WAVE PACKETS

Wave Packets is a multi-talented complex modulation and audio source. The module allows you to craft 'wave packets', with each of the 5 main outputs deploying a different recipe from the contour function (linear segments between each time stage) and frequency-dynamic oscillator (LFO or audio-rate oscillation which transitions through 3 target frequencies) to produce a unique modulation shape, burst of energy, or fragment/ phrase of audio.

PANEL OVERVIEW

EXCITATION MODE SWITCH

The toggle switch position determines the excitation mode (in conjuction with the presence of a cable in the TRIGGER INPUT). Refer to MODES on p.6.

TRIGGER INPUT

This input is used to excite a wave packet. The presence of a cable in this input is also used in conjunction with the EXCITATION MODE SWITCH above it to set the excitation mode. Refer to MODES on p.6.

3x D (DEPTH) SLIDERS

The 3 sliders draw out a contour function (linear segments from each T stage to the next), also referred to as the 'minimal contour line'.

>> (GLIDE)

The glide control determines the fluidity of change in the 3 F frequencies. With no glide at the counterclockwise position, turning the knob clockwise will progressively increase the width of the transition time about the T1/T2 and T3/T4 stage boundaries, with a linear-sounding glide always ensured.

D-CV (DEPTH CV)

CV Input with attenuverter for D (depth) parameter. Adds or subtracts to each of the 3 D slider positions.

V/OCT INPUT

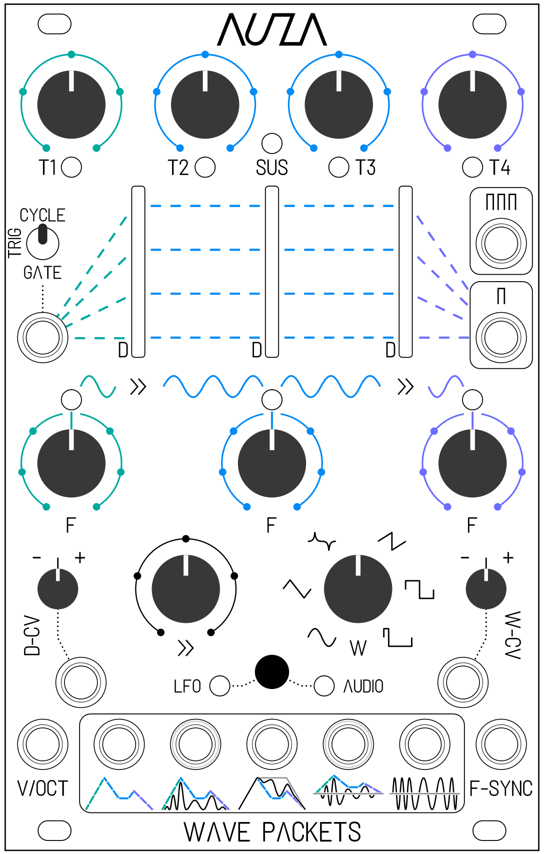
CV input (1V per octave) modulation of oscillator frequency - a global frequency (or rate) shift. If in AUDIO frequency mode, plugging a cable in to V/OCT will semitone-quantise the frequency selection on the 3 F knobs. If F-SYNC is also used, V/OCT will modulate the F-SYNC frequency at 1V/Oct.

MAIN OUTPUTS

5 main outputs (3 unipolar and 2 bipolar). Output 1 (leftmost) provides a direct feed from the contour function, output 5 (rightmost) provides a direct feed from the oscillator, and the remaining 3 outputs use the contour function to sculpt the oscillator output in to various wave packet forms.
Refer to the outputs description on p.5.

4x T (TIME) CONTROLS

Times for the 4 T stages. Max time is 10s, and min time is 0s (completely skipping the stage). If in CYCLE-PING excitation mode or LINKED LFO mode, the T knobs have a different functionality (refer to MODES on p.6/ p.7).



BUTTON

Tapping the button will toggle between LFO and AUDIO frequency modes.

Additional Modes/ Shift Parameters Access:

- Holding down the button for 3s while in LFO frequency mode will toggle LINKED LFO mode on and off.
- Holding down the button while toggling the EXCITATION MODE SWITCH to the up (CYCLE) position will activate CYCLE-PING excitation mode.
- Holding down the button while moving the >> (glide) knob will change the oscillator phase in 90° increments (along the knob 'dot' markings).
- Holding down the button while moving the W (wave) knob fully clockwise or counterclockwise will change the saw wave shape direction.

EOS OUTPUT

Trigger output at end of each stage

EOC OUTPUT

Trigger output at end of a full wave packet cycle

3x F (FREQUENCY) CONTROLS

The module's oscillator traverses through 3 target frequencies during the course of a wave packet, represented on the module panel from left to right with 3 colours: green {T1}, blue {T2, SUS, T3} and purple {T4}.

- In **LFO frequency mode**, the 3 F knobs are 3 independent rate (frequency) controls, each centred at 4 Hz. Each LED above the 3 F knobs flashes a sine pattern at the corresponding rate.

- In **AUDIO frequency mode,** the middle (blue) F knob sets the 'base' frequency, centred on note C3. The left and right F knobs set starting/ ending pitch offsets to the middle base frequency with a ±5 octave range. Therefore a frequency transition profile similar to a pitch envelope can be constructed, trackable in pitch using V/OCT. The 3 LEDs represent frequency using a colour spectrum, and indicate the relationship between the 3 F knobs.

W (WAVE)

Waveform shape of the oscillator, with continuous morphing in between the 6 main shapes.

W-CV (WAVE CV)

CV Input with attenuverter for W (wave) parameter. Adds or subtracts to the W knob position.

F-SYNC INPUT

A tempo/ clock signal, LFO or audio oscillator output (primitive waveforms only) can be plugged in to this input to clock in the oscillator frequency.

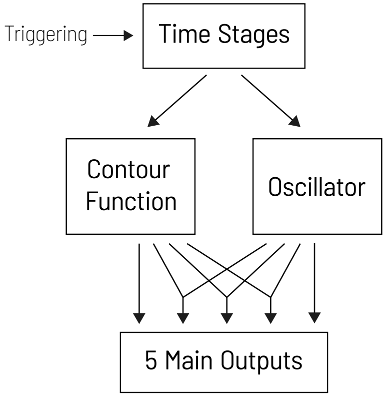
- In **LFO frequency mode**, the 3 F knobs function as individual clock dividers/ multipliers to the F-SYNC clock rate.

