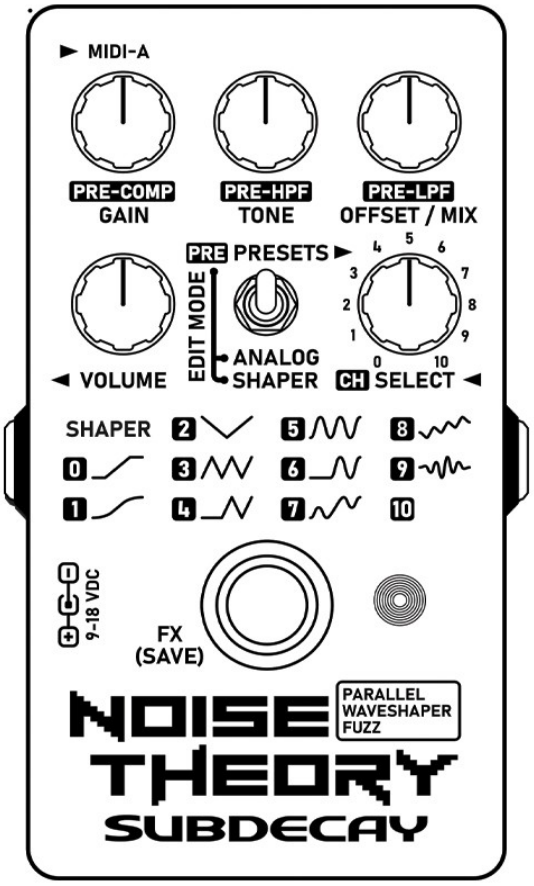
SUBDECAY

NOISE THEORY

PARELLEL WAVESHAPER FUZZ



USER GUIDE

VERSION 1.00A

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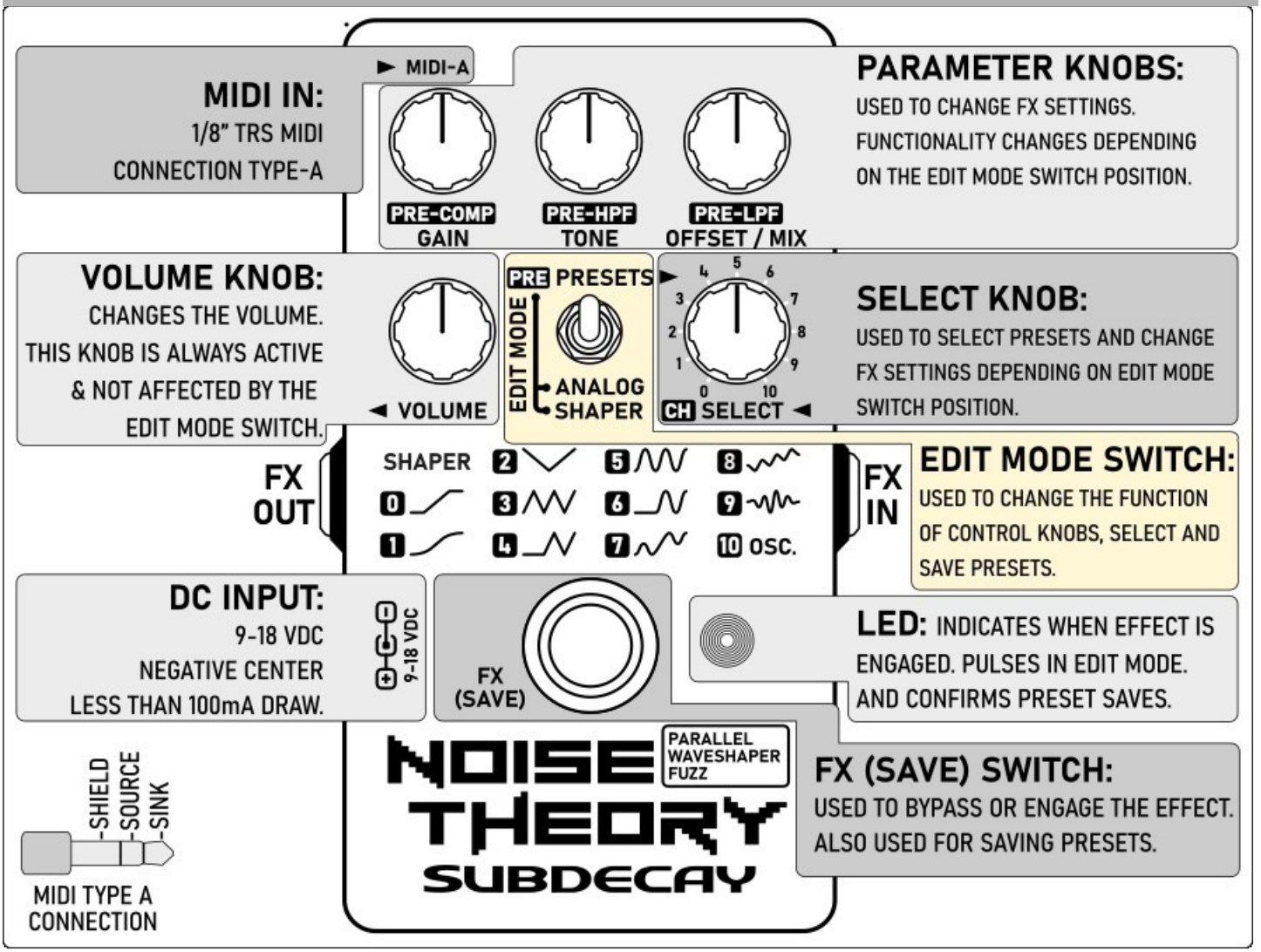
INTRODUCTION:

The Noise Theory is not your average fuzz pedal. It includes savable presets, MIDI control via CC messages for all fuzz parameters, 11 digital fuzz types and one analog fuzz.

And just because we could it also includes a chorus/flanger. The digital fuzzes are based on wave shaping and wave folding. Some can add a lot of harmonic content and greatly enhance inter-modulation between notes.

Oh, it's also a MIDI controlled 4 voice polyphonic synthesizer.
By default you can plug in a midi controller (you will need a type A 1/8" adapter) and press any note to activate the synthesizer. The fuzz will turn off. Press the FX bypass switch to exit synthesizer mode.

INPUTS, OUTPUTS, CONTROL SURFACE:



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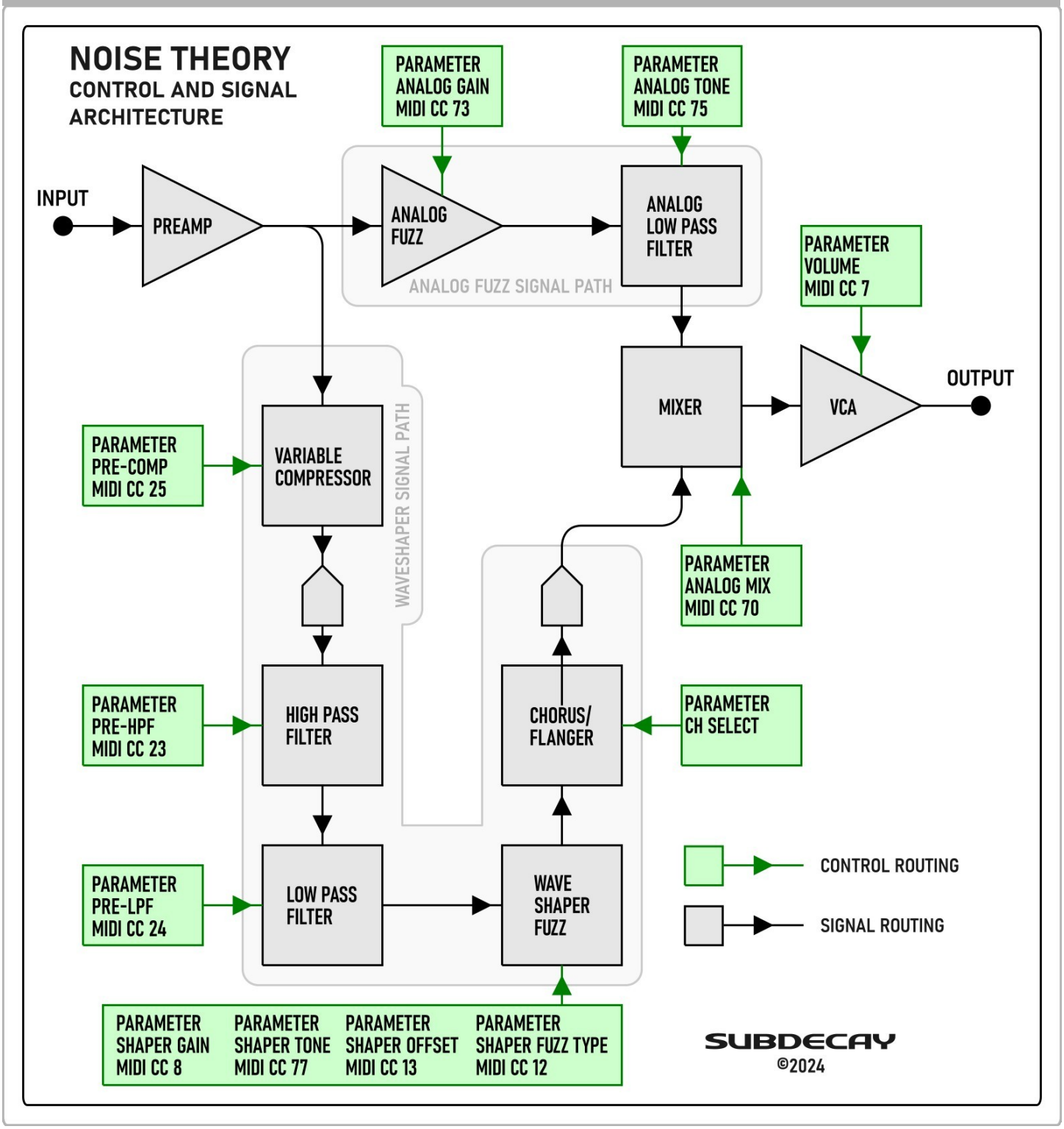
ARCHITECTURE AND SIGNAL PATH:



