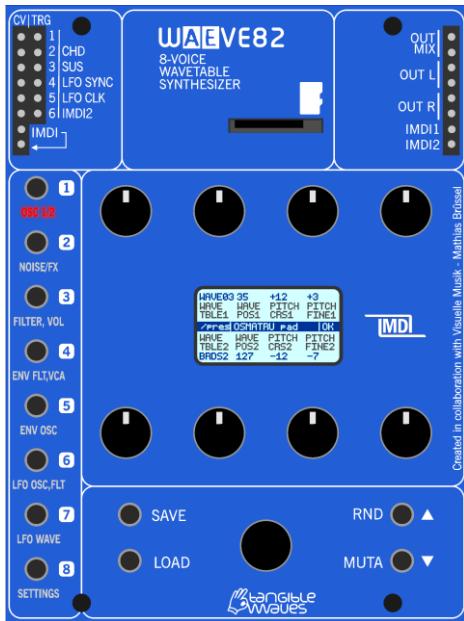




WAEVE82 – Wavetable Synthesizer

Technical & Creative User Manual

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WAEVE82 User Manual

1. Introduction

The WAEVE82 is an eight-voice polyphonic wavetable synthesizer module designed for the AE modular ecosystem.

It combines the unmistakable charm of early digital wavetable instruments with a modern, performance-oriented workflow and a clear, page-based interface that invites exploration.

Its conceptual DNA is inspired by the PPG Wave 2 synthesizers of the 1980s — iconic instruments known for glassy timbres, animated spectra, and futuristic character.

Yet, the WAEVE82 is *not* a clone.

It draws inspiration from that lineage but follows its own path, with a unique audio engine, expanded modulation options, modern randomization tools, and a streamlined interface tailored for the AE modular format.

At its core, WAEVE82 provides:

- **Two independent wavetable oscillators**, with 64 internal wavetables plus support for external tables loaded from microSD.
- **Three envelopes and four LFOs**, each with clearly defined primary and secondary roles.
- An extensive modulation matrix, enabling both traditional and experimental routing.
- Dual operating modes:
- *Edit Mode* for deep sound design
- *Play Mode* for live playability with direct access to favorites
- **A powerful Randomize & Mutate system** that generates entirely new patches or gently transforms sounds while keeping them musical.
- **Full MIDI and CV/Gate integration**, including an eight-voice MIDI engine and flexible chord generation from CV.

1.1 Operating Philosophy

The WAEVE82 was created with a clear idea in mind:

Fast sonic results, minimal friction.

Every control is presented on a simple, page-based interface:

10 pages × 8 parameters each.

No scrolling through long lists, no nested menus, no hidden screens.

- Knobs always show their current values
- Every parameter responds immediately
- Pages are structured so that related controls live together
- Play Mode provides instant, live-friendly access
- The entire randomizer/mutate workflow is optimized for uninterrupted creativity

If you prefer detailed programming, the WAEVE82 gives you precise control across 80 parameters.

If you prefer intuitive discovery, **Randomize** and **Mutate** offer a playground of instant inspiration — with musically curated boundaries that can be switched between PAD, FX, PERCUSSIVE, and RHYTHMIC styles.

Preset names are generated automatically during randomization, drawing from a mix of synthesizer terminology, sci-fi and fantasy fragments, natural imagery, and abstract invented words.

Their purpose is not documentation — it is **inspiration**.

Whether you sculpt sounds or discover them, the WAEVE82 encourages a flow where ideas come quickly, unpredictably, and musically.

2. Interface Overview

The WAEVE82 is designed around clarity, speed, and musical focus. Every control is placed so that essential parameters are never more than one button press and one knob turn away.

2.1 Page Buttons



Eight buttons on the left side select the parameter page currently shown. Each page contains **8 parameters**, arranged to match the physical layout of the 8 knobs (4 above the display, 4 below).

In **Edit Mode**, the Page Buttons select:

- Page 1 – Oscillators
- Page 2 – Noise & Ringmodulator
- Page 3 – Filter & VCA
- Page 4 – Envelopes 1 & 2
- Page 5 – Envelope 3 & Mod Amounts
- Page 6 – LFO 1 & 2
- Page 7 – LFO 3 & 4
- Page 8A → 8B → 8C – System & Modulation Settings (cycled by pressing the same button repeatedly)

In **Play Mode**, these same 8 buttons select your **8 Favourite Presets**, turning the module into a compact performance instrument with instant sound access.

2.2 Display

The color display shows:

- The current **Page Name**
- The **8 parameter labels** (matching the knob positions)
- The numeric or textual values of parameters
- The **center bar**, which displays patch name, current folder and messages

Value Format

- Most parameters show numeric values from **0–127**.
- Bipolar parameters show **–64 ... +63**.
- Menu-based parameters (e.g., Wavetable names, LFO waveforms, Filter type) show **text values**.

In **Play Mode**, the center bar appears in an alternative color, giving a clear visual cue that WAEVE82 is in performance configuration rather than editing mode.

2.3 Knobs

The WAEVE82 uses **eight knobs** corresponding 1:1 to the 8 parameters displayed on each page.

The value shown on the screen always reflects the active state of the patch.

The latest changed parameter is indicated by an underline; and in this case, **the parameter can also be changed by the encoder**, for a more comfortable fine-tune or selection of specific values.

Knob Response Modes

In the menu (**KNOB MODE**), you can choose:

- **DIRECT**
 - Turning a knob immediately changes the parameter to the value corresponding to the knob position.
- **PICKUP**
 - Knob must first “pick up” the displayed value before changes take effect. Different colors indicate if the knob is attached to the parameter or not (yet)
 - Useful for performance situations where you want to avoid sudden value jumps.

These settings affect **all pages** and are global (not per preset).

2.4 Function Buttons

In the bottom section of the module, you find the following Buttons:

- **LOAD** – loading and saving presets to / from SD card
- **SAVE** – saving presets; “quick-save” for randomized presets
- **RND** – randomize complete sounds
- **MUTA** – apply gradual, random changes to the current sound

2.5 The Encoder

The rotary encoder with push function (located below the display) is used for:

- **Scrolling** through the menu
- **Editing** the preset name
- **Selecting items** such as wavetables or folders
- **Changing parameter values** for underlined parameter per page
- Performing **UNDO** and **REDO** during Randomize/Mutate
 - Turn left: return to previous randomized preset
 - Turn right: go to next previous randomized preset

A short press on the encoder button opens the **Main Menu**.

A long press **executes an All Notes Off**, even outside the menu — useful if stuck notes occur due to missing Note Off events.

2.6 Inputs & Outputs

- **CV1 + GATE1**
Standard 1V/oct monophonic control.
Starts Envelope 1 when Gate1 rises.
- **CV2 + GATE2**
Generates chords based on:
 - CV CHRD MODE (Stradella or Scale Mode)
 - CV CHRD SCALE (only needed for adjustment in SCALE Mode)
 - CV CHRD ROOT (only needed for adjustment in SCALE Mode)
 - CV CHRD BASE (Root note for SCALE mode)
- **CV3–CV6**
Four freely assignable CVs via the Modulation Matrix.

- **SUS**
Controls sustain (holding sounding notes when SUS on, until signal SUS changes to off)
- **LFO SYNC**
Resets all LFOs that are running in sync mode.
- **LFO CLK**
Provides clock pulses for synced LFO operation (quarter notes).
- **IMDI IN**
Receives notes and CCs for **8-voice polyphony**, plus full parameter control.
- **IMDI 2**
A secondary input to be used as programmer input (future use)
- **IMDI THRU**
For daisy-chaining and routing MIDI downstream.
- **MIX OUT**
Combined stereo signal mixed into mono.
- **OUT L / OUT R**
Played notes are sent alternating to OUT L / OUT R, this can be used to have some or full spatial separation of (clustered) voices.
- **IMDI OUT 1**
(future use)
- **IMDI OUT 2**
Used for “Dump Preset” (transmits the current patch as a SysEx file).

2.7 microSD Card Slot

The microSD card enables:

- Loading and saving **presets**
- Loading **external wavetables**
- Randomizer/Mutate history

3. Operating Modes

The WAEVE82 has two primary modes that define the behavior of the Page Buttons and display.

3.1 Edit Mode

- Pressing Page Buttons selects one of the parameter pages.
- All 8 knobs edit the 8 parameters shown.
- Randomize and Mutate operate on the current preset.
- Loading and saving presets to/from the inserted micro-SD card (see chapters 7.3 and 7.4 for details).
- Edit Mode is indicated by the **standard center-bar color**.

3.2 Play Mode

Optimized for live situations.

- Page Buttons select **Favourite Presets** instead of parameter pages.
- The display shows **8 key performance parameters** (such as Filter Cutoff, Resonance, Envelope Amounts, LFO Depths).
- You can still change patches live without leaving performance workflow.
- In Play Mode you are still able to save your current edit as a preset, the logic is identical as described above concerning Edit-Mode (again given that an SD-Card is inserted, of course)

Play Mode is indicated by a **distinct center-bar color**, ensuring you always know which mode you are in.

Switching between Edit and Play mode is triggered through the menu (“OPERATION MODE”).

4. Signal Flow

The WAEVE82's architecture might look complex at first glance; but at its core, it is based on two wavetable oscillators, running through a filter. This is accompanied by a lot of modulation capabilities and specialties like noise and ring modulator.

The following diagram shows the main audio path in solid lines and secondary/optional modulation paths in dashed lines. Modulators (LFOs, Envelopes) are represented as rounded boxes.

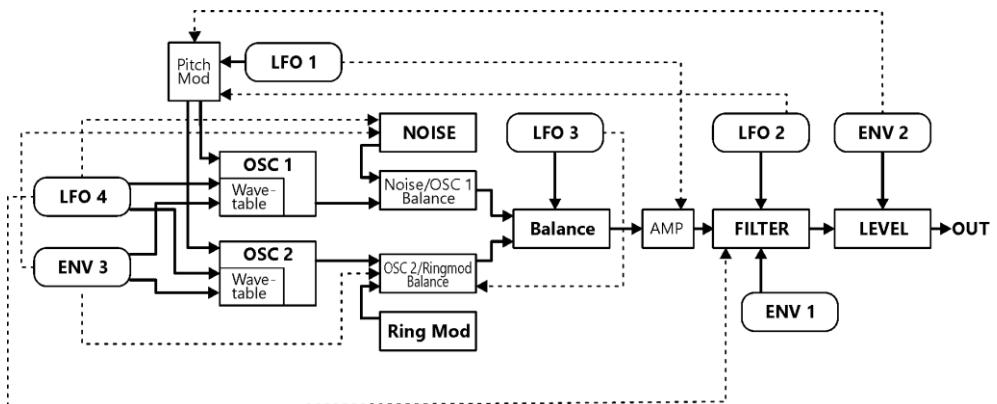


Diagram Interpretation

- **Solid lines**

Represent the *primary* audio and modulation paths, e.g.

