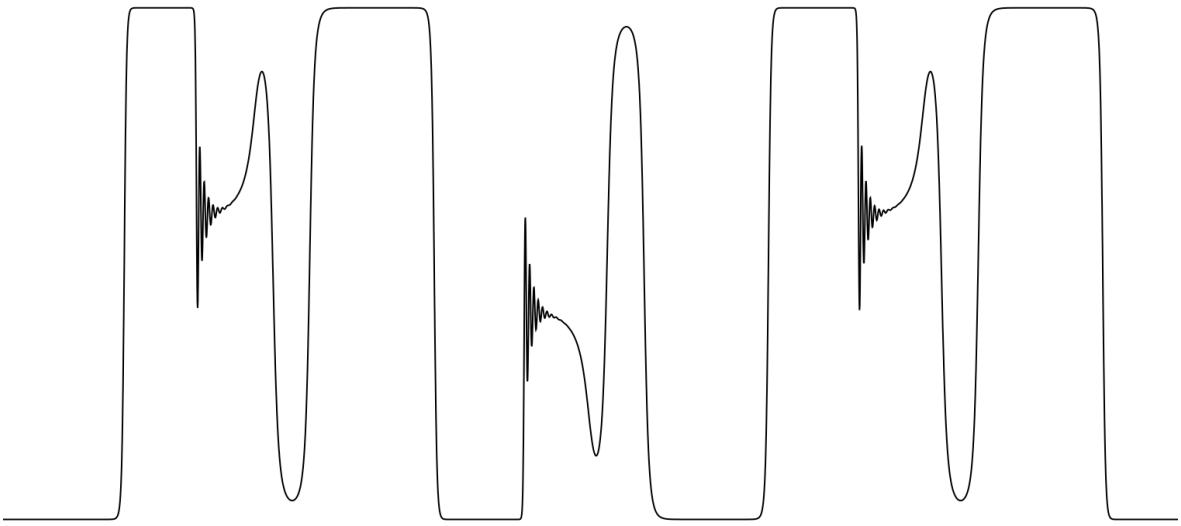
BZR-1 Chaotic Signal Generator

Utility Rack Extension for Propellerhead Reason

Version 1.0.0



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Overview

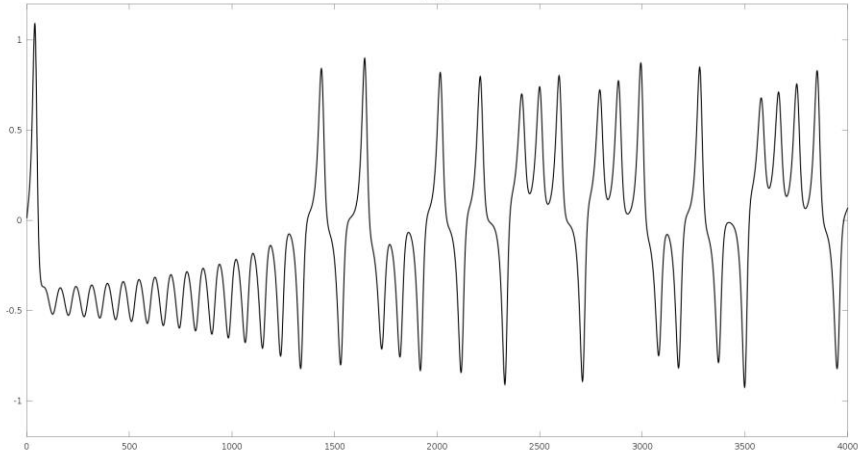
BZR-1 is a creative utility device that outputs **chaotic CV signals**.

What is a chaotic signal? In physics, it is common to distinguish between *stochastic* signals (such as white noise) and *predictable signals* (such as a periodic sine wave). Chaotic signals lie somewhere between these two categories. A chaotic signal is predictable in the sense that it exhibits some sort of recognizable pattern that repeats over time. But it is also stochastic in the sense that it is impossible to predict the exact values that it will assume over time.

