### SATURATION OVERKILL



### SPATIAL MOVEMENT



### FIRMWARE UPDATE

download latest firmware/bank when available from: <http://airways.endorphin.es>

Power OFF your modular system:

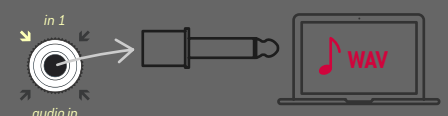


Hold 'tap' while powering your system again:



You will see status LED will blink blue:

Connect the audio output from your computer headphones output to one of the audio inputs of the module with simple mono or stereo cable.



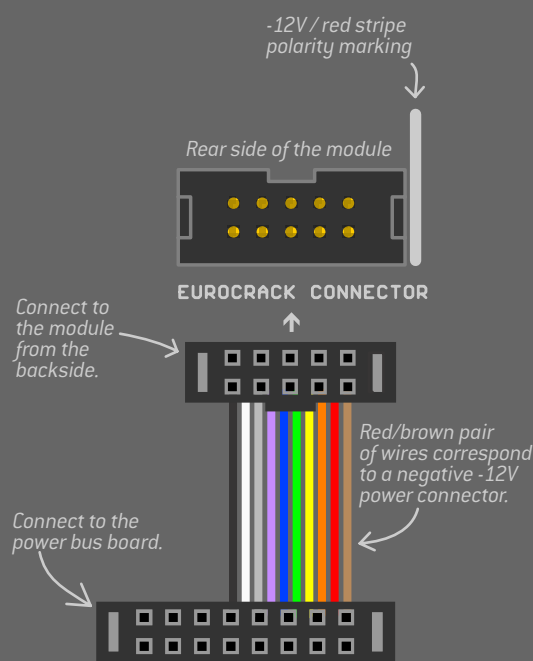
Press PLAY and wait 2+ minutes. Use a file player that does not apply audio compression to the file. During the update process you should observe that the BLUE light is blinking faster than initially. The module will reboot automatically after the new firmware was installed



Make sure you don't input any extra sounds during update process (reminder signals from your calendar, etc.). When status LED flashes RED – that means signal is too low or too high – just reset the firmware acquire process by pressing TAP once.

IMPORTANT: To prevent the errors during the audio playback of the firmware, please use any audio editor without any effects applied (EQ etc).

### POWER CONNECTION



Visit us:

<http://endorphin.es>

<https://youtube.com/user/TheEndorphines>

<https://facebook.com/TheEndorphines>

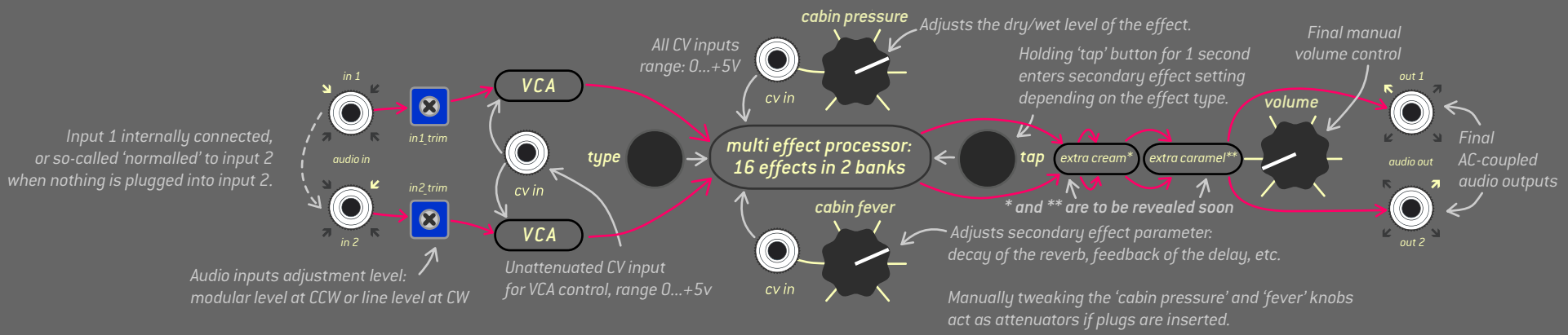
<https://www.instagram.com/endorphin.es/>

For technical requests: [support@endorphin.es](mailto:support@endorphin.es)

For general requests: [info@endorphin.es](mailto:info@endorphin.es)

FURTH BARCELONA, S.L.

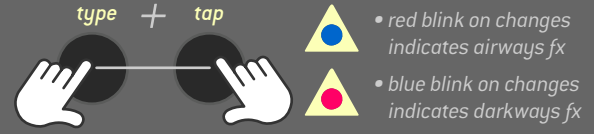
VAT ID: ES B66836487



## EFFECT TYPES



Short both buttons press changes the bank:



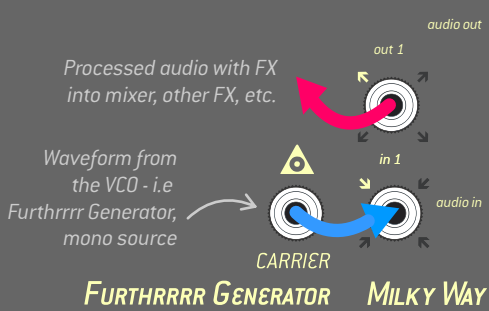
## AIRWAYS BANK ▲

- I HALL REVERB:** 'Cabin fever' knob defines the decay of the reverb or hall size. Holding 'tap' for longer than 1 second enables the secondary function for 'cabin fever': fixed hi-pass filter to cut off low frequencies and have more 'air' in the final output.
- II SHIMMER REVERB** is a variation of the hall reverb with a pitch shifter to create choir-like, huge and unrealistic spaces. The primary 'cabin fever' function defines the decay and the secondary function defines the amount of pitch-shifter mixed into original reverb.
- III STEREO ROOM REVERB** recreates a sort of stereo room ambience. Primary 'cabin fever' parameter defines room size and the secondary defines the stereo spread of the reverb, from mono up to a huge stereo spread.
- IV PLATE REVERB.** The primary 'cabin fever' defines the decay of the reverb. In real life equivalent this is the distance from the pickups to the metal plate which is how long the tail of the reverb is present. Secondary parameter defines the amount of pre-delay to distant sounds in ambience.
- V SPRING REVERB.** The primary 'cabin fever' defines the decay of the reverb. With the 'tap' button you can simulate a sound as if you pluck the real spring with your finger. The secondary function is tied to the 'tap' button's 'pluck the spring' feature and defines the decay of how fast the spring will calm down after manually plucking it.
- VI PING-PONG DELAY** is a stereo clocked delay. A 'tap' is usually three or more short clicks on the 'tap' button. The primary 'cabin fever' parameter defines the feedback of the delay or repeats. The secondary defines the clock division of the incoming tap/clock: 1, 3/4, 2/3, 1/2, 1/3, 1/4, 1/8
- VII TAPE ECHO** is a delay with 3 fixed playback heads. Primary 'cabin fever' parameter defines the delay repeat rate which is the speed of tape. The 'tap' button works in a limited frequency range of manual tapping and defines the amount of feedback. The secondary works as a divider for the incoming clock.
- VIII CHORUS:** Primary 'cabin fever' knob defines the feedback amount. In average amounts, it creates typical unison effect however in full CW it goes to an infinite feedback resulting unrealistic ambient. Secondary parameter defines the modulation depth, which is 'full on' by default.

