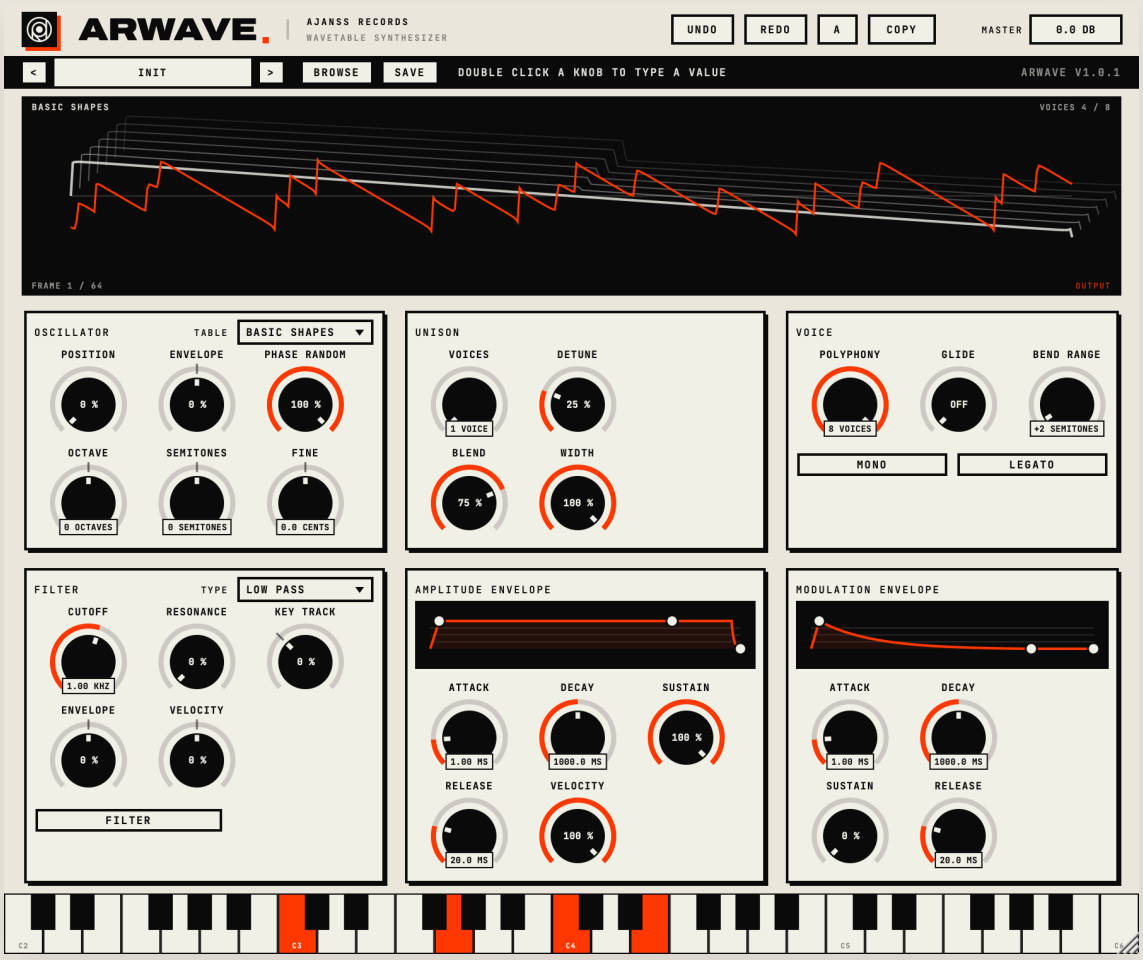
AJANSS RECORDS

ARWAVE

WAVETABLE SYNTHESIZER



VERSION	FORMATS	PLATFORMS	DOCUMENT
1.0.1	AU · VST3	macOS · WINDOWS	USER GUIDE

01 WHAT IT DOES

ARWAVE is a polyphonic wavetable synthesizer with **one oscillator**. That oscillator reads one of sixteen factory wavetables, sixty-four frames each (the sine is a single frame), and the POSITION control morphs between the frames. It runs up to **eight unison voices**. One **filter** — low pass, high pass or band pass, twelve decibels per octave — and **two envelopes**: one for the amplitude, one that moves the cutoff and the wavetable position. Eight voices, mono and legato, glide, and forty factory sounds.

There is no effect rack, no modulation matrix, no arpeggiator and no wavetable editor. That is the point: ARWAVE is the smallest honest version of the engine. If you want three oscillators, warp modes, twenty-two filter types, four envelopes, eight low frequency oscillators, a sixty-four slot modulation matrix, twelve effects and an arpeggiator, that instrument is **ARSYNTH** — the same engine, grown up. Sounds do not transfer between them, but everything you learn here does.

