

ENDORPHINES[®] EVIL PET

G R A N U L A R P R O C E S S O R



CONTENT

CONTENT.....	2
INTRO.....	2
CONNECTING THE POWER.....	4
TECHNICAL SPECIFICATIONS.....	4
FRONT PANEL.....	5
REAR PANEL WITH JACKS.....	5
INTERFACE.....	6
GRANULAR QUICKSTART.....	13
AS A SYNTHESIZER.....	14
AS A PEDAL EFFECT PROCESSOR.....	14
AS A REEL-TO-REEL RECORDER.....	15
AS AN FM RADIO RECEIVER.....	15
MAIN MENU.....	16
EXIT / BACK.....	16
EFFECTS & OSCILLATOR.....	17
INPUT SOURCE.....	18
LOAD PRESET.....	19
SAVE PRESET.....	19
LOAD WAV.....	19
SAVE WAV.....	19
DELETE PRESET / WAV / FOLDER.....	20
MIDI.....	20
LFO & ENVELOPE FOLLOWER.....	21
SETTINGS.....	21
MPE: MIDI POLYPHONIC EXPRESSION.....	24
MODULATIONS / LFO.....	24
EXPRESSION PEDAL SETUP.....	27
MIDI IMPLEMENTATION CHART.....	28
FIRMWARE UPDATE.....	31
CREDITS.....	32
COMPLIANCE.....	34

INTRO

Welcome to EVIL PET — your granular processor with built-in FM radio.

EVIL PET can be: a polyphonic synthesizer, an effect processor, a radio FM tuner, a reel-to-reel recorder, and more.

EVIL PET bites incoming audio into tiny grains and plays them in new, playful, or unexpected ways. Stretch, shrink, or flip the grains to create unique sounds, textures, and effects.

Layer grains to make dreamy, glitchy, or swirling soundscapes. It works with any input - guitar, voice, synth, or drums - turning ordinary sounds into something magical.

Audio can come from line inputs, the built-in microphone, the FM tuner, or samples on a microSD card. Grains can be triggered manually via the *PLAY* key or played up to 8-voice polyphonically via a MIDI or MPE keyboard - giving you endless expressive possibilities to explore.

EVIL PET is perfect for creating stretching, evolving effects, glitchy rhythms, and rich, layered textures. It is ideal for film, game soundtracks, or transforming simple recordings into complex, otherworldly audio.

The PET is supplied with a foldable antenna for FM receiver as well as universal power adapter to start discovering new pet out of the box.

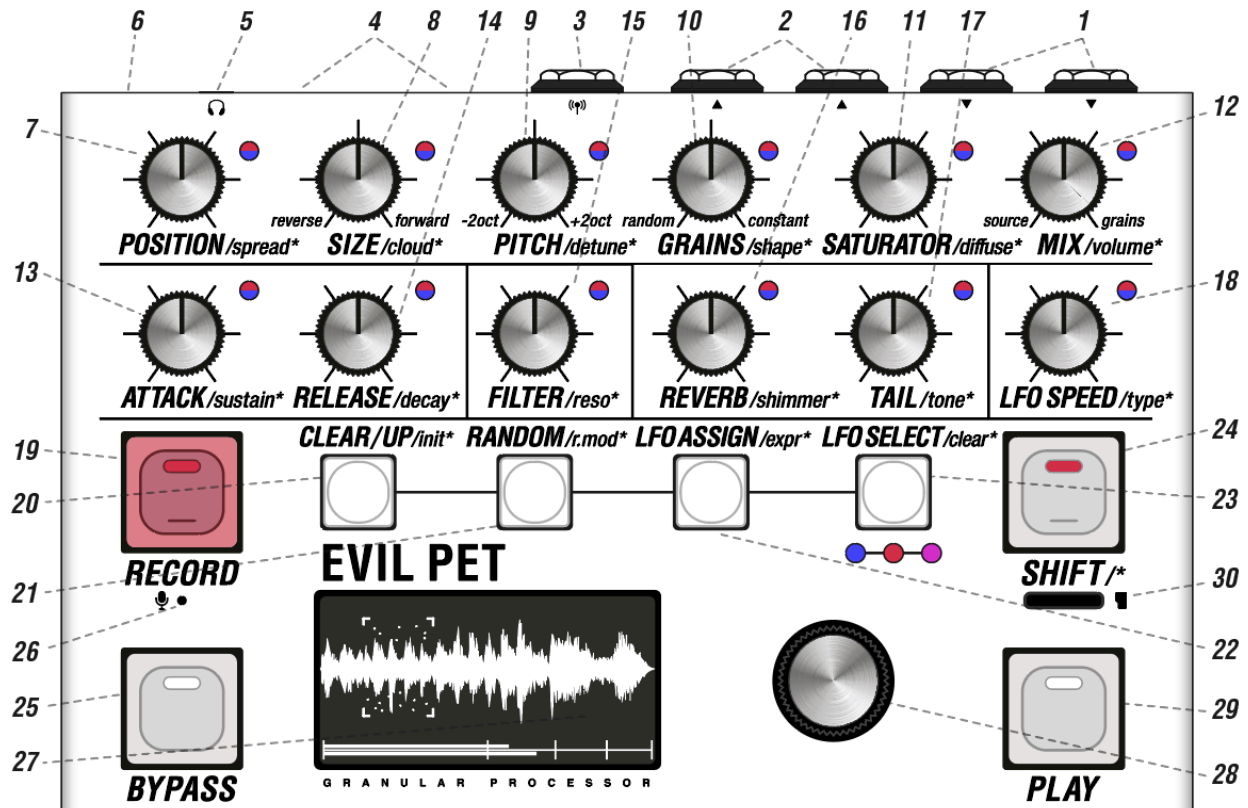
CONNECTING THE POWER

Use a quality 9V typical Boss® standard, 500mA, +9 to 18V. Power jack has internal reverse protection with voltage rectification therefore accepts any DC adapter of 9 to 18 volts of **any polarity** – both center positive or center negative adapters will work. A 12V 1A center positive universal power adapter with switchable US/EU/AU/UK plugs **is included** with the PET but you can use any of your pedalboard power supplies.

