ZVORK

VOLTCB-1

User Manual

version 1.0.1

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Introduction

The Volt CB-1 is a control voltage (CV) combiner unit that lets you generate an output control voltage signal from two other input CV signals. Whereas the classic Reason CV Spider lets you merge multiple CV signals by adding them, the CB-1 adds a number of new operations such as average, minimum or multiply. All these operations work on all types of CVs : note, gate or generic.

Front Panel

The signals and their controls flow from left to right. A view of the various signal transformations is detailed in the Back Panel section.

Bypass

The bypass switch is a little special as it lets you bypass the device by keeping input signal A or input signal B. Here are the four states of the switch :

- On : The default position. The input signals are transformed and combined and sent to the output.
- Off : No signal is sent to the output which is set to value 0.
- Input A : The signal coming in to the « Input A » slot is directly routed as the output, without any transformations.
- Input B : The signal coming in to the « Input B » slot is directly routed as the output without any transformations.

Input Multipliers

These knobs enable you to premultiply your inputs before they are combined. This is a bit more powerful than the trim knob as the multiply value ranges between -2 to +2. This lets you invert your signal and double it. The default settings leaves your inputs untouched as they are set to +1.

Metering

The central display of the CB-1 lets you visualize the two inputs (top and bottom meters) before they are combined and the resulting final output (center meter). -1 is at the left of the meter, 0 in the middle and +1 at the right.

Operation

This is where you actually set the combining operation. You can either click on the display and choose the operation from a menu, or cycle through the operations with the up and down buttons. Here is the list of the available operations :

- Average : use the average of both inputs.
- Minimum : use the lowest of the two inputs.
- Maximum : use the greatest of the two inputs.

- Multiply : use the multiplication of both inputs.
- Subtract : use difference between input A and input B (A-B).
- Add : use the sum of both inputs (same as CV Spider).
- Compare : returns +1 if input A is greater than input B, -1 if input B is greater than input A and 0 if both inputs have the same value.

Mix

The mix lets you smoothly interpolate between the result of the operation and both of the operation inputs. When set fully to the left, the input A of the operation is routed to the output. Fully to the right, the input B of the operation is routed to the output. Finally, when set at the center (the default), the operation result is routed to the output.

Output Multiplier

Just like the input multiplier knobs, the output multiplier lets you apply a final multiplication to the post mix signal. Once again, the multiplication values range from -2 to +2, the default being +1.

Back Panel

The back panel displays a schematic view of how the signals are routed, combined, mixed and transformed. All three signals – input A, input B and output – undergo the same transformations : multiplication and polarity change, albeit not in the same order.

Following is a more detailed view of the internal workings of the CB-1 :

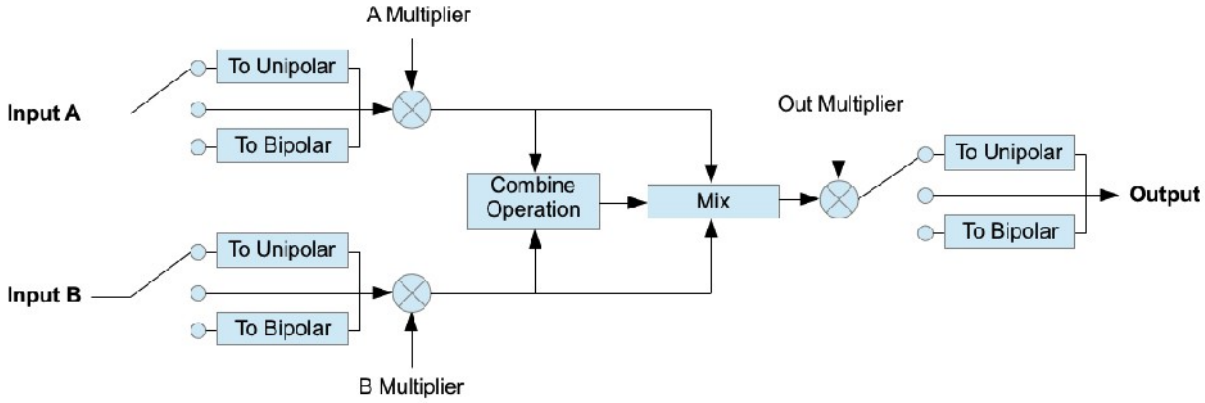

Illustration 1: View of the signal routing inside the CB-1

Polarity Changes

The polarity switches enable you to transform a control voltage signal in one of the two supported forms in Reason.

- Unipolar : the signal takes only positive values between 0 and 1. This is the case for instance for note, gate and enveloppe CVs inside Reason.
- Bipolar : the signal has values between -1 and 1 such as LFO values.

Unfortunately, the CB-1 has no way of knowing the form of the signal that has been plugged in one of its inputs or from its output. It is up to you to determine that knowing where the signals come from or where they go to. Fortunately, this usually doesn't have any major incidence and you can easily mix and match signal types without any risk or damage. It can even be a source of creativity ! Here are the three possibilities for polarity changes :

- To Unipolar : The signal is assumed to be bipolar and a « bipolar to unipolar » transformation is applied (The signal is offset by 1, divided by two and any value under zero is zero).
- Bypass : no polarity transformation is applied. This is the default.
- To Bipolar : The signal is assumed to be unipolar and a « unipolar to bipolar » transformation is applied (The signal is multiplied by two and offset by -1).

Modulation CV inputs

All the front knobs (Multipliers and Mix) can also have their values modulated by control voltage signals coming from other devices. Trim knobs let you control the amplitude of the modulation. These modulation signal can be seen as actually driving the knobs : a zero value indicates the knob is fully turned to the left while a one value indicates it is fully to the right.

MIDI Implementation Chart

MIDI Controller #	Volt CB-1 Parameter
12	Operation selection
13	A Multiplier
14	B Multiplier
15	Out Multiplier
16	Mix
17	Bypass

More information at http://www.zvork.fr/audio