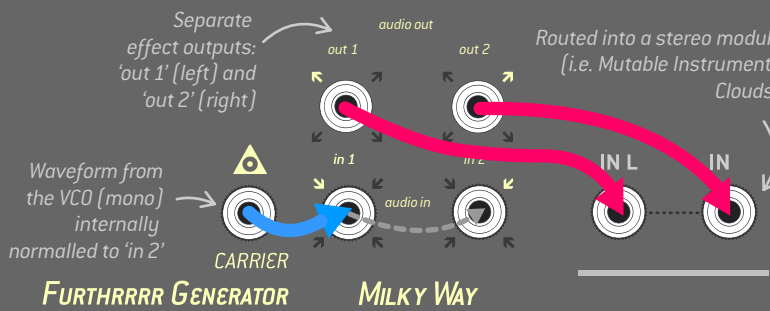
## DARKWAVES BANK ▲

- I GATED REVERB** is based around plate reverb with noise gate. The primary 'cabin fever' defines the reverb decay, but the secondary defines the threshold of the noise gate. Noise gate's attack and decay are fixed and chosen experimentally to fit most musical styles.
- II SPRING REVERB:** The primary 'cabin fever' defines the decay of the reverb. With the 'tap' button you can simulate a sound as if you pluck the real spring with your finger. The secondary function is tied to the 'tap' button's 'pluck the spring' feature and defines the DECAY of how fast the spring will calm down after manually plucking it.
- III REVERSED REVERB** takes the reverb tail of the sound and reverses it. If applied on drums like snare then it creates a breathing effect. 'Cabin pressure' knob defines the pre-delay time and acts as dry/wet control. 'Cabin fever' sets the reverb decay value. Holding 'tap' for longer than 1 second enables the secondary function for 'cabin fever': damping, i.e. volume of the tail (in our case tail = 'head' as the tail is reversed).
- IV FLANGER:** The 'cabin pressure' knob sets the amount of delay. With primary 'cabin fever' we set the LFO speed. The secondary defines the feedback. Playing with that three parameters allows to achieve sweeping, airplane engine alike sound with a pretty wide range.
- V RING MODULATOR** multiplies the signal with an internal sine wave oscillator. 'Cabin pressure' defines the amount of modulation and 'cabin fever' defines the speed of the oscillator. Secret ingredient – feedback! Its amount is controlled by the secondary 'cabin fever' and brings special dirtiness to the sounds.
- VI OVERDRIVE:** 'Cabin pressure' knob adjusts the drive amount with volume compensation, while 'cabin fever' defines the tone control as usually found in guitar pedals. The 'tap' button makes the effect active or bypassed, like the switch on a guitar pedal – and so does 'cabin fever' latching trigger CV input.
- VII PEAK COMPRESSOR:** 'Cabin pressure' knob defines the threshold from -90dB to 0dB (fully CW). Primary 'cabin fever' sets the amount of gain reduction [ratio] from 1 to 25. Secondary parameter defines the attack, from 1 to 200 msec. Release is always 'auto'. 'C. fever' CV input is an unattenuated side-chain input.
- VIII FREEZER/LOOPER:** When 'tap' is pressed (or 'cabin fever' CV gate is ON), the audio is looped by the grain length defined by the 'cabin fever' knob – and with the speed – defined by 'cabin pressure' knob or CV – applied.