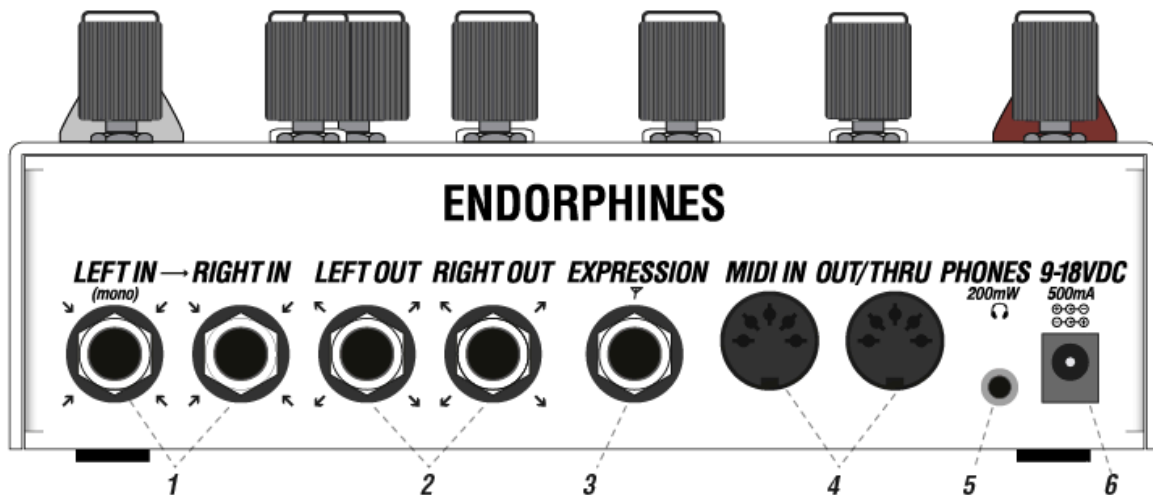
TECHNICAL SPECIFICATIONS

- Audio input impedance: 10 kΩ (line)
- Audio I/O: pro-line levels up to +4dBu or +/-1.736V. 48 kHz, 24 bit D/A and A/D converters with 32 bit floating point internal processing
- Audio output impedance: 100Ω (1/4" jacks), 200mW of continuous average power into an 8Ω load for the headphones jack
- Connectors: 1/4" or 6.35mm TS unbalanced. MIDI connectors: DIN-5. DC power connector: 2.1mm tip / 5.5mm barrel DC jack. Headphones jack: 3.5mm stereo. Micro SD card (included and also included SD to microSD card adapter), electret microphone 50Hz~16kHz response
- Memory: 512mb RAM or max. 10 minutes buffer size
- Bypass options: true-stereo on electromechanical relays, buffered, trails
- Current draw: 500 mA, 9V to 12V (12V 1A universal power adapter with switchable US/EU/AU/UK plugs **included**)
- 128 × 64 pixel 2.42" monochrome OLED screen
- Radio FM tuner: 76.0 to 108.0 MHz
- PET dimensions: 186x123x75 mm (7.3×4.8×3.0"); weight: 746gr. / 1.65 lbs.
- Packaging box: 253×128×83 mm (10×5.1×3.3"); weight: 1kg / 2.2lbs
- Shipping box: 280x160x100 mm (11.0×6.3×3.9"); weight: 1.11 kg / 2.45 lbs (incl. PET in the packaging box with power adapter & antenna)

FRONT PANEL



REAR PANEL WITH JACKS



INTERFACE

1. **LEFT IN (MONO), RIGHT IN JACKS** are [line level](#) stereo audio inputs. *LEFT INPUT* is *normalled*, i.e. pre-routed → to *RIGHT INPUT* when no audio cable is plugged into *RIGHT IN jack*. Those jacks expect standard unbalanced TS instrument 1/4" connectors, guitar or pro-line levels (up to +4dBu or +/-1.736V) with input hard-clipped with diodes forks.
2. **OUT LEFT (MONO), OUT RIGHT JACKS** are final stereo audio outputs, standard unbalanced TS instrument 1/4" jacks. Also work as pseudo-balanced with TRS 1/4" connectors.
3. **EXPRESSION PEDAL JACK:** assignable expression pedal input. Accepts standard TRS expression pedal, +3.3V supplied from the ring. Expression pedal morphing macro settings are saved for every preset. For more details on how to assign the expression pedal jack check [EXPRESSION SETUP](#) section below. That jack acts also as an **ANTENNA** (📶) for built-in [RADIO FM tuner](#) and can be used with the supplied foldable L-shape antenna or any longer dummy cables (including expression pedal itself!) acting as antenna to improve the radio reception.
4. **MIDI IN / MIDI OUT JACKS** are standard DIN-5 MIDI input and output connectors. *MIDI IN* accepts a list of CC values (see [MIDI implementation chart](#)) on the configured receiving MIDI channel and MIDI clock. *MIDI OUT* can act as a *MIDI THRU* or generate CC messages on knob's movement. MIDI can be switched into [MPE mode](#) to control from modern tactile controllers.
5. **PHONES** is a stereo 3.5mm 🎧 headphone jack. Can deliver up to 200mW of current and is able drive various impedance headphones.
6. **DC IN JACK** is a 2.1mm/5.5mm connector for the power adapter – typical Boss® standard, 500mA, +9 to 18V. This jack has internal reverse protection with voltage rectification therefore accepts any DC adapter of 9 to 18 volts of **any polarity** – both center positive or center negative adapters will work. 12V 1A center positive power

adapter is supplied with the PET but you can use any of your pedalboard power supplies.

7. **POSITION** knob sets the part from which the sample's part section played. You may see that area, surrounded by [...] brackets on the screen, move when you adjust the **POSITION** and **SIZE** (8) knobs. Secondary **/spread*** parameter accessed in combination with the **SHIFT** button (24) alters the maximum random panning of each grain i.e. how wide they are placed in the stereo field.
8. **SIZE** knob sets the size of each grain: turning from noon to CW the grain is played back in forward direction and from noon CCW - in reverse. The maximum possible grain size is **2** seconds. Secondary **/cloud*** sets the playback window size around the area set by the **POSITION** (8) knob. As you may notice, all three **POSITION** (7), **SIZE** (8) and **/cloud*** parameters alter the grains extraction area surrounded by [...] brackets.
9. **PITCH** knob sets the pitch of the grain playback in the default range of +/-2 octaves. It is possible to adjust range in 1, 2 or 3 octaves - unquantized or quantized to semitones or other scales in the [SETTINGS](#) menu. Secondary **/detune*** randomizes the grains pitch from the point set by the **PITCH** knob by +/-1 octave yet following the quantization setting.
10. **GRAINS** knob sets the rate at which the grains are generating: always 1 grain in the middle/noon position and adding faster rate by turning CW from noon and random rate by turning CCW from noon. Secondary **/shape*** adjusts the grain's shape - you may consider it as a micro envelope for each grain (the amount is shown with the brightness of the **red** LED): from soft (bell-like) at CCW to hard (square) shape at CW. It is possible to set the **GRAINS** knob to behave bipolar like described above (**DUAL**) or per constant (**CONST**) or per random (**RANDOM**) knob's ranges only or defining the divider for the incoming MIDI clock (set to *MIDI*) to generate the grains synchronized rhythmically.