- In **AUDIO frequency mode**, the 'base' frequency of the wave packet is set by the F-SYNC frequency plus a pitch offset added by the middle F knob. The left and right F knobs add starting/ ending pitch offsets to this base.

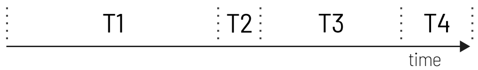
MODULE OVERVIEW

*What *is* Wave Packets?*

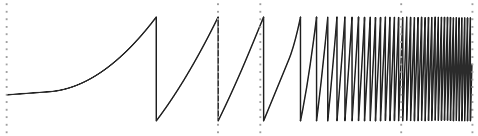
"Complex function generator" as an umbrella term could be used to describe Wave Packets, but let's not be so vague. To understand the module and what can be achieved, it needs to be broken down into 4 compartments: the **time stages**, **contour function**, **oscillator** and **outputs**.



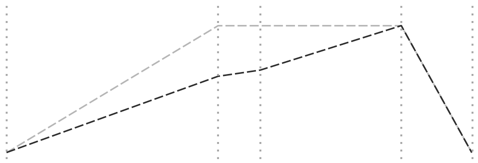
The **T stages** orchestrate movement from oscillator and contour function:



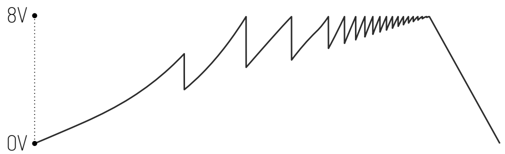
The **oscillator** transitions through target frequencies at LFO or audio rate:



The **contour function** creates successive linear segments:



Each **output** combines the above in a specific way. This one is output 3:



Capabilities

When the oscillator is at **LFO rate**, complex control voltage shapes can be created. Think: multi-stage envelopes, slightly oscillating envelopes, rate-varying bipolar oscillations and everything in between! This is really what those fancy CV wave packet diagrams you've probably seen are all about.

When the oscillator is at **audio rate**, the module turns in to an enhanced audio source - time stages can determine changes in pitch and the slider positions can envelope the sound.

But due to the assortment of oscillator features, I/O connectivity, and range of trigger and other deeper modes available, many other uses of the module emerge. The following is not exhaustive:

- Clock divider or multiplier (with synced LFO output)
- Pitched note sequences
- LFO with onset 'delay' time
- Pingable envelope generator
- Burst envelope generator
- Drum voice with integrated pitch envelope

Tips

- The relationship between contour function, oscillator and outputs (shown on the left of this page) remains consistent regardless of the mode you are in. This is the core 'model' (explored in depth on pages 3-5). Try getting familiar with this first, and the extra modes available will easily follow.

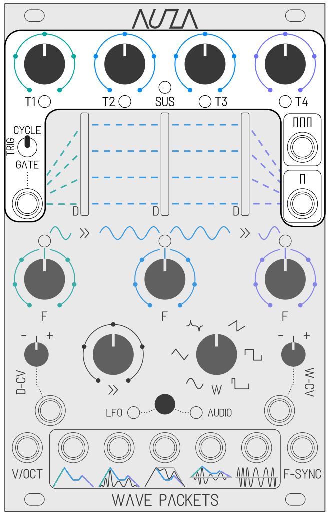
- Wave Packets encourages you take a visual approach to creating CV shapes. Use the D sliders to draw out a contour function, which for outputs 2-4 visually opens up a space for the module to insert wave oscillation in to (refer to outputs section on p5).

- Wave Packets keeps wide parameter ranges to allow for a very flexible use of the module. For predictable looking wave oscillation, make sure you give the T stages enough length, and aim for subtlety with any D-CV modulation!

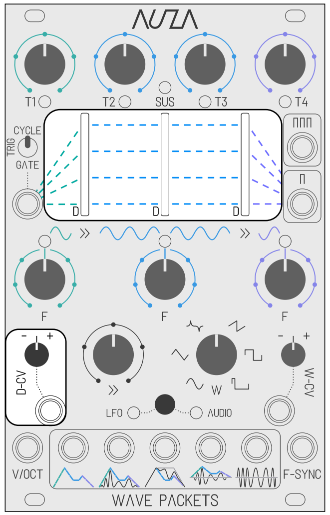
- On top of the wealth of functionality, there are many self patching possibilities to also be explored. For example, patch output 1 in to W-CV and use the sliders to morph timbre. Experiment and enjoy!

Panel breakdown

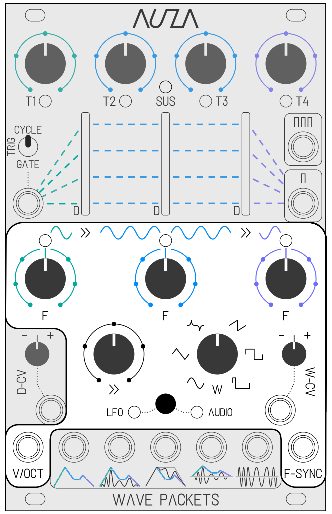
Time Stages



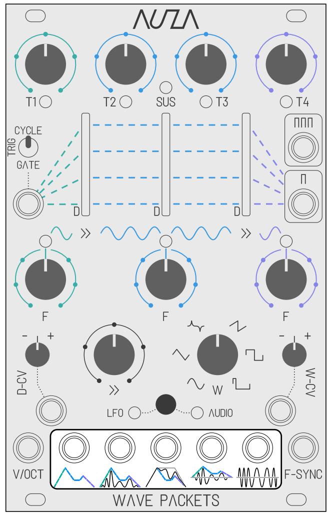
Contour Function



Oscillator

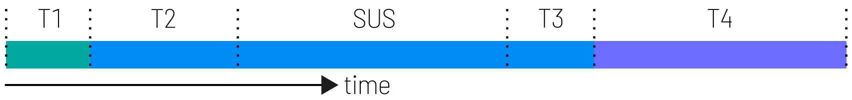


Main Outputs



THE MODEL

TIME STAGES

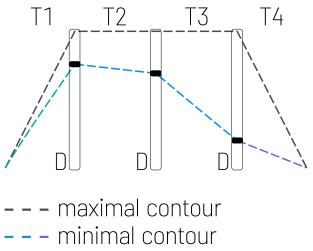


Common to every manner of using Wave Packets are the stages. As well as determining the overall duration of a wave packet (duration = T1 + T2 + SUS if in GATE mode + T3 + T4), the stages are what unifies the core components of a wave packet together: the contour function and oscillator - orchestrating the movement in depth (D), frequency (F), and glide of frequency (>>). White LEDs (top row) indicate the current stage, and the EOS (end of stage) and EOC (end of cycle/ end of the final stage) outputs can be used to control external modules. The excitation mode (refer to page 6) determines how stages are trigerred and controlled.

