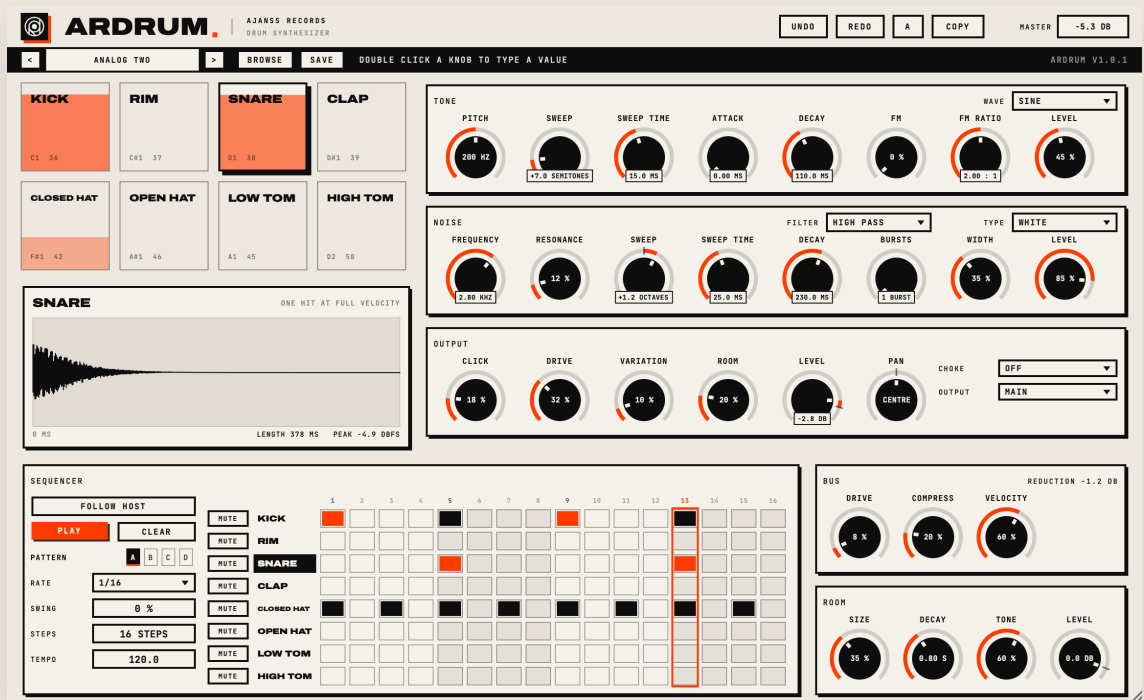


AJANSS RECORDS

ARDRUM

DRUM SYNTHESIZER



VERSION

1.0.1

FORMATS

AU • VST3

PLATFORMS

macOS • WINDOWS

DOCUMENT

USER GUIDE

01 WHAT IT DOES

ARDRUM is a drum synthesizer with eight pads: **KICK**, **RIM**, **SNARE**, **CLAP**, **CLOSED HAT**, **OPEN HAT**, **LOW TOM** and **HIGH TOM**. There are no samples in it. Every hit is made by the engine at the moment it is played, from the same parts on every pad: a tone in four shapes with frequency modulation, a noise through a resonant filter that can sweep, a click, drive and a touch of human variation. The pads differ only in their settings, so any pad can become any drum – a tom can turn into a bell, a snare into a clap.

A **step sequencer** with four patterns plays along with your host or on its own clock. A **bus** with a room, a compressor and drive shapes the whole kit, and every pad can also leave on its own output. **One hundred kits** in eleven styles come with it, each with four patterns of its own, and every pad level in every kit was set by measurement.

What it promises it measures: pitch within **0.00012 cents**, the **same output at every buffer size and on every run**, **exact silence** when a hit has ended, sequencer hits on **the same sample** as MIDI notes. The numbers are on the MEASURED page.