- 11. SATURATOR** knob sets the amount of an extra processor block which stands after the filter chain but before the reverb. It can be selected in the [EFFECTS](#) menu from: **DISTORTION**, **SAMPLE RATE REDUCER**, **BIT CRUSHER**, **FLANGER**, **CHORUS** and **FEEDBACK** (feedback works only when **RECORD** (19) is enabled). Secondary */diffuse** adjusts the **DIFFUSION** of the grains. It is a special processing block that follows after the */shape** micro-envelope (10) that additionally smears the sounds with an all-pass network. Think of it as an extra micro 'reverb' with a super short tail to smoothen the transients or glitches of the small spiky grains and to make the grains sound more out of phase and blurry (the amount is shown with the brightness of the **red** LED).
- 12. MIX** knob sets the blend between selected audio input source - **MIC**, **LINE IN** or **RADIO** - and the generated grain playback. Is useful to adjust dry/wet when the PET is used as an audio effect processor. Typically should be set to full CW when you mangle with the loaded WAV audio file or *frozen* recorded material as CCW state will give you silence when **RECORD** (19) is disabled. In the [EFFECTS](#) menu you may set the reverb to be applied as either for grains (pre-MIX) or for full post-MIX (both as dry/wet or send) which the later is useful when you use the PET as an effect processor so the source audio will also be processed under the reverb. Secondary */volume** sets the final output volume level for both line and headphones outputs (the amount is shown with the brightness of the **red** LED).
- 13. ATTACK** knob sets the attack time for the ADSR envelope generator from 0.1mSec to 10 seconds. Secondary */sustain** sets the sustain level from 0% to 100% (the amount is shown with the brightness of the **red** LED).
- 14. RELEASE** knob sets the release time for the ADSR envelope generator. Secondary */decay** sets the decay time (the amount is shown with the brightness of the **red** LED). Both decay and release values are from 0.1mSec to 10 seconds.

- 15. FILTER** knob sets the filter cutoff amount. Selectable filters from the [EFFECTS](#) menu are: **MULTIMODE** (dual LP/HP), **LOW PASS** 12db/oct, **HIGH PASS** 12db/oct, **BANDPASS**, **COMB**. Secondary */reso** sets the resonance or bandwidth for bandpass filters (the amount is shown with the brightness of the **red** LED). Note: in the same [EFFECTS](#) menu you can set the amount of envelope to modulate the filter cutoff.
- 16. REVERB** knob sets the reverb amount. Selectable reverb algorithms from the [EFFECTS](#) menu are: **PLATE** (S for small and L for large), **REVERSE**, **ROOM** via that same menu reverb can be applied to either grains only or overall mix in dry/wet or send modes. Secondary */shimmer** function controls the amount of **PITCHSHIFTER** in the reverb (the amount is shown with the brightness of the **red** LED) and creates sparkling echoes that glow like a dreamy effect.
- 17. TAIL** knob sets the decay of the reverb's **DECAY** (a.k.a. feedback). Secondary */tone** adjusts the **tilt EQ** after the reverb tank (the amount is shown with the brightness of the **red** LED) which is useful to get rid of the boomy low-end or vice-versa.
- 18. LFO SPEED** knob controls the frequency time (speed) of one of three selected LOW FREQUENCY OSCILLATORS or **LFO** from 0.01 Hz (100 seconds per cycle) at CCW to 50 Hz (0.02 seconds per cycle) at CW. LED flashes in three different colors: **blue**, **red** and **pink** according to one of the 3 LFO selected (23). Each of 3 LFOs can either run on independent internal clocks or synced to external MIDI clock applied from **MIDI IN** (4) - you can change those settings in the [LFO](#) settings menu. When a certain LFO is synced to external MIDI sync, its **LFO SPEED** knob selects the clock divisions. Secondary */type** gradually selects the LFO shape: **SINE**, **TRIANGLE**, **SAW**, **SQUARE**, **STEPPED RANDOM**, **FLUCTUATING RANDOM** and **ENVELOPE FOLLOWER** types. **Note:** when envelope follower is selected, speed acts as envelope follower digital gain (up to +20db). You may adjust additional envelope follower parameters in the [LFO](#) settings menu: attack, release and same gain value as with the knob.

- 19. RECORD** button activates audio recording in the buffer or in other words - activates sampling the input. Selectable record sources via [INPUT SOURCE](#) menu are: **MIC** (via built-in electret microphone (26), **RADIO** (via built-in FM receiver) and **LINE IN** (via left-right 1/4" TS input jacks). Recording activation and deactivation can be either momentary when the button is only pressed or continuous when button is pressed to enable and then pressed again to disable sampling: that behaviour is selected via [RECORD KEY](#) settings menu: as momentary or latched or via **SHIFT+RECORD** shortcut (1 second press). Red means recording: record is enabled when its **red** LED is on. At the same time a combination of a short **SHIFT+RECORD** press will enable the record's button **ARM recording** - i.e. the record will start once the audio material will pass through the selected [INPUT](#) from silence.
- 20. CLEAR/UP** button: single 1 second press clears current audio buffer. Also clears the buffer when the **RECORD** (19) is enabled without stopping the sampling itself. Acts as a *LEVEL UP / BACK / EXIT* for faster navigation in the [MENU](#). Combination of **SHIFT + CLEAR** for 1 second press clears both primary and secondary knobs to their default values without clearing the audio buffer - that combo helps to clear the mess up and start from the default values if you can't understand what's going on.
- 21. RANDOM** button generates random knobs setting on a single press except for the **MIX** and **/VOLUME*** (12) parameters. **SHIFT + RANDOM** applies the random **/r.mod*** modulations from the currently 1 of 3 selected LFO with **LFO SELECT** (23) button. The randomization idea to obtain happy accidents. It cannot be undone therefore we recommend saving your preset first. If you received heavy modulation result you don't like - you can always apply from scratch by pressing **SHIFT + CLEAR/init*** to reset all random result to default values or **SHIFT + LFO SELECT/clear*** to clear all currently assigned modulations to the selected LFO.
- 22. LFO ASSIGN** used to assign LFO modulations and expression pedal morphing. Tweak any of the knobs while holding this button (it will light up and the appropriately selected **LFO 1/2/3 LED** will blink).

The amount by which you tweak this knob from center/noon position to the **-/+** sides while holding that button sets the **negative/positive** depth amount of the selected **LFO 1/2/3** (23), which will be applied to the assigned parameter. Secondary combination of **SHIFT + LFO ASSIGN** for 1 second will open the expression pedal settings.

23. LFO SELECT button selects which one of 3 *low frequency oscillators* is currently selected so we may turn the **LFO SPEED** (18) knob to adjust its frequency or assign it to modulate any of the parameters with the **LFO ASSIGN** (22) button. There are three LEDs of three different colors: **blue**, **red** and **pink**. When selected, they coincide with the same **LFO SPEED** (18) color showing one of the three currently selected LFO. Only one of 3 LFO can be edited at a time with the knobs (or more over MIDI CC - see [MIDI IMPLEMENTATION CHART](#)). **SHIFT + LFO SELECT** combination for 1 second clears all assigned modulations for currently selected LFO.

24. SHIFT button is essentially a *shift* key. It gives access to secondary controls while held down - those functions are labeled with an asterisk after slash on the panel: **/...***. When the shift is enabled, its **red** LED is on and you may see all the LEDs near the knobs switch from **blue** to **red**, showing visually the amount of secondary parameters with their brightness and allowing you to edit them (or assign modulation as well!). The **SHIFT** button has an extra latched action, so you may press it once to leave enabled and adjust other parameters while operating with one hand only. Some rarely used settings like bypass types or record/play behavior require the **SHIFT** button to be held. Alternatively there is a quick access to secondary parameters without the latch - after you press and hold **SHIFT**, tweak some parameters and release the button - it turns that button action off.

25. BYPASS is essentially a *bypass / enable / activate* effect on button. Each consequent press enables and disables the whole effects chain. When the effects chain is enabled, the **white** LED on that key is ON. When the effect chain is bypassed, the LED is off and also all the remaining LEDs except the preset selection LEDs are dimmed. **SHIFT + BYPASS** for one second combination selects one of the three bypass states: true with relays, soft (buffered) and trails (buffered but

effect trails are still active when we bypass the chain). That bypass behaviour can also be selected via the [BYPASS](#) settings menu.