- OSC1 & OSC2 → Mixer
- Mixer → Filter
- Filter → VCA → Outputs
- ENV1 → Filter
- ENV2 → VCA
- LFO4 → Filter Cutoff
- ENV3 -> Noise/OSC1 Balance

- **Dashed lines**

Represent *additional* or *secondary* modulation routes, e.g.

- ENV3 / LFO3 → OSC / Ringmodulator Balance
- ENV2 → Pitch modulation
- LFO4 → Noise Color

These modulation paths highlight the expressive flexibility beyond the core architecture.

5. Parameter Pages Overview

The WAEVE82 organizes all sound-shaping controls into **ten parameter pages**, each containing **eight parameters** arranged in two rows corresponding to the groups of 4 physical knobs above and below the display.

This chapter details every page in depth, including parameter ranges, behavior, and sonic purpose.

5.1 Page 1 – Oscillators

WAVE03	35	+12	+3
WAVE	WAVE	PITCH	PITCH
TBLE1	POS1	CRS1	FINE1
/pres	OSMATTRU	Pad	10K
WAVE	WAVE	PITCH	PITCH
TBLE2	POS2	CRS2	FINE2
BRDS2	127	-12	-7

This page contains the most fundamental tone-shaping controls. Oscillator 1 and Oscillator 2 each select a wavetable, define the current wave position within that table, and offer coarse and fine tuning in bipolar ranges.

Together they form the core harmonic content of the sound.

Parameters

#	Parameter	UI Label	MIDI CC
1	Wavetable OSC1	WAVE TBLE	9
2	Wave Position OSC1	WAVE POS1	10
3	Coarse Pitch OSC1 (± 64)	PITCH CRS1	11
4	Fine Pitch OSC1 (± 63)	PITCH FINE1	12
5	Wavetable OSC2	WAVE TBLE2	13
6	Wave Position OSC2	WAVE POS2	14
7	Coarse Pitch OSC2 (± 64)	PITCH CRS2	15
8	Fine Pitch OSC2 (± 63)	PITCH FINE2	16

Behavior & Interaction

Changes take effect immediately.

Wavetable selection and wave-position scanning produce smooth or aggressively shifting spectra depending on modulation.

Coarse and fine pitch controls are bipolar, enabling detuning, interval creation, and wide-ranging harmonic effects.

CONCEPT FOCUS – Wavetable Scanning

Wave-position modulation shifts through the 64 waves that make up each table.

Slow modulation yields evolving textures; fast modulation creates vivid harmonic motion or metallic timbres.

5.2 Page 2 – Noise & Ringmodulator



This page blends noise with OSC1, shapes noise color and controls the dedicated ring modulator acting on OSC2.

Additional controls allow LFO4 and Envelope 3 to modulate noise coloration and noise level, while LFO3 and Envelope 3 shape the ring modulator depth.

Parameters

#	Parameter	UI Label	MIDI CC
9	Noise ↔ OSC1 Balance (±64)	NS-OSC BAL	17
10	Noise Color	NOISE COLOR	18
11	LFO4 → Noise Color	LFO4> NSECLR	19
12	ENV3 → Noise Amount (±64)	ENV3> NOISE	20
13	Ring modulator → OSC2 (dry/wet)	RING> OSC2	21
14	Ring modulator Rate	RING RATE	22
15	LFO3 → Ring modulator Amount	LFO3> RNGAMT	23
16	ENV3 → Ring modulator Amount (±64)	ENV 3 RNGAMT	24

Behavior & Interaction

Noise coloration ranges from dark to bright and adds a certain amount of **grit**.

Ring modulator uses OSC2 and a dedicated internal oscillator. Modulation from LFO3 and Envelope 3 creates dynamic harmonic complexity, and adds another type of grit and “roughness”. Ring modulator Rate responds musically to both slow and extreme settings.

CONCEPT FOCUS – Noise Color

Noise is not merely static broadband sound — shaping its spectrum allows subtle textures or percussive transients. In combination with modulation, it becomes an evolving, expressive layer.

5.3 Page 3 – Filter & VCA



This page controls the filter cutoff, resonance, envelope amount, LFO modulation, overall oscillator volume, oscillator balance, and modulation of these levels.

It is the primary page for crafting dynamics, brightness, articulation, and mix balance.

Parameters

#	Parameter	UI Label	MIDI CC
17	Filter Cutoff	FILTER CUTOFF	33
18	Filter Resonance	RESO NANCE	34
19	ENV1 → Cutoff (± 64)	ENV1 AMT	35
20	LFO4 → Cutoff	LFO4> CUTOFF	36
21	OSC1 + OSC2 Volume	OSC VOL	37
22	OSC1–2 Balance (± 64)	OSC BAL	38
23	LFO3 → OSC Balance	LFO3> OSCBAL	39
24	LFO1 → OSC Volume	LFO1> OSCVOL	40

Behavior & Interaction

Resonance boosts frequencies at the cutoff point for sharper or more vocal timbres.

Envelope 1 shapes plucks, swells, and dynamic sweeps, while LFO4 adds rhythmic or evolving movement.

OSC Balance shifts emphasis between OSC1 and OSC2.

If you're looking for Filter Type — it's on Page 8A.

CONCEPT FOCUS – Filter Modulation

Combining envelope movement with LFO motion creates expressive contour.

Layer slow LFO sweeps over fast envelopes for hybrid, animated textures.

5.4 Page 4 – Envelopes 1 & 2

14	37	95	37
ENV1	ENV1	ENV1	ENV1
ATTCK	DECAY	SUSTN	RELEASES
/pres	OSMATTRU	Pad	10K
ENV2	ENV2	ENV2	ENV2
ATTCK	DECAY	SUSTN	RELEASES
21	40	127	40

Envelope 1 controls the **filter**, **Envelope 2** controls the **amplifier (VCA)**.

Each has a traditional ADSR structure and directly shapes the articulation and phrasing of every sound.

Parameters

#	Parameter	UI Label	MIDI CC
25	ENV1 Attack	ENV1 ATTCK	41
26	ENV1 Decay	ENV1 DECAY	42
27	ENV1 Sustain	ENV1 SUSTN	43
28	ENV1 Release	ENV1 RELEASES	44
29	ENV2 Attack	ENV2 ATTCK	45
30	ENV2 Decay	ENV2 DECAY	46
31	ENV2 Sustain	ENV2 SUSTN	47
32	ENV2 Release	ENV2 RELEASES	48

Behavior & Interaction

Both envelopes use a standard ADSR curve but are tuned for musical response:

- ENV1 focuses on brightness and articulation
- ENV2 shapes volume

Their settings strongly influence perceived dynamics, transients, and rhythmic feel.

5.5 Page 5 – Envelope 3 & Mod Amounts



Envelope 3 primarily modulates **wavetable position** and **Ring modulator depth**, making it a powerful tool for shaping timbral evolution beyond traditional filters and amplitude contours.

The second half of the page contains modulation amounts that route ENV2 and ENV3 into pitch and wavetable position.

Parameters

#	Parameter	UI Label	MIDI CC
33	ENV3 Attack	ENV3 ATTCK	49
34	ENV3 Decay	ENV3 DECAY	50
35	ENV3 Sustain	ENV3 SUSTN	51
36	ENV3 Release	ENV3 RELEAS	52
37	ENV2 → Pitch OSC1 (±64)	ENV2> PITCH1	53
38	ENV2 → Pitch OSC2 (±64)	ENV2> PITCH2	54
39	ENV3 → Wavetable Pos OSC1 (±64)	ENV3> WAVE1	55
40	ENV3 → Wavetable Pos OSC2 (±64)	ENV3> WAVE2	56

Behavior & Interaction

Envelope 3's ADSR curve makes it ideal for:

- shaping wavetable sweeps
- controlling ring modulator timbre
- adding spectral motion independent of filter movement

ENV2 pitch modulation is ideal for expressive pitch bends, percussive sounds with pitch sweeps, or vintage-style detuning envelopes.

5.6 Page 6 – LFO 1 & LFO 2

```

SINE  12   3   3
LFO1  LF01  LF01> LF01>
WAVE  RATE  PITCH1 PITCH2
/pres OSMATRU Pad |OK
LFO2  LF02  LF02> LF02
WAVE  RATE  CUTOFF PITCH
TRIx2 5    13   0

```

Page 6 provides all controls for the first two Low Frequency Oscillators.

LFO1: modulates oscillator pitch independently for OSC1 and OSC2

LFO2: modulates filter cutoff and

global pitch.

Both LFOs support free-running or clock-synced operation, depending on the sync settings on Page 8A.

Parameters

#	Parameter	UI Label	MIDI CC
41	LFO1 Waveform	LFO1 WAVE	66
42	LFO1 Rate (Hz or synced subdivision)	LFO1 RATE	67
43	LFO1 → Pitch OSC1 Mod Depth	LFO1> PITCH1	68
44	LFO1 → Pitch OSC2 Mod Depth	LFO1> PITCH2	69
45	LFO2 Waveform	LFO2 WAVE	70
46	LFO2 Rate	LFO2 RATE	71
47	LFO2 → Filter Cutoff	LFO2> CUTOFF	72
48	LFO2 → Global Pitch	LFO2> PITCH	73

Behavior & Interaction

- **LFO waveforms are:**
TRI (triangle), SINE, SAW↓ (falling sawtooth), SAW↑ (rising sawtooth), SQUARE, RAND (random)
- **Rate ranges:**
All LFO waveforms in slower versions, marked as x2, x3, x4
- **Independent Pitch Modulation (LFO1):**
OSC1 and OSC2 can wobble together or separately, enabling stereo-like movement when combined with panning downstream or OSC detuning.
- **Filter Modulation (LFO2):**
LFO2 is the main rhythmic filter LFO. Synced modes allow precise tempo-locked sweeps.
- **Global Pitch Modulation (LFO2):**
Useful for vibrato-type effects, especially when LFO1 is already used.

CONCEPT FOCUS – LFO Sync & BPM

LFO sync is defined globally via Page 8A.

When a given LFO is set to synced mode, its Rate parameter becomes a tempo subdivision, determined by:

- External MIDI Clock or
- Internal BPM (Page 8A)

If external MIDI clock or trigger input clock is present, the synced LFOs follow this rate, otherwise adapting to the internal BPM setting.