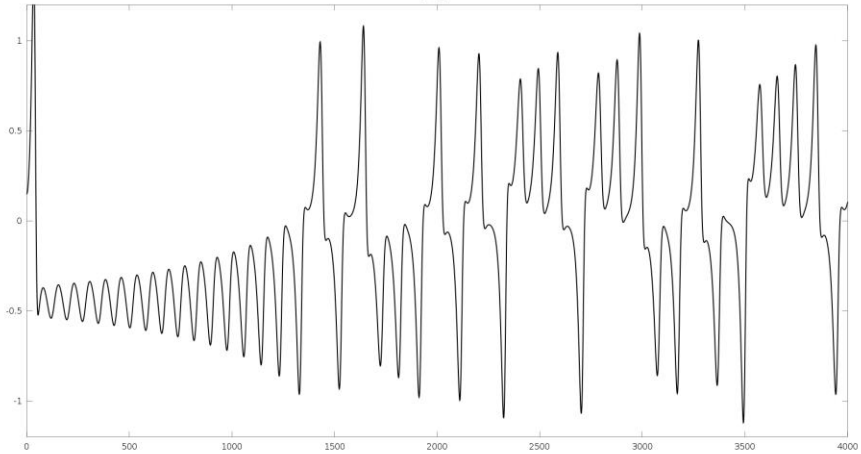
BZR-1 runs three chaotic dynamic systems in parallel, called A, B, and C. Each of these systems has three output signals, called 1, 2, and 3. The graphs on the following pages show typical behaviors of the nine signals.

Each of the three systems is initialized with three values (one for each output signal). The systems will generate different outputs depending on how you set the initialization values, but in general they will exhibit patterns similar to the ones you see in the graphs.

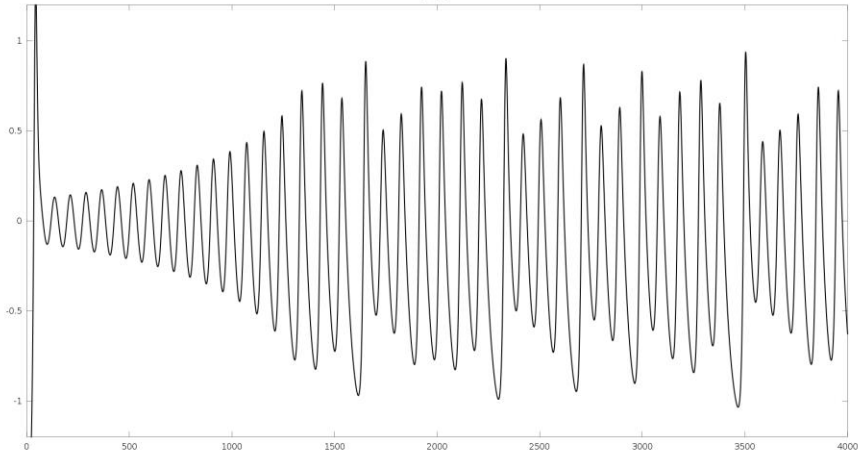
A1


1
0.5
0
-0.5
-1
0
500
1000
1500
2000
2500
3000
3500
4000

A2


1
0.5
0
-0.5
-1
0
500
1000
1500
2000
2500
3000
3500
4000

A3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-1
0
500
1000
1500
2000
2500
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3500
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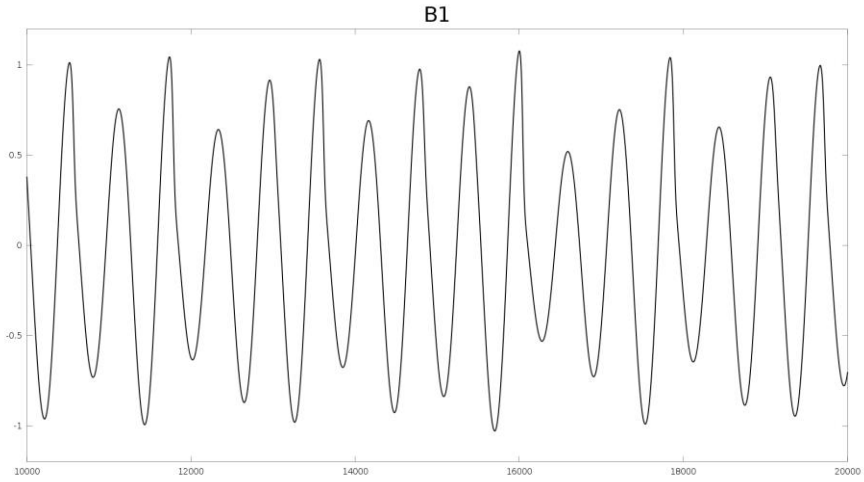
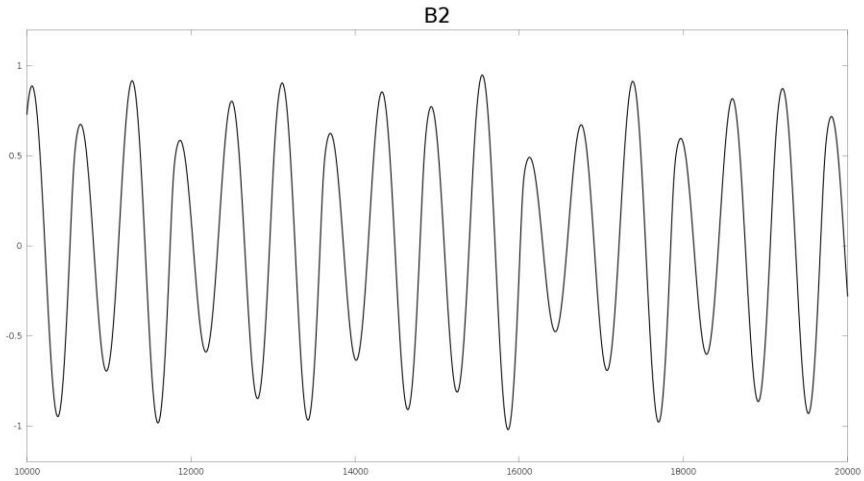