26. MIC is a small electret microphone used to record voice or ambient sounds when MIC is selected in the [INPUT SOURCE](#) menu. When we are in the main menu (a.k.a. stand-by mode) the combination with **SHIFT** button pressed and rotating big **ENCODER** knob (28) can adjust up to +20db digital boost for the MIC, audio jacks or radio FM tuner audio.

27. DISPLAY shows the recorded waveform, the state of the tweaking knobs and also used to navigate through the presets and [MENU](#) with **ENCODER** (28). Normal mode for the display is called stand-by mode when it shows the waveform on full screen with animated grains as dots. There is a dedicated screensaver and automatic exit to stand-by mode in the [DISPLAY](#) settings menu.

28. ENCODER is used to navigate through the presets rotating the knob from standby mode. When selecting the preset currently loaded preset is marked with asterix * symbol. Folders are shown with triple bar ≡ symbol. Encoder click in stand-by mode enters the **MENU**. When in the menu, **CLEAR/UP** button (21) acts as a BACK / RETURN 1 LEVEL UP / MENU EXIT button.

NOTE: Turning the encoder with **SHIFT** button (24) pressed adjusts up to +20 db input gain for the MIC, LINE or RADIO inputs (same setting can also be adjusted via [INPUT SOURCE](#) menu).

29. PLAY is a manual, single monophonic voice generation button. Same as with the **RECORD** (19) button, its action can be either **momentary** when the button is only pressed or **latched** when button is pressed with sustain continuously - so we can mangle the audio without the need to hold that button. That behaviour is selected via [PLAY KEY](#) settings menu or via **SHIFT + PLAY** shortcut (1 second press). Each **PLAY** press launches the ADSR envelope generator adjusted with **ATTACK/sustain*** (13) and **RELEASE/decay*** (14) knobs and when the PLAY is latched then the envelope after firing remains in the *sustain* state. Along with the PLAY button, up to 8 more voices can be triggered normally via MIDI or MPE. When **PLAY** is pressed its **white**

LED shows the ADSR envelope with its brightness - it that way you may notice that LED will be always ON when **PLAY** is latched in the sustain state of ADSR.

- 30. SD** is a socket for the microSD card. SD card is used for storing the samples, presets as well as for updating the firmware. The SD card should be formatted to the FAT32 file system. FAT16 and exFAT are also supported, and the card can be formatted from the [SETTINGS](#) menu. The filesystem is chosen automatically based on the card's size. SD to microSD card adapter is supplied with the PET.

GRANULAR QUICKSTART

Granular synthesis works by slicing audio into thousands of tiny fragments called grains, each lasting anywhere from a fraction of a millisecond to a few seconds. Instead of playing the original sound straight through, the processor replays and reshapes these grains in endlessly variable ways.

By tweaking top row knobs on the EVIL PET like **POSITION/spread*** (7), **SIZE/cloud*** (8), **PITCH/detune*** (9), **GRAINS/shape*** (10) you can control how smooth, chaotic, or rhythmic the result becomes. A single voice recording can transform into a shimmering pad; a drum hit can dissolve into a swirling cloud.

To generate the grains you have to [record](#) some audio into a buffer or [load a sample or a preset](#). Turn the encoder knob to quickly enter the presets selection, select something interesting and click the encoder to load it. A preset is a combination of saved knob settings typically paired with an audio file. In case the file is not loaded - that preset typically used for live audio processing - just hit **RECORD** (19) to have it started. Start to tweak the knobs intuitively to feel things moving: **GRAINS, SIZE, POSITION, PITCH** and you shall see the changes with dots resembling grains on the display. Because the grains overlap and blend, the output can sound organic and fluid, like a constantly shifting soundscape. Let's add some

vibe: tweak **FILTER, REVERB, SATURATOR** - nice! Turn the encoder and choose another preset. Check the **LFO SPEED, MIX, PITCH**. Slowly we get there so let's move on to how to use the PET in different cases.

AS A SYNTHESIZER

When EVIL PET is used as a synthesizer - that means usually it is expected to play via incoming MIDI notes. The most straightforward way would be to play the notes based on the loaded or recorded (sampled) WAV-audio file. Synth mode is typically played with the **RECORD** (19) off and **MIX** knob (12) set to fully CW (grains). **BYPASS** (25) shall be always enabled (active) and you may preview how the synth sounds by pressing the **PLAY** button (29) which corresponds to a fixed C3 MIDI note number 60 and it is when the grains are expected to play at 100% original sample speed without detune.

AS A PEDAL EFFECT PROCESSOR

EVIL PET can process the incoming audio - so instead with a fixed loaded WAV-file in the synth example above, its buffer is always variable and refreshes with the fresh audio material in a similar way as a reel-to-reel audio tape recorder with looped tape work. The most straightforward way would be to enable the **RECORD** (19) off and **MIX** knob (12) set to middle values to hear the original vs grains signal. **PLAY** button (29) shall be latched (via **SHIFT+PLAY** for 1 second) so the voice generation is always working. You may play with **BYPASS** (25) switching it to the trails mode (**SHIFT+BYPASS** for 1 second) to dynamically enable/disable the processing. For simple processing we recommend setting a shorter [buffer size](#) for a few seconds. And what if we set the buffer size to a longer up to 10 minutes length? That's the idea of the next chapter:

AS A REEL-TO-REEL RECORDER

Imagine an EVIL PET can be a magical reel-to-reel recorder. The sound you feed into it is recorded onto a *virtual tape* inside the processor, just like tape on a reel. But instead of playing the tape straight from start to finish, the processor can cut it into tiny snippets called *grains*. Each grain is like a tiny slice of tape.

Now, you can play these slices in any order you want: forward, backward, stretched, squished, or layered on top of each other. You can even play dozens of grains at once, like spinning many tiny reels at the same time. Changing the grain size is like changing how long each tape snippet is. Sliding the grains around is like moving the tape up and down the reel.

Set the **SATURATOR** knob (11) to adjust the [FEEDBACK](#) to some of the output (the processed sound) and feed it back into its input. This means the output influences what goes into creating new grains, which can create build-ups, echoes, self-oscillation, and more dramatic textures

In this way, the *reel* becomes a playground: you can repeat, rearrange, or scatter the sound snippets to make evolving textures, stutters, or dreamy pads. Unlike a real tape recorder, this virtual reel can warp, reverse, and multiply itself endlessly. So the EVIL PET is like a tape recorder on steroids, chopping the reel into tiny pieces and letting you remix your sound in magical ways. What was once a simple, continuous recording now becomes a universe of tiny, movable sound pieces.

AS AN FM RADIO RECEIVER

EVIL PET has a built-in stereo FM radio receiver. Its FM reception range is from 76.0 to 108.0 MHz, with a step of 0.1 MHz, thus covering all FM radio stations worldwide.

