SwarmaDie 2 — User Manual

Plugin Version 1.0 — Developed by Diego Capoccitti

*A faithful (**unofficial**) software emulation of the Dewanatron Swarmatron synthesizer*

Table of Contents

1. Introduction

SwarmaDie 2 is a meticulous software emulation of the Dewanatron Swarmatron — a rare, hand-built analog synthesizer known for its organic, swarming, cluster-based sound. The Swarmatron was famously used by Jonny Greenwood of Radiohead or Trent Reznor of Nine Inch Nails, and has appeared on countless film scores and experimental recordings.

The core concept is simple and radical: eight independent oscillators all tuned approximately to the same pitch, slightly offset from each other. A second ribbon controller — the swarm ribbon — can "pull" these oscillators apart like taffy, spreading them from a tight unison cluster into a wide chord of equidistant pitches spanning the entire audio spectrum.

SwarmaDie 2 replicates not only the visual aesthetic of the original hardware but, more importantly, the functional logic behind every knob and switch. All controls behave as close as possible to their hardware counterparts. Additionally, the plugin introduces full MIDI compatibility for modern DAW workflows, while preserving the ribbon-based playing style of the original instrument.

> ***SwarmaDie 2 is an independent software emulation and is not affiliated with, endorsed by, or sponsored by Dewanatron or its creators.***

2. Installation & Activation

Installation

Run the installer for your operating system (macOS .pkg or Windows .exe) and follow the on-screen instructions. The plugin will be installed in the standard directories for your supported formats:

- macOS: VST3 and AU
- Windows: VST3

Activation

Upon loading the plugin in your DAW for the first time, you will be prompted to enter your unique 16-character license key received via email after purchase. Paste the code into the designated field and click Activate. An active internet connection is required only for this initial activation step. Once activated, **SwarmaDie 2** will function entirely offline.

3. Quick Start

You will make sound in under 2 minutes.

Step 1 — Power on

Find the Power toggle (top-right area) and switch it on.

Step 2 — Connect a MIDI keyboard (or use your DAW's piano roll)

SwarmaDie 2 responds to MIDI notes. Make sure the A button (bottom-right) is lit (on). This enables MIDI + ribbon playback.

Step 3 — Play a note

Press any key. If you hear silence, check: Power is on; V (Volume) is turned up; at least one of the 8 voice buttons (1–8) is lit — turn them all on for the fullest sound.

Step 4 — The two ribbons

The top wide ribbon (Pitch Ribbon) sweeps pitch left/right. The bottom ribbon (Swarm Ribbon) spreads the 8 oscillators apart. Start the Swarm Ribbon at the leftmost position and drag slowly right — you will hear the cluster spread apart.

Step 5 — The X switch

With X up (default): Swarm Ribbon controls swarm spread, F/SW knob controls filter cutoff. With X down: they swap. Start with X up.

Step 6 — Saw or Sin

The Saw/Sin toggle (bottom-left) selects the waveform. Saw (default) is bright and buzzy. Sin is pure and smooth.

Step 7 — Trigger modes (A and B buttons)

A=ON, B=OFF (default): ribbon or MIDI triggers notes. A=OFF, B=OFF: ribbon only. A=OFF, B=ON: latch mode — note holds until you press I. A=ON, B=ON: MIDI only.

Classic Swarmatron Drone — Quick Recipe

- Power on, all 8 voices on, Saw waveform
- Play and hold a low note (e.g. C2)
- X switch up
- Drag the Swarm Ribbon slowly from left to right → oscillators spread apart
- Turn Q up to ~60% for resonance
- Drag the ribbon back left → cluster returns to unison

4. Interface Overview

SwarmaDie 2 presents all controls on a single front panel, faithfully reproducing the layout of the original Dewanatron Swarmatron hardware.

The top row contains the Oscillator Bank (voice on/off buttons), the Filter Tracking controls, and the global switches (Cluster Preset, X, Swarm Range, Power). The middle row contains all the continuous knobs: filter and pitch parameters on either side of the ADSR envelope. The bottom section contains the two ribbon controllers and the trigger select buttons (A, B) and Interrupt (I).

5. Control Reference

All control numbers in parentheses refer to the corresponding numbered control on the original Swarmatron hardware panel.

5.1 Power & Master Volume

Power On/Off (#15)

Parameter	Value
Type	Toggle switch
Default	On

Turns the entire plugin on or off. When off, no audio is produced regardless of any other settings.

