

RC-808 “Re-Create the 808”
Plugin
Reference Manual

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1. Overview

The RC-808 “Re-Create the 808” emulates the original TR-808 sound with analog manner synthesis. Starting from this criterion, explore the multiverse of sounds, stretch your vectors, to find out new criterion of your own.

Hence it is not a drum machine but is a drum synthesizer. No samples nor effects processing are being used, just genuine synthesis only, all in analog manner.

The sound source employs DCO which is in this case Down Chirp Oscillator, combined with a noise source that outputs various kinds of noises including metallic noises. There is also a programmable infinite point wave shaper, variable Biquad Filters, infinite point envelope generators and so on. With maximum 8 partials per voice, it allows sound designing in subtractive synthesis manner which is familiar to all and yet still with vast space out there beckoning to be discovered.

Thanks to this flexible architecture, all instruments can have new expressions such as Open and Close variations to all kinds of percussions just like Hi-Hats or cymbal choke performance. Coupled with piano-roll sequencer utility this brings new art of sound with gate time programming, that you don’t often see on a drum sequencer.

Please note that the RC-808 “Re-Create the 808” however is merely a conceptual model to show the originally intended architecture of the TR-808, and thus is not fully developed as an instrument for actual usage. We do not bear any responsibility for any possible inconvenience or damages caused by this. We cannot answer to any inquiries for this product as well.

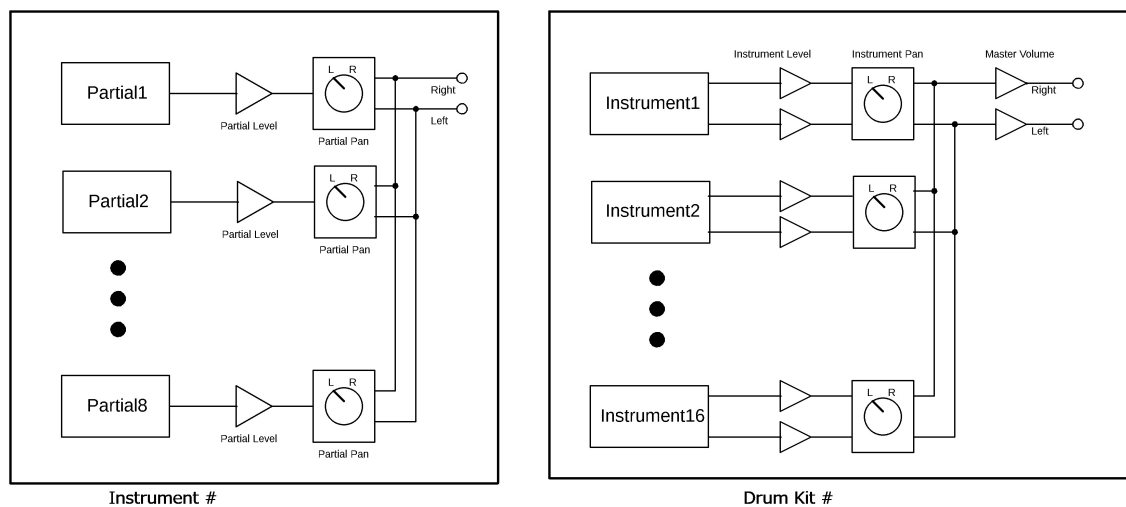
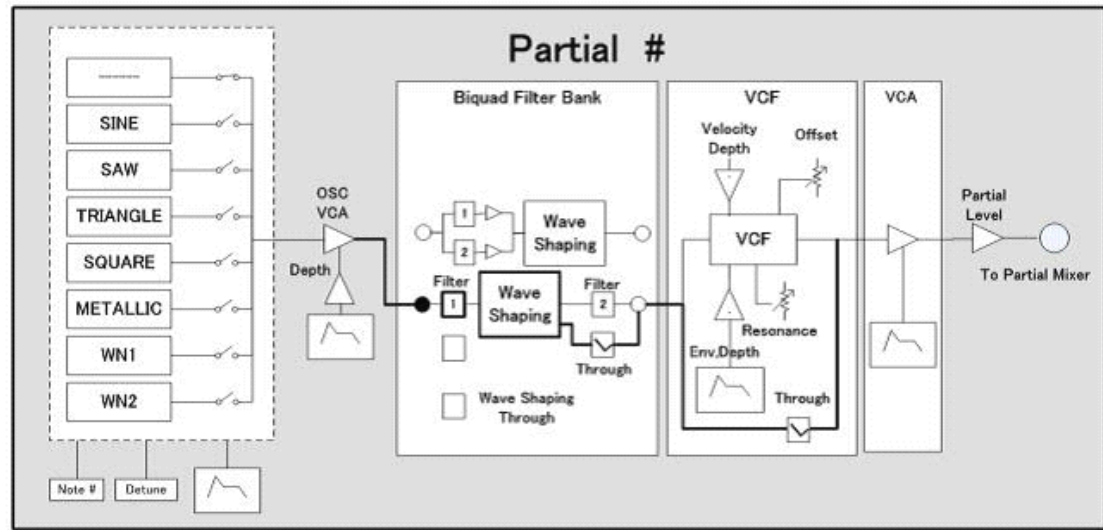
Also we are independent from Roland Corporation. Therefore, Roland cannot answer to any inquiries about this or us too.

We sincerely appreciate your understanding on above all.

This manual explains how to use it with Logic Pro X(MacOS).

1.1 Configuration

- A Drum Kit on the RC-808 is comprised of 16 Instruments.
- An Instrument consists of maximum 8 Partials.
- A Partial is a subtractive synthesizer in analog manner.



1.1.1 Instrument (Fig. Instrument#)

Partial Level : Set the volume of each Partial.

Partial Pan : Set the localization of the sound image of each Partial.

1.1.2 Partial (Fig. Partial#)

A Partial is a subtractive synthesizer, but with a dynamic Down Chirp Oscillator, which can also be used as a Metallic Oscillator.

The Biquad Filter pair can be configured either in serial or in parallel. The location of the Wave Shaper changes accordingly to the Biquad Filter configurations. In above diagram example, the Biquad Filters are in serial, with the Filter 2 set to be bypassed.

1.1.3 Drum Kit (Fig. Drum Kit#)

Drum Kit is a collection of 16 Instruments, each with Instrument Level, and Instrument Pan.

The final Instrument Level will be the aforementioned Voice Level and Voice Pan being multiplied.

The user can adjust Instrument Level and Pan with an external sequencer or a DAW via MIDI Control Change. That revised value will be part of the song data created on the DAW. Thus the original Drum Kit balance parameters stay untouched, and will be loaded again once a new Drum Kit is selected.

The Instrument Level and Pan will be shown and can be adjusted with the red and white knobs on the Main Panel.

1.1.4 Master Volume (Fig. Drum Kit#)

The Master Volume defines the final total sound volume level. This value cannot be saved as a song data file from external sequencer nor a DAW.

1.1.5 Audio Processing

The audio is processed at the sampling rate of 44,100Hz, and 16bit Monaural.

1.2 Installation

◆Windows

Please see the separate sheets

"ReCreate-Win with PLG¥Manuals¥Manuals¥Win_English¥Install Manual¥

Cubase plug-in installation manual for Win.pdf"

and "ReCreate-Win with PLG¥Manuals¥Win_English¥Install Manual¥

Standalone version RC-808 Read this first Win.pdf".

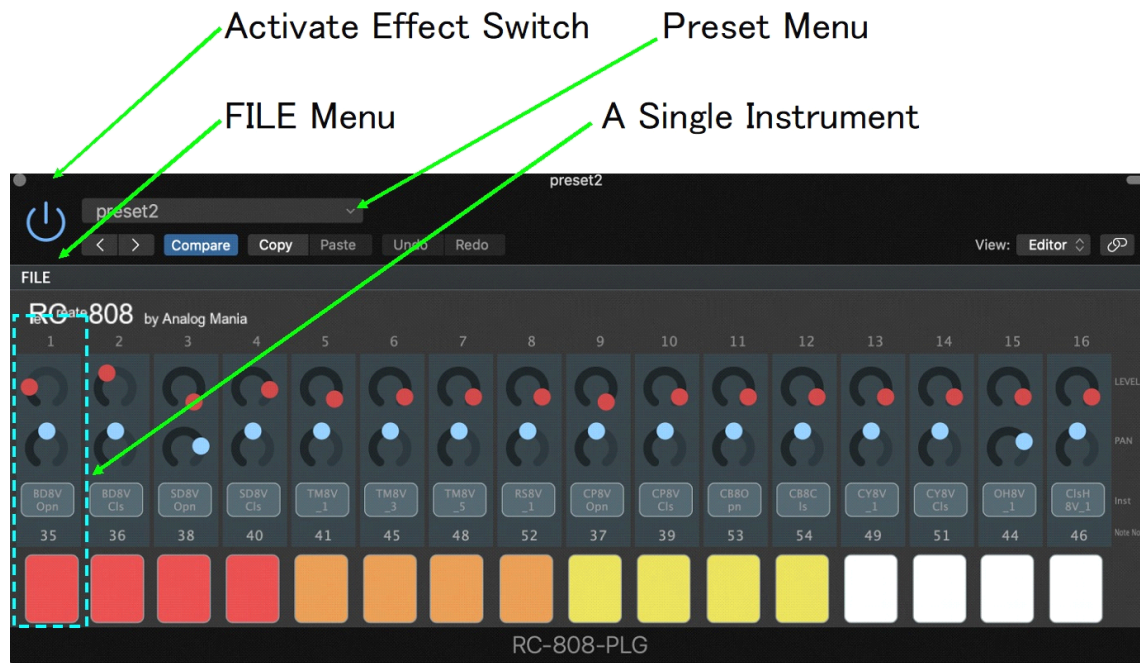
◆MacOS

For Logic Pro X , see the separate sheet "ReCreate-Mac with PLG¥Manuals¥Mac_English¥Install Manual¥Logic Pro X plug-in installation manual.pdf"

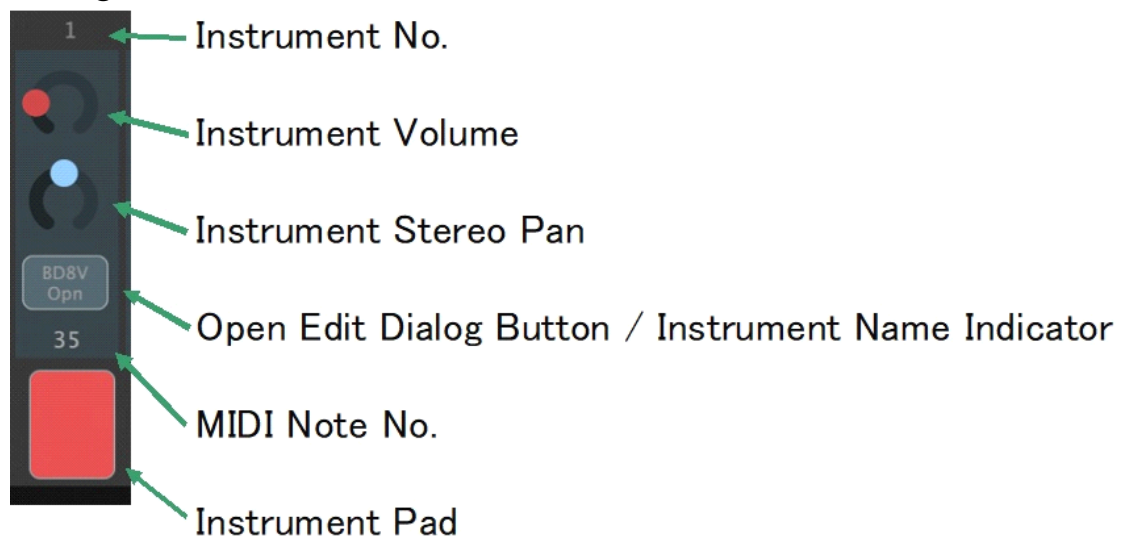
For Cubase, see the separate sheet "ReCreate-Mac with PLG¥Manuals¥Mac_English¥Install Manual¥Cubase plug-in installation manual for MacOS.pdf".

