# Tasty Chips Electronics ECR-1
User manual

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Introduction

We originally designed this module to offer the Eurorack community access to long and lush natural stereo reverbs, and to allow tweaks in real-time with minimal delay. But it goes well beyond a mere reverb module.

The ECR-1 offers various modulation options: for instance, the position in the response sample, allowing for filter-like sweeps. Another example is modulating between two reverb spaces. It's even possible to pitch bend the response sample in real-time. Want to record your own response and use that right away? No problem. That's what a modular system is for, right?
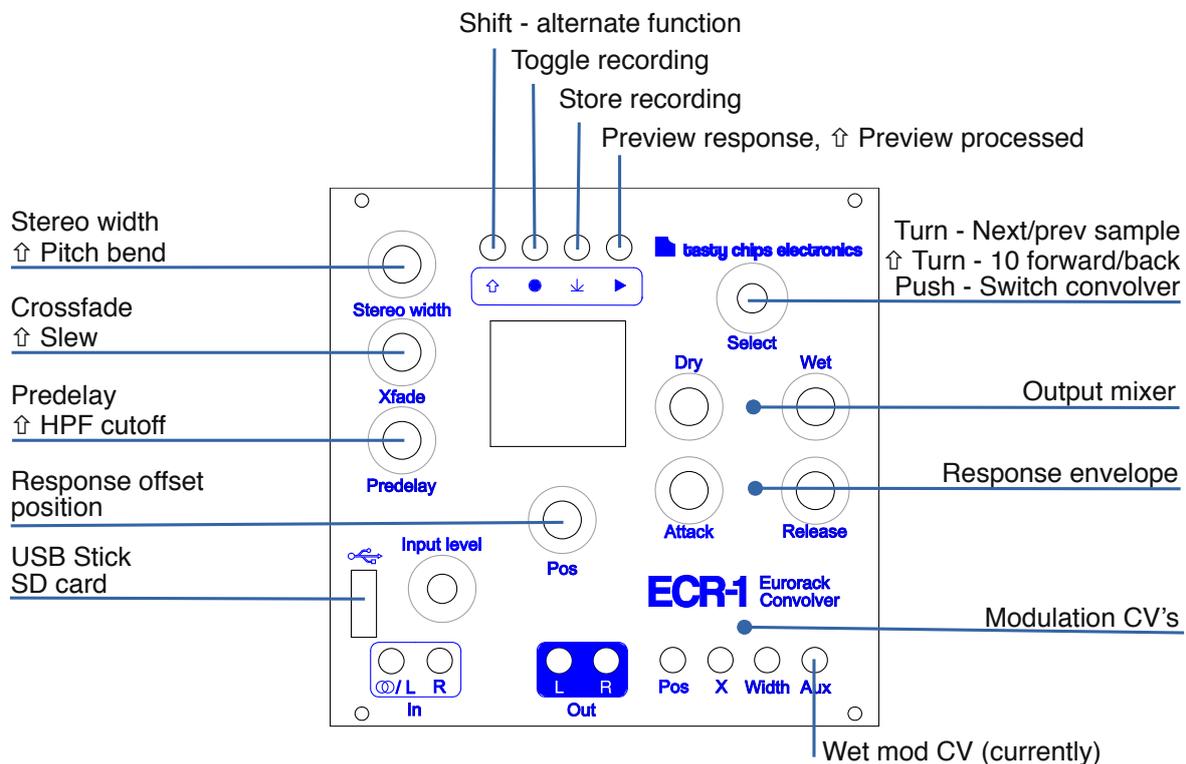
Contents of the box

- ECR-1 module.

- Ribbon cable for power.

- Micro SD card with USB adapter. This comes pre-installed with a pack of unique response samples.

Warranty

The ECR-1 comes with a <u>1 (one) year</u> warranty on factory defects. Warranty is effective from the date of shipping of the unit.

"Factory defects" covers:

- Missing parts (see previous section)

- Broken parts (for instance: cracked screen, broken buttons, or knobs)

- Non-functional unit ("dead on arrival")

- Semi-functional unit with serious defect (for instance: inability to access the SD card, mute audio inputs or outputs).

In case of such defects, you can reach us at <u>info@tastychips.nl</u>, and claim your unit to be repaired. We'll contact you with all the necessary information for return shipping and will refund all postage costs incurred. Please understand that shipping and repairs may take several weeks depending on the severity of the defect and your location in the world.

We'll first attempt to repair your unit. <u>If, and only if</u>, the unit is damaged beyond repair, we'll send a new unit.

Installation

1. Power down your rack.

2. Use the included power cable to connect the ECR-1 to your bus board.

3. Screw the module onto your rack casing's rails.

4. Power up and wait a few seconds until the display is initialized.

Getting started

1. Hook up audio output cables.

2. Press play ▶ to test the output of the selected response.

3. Press play ▶ again to stop the test.

4. Hook up the audio input. Either try the stereo input and hook this up to your phone or laptop, or use both inputs in mono mode and connect them to your modular sources.

