WMD — Skorpion

- Manual PDF

Manual PDF

WMD Skorpion — Cheat Sheet

What it is

A **stereo wavefolder / waveform processor** built around a “vector core.” Instead of simply clipping/amplifying, Skorpion analyzes the **IN** signal against **8 threshold comparators** and reverses the vector core direction when thresholds are crossed. Result: highly controllable, animated folding with sequencing, feedback shaping, stereo widening, and lots of self-patching options.

Fast Start

1. Patch audio to **IN**
2. Patch **OUT L** and/or **OUT R** to your mixer
3. Set:
4. **OUTPUT** around noon or below for mostly wet mono-ish folding
5. **FOLD** to taste
6. **SLOPE** up for brighter/more harmonics
7. **SHIFT** at noon for symmetry
8. **TARGET** to **5V** for hard/square-ish folding, or toward **CLIP** / **SLIDERS** for more complex behavior
9. Move the **8 sliders** in default mode to set fold thresholds
10. Experiment with:
11. **SHAPE** + shape source switch

12. **SYNC**
13. **EQUALIZE THLDs**
14. **TARGET ORDER**
15. **OUTPUT FILTERS/DC**

Core Controls

Knobs

FOLD

Amount of wavefolding; effectively amplifies the input against the threshold stack.
- CV controllable via **FOLD CV jack** + attenuverter

SLOPE

Rate of change of the vector core. Higher = faster movement = more harmonic content.
- CV controllable via **SLOPE CV jack** + attenuverter - **1V/OCT** also affects slope for pitch-consistent timbre

SHIFT

Offsets the input signal against the comparators for asymmetry.
- Noon = ~0V shift - Slow modulation can create frequency-shift-like motion - CV controllable via **SHIFT CV jack** + attenuverter

SHAPE

Modulates the slope using selected feedback/modulation source.
- Noon = no feedback - CV controllable via **SHAPE CV jack** + attenuverter

TARGET

Sets vector core destination voltage: - **5V**: static 5V, more square-like - **CLIP**: target follows clip/input waveform - **SLIDERS**: uses 8 target slider voltages as sequenced destinations - CV controllable via **TARGET CV jack**

OUTPUT

Crossfade/width control: - Lower half: **DRY** ↔ **WET** - Upper half: **WET** ↔ **WIDE** - CV controllable via **OUTPUT CV jack** + attenuverter

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Switches / Toggles

EQUALIZE THLDs (3-position)

Forces equal threshold spacing, making it behave more like a classic wavefolder. LED on = equalized. - **ON**: always equalized; jack ignored - **XOR (middle)**: equalized unless jack is high - **JACK**: off unless jack is high

DRY IF NO THLDs

If no thresholds are active, output becomes dry/following input. Useful when heavily modulating FOLD so you still get signal.

SYNC (3-position)

Resets vector core at **IN** zero crossings. - **SOFT**: ramps toward 0V at current slope - **X**: off - **HARD**: fast reset to 0V

OUTPUT SWITCH

- **DC**: direct signal, no output filtering
- **FILTERS**: low end (<240Hz) centered; highs (>240Hz) delayed / widened by mid-side network

TARGET ORDER

How slider targets are selected: - **SEQ**: by count of active thresholds - **TIED**: by most recently crossed threshold

SHAPE SYM switch

For the SHAPE circuit: - **SYM**: symmetric modulation for positive/negative waveform halves - otherwise asymmetrical behavior

TRGT MOD SYM / ASYM

For **TRGT MOD** input: - **SYM**: full-wave rectified; symmetric effect - **ASYM**: passes direct; asymmetric effect

HALT IF TARG=0

If a target slider is at 0, this can halt motion during that segment for square/pause-like segments. Normals to HALT behavior.

Spring Toggle

Multi-function center-off momentary switch next to sliders: - **Center**: threshold editing - **Hold left**: edit **TRGTs** - **Hold right**: after ~1 sec enters **MACRO SETUP** - **Tap right**: toggles Macro Envelope on/off

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Sliders

Default mode: THLDs

The 8 sliders set the **8 threshold voltages** where folds occur.
LED brightness shows threshold voltage.

Hold left: TRGTs

The 8 sliders set the **8 target voltages** used when TARGET points toward **SLIDERS** and/or SHAPE source uses **TRGTs**.