2. Basic operation

2.1 Names of main panel components

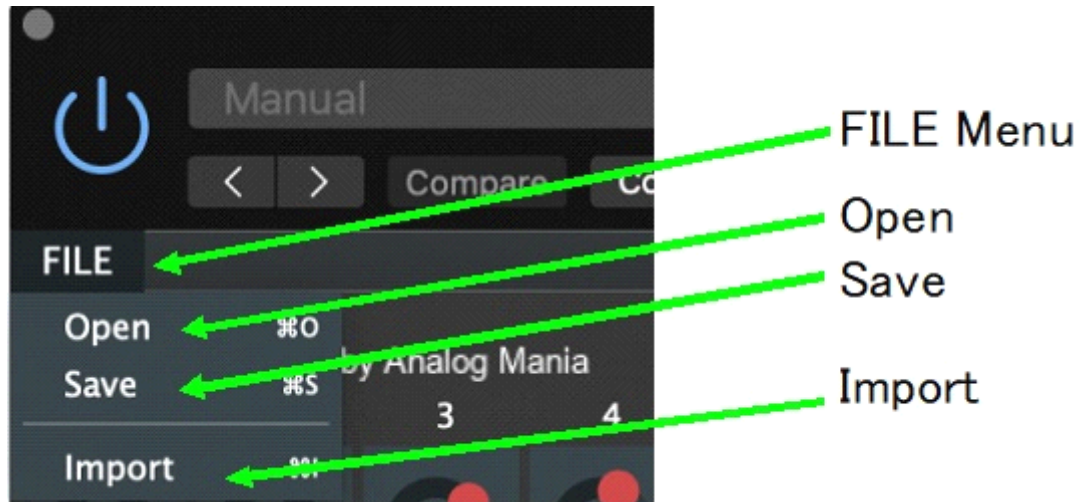


A Single Instrument



2.2 Main panel functions

2.2.1 File Menu and Files



2.2.1.1 Files

*.prm: A file with extension .prm is an Instrument with all of its parameters saved in XML format. More on this later on 4. Edit Dialog.

*.allprm: A file with extension .allprm is a Drum Kit comprised of maximum 16 Instruments names and others. 1 line is 1 Instrument.

The file defines the data in order of the Instrument Number, Instrument File Name, MIDI Note Number, Inst Level, and Inst Pan. The file format is in .txt.

The Instrument's Level and Pan here are the Drum Kit values. They can be overridden on an external sequencer or a DAW. The overridden values can be saved as part of the sequence data, but the originals in the Drum Kit will be left untouched.

Caution!

Save the all Instrument files and Drum Kit files in same single folder.

If all 16 Instruments are set, then the files will be as follows:

- 1,Inst1.prm
- 2,Inst2.prm
- 3,Inst3.prm
- 4,Inst4.prm
- 5,Inst5.prm
- 6,Inst6.prm
- 7,Inst7.prm
- 8,Inst8.prm
- 9,Inst9.prm
- 10,Inst10.prm
- 11,Inst11.prm
- 12,Inst12.prm
- 13,Inst13.prm
- 14,Inst14.prm
- 15,Inst15.prm
- 16,Inst16.prm

In below example, only five Instruments are being written:

- 1,Inst1.prm
- 2,Inst2.prm
- 3,Inst3.prm
- 4,Inst4.prm
- 5,Inst5.prm

2.2.1.2 File > Import

A file dialog opens.

Select a folder to open and specify the DrumKit (allprm) file to load the Drum Kit into the main panel.

The Instrument file(extension: .prm)according to instrument 1-16 is loaded and each sound can be played by the Instrument Tap.

16 Inst Names that make up the Drum Kit are displayed on the Edit Dialog start button, You can also check the sound with the Play button in edit dialog.

The .allprm file can only be output on RC-808 (standalone).

2.2.1.3 File > Open

It reads the .xml format containing all the parameters of RC-808-PLG.

This .xml format file can be handled in common by all supported DAWs.

RC-808 (standalone) does not support this .xml format file.

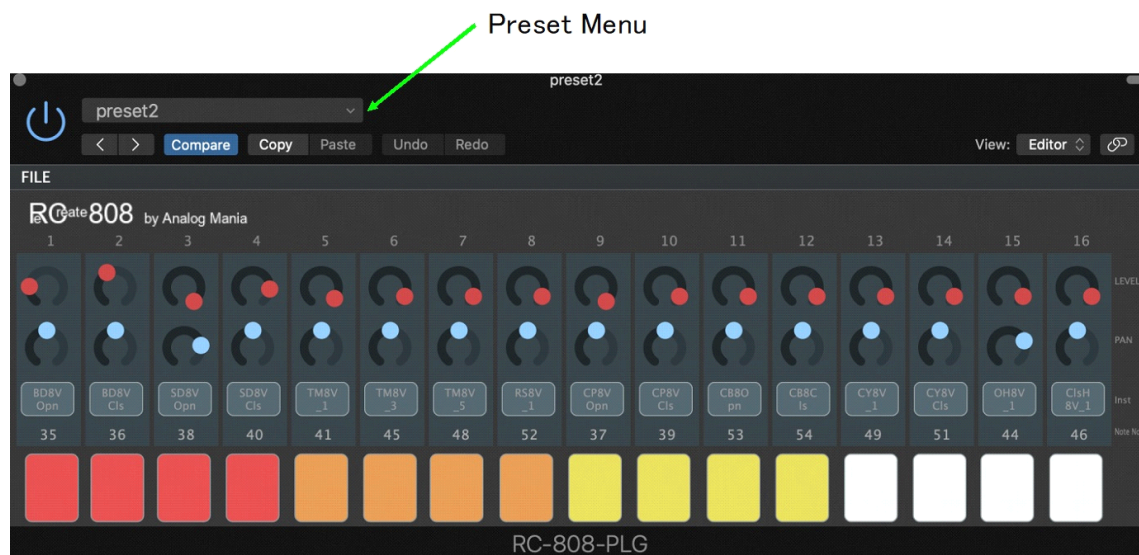
2.2.1.4 File > Save

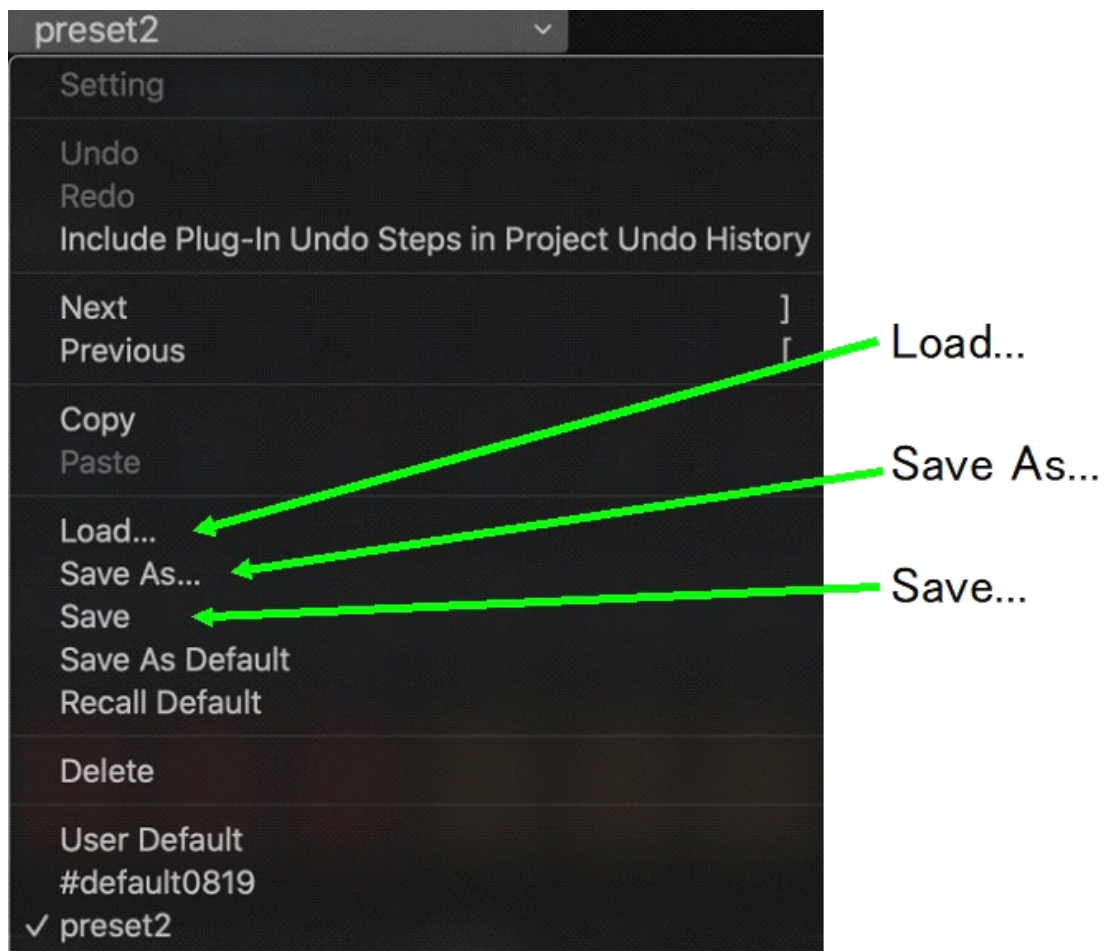
It saves the .xml format contains all the parameters of RC-808-PLG.

This .xml format file can be handled in common by all supported DAWs.

RC-808 (standalone) does not support this .xml format file.

2.2.2 Preset Menu





You cannot save the created data as an .allprm file, but you can save it as DAW preset data.

2.2.3 Activate Effect Switch

The RC-808 switches between ON and OFF each time it is pressed.