CONTROLS:

Top left you'll see the MIDI input. This uses a 1/8" TRS type A MIDI connector. You may need an adapter which is not included.

To get started:

1. set the EDIT MODE switch to PRESETS.
2. Connect the pedal to your guitar, amp and power.
3. When powering up the LED will flash 5 times. Wait for flashing to stop (~2 seconds)
4. Press the bypass switch to engage the effect. The LED will turn on.
5. Use the SELECT knob to try the stock presets.

While the EDIT MODE switch is set to PRESETS the top three knobs are disabled. You can still change presets and the volume.

To edit settings change the EDIT MODE switch position. Once the EDIT MODE position is set to ANALOG or SHAPER the LED will begin to pulse. This indicates edit mode is active. Exit edit mode by returning the EDIT MODE switch to PRESETS and pressing the FX switch.

EDIT MODE SWITCH:

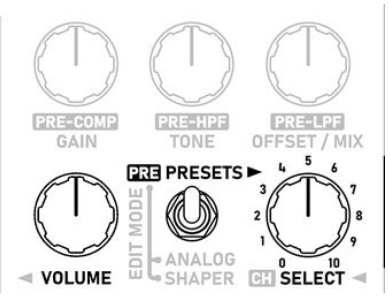
PRESETS: In this mode you can recall 11 user presets with the SELECT knob. The top 3 knobs will be inactive.

ANALOG: For editing analog fuzz and mix settings.

SHAPER: For editing waveshaper fuzz settings.

PRE: Return the EDIT MODE switch to PRESETS while edit mode is active allows control of the pre-fuzz settings and select a chorus effect.

PRESETS:

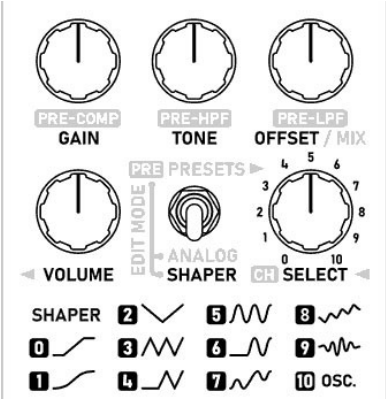


Only the SELECT & VOLUME knobs are active while the EDIT switch is set to PRESETS.

Use the SELECT knob to change presets.

The VOLUME knob adjusts the volume and is always active for all EDIT SWITCH settings.