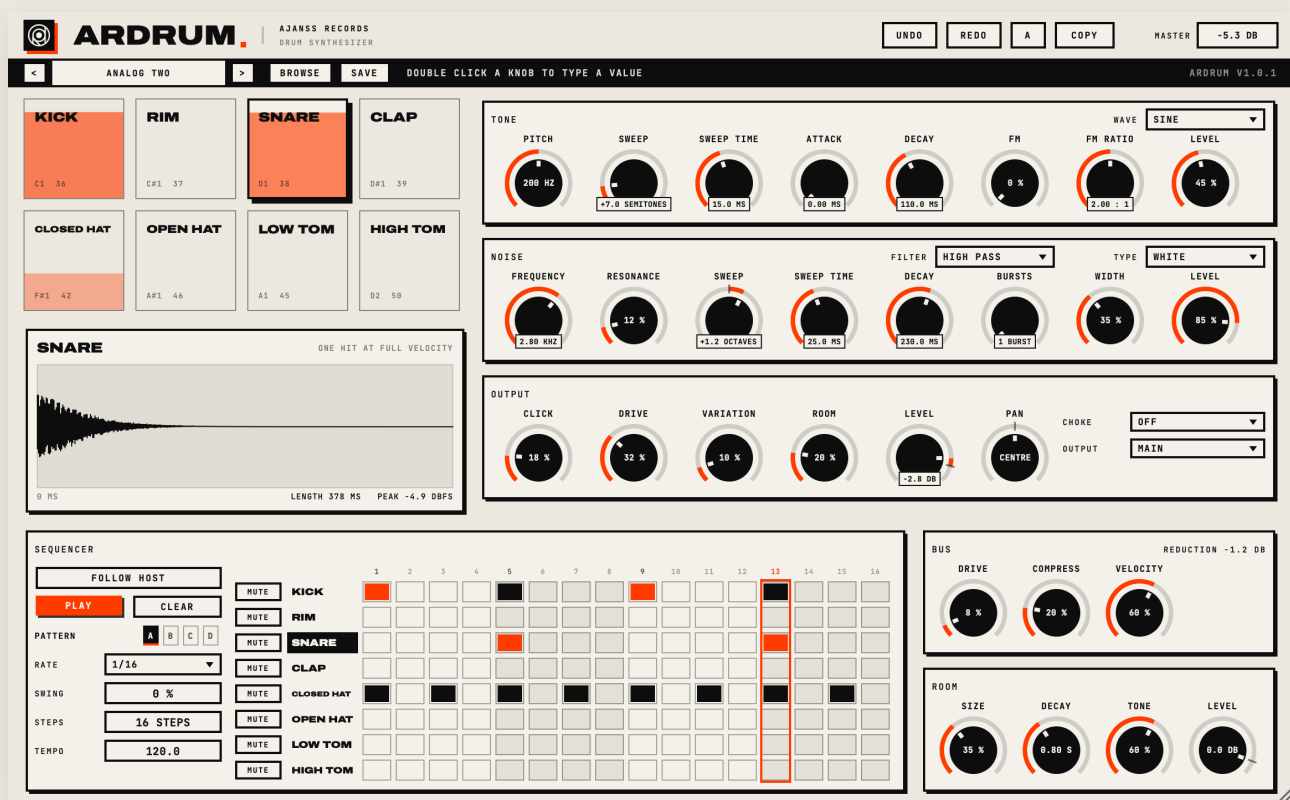
02 INSTALLING

macOS – run ARDRUM 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 – install it through MuseHub, or run ARDRUM Installer.exe; either way the plugin goes to the shared VST3 folder. If SmartScreen warns about the installer, click More info, then Run anyway.

After installing – rescan the plugin list in your DAW; ARDRUM appears under Ajanss Records > ARDRUM in the **instrument** list, not among the effects. Put it on an instrument or MIDI track and play it from a controller, the piano roll or its own sequencer. 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 – use your DAW's own bypass or mute. The black strip below is the **kit bar**: previous, the kit name (click it to open the browser), next, BROWSE and SAVE, and a **hint** for whatever the mouse is over.

At the **top left** are the eight pads and the **one-shot view** of the selected pad; at the **top right** the selected pad's **TONE**, **NOISE** and **OUTPUT** cards. Click another pad and the cards change to it; every pad has the same controls. At the **bottom** are the **SEQUENCER**, and the **BUS** and **ROOM** cards, which act on the whole kit.

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. **Window size**: drag the corner; the window scales from 75 to 150 percent and keeps its proportions. When nothing is playing the window stops moving entirely.

04 THE PADS

Click a pad to select it and hear it. Where you click sets how hard it is hit: the top edge is full velocity, the bottom edge 35 percent. A pad lights with its own level while it sounds. Under its name each pad shows the MIDI note it answers to, as a name and a number (middle C is C3).