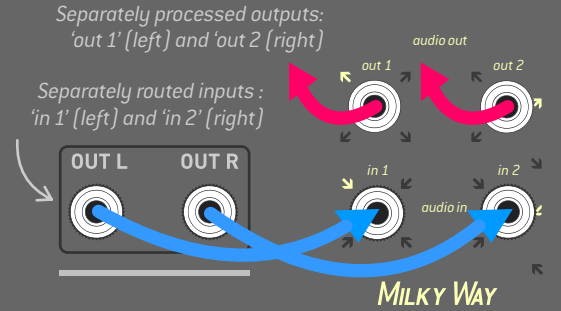
## SIMPLE MONO OPERATION



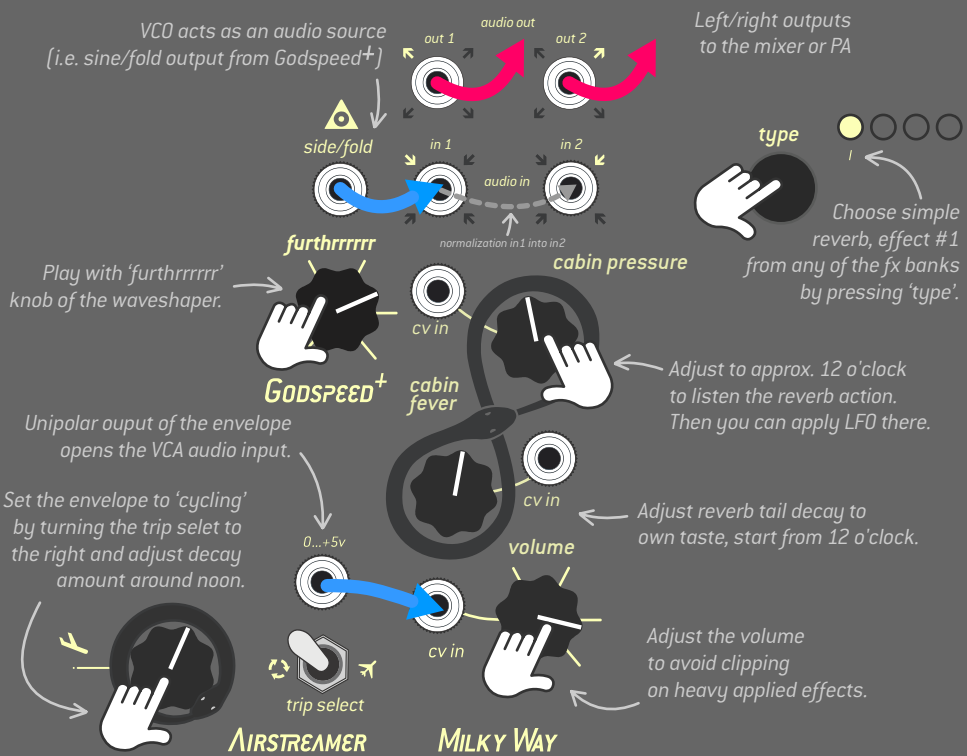
## MONO TO STEREO OPERATION



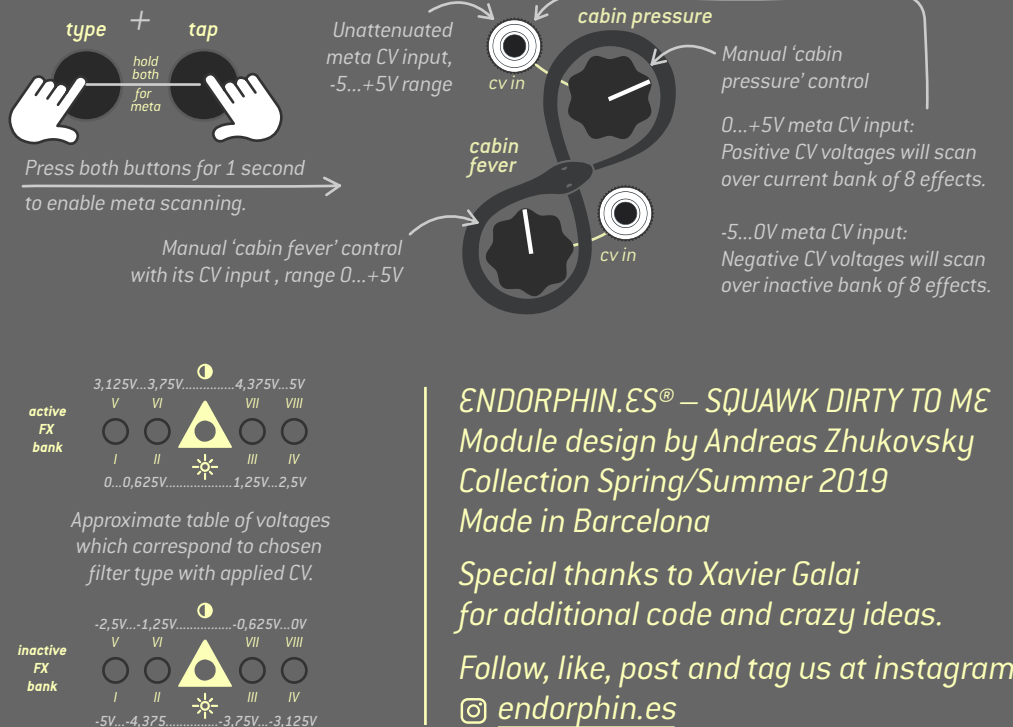
## TRUE STEREO OPERATION



## MILKY WAY QUICK PATCH EXAMPLE



## META META META META META META META META



ENDORPHIN.ES® – SQUAWK DIRTY TO ME  
Module design by Andreas Zhukovsky  
Collection Spring/Summer 2019  
Made in Barcelona

Special thanks to Xavier Galai for additional code and crazy ideas.

Follow, like, post and tag us at instagram:  
@endorphin.es

# STARS CAN'T SHINE WITHOUT THE DARKNESS

**CABIN PRESSURE EFFECT PROCESSOR** hosts 16 effects organized in two banks of 8.

The first effect bank is known as 'AIRWAYS' and contains effects tailored for tonal content. It recreates different ambient spaces. The effects are approximately arranged by size – going from bigger spaces (like halls) to smaller ones finishing with delays and chorus

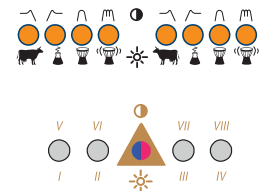
The second bank 'DARKWAVES' contains 8 effects suitable for percussive sounds and serves a variety of different flavours.

See <https://airways.endorphin.es> for more details and latest updates.

INDICATOR (Queen of Pentacles, Blck Noir, Grand Terminal, Milky Way)	AIRWAYS (ambient effect bank)	DARKWAVES (drum effect bank)
1 • (QoP) • (BN) ●●●●● (GT) ○●●● (MW)	HALL REVERB	GATED REVERB
2 ●● (QoP) ●● (BN) ●●●●● (GT) ○●●● (MW)	SHIMMER REVERB	SPRING REVERB
3 ●●● (QoP) ●●● (BN) ●●●●● (GT) ●●○● (MW)	ROOM REVERB	REVERSED REVERB
4 ●●●● (QoP) ●●●● (BN) ●●●●● (GT) ●●○● (MW)	PLATE REVERB	FLANGER
5 ● (QoP) ● (BN) ●●●●● (GT) ○●●● (MW)	SPRING REVERB	RING MODULATOR
6 ●● (QoP) ●● (BN) ●●●●● (GT) ○●●● (MW)	PING-PONG DELAY	OVERDRIVE
7 ●●● (QoP) ●●● (BN) ●●●●● (GT) ●●○● (MW)	TAPE ECHO DELAY	COMPRESSOR
8 ●●●● (QoP) ●●●● (BN) ●●●●● (GT) ●●○● (MW)	CHORUS	FREEZER

## SPECIFIC FOR GRAND TERMINAL/MILKY WAY

The current effect type chosen is shown at the row of LEDs by shortly blinking of the LED. Only one effect may be chosen at a time. The 8 LEDs of Grand Terminal correspond to the 8 effect preset cells. Milky Way uses 4 LEDs that shine either half or fully lit to indicate the chosen effect.

