	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**Precision Adder** A = X + Y + offset, or X + offset B = X - Y - offset, or Y + offset offset = +-10V in 1V steps derived from Z *Knob recorder enabled*	**Sample and Hold** A = X when Y exceeds 1V B = noise +-8V Z is slew rate	**Precision Adder (fractional offsets)** A = X + Y + offset B = X - Y - offset offset in steps derived from Z *Knob recorder enabled*	**DJ Filter** X & Y are stereo audio input A & B are stereo audio output Z is filter sweep	**AR Envelope** X is trigger input Y is trigger input Z sets the envelope times A is envelope output B is envelope output *Press Z to trigger*	**Clockable AD Envelope (with mute)** X is clock input Y is mute input Z sets the envelope shape A is envelope output B is envelope output *Tap tempo enabled*	**ES-1 Emulation** X is input 1 Y is input 2 Z is trim A is output 1 B is output 2	**Crossfade/Pan** A = Mix of X & Y according to Z B = Inverted mix of X & Y according to Z, or LFO *Knob recorder enabled*	**Audio Playback** X is retrigger CV Y is start position CV Z selects the sample A is left audio output B is right audio output	**MIDI File Playback (Clocked)** X is clock Y is retrigger CV Z selects the MIDI file A is pitch CV output B is gate output *Outputs MIDI*	**Wavetable VCO** X is V/Oct pitch input Y is wavetable input Z is tune +-0.5 octaves A is wavetable output B is sub-octave square output or detuned output	**Stereo Reverb** X is left input Y is right input A is left output B is right output Z is wet/dry or freeze Z press is freeze	**Delayed LFO** A and B are LFOs, ramps, or ramped LFOs X is trigger input Y is ramp time Z is LFO speed	
2	**Four Quadrant Multiplier** A = X * Y * scale B = -X * Y * scale scale = 1/10 to 10x in steps derived from Z *Knob recorder enabled*	**Slew Rate Limiter** A = linear slew rate limited (X + Y) B = log slew rate limited (X + Y) Z is slew rate	**Voltage Controlled Delay Line** X is audio input Y is delay time Z is feedback (bipolar) A is delay output B is delay output plus input signal	**Tape Delay** X is audio input Y is tape speed Z is feedback A = output according to mode B = output according to mode	**AR Envelope & VCA** X is trigger input Y is VCA input Z sets the envelope times A is envelope output B is VCA output *Press Z to trigger*	**Clockable AD Envelope (with gate)** X is clock input Y is gate input Z sets the envelope shape A is envelope output B is envelope output *Tap tempo enabled*	**ES-2 Emulation** X is input 1 Y is input 2 Z is trim A is output 1 B is output 2	**Dual Sample and Hold** A = X when Z exceeds 1V B = Y when Z exceeds 1V	**Clocked Audio Playback** X is retrigger CV Y is clock Z selects the sample, or start position A is left audio output B is right audio output	**Multisample 2 Audio Playback** X is retrigger CV Y is V/octave pitch CV Z is tune +-0.5 octaves A is left audio output B is right audio output	**Clockable Wavetable LFO** X is clock input Y is wavetable input Z is integer multiplier/divider A & B are wavetable output	**Mono-to-Stereo Reverb** X is audio input Y is feedback CV A is left output B is right output Z is wet/dry or freeze Z press is freeze	**Scaled LFO** A and B are LFOs X and Y are min/max or offset/scale Z is LFO speed	
3	**Full-Wave Rectifier** A = abs(X + Y) or abs(X) B = abs(X - Y) or abs(Y) Z selects mode	**Pitch and Envelope Tracker** A = V/octave pitch derived from X, plus Y B = envelope dervied from X Z is slew rate for envelope	**Clockable Ping Pong (Z feedback)** X is audio input Y is clock Z is feedback A is left output B is right output *Tap tempo enabled*	**Waveform Animator** X is audio input Y is threshold Z is separation A = animated output B = square waves output	**Dual AR Envelope** X is trigger input A Y is trigger input B Z sets the envelope times A is envelope output A B is envelope output B *Press Z to trigger*	**Clockable AD Envelope (with trigger)** X is clock input Y is trigger input Z sets the envelope shape A is envelope output B is envelope output *Tap tempo enabled*	**Pitch Reference** X & Y are not used A is sine output B is square output Z sets the amplitude of A & B	**Dual Quantizer (Z scale)** A = quantized(X) B = quantized(Y) Z chooses scale *Outputs MIDI*	**Audio Playback with V/Oct** X is retrigger CV Y is V/octave pitch CV Z selects the sample A is left audio output B is right audio output	**MIDI File Playback (Free Running)** X is V/octave speed CV Y is retrigger CV Z sets the playback speed A is pitch CV output B is gate output *Outputs MIDI*	**Wavetable Waveshaper** X is signal input Y is wavetable input Z is gain A is wavetable output B is complementary wavetable output	**Dual Reverb** A is X plus reverb B is Y plus reverb Z is wet/dry or freeze Z press is freeze	**Logic** A and B are logic outputs X and Y are inputs Z selects logical operation for output A	
