neutron

_travelers guide
_for navigating original ideas

2	56	21
3340 vcos	patch points	clock divisions

[osc sync] press **[osc sync]** hold › then noon = 12 o'clock cw / ccw = clockwise / counter

paraphonic analog semi-modular · two 3340 vcos, 12 dB multi-mode filter, bbd delay, overdrive · 32 in / 24 out patch bay

behringer neutron · manual v1.2

blue = hold

01 signal path

nt_01 · fig.01

audio	OSC MIX + NOISE + rear INPUT › VCF › OVERDRIVE › VCA › DELAY › OUTPUT
semi-modular	plays with no cables · a cable replaces the normal
play it	MIDI DIN or USB · rear DIP switches

02 oscillators

nt_02 · 2× 3340

[tune]	±1 octave · ±10 octaves (0.7 Hz – 55 kHz) with all 3 range LEDs lit
[range]	32' · 16' · 8' · all three = full range
[osc mix]	OSC 1 › OSC 2 blend
[width]	tone mod + square only · LFO via ATT 2

03 shapes

nt_03 · fig.02

[shape]	tone mod · square · saw · triangle · sine
switched	one shape at a time
blend	morphs into the next shape · per osc + LFO

04 sync · paraphonic

nt_04

[osc sync]	OSC 1 restarts OSC 2 each cycle · tune OSC 2 for the sweep
[paraphonic]	two held notes split across the oscillators · one note = both
[paraphonic]	2 s = poly chain: extra notes go out MIDI THRU to the next Neutron

05 filter

nt_05 · fig.05

[freq] **[reso]**	cutoff 10 Hz – 15 kHz · near full = it sings a sine
[mode]	LP · BP · HP on VCF 1
[key trk]	cutoff follows the last note · plays the resonance in tune
[mod depth]	FREQ MOD amount, the LFO by default
[env depth]	envelope 2 amount

09 delay

nt_09 · bbd

[time]	25 – 640 ms, longest fully cw · DELAY TIME cv
[repeats]	feedback · fully cw = endless, building
[mix]	dry › wet · fully ccw = no delay

10 overdrive

nt_10

[drive]	warmth › all-out distortion
[tone]	ccw = darker, warmer · cw = thinner, brighter
[level]	volume after the drive · **fully ccw = silence**

11 sample + hold

nt_11

[rate]	clock 0.26 – 28 Hz, or the S&H CLOCK jack (3 V)
[glide]	slides between steps, 0.5 ms – 1 s
input	noise by default = random · patch anything into S&H IN

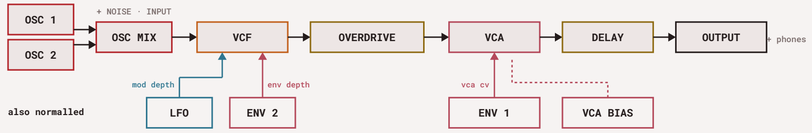
12 slew · attenuators

nt_12

[slew]	lag on SLEW IN, 1 ms – 3 s
[porta time]	glide between MIDI notes, 0 – 10 s
[1]	a VCA, up to +4 dB · its CV = ASSIGN by default
[2]	passive · LFO in, out to both WIDTHs (PWM)

__fig.01 : signal path

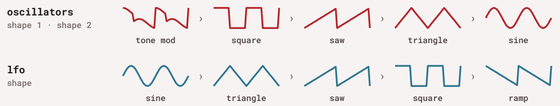
normalled · no cables



LFO › ATT 2 › both WIDTHs · LFO › MULT · ENV 2 › INVERT · NOISE › S&H · ASSIGN › ATT 1 CV · E. GATE 1 › E. GATE 2

__fig.02 : shapes

[shape] · switched or blended



switched one at a time

blend neighbours morph

switch or blend is set per osc and for the LFO (see where things hide)

width changes tone mod + square only

13 utilities

nt_13 · patch bay

[invert]	flips a signal · envelope 2 by default
[mult]	one in, two copies · the LFO by default
[sum 1] **[sum 2]**	A + B mixers, audio or CV
[assign]	0 – 5 V: OSC 1 CV · OSC 2 CV · velocity · mod wheel · aftertouch
[midi gate]	3.3 V while a key is held