B1
1
0.5
0
-0.5
-1
10000
12000
14000
16000
18000
20000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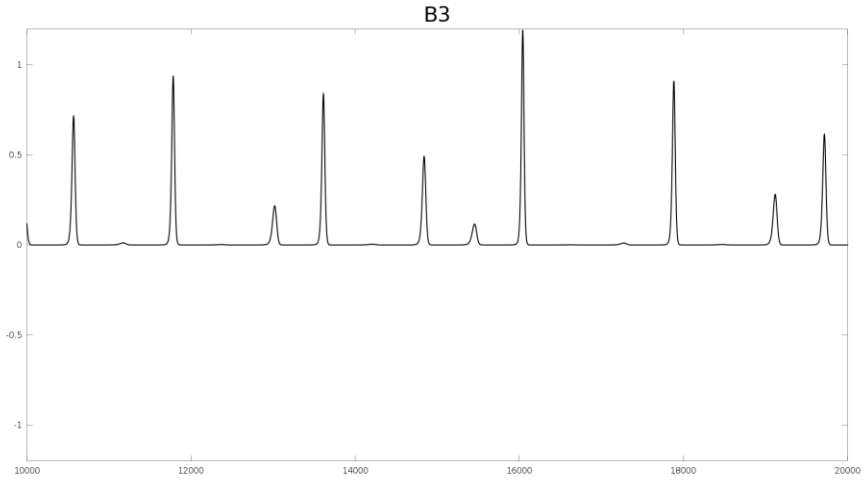
-1
10000
12000
14000
16000
18000
20000


B3
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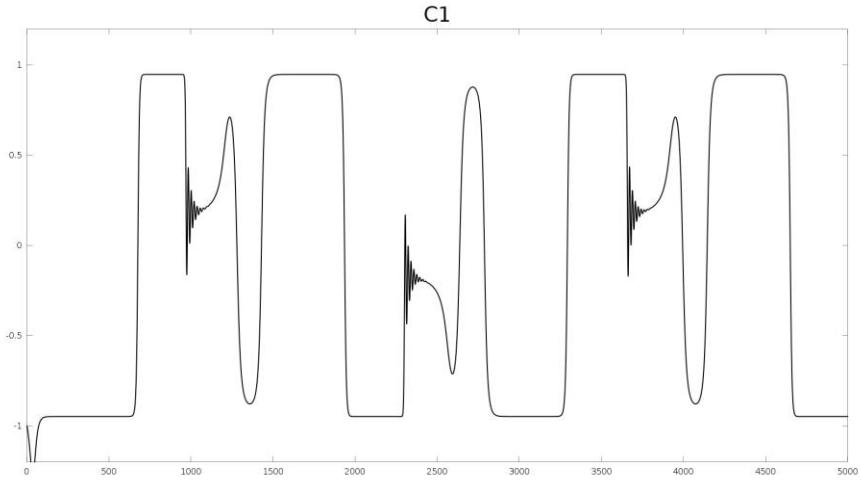
0.5
0
-0.5
-1
10000
12000
14000
16000
18000
20000