2.3 Edit Dialog

This is for editing Instrument sounds on the RC-808 Conceptual Model.

To open the Edit Dialog, click the Instrument Name above the Instrument Trigger Pad.

Edit Dialog

Instrument [11]

Partial 1Partial 2Partial 3Partial 4Partial 5Partial 6Partial 7Partial 8

Oscillator

WAVE

METAL

NOTE#

80

DUTY

0.50

DETUN

0

A.E DEP

1.00

METALLIC

Freq L

20000

Freq H

20000

Duty

0.50

N

1

Pitch Env

Num	TIME[msec]	FREQ[Hz]
1	0	1.02796

AMP ENV

Num	TIME[msec]	LEVEL[dB]
1	0	0

Biquad 1

HPF

THRU

FREQ

871

Q

2.2

GAIN

3.0

LEVEL

0

SERIES

Biquad 2

LPF

THRU

FREQ

1622

Q

1.2

GAIN

9.0

LEVEL

0

Wave Shaping

THRU

x	y
-1.000	-1.000
1.000	1.000

VCF

Cutoff

100

RESO

0.7

E.Dep

1.00

V.Dep

1.00

THRU

VCF Env

Num	TIME[msec]	FREQ[Hz]
1	0	400

AmpMod

OFFSET

0.00

P1 X

VCA Env

Num	TIME[msec]	LEVEL[dB]
1	0	0
2	3.62812	0
3	16.3265	-6.58683
4	501.406	-28.7425

PARTIAL PAN & LEVEL

P1

P2

P3

P4

P5

P6

P7

P8

-Inf

-2.25

-Inf

-Inf

-Inf

-Inf

-Inf

-Inf

S

M

S

M

S

M

S

M

S

M

S

M

S

M

S

M

INSTRUMENT

NAME

CB8Opn

NOTE#

53

NOTE OFF

☒ disable

☐ truncate

Repeat

1200 msec

STOP

PLAY

2.3.1 Oscillator

The image shows a software interface for an oscillator, titled "Oscillator". It features several control knobs and two data tables. Green arrows point from text labels to specific controls in the interface.

Labels on the left (pointing to controls):

- WAVE
- NOTE#
- DUTY
- DETUNE
- A.E DEP

Labels on the right (pointing to sections):

- Pitch Env
- AMP Env
- METALLIC

Oscillator Controls:

- WAVE:** A knob with a yellow indicator, currently set to "METAL".
- NOTE#:** A knob with a yellow indicator, currently set to "80".
- DUTY:** A knob with a yellow indicator, currently set to "0.50".
- DETUNE:** A knob with a yellow indicator, currently set to "0".
- A.E DEP:** A knob with a yellow indicator, currently set to "1.00".

Pitch Env Table:

Num	TIME[msec]	FREQ[Hz]
1	0	1.02796

AMP ENV Table:

Num	TIME[msec]	LEVEL[dB]
1	0	0

METALLIC Section:

Freq L	Freq H	Duty	N
100	600	0.50	6

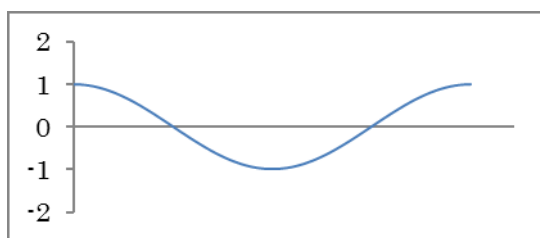
WAVE :

"-----"

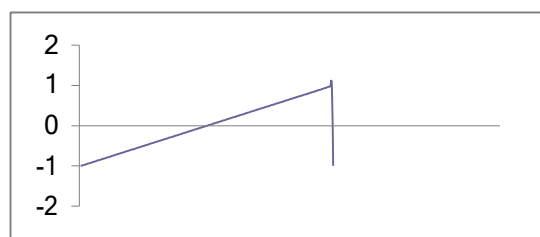
This means not just no waveform is available, but also means that the partial is deactivated. Select this for any unused partials to save the PC processing power.

SIN

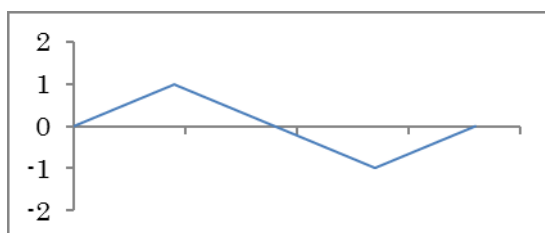
Actually it starts from phase 90 degrees or amplitude 1.0 as a Cosine wave.



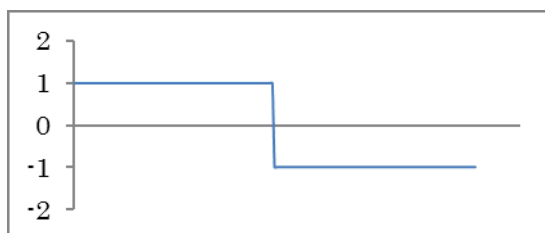
SAW



TRI



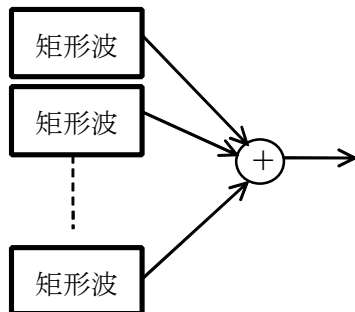
SQR



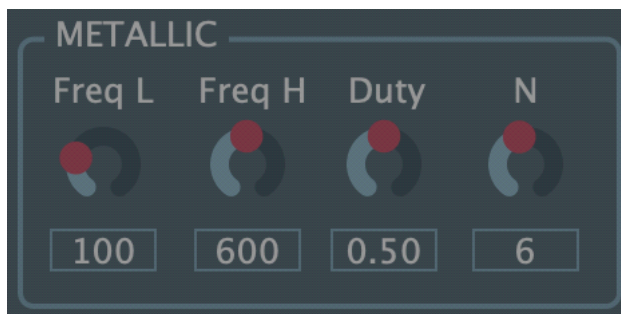
METAL

These are White Noise generated by different random generator algorithms.

Metallic Oscillators that were originally used in the TR-808 are emulated here.



METALLIC Parameter



Frequency H : The highest pitched square wave generator fundamental frequency in Hz.

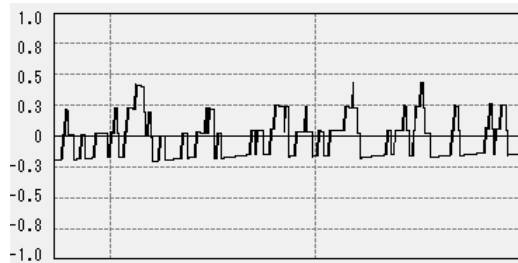
Frequency L : The lowest pitched square wave generator fundamental frequency in Hz.

Duty : The duty ratio of the individual square waves for the Metallic Oscillator.

N : Number to logarithmically equally divide the frequency band between the Frequency H to L. As the result, square wave generators will be from 1 to N.

An example of the Metallic Oscillator:

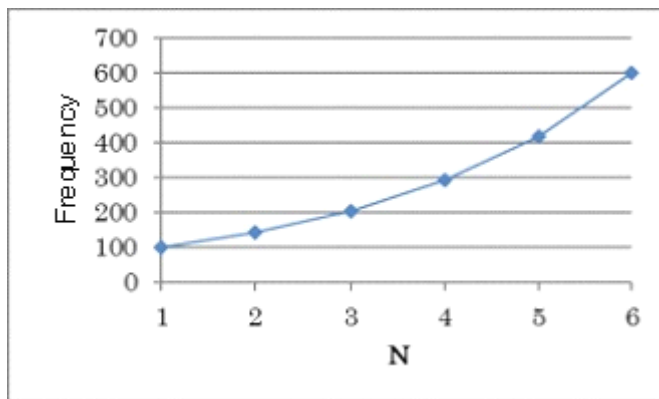
In the dialog box, set the Frequency L = 100, Frequency H = 600, and N = 6.



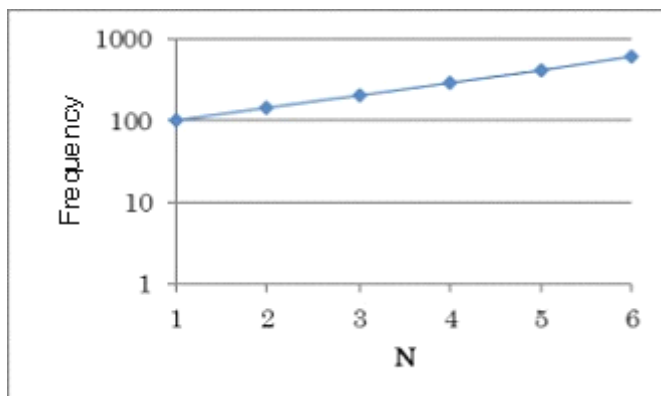
The resulting square wave generator frequencies will be:

- 1: 100.000000 Hz
- 2: 143.096908 Hz
- 3: 204.767251 Hz
- 4: 293.015605 Hz
- 5: 419.296271 Hz
- 6: 600.000000 Hz

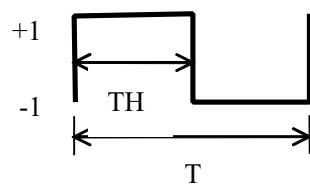
With frequency in linear



With frequency in log

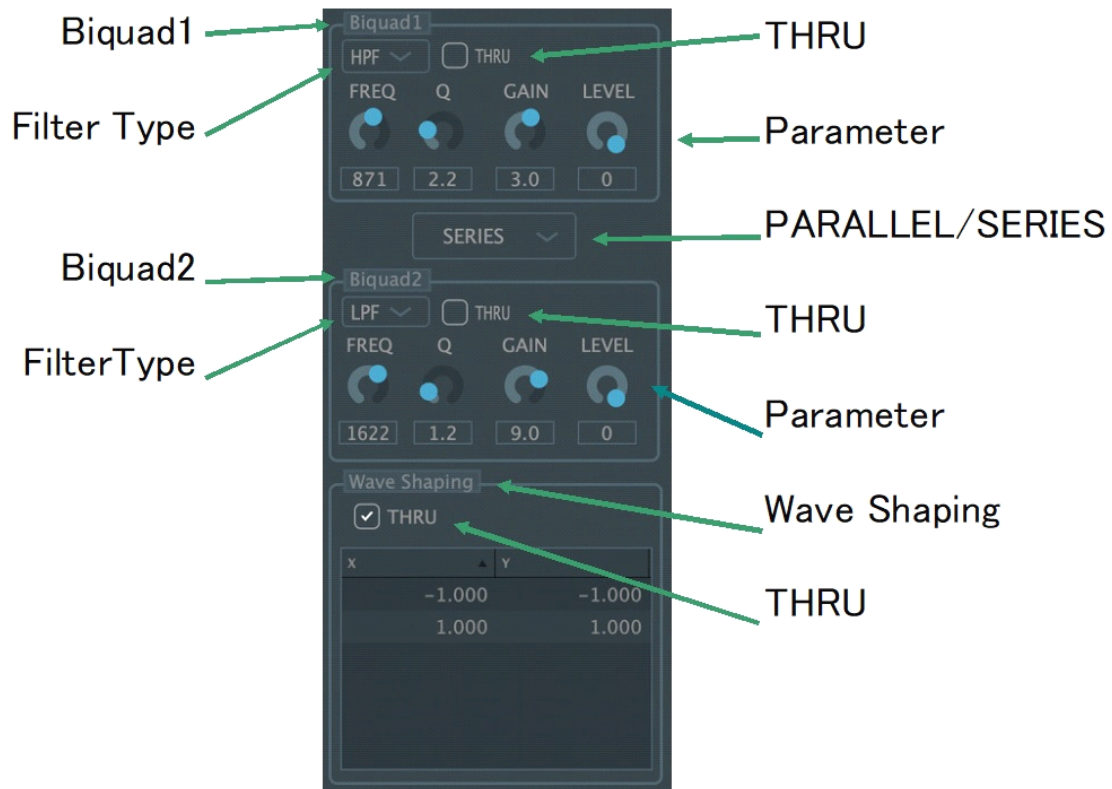


By the way the Duty is TH/T .