V — Volume (#1)

Parameter	Value
Type	Knob
Range	−72 dB to +12 dB
Default	0 dB

Master output volume. Setting it too high combined with high Q and Drive values can produce very loud momentary peaks — use with care, especially at high resonance settings.

5.2 Oscillator Bank — The Swarm

Voices 1–8 (#3)

Parameter	Value
Type	8 toggle buttons
Default	All on

Each button enables or disables one of the eight oscillators. The remaining active voices are automatically re-normalized so that the total output level stays consistent regardless of how many voices are active.

Tips:

- Turning off voices creates asymmetric clusters — e.g., voices 1, 3, 5, 7 only give a sparser, more airy texture.
- Reducing to 2–3 voices is great for creating subtle beating effects.
- Each voice has a unique, small pitch offset from the others (a few hundredths of a semitone), so even in perfect unison you get a natural, chorus-like thickening.

Saw/Sin (#23)

Parameter	Value
Type	Toggle switch
Default	Saw (on)

Selects the waveform for all eight oscillators simultaneously:

- Saw — A sawtooth wave: rich in harmonics, bright and buzzy, ideal for dense string-like textures and aggressive filter sweeps. This is the classic Swarmatron sound.
- Sin — A pure sine wave: no harmonics, smooth and pure. Produces deeply hypnotic drones and sub-frequency rumbles. Works beautifully at very low pitch settings.

  Technical note: Both waveforms include a subtle analog drift simulation. Each oscillator's pitch wanders by up to ±5 cents, updating approximately every 1.4 ms. This mimics the natural instability of real analog VCOs and is what gives the Swarmatron its "living" quality — even a static note always breathes slightly. Additionally, each oscillator passes through a gentle soft saturation stage, adding warmth before the voices are summed.

5.3 Cluster Preset (C) (#6)

Parameter	Value
Type	Stepped knob (0–5)
Default	0 (ribbon control)

Replaces the continuously variable swarm spread with one of four fixed harmonic intervals. At position 0 (fully counterclockwise), the spread is controlled by the Swarm Ribbon or F/SW knob as normal. The actual interval depends also on the Swarm Range (R) knob.

Position	Spread (R = max)	Approximate Interval
0	Ribbon/F·SW controlled	— (free)
1	~4 semitones	Major third
2	~7 semitones	Perfect fifth
3	~9 semitones	Major sixth
4	~12 semitones	Octave
5	~16 semitones	Octave + major third

5.4 Pitch Section

F — Pitch Floor (#16)

Parameter	Value
Type	Knob
Range	−50 to +50 semitones
Default	+20 semitones

Sets the base pitch offset added to the incoming MIDI note. The Pitch Ribbon then sweeps upward from this floor.

Practical formula: *Final pitch = MIDI note + Pitch Floor + (Pitch Range × Ribbon position)*

- +20 (default): The base pitch is raised by 20 semitones above the MIDI note.
- 0: The ribbon starts exactly at the played MIDI note.
- Negative values: lower the base pitch below the MIDI note — useful for sub-bass drones.

  In the original hardware the pitch floor was an absolute frequency independent of MIDI. In SwarmaDie 2 it is always relative to the incoming MIDI note, which makes it more practical for DAW use. In ribbon-only mode (A=OFF, B=OFF), MIDI note 0 is assumed.

R — Pitch Range (#21)

Parameter	Value
Type	Stepped knob (0–5)
Default	2 (3 octaves)

Position	Range
0	1 octave (12 semitones)
1	2 octaves (24 semitones)
2	3 octaves (36 semitones) — default
3	4 octaves (48 semitones)
4	5 octaves (60 semitones)
5	6 octaves (72 semitones)

Pitch Ribbon (#22)

Parameter	Value
Type	Horizontal slider (0–1)
Default	0 (leftmost)

The top wide ribbon controller. Click and drag horizontally to sweep the pitch of all eight oscillators in real time. Small back-and-forth motion creates vibrato. In A=1, B=0 or A=0, B=0 mode, clicking the ribbon also triggers the envelope (acts as a gate).

> *Tip: Use the ribbon for portamento glissandos by smoothly dragging from one position to another while a note is held. The ribbon value is fully automatable.*

5.5 Filter Section

SwarmaDie 2 uses a 24 dB/octave Ladder filter — a topology made famous by the Moog synthesizer — known for its warm, thick character and self-oscillation capability at high resonance. Additional low-pass shaping and a subtle bass-boost stage add warmth and body to the filtered sound.