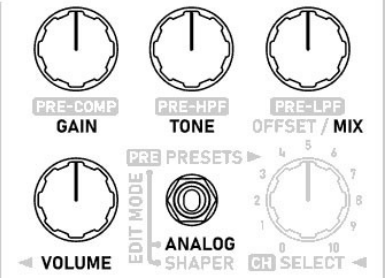
SHAPER:



Set the EDIT MODE switch to shaper to control the waveshaper fuzz.

SELECT: chooses the fuzz type.
GAIN: sets the total gain into the waveshaper fuzz.
TONE: controls a low pass filter. Turn to the left to cut high frequencies.
OFFSET: For fuzz types 0-9 this controls the bias voltage of the fuzz. Turning to the right will add a prominent 2nd harmonic. For fuzz 10 (OSCillator) this controls the low frequency of the oscillator.

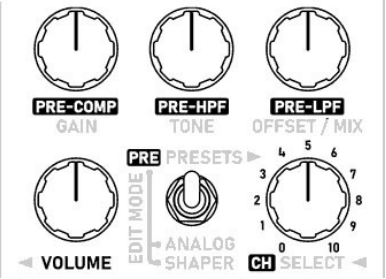
ANALOG: **The analog fuzz can get very low gain. Very useful to mix some in for bass players or when the shaper fuzz is getting into crazy territory. This helps to retain low end and musicality.*



Set the EDIT MODE switch to ANALOG to control the analog fuzz.

GAIN: set the total gain for the analog fuzz.
TONE: controls a low pass filter. Turn to the left to cut high frequencies.
MIX: Total mix of analog fuzz. Turn to the right for 100% analog fuzz. Turn to the left for 100% shaper fuzz.
SELECT knob is inactive.

PRE: Pre-fuzz and chorus.



While edit mode is active set the EDIT MODE switch to PRE to control the analog fuzz. The LED will remain pulsing. This is also when you can save a preset. See the next page for saving presets.

PRE-COMP: sets the amount of pre-fuzz compression.
PRE-HPF: controls the cutoff frequency of a high-pass filter before the fuzz. Turn to the left for more low end. Turn to the right for less.
PRE-LPF: controls the cutoff frequency of a low pass filter. Turn to the left for less high end. Turn to the right for more.
SELECT: Select 0 to turn the chorus off. Select 1-10 to choose a chorus/flange effect. *The chorus has 10 internal parameters which can be changed via MIDI in real time, but only the chorus effects from the select knob can be saved to a preset.*

SAVING A PRESET:

Saving: When the EDIT MODE switch is in the PRESET position you can save a preset at any time.

1.EDIT MODE switch set to PRESET.
2.Hold the FX(SAVE) for two seconds.
3.The LED will flash.
4.Use the SELECT knob to choose a save location. (0-10)
5.Press the FX(SAVE) switch again to save the preset.

Now, whenever edit mode is deactivated you can recall your preset with the SELECT knob.

Deactivating edit mode: If edit mode is active and the EDIT MODE switch is set to PRESET, simply bypassing the pedal with the FX switch will deactivate edit mode. Whatever changes you have made will persist until a new preset is chosen with the SELECT KNOB.

SYNTHESIZER MODE:

For some reason we decided to add a fully functional MIDI controlled 4 voice polyphonic synthesizer to the Noise Theory. This made some things complicated, but we made activating the synthesizer super simple.

Other than the normal stuff you use with guitar (cables, power supply, etc) you will need:

- A Noise Theory (duh)
- A MIDI controller or keyboard with a MIDI out port.
- A MIDI cable.
- A 1/8" MIDI type A adapter to plug into the pedal's MIDI input.

Connect this all up and press any note on the keyboard. The synthesizer should start right up.

By default the Noise Theory is set to MIDI channel 1 as are most MIDI controllers. If it doesn't work a channel mismatch is the most likely reason. See page 8&9 if you need to change the Noise Theory's MIDI channel.

SETUP MODE: FACTORY RESET AND STARTUP OPTIONS

To access startup options, restore settings or factory reset:

Setup mode is used to change global parameters like the MIDI channel or initiate a factory reset.
When powering up the pedal the LED will flash 5 times. Access setup mode by pressing the FX(SAVE) switch while the LED is flashing.
Options are chosen with the select knob.
The LED will display a series of flashes to confirm the option selected.
To use Setup Mode follow these steps and see the table below.

