

Centripidity

Voltage Bank



Introduction

The Voltage Bank is essentially a sequencer with the hood off. It can record and playback a sequence but rather than each step being entered or read as a particular pitch, or some other musical representation, the Voltage Bank records, stores, displays and outputs voltages. Unlike most sequencers however, the Voltage Bank does not have a fixed number of steps. In fact, the number of steps is limited only by your systems resources. It has successfully recorded and played back sequences of voltages up to 10,000 steps in length.

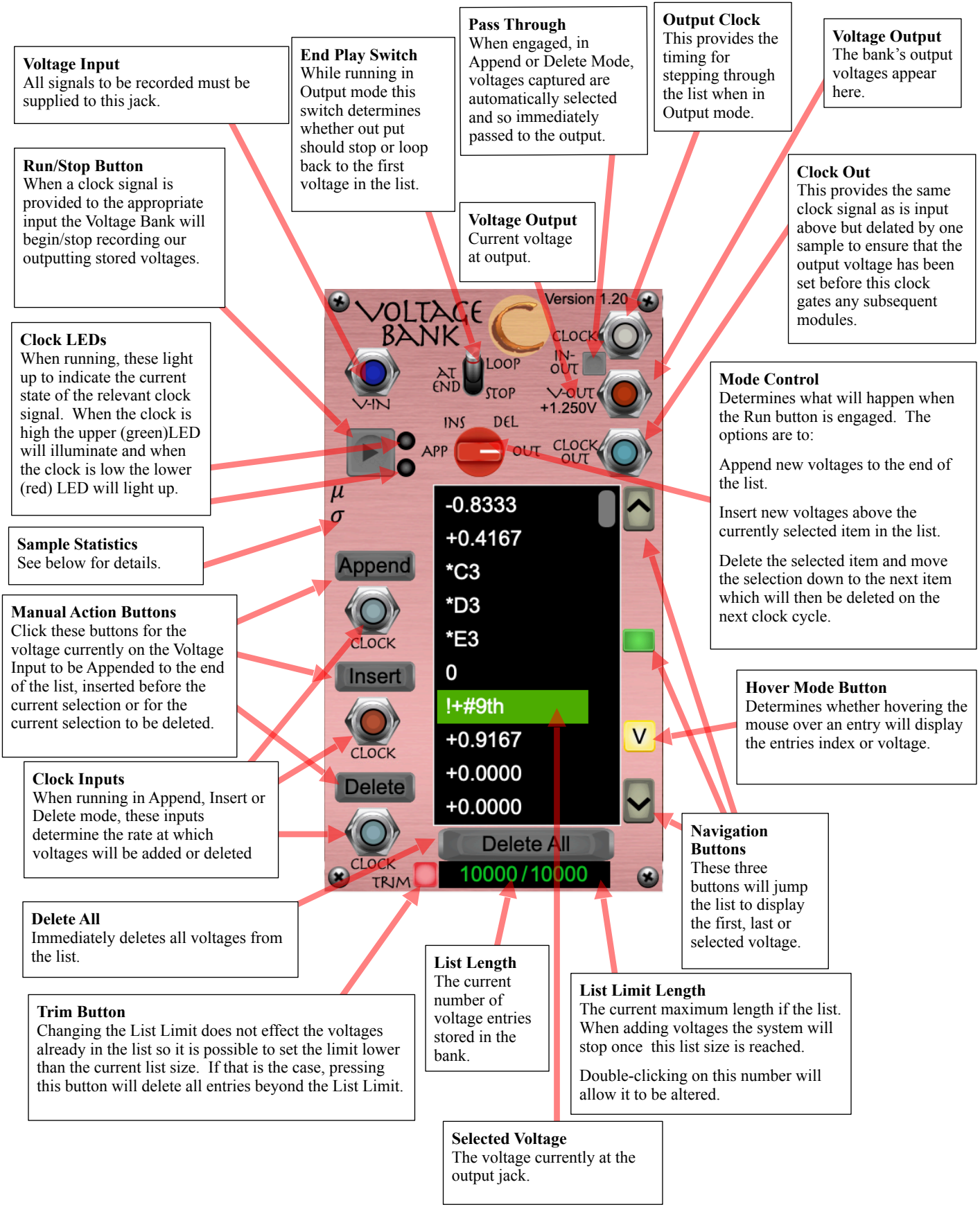
Any voltage presented to its input can be stored in the bank for later recovery. Storage can happen manually, via button clicking, or automatically when driven by a clock signal. The same goes for playback.

Each recorded voltage is displayed in a scrollable window and clicking on any voltage entry in the list will immediately set the Voltage Bank's output to that voltage.

