Cheatography

Disting Mk4 Algorithms Cheat Sheet

by Bill Smith (Naenyn) via cheatography.com/21154/cs/15921/

Welcome & Conventions

Welcome! This cheat sheet describes the algorithms available in Expert Sleepers' **Disting Mk4** Eurorack module. There are so many great features crammed in to this tiny thing that I felt a compact algorithm guide would be helpful to master using it. I hope you find this guide to be useful. Please refer to the excellent manual for other functions and detailed algorithm info.

Choosing an algorithm: press **S** to enter menu, **S** again to select Algorithm, rotate **S** to choose an algorithm, then press **S** to switch to that algorithm. Click click twist click.

Example Algorithm

In/Out	
Z	top CV input
X	input
Y	input
A	output
B	output

Note: if X or Y is omitted from the left column, it is assumed to be a standard input.

Params	
param id	min/max - function
0	-31/31 - something fun

A-1 Precision Adder

In/Out	
Z	offset (+/- 10V in 1V steps)
A	X + Y + offset
B	X - Y - offset

Params	
0	0/1 - When 1, Z changes smoothly

A-2 Four Quadrant Multiplier

In/Out	
Z	scale (1/10 to 10x)
A	X * Y * scale
B	-X * Y * scale

Params	
0	0/1 - When 1, Z changes smoothly

A-3 Full-wave Rectifier

In/Out	
Z	mode (-0: independent, 0: combined)
A	abs(X+Y) or abs(X)
B	abs(X-Y) or abs(Y)

A-4 Minimum/Maximum

In/Out	
Z	gate (>2.5V, "HI"; <-1.5V, "LO")
A	min(X,Y)
B	max(X,Y)

A-5 Linear/Exponential Converter

In/Out	
Z	scale (Hz/V, centered on 1kHz)
A	(2^X) * scale
B	log2(Y/scale)

A-6 Quantizer

In/Out	
Z	scale, function of Y
X	input CV, 1V/Oct
Y	Z > 0, transpose; Z < 0, trigger
A	quantize(X)
B	trigger on note change

Params	
0	-1/31 - input X attenuation
1	0/1 - transpose mode
2	-31/31 - key
3	0/31 - offset

A-7 Comparator

In/Out	
Z	hysteresis; in 0-4V, out 0-10V
A	gate from X > Y
B	inverted gate

A-8 Dual Waveshaper

In/Out	
Z	gain (negative inverts)
A	folded X
B	triangle-to-sine Y

B-1 Sample and Hold

In/Out	
Z	slew rate
A	X when Y > 1V
B	noise +/- 8V

Params	
0	0/1 - Mode (0 = Sample and Hold, 1 = Track and Hold)

Note: Pressing Z triggers a sample manually

B-2 Slew Rate Limiter

In/Out	
Z	slew rate
A	linear slew rate limited (X+Y)
B	log slew rate limited (X+Y)

B-3 Pitch and Envelope Tracker

In/Out	
Z	slew rate for envelope
A	1V/Oct pitch derived from X + Y
B	envelope derived from X

B-4 Clockable Delay/Echo

In/Out	
Z	feedback
X	signal
Y	clock input
A	output according to mode



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B-4 Clockable Delay/Echo (cont)

B	output according to mode
	Params
0	-15/8 - delay time multiplier
1	0/2 - output mode
	Output Mode
0	A is mix; B is delay only
1	A & B are mix
2	A * B are delay only

B-5 LFO

Z	tune
X	Hz/V frequency
Y	waveshape
A	saw -> sine -> triangle
B	pulse -> square -> pulse

B-6 Clockable LFO

	In/Out
Z	integer multiplier / divider
X	clock input
Y	waveshape
A	saw -> sine -> triangle
B	pulse -> square -> pulse
	Params
0	-1/31 - attenuation for A & B

B-7 VCO with Linear FM

Z	tune +/- 0.5 octaves
X	1V/Oct pitch
Y	linear FM input
A	sine
B	saw
	Params
0	-16/8 - Octave shift
1	-1/31 - attenuation for A
2	-1/31 - attenuation for B