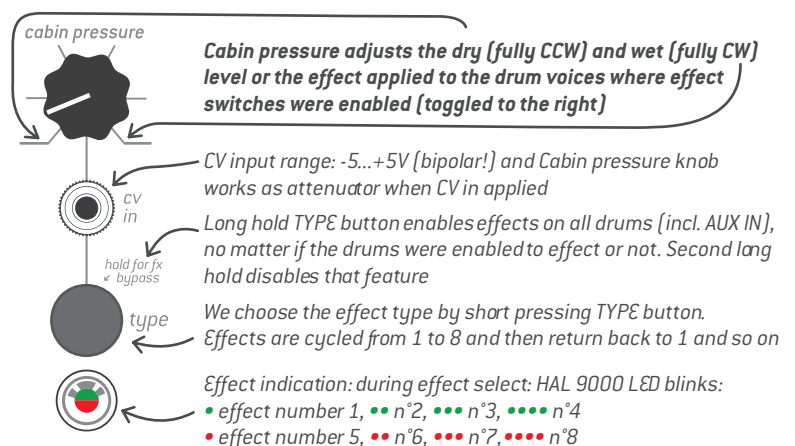


## SPECIFIC FOR BLCK\_NOIR AND QUEEN OF PENTACLES

**IMPORTANT:** holding the **TYPE** button for longer than 1 second will enable effects on all drum voices no matter if they were enabled or disabled from the effect. Another long hold press will revert the effect only to those drums that have their switches enabled.

The effect type is selected by pressing the **TYPE** button in the CABIN PRESSURE area on the upper right corner of the module. The effects are cycled one by one (from 1st to 8th and then back to 1st and so on). When powering the module as well as when selecting an effect the '**HAL9000**' LED blinks certain times (1-4) in green or red, identifying the effect currently selected. If the first effect is selected, then it blinks **green** ● once. Second effect: **green** ●● twice. Third effect: **green** ●●● trice and four times **green** ●●●● for effect #4.

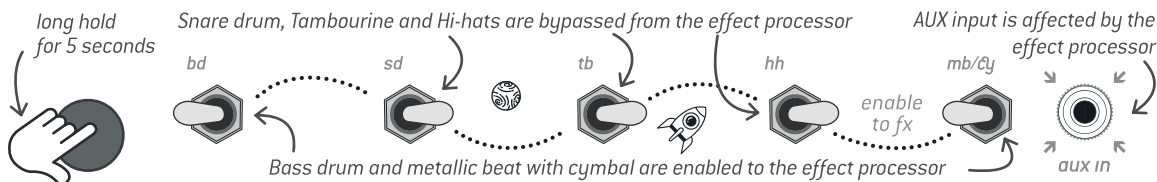
At effect #5 it blinks **red** ● once. Twice **red** ●● for effect #6, trice **red** ●●● for effect #7 and four times **red** ●●●● when effect #8 is chosen.



## SPECIFIC FOR BLCK\_NOIR, QUEEN OF PENTACLES AND GRAND TERMINAL

**ALTERNATIVE EFFECTS ENABLE MODE:** by default, all audio that goes into AUX IN input isn't affected by effect processor. Long hold (1 second) of TYPE button enables effects on all drums including AUX IN, however pressing again for 1 second disables that function.

BLCK\_NOIR & QUEEN OF PENTACLES: By holding the TYPE button (for more than 5 seconds), the alternative effects selection mode is chosen: each of the five drum voice groups can be separately routed into the effect processor by turning their toggle switches to the LEFT position. In that mode AUX Input is affected by effect processor. Selected mode is saved in the memory and selected on next module's power up.



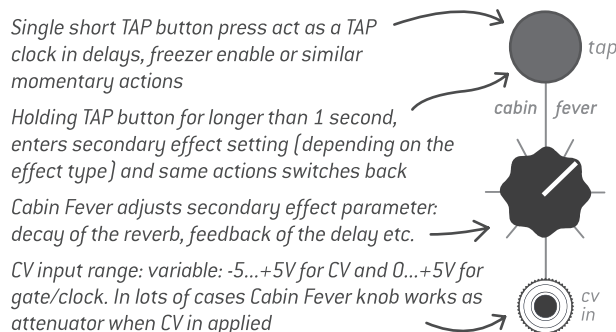
In case of the GRAND TERMINAL, holding the TAP button for 5 seconds switches the channel, on which the effects can be bypassed (by holding TYPE for 1 second). Normally "Gate A" is bypassing the effects. After holding TAP for 5 seconds "Gate B" will have bypassed effects instead (in case you have the bypass activated).

## IN GENERAL

Some effects work in true stereo, and some widen the stereo spread (which would not be audible in the mono output). Only one effect can be chosen at a time. The **CABIN PRESSURE** knob always defines the DRY/WET parameter of the effect. When the knob is fully CCW, then there is no effect at all: dry output only. When the knob is fully CW, then the signal will be fully processed with the effect: 100% wet. Adjusting that knob is a balance of how the sound is processed: think of it as opening the window to get some fresh air – you may open it only a bit for some ventilation, or fully open it to get lots of fresh air. The corresponding CV IN jack is a CV control for the dry/wet parameter. It accepts BI-POLAR -5v...+5v voltage and when the plug with CV is inserted (3.5mm MONO jack), the CABIN PRESSURE knob acts as an attenuator for that incoming CV.

Each effect has a few additional parameters. These parameters are defined by the **CABIN FEVER** knob, corresponding to the CV IN jack and a TAP button. Depending on the effect, these controls are assigned to different parameters as described below.

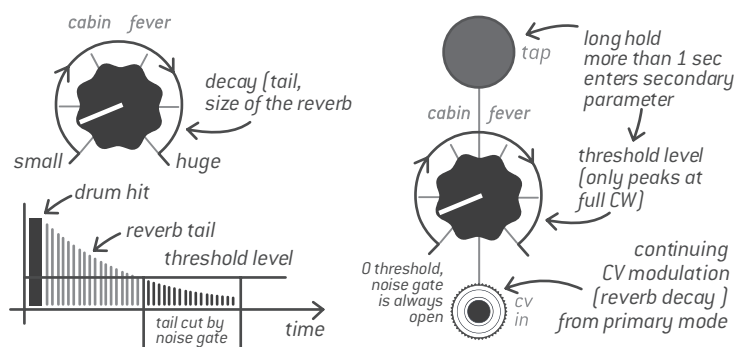
Pressing and holding the **TAP** button longer than 1 second in almost all effects activates the secondary mode for the CABIN FEVER knob. The corresponding LED will blink once, to show that you are in secondary mode. Press and hold the TAP again for around 1 second and you will notice the corresponding LED will blink once again meaning you are back in primary mode.



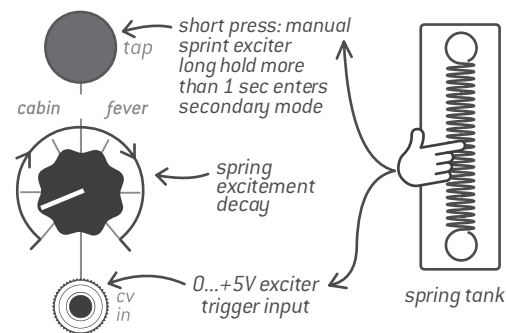
# WELCOME TO THE DARK SIDE.