2.3.2 Biquad Filter

The Biquad Filters can be configured serial or parallel. The time variant frequency response curve changes cannot be added, hence that part of the sonic changes is done by the VCF which comes after.



Biquad1, Biquad2 : Click to open the Biquad dialog.

Wave Shaping : Click to open the Wave Shaping dialog.

Filter Type : You can select the filter type.

THRU : Through Biquad1, Biquad2, and Wave Shaping.

Parameter:

Freq : Set the cutoff or center frequency.

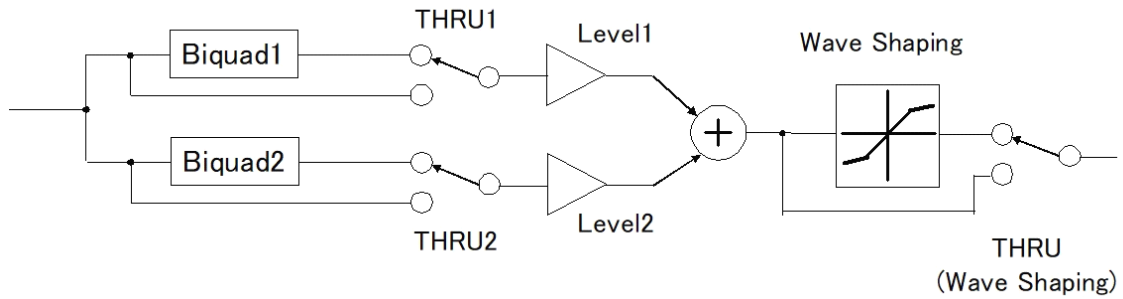
Q : Adjust the Quality Factor (sharpness).

Creates a timbre characteristic by increasing the gain at cutoff frequency.

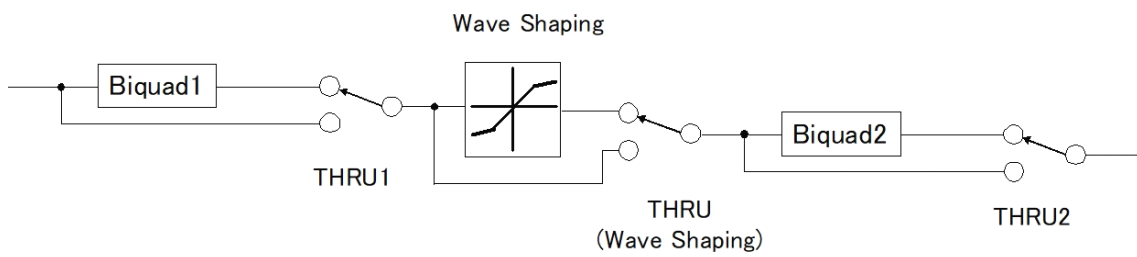
Gain : Adjusts the level of the center frequency or the level of the entire signal.

Level : Adjusts the output level of each Biquad in parallel. It is invalid in series.

PARALLEL/SERIES : Various sounds can be created by using parallel or series.



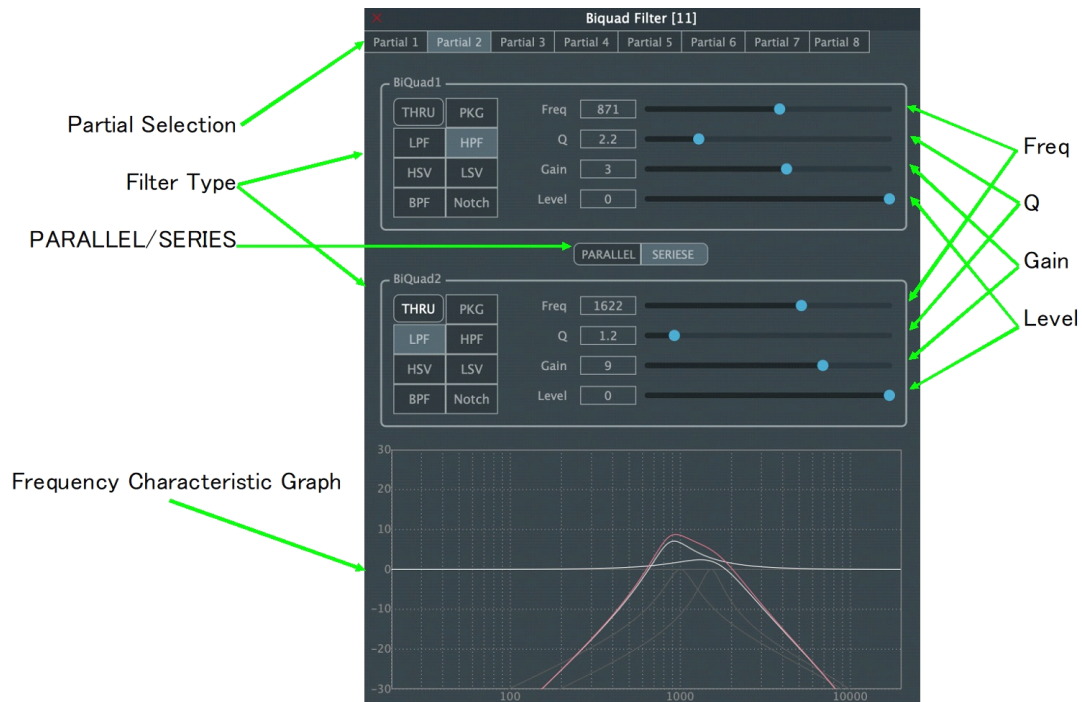
PARALLEL



SERIES

2.3.2.1 Biquad Filter Dialog

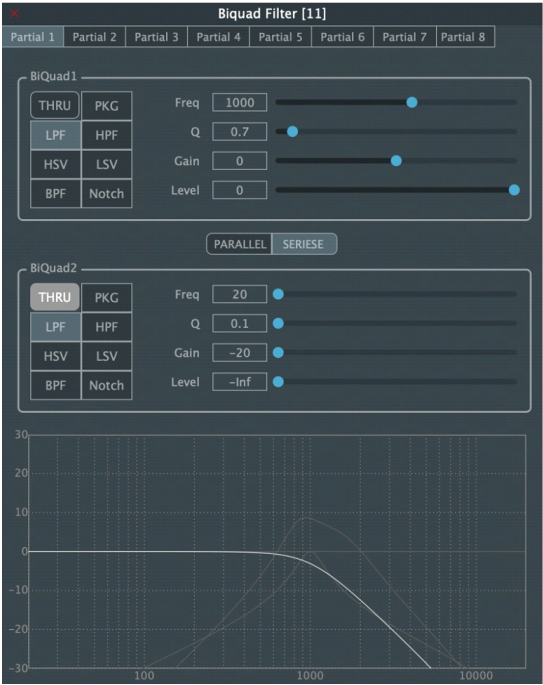
You can adjust the filter type, cutoff frequency, Q, gain, and level.



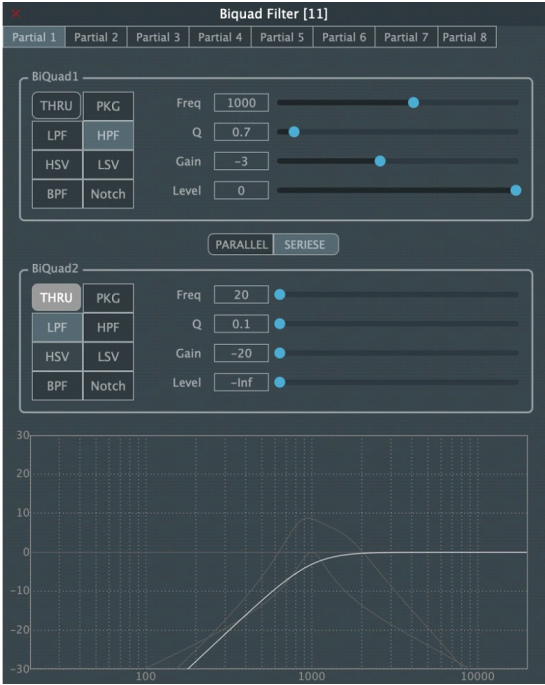
Frequency Characteristic Graph : Displays the frequency characteristics of each Biquad filter and the frequency characteristics after synthesis.