F — Filter Frequency Floor (#10)

Parameter	Value
Type	Knob
Range	0–127 (MIDI note scale, approx. 8 Hz – 12.5 kHz)
Default	72 (C5, ≈523 Hz)

Sets the minimum cutoff frequency of the low-pass filter. The filter can be swept upward from this floor by the F/SW knob, the envelope (N), and key tracking (T / +/−), but it cannot go below this value.

- Low values (0–30): filter floor is below the audio range. Deep, dark timbres or complete silence if other parameters are also low.
- Middle values (60–80): good starting range for expressive filter sweeps.
- High values (100–127): filter mostly open — filter effect becomes subtle.

  Warning: Setting this all the way down (0) with a flat envelope will result in complete silence, as the filter cuts the entire audio spectrum.

Q — Filter Resonance (#11)

Parameter	Value
Type	Knob
Range	0–0.98
Default	0.5

Controls the filter's resonance — the emphasis of frequencies around the cutoff point. Higher values create a sharper, more nasal, "liquid" sound. As Q approaches its maximum, the filter approaches self-oscillation, generating a strong tonal ringing at the cutoff frequency.

Range	Character
0–0.3	Gentle filtering, no audible resonance peak
0.3–0.6	Classic filter sweep character
0.6–0.9	Strong resonance, begins to sing
0.9–0.98	Near self-oscillation — filter generates its own pitch

F/SW — Filter/Swarm Frequency (#12)

Parameter	Value
Type	Knob
Range	0–1
Default	0.5

A dual-function knob whose behavior depends on the X switch position:

- X up (default): F/SW controls the filter cutoff, sweeping it upward from the Filter Floor by up to 4 octaves (48 semitones).
- X down: F/SW controls the swarm spread, functioning identically to the Swarm Ribbon.

N — Filter Envelope (#13)

Parameter	Value
Type	Bipolar knob
Range	−1 to +1
Default	0 (center, no effect)

Controls how much the ADSR envelope modulates the filter cutoff (or swarm spread when X is down). This is a bipolar control:

- Center (0): the envelope has no effect on the filter.
- Clockwise (+1): maximum positive envelope influence — filter opens on attack, closes on release. Classic "wah" or "pluck" character.
- Counterclockwise (−1): maximum negative — filter starts open and closes during the note, then reopens during release.

D — Filter Drive (#14)

Parameter	Value
Type	Knob
Range	1–10
Default	3

Adjusts the amount of overdrive fed into the Ladder filter, yielding complex harmonic distortion and chaotic waveforms — especially at higher Q settings.

> **Warning:** Near-maximum Q and Drive together can temporarily silence the filter as it saturates and recovers. This can take up to several seconds. Reduce one of the two values to recover.

T — Filter Tracking On/Off (#4)

Parameter	Value
Type	Toggle switch
Default	On

When enabled, the filter cutoff tracks the pitch of the played note, keeping the tonal character consistent across different octaves.

+/− Filter Tracking Amount (#5)

Parameter	Value
Type	Bipolar knob
Range	−1 to +1
Default	0

Controls the direction and intensity of pitch-to-filter tracking. Only active when T is on.

- +1 (fully clockwise): as pitch rises, filter cutoff rises proportionally.
- −1 (fully counterclockwise): as pitch rises, filter cutoff falls.

5.6 The X Switch — Crossing Filter and Swarm (#7)

Parameter	Value
Type	Toggle switch
Default	Up (X=1)

This is one of the most important controls on the instrument. The X switch crosses the routing of the Swarm Ribbon and the F/SW knob, swapping what each one controls.

X Up (default):

Control	Controls
Swarm Ribbon	Swarm spread
F/SW knob	Filter cutoff
Envelope (N)	Modulates filter cutoff
Tracking (T/+/−)	Modulates filter cutoff

X Down:

Control	Controls
Swarm Ribbon	Filter cutoff
F/SW knob	Swarm spread
Envelope (N)	Modulates swarm spread
Tracking (T/+/−)	Modulates swarm spread

The Filter Floor still sets the minimum cutoff frequency regardless of X position.

> **Warning:** Playing with X in the down position can often result in the filter cutoff falling below the audio range, especially if the Swarm Ribbon is at the leftmost position (value = 0). Make sure the Filter Floor is high enough to keep the filter audible, or use the ribbon to sweep it open.