5.7 Page 7 – LFO 3 & LFO 4



These LFOs specialize in *timbre modulation*, particularly wavetable movement and spectral motion:

LFO3: Primary: modulates OSC1/OSC2 wavetable position,
secondary: modulates Ringmodulator depth and OSC balance (see Page 2)

LFO4: Primary: modulates **wavetable position**, **secondary:** modulates noise color (see Page 2) and filter cutoff (see Page 3)

Parameters

#	Parameter	UI Label	MIDI CC
49	LFO3 Waveform	LFO3 WAVE	81
50	LFO3 Rate	LFO3 RATE	82
51	LFO3 → Wave Position OSC1	LFO3> WPOS1	83
52	LFO3 → Wave Position OSC2	LFO3> WPOS2	84
53	LFO4 Waveform	LFO4 WAVE	85
54	LFO4 Rate	LFO4 RATE	86
55	LFO4 → Wave Position OSC1	LFO4> WPOS1	87
56	LFO4 → Wave Position OSC2	LFO4> WPOS2	88

Behavior & Interaction

- **LFO waveforms are:**
TRI (triangle), SINE, SAW↓ (falling sawtooth), SAW↑ (rising sawtooth), SQUARE, RAND (random)
- **Rate ranges:**
All LFO waveforms in slower versions, marked as x2, x3, x4
- Both **LFO 3** and **LFO 4** add motion that affects timbre and adds spectral animation by moving the wavetable position, the core of a wavetable synth
- Both can sync to BPM/MIDI/TRIG5 clock when configured in Page 8A.

CONCEPT FOCUS – Spectral Motion

Sweeping wavetable position with slow LFOs yields evolving pads; fast modulation produces shimmering or metallic edges.

Combining LFO3 + LFO4 at different rates creates complex organic motion.

5.8 Page 8A – Global Settings I



This page contains global parameters such as oscillator type selection, filter mode, key tracking, envelope looping, portamento, and LFO sync configuration.

Parameters

#	Parameter	UI Label	MIDI CC
57	OSC Types (Plassic / Modern)	OSC TYPES	89
58	Filter Type (LP/BP/BF/HP)	FILT TYPE	90
59	Filter Key Tracking (± 64)	FILT TRAK	91
60	Portamento Time	PORTA TIME	92
61	Wave envelope Looping (on/off)	WAVE EG LP	93
62	Filter envelope Looping (on/off)	FILTER EG LP	94
63	LFO Sync Assignment	LFO SYNC	95
64	BPM for Synced LFOs (60–187)	LFO BPM	96

OSC Types

Classic is a more simple wave generation algorithm, similar to the technique available in the 80ies synths – a bit more “rough”;

Modern uses an advanced, smoother method of generating the waveforms. All combinations for Oscillator 1 and 2 can be chosen, displayed as “**C+M**”, “**C+C**”...

The resulting sound is significantly different and always worth a try!

NOTE: Sometimes, with **Modern** used, the total volume might run into clipping; in this case, reduce the total volume on Page 3, **OSC VOL.**

Filter Type Reference

- **LP – Lowpass**
Classic subtractive filtering; smooth and versatile.
- **BF – Band Filter / Notch**
Narrow spectral carving; useful for phasey or shifting textures.
- **BP – Bandpass**
Removes lows and highs; excellent for vocal-like shaping.
- **HP – Highpass**
Bright, cutting, and ideal for percussion or thin leads.

Behavior & Interaction

- **LFO SYNC** uses a **four-character code** (e.g., “13” = LFO1+LFO3 synced).
- **BPM** sets the rate for synced LFO; this is overridden by MIDI clock / TRIG5 clock.
- **Envelope looping** can create rhythmic or cycling modulation.

5.9 Page 8B – Global Settings II (Controllers & Dual-Target Controls)



Parameters

#	Parameter	UI Label	MIDI CC
65	Pitchbend Range (0–12 semitones)	PBEND	97
66	Mod Wheel → LFO1 Pitch / Volume	MDWHL	98
67	Velocity → Wave Position / Filter Cutoff	VELOC	99
68	Velocity → LFO2 Filter Mod / Volume	FL2-VOL	100
69	Mod Matrix Amount 1 (± 64)	MMTRX AMT 1	101
70	Mod Matrix Amount 2 (± 64)	MMTRX AMT 2	102
71	Mod Matrix Amount 3 (± 64)	MMTRX AMT 3	103
72	Mod Matrix Amount 4 (± 64)	MMTRX AMT 4	104

Dual-Target Value Representations

These parameters do **not** use the typical $-64\dots+63$ bipolar display. Instead, value labels indicate the active *modulation target*:

Parameter 98 – Mod Wheel → LFO1 Pitch / Volume

- Left: VM 1 – VM 64 (Volume Modulation)
- Right: PM 1 – PM 64 (Pitch Modulation)

Parameter 99 – Velocity → Wave Position / Filter Cutoff

- Left: WP 1 – WP 64 (Wave Position)
- Right: FL 1 – FL 64 (Filter)

Parameter 100 – Velocity → LFO2 Filter Mod / Volume

- Left: FL2 1 – FL2 64 (Velocity → LFO2 cutoff modulation)
- Right: VOL 1 – VOL 64 (Velocity → Volume)

CONCEPT FOCUS — Dual-Target Modulation Controls

Instead of switching between multiple menu items, these controls allow two different destinations to be selected smoothly using a single knob.

*Turning left increases modulation of Target A, turning right increases modulation of Target B.
Center = no effect.*

This makes expressive performance and fast sound-design decisions intuitive and hands-on.

5.10 Page 8C – Global Settings III (Mod Matrix Sources & Destinations)

CU3	CU4	CTR3	AFTCH
MMTRX	MMTRX	MMTRX	MMTRX
SRC1	SRC2	SRC3	SRC4
/Pre\$OSMATTRU	Pad	OK	
MMTRX MMTRX MMTRX MMTRX			DST 1 DST 2 DFST 3 DST 4
WU-PS FILTR LF01AM LF02AM			

Page 8C assigns the **four modulation sources** and **four destinations** for the modulation matrix. Amounts for each slot are set on Page 8B (Parameters 101–104).

Modulation Sources

#	Source Parameter	UI Label	MIDI CC
73	Modulation Source 1	MMTRX SRC 1	105
74	Modulation Source 2	MMTRX SRC 2	106
75	Modulation Source 3	MMTRX SRC 3	107
76	Modulation Source 4	MMTRX SRC 4	108

Available Sources

Label	Meaning	Description	CC value
CV3	External CV Input 3	User-assignable control voltage.	0
CV4	External CV Input 4	User-assignable control voltage.	1
CV5	External CV Input 5	User-assignable control voltage.	2
CV6	External CV Input 6	User-assignable control voltage.	3
PTBND	Pitch Bend	± values from pitch wheel via MIDI in.	4
MODWHL	Mod Wheel (CC1)	Continuous controller for expressive modulation.	5
AFTCH	Aftertouch (Channel Pressure)	Real-time pressure modulation.	6
CTR 2	MIDI CC#2	Breath/Expression controller.	7
CTR 3	MIDI CC#3	Undefined CC, user-assignable source.	8
CTR 4	MIDI CC#4	Foot Controller.	9
CTR74	MIDI CC#74	Standard “Brightness” controller (commonly used for filter cutoff).	10

Modulation Destinations

#	Destination Parameter	UI Label	MIDI CC
77	Modulation Destination 1	MMTRX DST 1	109
78	Modulation Destination 2	MMTRX DST 2	110
79	Modulation Destination 3	MMTRX DST 3	111
80	Modulation Destination 4	MMTRX DST 4	112

Available Destinations

Label	Meaning	Description	CC value
PITCH	Global Pitch	Modulates pitch of both oscillators.	0
P OS1	Pitch OSC1	Independent pitch modulation of OSC1.	1
P OS2	Pitch OSC2	Independent pitch modulation of OSC2.	2
WV-POS	Wavetable Position (Global)	Shifts wavetable position of both oscillators together.	3
WPOS1	Wavetable Position OSC1	Independent control for OSC1.	4
WPOS2	Wavetable Position OSC2	Independent control for OSC2.	5
FILTR	Filter Cutoff	Classic filter modulation (LP/BP/BF/HP).	6
FLTEG1	Filter EG Depth	Modulates ENV1 → Filter Amount.	7
EG2PTC	ENV2 → Pitch Amount	Alters pitch-envelope intensity.	8
WTEG3	ENV3 → Wavetable Amount	Controls wavetable-envelope depth.	9
FEG1-S	ENV1 Sustain	Modulates sustain level of ENV1.	10
EG2-S	ENV2 Sustain	Modulates sustain level of ENV2.	11
WEG3-S	ENV3 Sustain	Modulates sustain level of ENV3.	12
EG1LEN	ENV1 Length	Attack/Decay/Release scaling.	13

Label	Meaning	Description	CC value
EG2EN	ENV2 Length	Attack/Decay/Release scaling.	14
EG3LEN	ENV3 Length	Attack/Decay/Release scaling.	15
LFO1RT	LFO1 Rate	Speeds up or slows down LFO1 (positive or negative).	16
LFO1AM	LFO1 Amount	Modulation depth scaling.	17
LFO2RT	LFO2 Rate	Same for LFO2.	18
LFO2AM	LFO2 Amount	Same for LFO2.	19
LFO3RT	LFO3 Rate	Same for LFO3.	20
LFO3AM	LFO3 Amount	Same for LFO3.	21
NSE AM	Noise Amount	Controls noise level.	22
RNG SP	Ringmod Speed	Controls Ring Modulator frequency.	23
RNG AM	Ringmod Amount	Controls Ring Mod Depth.	24

CONCEPT FOCUS – The Modulation Matrix

The modulation matrix provides deep, modular-style patching inside a compact synthesizer.

Four freely assignable sources can be routed to four destinations, each with its own modulation amount.

Because assignments persist per preset, every patch can have completely different modulation behavior — from subtle movement to extreme modulation. If you prefer to have these settings as general settings, use the LOAD MODE option in the menu.

6. The Menu

The WAEVE82 keeps the front-panel workflow fast and musical, but certain global and file-handling functions live inside a compact, single-level menu.

It is opened at any time by **pressing the Encoder Button**.

Pressing the Encoder Button again always returns you to the main screen.

The menu never goes deeper than one level plus a selection here and there — every item acts immediately or presents a single selection screen.

If an item seems to “do nothing,” it is very likely one of the *toggle*-type items that apply the change instantly.

6.1 Navigating the Menu

- **Open Menu:** Press the Encoder Button.
- **Navigate:** Turn the Encoder.
- **Select:** Press the Encoder Button.
- **Exit Menu:** Select ← **BACK** (topmost menu item) and press the Encoder Button.
- **All Notes Off Shortcut:**
Press & hold the Encoder Button + RND Button during normal operation
→ sends *All Notes Off* immediately (menu flashes briefly and closes).

This is a safety function for stuck MIDI notes and works even when the menu is not actively open.