Use the supplied foldable antenna along with the 1/8" to 1/4" jack adapter to connect the antenna to the **EXPRESSION PEDAL JACK** (3) on the rear

side of the PET. To improve reception in remote areas, we recommend trying a longer dummy cable as an antenna or adjusting its placement. Additionally, you can use your expression pedal - even our PLUS 3 model will work perfectly, providing expression control while also enhancing reception.

To enable the radio working simply set the [INPUT SOURCE](#) to: RADIO. Enable the **RECORD** (19) and set the **MIX** knob (12) to CW to listen to the original source. Go to INPUT SOURCE - RADIO TUNE to select your favourite FM station. Then you can mangle with that radio similar to any other live audio source.

MAIN MENU

The menu is accessible via **ENCODER** (28) press. To exit the menu either navigate and click on the EXIT / RETURN on top of each list or press the **CLEAR/UP** (20) button shortly to return to the previous menu page or exit the menu. When in the menu you can still tweak the knobs with buttons - useful as you can select various types of filter/reverb/saturator and check them not quitting to the stand-by view.

When in the menu - rotating the encoder clockwise goes down the list and counterclockwise goes up in the list. To select the parameter we want to edit or enter the sub-menu folder simply click on the encoder: the arrow symbol > symbol will change to the asterisk * meaning you can edit that parameter with encoder rotation. Consequent click will exit from that parameter editing and transforming * back into the >.

When in the menu you may see the currently installed firmware version in the top right corner of the display. Refer for the [FIRMWARE UPDATE](#) section of how to get the latest features on your PET.

EXIT / BACK

Selecting that option exits the menu to the stand-by screen with the waveform view or returns to 1 level upper in the menu

EFFECTS & OSCILLATOR

Those are all the extra effects settings which relate to the effects and synth oscillator (called *overtone*). Those effects settings are individual for every preset.

- **FILTER**: selects the filter (15) type - MULTIMODE (dual LP/HP), LOW PASS 12db/oct, HIGH PASS 12db/oct, BANDPASS, COMB
- **REVERB**: selects the reverb (16) type - PLATE (S for small and L for large), REVERSE, ROOM
- **REVERB FOR**: selects how the reverb applies: for GRAINS only as 'DRY/WET' or as 'SEND' or applies to the whole MIX at the end of the chain as 'DRY/WET' or as 'SEND'. When we apply the reverb as 'SEND', then the original dry audio doesn't drop while in 'DRY/WET' mode the original dry audio fully crossfades with the fully processed version.
- **PREDELAY**: sets the time of the beginning of the first reflections of the reverb in mSec: 0 to 1000 mSec. The amount of pre-delay may be perceived as the apparent size of our 'space'.
- **SATURATOR**: selects the saturator processor type - FLANGER, CHORUS, DISTORTION, SAMPLE RATE REDUCER, BIT CRUSHER and FEEDBACK. **Note**: feedback works only when **RECORD** (19) of the audio input is enabled - as it doesn't feed back into the recorded buffer - because recording is *paused*).
- **CHORUS**: sets additional frequency and depth settings for the chorus when CHORUS is selected as a SATURATOR block
- **FLANGER**: sets additional feedback, frequency and depth settings for the flanger when FLANGER is selected as a SATURATOR block
- **TUNE**: sets extra tuning offset for the AUDIO material in semitones (+/-12 semitones) and in cents (+/-100 cents or +/-2 semitones). Use that to correct the recorded audio file to the correct tuning.
- **SYNTH OVERTONE**: is a simple digital oscillator used to layer up with the sample to tighten the sound.
- **WAVEFORM**: selecting oscillator type; options are: NONE, SINE, TRIANGLE, SAW and SQUARE.

- **VOLUME**: is a volume of that digital oscillator.
- **SEMIS/CENTS**: sets extra tuning offset for the OVERTONE synth oscillator in semitones (+/-36 semitones or +/-3 octaves) and in cents (+/-100 cents or +/-2 semitones).
- **ENVELOPE FILTER MOD**: is the amount of modulation from envelope generator applied to the filter's cutoff (range is +/-100%).

INPUT SOURCE

In that sub-menu we select which source is used for sampling into the audio buffer. Those settings are also individual per every preset.

- **INPUT**: MIC, LINE or RADIO are selectable audio sources.
- **LOAD FROM**: selects the INPUT SOURCE to remain as last used (**GLOBAL**) or per **PRESET**. Selecting GLOBAL will hard lock the input source to selected in the INPUT menu, while per PRESET will switch automatically what was saved in the newly loaded preset
- **RADIO TUNE**: selects the FM band for radio reception from 76.0 to 108.0 Mhz with the step of 0.1 Mhz
- **RADIO FREQUENCY**: selects the radio FM frequency to remain as last used (**GLOBAL**) or per **PRESET**. Selecting GLOBAL will hard enable the fm frequency band to remain which you tuned in the RADIO TUNE menu while per PRESET will switch automatically to the FM band saved in the newly loaded preset
- **IN GAIN**: adjusts 0 to +20 db digital input gain for the MIC or LINE inputs. An alternative fast shortcut for that is turning the encoder in stand-by (non menu) mode with the **SHIFT** button (24) pressed. Note: adding too much gain may result in a higher noise level and **CLIPPING** notice will blink at the VU meter. Try to set it to moderate levels.
- **VU METER**: enables or disables the VU-meter in the bottom part of the display (is ON by default).

LOAD PRESET

We can load a preset – a file from SD card in special json format with .ev/ extension with all the settings and also that file has a link to the WAV file (if that was recorded and saved of course).

SAVE PRESET

When we like what we recorded and adjusted we can save the result as a preset file on the SD card - a file with .ev/ extension will be saved with the name we entered. When we save the preset - recorded WAV file will be saved with the same name right next to the preset file. You can select a name for your preset with the encoder knob and random pet's name will be offered as a suggestion.

LOAD WAV

Here you can load (replace) an audio file only into the existing current preset. That is useful as you may have a very precise hard to recreate settings which you wish to apply with other audio sources. WAV PCM file format supported: 16 or 24 bits, 44.1, 48 or 96 kHz. All loaded files will be converted internally to the processor's native 24 bits 48 kHz processing and with left and right channels summed to mono. The bigger files you load - the longer it will take them to load. We recommend using 48kHz 16 or 24 bit mono files to speed up the load as there will be no resampling process and mono channels merge during the load. Bit depth and channel count don't matter on faster load, the only heavy operation is resampling from different sample rates. Note: if loading takes too long, it can be canceled by pressing encoder button or clear

SAVE WAV

With that option we save only the currently recorded audio buffer into the WAV file on the SD card (mono 24 bits 48kHz) without any preset settings. The audio buffer is always mono.

DELETE PRESET / WAV / FOLDER

You may also delete a preset, a wav file or whole folder when in LOAD PRESET or LOAD WAV menus by long hold encoder press. That action will pop up with a delete confirmation request and you have to use encoder to select from NO to YES with further encoder confirmation click. Note: deleting the preset will not automatically delete the connected WAV file with it and vice versa.