What it promises it measures: alias products **115 decibels down or better**, pitch within **0.000002 cents**, the same output at **every buffer size**, **exact silence** after the last note, and the filter switched off is **bit for bit** the oscillator itself. The numbers are on the last page.

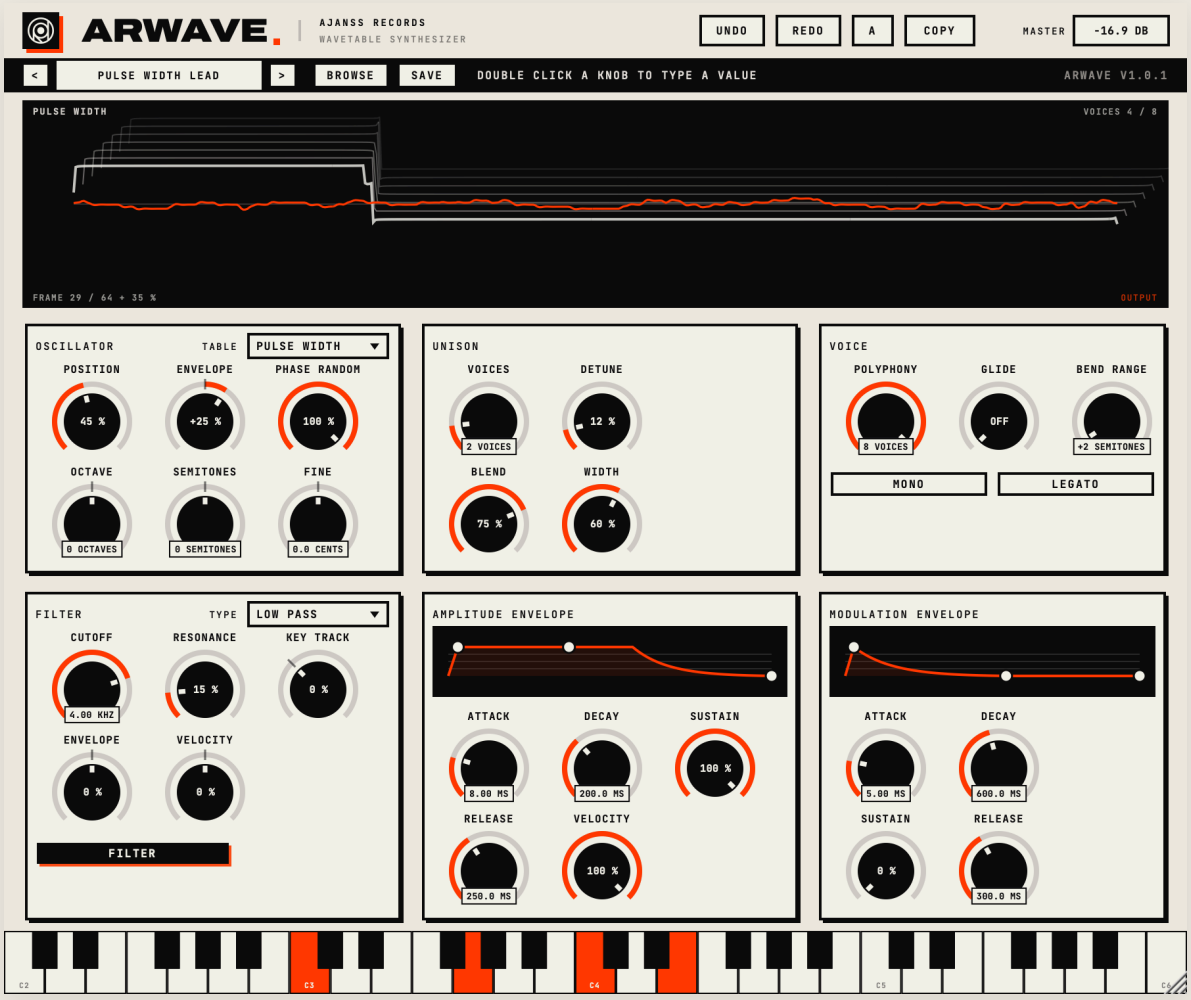
02 INSTALLING

macOS — run ARWAVE Installer.pkg and follow the steps; choose the formats and whether to install for every user or only yourself. The package is signed and notarised by Apple, so it opens normally.

