Pulsar Manual

SV Modular



November, 2026

Pulsar Users Manual

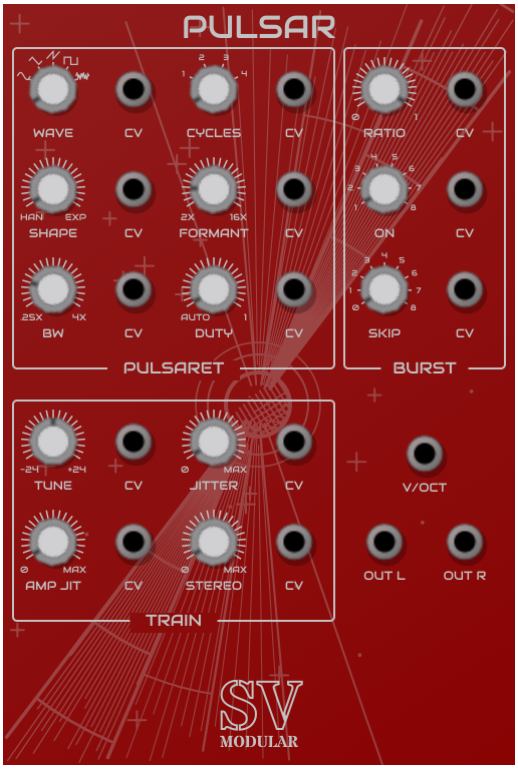


Figure 1: Pulsar

Pulsar is a Pulsar Synthesis oscillator, after the technique described by Curtis Roads in *Microsound*. It produces a train of very short sound particles, called *pulsarets*, at the pitch you play. It is a drone: every channel of the V/OCT input sounds continuously, so patch your own VCA or ADSR after it to shape notes. It provides two polyphonic (stereo) outputs.

Pulsar Synthesis

In Pulsar Synthesis, each period of the fundamental frequency contains a short burst of a waveform, the *pulsaret*, followed by silence. The repetition rate of the bursts sets the pitch you hear, while the frequency and length of the burst set a separate *formant*, a resonant peak in the spectrum. This lets you move the timbre independently of the pitch, much like sweeping a filter.

Because each pulsaret is windowed (faded in and out), the sound is smooth. When the bursts are spaced far enough apart that the ear separates them, the pitch turns into a rhythm, and Pulsar can move between the two.

Signal Path

V/OCT and TUNE set the fundamental. The pulsaret is generated from the WAVE carrier, shaped by the window, and masked by the burst pattern. Jitter is then applied, and the left and right channels are decorrelated by STEREO.

Panel Controls and Functions

Pulsar is divided into three sections: *Pulsaret*, *Burst* and *Train*. Each knob has a CV input to its right. A CV of `10v` sweeps the knob across its whole range, and the result is clamped to the range of the knob.

Pulsaret

The *Pulsaret* section shapes the individual burst.

Wave The *Wave* parameter selects the carrier inside the pulsaret: *Sine*, *Triangle*, *Sawtooth*, *Square* or *Noise*. Sine is the purest, the other shapes add harmonics, and noise gives an unpitched, breathy burst that still follows the rhythm of the train.

Cycles The *Cycles* parameter sets how many cycles of the carrier fit in one pulsaret, from `1` to `4`.

Shape The *Shape* parameter changes the window applied to the pulsaret, crossfading from a symmetrical *Hann* window to an *Exponential Decay*, which starts abruptly and fades away like a struck object.

Formant The *Formant* parameter sets the frequency of the carrier as a multiple of the fundamental, from `2X` to `16X`. This is the resonant peak that you hear sweeping as you turn the knob.

BW The *BW* parameter scales the length of the pulsaret, from `.25X` to `4X`. A longer pulsaret has a narrower, more focused formant, a shorter pulsaret has a broader one.

Duty The *Duty* parameter sets the length of the pulsaret as a fraction of the period. At *Auto* the length follows Formant and BW. Anywhere above that, the length is fixed, up to the full period at 1.

Burst

The *Burst* section masks the train so that only some pulsarets sound.

Ratio The *Ratio* parameter is the proportion of periods that fire, from 0 to 1. At 1 every period sounds. Lower values thin out the train evenly.

On The *On* parameter sets the number of consecutive periods that sound, from 1 to 8.

Skip The *Skip* parameter sets the number of periods that are silent after the *On* periods, from 0 to 8. At 0 nothing is skipped. Together On and Skip make a repeating pattern, and this pattern is combined with the Ratio.

Train

The *Train* section controls the pitch and the randomness of the train.

Tune The *Tune* parameter transposes the fundamental from −24 to +24 semitones.

Jitter The *Jitter* parameter randomly varies the spacing of the periods, from 0 to the maximum. A little adds a natural roughness, a lot dissolves the pitch.

Amp Jit The *Amp Jit* parameter randomly lowers the amplitude of each pulsaret, from 0 to the maximum.

Stereo The *Stereo* parameter sets how different the left and right outputs are. At 0 the outputs are identical, at the maximum they are fully decorrelated. This affects the jitter and, with the noise carrier, the noise itself.

Input

V/OCT The *V/OCT* input sets the pitch, at 1 volt per octave, with `0v` as C4. The input is polyphonic, and up to 16 channels will each play a voice. A voice restarts its pulse train when its channel first appears on the cable.

Output

OUT L / OUT R The *OUT L* and *OUT R* outputs carry the left and right channels of the sound at +/-5 volts. Both outputs are polyphonic: channel *n* carries voice *n* of the V/OCT input. Use a polyphonic mixer to sum the voices.