MIDI

Here are all the **MIDI** and **MPE** related settings. See dedicated chapter on [MPE](#) explanation

- **MIDI THRU**: ON or OFF - enables all incoming events at MIDI IN jack mirroring into MIDI OUT/THRU jack (ON by default)
- **RECEIVE / SEND CC**: ON or OFF - selects if the PET will receive incoming or send CC messages from its knobs changing (both RECEIVE and SEND are ON by default)
- **MIDI MODE**: selecting the MIDI control mode - normal MIDI or MPE. Depending on the selected MIDI or MPE modes the following settings will be applied to appropriate mode:

MIDI MODE ONLY SETTINGS:

- **MIDI CHANNEL**: ANY, 1...16 - selecting the MIDI channel the module will respond to in a normal MIDI mode. That settings is for MIDI mode only
- **MIDI PITCHBEND RANGE**: sets the range of pitch bend in semitones: default value is 2 semitones
- **MIDI PRESSURE**: is the source for where to map MIDI channel aftertouch

MPE MODE ONLY SETTINGS:

- **MPE PITCHBEND RANGE**: sets the MPE range of pitchbend (horizontal left-right X axis) in semitones: default value is 48 semitones or 2 octaves.
- **MPE MAPPING TIMBRE**: is the source for where to map MPE timbre (vertical up-down Y axis) from expected MIDI CC#74.
- **MPE MAPPING PRESSURE**: and pressure (downward pressure into surface, Z axis): to volume, filter frequency or filter resonance

LFO & ENVELOPE FOLLOWER

Here are placed LFO and envelope follower related settings:

- **LFO 1/2/3 CLOCK**: selecting if the LFO frequency is set to internal clock set by the **LFO SPEED** (18) knob or set to external MIDI clock.
- **LFO 1/2/3 DIVIDER**: selects which divider is applied to a certain LFO when it is synced to the external MIDI clock. Selectable options are: /8, /4, 3/2, 5/4, 1, 3/4, 1/2, 1/3, 1/4.
- **ENV ATTACK / RELEASE / GAIN** - those are settings when any of three LFOs are set to envelope follower. Shortcut to envelope follower gain is set on the **LFO SPEED** (18) knob when LFO TYPE is set to ENVELOPE FOLLOWER
- **LFO 1/2/3 RETRIG** is LFO restart action on MIDI notes. Available options are: **OFF**, **ON** and **ONE** (*oneshot*) when LFO will have only one cycle and will stop until the next key press.

SETTINGS

Here is where all the rest/generic/mostly global settings are allocated:

- **KNOB MODE**: sets the knobs to JUMP instantly to their values when return from/to their secondary parameters, or you have to SNAP them first i.e. catch its original value. When the knobs mode is set to SNAP, there is an extra dot on the display line showing knobs values where the original value is.
- **GRAIN MODE**: sets the **GRAINS** knob (10) to behave bipolar (*DUAL*) or only per constant (*CONST*) or per random (*RANDOM*) ranges only or

defining the divider for the incoming MIDI clock (set to *MIDI*) to generate the grains synchronized.

- **PITCH RANGE**: sets the range of the **PITCH** knob (9). Default range is +/-2 octaves (corresponds to what is written on the panel). It is possible to adjust range in 1, 2 or 3 octaves
- **PITCH QUANTIZE**: selects the pitch quantizer for the **PITCH** knob (9) and for the generated grains so they could be **OFF**, **SEMITONES**, **OCTAVES**, **5TH**, **MAJOR**, **PENTATONIC**, **LYDIAN**, **MINOR**, **MINOR PENTATONIC**, **MELODIC MINOR**, **HARMONIC MINOR**
- **BUFFER SIZE**: selecting the audio buffer size from 1 second to 600 seconds (10 minutes). Be careful as longer buffer size will increase loading time of your samples on the next power up. Shorter buffer times will probably be more useful for using the PET as a live effect processor, while longer buffer times are useful for reel-to-reel recorder mangling alike.
- **BUFFER OVERDUB**: selects amount of audio file volume which remains on the next buffer over-dubbed recording. Default value is 0% - i.e. when the buffer is overwritten - it overwrites with fully new material. When we add some value - the amount of that volume value in % will remain and mixed with the new recorded buffer.
- **PLAY KEY**: sets the behavior of **PLAY** (29) button to LATCHED or MOMENTARY. An alternative fast shortcut for that is press **SHIFT + PLAY** for 1 second.
- **RECORD KEY**: sets the behavior of **RECORD** (19) button to LATCHED or MOMENTARY. An alternative fast shortcut for that is press **SHIFT + RECORD** for 1 second.
- **AUTOSTART**: sets if **PLAY** (28) or **RECORD** (19) buttons shall be enabled on loading a certain patch. Possible options are: **OFF**, **PLAY**, **REC**, **PLAY+REC**. It is useful that the **RECORD** and **PLAY** will both be enabled when we load an effect patch but shall be turned off if that's a synth patch.
- **BYPASS**: sets the behavior of **BYPASS** (25) button to TRUE (with relays switching), BUFFERED (soft bypass, relays are always on), TRAILS (buffered but effect trails are still active when we bypass the

chain). An alternative fast shortcut for that is press **SHIFT + BYPASS** for 1 second.

- **ANTIALIASING: ON or OFF.** The processor has a very deep anti-aliasing algorithm that improves grain playback quality. Be careful: when enabled, that feature may dramatically lower the amount of generated grains - leave it ON when you only need a few grains and the *beehive* effect is not what you are aiming for.
- **DISPLAY:** here are the display related settings:
 - **SCREENSAVER:** OLED display has a built-in screensaver that puts it to sleep when not in use. This feature is designed to prolong the life of the display and we recommend using it. If, however, you want to disable this feature you can do so by setting it to OFF. Timeout options are: OFF, 10, 30, seconds, 1, 2, 5, 10, 30 minutes with default value to 1 minute.
 - **MENU TIMEOUT:** sets the time after which the menu returns back to the stand-by screen showing the recorded waveform buffer. Menu timeout options are: OFF, 10, 30, seconds, 1, 2, 5, 10, 30 minutes with default value to 1 minute.
 - **DISPLAY CONTRAST:** may be set from 0 to 255.
 - **DISPLAY FREQUENCY:** display refresh values 0 to 15 with 15 as a default value. Higher values mean higher frequency. You can adjust it to suit your video recording framerate while the
 - **DISPLAY PH1/2:** additional refresh value phase frequencies you may adjust to get less flickering while video recording. Better leave as default PH1 to 1 and PH2 to 15.
- **TO DEFAULTS:** sets all the global settings as well as the knobs to their default values - that also includes MIDI/MPE settings, LFO, antialiasing etc. Note: **SHIFT + CLEAR** for 1 second press only soft clears the current preset knobs settings and some deeper EFFECTS MENU parameters. In case you accidentally cleared the SD card or wish to check more good stuff from us - you may download constantly updated factory EVIL PET presets from our website here: https://endorphines.info/files/Evil_factory_presets.zip

MPE: MIDI POLYPHONIC EXPRESSION

In **MPE (MIDI Polyphonic Expression)** mapping - especially for expressive controllers like the ROLI Seaboard, LinnStrument, or Osmose - three key musical dimensions are typically mapped to the **X, Y, and Z axes** of touch. These correspond to pitch, timbre, and pressure (aftertouch) which you can assign in the [MIDI](#) settings menu when the PET is switched to MPE mode.