B-8 VCO with Waveshaping

	In/Out
Z	tune +/- 0.5 octaves
X	1V/Oct pitch
Y	waveshape/PWM
A	saw (fall) -> triangle -> saw (rise)
B	pulse -> square -> pulse

C-1 Precision Adder (fractional offsets)

	In/Out
Z	offset
A	X + Y + offset
B	X - Y - offset
	Params
0	1/12 - offset divisor

C-2 Voltage Controlled Delay Line

	In/Out
Z	feedback (bipolar)
X	audio input
Y	delay time
A	delay output
B	X + A mix
	Params
0	-31/31 - Y offset

C-3 Clockable Ping Pong Delay (Feedback)

	In/Out
Z	feedback
X	audio input
Y	clock input
A	left output
B	right output
	Params
0	0/1 - Output Mode (0 = mix, 1 = delay only)
1	-15/8 - Delay time multiplier
2	-32/32 - Input pan

C-4 Clockable Ping Pong Delay (Input Pan)

	In/Out
Z	input pan
X	audio input
Y	clock input
A	left output
B	right output
	Params
0	0/31 - Feedback
1	-15/8 - Delay time multiplier
2	0/1 - Output Mode (0 = mix, 1 = delay only)

C-5 Resonator

	In/Out
Z	strike
X	audio input
Y	center frequency (pitch)
A	audio output
B	envelope of audio output
	Params
0	-31/31 - Y offset

C-6 Vocoder

	In/Out
Z	decay time
X	modular input
Y	carrier input
A	audio output
B	envelope output
	Params
0	0/1 - filter bank
	Filter Bank
0	Half octave spacing, based on 100Hz
1	Third octave spacing, based on 250Hz



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C-7 Phaser

In/Out	
Z	feedback (bipolar)
X	audio input
Y	sweep
A	phase-shifted output plus input
B	phase-shifted output
Params	
0	-31/31 - Y offset
1	1/10 - Number of phaser stages

C-8 Bit Crusher

In/Out	
Z	bit reduction
X	signal input
Y	sample rate input
A	signal output
B	comparator output
Params	
0	-31/31 - Y offset
1	0/7 - bit reduction mode
2	0/7 - bit mangling mode

D-2 Tape Delay

In/Out	
Z	feedback
X	audio input
Y	tape speed
Params	
0	0/43 - Tape length
1	-9/8 - Fine length control
2	-8/16 - Tape speed
3	0/2 - Output mode
Output Modes	
0	A = mix, B = delay only
1	A & B are mix
2	A & B are delay only

D-3 Waveform Animator

In/Out	
Z	separation
X	audio input
Y	threshold
A	animated output
B	square waves output
Params	
0	-1/31 - LFO depth
1	-31/31 - Y offset
2	0/31 - LFO rate
3	-1/31 - Scale

D-4 State Variable Filter

In/Out	
Z	filter type
X	audio input
Y	filter frequency (1V/Oct)
A	LP->BP->HP
B	HP->BP->LP
Params	
0	0/31 - Filter resonance

D-5 LP/HP Filter

In/Out	
Z	filter resonance
X	audio input
Y	filter frequency (1V/Oct)
A	LP output
B	HP output

D-6 LP/BP Filter

In/Out	
Z	filter resonance
X	audio input
Y	filter frequency (1V/Oct)
A	LP output
B	BP output

D-7 BP/HP Filter

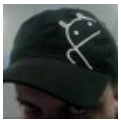
In/Out	
Z	filter resonance
X	audio input
Y	filter frequency (1V/Oct)
A	BP output
B	HP output

D-8 BP/Notch Filter

In/Out	
Z	filter resonance
X	audio input
Y	filter frequency (1V/Oct)
A	BP output
B	notch output