Hold right: MACRO SETUP

With spring toggle held right, sliders control:

1. **Macro Env Attack** — 50ms to 600s
2. **Macro Env Release** — 500ms to 600s
3. **THLD LFO Amount**
4. **THLD LFO Rate** — 0.0016Hz to 6Hz
5. **FOLD normal modulation**
6. **SLOPE normal modulation**
7. **SHIFT normal modulation**
8. **SHAPE normal modulation**

For sliders 5–8: - quick **top→bottom** gesture = **LFO mode** - quick **bottom→top** gesture = **ENV mode**

Modes: - **LFO**: 0.0016Hz to 6Hz, unipolar, amplitude controlled by Macro Envelope - **ENV**: 50ms to 600s envelope, gated by Macro Env gate

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Shape Sources

The SHAPE source rotary switch selects what modulates the slope:

- **IN** — direct input
- **OUT** — output feedback; log/exp-like behavior
- **DELAY** — delayed signal from width circuit
- **COUNT** — staircase count of active thresholds
- **DIFF** — target minus current vector position; harsh/spiky
- **TRGTs** — use target sequencer per-segment
- **DAC** — weighted version of threshold count, subtler than COUNT
- **DIR** — ±5V direction signal

Input Jacks Reference

> From manual specs: - **IN nominal range:** ±5V - **1V/OCT impedance:** 3MΩ - **TRGT MOD impedance:** 20kΩ - **All other CV/Gate inputs:** 220kΩ - Audio/CV inputs support audio-rate modulation unless noted

Audio / Main CV Inputs

IN

Main audio input.
- **Nominal range: ±5V** - **Impedance:** 100kΩ

1V/OCT

Controls slope for note-consistent timbre across pitches.
- **Voltage range:** not explicitly stated; standard 1V/oct CV expected

FOLD CV

CV for Fold amount via attenuverter.
- **Voltage range:** not explicitly stated

SLOPE CV

CV for Slope amount via attenuverter.
- **Voltage range:** not explicitly stated

SHIFT CV

CV for Shift amount via attenuverter.
- **Voltage range:** not explicitly stated

SHAPE CV

CV for Shape amount via attenuverter.
- **Voltage range:** not explicitly stated

TARGET CV

CV for Target control.
- **Voltage range:** not explicitly stated

OUTPUT CV

CV for Dry/Wet/Wide output control.
- **Voltage range:** not explicitly stated

Threshold / Target / Logic Inputs

THLDs/

Weighted global threshold CV input affecting all thresholds: - THLD1 gets CV ÷ 128 - THLD2 gets CV ÷ 64 - THLD3 gets CV ÷ 32 - THLD4 gets CV ÷ 16 - THLD5 gets CV ÷ 8 - THLD6 gets CV ÷ 4 - THLD7 gets CV ÷ 2 - THLD8 gets CV ÷ 1 - **Voltage range:** not explicitly stated

THLD1

Direct CV input for first threshold.
- **Voltage range:** not explicitly stated

EQ THLDs

Controls threshold equalization depending on switch setting.
- High gate enables/disables equalization depending on switch mode - **Voltage range:** not explicitly stated; treat as gate/CV input

TRGTs

Global CV input that modulates all targets simultaneously.
- **Voltage range:** not explicitly stated

TRGT MOD

Directly influences TARGET output; can be symmetrical or asymmetrical.
- **Voltage range:** not explicitly stated - **Impedance:** 20kΩ

CLIP

Overrides the normal clip source (normally IN).
Use another signal to define clipping/overlay target behavior.
- **Voltage range:** not explicitly stated

HALT

Stops vector core movement and holds current voltage. Audio-rate modulatable.
- **Voltage range:** not explicitly stated

MACRO ENV

Gate input for Macro Envelope.
- **Voltage range:** not explicitly stated; gate expected

Output Jacks Reference

> All outputs: **1kΩ impedance**

OUT L

Main left audio output.
- **Voltage range:** not explicitly stated

OUT R

Main right audio output.
- **Voltage range:** not explicitly stated

DELAY

Delayed waveform from the WIDE processing section. - No output if OUTPUT is below noon - Fades in from ~12:00 to 12:30 - Delay increases to ~3:00, then adds slower modulation up to full CW - Delay time spec: - **80µs to 1.8ms** during fade-in region - **8.2ms** by around 2:15 - **max 14.4ms ±3ms** at 2Hz modulation rate - **Voltage range:** not explicitly stated

ABS(IN)

Full-wave rectified version of IN.
- For modulation or patch utility - **Voltage range:** derived from IN; not explicitly stated

