

Clocked Delay

Programs for Z-DSP



TIPTOPaudio

Clocked Delay Programs for Z-DSP

This collection of programs uses an external clock source to set the delay times for easy synchronization. The delay programs include mono and dual delay lines for a variety of classic effects.

Quick Start with Trigger Riot or Circadian Rhythms:

Note: the Clock control knob has to be set to 0 (full counter clockwise) in order for tracking to work!

Trigger Riot:

The Clock output from the Trigger Riot cannot be used with these programs, so connect output 1 to the VC-P2 CV input on the Z-DSP.

Start with a blank Preset, set the BPM to 120BPM, and start by adjusting the Pulse Width on all division knobs to between 25 and 50%. You can save that into a preset as a template you can easily recall later. Switch back to Divide and set a division of 4 on one output for the quarter note clock into the Z-DSP.

In the range of 60 to 180 BPM, divisions from 3 to 7 can be used if the Speed setting is 16ths (the default). Above 120 BPM, a division of 8 will provide much longer times which is particularly useful on the Dual programs.

Adjusting the pulse width to 50% on shorter divisions may also work for slower tempos.

Circadian Rhythms:

The Clock output from the Circadian Rhythms cannot be used with these programs, so connect output of channel 1 to the VC-P2 CV input on the Z-DSP.

Use consistent 4th note intervals on the CR for the best sync. The output needs to be a GATE with at least 2 steps length for the Z-DSP to track.

Try a Gate on steps 1+2 (hold steps 1 and 2 until they turn Red) and 5+6 to send 4th notes. Above 120bpm, just a gate on steps 1 and 2 (half note) will give longer delay times, particularly useful on the Dual programs.

How To Sync With A Clock:

The middle CV input is used for the Clock signal, and accepts clocks in the general ranges:

BPM	Notes	Pulse Width
Below 60	8th, 16th	50%
61-120	4th	25-50%
120-180	4th, half	25%
180+	half, whole	25%

Note: the Clock control knob has to be set to 0 (full counter clockwise) in order for tracking to work!

When using regular intervals as the clock source in the ranges outlined above, these delay programs will sync after a few clocks are input, and can track changes in Tempo provided they stay in range.

A suitable pulse width length is needed for the programs to track the rising and falling edges. In general, triggers are too short and pulse width duty cycles of 25-50% work well. **The 16th note (4 PPQN) and DIN/MIDI (24 PPQN) clocks common to Euro have too short of a pulse for the Z-DSP to track.** Using a clock divider down to the note lengths above are needed (Divide by 4 for 16th, 24 for DIN/MIDI). Clock information for specific devices are listed in the 'Device Compatibility' section of this manual.

A Division control sets the ratio of the feedback time to the external clock length. Ratios vary between programs, and include ratios of 1:1, 1:2, 1:3, 1:4 and 1:6 to easily set 8th, 16th and triplet intervals.

Some of the programs have internal feedback while others will need the external Analog Feedback path for repeats.

Device Compatibility:

Pamela's Workout:

The default Gate length is too short for these programs, so use the following:

- 65 BPM: Gate set to >11 (this number is a division 96/pulse)
- 100 BPM: Gate set to >15
- 140 BPM: Gate set to > 20
- 180 BPM: Gate set to > 24

Other Tested Compatible Devices/Settings:

Doepfer A-160:	Clock outs
Doepfer A-160-5	Clock out
Doepfer A-161	Outputs
Metropolis RYK M-185	Clock out
MTM Turing Machine	Pulse outs
4ms RCD	Gate/Trig output is set to Trig
Blue Antlers Gate Sequencer	Gate Outs
Flame Clockwork	Gate Out
Koma Komplex sequencer	Clock outs
Koma Komplex sequencer	Gate outs
Arturia MicroBrute:	Seq gate out

Incompatible Devices/Settings:

Flame Clockwork:	Clock Out
MFB Seq-02 Step sequencer	Gate outs

Algorithm Structure:

MONO:

Mono programs use a single delay line up to 1000ms in length. Left and Right inputs are summed into mono and written into the delay line. Separate Left and Right output taps feed their respective signal outputs.