The module will always have to be in one of the stages for the module to be outputting anything other than 0V. However this does not mean you need to use *all* of the stages.

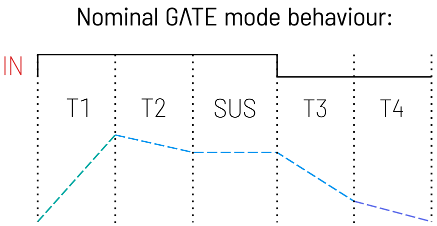
- Setting a T knob fully counterclockwise means you are setting the stage to 0 seconds, i.e. skipping the stage. A simple ramp function or oscillator glide/ chirp sound can be achieved by picking just one stage and setting all other T knobs at counterclockwise positions. Add complexity by introducing more stages, or loop the stage/s by going in to a CYCLE excitation mode!
- In GATE FREE-RUNNING excitation mode, the module will freeze at the SUS stage forever, meaning only the middle D slider and middle F knob will be relevant. The module functions as a continuously running LFO/ oscillator or DC voltage source.

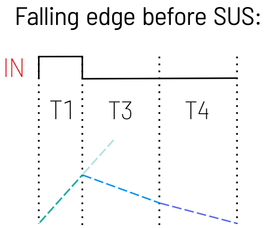
CONTOUR FUNCTION



By positioning the 3 D (depth) sliders, linear segments are created from each time stage to the next - the 'minimal contour'. The only constraints are that the T1 segment starts at zero, and the T4 segment ends at zero. A complementary 'maximal contour' resembling an ASR envelope shape is also created - equivalent to setting all 3 D sliders at the maximum position. Refer to OUTPUTS on page 5 to learn how the module utilises the contour function lines to generate each distinct output. Enter uncharted territory by modulating the position of the D sliders at full audio rate using the D-CV input.

In GATE excitation mode, in the event of an early falling edge from the TRIGGER INPUT, the contour function will create a smooth transition in depth to the proceeding stage boundary (ADSR-like behaviour):

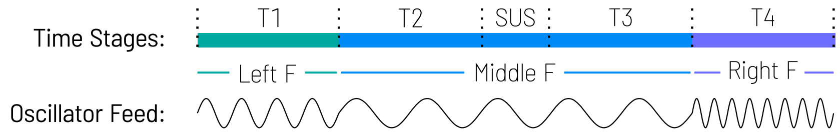




OSCILLATOR

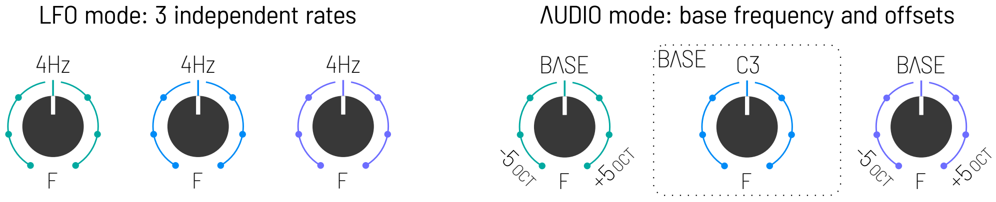
The 3 frequencies

Over the course of a wave packet, the oscillator will transition through 3 frequencies (or 'rates' in LFO mode) set by the 3 F knobs - the left (green) F in T1, the middle (blue) F in T2+SUS+T3, the right (purple) F in T4.



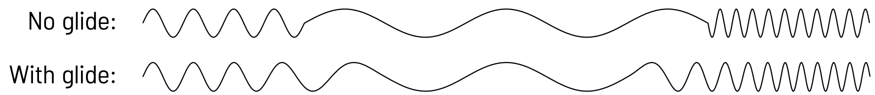
- In **LFO frequency mode**, the 3 F knobs are 3 independent LFO rate controls, centred at 4Hz. The LED above each F knob flashes a sine pattern to indicate the rate.

- In **AUDIO frequency mode**, the middle F knob is the 'base' frequency, centred at note C3, with the left and right F knobs providing starting/ ending ± pitch offsets to this base with a ±5 octave range. The LEDs represent frequency using a colour spectrum. This also displays the relationship between the knobs - changing the middle base frequency knob will change the colour (frequency) to all 3 LEDs.



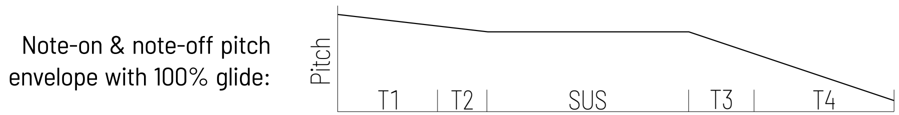
Glide

The glide (>>) parameter determines the fluidity of the change between the 3 oscillator frequencies.



- In **LFO frequency mode** and using the module as a control source, the glide is heard as an acceleration or deceleration to the oscillation at the transition between each target frequency/ rate. This allows for CV shapes that naturally morph between different oscillation speeds.

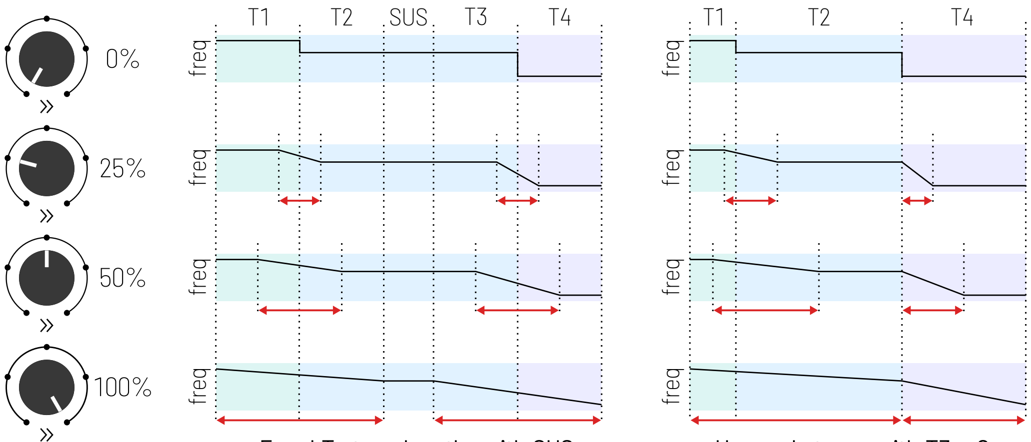
- In **AUDIO frequency mode**, the glide and left/ right F offset knobs can construct a pitch envelope shape.