## DARKWAVES: the stock bank containing 8 drum oriented effects

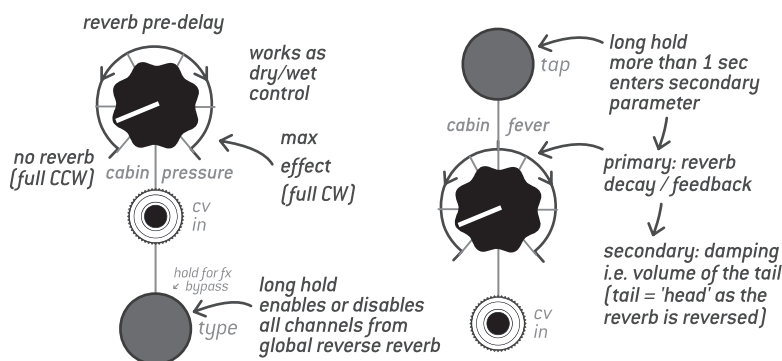
**1. GATED REVERB** That type of effect is widely known from records of the 80s. It was defining the sound of the snare drum (usually). Typical examples: Phil Collins – In The Air Tonight (1981), Peter Gabriel – Intruder (1980). To make a drum sound powerful, a reverb with huge tail is applied. However that tail is being cut by a noise gate (with defined threshold) after the drum was hit. This resulted in a mix still sounding clean and light because the lack long reverb tails. Gated reverb is based around plate reverb – the most universal sounding one from our point of view, which also fits nicely to drums. CABIN PRESSURE defines the reverb dry/wet amount and CABIN FEVER defines the reverb decay, as usually. However the secondary FEVER action defines the threshold of the noise gate – from zero (full CCW, sound always on) to max (full CW, only slight peaks). Default threshold value is 20%. This setting suits most of the drums. Noise gate's attack and decay are fixed and chosen experimentally to fit most musical styles.



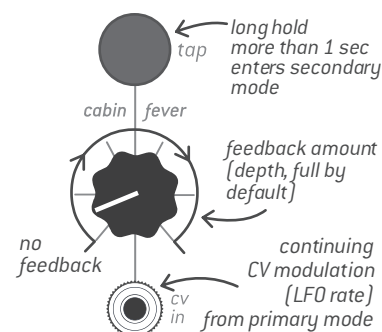
**2. SPRING REVERB** – effect is unchanged from original Airways bank (#5) because it works great for drums. It gets its unique sound from the diffusion in the metal spring, because higher frequencies travel more slowly through the spring than the lower ones. The CABIN FEVER knob, as usually, defines the decay of the reverb. We also implemented a unique feature: With the TAP button you can simulate a sound as if you pluck the real spring with your finger. That gives the distinct exciting spring reverb sound we all love so much. The secondary function of the CABIN FEVER is tied to the TAP button's 'pluck the spring' feature and defines the DECAY of how fast the spring will calm down after manually plucking it. The spring plucking may be done manually by using the TAP button or by applying a trigger into the CABIN FEVER CV input while being in the secondary function. By adjusting the decay to the maximum value, the spring sounds long (up to infinite) with a small self-oscillation. Keep that in mind when you select this effect.



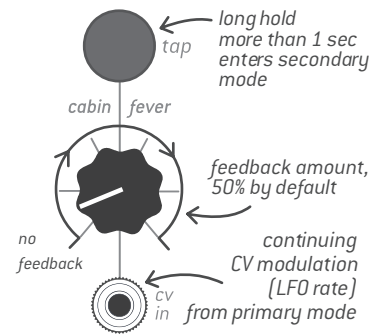
**3. REVERSE REVERB** – takes the reverb tail of the sound and reverses it. If applied on a drums like snare then it creates breathing effect. 'Cabin pressure' knob defines the pre-delay time along as acts as a dry/wet control. 'Cabin fever' sets the reverb decay value. Holding 'tap' for longer than 1 second enables the secondary function for 'cabin fever': damping, i.e. volume of the tail (in our case tail = 'head' as the tail is reversed).



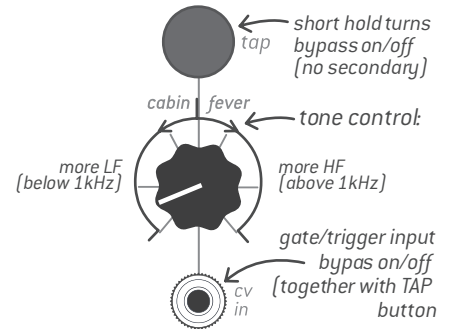
**4. FLANGER** is one of the typical effects used for drums and guitars. The signal is duplicated and its copy is delayed in time (typically around 20ms). That delay is modulated by an LFO, which rate is controlled by the CABIN FEVER knob. The CABIN PRESSURE knob defines the amount of delay. Finally, the secondary FEVER parameter defines the feedback. Playing with that three parameters allows to achieve sweeping, airplane engine alike sound with a pretty wide range.



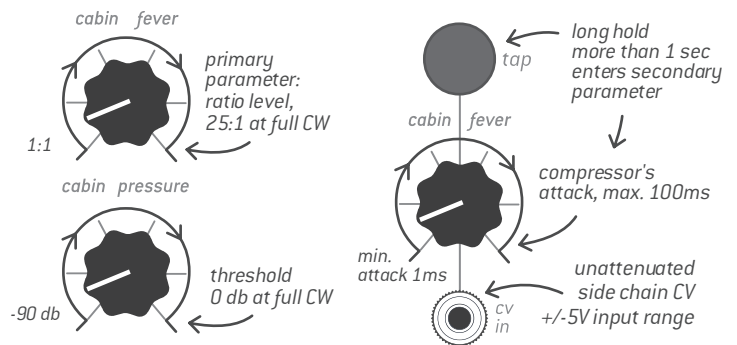
**5. RING MODULATOR:** It is a special type of amplitude modulation and is called 'balanced' in the FURTHRRRRR GENERATOR. The Ring Modulator multiplies the signal with an internal sine wave oscillator that results in an increase in side-band harmonics. CABIN PRESSURE defines the amount of modulation and CABIN FEVER defines the speed of the LFO. Secret ingredient: Feedback! Its amount is by default set to 50% on the secondary parameter (CABIN FEVER) and with further increase will bring special dirtiness to the drum sounds (or any other).