2.3.2.2 Filter Types

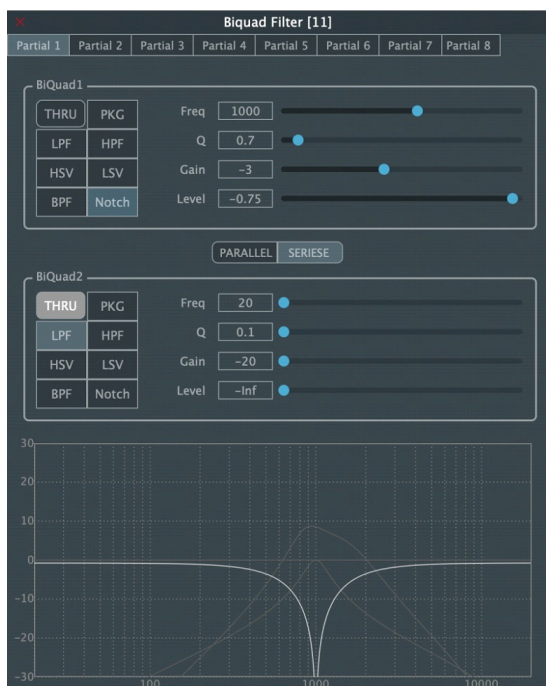
LPF(Low Pass)



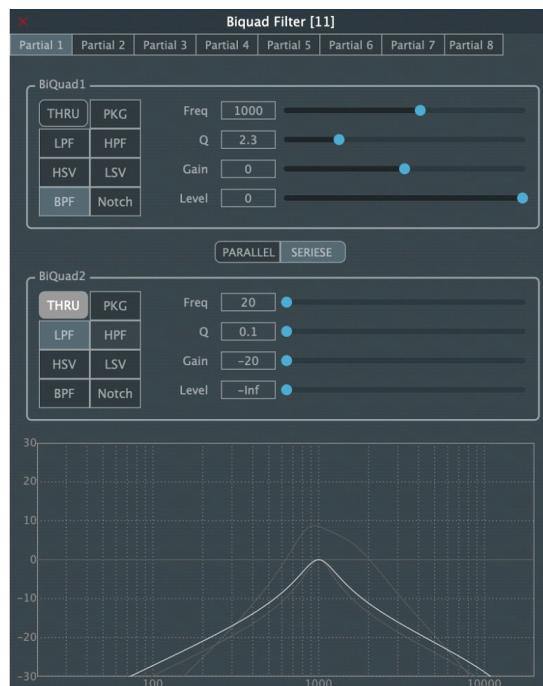
HPF (High Pass)



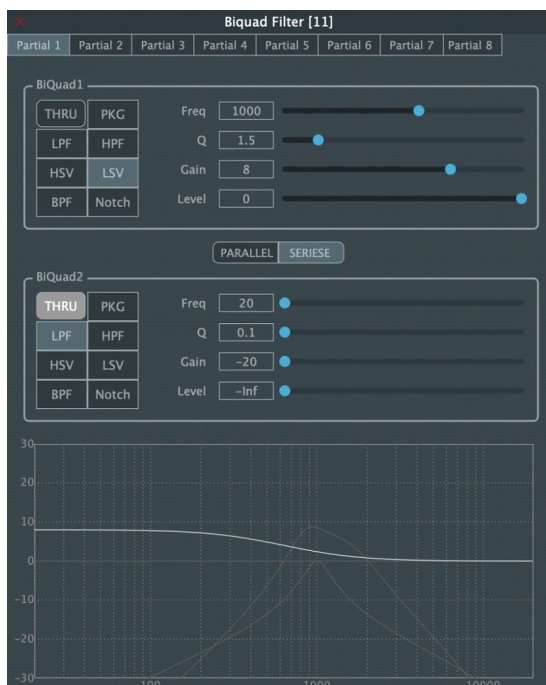
Notch (Band Reject)



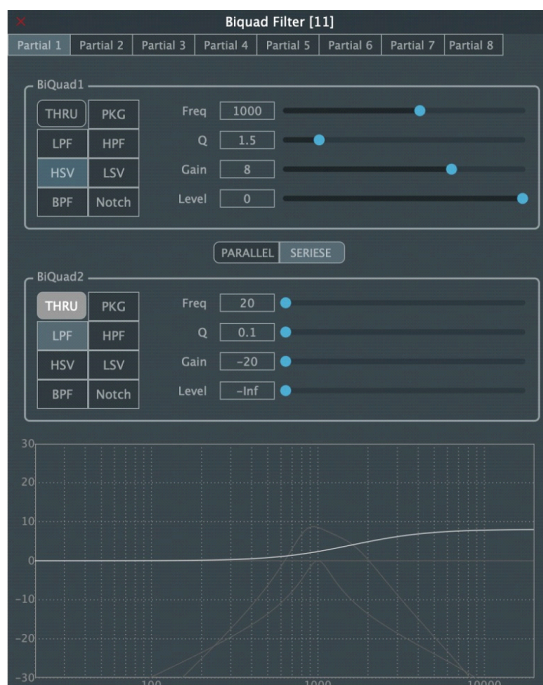
BPF(Band Pass)



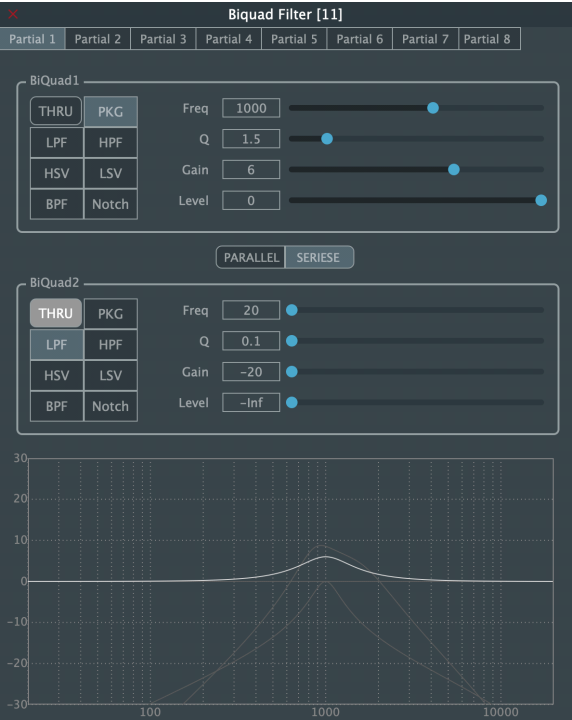
LSV(Low Shelving)



HSV(High Shelving)



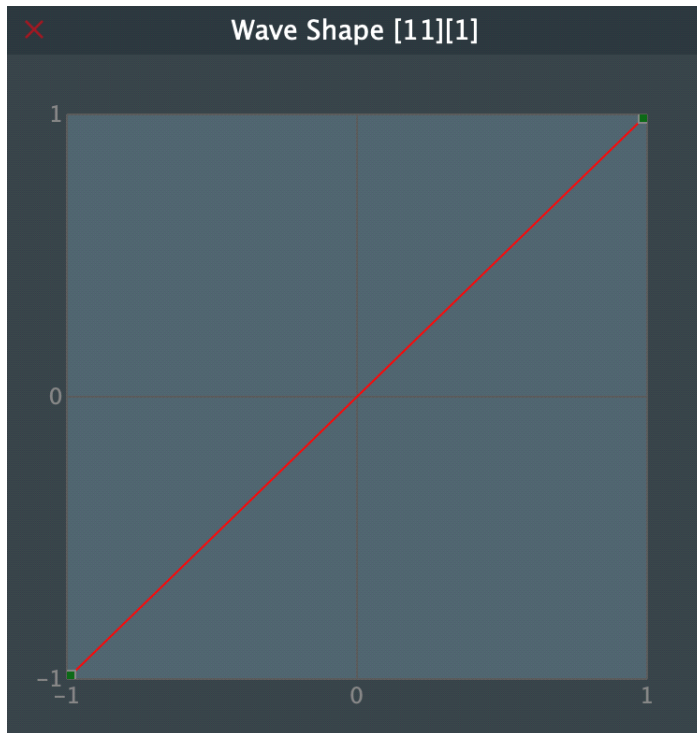
Peaking (Peak)



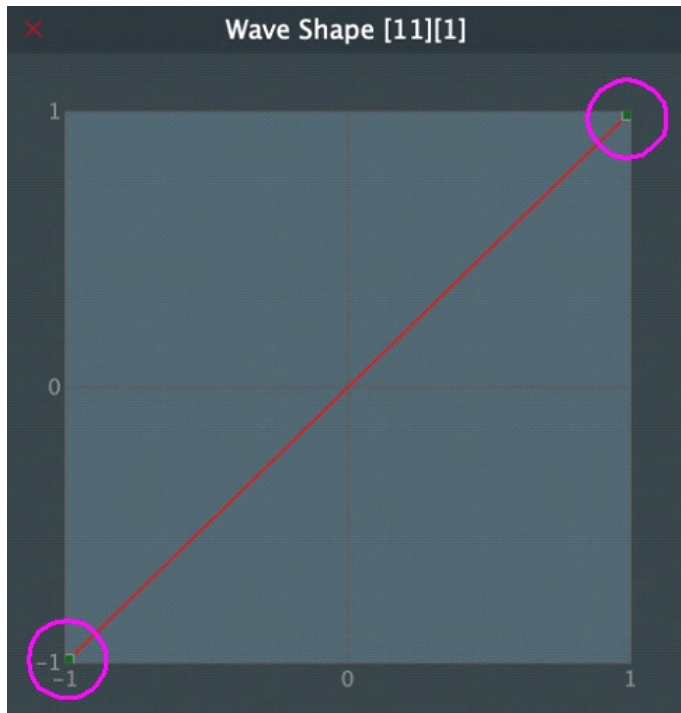
2.3.3 Wave Shaping Dialog

Wave Shaper changes its location according to the Biquad Filter configuration:

- Parallel: After the both Biquad Filters 1 and 2
- Serial: Between the Biquad Filter 1 and 2



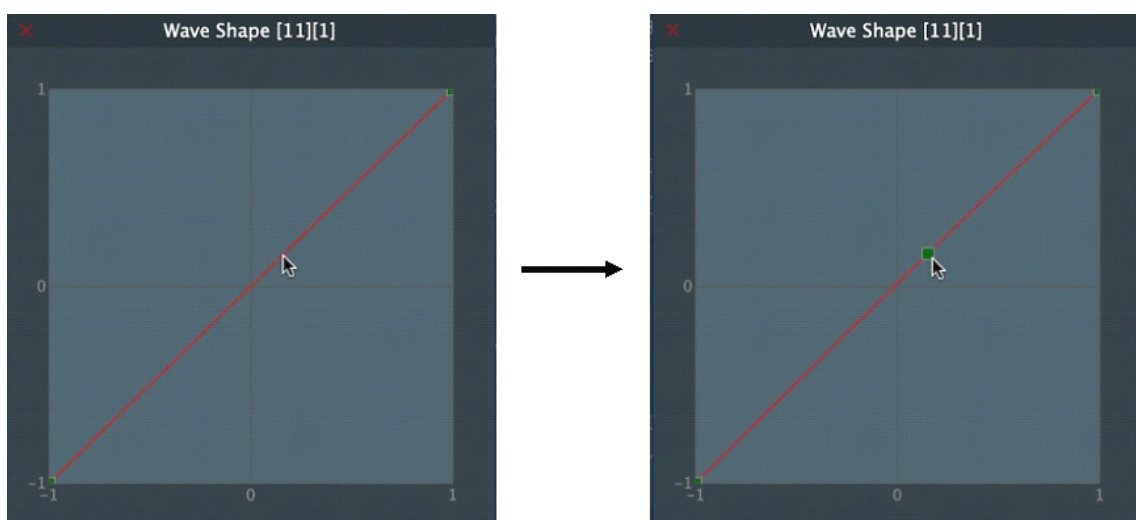
Editing the Wave Shaper



In the initial state, there are control points at the lower left $(-1.0, -1.0)$ and upper right $(1.0, 1.0)$.

◆ Adding the control points

Place a control point by left clicking the desired location.



◆ Deleting the control points

Erase the point by right clicking it.