E-1 AR Envelope

In/Out	
Z	envelope times
X	trigger input
Y	trigger input
A	envelope output
B	envelope output
Params	
0	0/2 - Trigger Mode
1	0/1 - Z Mode
2	-32/32 - A attenuverter
3	-32/32 - B attenuverter
Trigger Mode	
0	AR (ASR)
1	AD
2	looped AD
Z Mode	
0	Z sweeps range of AD values
1	Z sets A & D to same values



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E-2 AR Envelope (with push)

In/Out	
Z	envelope times
X	trigger input
Y	trigger input
A	envelope output
B	envelope output
Params	
0	0/2 - Trigger mode
Trigger Mode	
0	AR (ASR)
1	AD
2	looped AD

Note: pushing Z has the same effect as triggering via X/Y.

E-3 AR Envelope & VCA

In/Out	
Z	envelope times
X	trigger input
Y	VCA input
A	envelope output
B	VCA output
Params	
0	0/2 - Trigger Mode
1	0/1 - Z Mode
2	-32/32 - A attenuverter
3	-32/32 - B attenuverter
Trigger Mode	
0	AR (ASR)
1	AD
2	looped AD
Z Mode	
0	Z sweeps range of AD values
1	sets A & D to same values

E-4 AR Envelope & VCA (with push)

In/Out	
Z	envelope times
X	trigger input
Y	VCA input
A	envelope output
B	VCA output
Params	
0	0/2 - Trigger Mode
Trigger Mode	
0	AR (ASR)
1	AD
2	looped AD

Note: pushing Z has the same effect as triggering via X/Y.

E-5 Dual AR Envelope

In/Out	
Z	envelope times
X	trigger input A
Y	trigger input B
A	envelope output A
B	envelope output B
Params	
0	0/2 - Trigger Mode
1	0/1 - Z Mode
2	-32/32 - A attenuverter
3	-32/32 - B attenuverter
Trigger Mode	
0	AR (ASR)
1	AD
2	looped AD
Z Mode	
0	Z sweeps range of AD values
1	Z sets A & D to same values

E-6 Dual AR Envelope (with push)

In/Out	
Z	envelope times
X	trigger input A
Y	trigger input B
A	envelope output A
B	envelope output B
Params	
0	0/2 - Trigger Mode
Trigger Mode	
0	AR (ASR)
1	AD
2	looped AD

Note: pushing Z has the same effect as triggering via X/Y.

E-7 Euro to Buchla Converter

In/Out	
Z	tune +/- 0.5 octaves
X	1V/Oct
Y	gate
A	1.2V/Oct
B	gate/trigger

E-8 Buchla to Euro Converter

In/Out	
Z	tune +/- 0.5 octaves
X	1.2V/Oct
Y	gate/trigger
A	1V/Oct
B	trigger

F-1 Clockable AD Envelope (with mute)

In/Out	
Z	envelope shape
X	clock input
Y	mute input
A	envelope output
B	envelope output



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F-1 Clockable AD Envelope (with mute) (cont)

Params	
0	-15/8 - Delay time multiplier
1	-32/32 - A attenuverter
2	-32/32 - B attenuverter

F-2 Clockable AD Envelope (with gate)

In/Out	
Z	envelope shape
X	clock input
Y	gate input
A	envelope output
B	envelope output
Params	
0	-15/8 - Delay time multiplier
1	-32/32 - A attenuverter
2	-32/32 - B attenuverter

F-3 Clockable AD Envelope (with trigger)

In/Out	
Z	envelope shape
X	clock input
Y	trigger inptut
A	envelope output
B	envelope output
Params	
0	-15/8 - Delay time multiplier
1	-32/32 - A attenuverter
2	-32/32 - B attenuverter

F-4 Clockable AD Envelope & VCA

In/Out	
Z	envelope shape
X	clock input
Y	VCA input
A	envelope output
B	VCA output
Params	
0	-15/8 - Delay time multiplier

F-4 Clockable AD Envelope & VCA (cont)