6.2 Menu Items Overview

The menu items appear in this order:

- | | |
|------------------------|------------------|
| 1. ◀ BACK | 10. DUMP PRESET |
| 2. OPERATION MODE | 11. MASTER TUNE |
| 3. EDIT PRESET
NAME | 12. CV BASE NOTE |
| 4. LOAD WAVETBLE
1 | 13. CV CHRD MODE |
| 5. LOAD WAVETBLE
2 | 14. CV CHRD SCLE |
| 6. PRESET FOLDER | 15. CV CHRD ROOT |
| 7. SAVE FAVOURITE | 16. CV CHRD BASE |
| 8. RANDOMIZER
MODE | 17. KNOB MODE |
| 9. INIT PRESET | 18. UI THEME |
| | 19. CV SCALING |
| | 20. LOAD MODE |
| | 21. PARAM ZOOM |

6.3 Menu Item Details

◀ BACK

Returns directly to the main screen.

No additional levels exist.

OPERATION MODE

Toggles immediately between:

- **EDIT** mode
- **PLAY** mode

No confirmation box appears, but the center bar color changes between Edit mode and Play Mode.

EDIT PRESET NAME

The naming screen appears in the center display.

Controls

1. Cursor Mode:

Turning the Encoder moves the character cursor beneath the characters.

2. Character Mode:

Press the Encoder button, the cursor changes to a box.

Turning the Encoder scrolls through the allowed character list.

3. Exit:

Move the cursor *beyond the last character* to the right.

Then, name edit ends automatically — fast and frictionless.

This intentionally minimal interaction enables rapid naming during creative flow.

LOAD WAVETBLE 1 / LOAD WAVETBLE 2

Displays a list of all .wav wavetables found in the folder /wavetables on the SD card.

- The loaded wavetable is stored inside the preset.
- **External wavetables remain required on SD card,** unless the preset is saved as a **Favourite**, in which case they are embedded permanently.

Wave format:

16-bit mono, 256 samples per wave, 64 waves total

PRESET FOLDER

Allows selection of the active folder inside

/presets

including all subfolders (created on your computer).

- **LOAD always uses the currently selected preset folder; there is no folder navigation in the file select box.**
- **SAVE** shows a folder list and lets you select any target **including the /random folder**. The folder shown as “/” is the top level of the presets folder.

This provides a structured library (e.g., /presets/pad/, /presets/bass/) without nesting inside the synth.

SAVE FAVOURITE

Upon selecting this item, **all 8 page-labels begin to blink**.

Press one of the 8 Page Buttons → the current patch is stored to that Favourite slot.

Favourites store:

- the entire parameter set
- the loaded wavetables (internalized)
- the preset name

...and remain available without SD card from now on.

RANDOMIZER MODE

Selects one of the randomization profiles:

- TOTL RND (choosing randomly one of the below profiles)
- PAD
- FX
- RHYTHMIC
- PERCUSSIVE

Each profile sets different boundaries and probabilities for the randomizer.

The Randomize function creates:

- a new preset
- a *random name*, generated from a pool of synthesis, technology, nature and fantasy fragments
- and is undo/redo capable

Undo/Redo:

After randomizing or mutating, turning the Encoder:

- Left = Undo
- Right = Redo

This history is stored on SD card in the folder /history, allowing deep exploration without losing ideas.

INIT PRESET

Initializes the current patch to its default (simple waveform, neutral envelopes, zero modulations).

DUMP PRESET

Sends the current preset as a **SysEx dump** over IMDI OUT.

Useful for DAWs, librarians, snapshot saving inside MIDI tracks, or custom tools.

MASTER TUNE

Sets A - reference frequency in the range of **408 Hz ... 473 Hz**

The entire synth is tuned relative to this base pitch.

CV1 BASE NOTE

Defines the absolute note that corresponds to a CV of **0V** at CV1.

CV1 SCALE

Quantization for CV 1; same scales like **CV2 CHRD SCLE**, but additionally with “CHROMATIC” for all semitones.

CV2 CHRD MODE

Two chord-generation modes for CV-based polyphony:

1. STRADELLA

Accordion-style harmonic layout based on bass-root logic.

The available note range of the AE modular is used to provide 4 types of accords in all keys, each octave is assigned to one chord-type.

From lowest octave to highest octave the available chord-types are: **Major, Minor, Dominant 7th and Diminished 7th chords**

For more details on the original Stradella-System with accordions see

here: https://en.wikipedia.org/wiki/Stradella_bass_system

2. SCALE

Scale-based chords derived from

- CV CHRD SCLE

- CV CHRD ROOT
- CV CHRD BASE

Selecting this menu item immediately toggles between the modes — no submenu.

CV2 CHRD SCLE

Applies to CV CHRD MODE Setting **SCALE**; available scales:

UI Name	Scale Name	Musical Character & Usage
MINOR	Natural Minor	Dark, emotional, expressive; classic minor tonality.
MAJOR	Ionian Mode	Bright, stable, open; traditional major key.
DORIAN	Minor Mode with raised 6th	Smooth, soulful, slightly jazzy; great for pads & modal harmony.
PHRYGIAN	Minor Mode with flat 2	Exotic, tense, dark; Spanish/Arabic flavor.
LYDIAN	Major Mode with raised 4th	Dreamy, floating, “sci-fi” major; very open harmonies.
MIXOLYDIAN	Major Mode with flat 7	Bluesy, dominant, groove-oriented; great for lead harmony.
LOCRIAN	Minor Mode with flat 2 & flat 5	Dissonant, unstable, dramatic; experimental textures.
GYPSY MINOR	Harmonic Minor Variant	Eastern / Romani character; expressive & dramatic.
WHOLE TONE	Symmetric (whole steps only)	Futuristic, ambiguous, impressionistic; floating chords.
PNT MINOR	Pentatonic Minor	Clean, open, no semitone tension; universal musicality.
PNT MAJOR	Pentatonic Major	Uplifting, folk-like, simple & strong melodic/harmonic motion.

Chords in SCALE mode derive their color and tension from this selection.

CV2 CHRD ROOT

Defines the root note used for CV chord generation.

CV2 CHRD BASE

Defines the absolute note that corresponds to a CV of **OV** at CV2.
Works analog to **CV1 BASE NOTE** but for chord output.

KNOB MODE

Two interaction modes:

- **DIRECT**
Knob movement immediately updates the parameter.
- **PICKUP**
Knob must cross the current parameter value before it becomes active.
Prevents parameter value jumps when switching between pages and turning knobs.

UI THEME

Two visual styles:

- **AE:** Matches standard AE Modular aesthetic (orange/red).
- **BLUE:** Matches the blue WAEVE82 front panel and retro-digital look.

CV TRACKING

Set the tracking for external CV to get precise CV to note mapping.

LOAD MODE

Here, it can be chosen if the full parameter set of **ALL** pages is loaded, or only Pages **1...8A**; meaning the modulation assignment remains untouched.

Please note: When saving presets, all ten Parameter pages (1-8C) are saved.

So in combination with the Load Mode Logic, you could use this to save one or more presets reflecting your favorite controller settings on Pages 8B and 8C.

To switch between those settings you would at first load such a “controller-setting preset” with Load Mode **ALL**, then select Load Mode **1...8A** to keep your controller settings (Modulation matrix etc.) untouched when loading the preset actually containing the intended sound-patch.

PARAM ZOOM

LF03
WAVE
SINx2

If PARAM ZOOM is set to ON, the currently modified parameter is displayed much larger on the display, making it easier to adjust - admittedly, the display is small ;-)

Please note that any time a parameter is selected (its name is underlined) you can turn the Encoder for fine adjustment alternatively, too! Then, the parameter value will also be shown enlarged.

Concept Focus — Menu Philosophy

The menu is intentionally shallow and designed to never pull the musician out of the creative zone.

- *No multi-layer navigation*
- *Most items toggle instantly*
- *Naming is ultra-fast*
- *Randomizer and Mutate workflows integrate seamlessly*
- *Undo/Redo ensures exploration without fear*
- *File structure stays predictable*

Every detail supports sound design first, UI second.

7. Presets, Randomizer, Favourites & Storage

The WAEVE82 offers a flexible preset system that balances fast performance access, deep creative exploration, and long-term sound organization.

Presets live on the microSD card, but Favourites are stored *inside the module* for instant access.

7.1 What a Preset Contains

Each preset stores the *entire synthesizer state*, including:

- All **80 parameters** across Pages 1–8A/B/C
- Wavetable selection for OSC1 and OSC2
- The name of **external wavetables** (the actual wavetable file is expected on SD card)
- The preset name

Everything shown on the parameter pages is recalled exactly as saved.

7.2 Global Settings (not stored in presets)

These settings are universal and do **not** change with a preset:

- Operation Mode (Edit/Play)
- Knob Mode (Direct/Pickup)
- UI Theme (AE/BLUE)
- Master Tune
- CV Base Note
- CV Chord Mode (Stradella/Scale)
- CV Chord Scale
- CV Chord Root
- CV Chord Base
- CV Scaling

These remain constant across power cycles and influence how the WAEVE82 behaves system-wide.

7.3 Loading Presets

Presets are stored on the SD card in:

```
/presets
  /<optional user folders>
```

Loading always browses **the currently selected Preset Folder**, chosen via the menu item **PRESET FOLDER**.

- You can create subfolders on your computer (e.g., **PAD**, **BASS**, **LEAD**, **FX...**).
- The WAEVE82 cannot create new sub-folders but can navigate them.
- A second press of LOAD changes to the /random folder, and a third one leaves loading without any change.
- Loading works in both **Edit Mode** and **Play Mode**.
- If a preset references external wavetables:
 - They must exist in **/wavetables**,
 - Unless the patch is saved as a **Favourite**, in which case the wavetables are internalized.

7.4 Saving Presets

When pressing **SAVE**, the WAEVE82 displays all accessible folders:

- **/presets** and all its subfolders
- **/random** (see below)

You choose where the file is stored.

Overwriting

Saving overwrites existing files **without confirmation** (current behavior; may change in future firmware).

Be careful when saving over existing patches.

7.5 Randomizing and Mutating presets

Pressing the **RAND** button creates:

- a new preset
- a *random name*, generated from a pool of synthesis, technology, nature and fantasy fragments; based on the chosen randomizer profile (set in the Menu)
- and is undo/redo capable

The **MUTA** button mutates the current preset by

- applying gradual changes to a few, randomly chosen, parameters
- Adding a number to the name, starting with 001, 002....

After RAND / MUTA, the WAEVE82 is in a “randomizer context”; this means, by turning the encoder, the history of randomized sounds can be recalled (no matter if saved or not). This randomizer context is ended when SAVE or LOAD is executed or the Menu is opened.

7.6 Random Preset Saving (Randomizer Context)

When you press **SAVE** immediately after Randomize or Mutate:

- The preset is automatically saved to /random
- No confirmation is requested; this allows uninterrupted creative flow
- Leaves the “Randomize context”

It is re-enable it as soon as you press RAND or MUTA again

You can later browse /random, pick your favorite discoveries, refine them, and save them elsewhere.

7.7 Favourites

Favourites turn the WAEVE82 into a stage-ready instrument.