Hit a pad again while it is still ringing and the old hit fades out over three milliseconds while the new one starts from the beginning – cutting it would click, letting both ring would smear. Each pad has two voices for this, sixteen in all.

Settings are taken at the moment of the hit: turning a knob changes the next hit, not the one already sounding, which is why what you see in the one-shot view is exactly what plays.

05 THE ONE-SHOT VIEW

It draws one hit of the selected pad at full velocity, from its first sample to its last, and redraws as you turn. It is not a sketch: the view runs the same engine with the same noise as the pad's first hit. Underneath, **LENGTH** is how long the hit lasts – a hit ends when every part of it is 100 decibels down, and from there the output is exact zero – and **PEAK** is its loudest sample, before the bus and MASTER.

06 MIDI

ARDRUM answers the General MIDI drum map on every channel. Note-offs are ignored – a drum hit always plays out. All Sound Off and All Notes Off (controllers 120 and 123) silence everything, the room included, within three milliseconds. Notes outside the map, pitch bend, sustain and the modulation wheel do nothing.

KICK	C1 36 · B0 35	CLOSED HAT	F#1 42 · G#1 44
RIM	C#1 37	OPEN HAT	A#1 46
SNARE	D1 38 · E1 40	LOW TOM	A1 45 · F1 41 · G1 43
CLAP	D#1 39	HIGH TOM	D2 50 · B1 47 · C2 48

07 TONE

WAVE picks the shape: **SINE**, **TRIANGLE**, **SQUARE** or **SAW**. Every shape is band limited: the triangle, square and saw are made at four times the sample rate with their corners and edges smoothed and then filtered back down, so a saw at 4.5 kHz keeps what folds back below 16 kHz 72.6 decibels under the sound – drawn the naive way it would be 11.1.

PITCH is where the tone settles, 20 Hz to 2 kHz. **SWEEP** is how far above that pitch it starts, up to 48 semitones; at zero it reads OFF. **SWEEP TIME** is how long the fall takes: fast at first, slower as it arrives, and after SWEEP TIME only five percent of the sweep is left. **ATTACK** lets the tone rise instead of starting at full level – for soft mallets and swells. **DECAY** is how long the tone takes to fall 60 decibels, 10 milliseconds to 4 seconds. **LEVEL** sets how much tone you hear; at zero the pad is noise only.

FM modulates the tone with a second, hidden sine, and **FM RATIO** sets that sine's pitch against the tone's. The depth follows the tone's own envelope, so the attack is brightest and the tail settles back towards the plain shape. Whole ratios sound harmonic; ratios like 1.41, 2.76 or 3.5 give the inharmonic ring of skins, bells and metal.

A kick is a low PITCH with a large SWEEP over a short SWEEP TIME – the sweep is the punch. Toms use less sweep and a longer decay, and a little FM for the skin. A rim is a high triangle or square with no sweep.

08 NOISE

TYPE picks the source. **WHITE** is plain noise; every hit gets different noise, yet the same part plays back the same on every run. **METAL** is six square waves at inharmonic ratios – 1, 1.4827, 1.8003, 2.5460, 2.6303 and 3.8967 – tuned from the TONE card's PITCH: the sound of an electronic hi-hat or cymbal. It is made at eight times the sample rate, so below 16 kHz its aliasing stays at least 59.8 decibels under the sound.

FILTER shapes the noise: **LOW PASS**, **BAND PASS** or **HIGH PASS**, twelve decibels per octave. **FREQUENCY** is where it sits, 100 Hz to 18 kHz. **RESONANCE** makes it ring at that frequency; at 100 percent the low pass lifts its peak by 24.5 decibels. The band pass keeps its peak at the same height however narrow it gets, so a very resonant band pass is quieter overall.

SWEEP starts the filter up to six octaves above or below **FREQUENCY** and brings it back, and **SWEEP TIME** is how long that takes (five percent left, as on the tone). A snare that opens bright and closes, a clap that falls, a laser that rises: this is where they come from. **DECAY** is how long the noise takes to fall 60 decibels, 5 milliseconds to 4 seconds. **LEVEL** sets how much noise you hear.

BURSTS puts short bursts of the same noise in front of the main one, ten milliseconds apart, each dying away in twenty milliseconds – at 4 **BURSTS** three quick ones come first, and that stutter is what makes a clap sound like hands. **WIDTH** gives the right channel noise of its own: at 0 the two channels are identical, at 100 percent the white noise on the left and right is uncorrelated.