4	**Minimum/Maximum** A = min(X, Y) B = max(X, Y) Z is gate	**Clockable Delay/Echo** X is signal Y is clock input Z is feedback A = output according to mode B = output according to mode *Tap tempo enabled*	**Clockable Ping Pong (Z input pan)** X is audio input Y is clock Z is input pan A is left output B is right output *Tap tempo enabled*	**State Variable Filter** X is audio input Y is filter frequency Z is filter type A is filter output LP->BP->HP B is filter output HP->BP->LP	**Stereo Compressor** X is left input Y is right input A is left output B is right output Z is compression ratio	**Clockable AD Envelope & VCA** X is clock input Y is VCA input Z sets the envelope shape A is envelope output B is VCA output *Tap tempo enabled*	**Frequency Reference** X & Y are not used A is sine output B is square output Z sets the amplitude of A & B	**Dual Quantizer** A = quantized(X) B = quantized(Y) Z is trigger *Outputs MIDI*	**Audio Playback with Z Speed** X is retrigger CV Y is start position CV Z sets the playback speed A is left audio output B is right audio output	**Audio Playback with End CV** X is retrigger or end position CV Y is start position CV Z is end position or retrigger CV A is left audio output B is right audio output	**Clockable Wavetable Envelope** X is clock input Y is wavetable input Z is trigger A & B are wavetable output	**Dual Vowel Filter** X & Y are inputs A & B are outputs Z is vowel selection	**Half-wave Rectifier** A and B are outputs X and Y are inputs Z is threshold *Knob recorder enabled*	
5	**Linear/Exponential Converter** A = (2 ^ X) * scale B = log2(Y / scale) Z is HZ/V scale, centred on 1kHz	**LFO** X is Hz/V frequency Y is waveshape Z is tune A is saw -> sine -> triangle B is pulse -> square -> pulse	**Resonator** X is audio input Y is centre frequency (pitch) Z is gain A is audio output B is envelope of audio output Z press is 'strike'	**LP/HP Filter** X is audio input Y is filter frequency Z is filter resonance A is low pass filter output B is high pass filter output	**Side-chain Compressor** X is left input Y is right input A is left output B is right output Z is side-chain input	**Shift Register Random CVs** X is clock input Y is modify input Z sets the randomness A is unipolar output B is bipolar output	**Tuner** X is input Y is not used A is a copy of X B is a sine wave at the tracked pitch Z sets the amplitude of B	**Dual Euclidean Patterns** A is pattern 1 out B is pattern 2 out X is clock input Y is reset input Z sets the 'pulses' for pattern 2	**Audio Playback with Reverse** X is retrigger CV Y selects the sample Z sets the playback speed A is left audio output B is right audio output	**Audio Recorder** X is left audio input Y is right audio input Z controls recording A is left audio output B is right audio output	**Programmable Quantizer** A = quantized(X+Y) B = trigger on note change Z is slew Y = pitch or trigger *Outputs MIDI*	**Stereo Chorus** X is audio input Y is LFO rate A is left output B is right output Z is wet/dry	**Stereo Filter** X is left input Y is right input A is left output B is right output Z is filter frequency *Knob recorder enabled*	