Windows — run ARWAVE Installer.exe; the plugin goes to the shared VST3 folder. The installer is not codesigned yet, so SmartScreen may warn you: click More info, then Run anyway. Only needed once.

After installing — rescan the plugin list in your DAW; ARWAVE appears under Ajanss Records › ARWAVE in the instrument list. macOS 10.13 or newer, Intel or Apple Silicon (universal binary); Windows 10 or newer, 64-bit. Audio Unit and VST3 on macOS, VST3 on Windows.

03 THE WINDOW



The top bar holds UNDO, REDO, A (switch between the A and B states), COPY (copy the current state to the other slot) and MASTER, a level field you drag or double-click to type. There is no bypass button: an instrument has no audio input, so there is nothing to pass through — use your DAW's own bypass or mute. The black strip below is the **preset bar**: previous, the preset name, next, BROWSE and SAVE, and to the right of them a **hint** for whatever the mouse is over.

The display at the top shows the wavetable as a stack of frames, the frame POSITION is reading in front, and over it the live output in accent colour. To its right is the voice count. When nothing is playing the line is exactly flat and the display stops moving — the amplitude envelope ends on a counted sample and writes true zero.

The keyboard at the bottom plays the synth — click or drag — and lights the notes the engine is holding. It spans C2 to C6; play outside that range from a MIDI controller. **Knobs**: drag to change, double-click to type a value. Values that do not fit under the knob are written on a small tag inside the arc. Selection rows and drop-down lists never abbreviate. **Window size**: drag the corner; the window scales from 75 to 150 percent and keeps its proportions.

04 THE OSCILLATOR

TABLE picks one of sixteen factory wavetables. Fifteen of them are sixty-four frames of 2048 samples and SINE is a single frame, built from formulas rather than sampled, and stored as an octave-by-octave pyramid so nothing folds back however high you play. Changing the table takes a moment because the pyramid is built on the spot; it is a timbre choice, not a control to automate per note.

POSITION is which frame plays, from the first to the last, morphing smoothly between neighbours. On BASIC SHAPES, 0 percent is a sawtooth, 33 percent a square, 66 percent a triangle and 100 percent a sine. On PULSE WIDTH, 0 percent is a square and 100 percent a narrow pulse. On VOWELS, the five vowels sit at 0, 25, 50, 75 and 100 percent.

ENVELOPE is how far the modulation envelope moves POSITION, in either direction. Without it the table never moves and the synth is only a wave picker — this one knob is what makes it a wavetable synthesizer.

PHASE RANDOM sets how much the start phase of each note and each unison voice is randomised. At 0 percent every note starts identically, which makes short percussive sounds repeat exactly; at 100 percent the attacks vary. **OCTAVE**, **SEMITONES** and **FINE** transpose, the last in cents.

05 UNISON

VOICES stacks one to eight copies of the oscillator on each note. **DETUNE** spreads them in pitch; at 100 percent the outermost copies sit fifty cents away. The spread follows a curve that keeps the inner copies close and opens the outer ones — the classic seven-voice layout.

BLEND balances the centre copy against the outer ones: at 75 percent they are all equal, below it the centre dominates, above it the outer ones do. **WIDTH** spreads them across the stereo field; at 0 percent they all sit in the middle. Total power is held constant, so one voice and eight voices are within 1.1 decibels of each other — turning unison up does not turn the patch up.

06 THE FILTER

One filter per voice, stereo, twelve decibels per octave, in three types: **LOW PASS**, **HIGH PASS** and **BAND PASS**. It runs before the amplitude envelope, so a resonant tail ends with the note rather than after it.

The **FILTER** switch turns it on. With it off the output is the oscillator itself, bit for bit — the filter controls then change nothing at all, which is measured rather than assumed. Switching the type crossfades over ten milliseconds, so it never clicks.

CUTOFF is the corner frequency, 20 Hz to 20 kHz. **RESONANCE** lifts the response at the corner; at 100 percent it peaks about 34 decibels. **KEY TRACK** makes the cutoff follow the note you play: at 100 percent one octave up on the keyboard moves the cutoff one octave up, so the tone stays even across the range.

ENVELOPE is how far the modulation envelope moves the cutoff, and **VELOCITY** how far how hard you play moves it. Both are two-way: turn them below zero and the envelope or the velocity closes the filter instead of opening it.

07 THE ENVELOPES

Two envelopes, both attack, decay, sustain and release, both drawn from the engine's own formula rather than a sketch of it. Drag the three handles on the curve: the attack end, the decay end (sideways for time, up and down for sustain) and the release end.

