

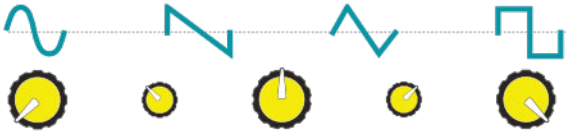
Advanced LFO

Wobbler² is an advanced LFO with two outputs. This mode is a modulation source that can add controlled chaos to your sound. The Wobbler² LFO has five shapes, two of which are based on physical modelling. It also gives you direct visual feedback on your CV outputs. You can see it wobble.

Quickstart
 - Patch the REGULAR output or the PHASED output to your favourite modulation target
 - Turn its LEVEL knob all the way to the right for maximum effect

1. SHAPE input & knob
 With SHAPE you select between five shapes. All shapes are calculated real-time. Wobbler² is constantly calculating or simulating these five shapes in the background, ready for you to crossfade between shapes without losing step.

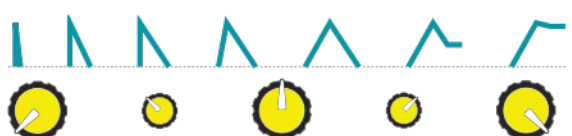
Simple
 This shape is a simple LFO that can crossfade between the four standard waveforms. On the road to chaos this shape is the starting point. You can use MOD to crossfade between sine, triangle, saw and pulse LFO:



Turning SHAPE beyond the Simple shape fades the LFO into slow-motion and the Simple LED will start blinking. Fully turning SHAPE to the left divides the frequency by 64.

Self-Phasing
 This shape is a combination of the Simple LFO with a copy of itself. The second waveform is shifted in and out of phase with the original one. The resulting shape is straightforward with sine waveforms and gets more complicated very fast with triangle, saw and pulse waveforms. PHASE controls the relative speed of the second waveform. MOD works the same as in the Simple shape.

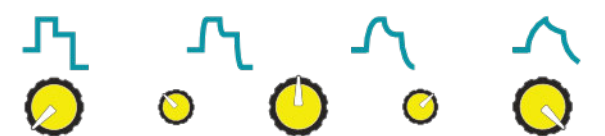
Twang
 The Twang shape uses a physical model of a resonating stick with dampening. We follow the movement of the stick and use this to generate control voltages. Please note that you must use the TRIGGER button or input to kick this shape into action. MOD changes the attack and decay time. Fully turning MOD to the right enables infinite sustain:



Double Pendulum
 This shape uses a physical model of a double pendulum. We follow the angles between both segments of the pendulum and the ground, and use these to generate control voltages. Use the TRIGGER to start the pendulum swinging. PHASE controls the amount of initial chaos. Due to the chaotic nature of this model, the FREQUENCY knob only roughly determines the actual speed of the pendulum. MOD works the same as in the Twang shape.



Sample-and-Hold
 An internal white noise source gets sampled several times per cycle, adjustable with FREQUENCY. With PHASE you can delay the noise samples for the phased SIGNAL output up to one LFO cycle. Turning SHAPE beyond the Sample-and-Hold fades the LFO into quantize-and-hold and the Sample-and-Hold LED will start blinking. Fully turning SHAPE to the right will quantize the noise into 8 values before sampling. Use MOD to apply a smoothing filter to the outputs:

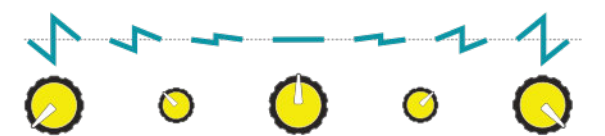


2. FREQUENCY input & knob
 FREQUENCY changes how fast your LFO wobbles. When you send pulses into the SYNC input the LFO will change its timing to match the incoming pulse frequency. With the FREQUENCY knob in the middle, the frequency of the LFO will match the frequency of the incoming pulses. Turning FREQUENCY to the left subdivides the incoming frequency, and to the right it multiplies.

3. PHASE input & knob
 The PHASE knob controls the phase difference between the two SIGNAL outputs.

4. MOD input & knob
 MOD controls the modulation amount for the selected SHAPE. The effect is different for each SHAPE. Please refer to the SHAPE section.

5 & 6. LEVEL knobs
 The amplitude of each output can be adjusted using the LEVEL knobs:



7 & 8. REGULAR & PHASED outputs
 Every SHAPE generates one primary REGULAR output and one secondary PHASED output. The two LED arms show you the control voltages running through these outputs. The bottom LED indicates about -5V and the top LED indicates about +5V.

9 & 10. CYCLE outputs
 Both outputs have an associated CYCLE output. This output will send a short pulse at the beginning of every LFO cycle. The cycle is always determined by the Simple LFO.

11. SYNC input
 You can use the SYNC input to make the LFO tempo-synced to something else. Please refer to the FREQUENCY section.