09 OUTPUT

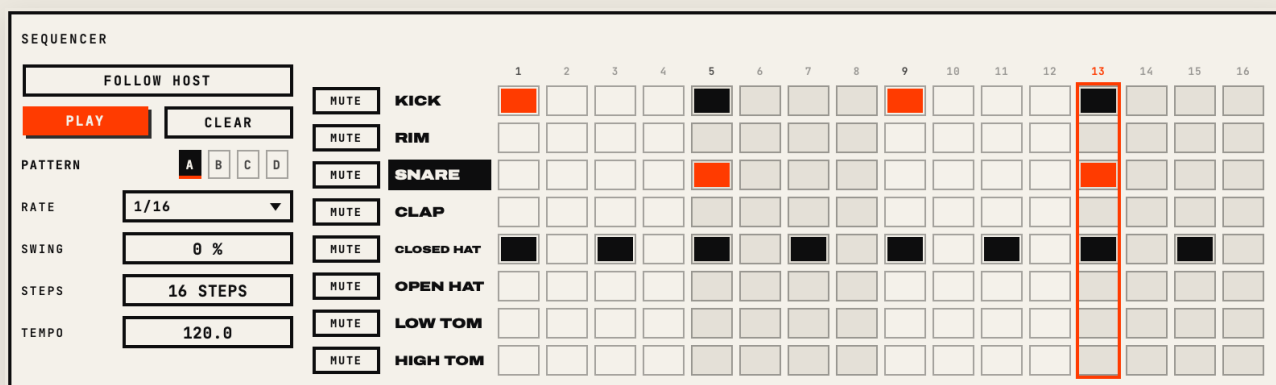
CLICK adds a short unfiltered tick at the very start of the hit, the beater on the skin. **DRIVE** saturates the pad: full scale stays at full scale while everything quieter comes up and the peaks round off. It starts from nothing at zero – the first step changes the sound by less than a hundredth of a decibel – and at 100 percent the quiet parts rise twelve decibels.

VARIATION makes every hit a little different, the way a player never hits twice the same: up to 50 cents of pitch, 1.5 decibels of level and 15 percent of decay at the top of the knob. At zero every hit is identical. The variation comes from the hit's own number, so a bounce plays back exactly what you heard.

ROOM sends the pad to the room on the bus. **LEVEL** is the pad's level, -48 to +6 dB. **PAN** places it with constant power: in the centre each side is 3 decibels down, fully to one side the other channel is silent.

CHOKE puts the pad in one of four groups: hitting any pad in a group cuts the others in the same group within three milliseconds – both hi-hats are in group 1, so the closed hat stops the open one. **OUTPUT** sends the pad to MAIN or to one of seven extra stereo outputs (see **OUTPUTS**).

10 THE SEQUENCER



The **grid** is eight pads by sixteen steps. Click a step to set it, click it again to clear it, drag to paint a run; **right-click or Alt-click** sets an **accent**, drawn in orange. A step plays at velocity 100 and an accent at 127, through the same velocity path as MIDI, so the **VELOCITY** knob shapes the difference. Setting a step plays the pad once so you hear what you placed. Each row starts with the pad's **MUTE** and its name; click the name to select the pad.

FOLLOW HOST plays the pattern along with your DAW, locked to its beats: start, stop, loop and jump, and the sequencer lands where the host is. **PLAY** runs it on its own clock at **TEMPO** when the host is not playing – the way to audition a kit. Its hits fall on exactly the same samples as the same notes sent from MIDI.

PATTERN picks one of four patterns, A to D; every kit brings its own four – a main groove, a variation, a fill and a breakdown. **RATE** is the length of a step: 1/8, 1/16, 1/32, or the eighth and sixteenth triplets. **SWING** delays every second step by up to a third of a step. **STEPS** shortens the pattern, from 1 to 16. **CLEAR** empties the pattern you are on. Patterns are part of the kit, of the A and B states and of undo.

11 BUS AND ROOM

The **BUS** acts on everything that plays through MAIN, in this order: the room returns, then **COMPRESS**, then **DRIVE**, then MASTER. At zero each stage is switched out entirely and passes the signal untouched.