AMPLITUDE ENVELOPE is the level of the note. Its **VELOCITY** knob sets how much the playing velocity sets that level: at 100 percent a note at half velocity is half as loud, at 0 percent every note is equally loud.

MODULATION ENVELOPE drives two destinations: the filter cutoff and the wavetable position. It does nothing on its own — the amount lives on the destination, in the FILTER card and in the OSCILLATOR card. Its default is a falling shape, sustain at zero, which is what a plucked or percussive sound wants.

The shortest times are half a millisecond for the attack and one millisecond for the decay and the release: fast enough to sound instant, slow enough not to click. Retriggering during a release continues from wherever the level is, so a repeated note never jumps.

08 VOICE

POLYPHONY is how many notes can sound at once, one to eight. When they are all busy the oldest released note gives way; if none has been released, the oldest held note does. The note that gives way fades out over four milliseconds in its own slot while the new note starts in another, so stealing never clicks.

MONO plays one note at a time: a new note takes over the voice that is already sounding. **LEGATO**, in mono, stops overlapping notes from retriggering the envelopes — hold one key, press the next, and the sound slides instead of starting again. **GLIDE** is how long that slide takes; at zero it is off. Glide is not tied to mono: with several voices a new note slides from the one played before it, over the same time.

BEND RANGE is how far the pitch wheel bends, in semitones, the same amount both ways.

09 PRESETS

Forty factory sounds in seven categories — every one of the sixteen factory wavetables is heard in at least one of them. Each was played through the plugin as a three note chord, its peak measured, and its MASTER set so that peak is -12 dBFS — switching presets does not change the level, and a seven note chord still has headroom.

The preset bar: the arrows step through the list currently visible in the browser (all presets, or one category), so you can walk through the basses alone. BROWSE opens the browser: categories on the left, the list on the right; click to load, use the up and down keys to move. SAVE stores the current sound as a user preset with the name you type; RENAME and DELETE work on user presets. User presets are files in **Documents / ARWAVE Presets**, one .arwave per preset — copy them to another computer and they appear under USER.

A preset is the complete state: every parameter including the wavetable choice. The DAW session stores the same state, plus the A and B slots and the undo history.

09 PRESETS, CONTINUED

CATEGORY	PRESETS
INIT	INIT, INIT SINE, INIT SAW, INIT SQUARE
BASS	SUB SINE BASS, DETUNED WIDE BASS, ACID BASS, PULSE BASS, PLUCK BASS, FOLDED BASS
LEAD	WIDE SAW LEAD, PULSE WIDTH LEAD, HARMONIC LEAD, VOWEL LEAD, SYNC LEAD, PHASE DISTORTION LEAD
PAD	WARM PAD, VOWEL PAD, GLASS PAD, DARK DRONE, SPECTRAL PAD, ORGAN PAD
PLUCK	BRIGHT PLUCK, GLASS PLUCK, SQUARE PLUCK, SOFT PLUCK, FM PLUCK, STEPPED PLUCK
KEYS	TINE KEYS, DIGITAL KEYS, BELL KEYS, ORGAN KEYS, FM PIANO, MUSIC BOX
FX	RISER, METAL HIT, WIND, DIGITAL GLITCH, FOLD SWEEP, RESONANT DROP

10 PARAMETERS

Thirty-three parameters, all of them automatable from the host under these names.

CONTROL	RANGE	DEFAULT	WHAT IT DOES
MASTER	-60 to +6 dB	**0.0 dB**	Output level, after the voices are summed
TABLE	16 factory tables	**BASIC SHAPES**	Which wavetable the oscillator reads
POSITION	0 to 100 %	**0 %**	Which frame of the table plays
ENVELOPE (oscillator)	-100 to +100 %	**0 %**	Modulation envelope to position
PHASE RANDOM	0 to 100 %	**100 %**	Start phase spread per note and per unison voice
OCTAVE	-4 to +4 octaves	**0**	Transpose in octaves
SEMITONES	-12 to +12	**0**	Transpose in semitones
FINE	-100 to +100 cents	**0.0**	Fine tuning
VOICES (unison)	1 to 8	**1**	Unison copies of the oscillator
DETUNE	0 to 100 %	**25 %**	Pitch spread; 100 % is fifty cents at the edges
BLEND	0 to 100 %	**75 %**	Centre against outer copies; 75 % is all equal
WIDTH	0 to 100 %	**100 %**	Stereo spread of the unison copies
FILTER	off / on	**off**	Off is bit for bit the oscillator
TYPE	LOW / HIGH / BAND PASS	**LOW PASS**	Filter type, twelve decibels per octave
CUTOFF	20 Hz to 20 kHz	**1.00 kHz**	Corner frequency
RESONANCE	0 to 100 %	**0 %**	Lift at the corner; about 34 dB at the top
KEY TRACK	-100 to +200 %	**0 %**	Cutoff follows the played note
ENVELOPE (filter)	-100 to +100 %	**0 %**	Modulation envelope to cutoff
VELOCITY (filter)	-100 to +100 %	**0 %**	Playing velocity to cutoff
ATTACK, DECAY, RELEASE	0 ms to 20 s / 30 s	**1 ms, 1 s, 20 ms**	Both envelopes, separately
SUSTAIN	0 to 100 %	**100 % / 0 %**	Amplitude envelope / modulation envelope
VELOCITY (amplitude)	0 to 100 %	**100 %**	Playing velocity to level
POLYPHONY	1 to 8 voices	**8**	How many notes sound at once
GLIDE	0 to 10 s	**off**	Slide time between notes
BEND RANGE	0 to 48 semitones	**+2**	Pitch wheel range, both ways
MONO, LEGATO	off / on	**off**	One voice; overlapping notes do not retrigger