1. Power up the pedal.
2. Press the FX(SAVE) switch while the LED flashes.
3. Choose an action with the select knob.
4. The LED will display one long flash followed by a series of short flashes to confirm your selection.
5. Press the FX(SAVE) switch again to initiate the action
6. To change the MIDI channel (action 8&9) there is an additional step.

Select	Long	Short1	Short2	
0	1	2	1	Factory reset
1	1	2	2	Restore factory fuzz presets
2	1	2	3	Restore factory synth presets
3	1	2	4	Reset start up options – Midi CH1. MIDI note enables synth.
4	1	3	1	Reserved
5	1	3	2	Reserved
6	1	3	3	MIDI note activates synth.
7	1	3	4	Only CC115 activates synth.
8	1	4	1	Set MIDI Channel 1-11.
9	1	4	2	Set MIDI Channel 12-16.
10	1	1	1	EXIT.

Changing the MIDI channel: Changing the MIDI channel requires and extra step. See the next page for details.

SETUP MODE: CHANGING THE MIDI CHANNEL

If you chose action 8 or 9 from the startup options to change the MIDI channel there are additional steps to choose a MIDI channel and save the setting.

The LED will continue flashing and wait for another input from the SELECT knob and a press of the FX switch to save the setting. See the charts below for the corresponding MIDI channels.

Action 8: MIDI channel 1-11:

SELECT	MIDI CHANNEL
0	1
1	2
2	3
3	4
4	5
5	6
6	7
7	8
8	9
9	10
10	11

Action 9: MIDI channel 12-16:

SELECT	MIDI CHANNEL
0	12
1	13
2	14
3	15
4	16
5	16
6	16
7	16
8	16
9	16
10	16

After a setup option is chosen and saved the pedal will attempt to restart. This often works without issue, but sometimes it is necessary to remove power and plug it back in.

MIDI CC IMPLEMENTATION:

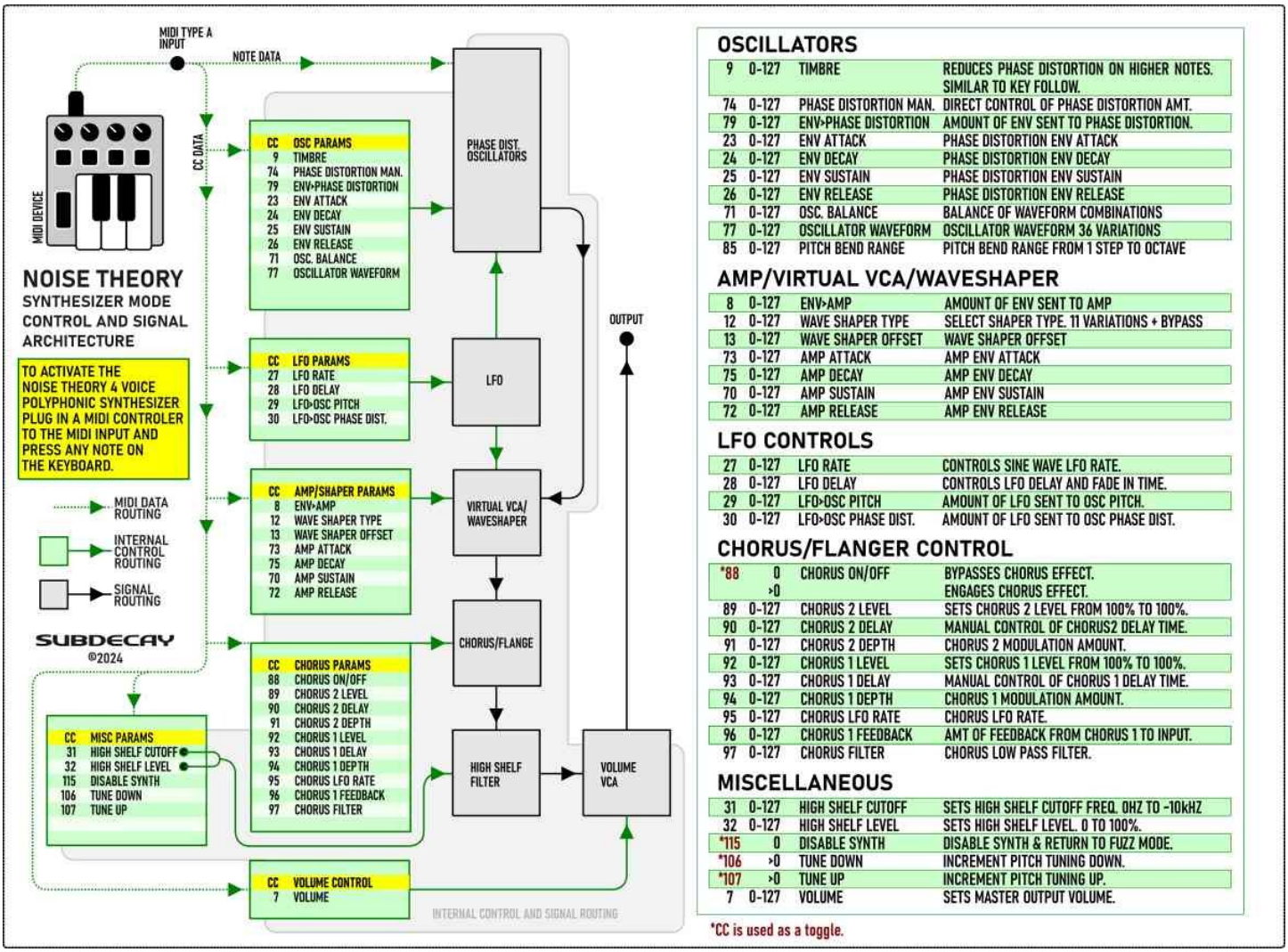
MIDI CC MAP: FUZZ MODE

MIDI CC	RANGE	FUZZ PARAMETER
7	0-127	VOLUME
8	0-127	SHAPER FUZZ GAIN
9	0-127	N/A
12	0-127	WAVE SHAPER TYPE
	0-11	Square
	12-23	Sine
	24-35	Full wave rectifier
	36-47	Wave folder
	48-59	Single sided wave folder
	60-71	Sine wave folder
	72-83	Single sided wave folder
	84–95	Zero limited wave folder
	96-107	Harmonic ripple
	108–119	Wave Smasher
	120-127	Oscillator fuzz
13	0-127	Wave shaper offset
23	0-127	Pre-HPF (pre-fuzz)
24	0-127	Pre-LPF (pre-fuzz)
25	0-127	Pre-Compressor (pre-fuzz)
70	0-127	Analog Fuzz Mix
73	0-127	Analog Fuzz Gain
75	0-127	Analog Fuzz Tone
77	0-127	Wave shaper Tone
88	0	Chorus off
	>0	Chorus on
89	-64 - +63	Chorus 2 level (can not be saved to fuzz preset)
90	0-127	Chorus 2 delay (can not be saved to fuzz preset)
91	0-127	Chorus 2 depth (can not be saved to fuzz preset)
92	-64 - +63	Chorus 1 level (can not be saved to fuzz preset)
93	0-127	Chorus 1 delay (can not be saved to fuzz preset)
94	0-127	Chorus 1 depth (can not be saved to fuzz preset)
95	0-127	Chorus LFO rate (can not be saved to fuzz preset)
96	0-127	Chorus 1 Feedback (can not be saved to fuzz preset)
97	0-127	Chorus low pass filter (can not be saved to fuzz preset)
100	0	Bypass Fuzz
	>0	Engage Fuzz
101	>0	Toggle bypass (Flip state)
115	>0	Enable Synth

Sending MIDI PC messages 0-10 will change the current preset.
Any PC messages above 10 will have no affect.