COMPRESS is one knob of glue. It lowers the threshold from -6 to -24 dBFS and raises the ratio from 1:1 to 4:1 together, with a soft knee, a 10 millisecond attack that lets the hits through and a 150 millisecond release, both channels together so the image never leans. Its make-up gain gives back half of what it takes from a hit at -6 dBFS. The reduction is written in the title, live. **DRIVE** saturates the bus the way DRIVE does on a pad, full scale staying full scale. **VELOCITY**, shared by all pads, sets how much velocity sets the level: at 100 percent a hit at velocity 64 is 11.9 decibels below one at 127, at 0 every hit is equally loud.

The **ROOM** is eight delay lines feeding each other through a mixing matrix that keeps their energy. **SIZE** scales the lines and glides when you turn it rather than jumping. **DECAY** is how long the room takes to fall 60 decibels, 0.2 to 8 seconds, and it is honest: set 1.2 seconds and 1.15 is measured in the middle of the spectrum. **tone** sets how quickly the highs die away inside it. **LEVEL** is how loud it comes back. Each pad reaches it through its own ROOM knob. When nothing is sent and the tail has died away, the room stops and returns exact zero.

12 OUTPUTS

ARDRUM has **MAIN** and **seven extra stereo outputs**. Most hosts show them when the plugin is loaded in its multi-output form; route a pad there with its OUTPUT and it leaves the kit to get its own channel strip. A pad sent to an extra output skips the bus – room, COMPRESS and DRIVE – but still follows MASTER. If the host has not enabled that output the pad plays through MAIN instead, so nothing ever goes silent by accident.

13 KITS

One hundred kits: INIT and nine in each of eleven styles. A kit is the complete state: every control of every pad, the bus and room, the sequencer settings and the four patterns. Each factory kit was played pad by pad through the plugin and its levels set so the pads sit at the same distances from the kick in every kit – the snare 2 decibels below it, the clap 3, the toms 4, the rim 6, the hats 11 and 12 – with the bus switched off, because a compressor would bend the measurement. Then, with the bus on, MASTER was set so that no single pad peaks above -6 dBFS and kick, snare, clap and closed hat together peak at -2 dBFS. Where a resonant band pass kept a clap from reaching its place, the clap sits lower instead.

The kit bar: the arrows step through the list visible in the browser. BROWSE opens it: styles on the left, kits on the right; click to load, up and down keys to move. SAVE stores the current state as a user kit; RENAME and DELETE work on user kits, which are files in **Documents / ARDRUM Presets** – copy them to another computer and they appear under USER.

STYLE	KITS
INIT	INIT – the defaults of every control
ANALOG	ANALOG ONE, ANALOG TWO, BOX RHYTHM, CIRCUIT CLASSIC, ANALOG THREE, VOLTAGE FUNK, ORGAN RHYTHM BOX, MODULAR PERCUSSION, HOT WIRED
HOUSE	DEEP HOUSE, WAREHOUSE, GARAGE, DISCO HOUSE, TECH HOUSE, JACKIN HOUSE, SOULFUL HOUSE, FILTER HOUSE, MICRO HOUSE
TECHNO	RUMBLE, HARD GROOVE, MINIMAL, INDUSTRIAL, HYPNOTIC, DUB TECHNO, ACID TECHNO, PEAK TIME, BROKEN TECHNO
ELECTRO	ELECTRO FUNK, BASS MACHINE, ROBOT, BREAKDANCE, MIAMI BASS, SPACE ELECTRO, ELECTRO CLASH, BIG BEAT, BREAKBEAT
HIP HOP	BOOM BAP, SOUL BREAKS, GOLDEN ERA, JAZZ LOOP, NEO SOUL, WEST COAST, EAST COAST, BOUNCE, MODERN BOOM BAP

13 KITS, CONTINUED

STYLE	KITS
TRAP	TRAP, DRILL, SUB TRAP, HALF TIME, DARK TRAP, MELODIC TRAP, PHONK, HARD TRAP, JERSEY CLUB
LOFI	TAPE ROOM, CASSETTE, DUSTY SAMPLER, BEDROOM, LATE NIGHT, JAZZ BRUSHES, BROKEN RADIO, BOOM BOX, SUNDAY MORNING
EXPERIMENTAL	METAL WORKS, ZAP KIT, BENT CIRCUIT, GLASS PERCUSSION, CIRCUIT BUGS, WATER DROPS, FM LABORATORY, GLITCH MACHINE, SONAR
DRUM AND BASS	LIQUID, JUNGLE, NEUROFUNK, ROLLER, JUMP UP, HALF STEP, ATMOSPHERIC, TECH STEP, RAGGA JUNGLE
SYNTHWAVE	OUTRUN, NIGHT DRIVE, GATED ARENA, NEON CITY, DARK SYNTH, CHROME, SUNSET, ARCADE, VAPOR
AFRO LATIN	AFRO HOUSE, TRIBAL DRUMS, CONGA SESSION, DEMBOW, TWELVE EIGHT BELL, DESERT PERCUSSION, BONGO GROOVE, STEEL AND WOOD, AMAPIANO