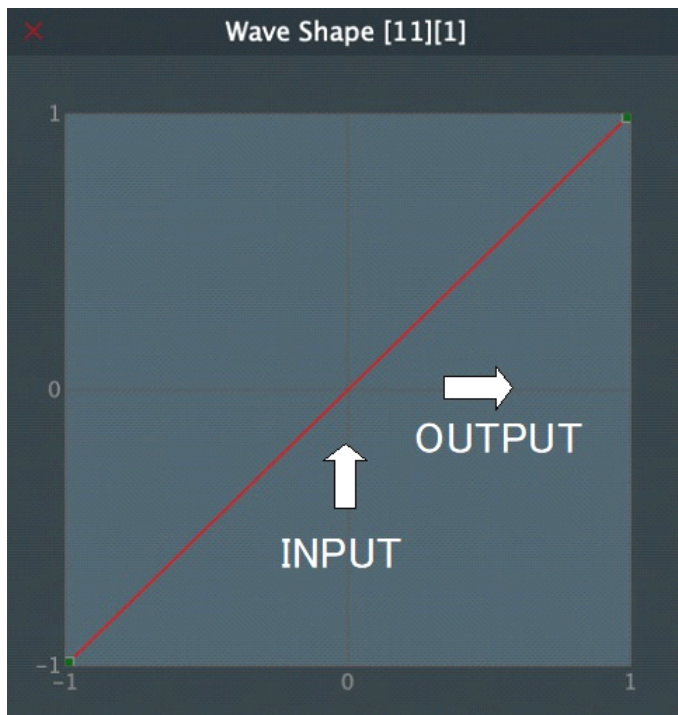
◆ Moving the control points

Left-click and drag the mouse on the control point.

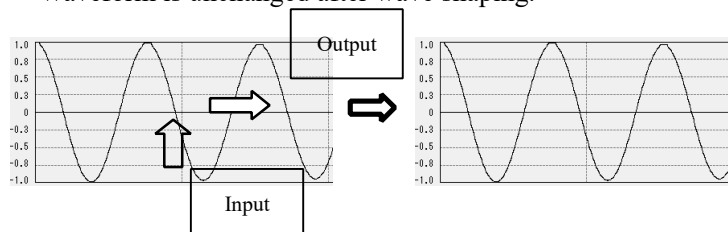
When the control point can be moved, the mouse pointer becomes a hand.

◆ Examples

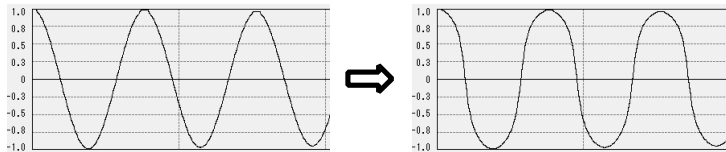
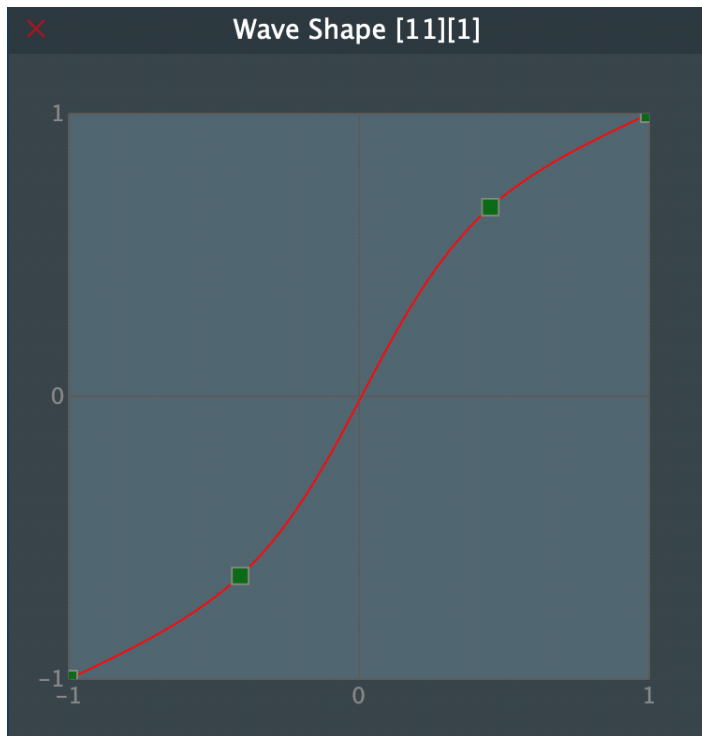
Linear = No distortion



Waveform is unchanged after wave shaping.



Diode Clip style



By activating the Oscillator Amp Envelope, the Wave Shaping effect can be limited to a certain duration of time.

2.3.4 VCF

Use the VCF envelope to change the tone color over time.



Cutoff : Cutoff offset.

RESO : Resonance.

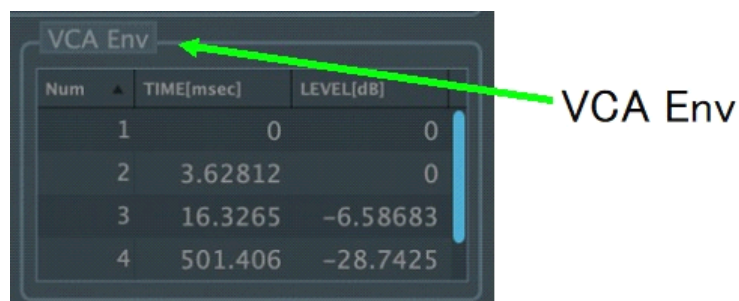
E.Dep : VCF envelope depth. Add an offset to the VCF envelope.

V.Dep : MIDI envelope depth.

THRU : Thru VCF.

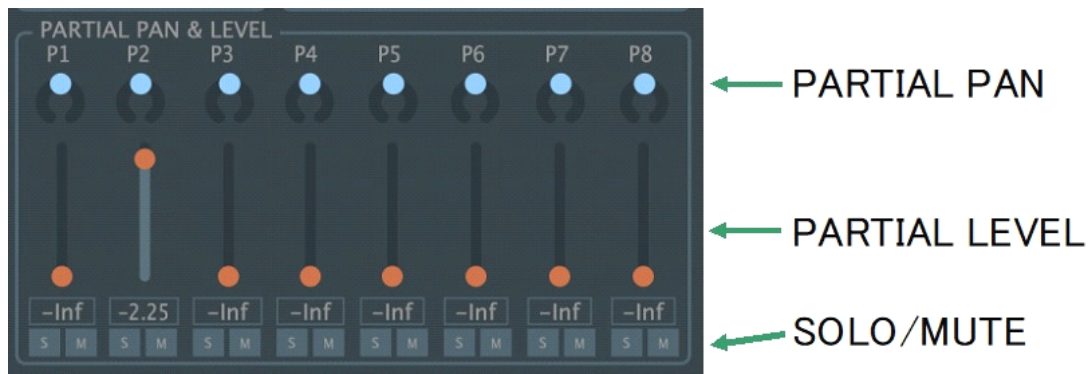
2.3.5 VCA

The envelope changes the amplitude with time.



VCA Env : Open the VCA Envelope Editor.

2.3.6 Partial Mixer



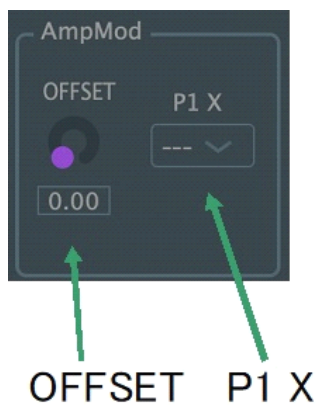
PARTIAL PAN : Set the left/right volume balance for each partial.

PARTIAL LEVEL : Set the volume of each partial.

SOLO/MUTE : Only specific partials can be pronounced and muted.

2.3.7 Amp (Ring) Modulator

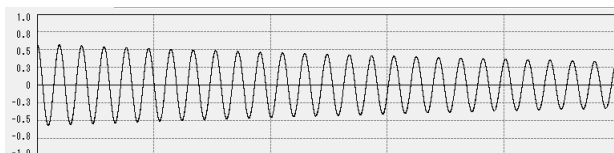
Partial 1 (P1) will be Amp (Ring) Modulated by another Partial.



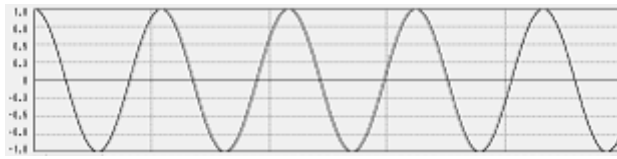
OFFSET : Add DC offset on the signal from the another Partial.

P1 X : Select another Partial to modulate Partial 1.

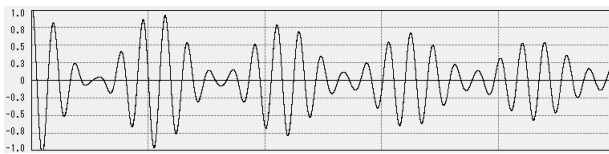
Partial 1 waveform



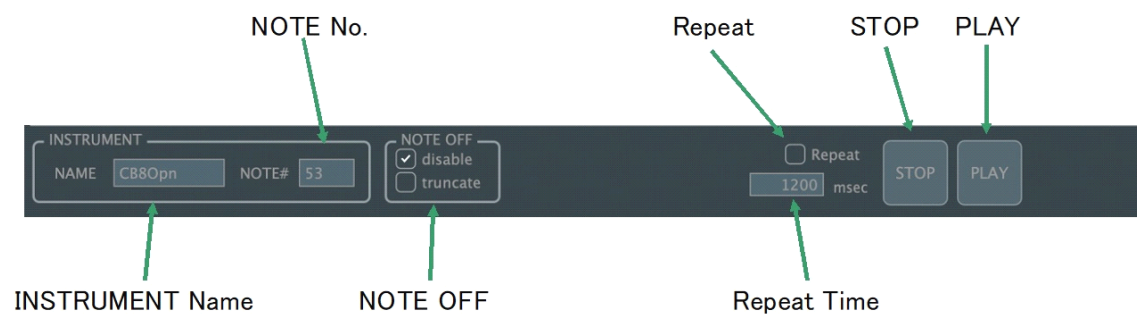
Partial 2 waveform with DC offset=0



Amp (Ring) Modulation result of Partial 1 * Partial 2



2.3.8 Play / Stop, and Instrument Name Editor



INSTRUMENT Name : Name of the instrument.

NOTE No. : Note number.

Repeat : If checked, the sound will be produced continuously at the Repeat Time cycle.

Repeat Time : Repeat cycle in milliseconds.