6	**Quantizer** A = quantized(X) B = trigger on note change Z chooses scale & function of Y Y = transpose (Z positive) or trigger (Z negative) *Outputs & Receives MIDI*	**Clockable LFO** X is clock input Y is waveshape Z is integer multiplier/divider A is saw -> sine -> triangle B is pulse -> square -> pulse *Tap tempo enabled*	**Vocoder** X is modulator input Y is carrier input Z sets the decay time A is audio output B is envelope output	**LP/BP Filter** X is audio input Y is filter frequency Z is filter resonance A is low pass filter output B is band pass filter output	**Mono Compressor** X is audio input Y is side-chain input A is audio output B is gain reduction output Z is compression ratio	**Shift Register Random Quantized CVs** X is clock input Y is modify input Z sets the randomness A is quantized CV output B is trigger output *Outputs MIDI*	**MIDI Clock** X is clock input Y is run/stop input A & B are clock outputs Z is not used *Outputs & Receives MIDI*	**Dual Delayed Pulse Generator** A is pulse triggered by X B is pulse triggered by Y Z function depends on parameter setting	**Audio Playback with Scrub** X is not used Y is playback position Z selects the sample A is left audio output B is right audio output	**Multisample Audio Playback** X is retrigger CV Y is V/octave pitch CV Z is tune +-0.5 octaves A is left audio output B is right audio output	**Clockable SD Delay** X is signal Y is clock input Z is feedback A = output according to mode B = output according to mode *Tap tempo enabled*	**Mono Chorus** X is audio input Y is LFO rate A is blended output B is wet output Z is wet/dry	**Stereo Tape Delay** X is left input Y is right input A is left output B is right output Z is tape speed	
7	**Comparator** A = gate from X > Y B = inverted gate Z is hysteresis	**VCO with linear FM** X is V/Oct pitch input Y is linear FM input Z is tune +-0.5 octaves A & B are selectable output waveforms	**Phaser** X is audio input Y is sweep Z is feedback (bipolar) A is phase-shifted output plus input signal B is phase-shifted output	**BP/HP Filter** X is audio input Y is filter frequency Z is filter resonance A is band pass filter output B is high pass filter output	**Euro to Buchla Converter** X is 1V/octave input Y is gate input Z is tune +-0.5 octaves A is 1.2V/octave output B is gate/trigger output	**Shift Register Random Triggers** X is clock input Y is modify input Z sets the randomness A is trigger output B is inverse trigger output *Press Z to modify sequence*	**MIDI/CV** X & Y are not used A is pitch CV output B is gate output Z is not used *Receives MIDI*	**Noise** A is noise, optionally scaled by X B is noise, optionally scaled by Y Z is blend	**Dual Audio Playback** X is trigger A Y is trigger B Z selects the samples A is left audio output B is right audio output	**Mono Audio Recorder** X is audio input Z controls recording A is audio output	**Stereo Clockable SD Delay** X & Y are stereo audio inputs A & B are stereo audio outputs Z is feedback *Tap tempo enabled*	**Mixer** X & Y are inputs A is left output B is right output Z is pan for input X		
8	**Dual Waveshaper** A = folded X B = triangle-to-sine Y Z is gain *Knob recorder enabled*	**VCO with Waveshaping** X is V/Oct pitch input Y is waveshape/PWM Z is tune +-0.5 octaves or sync A & B are selectable output waveforms	**Bit Crusher** X is signal input Y is sample rate input Z sets bit reduction A is signal output B is comparator output	**BP/Notch Filter** X is audio input Y is filter frequency Z is filter resonance A is band pass filter output B is notch filter output	**Buchla to Euro Converter** X is 1.2V/octave input Y is gate/trigger input Z is tune +-0.5 octaves A is 1V/octave output B is trigger output	**Shift Register Random Dual Triggers** X is clock input Y is modify input Z sets the randomness A is trigger output A B is trigger output B	**CV/MIDI** X is pitch CV input Y is gate input A & B are not used Z is mod wheel or velocity CV input *Outputs MIDI*	**Quantizer 2** X is pitch CV input Y is trigger input or pitch CV input Z sets the interval between A & B A is quantized CV out B is quantized CV out	**Dual Audio Playback with Z Speed** X is trigger A Y is trigger B Z sets the playback speed A is left audio output B is right audio output	**Audio Playback with Crossfade** X is gate/clock CV Y is V/octave pitch CV Z selects the sample A is left audio output B is right audio output	**Stereo Clockable SD Delay (Z clock)** X & Y are stereo audio inputs A & B are stereo audio outputs Z is clock input *Tap tempo enabled*	**Gate** X is left input Y is right input A is left output B is right output Z is threshold		**Clockable SD Ping Pong** X is signal Y is clock input A & B are stereo audio outputs Z is feedback *Tap tempo enabled*