12. TRIGGER input & button
 The TRIGGER input and button restart the LFO you selected with the SHAPE knob.

CV inputs
 PHASE, MOD, SHAPE and FREQUENCY have CV inputs. You can use these to alter values by external means. The incoming CV is always added to the position of the knob.

Make it wobble!

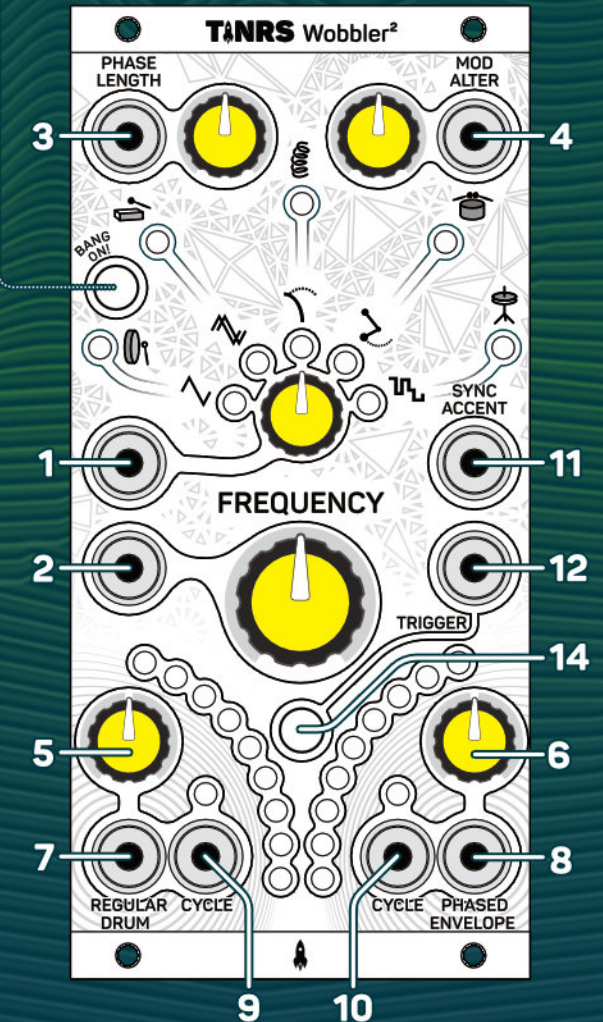
WOBBLER² manual

Introduction

Welcome and thank you for getting yourself into a This is Not Rocket Science Wobbler². In 2018 we made our first Wobbler and now we bring you another Wobbler with a whole new added layer.

Switching between modes
 Our Wobbler² has two modes: an Advanced LFO with 5 shapes that you may already know and love and a Drum Synthesizer with 5 regions of drum and a bonus drum sample bank.

Use the BANG ON! button to switch between modes. When the button is NOT lit your Wobbler² is in LFO mode, and when the button is lit it is all about the drums.



Drum Synthesizer

Wobbler² is a drum synthesizer with an envelope output and direct visual feedback. This mode is running five models that give you five regions of drum. Their progression matches the five LFO shapes moving from simple to more chaotic. We also added a drum sample bank for you to play with.

Quickstart
 - Patch the DRUM output to a speaker
 - Make sure its knob is not in the middle
 - Bang your drum by pressing the TRIGGER button or patching in a gate signal

1. REGIONS OF DRUM input & knob
 With the REGIONS OF DRUM knob you select between five regions of drum each based on a different model. These models are constantly being computed in the background, ready for you to crossfade between drums without missing a beat.

Big Drum
 This drum region makes bassdrums and toms. With ALTER you can change pitch envelope depth. Turning the knob to the left creates a negative amount of pitch envelope, and completely left it wraps trough zero so you get a positive-negative envelope amount. To the right creates a positive amount of pitch envelope, keeping the knob in the middle there is no change in pitch. When you sweep the REGIONS OF DRUM knob all the way to the left, the Big Drum LED will start blinking and you will find a reverse big drum sound with a reverse pitch and amplitude envelope.

Block
 This drum region uses an abstract model of a block that you bang with a stick. With ALTER you can select the shape of the block. Sweep between cube to plate on the left and disc to tube on the right.

Sproing
 This region bounces up and down while changing pitch - giving you a springy sound. With ALTER you control the speed of pitching the SPROING up or down. To the left the pitch goes down, there is no effect on the pitch with the knob in the middle position and when you sweep it to the right the pitch goes up.

Snare drum
 This model produces drum sounds with added noise. Sounds remarkably like a snare drum. With ALTER you can change the tonality of the snare. More harmonic on the left and more inharmonic to the right.

Hi-hat
 High-pitched inharmonics with a touch of noise. With ALTER you can change the high-pass filter on the high-hat by changing the cut-off frequency. Turn the knob to the right and only the higher frequencies will remain. When you sweep the REGIONS OF DRUM knob all the way to the right, the Hi-hat LED will start blinking and you will find a digital clap.