Voltages can be appended, inserted or deleted either manually or via clocked input.

The Interface

The figure below highlights all of the main controls and displays available on the Voltage Bank.



Notes

To Manually:

Append the current input voltage to the end of the list, click the Append Button.

Insert the current input voltage into the list, click a list item to select it then click the Insert button and the voltage will be inserted just before the selected list item.

Delete a voltage from the list, click a list item to select it then click the Delete button. The selected voltage will be deleted and the next list item selected.

Output a list voltage, just click in the list entry and the output voltage will jump to that value.

To Automatically:

Append voltages to the list, set the Mode switch to “App”, provide a clock signal to the Append clock input and press Play. Voltages will be appended to the list until either Stop is pressed to the list size reaches its limit.

Insert voltages to the list, set the Mode switch to “Ins”, provide a clock signal to the Insert clock input, click on a list entry to select the insertion point and press Play. Voltages will be inserted above the selected entry until either Stop is pressed to the list size reaches its limit.

Delete voltages from the list, set the Mode switch to “Del”, provide a clock signal to the Delete clock input, click on a list entry to select the first entry to be deleted and press Play. The selected entry will be deleted and selection will pass to the next entry which will then be deleted etc. When selection reaches the end of the list, that entry will be deleted and selection will pass to the new end of list entry. Deletion will continue until either Stop is pressed or the list is empty.

Output list voltages, set the mode switch to “Out”, provide a clock signal to the Output clock input, click on the where you want to start in the list then press Run. With each clock pulse the next entry in the list will be selected and hence its voltage passed to the output. This will continue until Stop is pressed. What happens when the list end is reached depends upon the setting of the “At End” switch. Playback of voltages in the list can be set to either stop at the end of the list or to loopback to the start of the list and continue indefinitely until Stop is pressed.

Navigating the List

Buttons are provided to jump to the beginning and end of the list as well as to the currently selected entry. If the list becomes longer than ten entries a scrollbar will appear to the right of the list. Hovering the mouse pointer over the scrollbar area will activate the mouse’s scroll wheel and allow scrolling up and down through the list.

If the mouse is hovered over an entry in the list extra data will appear to the right of the list entry, depending on the setting of the Hover Mode button. If you get lost as to just where you are in a long list just set the button to display an ‘I’ and hovering over a list entry will display the entry index of the item you are hovering over.

In the ‘V’ position, hovering displays the underlying voltage represented by that particular item.

Editing Entries

When a new voltage is added to the list it appears in the list labelled as the voltage stored. However, there may be some reason, particularly with short lists, to give each of the voltages a different, more meaningful name. Double-clicking on any voltages in the list allows its name to be altered. If the new name is non-numeric then the underlying voltage will not change but, if a numeric name is entered then the voltage for that entry will be changed to the new number entered as its name.

In addition, in Version 1.2, certain non-numeric names will also alter the underlying voltage.

MIDI Note Names

Note names entered in the standard format, C3, D#5, F-1 etc. will change the list item's underlying voltage to match the voltage required to produce that particular note. The voltage is referenced to C2 = 0V.

To indicate that the entry has been recognised as a valid MIDI note the name in the list will be prepended with an asterisk. Hence entering C#4 will change the entry name to *C#4. If there is no asterisk then the underlying voltage has not been changed from its original value.

Musical Intervals

Entering text as an optional sign, followed by optional accidental then an ordinal interval number will produce a voltage equivalent to that musical interval. For example, 6th, -3rd, +9th, -b4th, 1st...

Note that the lower case letter 'b' is used as the symbol for a flat.

The voltage produced is relative to 0V so an 8th is 1.0V and -8th is -1.0V.

To indicate that the entry has been recognised as a valid musical interval the name in the list will be prepended with an exclamation mark. Hence entering -b3rd will change the entry name to *C#4. If there is no asterisk then the underlying voltage has not been changed from its original value.

Sample Statistics

Earlier versions of the Voltage Bank had some timing limitations but now the timing accuracy of reading and writing voltages is limited only by the internal sample rate of the module, which is 48kHz. The sample statistic display is no longer really of much value but it has been retained for completeness.

To give an indication of how accurate timing is when adding, deleting or outputting voltages to and from the list, the Voltage Bank gathers statistics on its sampling rate and reports them just below the Play/Stop button. The display includes mean sampling frequency and percentage standard deviation of the sampling period.

The reported means should always be extremely close to the clock frequency with very small deviation. The mean should be exact with zero deviation for any clock frequency that is an integer factor of 48,000.