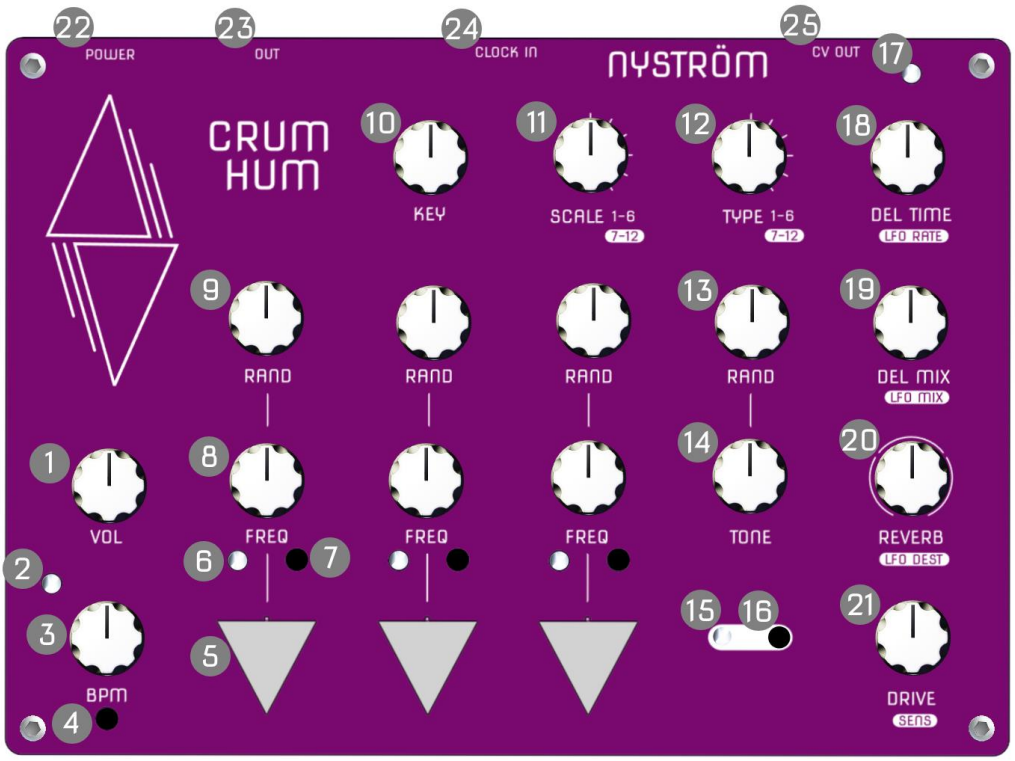
CRUM HUM

Features

- 3 melodic voices with dynamic touch control
- 12 different Sound engines
- Generative, randomized melodies and chords
- 12 different Scales
- Delay, Reverb, Drive, LFO
- CV output
- Receive Clock input
- Send and receive Midi sequencing and Midi CC



NYSTRÖM

Master parameters

1. VOL

Controls the master volume of the Crum Hum.

2. CLOCK LED

Indicates the internal or external clock of the Crum Hum.

3. BPM

Sets the tempo of the internal clock.
When clocked by an external clock source, BPM changes the clock subdivision.

4. PLAY / PAUSE BUTTON

Starts and stops the internal clock

Voice parameters

The Crum Hum has three sets of voices with identical parameters:

5. TOUCH PAD

Controls the voice volume and timbre.

6. VOICE LED

Indicates the voice volume.

7. LATCH BUTTON

Locks the voice volume to its current volume. Press button again or press the touchpad until it exceeds the latched volume in order to release the latch.

8. FREQ

Sets the lowest frequency for the voice. Scrolls through the selected **SCALE** in the selected **KEY**.

9. RAND

When no clock is running this sets the range of randomization each time a new note is played. More **RAND** gives wider range of randomized notes.
When a clock is running **RAND** sets the probability of a new note being played for each clock pulse. When **RAND** is turned all the way clockwise the voice will play a new note for each clock pulse.

Timbre & Scale parameters

10. KEY

Sets the master frequency / key. Turn the knob to tune the Crum Hum to different keys and note ranges. The key is fixed to a Chromatic scale but can be tuned unquantized when *SHIFT* is engaged.

11. SCALE

Selects which scale notes are quantized to.