5.7 Swarm Ribbon & Swarm Range (#25, #8)

Swarm Ribbon (#25)

Parameter	Value
Type	Horizontal slider (0–1)
Default	0 (leftmost)

The lower ribbon controller. With X up: controls swarm spread from tight unison (left) to maximum spread (right). With X down: controls filter cutoff, sweeping it from the floor upward.

The spread is equidistant: voices are spaced evenly across the total spread, with voice 1 at the base pitch and voice 8 at the maximum spread. At full swarm range and full ribbon, the voices span approximately 7 semitones (a perfect fifth) from first to last.

R — Swarm Control Range (#8)

Parameter	Value
Type	Knob
Range	0–1
Default	0.5

Scales the maximum range of the Swarm Ribbon:

- 0: no spread at any ribbon position — all voices stay in perfect unison.
- 0.5 (default): medium range — voices spread to approximately half the maximum (about 3.5 semitones at full ribbon).
- 1 (fully clockwise): maximum range — voices can spread up to a full 7 semitones at full ribbon.

5.8 ADSR Envelope (#17–20)

The ADSR envelope controls the amplitude of the sound (and optionally the filter cutoff via the N knob). It is triggered by pressing the Pitch Ribbon, playing a MIDI note, or both, depending on the A/B switch settings.

Control	Label	Range	Default	Description
#17	A — Attack	0–5 s	0.5 s	Fade-in time from silence to full volume
#18	D — Decay	0–5 s	0.5 s	Time to fall from peak to Sustain level
#19	S — Sustain	0–1	0.8	Volume level held while note is active
#20	R — Release	0–5 s	0.5 s	Fade-out time after note is released

> **Warning:** If A, D, S, and R are all set to 0, the envelope produces nothing more than a click. Set Sustain above 0 or increase Attack to hear a continuous tone.

5.9 Trigger Select Switches (A, B, I) (#26, #2)

These controls determine what triggers the volume envelope. In SwarmaDie 2, the Pitch Ribbon is the equivalent of the hardware ribbon trigger, and MIDI notes (from keyboard or DAW piano roll) are the equivalent of the hardware external trigger input.

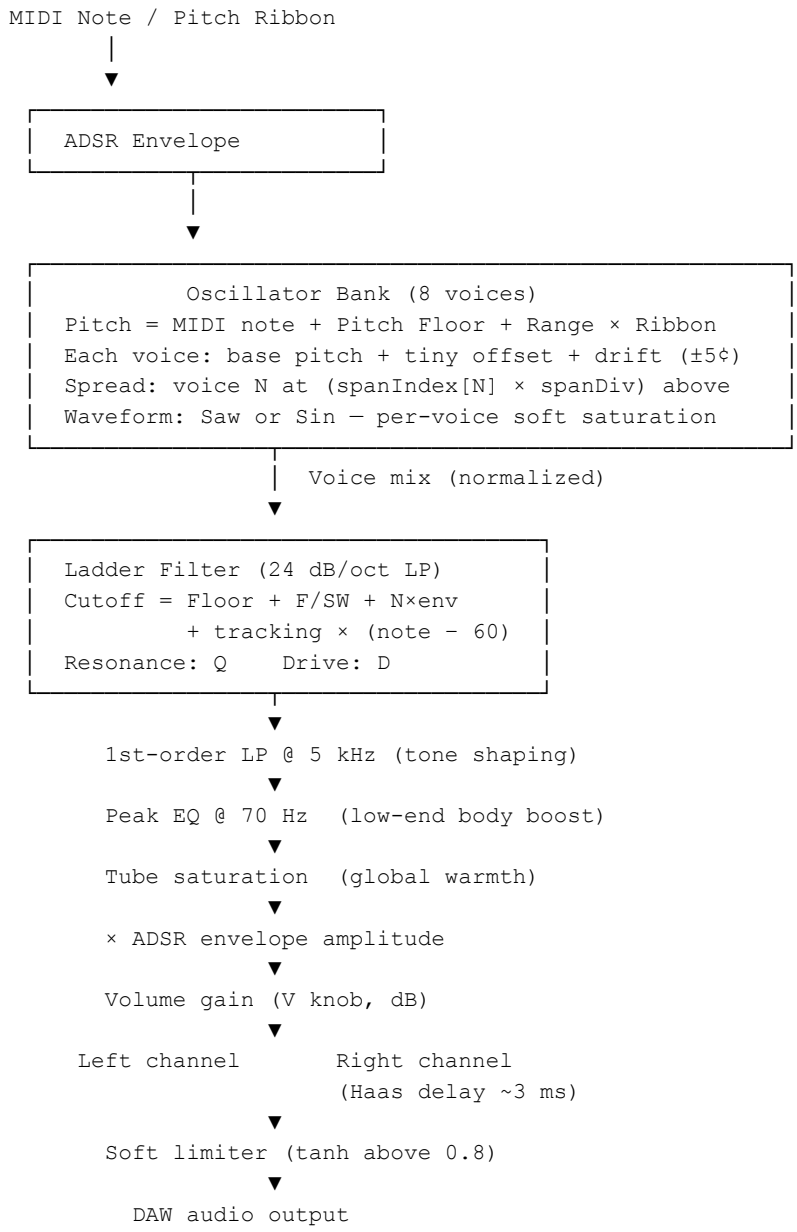
A	B	Behavior
ON	OFF	Normal (default) — both Pitch Ribbon and MIDI trigger notes independently
OFF	OFF	Ribbon only — MIDI messages ignored; only clicking the Pitch Ribbon triggers sound
OFF	ON	Latch + Both required — MIDI noteOn only accepted when Pitch Ribbon is also held; note latches indefinitely until released by the I button
ON	ON	MIDI only — Pitch Ribbon does not trigger notes (still controls pitch); only MIDI input triggers sound