THE MODEL

Precise relationship between Glide, F and T

The frequency/ rate trajectory (solid black lines) is shown here for 2 wave packet examples. The red arrows indicate periods of glide, which are transition regions opened up at the T1/T2 and T3/T4 stage boundaries.



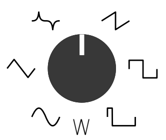
Equal T stage lengths with SUS

Unequal stages with T3 = 0s

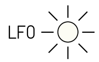
- With 0% glide, the frequency will instantly switch at the relevant stage boundaries.
- With 25% glide, the green-blue glide starts at 75% of the way into T1 and ends 25% of the way into T2, and likewise with the blue-purple T3/T4 glide.
- With 50% glide, the green-blue glide starts halfway into T1 and ends halfway into T2, and likewise with the blue-purple T3/T4 glide.
- With 100% glide, gliding will occur during the entire wave packet, other than during any SUS stage.
- A SUS stage (in GATE excitation mode) will always hold the middle (blue) F constant.

The module will create a linear glide across the duration of each glide start to end period. I.e. for each glide region (T1/T2 glide or T3/T4 glide), if one stage time is set shorter than the other (or even 0 seconds), a linear sounding glide will still be heard.

Wave shape



The oscillator's wave shape is determined by the W control, with additional modulation (in to audio rate) via the W-CV input. There are 6 distinct waveform shapes as well as continuous morphing in between. In AUDIO frequency mode, the morphing algorithm employs phase manipulations on band-limited wavetables for exceptionally low aliasing and maximal timbral variation. In LFO frequency mode, a different morphing algorithm maximises shape variability.



If the module is in LFO frequency mode, during an active wave packet the white LFO LED (left of the button) functions as a meter to the oscillator's output (i.e. a direct meter of output 5). While the F LEDs display the 3 rates using a fixed sine pattern, the live oscillator feed on the LFO LED will also inherently indicate the wave shape.

External frequency control

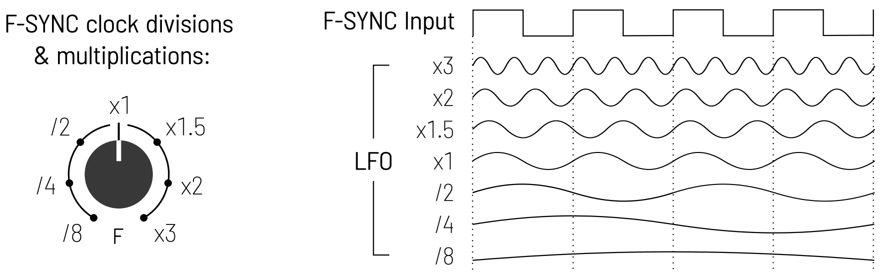
V/OCT tracks the oscillator's frequency according to the 1 Volt per octave standard, creating a global shift to the oscillation frequency of the wave packet. The input has a ±9V range and runs at full audio rate.

- In **LFO frequency mode**, V/OCT can be used to modulate the rate of the LFO, like a bipolar exponential FM input. Applying a DC voltage can achieve signficantly lower or higher LFO rates. Applying -9V and turning an F knob fully left/ counterclockwise will result in a oscillation period of 68 minutes! (See LINKED LFO mode on p.7 to learn how to also extend T stage times by matching the stage times to the oscillation period).

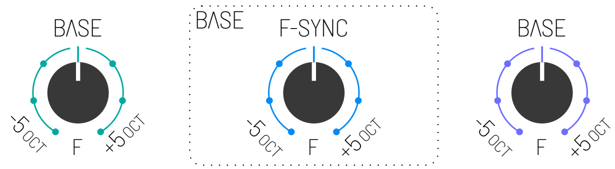
- In **AUDIO frequency mode**, V/OCT provides accurate pitch tracking of the 'base' frequency. The pitch envelope constructed with the left (green) F, right (purple) F and glide (>>) knobs determines a frequency transition profile. For example, a note-off pitch droop of 5 semitones. V/OCT can then 'play' this by modulating the base frequency. It can also be used as a more general bipolar exponential FM input, for adding vibrato effects, or at audio rate creating more complex timbres from the oscillator.

F-SYNC provides an additional method of oscillator frequency control. This input accepts periodic signals such as a tempo/ BPM/ clock pulse or LFO/ audio oscillator output (primitive waveform shapes only) to control (or 'ping') the frequency/ rate.

- In **LFO frequency mode**, F-SYNC determines a source clock rate, to which the 3 F knobs independently divide or multiply from.



- In **AUDIO frequency mode**, the module will instantaneously pitch track to an external audio oscillator plugged in to F-SYNC, mimicking its frequency characteric with no audible jumps as the external frequency changes. The wave packet 'base' frequency is now the F-SYNC frequency plus a pitch offset added by the middle F knob with a ± 5 octave range. As before, the left and right F knobs add starting/ ending pitch offsets to the base frequency, also with a ± 5 octave range.



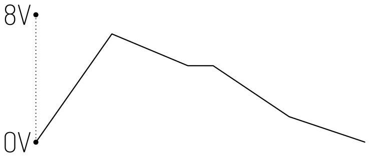
If both V/OCT and F-SYNC are used, V/OCT will modulate the F-SYNC frequency at 1 Volt per octave.

THE MODEL

OUTPUTS

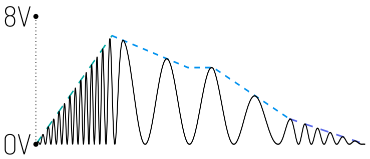
The contour function and oscillator feeds are the two main ingredients used in forming the five 24-bit outputs - each output deploying a different recipe to produce a different shape.

OUTPUT 1 *'The Pure Contour'*



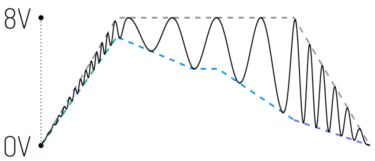
A unipolar (0V to 8V) output which is a direct feed from the contour function - the 'minimal' colour line, i.e. the shape drawn with the 3 D sliders. This output operates entirely independently from the oscillator, and can be used as a multistage envelope generator output. Or by self patching output 5 in to D-CV, an extra wave packet model is unlocked.