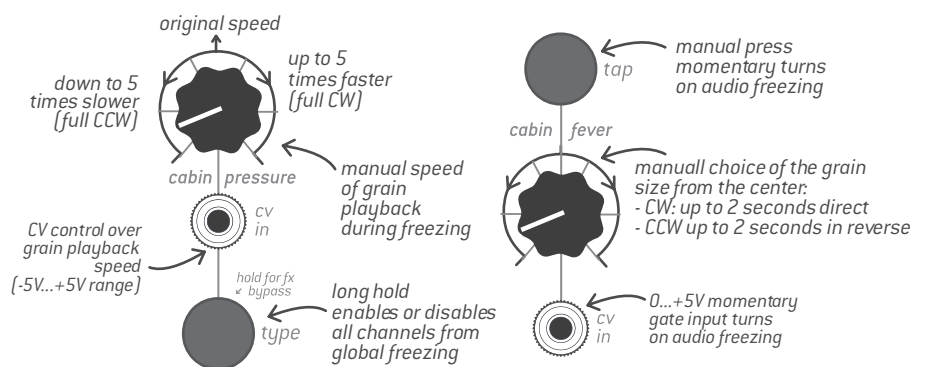
**6. OVERDRIVE** This is a typical guitar pedal effect simulating the creamy sound of an overdriven tube amplifier. CABIN PRESSURE knob adjusts the drive amount from initial to maximum (with volume compensation), while CABIN FEVER defines the tone control. Either it boosts the presence of lower or higher frequencies as usually found in guitar pedals. The TAP button defines if the effect is active or bypassed (like the switch on a guitar pedal) and so does FEVER CV input that accepts gates/triggers to activate or bypass of the effect. Overdrive effect uses 4x oversampling to eliminate aliasing at heavy distortion.



**7. PEAK COMPRESSOR:** The dynamic range of audio material is the ratio of the loudest signal to the quietest. A Compressor reduces loud sounds over a certain threshold while quiet sounds remain unaffected. It is an essential tool for shaping dynamics of audio sources – especially drums. CABIN PRESSURE knob defines the THRESHOLD from -90 dB (fully CCW) to 0 dB (fully CW). The amount of gain reduction is determined by the RATIO. The CABIN FEVER knob defines the RATIO: from 1 (fully CCW) to around 25 (fully CW) the compressor becomes a LIMITER then. The compressor provides a certain degree of control over how quickly it reacts. Secondary CABIN FEVER parameter defines the attack, from 1 to 200 msec. Release is automatically adjusted and is calculated using ratio of peak to RMS (crest factor). CABIN FEVER CV input is an unattenuated side-chain input for linear bipolar CV input, which is then subtracted from compressor threshold in dB. The Compressor also features automatic makeup-gain, which compensates for an eventual volume-loss caused by the compression itself.



**8. FREEZER/LOOPER:** When TAP is pressed (or FEVER CV receives an 'open gate' CV), the audio is looped by the grain length – defined by the CABIN FEVER knob – and with the speed – defined by CABIN PRESSURE knob or CV – applied. Both knobs are bi-directional: With the CABIN FEVER knob in the middle position the granule size is the smallest. Turning the knob CW will increase the granule size; turning CCW will do the same thing, but the granule will be reversed. Same for the speed parameter: With the CABIN PRESSURE knob in the middle position the speed is matching the original sound. It slows down the sound 5 times at full CCW and speeds it 5 times up at full CW.



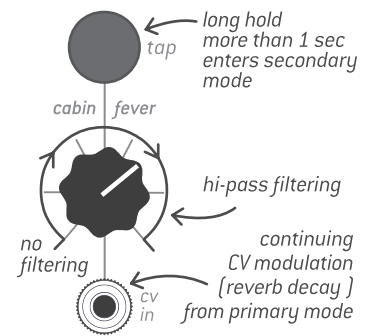
## **YOU WILL BE DEAD – DARKWAVES NEW EFFECTS BANK:**

	<b>EFFECT</b>	<b>PRIMARY 'CABIN FEVER' ACTION</b>	<b>SECONDARY 'CABIN FEVER' ACTION</b>	<b>TAP BUTTON</b>
<b>1</b>	GATED REVERB	Decay of the reverb	Noise gate threshold, by default set to 20%	Long hold: entering secondary function
<b>2</b>	SPRING	Decay of the reverb	Decay of spring excitement from TAP button or incoming by CV IN clock, by default set to maximum	Short press: spring excitement. Long hold: entering secondary function
<b>3</b>	REVERSED REVERB	Reverb's decay value	Damping volume of the tail (in our case 'tail' = 'head' as the tail is reversed)	Long hold: entering secondary function
<b>4</b>	FLANGER	Range of LFO	Feedback amount, by default set to 100%	Long hold: entering secondary function
<b>5</b>	RING-MODULATOR	Modulator's frequency rate	Feedback amount, by default set to 50%	Long hold: entering secondary function
<b>6</b>	OVERDRIVE	Tone control	None	Overdrive bypass on/off (latch)
<b>7</b>	COMPRESSOR	Ratio from 1:1 to 1:25	Attack of compressor from 1 to 100ms	Long hold: entering secondary function
<b>8</b>	FREEZER	Granule size (bipolar)	none	Short/long momentary press: freezing enable

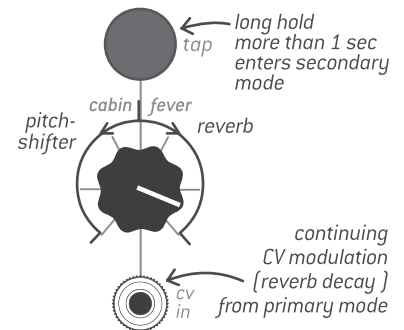
# I FEEL COMFORTABLE IN BLACK

## AIRWAYS – factory ambient effects bank:

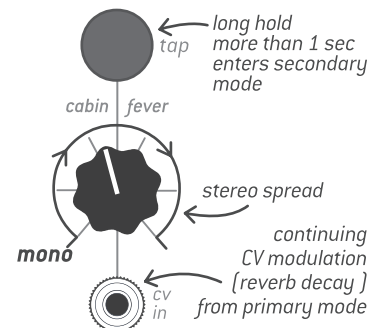
1. **HALL REVERB** is a very clean space effect that may create an extremely large - up to almost infinite - ambience. The CABIN FEVER knob defines the decay of the reverb, or in other words, can be considered as the hall size. At full CW position the sound will sustain up to infinite, while fully at CCW only the effect of a small room will be heard. Don't forget to adjust CABIN PRESSURE simultaneously to have a proper balance for your sound. Holding TAP for longer than 1 second enables the secondary function for CABIN FEVER knob. The amount of decay - primary parameter of the CABIN FEVER knob - will be stored and the CABIN FEVER knob will adjust the amount of fixed HI-PASS filter at the input of the reverb (only manual control, no voltage control). The hi-pass filter is an essential tool within almost any reverb to cut off low frequencies and have more 'air' in the final output without the 'boomy' low frequencies. Be aware: after applying too much hi-pass filter to the reverb, you will hear almost no reverb effect when you play Bass drum sound send to effect. By default, after firmware/bank update, this hi-pass filter cuts only a bit of low frequencies until you adjust it manually with the secondary CABIN FEVER function. Then that parameter is stored in the memory.