1	-32/32 - A attenuverter
2	-32/32 - B attenuverter

F-5 Shift Register Random CVs

In/Out	
Z	randomness
X	clock input
Y	modify input
A	unipolar output
B	bipolar output
Params	
0	0/1 Direction
1	1/16 - Length
2	0/31 - Slew rate
3	-1/31 - Output attenuator

F-6 Shift Register Random Quantized CVs

In/Out	
Z	randomness
X	clock input
Y	modify input
A	quantized CV output
B	trigger output
Params	
0	0/1 - Direction
1	1/16 - Length
2	0/15 - Scale
3	-1/31 - Output attenuator

F-7 Shift Register Random Triggers

In/Out	
Z	randomness
X	clock input
Y	modify input
A	trigger output
B	inverse trigger output
Params	
0	1/16 - Length

F-8 Shift Register Random Dual Triggers

In/Out	
Z	randomness
X	clock input
Y	modify input
A	trigger output A
B	trigger output B
Params	
0	1/16 - Length A
1	1/16 - Length B

G-1 ES-1 Emulation

In/Out	
Z	trim
X	input 1
Y	input 2
A	output 1
B	output 2

G-2 ES-2 Emulation

In/Out	
Z	trim
X	input 1
Y	input 2
A	output 1
B	output 2

G-3 Pitch Reference

In/Out	
Z	amplitude of A & B
X / Y	not used
A	sine
B	square
Params	
0	0/11 - Semitone
1	-1/9 - Octave



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G-4 Frequency Reference

In/Out	
Z	amplitude of A & B
X / Y	not used
A	sine
B	square

Note: turning S sets frequency. Pushing Z advances the decimal place. See manual for details.

G-5 Tuner

In/Out	
Z	amplitude of B
X	input
Y	not used
A	copy of X
B	sine wave of pitch of X

I-7 Dual Audio Playback

In/Out	
Z	selects the samples
X	trigger A
Y	trigger B
A	left audio output
B	right audio output
Params	
0	0/1 - panning option
Panning Option	
0	X triggers A, Y triggers B. Stereo samples mono-summed.
1	Mono samples are panned centrally, stereo samples are played in stereo.

M-2 Scaled LFO

In/Out	
Z	LFO Speed
X	min or offset
Y	max or scale
A	LFO A
B	LFO B

M-2 Scaled LFO (cont)

Params	
0	0/6 - Output type A
1	0/6 - Output type B
2	-32/32 - LFO speed range
3	0/1 - X/Y Mode
4	-48/48 - X offset
5	-48/48 - Y offset
Output Type	
0	triangle
1	sine
2	square
3	rising ramp
4	falling ramp

I-8 Dual Audio Playback with Z Speed

In/Out	
Z	playback speed
X	trigger A
Y	trigger B
A	left audio output
B	right audio output
Params	
0	0/99 - Selects sample A
1	0/99 - Selects sample B
2	0/1 - panning option (see I-7)
3	0/3 - selects which sample(s) are affected by Z
Z Speed	
0	Both samples' speeds controlled by Z.
1	Sample A speed fixed; B variable.
2	Sample B speed fixed; A variable.
3	Both samples' speeds are fixed.

J-1 MIDI File Playback (Clocked)

In/Out	
Z	selects MIDI file
X	clock
Y	retrigger CV
A	pitch CV output
B	gate output

J-3 MIDI File Playback (Free Running)

In/Out	
Z	playback speed
X	V/Oct speed CV
Y	retrigger CV
A	pitch CV output
B	gate output
Params	
0	0/31 - Selects the MIDI file

J-4 Audio Playback with End CV

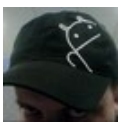
In/Out	
Z	end position or retrigger CV
X	retrigger or end position CV
Y	start position CV
A	left audio output
B	right audio output
Params	
0	0/99 - selects the sample
Retrigger / End Position Controls	

If Z is negative, X is retrigger and Z controls sample end point

If Z is positive, Z is retrigger input and X controls the sample end point.