I — Interrupt (#2)

Forces an immediate note-off, releasing any latched note. Particularly useful in Latch mode (A=OFF, B=ON), where notes would otherwise hold indefinitely. Pressing I sends the envelope into its Release stage.

6. Signal Chain

Understanding the internal signal path helps you get the most out of SwarmaDie 2. The following shows the order of processing from MIDI input to audio output:



Haas stereo effect: the right output channel is delayed by approximately 3 ms relative to the left. This creates a natural, spacious stereo image without altering the timbre or introducing comb filtering artifacts.

7. Automation & MIDI

SwarmaDie 2 fully supports DAW automation and MIDI control.

DAW Automation

Every knob, switch, and ribbon is an automatable parameter. You can draw automation curves for any control — including the ribbons — to create evolving performances over time. This is especially powerful for:

- Slow ribbon sweeps over many bars
- Gradual swarm spread automation for building tension
- Filter Floor automation to change the tonal center of a piece

MIDI Learn

SwarmaDie 2 supports standard MIDI Learn functionality. Consult your DAW's manual for specific MIDI CC mapping instructions. The ribbons, knobs, and switches can all be mapped to physical faders and buttons on a MIDI controller.

Preset Management

SwarmaDie 2 includes a preset browser at the top of the interface. Use the combo box to save, load, and organize presets into folders. A "*" indicator appears when you have unsaved changes to the current preset.

8. Presets & Iconic Sound Recipes

Recipe 1 — Classic Swarmatron String Swarm

The signature sound: a dense, organic, slowly evolving cluster.

Parameter	Value
Voices	All 8 on
Waveform	Saw
Pitch Floor	0
Pitch Range	1 (2 octaves)
Swarm Range (R)	0.7
X switch	Up
Filter Floor (F)	60
Q	0.4
F/SW	0.6
N (envelope)	+0.3
Drive	3
A / D / S / R	0.3 s / 0.5 s / 0.9 / 1.5 s

> *Play a note and slowly drag the Swarm Ribbon from left to right. The cluster of 8 oscillators separates into a shimmering, pulsing chord.*

Recipe 2 — Cinematic Drone (Radiohead style)

A long, thick, slowly evolving texture.

Parameter	Value
Voices	All 8 on
Waveform	Saw
Pitch Floor	−12
Pitch Range	2 (3 octaves)
Swarm Range (R)	0.5
X switch	Down (swarm ribbon = filter)
Filter Floor (F)	30
Q	0.65
F/SW	0.4 (sets swarm spread with X down)
N	+0.5
Drive	5
A / D / S / R	2 s / 1 s / 0.8 / 3 s

Hold a low note (C1–C2). The filter slowly opens as the note attacks. Drag the Swarm Ribbon right to sweep the filter higher — the sound opens and brightens dramatically.

Recipe 3 — Insect Swarm / Organic Texture

The buzzing sound that gives the instrument its name.