OUTPUT 2 *'The Unipolar Wave'*



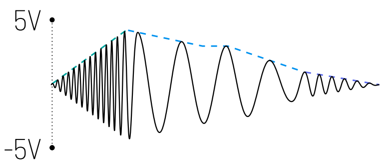
A unipolar (0V to 8V) output which sandwiches the oscillator feed between 0V and the minimal contour line. Excellent for forming dynamic oscillatory CV shapes to control a synthesis parameter on any Eurorack module in one offset direction; always dampening back down to 0V (no modulation) at the end of each generated wave packet.

OUTPUT 3 *'The Resonating Contour'*



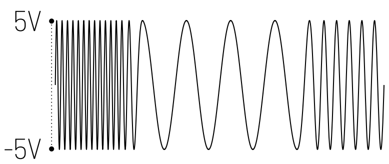
A unipolar (0V to 8V) output which resonates between the minimal (coloured) and maximal contour (grey) lines. The maximal contour is outputted when the 3 D sliders are at the maximum position. As the sliders are moved downwards, spaces for oscillation are opened up during specific T stages. Excellent for crafting very unique envelope'y CV shapes.

OUTPUT 4 *'The Capsulated Oscillator'*



A bipolar (-5 to 5V) output, which uses the contour function (minimal contour line) to envelope the oscillator. The generated packets of amplitude-varying bipolar oscillations makes this output a useful CV source. Or in AUDIO mode, VCA'd segments of audio can be generated, using a slightly exponentially scaled contour line for an improved amplitude response.

OUTPUT 5 *'The Pure Oscillator'*

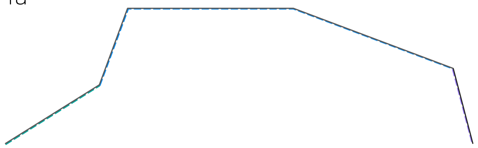


A bipolar (-5 to 5V) output, which is a direct feed from the oscillator. While this output still uses the T stages to create dynamic changes in oscillator frequency/ rate over time, it is independent of the contour function. As the signal is not enveloped, anti-popping is implemented to achieve a minimal 'pop' sound at the start/ end of wave packets if used as a direct audio source.

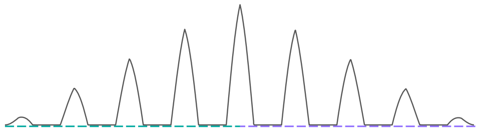
Example outputs

The following diagrams are wave packet examples for each output. **1b** has output 5 self patched in to D-CV, **5a** has ouptut 1 self patched in to W-CV, and **4b** has external FM via V/OCT.

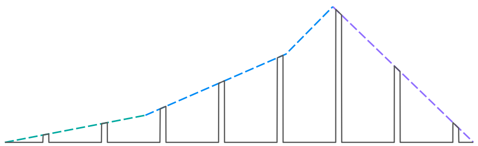
1a



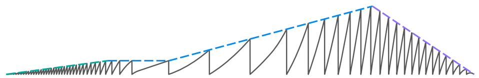
1b



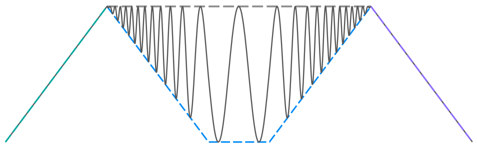
2a



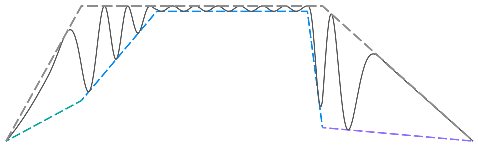
2b



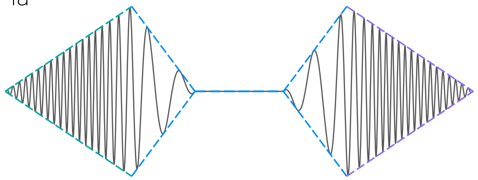
3a



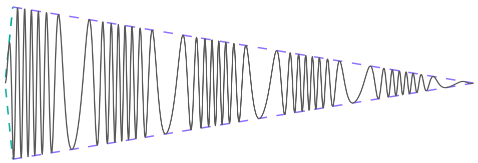
3b



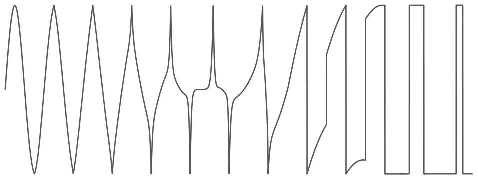
4a



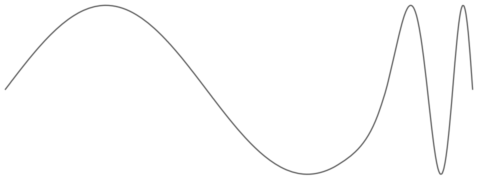
4b



5a



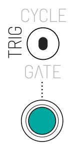
5b



MODES

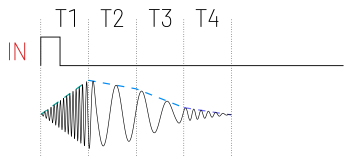
EXCITATION MODE

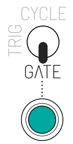
The mode is set by the EXCITATION MODE SWITCH and presence of a cable in the TRIGGER INPUT jack. The mode determines how wave packets are triggered and how the time stages are controlled.



TRIG

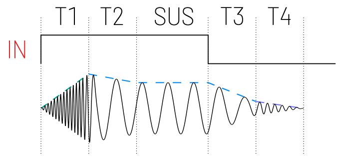
A single pulse (rising edge) initiates the wave packet. Time stages progress once from T1 to T4, without a SUS stage.





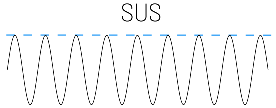
GATE

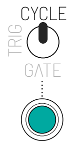
A rising edge initiates the wave packet. After T2, a SUS stage is held at for as long as the TRIGGER INPUT remains high.



GATE FREE-RUNNING

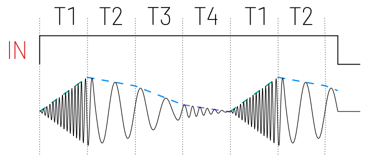
Unplug the TRIGGER INPUT cable, and the SUS stage is held at indefinitely. The outputs can be used as continuously running oscillators/ LFOs or DC voltages.