14 midi · tuning

nt_14

notes	C1 – C7, outside notes clamp · pitch bend ±2
channel	four rear DIP switches · MIDI THRU passes it on
tuning	self-calibrates at power-up · **[range]** tunes to a C
update	DFU updater from musictri.be

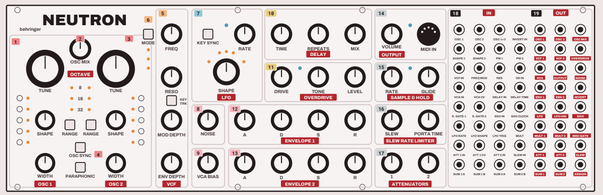
08 noise · vca bias

nt_08

[noise]	white noise into the filter · also feeds the S&H
[vca bias]	holds the VCA open with no note · drones, or hearing INPUT

__fig.03 : front panel

19 areas · tags in section colours



1	**osc 1** · tune · shape · width	11	**overdrive** · drive · tone · level
2	**osc mix** · **octave** · range LEDs	12	**envelope 1** › vca
3	**osc 2** · tune · shape · width	13	**envelope 2** › vcf
4	**range** · **sync** · **para** · the menu buttons	14	**output** · **midi in** · volume
5	**vcf** · freq · reso · depths	15	**sample & hold** · rate · glide
6	**mode** · **key trk** · LP / BP / HP	16	**slew** · slew · porta time
7	**lfo** · rate · shape · key sync	17	**attenuators** · 1 = vca · 2 = passive
8	**noise** · into the filter	18	**in** · 32 inputs
9	**vca bias** · hold it open	19	**out** · 24 outputs
10	**delay** · time · repeats · mix		

_where things hide

hold to enter, hold again to leave · nt_15

hold menus

- **osc sync** ASSIGN out: RANGE buttons pick, LFO LEDs show · KEY TRK = envelope retrigger
- **range 1 / 2** tune to C: turn TUNE till only the ramp LED is lit · PARAPHONIC = blend / switch that shape
- **key sync** PARAPHONIC = LFO blend / switch · flash = switched, throb = blend

combos

- **paraphonic 2 s** poly chain on / off · a tap still flips para
- **range + paraphonic** tune pot bypass: always in tune
- **osc sync + paraphonic** flashes the software version on the octave LEDs

_original ideas

patches from the manual

S&H › FREQ MOD	MOD DEPTH noon · random gliding filter
LFO › ATT 1 IN › DELAY TIME	short time, MIX half · chorus
VCF 1 + VCF 2 › SUM 1 › OD IN	mode LP · notch filter
OSC 1 › OSC 2 + OSC SYNC	FM
LFO › SHAPE 1 · MULT › INVERT › SHAPE 2	blend mode · mirrored morphing
square LFO › DELAY TIME · ENV 2 › LFO RATE	80s game sounds

lights

octave	● 8' · 16' · 32' ●●● full range flashing tuning or a menu
shape	● the shape in tune mode a tuning meter
blue	● LFO rate · drive · MIDI gate · S&H rate

__fig.04 : lfo clock sync

[rate] · midi clock

with MIDI clock coming in, the RATE knob picks how many beats one LFO cycle lasts

4/1	3/1	2/1	3/2	1/1	1/2	3/8	1/3	1/4	1/5	3/16	1/6	1/7	1/8	3/32	1/12	1/16	1/24	1/32	1/48	1/64

RATE fully ccw · slowest clock only, MIDI time code is ignored fully cw · fastest

__fig.05 : vcf 2

[mode] · second output