5. Make sure the Predelay is completely 0, Xfade is maximized, and Wet is also maximized. The Pos knob should be 0. The Attack knob should be 0, and Release should be maximized, enabling the full response to be used.

6. Adjust the "Input level" knob until the red "C" clipping indicator only seldomly appears.

7. Enjoy the reverberated sound!

8. Turn the Select knob right to try the next response.

Setting the audio input level

A single knob at the bottom left sets the input level. Turn it down, and the ECR-1 will accept Doepfer audio levels. Turn it up and it will accept studio audio levels or headphone audio levels. This an analog control and cannot be modulated or saved.

Configuring the output mixer

The knobs "Dry" and "Wet" control the output mix. These are digital controls, and their values are displayed on the display. They range from -100 dB attenuation up to 0 dB. Dry and wet are global controls that work on both internal convolutions.

Using the envelope controls

An attack-release type envelope allows attenuation of parts of the response sample. The start position (time) of this envelope can also be set using the "Pos" knob. Setting the position will completely skip over any sample data that comes before this position in the response sample. The combination of these three knobs allows you to precisely focus on any specific part of the response, for instance the tail, or only the early reflections. The position control has a precision of 1024 steps. The attack and release knobs have the same resolution, and using their exponential control curve you can achieve very short attacks or releases and still accurately control them. The attack and release time are displayed on screen down to milliseconds.

The applied envelope attenuates the response in places. To have no attenuation at all (to actually disable the envelope's function): turn attack and pos to 0, and turn release to its maximum. Note that the ECR-1 uses normalization after applying the envelope. This will preserve signal power, however it can also significantly boost the wet signal. You can compensate by turning this down.

Recording responses

Press record ●. This starts the recording process. The convolution engine will be disabled while recording and only dry output is heard. The recording stops when record is pressed again, or when it has recorded 20 seconds. You can now use the recording as if it were a response, apply the envelope, position, and modulation. Madness will ensue. When a USB stick or the furnished MicroSD card with the USB adapter is inserted, you can press store ↻. Otherwise the button will pulse two times to indicate no storage medium is present. When storing the recording is automatically assigned a filename `recXXXXXX.wav` and it can be found by using the "select" knob in the top right.

WARNING: DO NOT REMOVE STORAGE MEDIUM WHEN STORING RECORDING. PLEASE WAIT A FEW SECONDS BEFORE DOING SO. IF YOU DO NOT, DATA LOSS MAY OCCUR.

Using the remaining parameters

Predelay: 0-2.0s in with an exponential control curve. Using this often influences the perception of the size of a reverberating space. For instance, you can make a short reverb of a small room appear bigger by turning this up a little. Adjustment of this control causes the convolver to recompute its data. This may take a short while. Also note that the convolver restarts after adjustment and it starts with playing back the delay!

Stereo width: This is a Mid-Side matrix control that either turns the input into mono (turn it down to 0), or exaggerates the stereo effect (turn it completely right). The center keeps the stereo input audio signal exactly as it is.

Pitch [⇧+Stereo width]: Hold down shift and turn the stereo width knob to pitch bend the response. Completely left means -2 octaves, completely right means +2 octaves. Center keeps the response the same pitch.

Highpass filter cutoff [⇧+Predelay]: To keep the convolution from blowing up you can cut away some sub-bass from the audio input.

Xfade (crossfade): Crossfade between foreground convolution and background convolution. Please read the section "Using the dual convolvers".

Slew time [⇧+Xfade]: recomputation slew time controls the crossfading time between newly computed response and old response. Such a cross fade occurs when a new impulse response is offered to the convolver. For instance when a new response is selected by turning the select knob, or when the envelope or envelope position is changed. A short slew time sounds more choppy, but you'll hear the new response earlier.

Control voltages

Insert Doepfer level CV sources to modulate some of the ECR-1's parameters.

0V: or disconnected, no modulation,
+5V: maximum positive modulation,
-5V: maximum negative modulation.

Modulation clips the affected control its minimum and maximum. That means it will never exceed beyond the levels you can manually set it to by using the knob.

"Pos": Modulates the position knob. This control forces a re-computation of the envelope and hence also a re-computation of the response. There will be a lag depending on the size of the envelope, exactly like with the Pos knob itself. If the envelope is small enough, and you apply a CV envelope waveform, this allows for smooth sweeps over your response.

"X": Xfade, or crossfade. -5V will crossfade completely to the background convolution. +5V will crossfade completely to the foreground convolution. this is a direct control that takes effect in about 10ms.

"Width": Modulates stereo width. -5V will force the input signal to mono. +5V will exaggerate the stereo effect. This is a direct control that takes effect in about 10ms.