- There are 8 Favourite Slots
- Selected via Page Buttons in Play Mode
- Instant recall of performance-ready patches
- What Favourites store
 - Full preset (all 80 parameters)
 - External Wavetables used by the preset, **internalized into the modules memory**
 - The preset name

This means:

Favourites do not require the SD card.

Perfect for live setups or installations.

Saving a Favourite

1. Enter Menu → SAVE FAVOURITE
2. All Page Buttons begin blinking
3. Press one of the 8 Page Buttons to store the preset into that slot
4. Done.

7.8 Wavetables in Presets

Internal wavetables always load instantly.

External ones must be present in:

/wavetables

Exceptions:

If a preset is saved as a **Favourite**, its external wavetables are copied into internal memory — permanently available even without SD card.

7.9 Preset Dumping

The menu item **DUMP PRESET** sends the currently active preset as a **SysEx message** via the **IMDI 2** output.

- The full patch data is transmitted directly over MIDI in real time
- You can record this SysEx stream in a DAW, a hardware librarian, or any SysEx utility
- Later, you can send the message back to the WAEVE82 through **IMDI IN** to restore the preset exactly

This allows session-based storage, sharing patches with other users, or using external librarian tools.

Summary

- Trigger: Menu → DUMP PRESET
- **Output:** Real-time SysEx stream
- Port: IMDI OUT 2
- **Use:** Capture/restore presets externally; ideal for backups or DAW integration

8. microSD Card & File Handling

The microSD card is the central storage location for presets, randomizer output, and external wavetables.

A high-quality, brand-name SDHC card is recommended.

Capacity requirements are minimal — even 2 GB is far beyond what WAEVE82 needs.

8.1 Supported Cards

- **microSD or microSDHC** (Please make sure to use a quality card; cheap cards can fail in the WAEVE82)
- Recommended size: **4–32 GB**
- Format: **FAT32**
- Block size: any standard allocation size supported by FAT32
- If your card is new, most come preformatted; if not, use your operating system's "Format" option (ensure FAT32).

8.2 Folder Structure

The WAEVE82 expects the following folders at the root of the SD card:

/presets
/random
/wavetables
/history

Folder roles

- **/presets**
Main storage for user presets; may contain arbitrary **subfolders** created on a computer.
- **/random**
Target folder for auto-saves during randomizer work.
- **/wavetables**
Place all external wavetable files here (64-wave × 256-sample WAV format).
- **/history**
Stores undo/redo states for Randomize/Mutate operations.

The WAEVE82 creates these folder structure automatically if they do not exist, as soon as the SD card is accessed by a load/save operation.

LIMITS: A maximum of 30 subfolders under /presets, and a maximum of 500 files per folder.

8.3 Preset Files

- File format: **WAEVE82 SysEx format**
- File extension: **.syx**
- Presets are read/written as compact binary files used only by WAEVE82.

Typical filename example:

GlassPad01.syx

Preset names may include:

- Letters (upper- and lowercase)
- Digits, spaces, underscore _
- ...and a few more

Max filename length: **16 characters (without extension)**

8.4 Randomizer Output

When saving during Randomize/Mutate:

- Presets are always written into **/random**
- No confirmation dialogue
- Undo/Redo states stored in **/history**

You can later move these random results into your preferred preset folders.

8.5 Favourites and the SD Card

- Favourites do **not** require the SD card
- When saving a Favourite, any used **external wavetables** are internalized
- This ensures reliable performance even without the SD card inserted

8.6 Copying preset files to SD card on a computer

IMPORTANT: When **copying** preset files in one of the folders on the SD card or when **renaming** preset files, please make sure to **delete the index.** file** in the corresponding folder!

Why? The **file index.**** is responsible for the sorted display of files; for technical reasons, it's not possible (or at least not acceptably quick) to show files sorted "on the fly" in the WAEVE82 like we are used when on a computer. So, after file changes, this organizational file is recreated and reflects the actual folder contents the next time when the folder is accessed on the WAEVE82. In this case, you will see the message "**Reindexing...**" in the file list, before the files are shown. Might take some seconds, but this happens only once, subsequent requests of this folder will work without delay.

8.7 CV/Gate & IMDI Interaction with Presets

Preset storage does **not** affect:

- global CV settings (chord mode, root note etc.)
- scaling and master tune settings

These remain unchanged per section **6.3 Menu Item Details**.

8.8 Backup Strategy

A simple but effective backup method:

1. Remove SD card
2. Copy entire folder structure to computer
3. Zip it
4. Store it in cloud or external drive Since presets are small, the entire backup is tiny.

8.9 Using the WAVE82 without an SD card

In case your SD card is missing or not operable, the WAEVE82 will still work, but obviously there will be restrictions:

Without the SD-Card Loading and Saving Presets can't be done, but you still can load Favourites which are stored inside WAEVE82. Or you can generate random patches, edit them etc. To keep your creation after power-off in that scenario you are restricted to save your it as a new favourite, though!

Concept Focus – Why SD Card Instead of Internal Banks?

Using an SD card keeps the WAEVE82 open, modular, and expandable:

- *unlimited presets*
- *unlimited folders*
- *unlimited wavetables*
- *easy sharing between instruments*
- *computer-friendly workflow*
- *reliable offline backups*

This design mirrors the open, modular nature of the AE system itself.

9. External Wavetables

WAEVE82 supports loading external wavetable files for both oscillators independently. This significantly expands the sound palette beyond the 64 internal factory tables.

The supported format is compatible with **Synthesis Technology's WaveEdit** ecosystem, giving access to a vast library of community-created wavetables.

9.1 Wavetable File Requirements

A valid wavetable file must meet all criteria:

- **16-bit WAV file**
- **Mono**
- **64 waves total**
- **256 samples per wave**
- Standard PCM encoding (no µ-law, ADPCM, etc.)
- Filename: max 16 characters (without extension)
- File extension: .wav
If the format is invalid, the file is simply ignored in the load list.

9.2 Loading Wavetables

Use the menu items:

- LOAD WAVETBLE 1
- LOAD WAVETBLE 2

The display lists all .wav files inside:

/wavetables

Selecting a table instantly loads it into the oscillator.

When saving:

- **Normal preset save:**
Only the reference to the external file is saved
→ the SD card must contain that file later.
- **Saving as Favourite:**
The wavetable is **embedded** into the Favourite slot
→ SD card not needed afterward.

9.3 Recommended Workflow with WaveEdit

WAVE82 uses the same wavetable structure as **WaveEdit**:

- Load WaveEdit
- Compose or modify waves
- Export as 64x256 16-bit WAV
- Copy to /wavetables on SD

9.4 Removing or Replacing Wavetables

To replace or remove external tables:

- Remove SD card
- Modify /wavetables on your computer; copy to the **/wavetables** folder
- **Delete** the file **index. ix** within the /wavetables folder
- Reinsert card
- If a preset uses an external wavetable that is not available on the SD card, a message is shown when loading the preset.

9.5 Internal vs External Wavetable Priority

- Internal wavetables are always available
- External wavetables are loaded from SD card when loading a preset that uses them
- Favourites always use the stored internalized copy of the wavetable

9.6 Summary Table

Task	Location	Notes
Load External Wavetable	/wavetables	Must be valid WAV format
Save Preset using external table	/presets/<folder>	External WAV file required on card
Save Favourite	internal	External wavetables are stored in module's permanent memory

10. MIDI Implementation

The WAEVE82 includes a full-featured MIDI engine with **8-voice polyphony**, complete parameter control via MIDI CC, external clock sync, and preset dumping via SysEx.

The IMDI ports integrate seamlessly into the AE Modular ecosystem via the AE modular MIDI interface or external routing.

10.1 MIDI Input & Output

IMDI IN

- Receives MIDI Note On/Off
- Receives Velocity
- Receives Pitch Bend
- Receives Mod Wheel (CC1)
- Receives **all mapped MIDI CCs** (see Appendix A)
- Receives Channel Pressure (Aftertouch) as *modulation matrix source only*
- Receives external MIDI Clock

IMDI IN 2

- Programmer and/or Sysex input (for future use)

IMDI OUT 1 (reserved for future use)

IMDI OUT 2

- Sends **SysEx preset dumps** (via *DUMP PRESET*)
- Sends Note On/Off when playing via CV/Gate

10.2 MIDI Channels

The WAEVE82 listens on:

- **Each MIDI Channel** (Omni mode, like usual with AE IMDI devices)
- Incoming MIDI is treated as **8-voice polyphonic**
- No MPE mode
- Multitimbrality is not supported

10.3 Velocity

Velocity is used by multiple systems:

- Source for Filter cutoff / wave position dual-target modulation (Parameter #67, CC 99)
- Source for Volume/LFO 2 Filter cutoff depth dual-target modulation (Parameter #68, CC 100)

Both settings are available on Page 8B.

10.4 Pitch Bend

Pitch Bend is bipolar, full-resolution (14-bit).

The amount is controlled by Page 8B parameter **PBEND AMNT** (0...12 semitones).

Additionally, Pitch Bend also can be assigned via the Modulation Matrix to different destinations, thus switching off the associated controllers influence on pitch here by setting it to zero might make sense!

10.5 Channel Pressure (Aftertouch)

- Channel Pressure can be routed to all available destinations of the **Modulation Matrix** (see Page 8C).
- It appears as matrix source **AFTCH**.

10.6 MIDI CC Implementation

Every parameter on Pages 1–8A/B/C has a **dedicated CC number**, defined in Appendix A.

The WAEVE82:

- Supports **128 total CCs**, but only the mapped ones are active
- Ignores unmapped CCs gracefully
- Responds at full 7-bit resolution (0–127)

Important note

CC numbers **do not correspond** to parameter numbers or page numbers.

The mapping table in **Appendix A** is the authoritative source.

10.7 External MIDI Clock Sync

The WAEVE82 synchronizes its LFOs to an external MIDI clock if:

- Page 8A **BPM** parameter is set to **OFF**
- And at least one LFO is set to **synced** via Page 8A **LFO SYNC**
Clock interpretation:
- **24 PPQN MIDI Clock** standard
- LFO synced values include divisions like:
 - 8/1, 4/1, 3/1, 2/1, 1/1, 1/2, 1/4, ...
 - dotted and triplet values
 - down to 1/64t

If no MIDI clock or TRIG 5 clock is present, the internal BPM clock takes priority.

In any case quarter-notes, aka beats, are used as meter: Either as Clock-PulsesPerQuarter, as internal BeatsPerMinute or as 5V Clock Triggers.