11 MEASURED

Every number below comes from the plugin's own test suite, run on the shipped build at 48 kHz. They are not targets; they are what came out.

ALIASING	A sine table, where everything except the note itself is an alias product. Across C0 to C8 the strongest such component is 115.4 decibels below the note, and that worst case is C8. At C4 and C7 nothing rises above the measurement floor, which is about 120 decibels down.
PITCH	A4 measured from the zero crossings of a long note: 440.000001 Hz, 0.000002 cents from the ideal.
ANY BUFFER SIZE	The same MIDI at 1, 7, 16, 17, 64, 333, 1024 and 2048 samples, and at a size that changes every block, against 512: difference zero. Eight voices of unison, filter on, both envelope paths live.
SAMPLE ACCURATE	A note moved by 1 to 257 samples gives the same output moved by the same amount, to within -157 dBFS — one floating point step. The engine itself is bit identical; the residue comes from how the compiler rounds the final multiply.
EXACT SILENCE	After the last note is released the output is true zero, not a small number — measured with resonance at 98 percent, where the filter tail is longest.
FILTER OFF	With the filter switched off, changing its type, cutoff, resonance, key tracking and envelope amount changes the output by exactly zero.
UNISON	One voice against eight, with detune at 50 percent: 1.10 decibels apart.
VELOCITY	A note at velocity 32 against one at 127: 11.973 decibels quieter, which is exactly what the ratio predicts.
LATENCY	21 samples at 48 kHz, reported to the host and measured the same. It comes from the filter that brings the internal rate back down; nothing else adds to it. At 88.2 kHz and above the engine already runs at the host rate, so there is no filter and the latency is zero. An offline bounce is sample for sample what you heard.
TEXT	Every value the plugin writes on screen reads back to the same value if you type it in: 1353 readings, none lost.

12 STARTING POINTS

A wide lead from nothing. Load INIT. Turn unison VOICES to eight and DETUNE to about forty; the sawtooth opens out. Bring CUTOFF down to six kilohertz with the filter on, and give the amplitude envelope ten milliseconds of attack so the note does not start on an edge.

A sound that moves. Load INIT SQUARE and set the oscillator's ENVELOPE to about thirty. Now the modulation envelope walks POSITION through the table on every note: the attack is bright and it settles. Lengthen the modulation envelope's decay to hear it slower, or turn ENVELOPE negative to walk the other way.

A plucked bass. Load INIT, OCTAVE at -1, filter on and LOW PASS with CUTOFF near five hundred. Set the filter's ENVELOPE to about fifty and the modulation envelope to a short decay with sustain at zero — that is the whole trick. MONO and LEGATO with a little GLIDE make it playable with one finger.

A pad that breathes. Load WARM PAD and lengthen both envelopes. Then set the oscillator's ENVELOPE to about fifty and the modulation envelope's attack to two seconds: the table now drifts while the chord is held.

Playing in tune with your hands. The amplitude envelope's VELOCITY knob decides how much your playing sets the level, and the filter's VELOCITY knob how much it opens the tone. Set both and the patch answers how hard you play.

13 SUPPORT

ARWAVE is free. If something is wrong, write to **ajanssrecords@gmail.com** with your operating system, your DAW and what you did — a session that reproduces it is best.

If you want the same engine grown up — three oscillators, warp modes, twenty-two filter types, four envelopes, low frequency oscillators, a modulation matrix, an arpeggiator and an effect rack — that instrument is **ARSYNTH**.