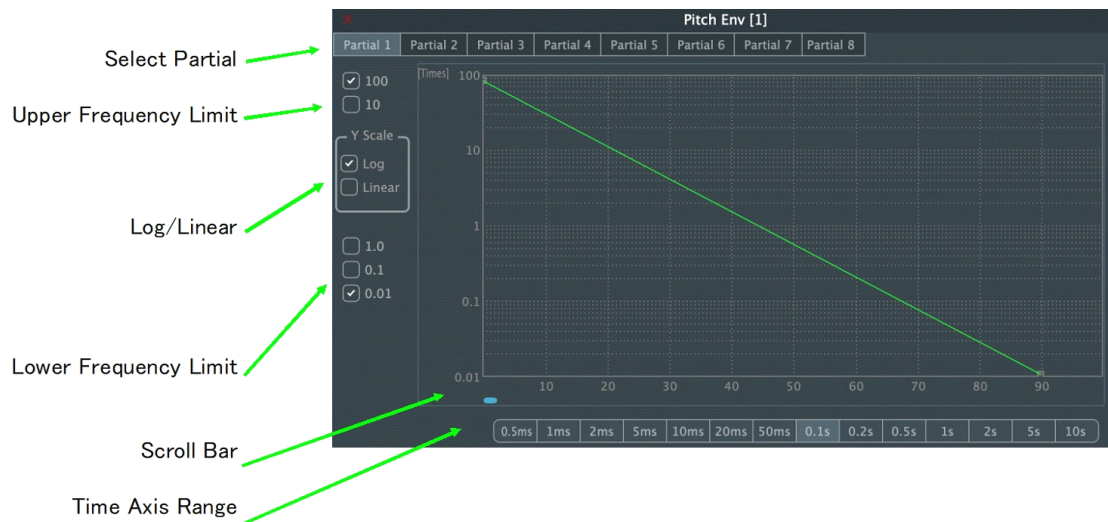
PLAY : Make the sound.

STOP : Stop the sound.

NOTE OFF : If you check truncate, you can set the note to stop at MIDI note-off.

If you check disable, it will be a normal drum sound source.

2.3.9 Envelope Editor



Select Partial : Partial selection tab.

Upper Frequency Limit : Graph upper limit frequency setting.

Lower Frequency Limit : Graph lower limit frequency setting

Scroll Bar : Time axis scroll bar.

Time Axis Range : Time axis expansion/reduction.

2.3.9.1 Frequency Envelopes

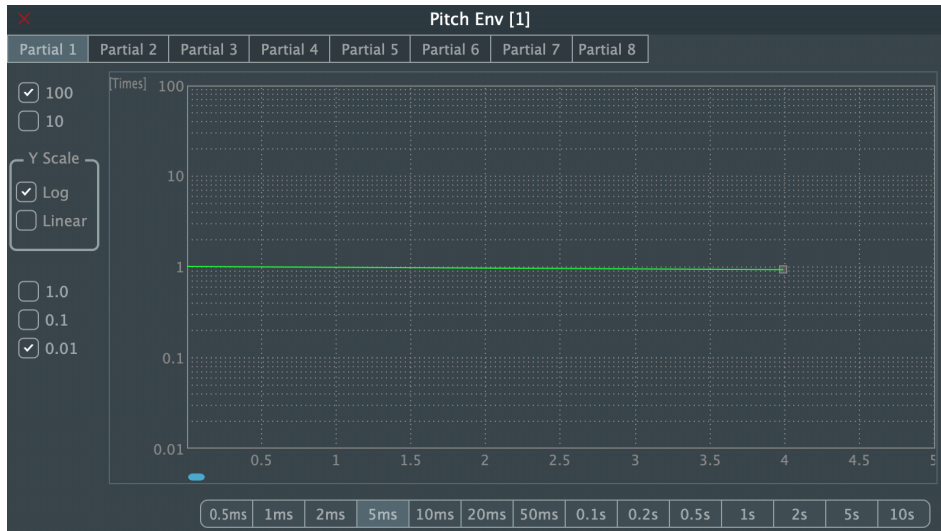
● Oscillator Frequency Envelope

Vertical scale of Envelopes is the multiplier to Frequency (MIDI Note No)

An example:

If Note# = 60 (261.625565Hz), then...

Vertical axis	Frequency(Hz)
0.1	26.1625565
1.0	261.625565
10.0	2616.25565



In this case, 261.625565Hz sound will be output.

● VCF Cutoff Frequency Envelope

When the vertical axis corresponds to BP, the cutoff frequency is expressed by the following formula.

$$\text{Cutoff frequency(Hz)} = \{1.0 + (\text{BP}-1) \times \text{EnvDepth}\} \times \text{CutoffOffset} + \text{VelocityCutoff}$$

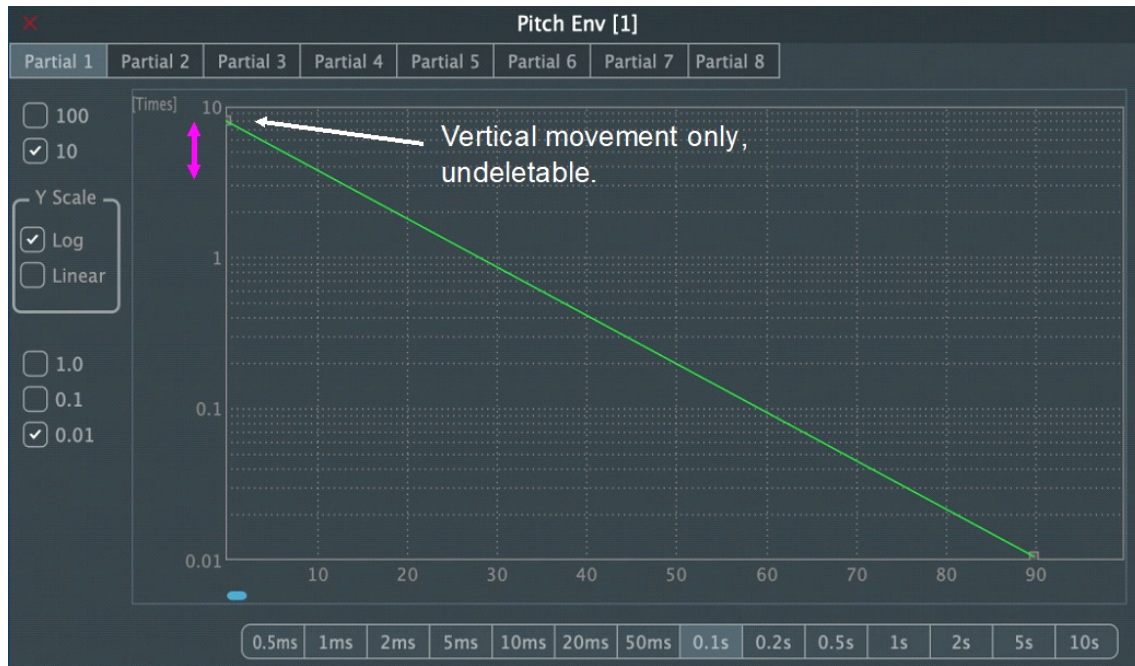
Velocity Cutoff is as shown in the table below.

V = (Velocity of MIDI note) × VelocityDepth	1~39	40~127
VelocityCutoff	0	$80.5 \times V - 3200$

1D Break Points

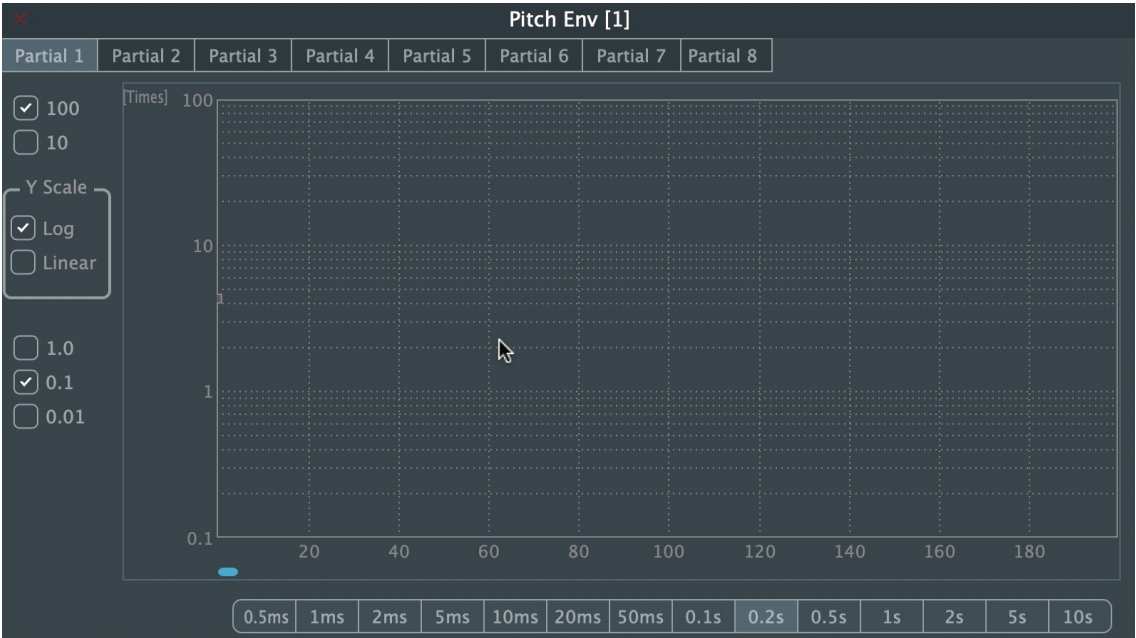
Envelope Start / Stop are indicated by Green Break Points.

The Break Point at the vertical scale can be moved up/down only. It cannot be deleted.

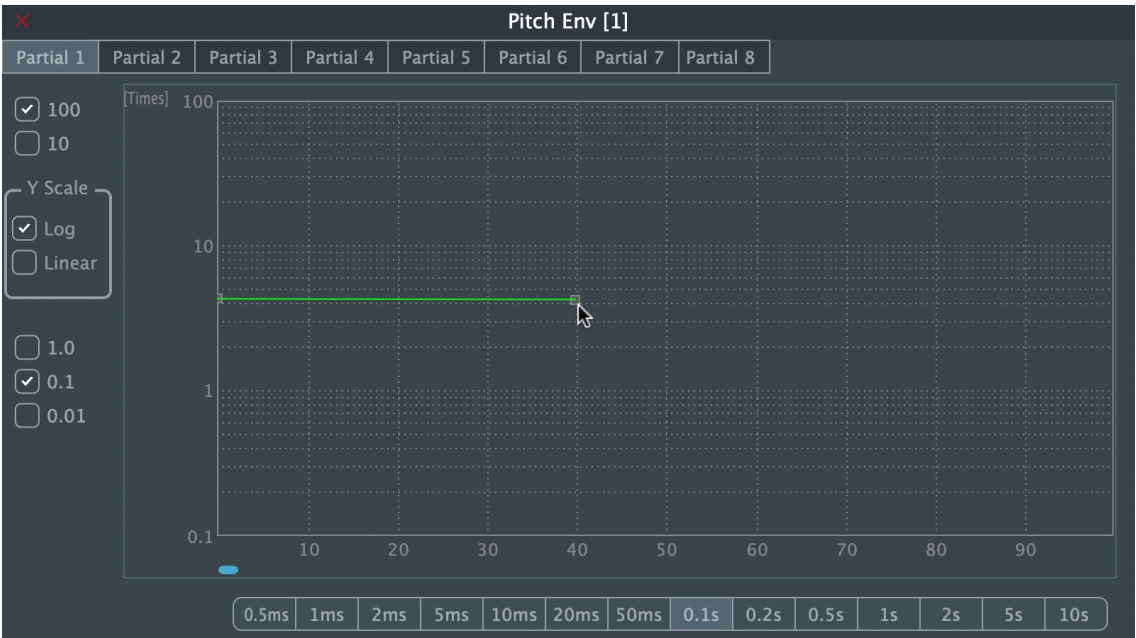


2D Break Points.