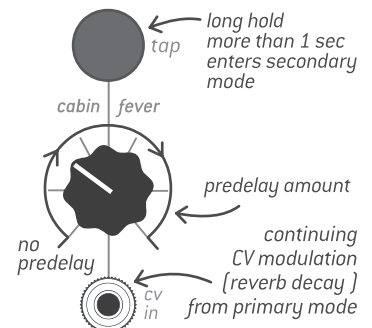
2. **SHIMMER REVERB** is a variation of the hall reverb, with a pitch shifter in the reverb feedback loop, which creates weird, choir-like, huge and unrealistic spaces. The primary CABIN FEVER function defines the decay of the reverb and the secondary function defines the amount of pitch-shifter mixed into original reverb. This means: no pitch-shifter at the fully CCW position of the CABIN FEVER knob, half-and-half in the middle, and pitch-shifted mix only at fully CW position. By default (or after resetting the module) this secondary parameter is set with an approximate ratio 40%/60% of shimmer/reverb until you adjust it manually with the secondary CABIN FEVER function.



3. **STEREO ROOM REVERB** uses four all-pass filters in series and eight parallel Schroeder-Moorer filtered-feedback comb-filters to recreate a sort of stereo (room) ambience. The CABIN FEVER defines the DECAY of the reverb, or again, adjusts the room size. The Secondary function (holding TAP for longer than 1 second) defines the stereo spread of the reverb, from mono (fully CCW) up to a huge stereo spread. By default (or after resetting the module) this spread is cranked up fully until you adjust it with secondary CABIN FEVER function. This change is audible when you use the stereo output of your module connected, e.g. to your headphones or speakerphones.

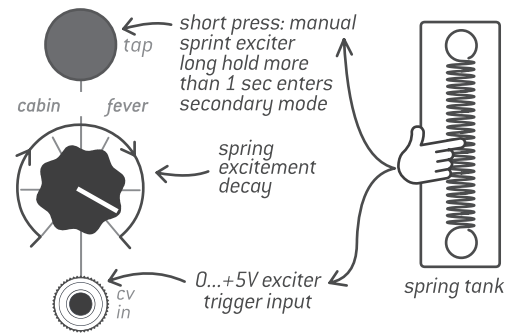


4. **PLATE REVERB** has a distinct sound that recreates picked up vibrations of a big metal sheet driven by an electromechanical transducer. It is one of the first digital reverb simulation approaches ever made. It suits various music genres, vocals and drums, ranging from a subtle effect up to an infinitely sustained ambience. The primary CABIN FEVER function defines the decay of the reverb. In real life this is the distance from the pickups to the metal plate, and defines how long the tail of the reverb is present. Secondary parameter defines the amount of pre-delay to psychologically distant sounds in ambience. By default (or after firmware/bank update) the pre-delay is set to maximum, until you adjust it manually with the secondary CABIN FEVER function.

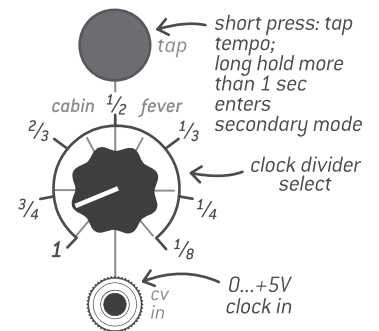




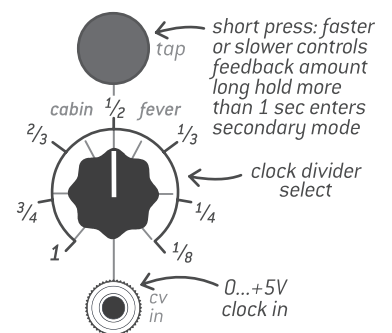
**5. SPRING REVERB** gets its unique sound from the diffusion in the metal spring, because higher frequencies travel more slowly through the spring than lower ones. The CABIN FEVER knob, as usual, defines the decay of the reverb. We also implemented a unique feature: with the TAP button you can simulate a sound as if you pluck the real spring with your finger. That gives the distinct exciting spring reverb sound we all love so much. The Secondary function of the CABIN FEVER is tied to the TAP button's 'pluck the spring' feature and defines the DECAY of how fast the spring will calm down after manually plucking it. The spring plucking may be done manually by using the TAP button or by applying a trigger into the CABIN FEVER CV input while being in secondary function. By adjusting the decay to the maximum value, the spring sounds long (up to infinite) with a small self-oscillation. Keep that in mind when you select this effect.



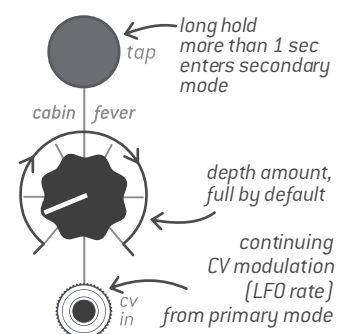
**6. PING-PONG DELAY** is a recreation of a stereo delay with the rate of repeats controlled by a manual tap or by a clock. A 'tap' is usually three or more short clicks in a row on the TAP button, after which the repeats of the delay follow the tempo you have tapped. Double internal down-sampling allows the delay to sustain up to a maximum of 2 seconds. The primary CABIN FEVER parameter defines the feedback of the delay – i.e. how much sound goes into the feedback loop to be repeated. At full CW knob position, almost no new incoming sound comes to the feedback loop and the sound regenerates itself infinitely. The secondary CABIN FEVER parameter defines the clock division of the incoming tap/clock. These taps/clock come either from the manual TAP button or from the CV IN jack. The CV IN jack becomes a 0...+5V trigger input in that mode. In the secondary mode the CABIN FEVER knob range is divided into 6 sectors that correspond to divisions: 1, 3/4, 2/3, 1/2, 1/3, 1/4, 1/8. Clock division change is possible during new taps, and is saved after you switch to the primary mode. Some pitch-shifting artefacts may arise during changing the divisions; just wait a few seconds until the delay buffer is fully emptied/renewed and you will have a proper tempo calibration. If the total tap applied (after division) is longer than the maximal time delay can handle, then the maximal tap tempo is set. Since this is a stereo delay, all taps affect the left and right channel.