Note that feedback, internal or external, also sums back into mono so both of the taps are fed with each other's signal. Using external feedback can allow for adjusting the amount of feedback each tap uses and the outputs can be fed through different external processes like filters and distortion.

DUAL:

Dual programs use two independent delay lines that are fed from Left or Right inputs. The length of these delay lines is limited to 500ms. External feedback will only affect the same Left/Right channel. The Ratios for Dual programs are 0.5 and below because the Tempo calculation is based on 1000ms.

Note: Program 6 Stereo Ping Pong has two delay lines like a Dual program, but the input is summed mono.

1> Mono L/R Clocked Taps

Single 1000ms delay line with inputs summed into mono and separate taps out to Left and Right. Feedback is done through the external Analog Feedback.

DivL - Division for the Left tap. 6 ratios
Clock - Clock input (set at 0)
DivR - Division for the Right tap. 6 ratios.

Ratios (from 0-100% on knob):

Left		Right	
1:3	0.333	1:6	0.1667
3:8	0.375	3:16	0.1875
1:2	0.5	1:4	0.25
2:3	0.6667	1:3	0.3333
3:4	0.75	3:8	0.375
1:1	1.0	1:1	1.0

2> Mono Clocked Low Pass

Mono 1000ms delay line with summed inputs and separate taps out to Left and Right. A Low Pass Filter is in the feedback path and the cutoff lowers as feedback increases.

Divide - Division for both Left and Right.
Clock - Clock input (set at 0)
Fdb+LP - Low pass filter cutoff and feedback level

Ratios (from 0-100% on knob):

Left		Right	
1:2	0.5	1:4	0.25
1:2	0.5	3:8	0.375
2:3	0.6667	1:3	0.3333
3:4	0.75	1:2	0.5
1:1	1.0	3:8	0.375
1:1	1.0	1:2	0.5
1:1	1.0	2:3	0.6667
1:1	1.0	3:4	0.75

3> Mono Clocked Fdbk+HPF

Mono 1000ms delay line with summed inputs and separate taps out to Left and Right. A High Pass Filter is on the input and the cutoff rises with the feedback amount. Note that the repeats can be very long on this program.

Divide - Division for both Left and Right.
Clock - Clock input (set at 0)
Fbk+HP - High pass filter cutoff and feedback.

Ratios (from 0-100% on knob):

Left		Right	
1:2	0.5	1:4	0.25
1:2	0.5	3:8	0.375
2:3	0.6667	1:3	0.3333
3:4	0.75	1:2	0.5
1:1	1.0	3:8	0.375
1:1	1.0	1:2	0.5
1:1	1.0	2:3	0.6667
1:1	1.0	3:4	0.75

4> Mono Clocked Bandpass

Summed inputs into a Mono delay line. Two separate taps feed Left and Right outputs. Feedback runs through a one pole bandpass filter with fixed frequency but increasing Q so the bandwidth narrows as the feedback increases.

Divide - Division for both Left and Right.

Clock - Clock input (set at 0)

Fb+Q - Feedback amount and increasing Q

Ratios (from 0-100% on knob):

Left		Right	
1:2	0.5	1:4	0.25
1:2	0.5	1:3	0.3333
2:3	0.6667	1:3	0.3333
3:4	0.75	3:8	0.375
1:1	1.0	2:3	0.6667
1:1	1.0	1:2	0.5

5> Dual Clocked Delays

Two 500ms delay line with inputs for Left and Right and separate out to Left and Right.

Feedback is done through the external Analog Feedback.