- **X AXIS (PITCH):** moving your finger left or right on the playing surface bends the note's pitch smoothly. This replaces the traditional pitch wheel, but polyphonically each finger can independently bend ***pitch***.
- **Y AXIS (TIMBRE):** sliding your finger forward (away from you) or backward (toward you) controls timbral parameters like **VOLUME, FILTER FREQUENCY, FILTER RESONANCE, SPREAD, SIZE, DETUNE, POSITION, SHAPE** to assignable modulation. + or - sign next to that parameter in the menu means if modulation will be applied directly or inverted. This ***timbre*** is usually expected from the MPE keyboard with continuous controller **CC#74**.
- **Z AXIS (PRESSURE):** pressing down harder on the key or surface increases pressure data. Similar as with the timbre it can be mapped to **VOLUME, FILTER FREQUENCY, FILTER RESONANCE, SPREAD, SIZE, DETUNE, POSITION, SHAPE**. In terms of MIDI data this is sent as Channel Pressure / Aftertouch.

NOTE: only certain destinations are possible to modulate via polyphonic expression - only those which are true polyphonic. For example, GRAINS and SATURATOR are global.

MODULATIONS / LFO

You can assign a movement to literally any knob or as many knobs you like in a desired amount directly or inverted. Applied modulation then sums up

in its depth with the manual knob value (a.k.a. *offset*) along with the expression pedal min-max settings.

The LFO can be synchronized to external *MIDI CLOCK* applied from *MIDI IN CONNECTOR* (4) in the [LFO](#) menu. When an external MIDI clock is enabled this knob then acts as a divider with the following coefficients $/8$, $/4$, $3/2$, $5/4$, 1 , $3/4$, $1/2$, $1/3$, $1/4$ applied for the clock and LED flashes according to the finally adjusted external MIDI clock speed.

NOTE: *MIDI STOP* and further *MIDI PLAY* message will restart the LFO cycle when it is synchronized to the external MIDI clock.

The **LFO SPEED** or frequency of internal **LFO / MODULATOR** can be set from 0.01 Hz (100 seconds per cycle) at CCW to 50 Hz (0.02 seconds per cycle) at CW.

There are following LFO shapes available:

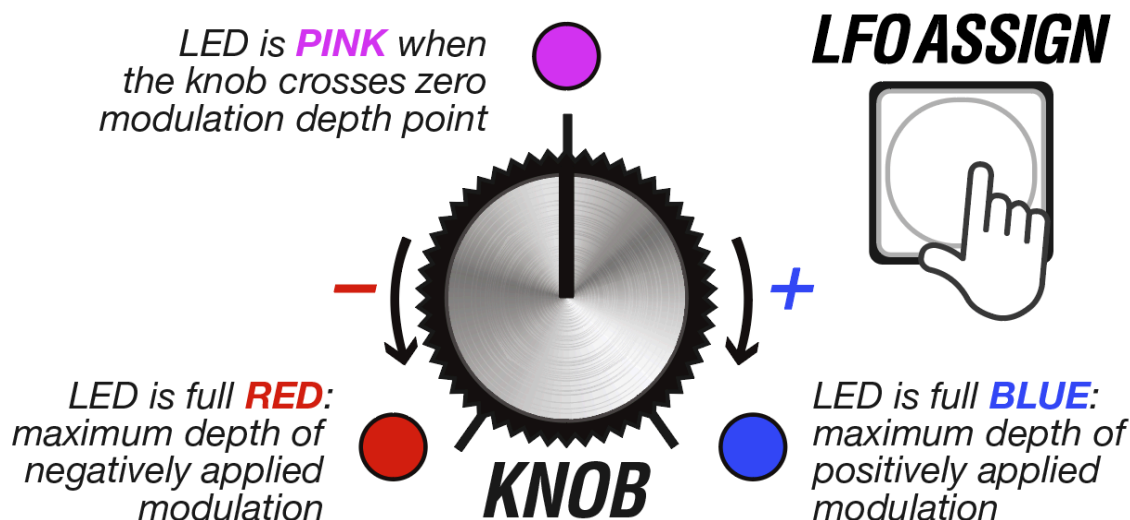
- **SINE** wave
- **TRIANGLE** wave
- **SAW** or falling sawtooth ramp (becomes rising ramp when inverted modulation applied)
- **SQUARE** wave
- **STEPPED RANDOM** / sample & hold wave
- **FLUCTUATING RANDOM**, inspired by the Source of Uncertainty™ generators in modular synthesizers. With this shape the selected **LFO SPEED** knob (18) sets the probable rate of random change.
- **ENVELOPE FOLLOWER**: instead of a cycling wave, a modulation contour shape is extracted from the incoming audio according to its dynamics. When a certain LFO is set to envelope follower, its **LFO SPEED** knob (18) acts as a gain adjustment up to +20db digital boost. You may adjust additional envelope follower parameters in the [LFO & ENVELOPE FOLLOWER](#) menu, like attack, release and same gain value as with the knob.

NOTE: envelope follower can open a totally new world for dynamic modulation possibilities. Apply it gently to the **FILTER** with adjusted **/resonance*** to get a *wah-wah* effect. Use the microphone as an [INPUT SOURCE](#) and blow a bit of air into the built-in **MIC** (26) to create a modulation like adding more grains etc.

TO ASSIGN THE MODULATION: simply tweak the knobs while holding the **LFO ASSIGN** (22) button. Doing the same with **SHIFT** button (24) enabled will assign the modulation to knobs' secondary parameters.

The amount by which you tweak a knob from center to side positions while holding the **LFO ASSIGN** (22) button sets the depth of the selected **LFO** (23) and its **/type*** (18), which will be applied to the assigned parameter.

You can apply modulation so the LFO will move the knob from its current position directly (positive modulation) or inverted (negative modulation). When you hold or latch **LFO ASSIGN** (22) button, all the parameter knobs (except **LFO SPEED/type***) temporarily become *polarizer* (or so called 'attenuverter') knobs which set the depth of modulation from center / zero position (no modulation) to CW for positive or CCW for inverted modulation. The amount of positive modulation depth is shown with the **blue** and negative modulation with the **red** brightness of the LED which stands next to the parameter we apply modulation and increases to maximum when the knob reaches the sides. There is no modulation applied when the LED is **pink** when **LFO ASSIGN** (22) is active. The parameter LED stays in **pink** when the knob crosses the center point - that's convenient to know when we want to set the modulation to zero depth.



After you release the **LFO ASSIGN** (22) button, you will see the modulation applied with the LED brightness near the knob - it will *breathe* according to

the selected **LFO SPEED** knob (18). You may assign those movements to any primary or certain secondary parameters to the LFO with various depths to any of three selected LFO. To have the LFO covering the full range of the knob, adjust its modulation in maximum or minimum (full blue or red) and then adjust a manual knob offset.

→ **HINT: LFO ASSIGN** (22) button can also be pressed once (latched) so you can adjust the modulation depth playing with various parameters with one hand.