AFRO LATIN gives the pads other parts to play. The rim becomes a clave, a bell or a woodblock, the snare a slap, the closed hat a shaker and the toms congas, bongos or a log drum. The shaker and the open hat are two instruments there, so their choke group is off and one does not cut the other. TWELVE EIGHT BELL, DESERT PERCUSSION and STEEL AND WOOD run the sequencer at 1/8 TRIPLET over twelve steps – a bar of twelve-eight.

Every style has its own patterns, and the kits added in version 1.0.1 bring new ones rather than repeating the first four kits of their style: DRUM AND BASS in two-step, broken and half-step forms, SYNTHWAVE with its big backbeat and tom fills, AFRO LATIN with the three-two clave, the twelve-eight bell and the dembow.

14 PARAMETERS

238 parameters: twenty-eight for each of the eight pads, and fourteen for the whole instrument. The host names them by pad – Kick Pitch Sweep, Closed Hat Noise Decay. The default shown is the KICK's; each pad has its own, and together they are the INIT kit.

PAD CONTROL	RANGE	DEFAULT	WHAT IT DOES
WAVE	four shapes	SINE	Shape of the tone
PITCH	20 Hz to 2 kHz	48.0 Hz	Where the tone settles
SWEEP	off to +48 semitones	+24.0	How far above PITCH the tone starts
SWEEP TIME	1 to 500 ms	40.0 ms	Until five percent of the sweep is left
ATTACK	0 to 100 ms	0.00 ms	Rise of the tone
DECAY (tone)	10 ms to 4 s	520.0 ms	Time for the tone to fall 60 dB
FM	0 to 100 %	0 %	Frequency modulation depth
FM RATIO	0.25 to 16.00 : 1	2.00 : 1	Modulator pitch against the tone
LEVEL (tone)	0 to 100 %	100 %	How much tone
TYPE	WHITE / METAL	WHITE	Plain noise, or six tuned square waves
FILTER	LOW / BAND / HIGH PASS	LOW PASS	Noise filter, twelve decibels per octave
FREQUENCY	100 Hz to 18 kHz	3.00 kHz	Where the noise filter sits
RESONANCE	0 to 100 %	0 %	Ring at the filter frequency
SWEEP (noise)	-6 to +6 octaves	OFF	Where the filter starts
SWEEP TIME (noise)	1 ms to 2 s	50.0 ms	How long it takes to arrive
DECAY (noise)	5 ms to 4 s	40.0 ms	Time for the noise to fall 60 dB
BURSTS	1 to 4	1 BURST	Short bursts ten milliseconds apart first
WIDTH	0 to 100 %	0 %	Right channel gets its own noise
LEVEL (noise)	0 to 100 %	0 %	How much noise
CLICK	0 to 100 %	30 %	Unfiltered tick at the start
DRIVE	0 to 100 %	40 %	Saturation; full scale stays full scale
VARIATION	0 to 100 %	0 %	Every hit a little different
ROOM	0 to 100 %	0 %	Send to the room
LEVEL (output)	-48 to +6 dB	0.0 dB	The pad's level
PAN	L 100 to R 100	CENTRE	Constant power

PAD CONTROL	RANGE	DEFAULT	WHAT IT DOES
CHOKE	OFF, GROUP 1 to 4	OFF	Pads in a group cut each other
OUTPUT	MAIN, OUTPUT 2 to 8	MAIN	Where the pad plays
MUTE	off / on	off	Takes no hits

Fourteen more act on the whole instrument:

INSTRUMENT	RANGE	DEFAULT	WHAT IT DOES
MASTER	off (-60) to +6 dB	-4.5 dB	Level of every output
VELOCITY	0 to 100 %	60 %	How much velocity sets the level
DRIVE (bus)	0 to 100 %	0 %	Saturation on MAIN
COMPRESS	0 to 100 %	0 %	Glue compression on MAIN
SIZE	0 to 100 %	50 %	Room size
DECAY (room)	0.20 to 8.00 s	1.20 s	Room time to fall 60 dB
tone	0 to 100 %	60 %	How bright the room stays
LEVEL (room)	off (-60) to +6 dB	0.0 dB	Room return
FOLLOW HOST	off / on	off	Sequencer plays with the host
PATTERN	A / B / C / D	A	Which pattern plays
RATE	1/8 to 1/16 TRIPLET	1/16	Length of a step
SWING	0 to 100 %	0 %	Delay of every second step
STEPS	1 to 16	16 STEPS	Pattern length
TEMPO	40 to 240	120.0	Beats per minute for PLAY

15 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.

PITCH	Tones from 30 Hz to 1999 Hz, from their zero crossings: the largest error is 0.00012 cents.
SWEEP	The measured pitch curve of a sweeping tone stays within 0.011 semitones of the formula.
DECAY	A tone DECAY of 300 ms measures 300.00 ms to 60 dB down; a noise DECAY of 200 ms measures 201.31 ms.
THE END OF A HIT	A 500 ms hit writes its last sample at 500.021 ms; after that the output is exact zero.
ANY BUFFER SIZE	Buffers of 1, 64 and 1024 samples and a size that changes every block, against 512: difference zero.
EVERY RUN	The same MIDI twice: difference zero, so a bounce is what you heard. Two snares in a row still differ.
ALIASING	At 4.5 kHz, below 16 kHz: TRIANGLE 102.6, SQUARE 73.6, SAW 72.6 dB under the sound; METAL at least 59.8 dB.
FILTER	RESONANCE at 100 percent lifts the peak 24.5 dB; WIDTH at 100 percent: left and right correlate 0.004.
VARIATION	At 100 percent the largest pitch change measured is 49.2 cents; at 0 every hit is identical.
ROOM	DECAY 0.5, 1.2 and 3.0 s measure 0.49, 1.15 and 2.81 s in the middle band; idle, it returns exact zero.
SEQUENCER	Its hits, with and without swing, at seven buffer layouts: identical to the same notes from MIDI, sample for sample.
OUTPUTS	A pad on an extra output is bit for bit what it is on MAIN; a closed output falls back to MAIN exactly.
CHOKE	Three milliseconds after a pad in the same group, the choked pad contributes exactly zero.
VELOCITY, PAN	Velocity 64 at 100 percent: 11.905 dB below 127 (the formula says 11.905). Centre pan 3.010 dB down.
TEXT	Every value typed into a control reads back as the value the plugin writes: none lost.
PROCESSOR	On an Apple silicon Mac, all one hundred kits, each of their four patterns on the kit's own clock: median 0.71 percent of one core, the heaviest 3.6 (METAL WORKS); sixteen voices with every feature at once, 9.9 percent. Zero latency.

16 STARTING POINTS

Hear a kit first. Load a kit and press PLAY: every kit brings four patterns. Step through A to D to hear the groove, the variation, the fill and the breakdown, then turn FOLLOW HOST on and the pattern plays with your session.

A longer, deeper kick. Select KICK. Bring PITCH down to about 40 Hz, SWEEP up to 36 semitones and the tone DECAY out to a second. Watch the one-shot view stretch. Add DRIVE until the tail sits forward.

A clap from the snare. Select SNARE, turn the tone LEVEL to zero, set the FILTER to BAND PASS near 1.2 kHz, BURSTS to 4, the noise DECAY to about 300 ms and a little WIDTH and ROOM.

A bell from a tom. Select HIGH TOM, SWEEP off, PITCH near 440 Hz, FM at 50 percent with an FM RATIO of 3.5 and a DECAY of a second. Send some of it to the ROOM.

A laser. Any pad: SAW, a large SWEEP over 100 ms, then a noise SWEEP of -3 octaves with plenty of RESONANCE.

Hands, not a machine. VARIATION around 20 percent on the hats and snare, VELOCITY near 100 percent and a little SWING: the same pattern stops sounding programmed.

Mixing in the DAW. Load ARDRUM with its extra outputs, send KICK and SNARE to OUTPUT 2 and OUTPUT 3, and give them their own channel strips; the rest of the kit stays on MAIN with the bus.

17 SUPPORT

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.

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