C1
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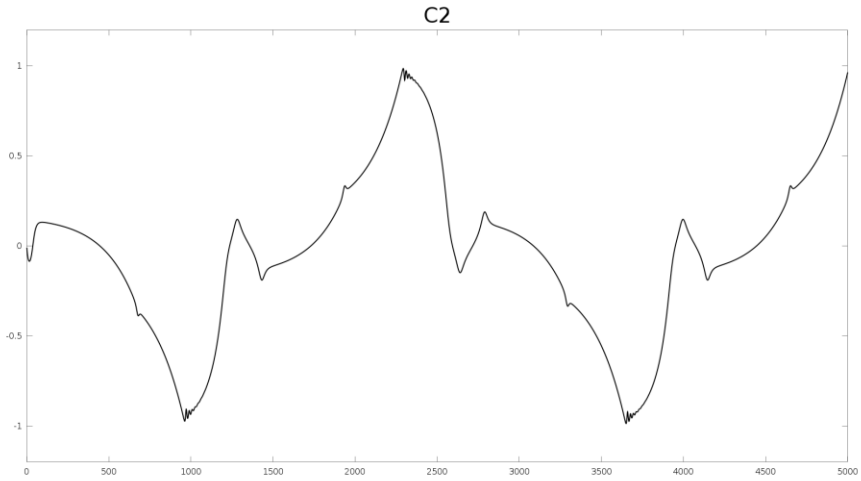
0
-0.5
-1
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000


C2
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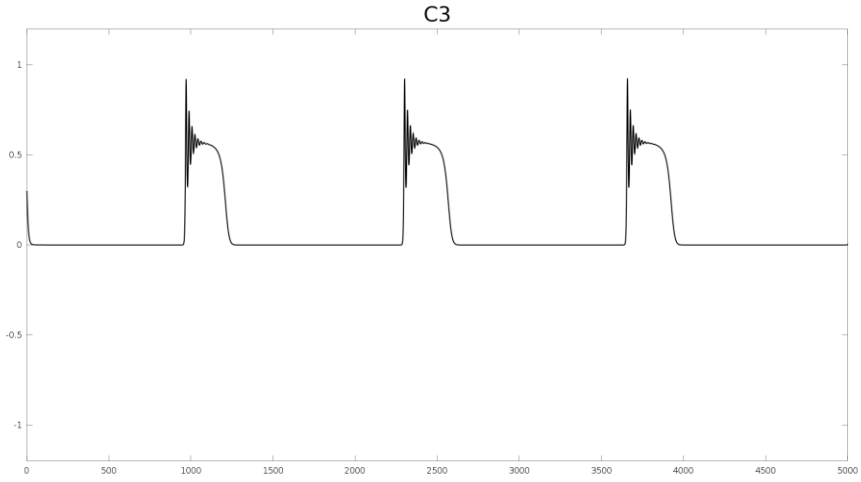
0.5
0
-0.5
-1
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000


C3
1
0.5
0
-0.5
-1
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000

User Interface

BZR-1 is quite straightforward to use. Here is the front panel:

The row of lamps (OUTPUT) on the right of the panel shows you the CV signal that BZR-1 outputs.

The leftmost knob, TYPE, is used to select which of the nine chaotic signals to output: A1, A2, A3, B1, B2, B3, C1, C2, or C3. All three systems are running in parallel, regardless of how this knob is set.

The three INITIALIZATION knobs are used to set the start point for the three chaotic systems. When you change one (or several) of the initialization knobs, all three systems will restart. Note that the since the output is chaotic, it is impossible to predict the exact behavior of the systems for a given set of initialization values – turning one of the knobs ever so slightly can have a large impact on the output signals! However, the sequence of CV values for a given set of initialization values are always the same, so if you set the initialization knobs to a configuration that you have used before BZR-1 will output the same values as it did that time.

Flipping the RETRIG switch will retrigger the three systems with the current initialization values.

The AMP knob controls the amplitude of the output CV signal.

The OFFSET knob shifts the output signal towards -1 (counter-clockwise) or towards +1 (clockwise).

The SPEED knob controls the rate of change of the output signal. Turning it counter-clockwise will slow down the signal, while turning it clockwise will speed up the signal.

This is the back panel:

The output signal from BZR-1 is sent through the OUTPUT socket.

The UNIPOLAR/BIPOLAR switch determines whether the output signal will be unipolar (0 to 1) or bipolar (-1 to 1). In the unipolar setting, negative signal values will have their sign reversed, i.e., the signal sent to the OUTPUT socket is the absolute value of the signal from the chaotic systems.

The AMP, OFFSET, and SPEED input CV sockets can be used to modulate the amplitude, offset, and speed settings. The signals input here are multiplied by the trim knob setting (0 to 1), and then added to the corresponding front panel setting.