G(IN>0)

Gate derived from input polarity: - **0V** when IN < 0V - **+5V** when IN > 0V

TRGTs OUT

Direct output of the target sequencer.
Useful as modulation source or 8-step wavetable-like oscillator control.
- **Voltage range:** not explicitly stated

DIFF

Difference between target voltage and current vector-core voltage.
Always slopes toward 0V; high harmonic content.
- **Voltage range:** not explicitly stated

±G(DIR)

Bipolar direction gate: - **+5V** when vector core rises - **-5V** when vector core falls

COUNT/

Staircase output based on number of active thresholds: - **0V to 4V** - each active threshold adds **0.5V**

DAC

Weighted version of threshold count: - **Full scale: 0V to 4V** - THLD1 = 1/256 FS - THLD2 = 1/128 FS - THLD3 = 1/64 FS - THLD4 = 1/32 FS - THLD5 = 1/16 FS - THLD6 = 1/8 FS - THLD7 = 1/4 FS - THLD8 = 1/2 FS

LEDs / Indicators

Threshold Slider LEDs

Show current slider value in the active context: - THLDs - TRGTs - Macro setup values/modulation state

EQUALIZE THLDs LED

On when thresholds are equalized.

MACRO ENV LED

- **Red**: Macro gate is on
- **Blue**: Macro envelope level fading in/out

Important Voltage / Timing Specs

Explicit ranges from manual

- **IN nominal range: ±5V**
- **G(IN>0): 0V / +5V**
- **±G(DIR): -5V / +5V**
- **COUNT/: 0–4V**
- **DAC: 0–4V**
- **LFO rates: 0.0016Hz to 6Hz**
- **Envelope times: 50ms to 600s**
- **Macro env release: 500ms to 600s**
- **Mid-side crossover: 240Hz**
- **Max slew rate: 0.4V/µs**
- **Delay: 80µs to 14.4ms max** depending on OUTPUT position

Not explicitly specified in the manual

The manual does **not** give exact voltage ranges for these CV inputs/ outputs: - FOLD CV - SLOPE CV - SHIFT CV - SHAPE CV - TARGET CV - OUTPUT CV - THLDs/ - THLD1 - EQ THLDs - TRGTs input - TRGT MOD - CLIP - HALT - MACRO ENV - OUT L / OUT R - TRGTs OUT - DIFF - DELAY output amplitude

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Practical Patch Tips

1. Classic-ish wavefolder

- Enable **EQUALIZE THLDs**
- Set **TARGET** near **5V**
- Use modest **FOLD**

- Keep **SHIFT** near noon
- **SYNC** off or soft

2. Animated stereo timbre

- Set **OUTPUT** above noon toward **WIDE**
- Use **FILTERS** mode
- Patch **DELAY** somewhere else too
- Modulate **SHIFT** or **SHAPE**

3. Sequenced folding

- Hold left and set **TRGT sliders**
- Put **TARGET** toward **SLIDERS**
- Flip **TARGET ORDER** between **SEQ** and **TIED**
- Result: each threshold crossing picks a different destination voltage

4. Aggressive / broken digital-ish tones

- SHAPE source = **DIFF** or **OUT**
- Increase **SLOPE**
- Try **HARD SYNC**
- Use **HALT IF TARG=0**
- Patch **±G(DIR)**, **COUNT/**, or **DAC** back into CV inputs

5. Stable pitched use

- Feed pitch to **1V/OCT**
- Keep **SHIFT** centered
- Use **SYNC** if needed for more repeatable resets
- Use **TARGET = 5V** for more consistent/firm folded shapes

6. “Always audible” setup

- Turn on **DRY IF NO THLDs**
- Good when modulating **FOLD** deeply and folds may disappear

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Workflow Notes

- **Default slider mode** = thresholds
- **Hold left** = edit targets
- **Hold right** = macro setup
- Settings save after **1 minute of inactivity**
- **Macro Env** is always **OFF on power-up**

One-Page Mental Model

- **IN** is analyzed by 8 thresholds
- Each threshold crossing flips vector-core direction
- **FOLD** = how hard input hits thresholds
- **SLOPE** = brightness / speed / harmonic density
- **SHIFT** = asymmetry
- **TARGET** = where the vector wants to go
- **SHAPE** = bends slope using feedback/modulation source
- **OUTPUT** = dry/wet/wide stereo treatment
- Sliders are either:
- thresholds,
- target sequencer,
- or macro modulation setup