J-5 Audio Recorder

In/Out	
Z	controls recording
X	left audio input
Y	right audio input
A	left audio output



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J-5 Audio Recorder (cont)

B	right audio output

K-1 Wavetable VCO

In/Out	
Z	tune +/- 0.5 octaves
X	1V/Oct pitch input
Y	wavetable input
A	wavetable output
B	sub-octave square output
Params	
0	0/99 - selects the wavetable
1	-16/8 - octave shift
2	-31/31 - Y offset

K-5 Programmable Quantizer

In/Out	
Z	slew
Y	pitch or retrigger
A	quantized(X+Y)
B	trigger on note change
Params	
0	0/31 - Scale
1	-1/31 - X attenuation
2	-2/31 - Y attenuation (if -2, Y becomes a trigger)
3	-31/31 - Transpose
4	0/31 - Offset between X & Y

L-1 Stereo Reverb

In/Out	
Z	wet/dry
X	left input
Y	right input
A	left output
B	right output
Params	
0	0/31 - Size
1	0/31 - Feedback

L-1 Stereo Reverb (cont)

2	0/5 - Character
3	-1/31 - Lowpass filter

L-2 Mono-to-Stereo Reverb

In/Out	
Z	wet/dry
X	audio input
Y	feedback CV
A	left output
B	right output
Params	
0	0/31 - Size
1	0/31 - Feedback
2	0/5 - Character
3	-1/31 - Lowpass filter

L-3 Dual Reverb

In/Out	
Z	wet/dry
A	X + reverb
B	Y + reverb
Params	
0	0/31 - Size
1	0/31 - Feedback
2	0/5 - Character
3	-1/31 - Lowpass filter

L-5 Stereo Chorus

In/Out	
Z	wet/dry
X	audio input
Y	LFO rate
A	left output
B	right output
Params	
0	0/31 - LFO depth
1	-31/31 - Y offset
2	-31/31 - Feedback

L-5 Stereo Chorus (cont)

3	-1/31 - Lowpass filter

L-6 Mono Chorus

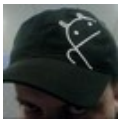
In/Out	
Z	wet/dry
X	audio input
Y	LFO rate
A	blended output
B	wet output

L-8 Gate

In/Out	
Z	threshold
X	left input
Y	right input
A	left output
B	right output
Params	
0	0/99 - Attack time
1	0/99 - Hold time
2	0/99 - Release time
3	0/99 - Lookahead

M-1 Delayed LFO

In/Out	
Z	LFO Speed
X	trigger input
Y	ramp time
A	configurable output
B	configurable output
Params	
0	0/6 - Output type A
1	0/6 - Output type B
2	-32/32 - LFO speed range
3	-32/32 - Ramp time range
4	-32/32 - A attenuverter
5	-32/32 - B attenuverter
Output Types	



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M-1 Delayed LFO (cont)

0	ramp
1	triangle affected by rap
2	sine affected by ramp
3	square affected by ramp
4	triangle
5	sine
6	square

I-6 Audio Playback with Scrub

In/Out	
Z	selects the sample
X	not used
Y	playback position
A	left audio output
B	right audio output
Params	
0	1/99 - Speed limit
1	0/20 - Slew limit
2	-32/32 - Y offset

I-5 Audio Playback with Reverse

In/Out	
Z	playback speed
X	retrigger CV
Y	selects the sample
A	left audio output
B	right audio output
Params	
0	-49/49 - Y offset

I-4 Audio Playback with Z Speed

In/Out	
Z	playback speed
X	retrigger CV
Y	start position CV
A	left audio output
B	right audio output
Params	

I-4 Audio Playback with Z Speed (cont)

0	0/99 - selects the sample

I-3 Audio Playback with V/Oct

In/Out	
Z	selects the sample
X	retrigger CV
Y	V/Oct pitch CV
A	left audio output
B	right audio output
Params	
0	-8/8 - Octave shift