DivL - Division for the Left tap

Clock - Clock input (set at 0)

DivR - Division for the Right tap

Ratios (from 0-100% on knob):

Left		Right	
1:6	0.1667	1:6	0.1667
3:16	0.1875	3:16	0.1875
1:4	0.25	1:4	0.25
1:3	0.3333	1:3	0.3333
3:8	0.375	3:8	0.375
1:2	0.5	1:2	0.5

6> Clocked Ping Pong

Summed mono input feeds the Left delay line and the output of the Left is the input of the Right delay line. Each delay is 500ms in length and the internal feedback sends the output of the Right delay back into the Left.

A low pass filter cutoff is lowered as the feedback increases.

Divide - Same ratio for both delay lines (1:2, 1:3, 1:4, 1:6)
Clock - Clock input (set at 0)
Fdbk - Feedback amount and LPF cutoff (inverse)

Ratios (from 0-100% on knob):

Left		Right	
1:4	0.25	1:4	0.25
1:3	0.3333	1:3	0.3333
3:8	0.375	3:8	0.375
1:2	0.5	1:2	0.5

7> Dual Clocked HPF

Two 500ms delay line with inputs for Left and Right and separate out to Left and Right. A High Pass Filter is in the feedback path and the cutoff frequency rises with feedback level.

Divide - Division for both Left and Right.
Clock - Clock input (set at 0)
HPF - High pass filter cutoff

Ratios (from 0-100% on knob):

Left		Right	
1:3	0.3333	1:6	0.1667
1:2	0.5	1:6	0.1667
1:2	0.5	3:16	0.375
1:2	0.5	1:4	0.25
1:2	0.5	1:3	0.3333
1:2	0.5	3:8	0.375

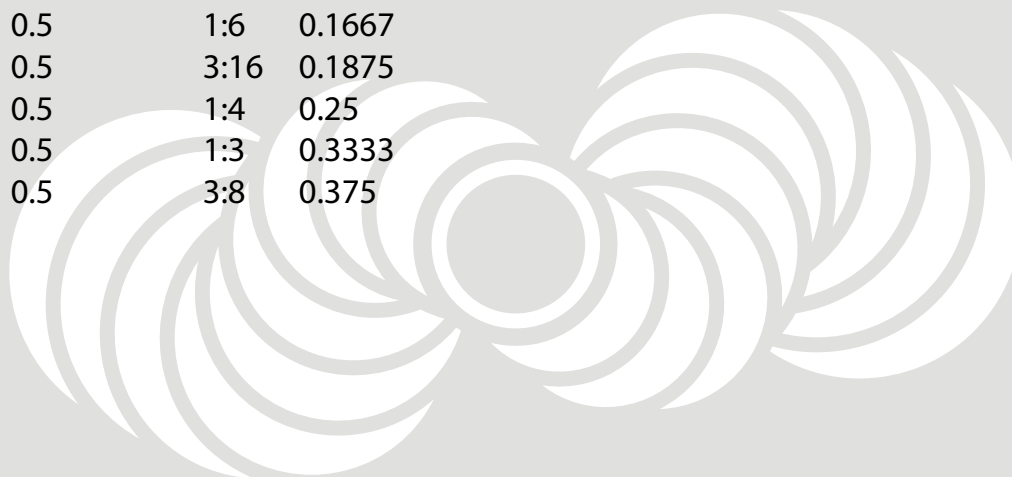
8> Dual Clocked Feedback

Two 500ms delay line with inputs for Left and Right and separate out to Left and Right. Feedback is internal and a low pass filter removes high end from the repeats as feedback increases.

Divide - Division for both Left and Right
Clock - Clock input (set at 0)
Fdbk - Feedback amount + LPF cutoff

Ratios (from 0-100% on knob):

Left		Right	
1:3	0.3333	1:6	0.1667
1:2	0.5	1:6	0.1667
1:2	0.5	3:16	0.1875
1:2	0.5	1:4	0.25
1:2	0.5	1:3	0.3333
1:2	0.5	3:8	0.375



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