"Aux": This currently modulates pitch bend. This control forces a re-computation of the envelope and hence also a re-computation of the response. There will be a lag depending on the size of the envelope, exactly like with the Pos knob itself. TODO: what V/oct scale?

Using the dual convolvers

The ECR-1 runs two internal convolvers simultaneously. There's one in the foreground, which is directly controlled by the knobs, and there's one in the background. The background convolver cannot be controlled by the knobs. It's basically a "frozen" copy of the foreground convolver at one point in time. The Xfade (crossfade) knob creates a mix of background and foreground convolutions.

1. Set up your foreground convolver using the "select knob" to choose a response, and turn the other knobs (except crossfade!) until you have a satisfying convolution.

2. Now press "select". This copies the foreground convolver into the background.

3. Turn xfade to the left a bit to hear the background convolver.

4. Select a nice new foreground convolution by turning "select", and set the parameter knobs to your liking.

5. Wiggle xfade. If you're using reverb responses, you are now travelling between spaces!

6. Optional: hook up a CV to the X modulation input to automate this travel in a pattern of your liking. A simple sine wave is already quite convincing.

Using an external storage medium

The ECR-1's USB A port allows you to use the furnished Micro SD card (via the USB-SD adapter). This was chosen because of its small form factor. It also comes pre-formatted and with loads of original responses recorded by the Tasty Chips Team.

Once this SD card is inserted the ECR-1 will automatically register all the `.wav` files in the root directory. It may take a few seconds before the ECR-1 has correctly mounted and processed all the files. You can now browse through them using the select knob. Browse a bit to the right and after the 8th response, you're browsing the external medium. Of course you are free to remove and add `.wav` files at your leisure. Since there are a lot of responses on the SD card, you may want to hold down Shift [⇧] when turning the Select knob. This jumps 10 files per click instead of just one.

The ECR-1 accepts USB sticks other than the one we've supplied, but your mileage may vary. Some USB sticks are very slow. Only FAT, ExFat, and Linux Ext filesystems are properly supported.

WARNING: DO NOT REMOVE STORAGE MEDIUM WHEN STORING RECORDING. PLEASE WAIT A FEW SECONDS BEFORE DOING SO. IF YOU DO NOT, DATA LOSS MAY OCCUR.

Features

– Long true-stereo natural reverbs (20s max).

– Dual simultaneous reverbs (foreground and background).

– Multi-channel display with envelope and parameter-value overlays, and a clipping indicator.

– Predictive gain control (to preemptively stop the output from blowing up).

– Stereo or dual-mono input, accepts line level or Doepfer Eurorack level. Adjustable using gain control knob.

– Separate dry and wet knobs.

– Attack-Release Envelope with direct controls (2 knobs).

– Cross fade knob (cross fades between the foreground and background response)

– Pre-delay up to 2 seconds.

– Rotary encoder to quickly select responses (internal presets and the ones present on USB/SD).

– High-pass (12 dB/oct) filter with adjustable cutoff.

– Real-time pitch adjustment of response (-2 .. +2 octave).

– Dual mono (stereo pair) output.

– Record responses to USB / SD. 20 s max.

– Use responses from USB / SD.

– 4 modulation CV's:
> - Response sample position
> - Crossfade
> - Stereo width
> - Wet

– Audition feature to quickly evaluate responses.

– High quality ALPS potentiometers.

Specifications

– 48 kHz stereo input (90 dB SNR) and output (100 dB SNR)

– 1.5″ true color 128×128 pixel OLED

– USB2.0 port with Micro SD card adapter, SD card included.

– Saves samples as 32 bit float stereo WAV files.

– 10 bit resolution and ~50 Hz refresh on potentiometer action.

– +12V, -12V powered (5V busboard line not used)

– 130 mm / 25.6 HP wide

– approx 5cm deep (counting from the front plate)

– Scratch proof and solvent proof anodized front plate.

Power consumption

+12V: 180 mA (idle) – 400 mA (longest reverbs and continuously modulating)

-12V: 21 mA

Credits

Internal reverbs are creative commons (CC BY-SA 3.0) https://creativecommons.org/licenses/by-sa/3.0/ licensed responses that were available from openairlib.net. They're all resampled to 48 kHz: the ECR-1's native sample rate.

Falkland Palace Bottle Dungeon: Dr. Damian T. Murphy

Falkland Palace Royal Tennis Court: Dr. Damian T. Murphy

Hamilton Mausoleum: Dr. Damian T. Murphy

Lady Chapel, St Albans Cathedral: Audiolab, University of York
Marcin Gorzel
Gavin Kearney
Aglaia Foteinou
Sorrel Hoare
Simon Shelley

Middle tunnel: ?? Author unknown ?? Please contact us if you read this.

R1 Nuclear Reactor Hall: Audiolab, University of York, Dr. Damian T. Murphy

Terry's Factory Warehouse: Audiolab, University of York, Dr. Damian T. Murphy

York minster: Audiolab, University of York, Damian T. Murphy

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Contact

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