I-2 Clocked Audio Playback

In/Out	
Z	selects the sample
X	retrigger CV
Y	clock
A	left audio output
B	right audio output

I-1 Audio Playback

In/Out	
Z	selects the sample
X	retrigger CV
Y	start position CV
A	left audio output
B	right audio output

H-7 Noise

In/Out	
Z	blend
A	noise, optionally scaled by X
B	noise, optionally scaled by Y
Params	
0	-1/3 - Type of A
1	-1/3 - Type of B
2	-1/31 - A Attenuation
3	-1/31 - B Attenuation

H-7 Noise (cont)

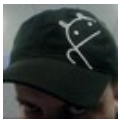
Noise Types	
-1	Blended
0	Violet
1	White
2	Pink
3	Red

H-6 Dual Delayed Pulse Generator

In/Out	
Z	function
A	pulse triggered by X
B	pulse triggered by Y
Params	
0	0/6 - Z mode
1	0/12 - Range
2	-1/31 - Delay
3	0/31 - Length
Z Mode/Function	
0	delay
1	length
2	Output override (high). Z > 1V forces both outputs high
3	Output override (low). Z > 1V forces both outputs low
4	Input enable. Z < 1V disables input triggers.
5	Input disable. Z > 1V disables input triggers.
6	Z is an additional trigger input which triggers both outputs.

H-5 Dual Euclidean Patterns

In/Out	
Z	sets 'pulses' for pattern 2
X	clock input
Y	reset input
A	pattern 1



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Cheatography

Disting Mk4 Algorithms Cheat Sheet

by Bill Smith (Naenyn) via cheatography.com/21154/cs/15921/

H-5 Dual Euclidean Patterns (cont)

B	pattern 2
	Params
0	1/16 - Steps
1	1/16 - Pulses (pattern 1)
2	0/16 - Rotation
3	0/31 - Pulse length

H-4 Dual Quantizer

	In/Out
Z	trigger
A	quantize(X)
B	quantize(Y)
	Params
0	-1/31 - X attenuation
1	-1/31 - Y attenuation
2	-16/16 - X scale/trigger mode
3	-16/16 - Y scale/trigger mode

Note: if 2/3 < 0, input Z > 1V to trigger

H-3 Dual Quantizer (Z scale)

	In/Out
Z	scale
A	quantize(X)
B	quantize(Y)
	Params
0	-1/31 - X attenuation
1	-1/31 - Y attenuation
2	-31/31 - X transpose
3	-31/31 - Y transpose

H-2 Dual Sample and Hold

	In/Out
Z	trigger
A	X when Z > 1V
B	Y when Z > 1V
	Params
0	0/1 - Mode: (0, Sample & Hold; 1, Track * Hold)

H-2 Dual Sample and Hold (cont)

Note: pushing Z triggers a sample manually.

H-1 Crossfade/Pan

	In/Out
Z	pan position/crossfade amount
A	mix of X & Y
B	inverted mix of X & Y
	Params
0	0/2 - Crossfade/pan law
	Crossfade/pan law
0	Equal gain (for phase-coherent material)
1	Equal power (for non-phase-coherent material)
2	Transition (DJ-style)

G-8 CV->MIDI

	In/Out
Z	mod wheel or velocity CV input
X	pitch CV input
Y	gate input
A & B	not used
	Params
0	0/99 - offset, in frames, between X & Y
1	0/1 - Z mode
	Z Mode
0	Z sets velocity of generated MIDI notes
1	Z generates CC1 (note: velocity fixed at 64)

G-7 MIDI->CV

	In/Out
Z	not used
X & Y	not used
A	pitch CV output
B	gate output

Note: receives MIDI from expansion board.

G-6 MIDI Clock

	In/Out
Z	not used
X	clock input
Y	run/stop
A	clock output
B	clock output
	Params
0	-2/12 - Clock divisor for A
1	-2/12 - Clock divisor for B
2	0/11 - Clock divisor for MIDI clock output
3	0/1 - Y mode (0, Y is not used; 1, Y is run/stop)



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