10.8 MIDI Note Priority & Voice Allocation

The WAEVE82 uses the following logic for voice assignment:

- If a note is released the aim is to let it sound to the end of its ADSR
- Voice stealing occurs when more than 8 notes are played
- Until then previously unused voices are prioritized to be used
- As an exception to this rule the lowest note will not be "stolen" at all, to keep the bass-note assumed
- When more than 8 voices are demanded the lower notes win ("low note priority")
- Legato in case of voice stealing is explained in more detail below
- Sustain / CC 64 has the effect as if the notes still would be held (this may seem obvious but can yet lead to special behavior with the rules in place as above)

- CV/Gate and MIDI can be used in parallel, enabling hybrid sequencing via three different modes of operation:
 - IMDI-in (MIDI) → Polyphonic Mode
 - CV/Gate 1 → Monophonic Mode
 - CV/Gate 2 → Chord Mode
- Any of the three modes above can be used alone or in any combination
- Legato behavior is available with the Polyphonic Mode in case of voice-stealing, meaning more than 8 voices in total are played
(In this rare case Pitch will change, but ADSR will not retrigger)

10.9 SysEx Preset Dumping

Triggered via:

Menu → DUMP PRESET

What happens:

- The entire current preset is encoded as a **SysEx message**
- Sent via **IMDI OUT 2**
- No file is written to SD
- The dump can be captured in any DAW or SysEx utility

10.10 MIDI Panic

Holding **Encoder Button** for one second:

- Instantly sends **All Notes Off**
- Actually, the menu only flashes briefly; panic works even when the menu is not shown

This resolves stuck notes from external sequencers or incomplete Note Off messages.

10.11 Summary Table

Feature	Support?	Notes
Note On/Off	Yes	8-voice polyphonic
Velocity	Yes	Audio engine + modulation matrix (8B)
Pitch Bend	Yes	Range via PBEND AMNT (8B)
Mod Wheel (CC1)	Yes	Page 8B dual-target modulation
Aftertouch	Yes	Via Modulation Matrix
CC 2, 3, 4	Yes	Via Modulation Matrix, see Appendix A
CC 5	Yes	Portamento Time
CC 7	Yes	Volume
CC 64	Yes	Sustain
CC 65	Yes	Portamento on/off
Program Change	Yes	Select one of 8 Favourites
SysEx Dump	Yes	Send on IMDI OUT 2
External MIDI Clock	Yes	Overriding internal BPM setting
MPE	No	Not supported, yet CC 74 is assignable to all available destinations via Modulation Matrix
MIDI Start	Yes	Resets the phase of LFOs if in Sync, use in combination with MIDI-Clock whenever required

Concept Focus — MIDI & Modulation Philosophy

While the WAEVE82 is deeply rooted in wavetable tradition, its MIDI support follows a “modulation-first” philosophy:

- *Velocity, mod wheel, pressure, CCs can be modulation source*
- *Please keep in mind that IMDI/MIDI has limitations compared with those other modulators regarding data-rate.*
- *Hybrid control setups (CV + MIDI simultaneously)*
- *External MIDI clock integrates with the LFO Sync system*

The goal is not to mimic DAW-style automation, but to create a playable, performable modulation environment.

11. CV/Gate Integration

The WAEVE82 integrates deeply into analog modular setups through the AE Modular CV/Gate environment.

Unlike many digital wavetable engines, it treats external CV/Gate not merely as optional triggers but as **first-class control sources** that coexist seamlessly with MIDI.

WAEVE82 supports:

- Monophonic CV/Gate control
- Chord generation via CV2/Gate2
- Four freely assignable modulation CVs
- Dedicated sustain and LFO-control triggers
- Parallel operation with IMDI (AE's internal MIDI format)

Note: The WAEVE82 is not multi-timbral, thus CV based Voice-Modes and MIDI-Polyphony share the same sound

11.1 CV1 / GATE1 — Monophonic Control

CV1

- Controls pitch for the *monophonic* voice
- 1 V/octave
- The base reference note is defined by menu parameter **CV BASE NOTE**

GATE1

- Starts the envelope cycle (ENV1, ENV2, ENV3)
- No velocity; amplitude follows ENV2
- **Parallel operation:**
 - CV/Gate and MIDI **can be used simultaneously**.
For example:
 - MIDI plays 8-voice chords
 - CV1/Gate1 plays a monophonic line
 - Both sounds blend together inside the WAEVE82
 - This hybrid behavior is intentional and musically powerful.

11.2 CV2 / GATE2 — Chord Generator Input

This pair activates the WAEVE82's **CV-driven chord engine**, generating harmonically intelligent chords from a single CV/Gate input.

- **CV2** selects the chord degree
- **GATE2** triggers the chord
- The number of notes and their intervals depend on global parameters:

Controlled by Menu Items:

- **CV CHRD MODE**
 - *STRADELLA* (accordion-style harmonic layout; see Section 7.2 for details)
 - *SCALE* (diatonic chords derived from chosen scale & root)
- **CV CHRD SCLE**
(e.g., Minor, Dorian, Lydian, Gypsy Minor, Whole Tone... full list in scale table)
- **CV CHRD ROOT**
Starting note of the scale
- **CV CHRD BASE**
Octave in which chords are generated
This system allows extremely musical chord progressions from simple analog sequencers.

Hybrid CV/MIDI behavior

Chords generated from CV2 are played **in addition to** any MIDI notes currently active.

11.3 CV3-CV6 — Assignable Modulation Inputs

These four modulation CV inputs appear as **sources in the Modulation Matrix** (Page 8C):

- CV3
- CV4
- CV5
- CV6

Typical uses:

- Filter sweeps
- Wavetable movement
- OSC balance animation
- Modulating envelope depths
- Driving LFO rates
- Anything the matrix allows

The inputs accept standard AE Modular ranges and are internally normalized and scaled.

Fine calibration is available via **CV SCALING** in the menu.

11.4 GATE3 — Sustain Control

Gate3 acts as a **Sustain Pedal** input:

- High = sustain active
- Low = envelopes release normally

Useful with keyboards, sequencers, or footswitch-driven performance situations.

11.5 TRIG4 — LFO Reset

A rising edge on **TRIG 4**:

- Resets all LFO phases
- Applies to LFO1, LFO2, LFO3, LFO4
- Works in both free-running and synced modes

Great for rhythmic modulation patterns synchronized to external sequencers.

To achieve time-synced LFOs via Triggers only, please use in combination with TRIG 5 (LFO Clock).

Please note that this trigger also can make sense in combination with MIDI clock when used only once for (re)starting a sequence of notes for instance.

Besides resetting LFO-cycles, technically internally this trigger also is used to mark the beginning of quarter notes in terms of meter.

In the MIDI realm with WAEVE82 the MIDI start event does the same.

11.6 TRIG5 — LFO Clock (Quarter Notes)

TRIG 5 provides an external CV-clock source that the WAEVE82 interprets as **1/4 notes**.

- LFOs set to Synced (via **LFO SYNC**) will lock to this pulse
- Works even if no MIDI Clock is present
- Internal BPM is ignored for synced LFOs when TRIG 5 is clocking

This enables CV-based modular tempo control without MIDI involvement.

To achieve time-synced LFOs via Triggers only, please use in combination with TRIG 4 (LFO Reset).

Please note that in the MIDI realm 24 MIDI clock events have the same effect, so using only one of the both options for time-sync is recommended.

11.7 Parallel CV + MIDI Operation

One of WAEVE82's unique strengths is the ability to use:

- CV1/Gate1 monophonic line
- CV2/Gate2 chord engine
- Four modulation CVs
- Full polyphonic MIDI input

simultaneously.

These signals blend into a single, coherent eight-voice engine. There is no “CV priority” or “MIDI override” — both simply add voices or modulation.

This hybrid control environment encourages:

- Layered sequences
- MIDI chords + CV basslines
- CV chords + MIDI melodies
- CV LFOs combined with MIDI CC automation

The result is a surprisingly expressive, hybrid-modular instrument. In combination with the destinations of the Modulation Matrix, this concept also can be used to achieve automated modulations that are not available directly by the parameters, like envelope durations, envelope amounts, Ringmodulator speed, LFO speeds etc.

11.8 CV Scaling & Calibration

The global menu item **CV SCALING** allows compensation if CV from a keyboard or sequencer runs slightly sharp/flat

Concept Focus — CV Meets Digital Wavetable

*The WAEVE82 is intentionally not a MIDI-only synthesizer.
It bridges digital wavetable synthesis with modular immediacy:*

- *CV/Gate for expression*
- *MIDI for polyphony*
- *Randomizer/Mutate for inspiration*
- *Mod Matrix for deep design*
- *LFO resets & external CV clock for rhythmic precision*

12. Troubleshooting

This chapter lists common issues and their solutions.

The WAEVE82 is designed to be reliable and predictable, but modular setups can introduce unexpected behavior.

Most problems can be resolved quickly by checking the points below.

12.1 No Sound

Check the following:

- **Volume (OSC VOL)** on Page 3 is not set to 0.
- **Filter Cutoff** is not fully closed.
- **EG2 (volume envelope)** attack, sustain or release are not set to extremes.
- **Modulation sources** are not pushing parameters to silence (e.g., strong LFO → OSC VOL).
- If using **CV/Gate**, ensure Gate1 is active.
- Ensure no extreme **wave position** has selected a nearly silent waveform.

Play Mode:

A Favourite may use internalized wavetables even without SD card — but normal presets need the SD card for external wavetables.

12.2 No Sound When Using CV/Gate

- Ensure **CV SCALING** is set correctly in the menu.
- Check **CV BASE NOTE** — incorrect base pitch may push notes out of audible range.
- CV cables may be loose or mismatched.
- Gate polarity may be incorrect; Gate must go high to trigger envelopes.
- Using CV/Gate does *not* disable MIDI — both can play simultaneously (this is intended).

12.3 Pitch Tracking Seems Wrong

- Verify the correct **CV BASE NOTE**.
- Check for modulation sources affecting pitch:
 - LFO1 → Pitch1/Pitch2
 - ENV2 Pitch modulation
 - Mod Matrix assignments
- Inspect **Coarse** and **Fine** pitch settings for OSC1/OSC2.
 - If using CV:
Recalibrate with **CV SCALING**.

12.4 External Wavetables Do Not Load

- The WAV file must be 16-bit, mono, 64 waves × 256 samples.
- Format must be standard PCM (not ADPCM or u-law).
- Filename must be **max 16 characters**.
- File must be in **/wavetables**.
- The SD card must be FAT32 formatted.

If a preset loads but the external file is missing, the oscillator may produce silence or a fallback wave.

12.5 Presets Do Not Appear in LOAD Menu

- Check that presets are inside **/presets** or its subfolders.
- Confirm the correct **Preset Folder** is selected in the menu.
- Preset filenames must be max 16 characters (without extension).
- After copying / renaming preset files on a computer, make sure to delete the index.ix file in the folder (will be recreated automatically)
- Ensure the SD card is correctly inserted.

12.6 Saving Goes to the Wrong Folder

This happens only during **randomizer work**:

- When Randomize/Mutate was used, pressing **SAVE** automatically stores into **/random**.
- This is intentional to preserve creative flow.
- The “Randomize context” ends when another preset is loaded.