SYNTHESIZER MODE:

Architecture and CC list for Synthesizer mode:



OSCILLATORS

9	0-127	TIMBRE	REDUCES PHASE DISTORTION ON HIGHER NOTES. SIMILAR TO KEY FOLLOW.
74	0-127	PHASE DISTORTION MAN.	DIRECT CONTROL OF PHASE DISTORTION AMT.
79	0-127	ENV>PHASE DISTORTION	AMOUNT OF ENV SENT TO PHASE DISTORTION.
23	0-127	ENV ATTACK	PHASE DISTORTION ENV ATTACK
24	0-127	ENV DECAY	PHASE DISTORTION ENV DECAY
25	0-127	ENV SUSTAIN	PHASE DISTORTION ENV SUSTAIN
26	0-127	ENV RELEASE	PHASE DISTORTION ENV RELEASE
71	0-127	OSC. BALANCE	BALANCE OF WAVEFORM COMBINATIONS
77	0-127	OSCILLATOR WAVEFORM	OSCILLATOR WAVEFORM 36 VARIATIONS
85	0-127	PITCH BEND RANGE	PITCH BEND RANGE FROM 1 STEP TO OCTAVE

AMP/VIRTUAL VCA/WAVESHAPER

8	0-127	ENV>AMP	AMOUNT OF ENV SENT TO AMP
12	0-127	WAVE SHAPER TYPE	SELECT SHAPER TYPE. 11 VARIATIONS + BYPASS
13	0-127	WAVE SHAPER OFFSET	WAVE SHAPER OFFSET
73	0-127	AMP ATTACK	AMP ENV ATTACK
75	0-127	AMP DECAY	AMP ENV DECAY
70	0-127	AMP SUSTAIN	AMP ENV SUSTAIN
72	0-127	AMP RELEASE	AMP ENV RELEASE

LFO CONTROLS

27	0-127	LFO RATE	CONTROLS SINE WAVE LFO RATE.
28	0-127	LFO DELAY	CONTROLS LFO DELAY AND FADE IN TIME.
29	0-127	LFO>OSC PITCH	AMOUNT OF LFO SENT TO OSC PITCH.
30	0-127	LFO>OSC PHASE DIST.	AMOUNT OF LFO SENT TO OSC PHASE DIST.

CHORUS/FLANGER CONTROL

*88	0	CHORUS ON/OFF	BYPASSES CHORUS EFFECT.
	>0		ENGAGES CHORUS EFFECT.
89	0-127	CHORUS 2 LEVEL	SETS CHORUS 2 LEVEL FROM 100% TO 100%.
90	0-127	CHORUS 2 DELAY	MANUAL CONTROL OF CHORUS2 DELAY TIME.
91	0-127	CHORUS 2 DEPTH	CHORUS 2 MODULATION AMOUNT.
92	0-127	CHORUS 1 LEVEL	SETS CHORUS 1 LEVEL FROM 100% TO 100%.
93	0-127	CHORUS 1 DELAY	MANUAL CONTROL OF CHORUS 1 DELAY TIME.
94	0-127	CHORUS 1 DEPTH	CHORUS 1 MODULATION AMOUNT.
95	0-127	CHORUS LFO RATE	CHORUS LFO RATE.
96	0-127	CHORUS 1 FEEDBACK	AMT OF FEEDBACK FROM CHORUS 1 TO INPUT.
97	0-127	CHORUS FILTER	CHORUS LOW PASS FILTER.

MISCELLANEOUS

31	0-127	HIGH SHELF CUTOFF	SETS HIGH SHELF CUTOFF FREQ. 0HZ TO -10kHZ
32	0-127	HIGH SHELF LEVEL	SETS HIGH SHELF LEVEL. 0 TO 100%.
*115	0	DISABLE SYNTH	DISABLE SYNTH & RETURN TO FUZZ MODE.
*106	>0	TUNE DOWN	INCREMENT PITCH TUNING DOWN.
*107	>0	TUNE UP	INCREMENT PITCH TUNING UP.
7	0-127	VOLUME	SETS MASTER OUTPUT VOLUME.

*CC is used as a toggle.

MIDI PC changes presets. 0-63 are user presets. 64-127 are factory presets and can not be overwritten.

Additionally CC 119 & 118 are used for saving presets. To save a preset:

1. Send a non zero value to CC119.
2. Select PC 0-63.
3. Send a non zero value to CC118.

WARRANTY

Warranty: Subdecay Studios offers a 3 year limited warranty from the purchase date to the original purchaser. This warranty does not cover polar bear attacks, willful destroyment, using your pedal as a hammer, or the neglect of the user. It does not cover the finish, paint or any external superficial damage. Any unauthorized repairs or modifications voids the warranty.
This document was believed to be accurate at the time it was created. Specifications are subject to change without notice.