Parameter	Value
Voices	5–8 on, 1–4 off
Waveform	Saw
Pitch Floor	+10
Pitch Range	0 (1 octave)
Cluster Preset (C)	2 (fifth)
Swarm Range (R)	0.8
X switch	Up
Filter Floor (F)	50
Q	0.75
N	−0.4 (filter closes on attack)
Drive	7
A / D / S / R	0.05 s / 0.3 s / 0.6 / 0.2 s

Play rapid staccato notes. High drive + high Q + asymmetric voices creates an unpredictable, buzzing, insect-like texture.

Recipe 4 — Sub-Bass Pure Sine Drone

Eight sine waves in near-unison: a massive, pulsating sub-bass drone.

Parameter	Value
Voices	All 8 on
Waveform	Sin
Pitch Floor	−24
Pitch Range	1 (2 octaves)
Swarm Range (R)	0.2
X switch	Up
Filter Floor (F)	90 (filter fully open)
Q	0.1
F/SW	1.0
N / Drive	0 / 1
A / D / S / R	3 s / 0.5 s / 1.0 / 4 s

> *Play a low note (C1 or lower). Increase swarm spread slowly for a deep, meditative cluster. The almost-unison beating creates a hypnotic, pulsating quality.*

Recipe 5 — Cluster Chord Stabs

Percussive atonal hits voiced across a full octave.

Parameter	Value
Voices	All 8 on
Waveform	Saw
Cluster Preset (C)	4 (octave)
Swarm Range (R)	1.0
X switch	Up
Filter Floor (F)	70
Q	0.55
F/SW	0.7
N	+0.6
Drive	4
A / D / S / R	0.01 s / 0.4 s / 0.0 / 0.8 s

> *Short staccato notes produce percussive cluster stabs, each voiced across a full octave with the filter punching open on every attack.*

Recipe 6 — Self-Oscillating Filter Tone

The Ladder filter self-oscillates, generating its own pitched tone.

Parameter	Value
Voices	Any (sound comes from filter)
Waveform	Sin
Swarm Range (R)	0 (unison)
Filter Floor (F)	48
Q	0.95–0.98
F/SW	0–1 (varies the oscillation pitch)
N / Drive	0 / 2

> *At near-maximum Q, the Ladder filter self-oscillates. The F/SW knob controls the pitch of this tone. Use the pitch ribbon to play it melodically. Warning: self-oscillation produces very high output levels — keep V low.*

9. Troubleshooting — Unexpected Silence

Because SwarmaDie 2 covers the entire audio spectrum — including sub-audio and ultra-high frequencies — there are several parameter combinations that can result in no audible output. Here are the most common causes:

1. **Pitch out of audio range**
   Check the Pitch Floor (F) value. If very high (above +40) with minimal swarm spread, all oscillators may be above the audible range (~20 kHz). Similarly, very low values push the pitch sub-audio, producing intermittent clicks or silence.
2. **Filter cutoff below audio range**
   Check the Filter Floor (F) in the filter section. If set to 0 with a flat envelope and no F/SW contribution, the Ladder filter will cut the entire audio spectrum. Raise the Filter Floor to at least 30–40 to restore sound.
3. **Filter Drive and Q too high together**
   Near-maximum Q and high Drive can temporarily saturate and silence the filter until it resets — this can take several seconds. Reduce one of the two values.
4. **Filter cutoff and Q both extreme**
   Extremely high filter cutoff combined with extremely high Q can also result in silence. Reduce Q or lower the Filter Floor.
5. **X switch down with Swarm Ribbon at minimum**
   With X down, the Swarm Ribbon controls the filter cutoff. If the ribbon is at the leftmost position (value = 0) and the Filter Floor is low, the filter is closed. Move the Swarm Ribbon to the right, or raise the Filter Floor.
6. **ADSR all at zero**
   If A, D, S, and R are all 0, the envelope produces only a click. Increase Sustain above 0 or increase Attack.
7. **Trigger select switch settings**
   A=OFF, B=ON: MIDI noteOn is blocked unless the Pitch Ribbon is also being pressed. A=OFF, B=OFF: MIDI is completely ignored; only the ribbon triggers notes. A=ON, B=ON: the Pitch Ribbon does not trigger notes; only MIDI works.
8. **Plugin not activated**
   If the license is not valid, SwarmaDie 2 will produce no output. Ensure your license key has been entered correctly and activation was successful.

10. Support

For technical support, licensing questions, bug reports, or additional information, please visit:

www.diegocapoccitti.it

When reporting a bug, please include your DAW name and version, operating system, and plugin format (VST3 / AU).