Outside the randomize context, SAVE always shows the normal folder selection.

12.7 Unexpected Notes, Extra Voices, or Overlapping Sounds

Likely reasons:

- **MIDI and CV/Gate operate in parallel**, not exclusively.
→ You may be hearing notes from both systems.
- External sequencers may send overlapping MIDI notes.
- Check if **chords** are being generated from CV2 while MIDI notes are active.

If stuck notes occur:

Use All-Notes-Off

Hold the **Encoder Button pressed** for one second.

This sends a global All Notes Off (does not require the menu to be open).

12.8 LFO Sync Does Not Work

- Ensure **LFO SYNC** (Page 8A) includes the LFO you want to sync.
- For **TRIG5 clock**, ensure clean rising edges at quarter-note timing.
- Mixed clock sources: TRIG clock overrides internal BPM for synced LFOs.
- Optionally, to mark the beginning of a new sequence (effectively a new quarter-note) either use the MIDI event Start or TRIG 4 (LFO Reset)

12.9 Mutate Overwrites My Preset Name

Mutate appends a **version number** (001, 002, ...) to the preset name.

This is intentional so that evolving sound variations remain distinguishable.

12.10 Undo/Redo Does Not Work

Undo/Redo requires:

- Using **Mutate** or **Randomize** beforehand
- The SD card inserted (history stored in /history)

If SD is missing or full, Undo/Redo is unavailable.

12.11 Wavetables Missing Possible reasons:

- Preset uses **external wavetables** that are no longer on the SD card.
- A wavetable was renamed or replaced.
- Only **Favourites** store wavetables internally; normal presets do not.

Fix: Restore or re-add the wavetable to /wavetables.

12.12 Favourite(s) not playing

Please note that you have to save any of your patches at first as a Favourite (1-8) in order to have Favourites available from then on.

12.13 Favourite sounds different than the used preset

You may have changed the preset in Edit mode before copying it to a favourite, but not saved the preset to SD-card as well after that, or a wavetable may have been changed on the SD card but not with the favourite etc.

12.14 Notes or controller-events seem to lag

When using a MIDI-device to drive the WAEVE82 be aware that MIDI has its limitations in terms of max. events per time-frame. Especially when you use many control events for automation or fast note-sequences there may be audible latency.

In that case try to use CV and/or 5V Trigger Signals instead or at least as a substitute for some of the MIDI-data to be processed

12.15 Only about every second note seems to be audible

When using a mono audio-signal make sure to use one the audio outlets labelled OUT MIX.

OUT-L or OUT-R are linked to about half of the internal voices, each!

12.16 The Filter Envelope seems to behave strangely

Please note that the Filter-Envelope-Amount (aka ENV1 AMNT on Page 3) can also be set to negative values by twisting the Filter-Amount-Knob to the left, so that the envelope works kind of mirrored/in reverse to its normal form.

12.17 The sound gets unexpectedly brighter or duller in different octaves

This can be the case when Filter-Tracking (aka FILT TRAK on Page 8A) is set to extreme values.

Appendix A — Full MIDI CC Map

This appendix lists **every parameter of the WAEVE82**, together with its **assigned MIDI CC number**, **display label**, **range type**, and **whether the parameter is bipolar**.

Note:

For the three **Dual-Target Controls** (parameters #66-68), see the dedicated note after the table. Their value ranges differ from standard bipolar/unipolar mappings.

A.1 Complete Parameter–CC Mapping Table

CC	Parameter Name	UI Label	Range Representation
9	Wavetable OSC1	WAVE TBLE	0...63
10	Wave Position OSC1	WAVE POS1	0...63
11	Coarse Pitch OSC1	PITCH CRS1	-64...63
12	Fine Pitch OSC1	PITCH FINE1	-64...63
13	Wavetable OSC2	WAVE TBLE2	0...63
14	Wave Position OSC2	WAVE POS2	0...63
15	Coarse Pitch OSC2	PITCH CRS2	-64...63
16	Fine Pitch OSC2	PITCH FINE2	-64...63
17	Noise ↔ OSC1 Balance	NS-OSC BAL	-64...63
18	Noise Color	NOISE COLOR	0...127
19	LFO4 → Noise Color	LFO4> NSECLR	0...127
20	EG3 → Noise Amount	ENV3> NOISE	-64...63
21	Ringmod Dry/Wet	RING> OSC2	0...127
22	Ringmod Rate	RING RATE	0...127
23	LFO3 → Ringmod Amt	LFO3> RNGAMT	0...127
24	EG3 → Ringmod Amt	EG3 RNGAMT	-64...63
33	Filter Cutoff	FILTER CUTOF	0...127
34	Filter Resonance	RESO NANCE	0...127
35	EG1 → Filter	ENV1 AMT	-64...63
36	LFO4 → Filter	LFO4> CUTOFF	0...127

CC	Parameter Name	UI Label	Range Representation
37	OSC1+2 Volume	OSC VOL	0...127
38	OSC1-2 Balance	OSC BAL	-64...63
39	LFO3 → OSC Balance	LFO3> OSCBAL	0...127
40	LFO1 → OSC Volume	LFO1> OSCVOL	0...127
41	ENV1 Attack	ENV1 ATTCK	0...127
42	ENV1 Decay	ENV1 DECAY	0...127
43	ENV1 Sustain	ENV1 SUSTN	0...127
44	ENV1 Release	ENV1 RELEAS	0...127
45	ENV 2 Attack	ENV2 ATTCK	0...127
46	ENV 2 Decay	ENV2 DECAY	0...127
47	ENV 2 Sustain	ENV2 SUSTN	0...127
48	ENV 2 Release	ENV2 RELEAS	0...127
49	ENV 3 Attack	ENV3 ATTCK	0...127
50	ENV 3 Decay	ENV3 DECAY	0...127
51	ENV 3 Sustain	ENV3 SUSTN	0...127
52	ENV 3 Release	ENV3 RELEAS	0...127
53	ENV 2 Pitch → OSC1	ENV2> PITCH1	-64...63
54	EG2 Pitch → OSC2	ENV2> PITCH2	-64...63
55	ENV 3 Wavetable → OSC1	ENV3> WAVE1	-64...63
56	ENV 3 Wavetable → OSC2	ENV3> WAVE2	-64...63
66	LFO1 Waveform	LFO1 WAVE	Selection 0...23
67	LFO1 Rate	LFO1 RATE	0...127 or synced ratios
68	LFO1 → Pitch OSC1	LFO1> PITCH1	0...127
69	LFO1 → Pitch OSC2	LFO1> PITCH2	0...127
70	LFO2 Waveform	LFO2 WAVE	Selection 0...23
71	LFO2 Rate	LFO2 RATE	0...127 or synced ratios
72	LFO2 → Filter	LFO2> CUTOFF	0...127
73	LFO2 → Global Pitch	LFO2> PITCH	0...127
81	LFO3 Waveform	LFO3 WAVE	Selection 0...23

CC	Parameter Name	UI Label	Range Representation
82	LFO3 Rate	LFO3 RATE	0...127 or synced ratios
83	LFO3 → WP OSC1	LFO3> WPOS1	0...127
84	LFO3 → WP OSC2	LFO3> WPOS2	0...127
85	LFO4 Waveform	LFO4 WAVE	Selection 0...23
86	LFO4 Rate	LFO4 RATE	0...127 or synced ratios
87	LFO4 → WP OSC1	LFO4> WPOS1	0...127
88	LFO4 → WP OSC2	LFO4> WPOS2	0...127
89	OSC Types	OSC TYPES	Selection 0...3
90	Filter Type	FILT TYPE	Selection 0...3
91	Filter Key Tracking	FILT TRAK	-64...63
92	Portamento Time	PORTA TIME	0...127
93	Wavetable EG Loop	WAVE EG LP	OFF/ON
94	Filter EG Loop	FILTER EG LP	OFF/ON
95	LFO Sync Mode	LFO SYNC	"1...4" combinations
96	LFO BPM	LFO BPM	60–187
97	Pitch Bend Range	PBEND AMNT	0...12 semitones
98	ModWheel → LFO1 Pitch/Vol	MDWHL LFO1	VM 1–64 / PM 1–64
99	Velocity → WP / Filter	VELOC WV-FLT	WP 1–64 / FL 1–64
100	Velocity → LFO2 Filter / Volume	VELOC FL2-VOL	FL2 1–64 / VOL 1–64
101	Matrix Amount Slot 1	MMTRX AMT 1	-64...63
102	Matrix Amount Slot 2	MMTRX AMT 2	-64...63
103	Matrix Amount Slot 3	MMTRX AMT 3	-64...63
104	Matrix Amount Slot 4	MMTRX AMT 4	-64...63
105	Matrix Source 1	MMTRX SRC1	selection
106	Matrix Source 2	MMTRX SRC2	selection
107	Matrix Source 3	MMTRX SRC3	selection
108	Matrix Source 4	MMTRX SRC4	selection
109	Matrix Destination 1	MMTRX DST1	selection
110	Matrix Destination 2	MMTRX DST2	selection
111	Matrix Destination 3	MMTRX DST3	selection

CC	Parameter Name	UI Label	Range Representation
112	Matrix Destination 4	MMTRX DST4	selection

A.2 Special Notes for Dual-Target Modulation Controls

These three parameters **do not** use bipolar ranges.

Instead, each direction of the knob selects **one of two different modulation domains**:

Parameter	UI Label	Left Side Range	Right Side Range
#66	MDWHL LFO1	VM 1–64 (Volume Mod)	PM 1–64 (Pitch Mod)
#67	VELOC WV- FLT	WP 1–64 (WavePos Depth)	FL 1–64 (Filter Depth)
#68	VELOC FL2- VOL	FL2 1–64 (Vel-scaled LFO2→Cutoff)	VOL 1–64 (Velocity→Volume)

Appendix B — Internal Wavetables

This appendix lists all 64 factory wavetables.

Each wavetable has:

- a file/technical name
- a UI abbreviation
- a short descriptive tag

(Descriptions match those used earlier in Chapter 10.3.)

B.1 Internal Wavetable Overview

Classic Wavetables (WAVE00–WAVE31) from the 8-bit era

(Please note: All Classic wavetables have standard waveforms on position 120-127, triangle, squares and sawtooth. Therefore, with modulations, unexpected “jumps” can happen.)