EXPRESSION PEDAL SETUP

The expression pedal connected to **EXPRESSION** jack (3) can be assigned to morph between two knob states including secondary parameters marked with **/...*** ! When connected, the expression pedal also acts as an antenna for built-in radio FM tuner eliminating the need to use a dedicated supplied L-shape antenna. Any TRS expression pedal will work and we also recommend our [PLUS 3](#) as a perfect companion to the PET. Mapping some parameters like **POSITION** (7) to horizontal slider may even reimagine the PET interface.

The expression menu setup is accessible via **SHIFT + LFO ASSIGN/expr*** for 1 second press. Each expression mapping is saved per preset.

Once you have an expression pedal connected you will see the slider on the screen to show its full range in the expression menu setup. MIDI keyboard connected to **MIDI IN** jack (4) will do the same with the modulation wheel assigned on the **CC#01**. All the manipulations with the **CC#01** received at **MIDI IN** (4) are interpreted identically to the expression pedal and vice versa: manipulation with the pedal sends **MIDI CC#01** values on the pedal **MIDI OUT/THRU** (4).

Once you enter the expression pedal setup, put the expression pedal in the lower *heel* position (or any initial / *min* position) and set the position of the knobs to their desired positions. Save that state selecting **SET DOWN** with encoder.

Then put the expression pedal in the upper *toe* position (or any other final / *max* position) and set the position of the desired knobs. Save that state as selecting **SET UP** with encoder. Exit that menu selecting **APPLY** with encoder. [Save the preset](#) via menu so the expression pedal settings will be saved on the next power up. If you exit the expression pedal settings via **EXIT** or CLEAR/UP button without applying the settings, they will not be implied.

If in one of the min-max states we put the pedal not fully up or down, then all further side values have no effect on the parameter. This makes sense when we want to make the expression pedal start working from, let's say the middle of the move.

MIDI IMPLEMENTATION CHART

CC#	PARAMETER	RANGE
01	EXPRESSION	0...127, expression pedal connected generates CC#01 on the <i>MIDI OUT</i> as well as expression is received from CC#01 from the <i>MIDI IN</i>
07	VOLUME	0...127 0=silence, 100 = 100%
11	GRAINS VOLUME	0...127, just the volume of grains part controlled by a MIDI only - no physical knob on the PET has access to it
39	SATURATOR	0...127
40	MIX	0...127, 0=source, 127=grains
41	/DIFFUSE*	0...127
42	/SPREAD*	0...127
43	/CLOUD*	0...127
44	PITCH	0...127
45	/DETUNE*	0...127
46	GRAINS	0...127
47	/SHAPE*	0...127
49	POSITION	0...127
50	SIZE	0...127
64	SUSTAIN PEDAL	0...63=OFF, 64...127=ON
69	RECORD ENABLE	0...63=OFF, 64...127=ON
70	FILTER FREQUENCY	0...127
71	FILTER RESONANCE	0...127
72	RELEASE	0...127

CC#	PARAMETER	RANGE
73	ATTACK	0...127
74	MPE TIMBRE	0...127, vertical Y-axis per voice/channel
75	/DECAY*	0...127
76	LFO 1 SPEED	0...127
77	LFO 2 SPEED	0...127
78	LFO 3 SPEED	0...127
79	/SUSTAIN*	0...127
80	FILTER TYPE	0...25 = MULTIMODE, 26...51=LP, 52...77=HP, 78...102=BP, 103...127=COMB
81	LFO 1 TYPE	0...8 = SIN, 19...37=TRI, 38...55=SAW, 56...73=SQUARE, 74...91=STEP RAND., 92...109=FLUCT. RAND, 110...127= ENV. FOLLOWER
82	LFO 2 TYPE	
83	LFO 3 TYPE	
84	SATURATOR TYPE	0...21=CHORUS, 22-43=FEEDBACK, 44...64=DIST, 65...85=SAMPLE RATE REDUCER, 86...106=BIT CRUSHER, 107...127=FLANGER
85	OVERTONE VOLUME	0...127=0...100%
86	OVERTONE TYPE	0...25 = NONE, 26...51=SINE, 52...77=TRI, 78...102=SAW, 103...127=SQUARE
91	REVERB AMOUNT	0...127
92	REVERB TONE	0...127
93	REVERB TAIL	0...127
94	REVERB SHIMMER	0...127
95	REVERB TYPE	0...31=PLATE L, 32...63=REVERSE, 64...95=ROOM, 96...127=PLATE S

CC#	PARAMETER	RANGE
96	ENVELOPE FILTER MODULATION	0...127=0...100%
-	MIDI CLOCK	RX only and pass-thru if THRU if enabled
-	ALL NOTES OFF, ALL SOUNDS OFF, RESET ALL CONTROLLERS	shuts off the voices
-	MPE MIDI MODE	Pressure is received as channel pressure Glide (left/right) is received as pitch bend Slide (front/back) is received as CC#74

If some parameter receives a mapped midi value via CC message from **MIDI IN** (4), then it is immediately intercepted instead of the current position of the knob (or a secondary value too). However, this CC value still adds up to the LFO modulation and expression pedal morph (or CC#01). And vice versa: when the CC value has stopped being sent and we move the knob, the knob's value intercepts the previous CC value.

FIRMWARE UPDATE

Firmware updates are essential for any digital devices. They bring new features or bug fixes. Feel free to write any bugs, features ideas or improvements to beta@endorphin.es. Have any issues? Write us to support@endorphin.es

To update the firmware on your EVIL PET. first download the latest firmware file:

https://www.endorphines.info/updates/Evil_update.zip

For that update you need to take out the microSD card from the EVIL PET and put it into your computer (or a card reader connected to your computer).

1. No need to power OFF your EVIL PET.
2. Take OFF the microSD card and insert it into the computer.
3. Unpack the downloaded archive and place the **evilpet0pXX.fw** file into the root folder of the microSD card.

IMPORTANT: don't rename the file and **SAFELY EJECT** the SD card from the computer to properly close its file system.

4. Put the card back into the EVIL PET and you shall see an update request message on screen: **UPDATE WITH EVILPET0PXX.FW?**
5. With encoder navigate to **YES** and click with the update confirmation. Press *any* key (or encoder click) and the PET will restart with the new firmware installed.
6. Enjoy the new features.

CREDITS

ENDORPHIN.ES – EVIL PET

COLLECTION AUTUMN/WINTER 2026

Pedal idea and concept by BSVi and Andreas Zhukovsky

Core engine programming by BSVi

Hardware design, code direction and manual by Andreas Zhukovsky

Beta testing by Jon Modular (N3), Leonardo Mirabal (Insula), Stefan Heinrichs (Limbic Bits and Ziv Eliraz (Loopop)

Factory presets bank by Jon Modular & Stefan Heinrichs (Limbic Bits)

ENDORPHIN.ES are made in Barcelona province of Spain

Follow, like, post and tag us at Instagram: [@endorphin.es](https://www.instagram.com/endorphin.es)

COMPLIANCE

FCC

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 / modifications not approved by ENDORPHIN.ES doing business as Furth Barcelona, S.L. could void the user's authority to operate the equipment.

This 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.

CE

This device meets the requirements of the following standards:

EMC: 2014/30/EU EN 55032: 2015 ; EN 55103-2: 2009 (EN55024) ;
EN61000-3-2; EN 61000-3-3

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

RoHS: 2011/65/EU

WEEE: 2012/19/EU