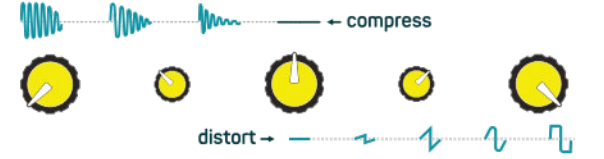
2. FREQUENCY input & knob
 FREQUENCY changes the pitch of the drums. Sweeps from here to there with a five octave range (does NOT track 1v/oct).

3. LENGTH input & knob
 The LENGTH knob sets the decay length of the drum sound. In SPROINGs case it sets the length of the silence in between hits.

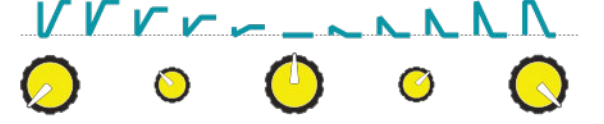


4. ALTER input & knob
 ALTER controls the modulation amount for the selected REGIONS OF DRUM. The effect is different for all of them. Please see the REGIONS OF DRUM section.

5 & 7. DRUM knob & output
 This output gives you your selected drum sound. The knob above it determines the level (middle) and compression (left) versus distortion (right) of the sound. The left LED arm lights up with the waveform of the drum sound.



6 & 8 ENVELOPE knob & output
 This output gives you the exponential decay envelope of your selected drum sound. The knob above it determines the level (middle) and positive envelope (right) versus a ducking envelope (left). The right LED arm lights up with the progression of the envelope.



9 & 10. CYCLE outputs
 Every triggered drum sound has two associated CYCLE gate outputs. When a drum sound is triggered, the 9 output will remain on and the 10 output will remain off as long as the drum lasts. The LEDs indicate which gate is on.

11. ACCENT input
 Patch a gate signal into the ACCENT input to add a small accent to your drums. Every REGIONS OF DRUM has its own accent.

12. TRIGGER input & button
 The TRIGGER input and button (re)start the current drum sound.

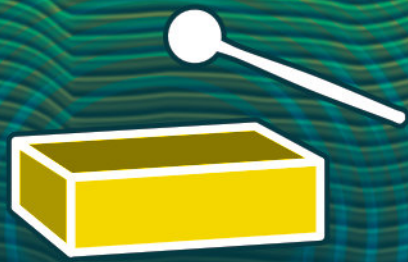
CV inputs
 LENGTH, ALTER, REGIONS OF DRUM and FREQUENCY have CV inputs. You can use these to alter the values by external means. The incoming CV is always added to the position of the knob.

Drum Sample Banks
 Wobbler² also includes a drum sample bank filled with 7 banks of 7 drum sounds. When you push the BANG ON! and the TRIGGER buttons at the same time, your Wobbler² will switch the drum models for samples. Both the SHAPE icons and the REGIONS OF DRUM icons will now have lit LEDs.

With ALTER you can sweep between the 7 drum banks that are filled with samples of electronic drums, acoustic drums and vocal percussion.

Use the REGIONS OF DRUM knob to select one of the 7 sounds within a bank. All other inputs/outputs/knobs work the same as with the drum models.

Bang on!



Advanced LFO WOBBLER² Drum Synthesizer

manual

MOD→

SHAPE←



Wobbler² LFO Map



LFO to Drum

Classic analogue oscillators had a switch to pitch them down into an LFO. Flipping it moved the waveform into inaudible subsonics that could happily be used as a modulation source. When we replaced the chip in the original Wobbler with the RP2040, we suddenly had a lot of compute left to run around with and it made sense to us to go the other way round.

Speeding up the Twang and Double Pendulum waveshapes already sounded like a drum with both tone and decay. The chaotic nature of these models made them drummy. We started from there and mapped each of the LFO types to a compatible drum model.

The LFO models start with the super-regular waveshapes of the Simple LFO and slides further into chaos as you move from left to right. The same slide applies to the drum models.



Installing the Module

- Power down your system
- The red stripe on the power cable and the 'red stripe' on the module indicate minus 12 volt
- Connect the included power cable between the back of the module and your power strip
- Screw the module into place
- Power up your system

Let us know!

Please check out our website for more information, demo videos and various links. You can also get in touch with us here for any questions or feedback you may have and share your Wobbler² beepings: www.thisisnotrocketscience.nl

Credits

Design and programming by Stijn Haring-Kuipers
Operations and vocals by Priscilla Haring-Kuipers
Compute by Raspberry Pi (UK)
PCB: JLC-PCB (CHINA)
SMD assembly by Quant (NL)
Frontpanel production by Repos (NL)
Light pipes by Binkhorst Creations (NL)
Drum samples by Maurice van Kampen & Aron Smit (NL)
Ceramic linggg sound by Daniel Maalman (NL)
Print work by De Regenboog Groep (NL)
Sanity checks and emotional support by our friends on the TiNRS and Plinky discord channels - thank you!

All TiNRS products are proudly assembled at our antistatic kitchentable in Amsterdam, The Netherlands.