Full Name	UI Code	Description
WAVE_WA00	WAVE00	Very strong harmonics 1–8, behaving like a resonant filter; Wave 0 is a pure sine.
WAVE_WA01	WAVE01	Similar to WA00 but with added upper harmonics; evokes a dual-VCF character.
WAVE_WA02	WAVE02	Related to WA00/01; also good for vibes, bells, and tubular-bell tones.
WAVE_WA03	WAVE03	Sweep from sine to rectangular waves; low-resonance filter feel, suitable for clarinet and flute timbres.
WAVE_WA04	WAVE04	Waves 00–47 add increasingly strong high harmonics; 48–59 add them faster. Useful for delay-like and church-bell effects.
WAVE_WA05	WAVE05	Highly emphasized upper harmonics; similar to WA15 but more mixed in character.
WAVE_WA06	WAVE06	Sine-to-ramp sweep with low-resonance VCF behavior; works well for woodwind-style sounds.
WAVE_WA07	WAVE07	Filter sweep without resonance; also good for woodwind-type timbres.
WAVE_WA08	WAVE08	High-pass filter simulation with no resonance. Wave 00 lacks the fundamental; Wave 25 has it at maximum. Great for dark percussive strings or basses with clicky attacks.
WAVE_WA09	WAVE09	Strong mid-range formants; excellent for ring-modulated or vocal-like tones.
WAVE_WA10	WAVE10	Very similar to WA09.

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Full Name	UI Code	Description
WAVE_WA11	WAVE11	Low formants: Wave 00 is dark, Wave 32 bright, Wave 59 dark again.
WAVE_WA12	WAVE12	High formants that shift across the table.
WAVE_WA13	WAVE13	Strong high-order harmonics with weak fundamental; ideal for bright percussive string-keyboard tones. Sweeps create amplitude-modulation effects.
WAVE_WA14	WAVE14	Combinations of multiple organ registers.
WAVE_WA15	WAVE15	Mainly harmonics 2 and 3 progressing into a sawtooth-like sweep; good for harmonium and accordion sounds.
WAVE_WA16	WAVE16	Produces wild amplitude-modulation effects when swept, with strong peaks and dips.
WAVE_WA17	WAVE17	Wave 00: fundamental + 2nd harmonic. Wave 14: fundamental only. Around Wave 40: strong upper harmonics. Wave 59 returns to fundamental.
WAVE_WA18	WAVE18	Sweeping results in a high-low-high harmonic motion.
WAVE_WA19	WAVE19	Waves 00–32 are static waves with string-like upper harmonics and few lows; Wave 59 has no fundamental.
WAVE_WA20	WAVE20	Fast discrete shifts between low and high harmonics for sample-and-hold-type effects. Wave 00 is a sine.
WAVE_WA21	WAVE21	Progression from sine into very high-frequency formants.
WAVE_WA22	WAVE22	Ideal for echo-type textures: attack plus one delay up to two colored delays. Wave 00 is a sine.
WAVE_WA23	WAVE23	Strong, dominant high harmonics.
WAVE_WA24	WAVE24	Stationary organ-like waves; sweeping produces rising high-harmonic motion.
WAVE_WA25	WAVE25	Waves 59–49 fade from bright to sine; 48–33 have colored delays; 33–18 are sines; 17–00 feature a colored delayed echo.
WAVE_WA26	WAVE26	Variations of sawtooth waves with bright, strong formants; excellent for brass tones.
WAVE_WA27	WAVE27	Formant sweeps; keyboard-controlled wave selection works well for vocal and choir textures.
WAVE_WA28	WAVE28	Phasing sawtooth structures; great for ensemble-string timbres.
WAVE_WA29	WAVE29	Square → rectangular → narrow pulse. Sweeps produce pulse-width-modulation-type effects.
WAVE_WA30	WAVE30	Used on early Wave 2.2 units to store Waveterm-loaded samples.
WAVE_WA31	WAVE31	Held samples of piano and saxophone in pre-MIDI versions.

Additional Wavetables (32 more)*(16-bit, from classic synths, modern engines, and creative sources)*

Full Name	UI Name	Description
ACCESS_V	ACVRS	Inspired by Access Virus
BRAIDS01	BRDS1	Mutable Braids tone set 1
BRAIDS02	BRDS2	Braids tone set 2
BRAIDS03	BRDS3	Braids tone set 3
BRAIDS04	BRDS4	Braids tone set 4
ENSONIQ	ENSNQ	Ensoniq-style transwaves
ESQ1_HI	ESQ1H	ESQ-1-like spectra
ESQ1_LO	ESQ1L	ESQ-1 waves
FAIRLIGHT01	FRLGT	Fairlight-inspired vintage sampling
KAWAI_K1	KAWK1	Classic K1 sample hybrids
MICROW02	MCRW2	Microwave II/XT-style motion
PLAITS01	PLTS1	Mutable Plaits — tone bank 1
PLAITS02	PLTS2	Plaits — tone bank 2
PLAITS03	PLTS3	Plaits — tone bank 3
PPG_UPPE	PPGUP	Classic timbres
CZ_ISH	CZISH	Casio CZ-style phase-distortion waves
PROPHE00	PRPH0	Prophet VS-inspired table — vector-like motion
PROPHET	PRPHT	hybrid digital waves
ROLAND	ROLND	Roland-inspired harmonics
SINE2SAW	SIN2SW	Morph from sine → saw —sweep
SQ8_SH	SQ8SH	Ensoniq SQ-8-style digital-analog hybrid
STREICHF	STRFT	String-machine inspired ensemble harmonics
SUPERSAW	SPSAW	Multi-saw supersaw cluster
VIRUS_SA	VRSSA	Virus-style
VOCAL_FO	VOCFO	Vocal-formant table
MICROBRU	MCBRT	MicroBrute-style harmonics
BELLS	BELLS	metallic bell blends
DRONE	DRONE	Slow-evolving spectra for ambient textures
FMADDIO2	FMADD	FM/additive hybrid spectrum
SITAR	SITAR	Plucked, resonant, harmonic-rich
SYNTHARP	SYARP	Bright arpeggiator-friendly shapes
TIDAL	TIDAL	liquid digital movement

Appendix C — Glossary

A compact reference for musical and technical terminology used throughout the WAEVE82 manual.

Additive Spectrum

A waveform constructed by stacking partials (harmonics). Many digital wavetables contain additive clusters that evolve over time.

Aftertouch (Channel Pressure)

A MIDI message generated by pressing deeper into a key *after* initial note-on. On the WAEVE82, aftertouch can be routed via the Modulation Matrix.

All-Notes-Off

A command that stops all currently playing voices, on the WAEVE82 by holding the **Encoder Button** pressed for one second.

Attack / Decay / Sustain / Release (ADSR)

The four phases of an envelope generator controlling parameter evolution over time.

Bipolar Parameter ranges

A modulation range spanning negative to positive (e.g., -64...+63). Used for pitch, balance, and certain modulation depths.

Chord Mode (Stradella / Scale)

Two different CV2 chord-generation systems on the WAEVE82:

- **Stradella:** Accordion-style chord logic
- **Scale:** Chords derived from musical scales set by root + mode

Coarse / Fine Pitch

Large and small oscillator tuning increments.

Coarse = semitone steps, Fine = detuning around center.

Envelope Generator (EG)

Shapes how a signal changes over time.

The WAEVE82 has three:

- ENV1 → Filter
- ENV2 → VCA
- ENV3 → Wavetable/Noise Amount/Ringmodulator Amount

Favourite Preset

A preset assigned to one of eight slots for instant access in Play Mode.

IMDI

“Inter Module Digital Interface” – the internal, patchable MIDI used in AE Modular.

LFO (Low-Frequency Oscillator)

Slow modulation source, used for pitch, filter, wavetable position...

Modulation Matrix

A routing system allowing any supported source (e.g., CV, LFOs, envelopes, velocity) to affect a destination with independently set depth.

Mutate

Small but meaningful parametric variation based on the current patch, including auto-incremented version tag.

Pitch Bend Range

Selects the range of MIDI pitch bend (0...12 semitones).

Pickup Mode

A knob mode preventing sudden parameter jumps — value changes apply only once the knob “catches” the stored value.

Polyphony

The WAEVE82 supports **8-voice polyphony** via IMIDI and/or CV2+GATE (monophonic) and/or CV2+GATE2 (chords)

Randomizer

Generates a completely new patch using category-based constraints (“PAD”, “FX”, “RHYTHMIC”, “PERCUSSIVE”). Includes random name generation and unlimited undo/redo.

Ring Modulator

Multiplies OSC2 with a separate ring oscillator. Produces metallic, inharmonic spectra.

Stradella

Accordion-like chord logic used when CV CHRD MODE = *STRADELLA*.

Wavetable

A set of 64 waves that the oscillator scans through in real time. Defines the basic timbre of the sound.

Appendix D — Firmware & Service Notes

These notes describe system-level behavior, developer info, and recovery options.

D.1 Firmware Updates

Firmware updates may be provided in the future to introduce new features or refine existing ones.

Updates will typically be distributed as: a binary requiring a USB or programmer interface (depending on release)

Installation instructions will be provided with the firmware.

D.2 System Reset (Global Settings Reset)

To reset WAEVE82 to factory defaults:

Hold during power-up:

RND Button + Encoder Button

This resets:

- Operation Mode (to EDIT)
- Knob Mode (to DIRECT)
- CV/Base Note settings
- UI Theme
- Chord Mode & Scale
- Any other global system parameters
-

Presets and favourites remain untouched.

D.3 History Storage (Undo/Redo)

Randomize and Mutate operations create history entries stored as tiny text files on the SD card:

/history

This enables:

- Unlimited undo
- Unlimited redo
- Persistence across power cycles (only while SD remains inserted)

If no SD card is inserted → undo/redo are unavailable.

D.4 Developer Credits

WAEVE82 is a collaborative development between:

- **Mathias Brüssel** — Audio Engine & MIDI Concept
(conceptual design of the audio engine, programming the DSP / audio engine part and its MIDI-connectivity)
- **Robert Langer** — User Interface & Overall Concept
(UI design, hardware design, firmware architecture, workflow, layout)

Many ideas in the WAEVE82 would not exist without the synergy between conceptual design and deep DSP engineering – huge THANKS to Mathias for his awesome work!

...and a final note:

The WAVE82 contains an easter egg; have fun finding it :-)

D.5 Acknowledgements

We'd like to thank the authors of free WaveEdit wavetables for sharing their work!

All wavetables used by or redistributed with WAEVE82 are from the resource linked below and are used under CC0 1.0 Universal (CC0 1.0) Public Domain Dedication.

<https://github.com/smpldsnds/wavedit-online>

We'd also like to thank Leonardo Laguna Ruiz (VULT) for his help regarding the usage of the VULT-language and the free examples that come with it.

<https://github.com/vult-dsp/vult>

Robert Manzke (ctag-fh-kiel) was of huge help regarding WaveEdit Format integration and some of WAEVE82's features have been tested beforehand with the TBD as a kind of sandbox-environment.

<https://github.com/ctag-fh-kiel/ctag-tbd>

Without these people WAEVE82 would not be the same!

D.6 Support

For updates, community patches, support, and new wavetables, visit:

forum.aemodular.com



www.tangiblewaves.com