Right click adds a new Break Point..

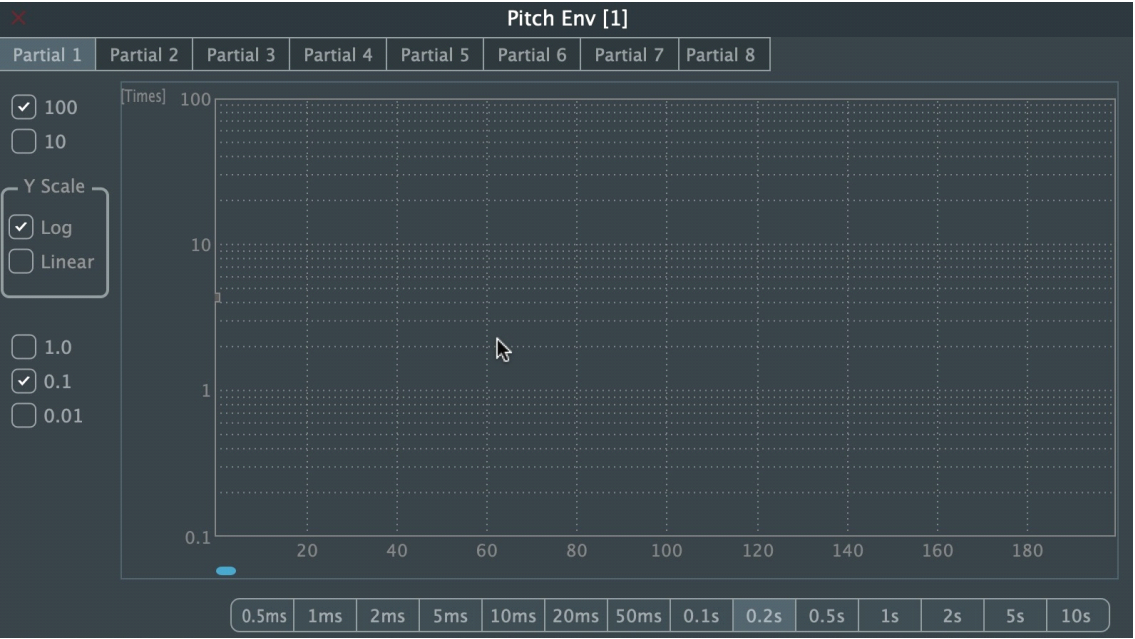


It's Connected to the first point.



Left click and Drag moves the Break Point around.

Right click deletes the Break Point.



3. Tips

This chapter contains tips on the standalone version of RC-808. Please refer.

3.1 Assembling a new Drum Kit by collecting Instruments from existing multiple Drum Kits

You can assemble a new Drum Kit by picking up individual Instruments from multiple Drum Kits. Maximum 16 Instruments can be collected and gathered to create a new Drum Kit.

Create a folder in beforehand, with its name being the new Drum Kit.

On the Main Panel, press the Instrument Name button of the Instrument you want to assign Go File > Load, and search for the Instrument File (.prm) you want to use from the folders. Then load it.

Confirm the Inst Name on the Edit Dialog and the Instrument Name on the Instrument Number you want to use on the Main Panel is identical.

Likewise, load the other Instrument Files (.prm) to other Instruments on the Main Panel.

From the Main Panel, go Settings(S) -> “Inst# <-MIDI Note No” menu, and set the MIDI Note numbers of individual Instruments.

From the Main Panel, go File (F) -> Save Parameters (kit) and open the dialog to confirm the relation of the 16 Instrument Numbers and their MIDI Note numbers.

Check the check boxes of the Instruments you want to save.

Click the File button mentioned earlier, and open the Save File with Different Name dialog.

Select the folder you made at first.

Type in the new Drum Kit name to the File Name (N) field.

Click Save (S) button. return to the Save Parameter display to confirm the directory to be saved, and then press OK.

3.2 Editing an existing Drum Kit

If various Instrument files (.prm) are stored within a same Drum Kit folder, then multiple Drum Kits can be assembled from them and saved into the same folder.

Copy and paste the Instrument files you want to use, and Drum Kit files you want to edit, into a single folder.

From the Main Panel menu, go File (F) > Load Parameters (kit) to open the file explorer dialog.

Select the Drum Kit (.allprm) you want to edit, and click it to deploy it on the Main Panel.

Open the Edit Dialog of the Instrument with Instrument Number button.

Go File > Load, to select and load the Instrument file (.prm) you want to edit. Confirm the sound by triggering it with the Instrument Pad.

Change the Note Number of the Instrument if necessary.

From the Main Panel menu, go File (F) > Save Parameter (kit) and open the Save Parameter display.

Confirm the Instrument Name and Note Number.

Click the File button on the upper right, and open the “Save as” dialog.

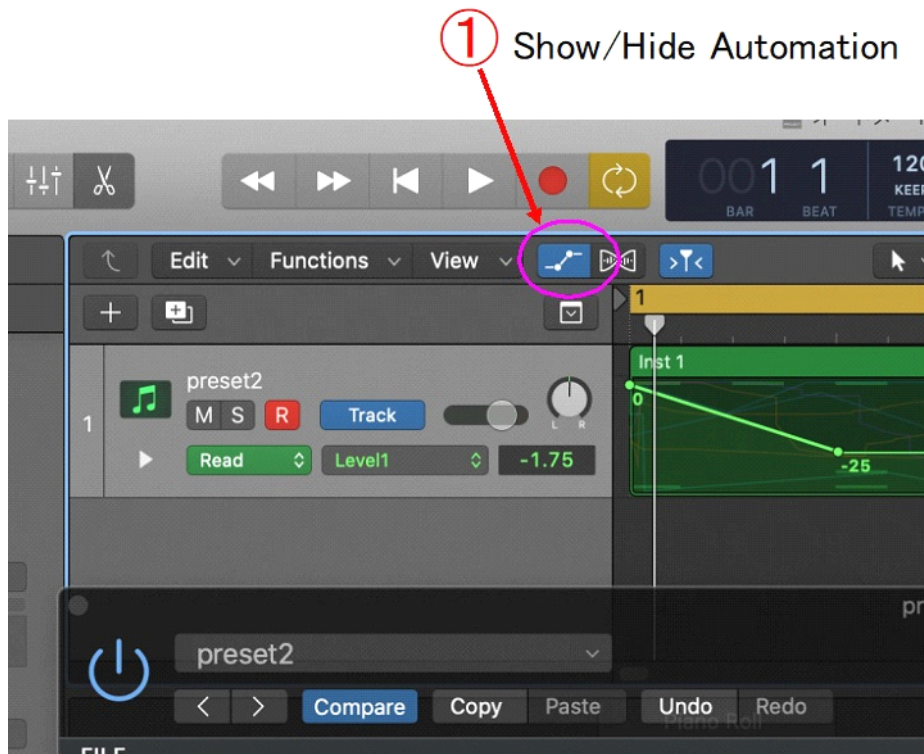
Write the new file name to the File (N) if necessary, and click Save (S) button.

If the Inst File Name will be as is, then overwrite it.

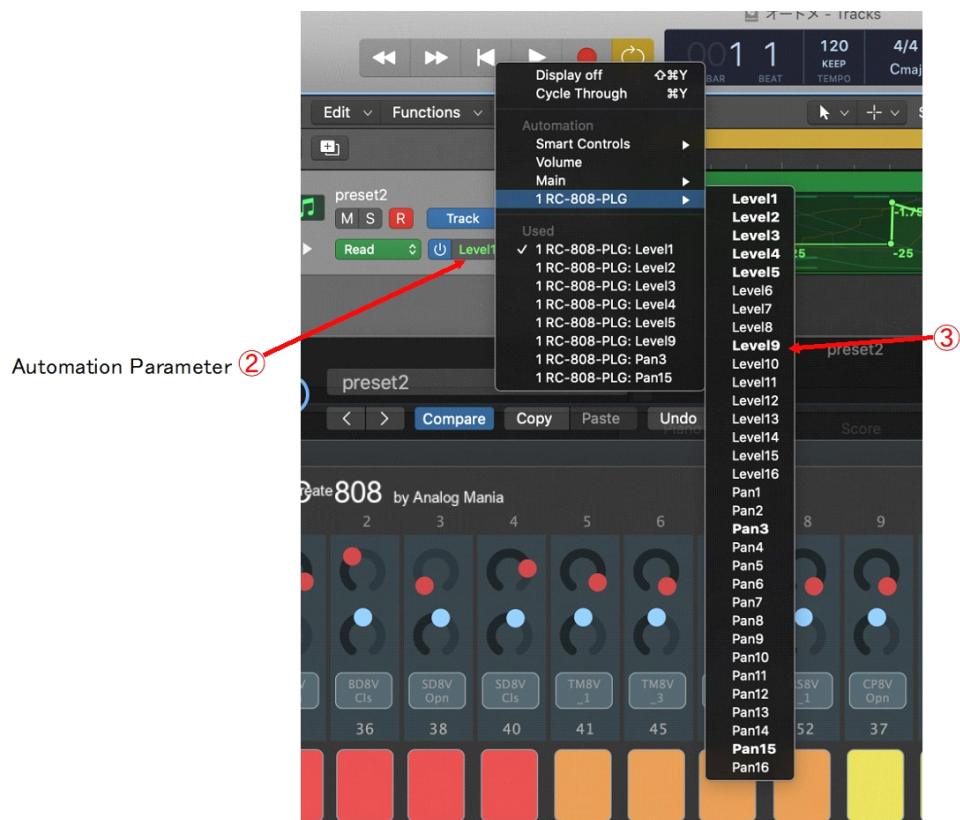
Click the OK button in the Save Parameter.

4. Automation

Instrument Level and Instrument Panning can be assigned to automation functions of DAW. This allows you to create dynamic sounds.



- ① Click the "Show/Hide Automation" button.



② Click the "Automation parameter" button.

③ Select the item you want to assign.

*Refer to the manual of each DAW for detailed setting method.

5. Revision History

Revision	Date	Contents
1.0	Sep. 9 2020	First Publication
1.1	Oct. 31 2020	To correct errors
1.2	Jun. 6 2021	Added functionality to File Menu. Fixed a bug in the Pitch Envelope.

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