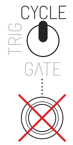




CYCLE

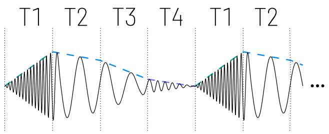
A rising edge initiates the wave packet. Wave packets repeat through T stages for as long as the TRIGGER INPUT remains high.

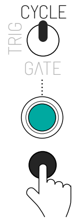




CYCLE FREE-RUNNING

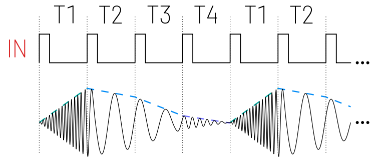
Unplug the TRIGGER INPUT cable. Like normal CYCLE mode but Wave packets now repeat through T stages indefinitely with no input needed.





CYCLE-PING

Hold down the BUTTON while flicking the EXCITATION MODE SWITCH up. T stages are pinged by an input pulse train, and the T knobs control stage positions within the repeating 4/4 pattern. T1 LED oscillates while waiting for initial pulses, and all T LEDs blink on each new pulse.

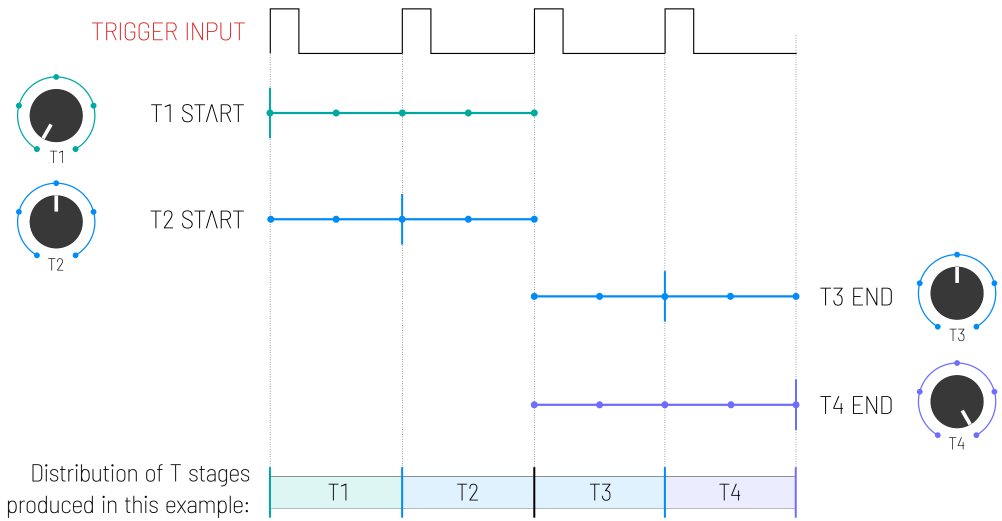


How CYCLE-PING works

In CYCLE-PING excitation mode, not only are pingable envelopes possible, but also pingable complex wave packet modulation shapes, or in AUDIO frequency mode, note sequences in 4/4 synced to a tempo clock.

Time stages are pinged by an input pulse train (such as a clock signal) from the TRIGGER INPUT. Each new pulse enables the wave packet to proceed to the next time stage, and the difference in time between the pulses (the "pulse period") is used to determine the stage time lengths. Each full wave packet cycle (T1 to T4) always takes place over 4 pulses (i.e. fixed 4/4 or quadruple metre), but timing offsets are created by the T knobs; the T1 and T2 knobs set stage *starting* time positions within the first 2 pulses, and the T3 and T4 knobs set stage *ending* time positions within the last 2 pulses. The diagram below shows this relationship, using an example of T knob settings which create an even time stage distribution over the pulses.

Relationship between input pulses, T knob positions and achieved stage timings:



The T2 control takes precedence over T1, and the T3 control takes precedance over the T4. This means if T1 is set further to the *right* of the T2 position, T1 stage will be skipped (in idle state until the start of T2). Likewise if T4 is set further to the *left* of the T3 position, T4 stage will be skipped (in idle state after T3 until the end of the current wave packet cycle). The module uses a clever catch-up algorithm to cope with variable tempo signals while preventing audible glitches or sudden jumps in amplitude.

Starting/ Stopping/ Restarting:

- To enter the mode, hold down the BUTTON while flicking the EXCITATION MODE SWITCH up to CYCLE.
- The cycle of wave packets will then start on the second input pulse, and the T1 LED will oscillate in the meantime to denote that pulses are pending. All T LEDs dimly blink on each pulse.
- Alternatively, the start can be delayed by continuing to hold down the BUTTON when entering this mode and the wave packet cycling will start on the first pulse after the button is released.
- If input pulses terminate, the module will soon go back in to pending state (T1 LED oscillating). Thereafter, cycling will restart on the first new pulse, using the pulse period time clocked in from before termination.

MODES

FREQUENCY MODE

This mode is set by tapping the BUTTON, which will toggle a light between the LFO and AUDIO LEDs.

The mode determines the frequency range of the oscillator, and therefore the intended use as either a control or audio source. The module will also adapt its behaviour in a number of other ways to optimise the intended use. Many of the differences are discussed throughout the manual, but are all summarised below.

LFO

- Centre position of F knobs at 4 Hz, spanning 5 octaves either side
- 3 F knobs are independent controls
- Selection on the F knobs is never quantised
- F LEDs flash at each F knob rate. During a wave packet, the LFO LED is a meter of the oscillator feed
- If using F-SYNC, the 3 F knobs function as 3 clock multipliers/ dividers
- Uses a wave generation and morphing algorithm to maximise shape variation. Not optimum for audio
- Oscillator phase is always reset at the start, so each triggered wave packet follows the same shape

AUDIO

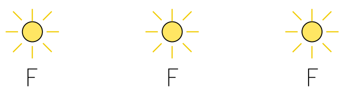
- Centre position of middle (blue) F knob at note C3, spanning 5 octaves either side
- Left (green) & right (purple) F knobs provide starting/ ending pitch offsets to the middle 'base' F knob
- Selection on the F knobs is quantised to semitones if V/OCT is plugged in, to aid quicker tuning
- The F LEDs represent each frequency using a colour spectrum
- If using F-SYNC, the 'base' frequency is the F-SYNC frequency plus a pitch offset set by the middle F knob
- Uses a wave generation and moprhing algorithm to maximise timbral variation with very low aliasing
- Oscillator phase will NOT reset at a wave packet overflow (e.g. T4 back to T1 in a CYCLE excitation mode)
- Slightly exponentially scaled contour segments on output 4 for an improved VCA-like amplitude response

LINKED LFO MODE

This mode is toggled ON and OFF by holding the BUTTON for 3 seconds while in LFO frequency mode.

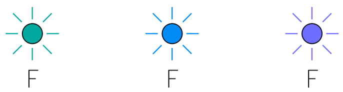
LINKED LFO mode OFF

This refers to the normal functioning of Wave Packets, with the 4 T knobs operating independently from anything else.
In this mode the 3 F LEDs are yellow.



LINKED LFO mode ON

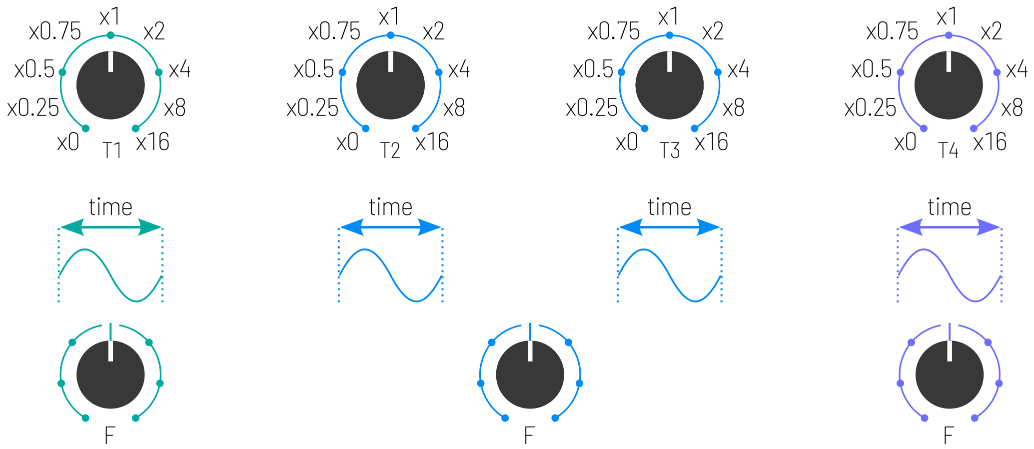
The 4 T knobs set stage lengths in terms of multiples of the oscillator periods set by the 3 F knobs.
In this mode the 3 F LEDs are green-blue-purple.



How LINKED LFO mode works

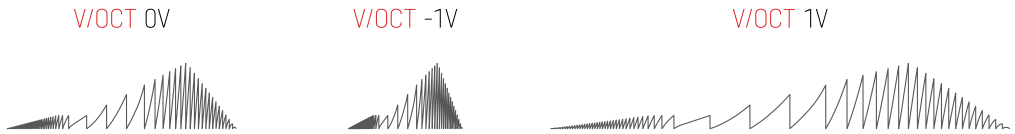
When designing wave packet CV shapes, having the T and F knobs operate independently is often perfectly adequate. However sometimes you may require a closer relationship. For example, what if you wanted to fit exactly half a sine wave oscillation in to T1, and then exactly 4 oscillations in to T2? Or generate burst pulses or a burst envelope (e.g. repeated saw wave) with an exact integer number of repetitions? LINKED LFO mode makes this possible by allowing the T knobs to set lengths for each T stage in terms of multiples of the oscillator periods (the time to complete 1 wave oscillation) set by the 3 F knobs.

T knob time multiplier values (discrete options):



In this mode, the oscillator becomes the master time controller. As an example, if you have a particular oscillator pattern in T1 which you want to oscillate quicker or slower but still contained within T1, now you only need to turn the left (green) F knob and the T1 stage time will adjust automatically to fit.

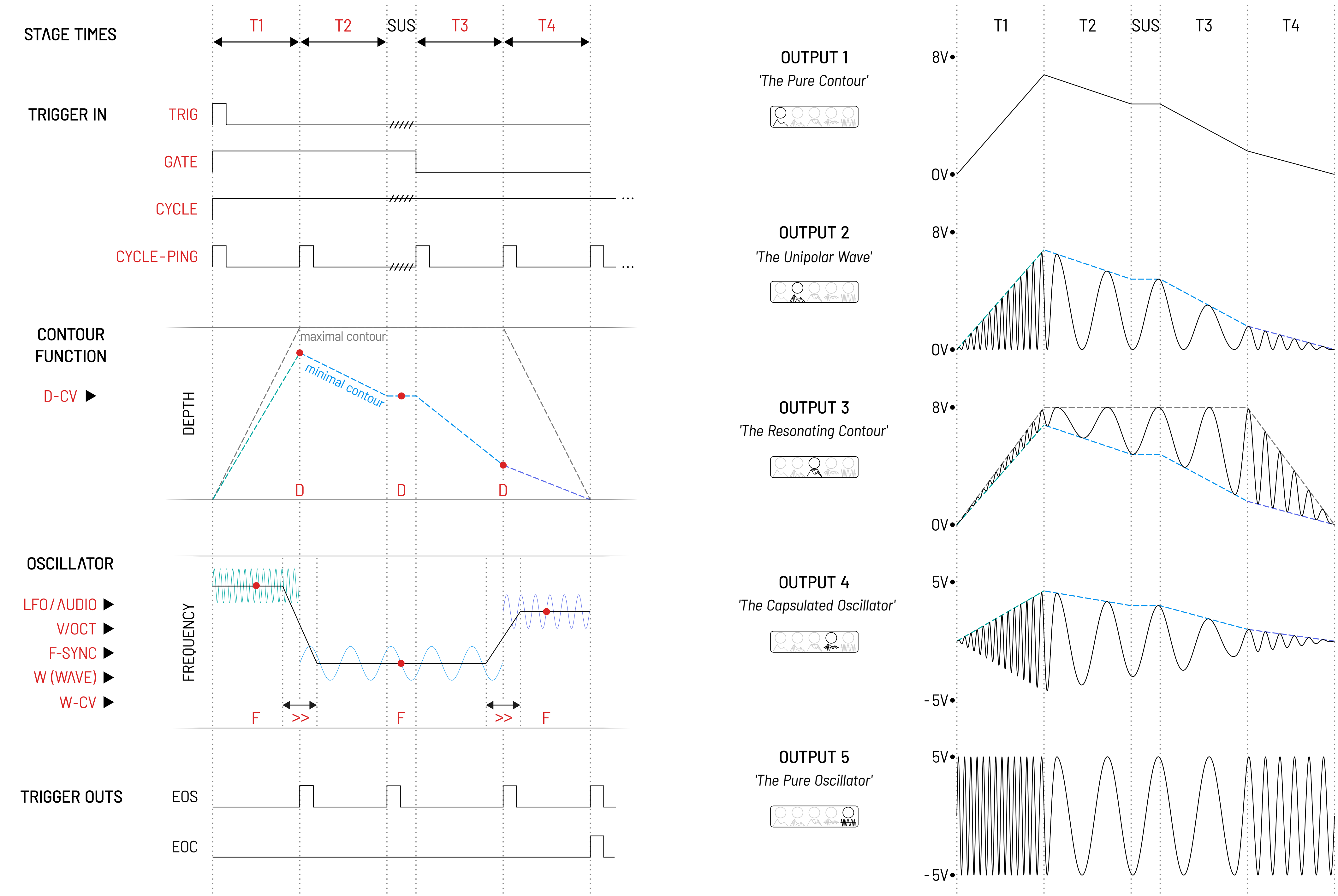
The T stage lengths will now also scale in proportion to external modulation of frequency via F-SYNC or V/OCT. Since both oscillator frequency and T lengths (which now derive from frequency) will be scaled in equal proportions, these inputs can now be used to shrink or stretch an entire wave packet shape:



Alternatively, crafting a multi-stage envelope for output 1 (i.e. independent from oscillator) while in this mode allows V/OCT to be used solely as a time CV.

Because this mode derives stage lengths from the oscillator, it not compatible with CYCLE-PING excitation which derives stage lengths from input pulses. Entering CYCLE-PING mode while in LINKED LFO mode will turn off LINKED LFO mode.

DIAGRAMMATIC MODEL OVERVIEW

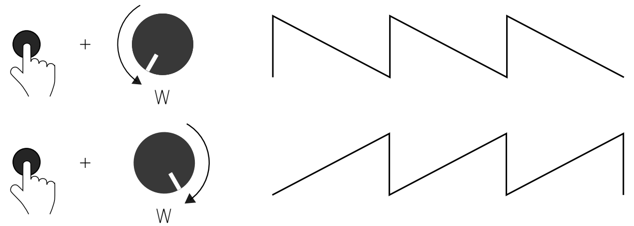


ADDITIONAL INFORMATION

SHIFT PARAMETERS

SAW WAVE DIRECTION REVERSAL

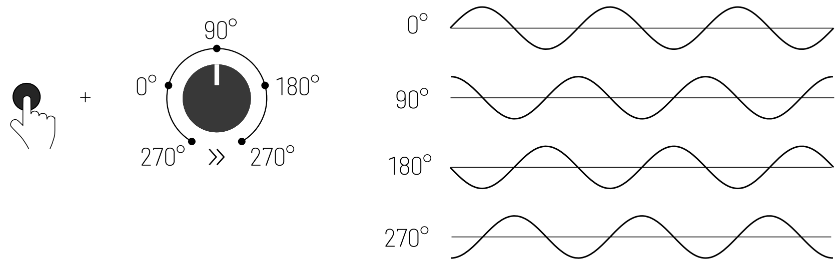
Holding down the BUTTON while moving the W knob fully clockwise or counterclockwise will flip the saw wave direction between rising and falling.



After releasing the button, the new knob position will determine the normal wave shape parameter.

OSCILLATOR PHASE

Holding down the BUTTON while moving the >> knob will change the oscillator phase in 90 degree increments.



After releasing the button, the new knob position will determine the normal glide parameter.

CALIBRATION

All inputs and outputs of the module are factory calibrated, although to compensate for variance between Eurorack systems and pitch CV sources you may wish to recalibrate V/OCT using the following procedure:

1) Position D-CV and W-CV in the counterclockwise (most left) position and hold the BUTTON for 8 seconds.
2) The left F LED will blink in green. Send 1.000V from your pitch source in to V/OCT.
3) Press the BUTTON.
4) The middle F LED will blink in green. Send 3.000V from your pitch source in to V/OCT.
5) Press the BUTTON. Your module is now calibrated to your source.

MODULE INSTALLATION

Wave Packets requires a standard 12V/-12V Eurorack power supply. Only ever connect or disconnect the module with your power supply completely switched off and powered down. The ribbon cable (supplied) must be connected from a 2x8 pin power supply header to the module's 2x5 pin header such that the red stripe of the ribbon cable (-12V side) aligns with the ⊖ marking on the PCB.

SPECIFICATIONS

- 16 HP width, 25 mm depth
- Current draw: 200mA on +12V rail, 12mA on the -12V rail
- ARM Cortex-M4 architecture, with 32-bit floating point internal processing
- 5 main outputs: 24-bit, 48kHz audio-grade DAC, DC-coupled
- V/OCT Input: +/-9V input range, 16-bit, 48kHz w/ 2x oversampling
- D-CV Input: +/-8V input range, 12-bit, 48kHz w/ 10x oversampling
- W-CV Input: +/-8V input range, 12-bit, 48kHz w/ 10x oversampling
- F-SYNC Input: Digital input capture at 180MHz
- Output frequency range: DC to 20kHz
- 100K input impedance on all inputs

WARRANTY

A one-year limited warranty is provided from the date of manufacture to the first owner. The warranty covers the repair or replacement of the module only and is limited to manufacturing defects. Return shipping is to be paid by the customer and the choice of repair or replacement is to be solely determined by Auza upon inspection of the returned module. The warranty does not cover any damages resulting from incorrect use, or any damages or costs beyond the repair or replacement of the module. Examples of incorrect use include but are not limited to: physical damage as a result of the use of excessive force or misuse, dropping or submerging the module; exposure to moisture or liquid; damage caused by incorrect power conditions, excessive or poorly regulated voltages; overexposure to heat or direct sunlight; placement of the module in conditions that do not facilitate good heat dispersion or are in any way comburant; the use of unofficial firmware. No responsibility for harm to persons or property caused by use of this module is implied or accepted. If you suspect your module to be faulty, you must immediately power off the module and contact team@auzaaudio.com for assistance. Please do not attempt to return a module without express consent and instruction from us.

Does your panel have a slightly different design to what is shown here?
Try our alternate manual: docs.auzaaudio.com/wavepackets-manual-panela.pdf