	(*SHIFT*)
1. Minor Pentatonic	7. Melodic Minor
2. Major Pentatonic	8. Whole Tone
3. Minor (aeolian)	9. Chromatic
4. Lydian	10. Microtonal
5. Blues Scale	11. Harmonic Series (Overtones)
6. Phrygian dominant (mixo b2 b6)	12. Unquantized

12. TYPE

Selects different sound engines that have different timbres and sound characteristics.

	(*SHIFT*)
1. SAW with lowpass filter	7. Chords x 3
2. SQUARE with lowpass filter	8. Bas + Chord + melody 1
3. Wavetable 1	9. Bas + Chord + melody 2
4. Wavetable 2	10. Wavetable 3
5. FM 1	11. Chaotic, glitchy, noisy FM
6. FM 2	12. Noise

13. RAND

When no clock is running this sets the range of *Tonal randomization* each time a new note is played. More **RAND** gives wider range of *Tonal randomization*. When a clock is running **RAND** sets the probability of *Tonal randomization* for each clock pulse.

14. TONE

Changes the timbre / tone of the Crum Hum. **TONE** changes different things depending on which **TYPE** is selected.

15. SHIFT LED

Indicates whether or not *SHIFT* is engaged. *SHIFT* is engaged when the LED is lit. *SHIFT* allows editing of the secondary functions, indicated by text on white background (SCALE 7-12, TYPE 7-12, LFO RATE, LFO MIX, LFO DEST, SENS)

16. SHIFT BUTTON

Toggles *SHIFT* on and off.

Effects

17. LFO LED

Indicates the LFO rate.

18. DEL TIME / LFO RATE

DEL TIME

Changes the time between delay pulses. Delay time is tempo synced when a clock is running.

LFO RATE

Changes the speed of the LFO

19. DEL MIX / LFO MIX

DEL MIX

Changes the Delay feedback and mix. 100% feedback is set at 2 o' clock. Beyond that, the delay will self-oscillate.

LFO MIX

Changes the depth of the LFO

20. REVERB / LFO DEST

REVERB

Changes the reverb size and mix.

LFO DEST

Changes the destination of the LFO. The three arcs indicate the destination. The destinations from left to right are: Freq, Tone, Amplitude.

21. DRIVE / SENS

DRIVE

Changes the amount of overdrive.

SENS

Changes the sensitivity of the touch pads. Touchpad sensitivity varies depending on finger moisture and size. Default sensitivity = knob at 12 o' clock.

Inputs & Outputs

22. POWER

5V micro-USB power input.

This port can also be used to transmit MIDI-data. Each voice transmits data on a separate channel. Each voice can send and receive gate and note data.
To change MIDI channels, press and hold the *SHIFT BUTTON* while pressing the *VOICE BUTTONS.*

VOICE BUTTON	MIDI Channels
1	1-3 (default configuration)
2	2-4
3	3-5

The corresponding Voice LED will blink to indicate the change of MIDI channel.

23. OUT

3.5mm stereo audio output.

24. CLOCK IN

3-12V clock input. While clocked via CLOCK IN, the BPM knob sets the clock division to 1/4, 1/4 triplets, 1/8 or 1/16 notes.

25. CV OUT

0-3V *Control Voltage* output. CV output corresponds to the amount of touch applied touch pads. To configure which voices are active for CV output, press the *VOICE BUTTONS* while pressing and holding the *SHIFT BUTTON* and *PLAY / PAUSE BUTTON*. The *VOICE LEDs* will indicate whether the corresponding touch pad is active for CV output.

MIDI implementation

Most parameters on the Crum Hum can be controlled via Midi CC. The table below describes which CC values controls which parameter on the Crum Hum.

Midi CC messages are received on the selected Midi Channel (1, 2 or 3).

MIDI CC	Value	Parameter
3	0-127	Key
7	0-127	Master Vol
9	0-127	BPM / tempo
20	0-127	Voice 1 Freq
21	0-127	Voice 2 Freq
22	0-127	Voice 3 Freq
23	0-127	Voice 1 Rand
24	0-127	Voice 2 Rand
25	0-127	Voice 3 Rand
26	0-127	Voice 1 Touchpad
27	0-127	Voice 2 Touchpad
28	0-127	Voice 3 Touchpad
70	0-127	Type
71	0-127	Scale
74	0-127	Tone
75	0-127	Tone Rand
91	0-127	Delay Time / Lfo rate
92	0-127	Delay Mix / Lfo Mix
93	0-127	Reverb / Lfo Dest
94	0-127	Drive / Sens
95	<63 = off >64 = on	Shift Button