**7. TAPE ECHO** is a recreation of Variable Tape Speed Echo machines with 3 fixed playback heads – inspired by the Roland RE-201 Space Echo, with a warm saturation emulation. With double internal downsampling, the total delay time is around 1.4 seconds from the initial echo input until the output of the third delay. The overall time is spread over all three tape heads/delays, that's why the total 1.4 seconds may be audible as 480ms delay. In primary mode, the CABIN FEVER knob defines the delay repeat rate (speed of the tape). Bipolar +/-5V CV input applied (i.e. an LFO) to the CABIN FEVER CV input, using the knob as attenuator, may create interesting detuned audio effects. The tap button works in a limited frequency range of manual tapping, and defines the INTENSITY (number or repeats, or feedback) of the delays. The faster you tap, the longer the decay (delay tail) you obtain. The secondary CABIN FEVER parameter works as a divider for the incoming clock (into CV IN jack) or by using manual taps with the same dividers as in Ping-Pong delay described above.



**8. CHORUS** is an ambient effect to thicken the sound and create unrealistic spaces by varying the modulation parameters continuously. The chorus effect is the result of delaying an original signal in time and mixing it with a signal modulated by a few of fixed LFOs and obtaining unison effect as a result, or to make sound fatter. CABIN PRESSURE defines the amount of dry and wet signal. Primary CABIN FEVER knob defines the feedback amount. In average amounts, it creates typical unison effect, however in full CW amount in goes to an infinite feedback resulting unrealistic ambient. Secondary FEVER parameter defines the modulation depth, which is 'full on' by default.

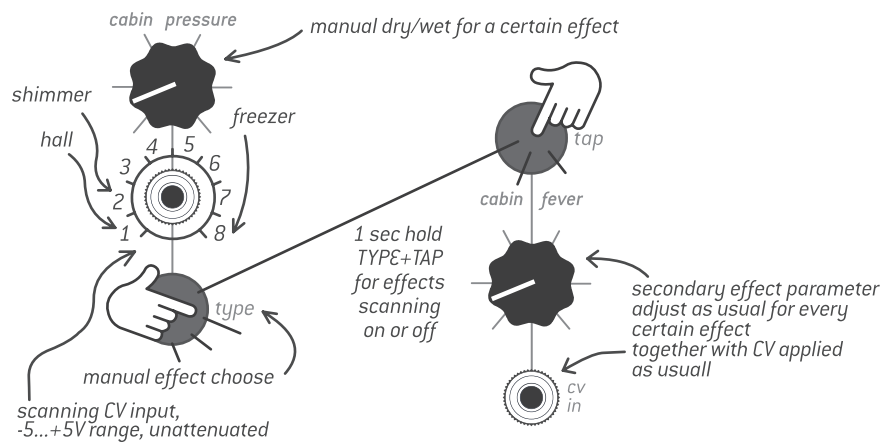


## EVERBODY HAS A DARK SIDE

	<b>EFFECT</b>	<b>PRIMARY 'CABIN FEVER' ACTION</b>	<b>SECONDARY 'CABIN FEVER' ACTION</b>	<b>TAP BUTTON</b>
<b>1</b>	HALL REVERB	Decay of the reverb	Hi-pass filter at reverb input, by default set to 50%	Long hold: entering secondary function
<b>2</b>	SHIMMER	Decay of the reverb	Pitch-shifter vs reverb mix, by default set to 40/60%	Long hold: entering secondary function
<b>3</b>	ROOM	Decay of the reverb	Room stereo spread, by default set to maximum	Long hold: entering secondary function
<b>4</b>	PLATE	Decay of the reverb	Pre-delay amount, by default set to maximum	Long hold: entering secondary function
<b>5</b>	SPRING	Decay of the reverb	Decay of spring excitement from TAP button or incoming by CV IN clock, by default set to maximum	Short press: spring excitement. Long hold: entering secondary function
<b>6</b>	PING-PONG DELAY	Delay's feedback amount	Divider for delay's frequency from TAP button or incoming by CV IN clock, by default set to 1/1 (max length)	Short press: tap tempo Long hold: entering secondary function
<b>7</b>	TAPE ECHO	Tape speed	Divider for delay's feedback from TAP button or incoming by CV IN clock. By default set to 1/1 (max length)	Short press: tap for feedback Long hold: entering secondary function
<b>8</b>	CHORUS	Feedback amount	Modulation depth, by default 100%	Long hold: entering secondary function

## YOU WILL HAVE NIGHTMARES FOREVER

**CABIN PRESSURE SCAN:** by pressing and holding the **TYPE + TAP** buttons simultaneously for longer than 1 second, you enable the effect type change under incoming CV. Every effect type has a memory, so the values of every parameter are stored and then immediately recalled under incoming CV for a certain effect type. In that mode, the CABIN PRESSURE parameter is no longer CV controlled and works only as a manual DRY/WET control. The CV input for CABIN PRESSURE accepts bi-polar -5...+5V CV signal and changes the type of effect under incoming CV. The range of -5...+5V is divided into 8 zones (with adjusted hysteresis range) with approx. 1.25V per step. If the incoming CV is from -5V to -3.75V, then the first effect type is chosen. If the CV is in the range from -3.75 to -2.5V, then the second effect is chosen and so on, up to the 8<sup>th</sup> effect.



## NOT A NIGHTMARE IF YOU KNOW WHAT YOU ARE DOING

**IMPORTANT:** Because the DSP in the module can only handle loading one effect at once, very fast scanning of effects may cause clicks. There are small crossfades in volume during effect transitions, and we tried to minimize the clicks as much as possible, but they cannot be fully eliminated.

## I'M THE DEATH

In case you tweaked everything so hard, you finally don't hear any signal from the main outputs, or only things you don't want to hear, there is a soft reset that adjusts all parameters to their default values, so you may start tweaking from the beginning. Reset also clears all effect memories. Press both TYPE and TAP buttons simultaneously and hold for more than 5 seconds. You may hear a short blip and then you will see the effect will be set to the first cell by one green blink.

This works for Grand Terminal, Bkck\_Noir and Milky Way:

