

OS 1.803 General

Introduction

Dear Wave User,
after a couple of years of work, I finally succeeded to get some bugs fixed and some additional features implemented.

This document will give you an introduction into the changes, will guide you through the installation process and include some pages that can be added to the original manual as an expansion containing the new functionality. Please refer to the appropriate section as marked in this manual.

At this point, I like to thank Jürgen Fornoff, Hermann Seib and last but not least Stefan Stenzel. Without their initial help, it would not have been possible to do this work. I also like to thank Till Kopper for the support and the indefatigable encouragement to continue the development.

Due to different reasons, the installation of the new OS will be personalized. Therefore you will get your personal key for running the OS. Details can be found in the section "installation".

Even if there are some new features and improvements available for now, the possibilities for further development of the Wave OS are limited. For example, I doubt if I will be able to build in the intended sequencer and for sure I will not add any hardware-based option. But nevertheless, if you have any suggestions, send me a mail and maybe they will be implemented.

So, I wish you a lot of fun with the Wave and to speak in the words of Till Kopper "keep on turning these knobs".

Werner Schönenberger, August, 2009

(werner.schoenenberger@gmx.ch)

News

OS 1.803

- Personal Key "1" feature added.

OS 1.801/ 1.803

- Small bug fixes.

OS 1.800

This chapter gives an overview of the features and fixed bugs.

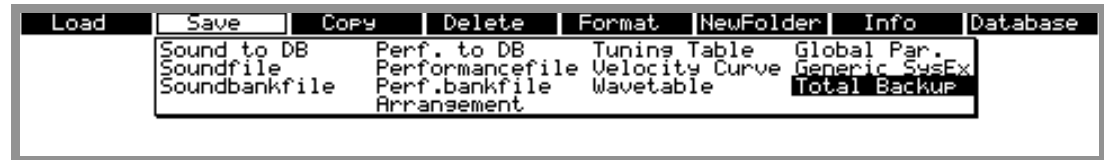
- The Wave shows a splash screen at start up.
- LFO 1 & LFO 2 independently can be synched to MIDI in various options.
- The Wave now can analyze .WAV files.
- Pedal 1&2 now can be changed in their polarity after boot phase.
- In the Waves Edit mode, in Harmonics Edit, there is a "silence" function, which sets all Harmonics to zero.
- The Wave now maps velocity tables to externals too. This feature is described in the manual but was not implemented.
- The bug in the velocity table mapping is fixed.
- In Group Edit now instruments and externals can be switched on again after switching them off.
- The sustain pedal only is sent to externals which are not muted.
- Pedal 1&2 also send only to externals when these are not muted.
- Sending and receiving of the pedals via MIDI now works.
- The Buttos work for external Instruments not only on MIDI channel 1.
- The voice allocation bug of OS 1.700 is fixed.
- SysEx store and dump fixed
- Controller 64 – 117 assigned to the Faders now send values 00...127 (not only on/off)
- Aftertouch, Volume, Detune, Pan assigned to the Faders now are correctly displayed
- The MIDI controllers for free wheel up and free wheel down in performance definition now also control free wheel bidirectional parameters
- Some bug fixes were done in the file access functions.

Installation

This chapter describes the installation process step by step. Since you will need a key to install the software, it cannot be done in one single attempt.

Note: The key only has to be used, if you never installed an OS 1.8 before.

1. As usual before installing a new OS, first make a total backup of your current system by activating the disk functions and then choosing the <save>. After this you have to select the function "Total Recall" by using the [+/-] buttons (see figure below).



Press [OK] to go to the selector box for starting the total backup.

2. Create a Wave OS disk and label it with OS 1.803. The disk should include the following files:
 - Init.SND
 - Init.PFM
 - W2Sys.Bin
 - WDV.SYS
3. Start the Wave using the new disk. The Wave will boot as usual but will stop with the following display (this and the following steps only happen, if you did never install an OS 1.8):

```
TESTING GLOBAL PARAMETERS :   OK
TESTING TABLES           : 10 OK
READING "WDV.SYS"... DONE. (15112 BYTES READ)
INITIALIZING VOICE BOARDS:   2 BOARD(S) OK
INITIALIZING OSCILLATORS... WAITING...   OK
INITIALIZING OSCILLATORS... WAITING...   OK
FOUND 0 WAVETABLES DAMAGED, NOW INITIALIZED

IDENTIFICATION NR: 1E67FA12
KEY                :
```

Now it is time to note the *Identification Nr.* (in this example 1E67FA12). This number depends on your instrument. Send this number *together with the serial number of your Wave* (which can be found on the back of the instrument) to the e-mail address mentioned in the introduction. After everything is cleared, you will receive a key number for your personal OS

version.

In the meantime you can reboot your Wave with the former OS (1.7 etc.) and work as you are used to do. You also can enter the "Key 1" by pressing <1> on the keypad, which normally is used for the sound selection. and then press <OK>. Please note in mind that you can use this Key only once. When you swich off the Wave and restart it again, then you will need a key, Key 1 will not work again.

4. After having received the key number, restart your wave with the OS disk 1.8. The system shows the same screen as shown above. At this point, it would be wise to write down the key your received:

KEY : _____

Please enter the key you received by using the keypad. If you make a mistake, press <CANCEL> and you can start over again to enter the key. If you finished the entry, press <OK> to accept the key. E.g. the display will show the following (just before pressing <OK>):

```
TESTING GLOBAL PARAMETERS :   OK
TESTING TABLES           :  10 OK
READING "WDV.SYS"... DONE. (15112 BYTES READ)
INITIALIZING VOICE BOARDS:   2 BOARD(S) OK
INITIALIZING OSCILLATORS... WAITING...   OK
INITIALIZING OSCILLATORS... WAITING...   OK
FOUND 0 WAVETABLES DAMAGED, NOW INITIALIZED

IDENTIFICATION NR: 1E67FA12
KEY               : 123456
```

5. Now the Wave will start up and in future you will not have to enter the key again - it is kept in the memory. Please proceed with saving a backup of your current Wave memory on your OS disk (as done in step 1) just for security reasons.

Hint (only available with OS 1.803)

When the backup battery power is down or a sound set of another Wave (OS 1.7 or earlier) is loaded with "Add Wave Specific Parameters" set to yes, the personal key is destroyed. Also the identification number at start up does not correspond anymore with the correct one. In this case it must be possible to start the Wave without a key. Therefore "Key 1" was introduced. Is possible to start up the Wave **once** and only once by entering the key "1" by pressing <1> on the numeric keypad and accept it with <ok>. The Wave will boot and then you immediately should load the latest backup you

made with your own Wave. Of course, also load the "Wave Specific Parameters" in this case. If the battery power is down, it is possible to every time start the Wave with "Key 1", since the key cannot be stored. If the battery is ok but you loaded a wrong sound set, it will **not** be possible to enter "Key 1" twice.

Note: You never should load a foreign sound set with "Wave Specific Parameters", because this will destroy the specific adjustments made for your Wave including the personal key.

Note: If the battery still is ok and you forgot to load the latest backup before switching off the Wave, the only work around is to start the Wave with OS 1.7 or earlier and load the latest backup from there. Then you have to reboot the Wave with OS 1.8 and everything is ok. Sounds complicated but isn't.

Compatibility

All sounds stored with the new software are backward compatible to the old OS. Of course, old OS of the Wave cannot handle new parameters for LFO MIDI synchronisation.

Start Up

The splash screens shown up when the Wave boots is just a small add on.

After final initialisation the Wave will show up with the following screen, displaying the current OS:

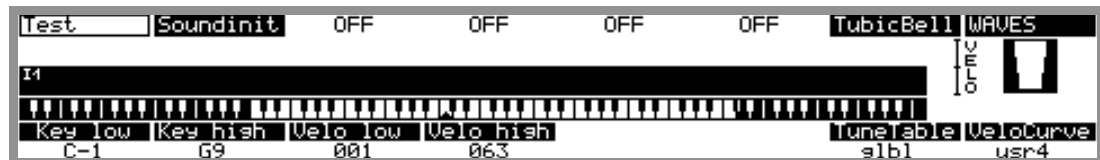


Bug Fixes

This section describes in more detail the different bugs, which were fixed with OS 1.8.

Use Velocity Tables for External

In former versions, velocity tables for external MIDI instruments indeed could be selected but only the linear velocity scale was sent to the MIDI instruments (Parameter "VeloCurve").



OS 1.8 adds the feature to process the selected velocity mapping for external MIDI instruments.

Velocity Table Mapping

In former versions, the mapping of the user velocity tables was wrong.
When selecting *Full*, user table 1 was selected.
When selecting *User 1*, user table 2 was selected.
When selecting *User 2*, user table 3 was selected.
When selecting *User 3*, user table 4 was selected.
When selecting *User 4*, the full table (no velocity) was selected.

With OS 1.8 the correct user velocity table is selected.

Group Edit: On & OFF for Instruments and Externals

In former versions in menu Group Edit, instruments and externals could not be switched on again after being switched off. The screen is displayed in the Group Edit when called from either Page 1 or 2 of Instruments or Externals.

Volume	Panning	Aux Vol	Audio Out	Transpose	Detune	MIDI Chnl	Source
Parameter : Source							
Test Prs b122 Chnl base keys&MIDI	Christ' B Prs a001 Chnl base keys&MIDI	Christ' B Prs a001 Chnl base keys&MIDI	OFF	OFF	OFF	OFF	OFF

Menu "Source" of Instruments Group Edit which did not switch on instruments after having switched them off.

Volume	Panning	MW Scale	PW Scale	Transpose	Detune	MIDI Chnl	MIDI Out
Parameter : MIDI Output Port							
Kora WS B000 P000 Chnl 02	B000 P000 Chnl 06	Matrix 12 B000 P000 Chnl 11	Kora 01/W B000 P000 Chnl 01	PPG EVU c B000 P000 Chnl 14	OFF	PPG W2.2 B000 P000 Chnl 04	OFF
out A	out A	out A	out A	out A	off	out A	off

Menu "MIDI Out" of Externals Edit which did not switch on externals after having switched them off.

With OS 1.8 instruments and externals can be switched on after having switched them off.

Sustain Pedal

With former versions, the sustain pedal was sent to external MIDI instruments, even if they were muted. With OS 1.8, the sustain pedal only is sent to un-muted external instruments.

Pedal 1 & 2

With former versions, pedal 1 & 2 was sent to external MIDI instruments, even if they were muted. With OS 1.8, the pedal 1 & 2 only are sent to un-muted external instruments.

Pedal 1 & 2 sending and receiving via MIDI

With former versions, there was a shift in controllers, when pedal 1 & 2 were received by MIDI. This led to the fact that e.g. pedal 2 had to be sent as controller X to be received correctly. With OS 1.8, pedals are sent and received correctly.

Buttons 1&2 are sent on all MIDI Channels

With former versions, the two buttons only were sent to external instruments, if they were set to MIDI channel 1. With OS 1.8, the buttons are sent to external instruments on any MIDI channel.

Voice Allocation Problem

With version 1.700 there was a voice allocation bug in certain circumstances that led to missing notes. With OS 1.8, the bug is fixed.

SysEx Problem

With former versions it was possible to store SysEx information on a floppy, but it was not possible to send it back correctly to the MIDI device via MIDI Out. With OS 1.8, the bug is fixed; the Wave can send received SysEx information correctly to the connected instruments.

Fader Assignment of Controllers #65..#117

This is not a real bug. Former versions send controllers #01..#63 assigned to faders as 00..127 and controllers #64..#117 as on/off (00/127). These latter controllers nowadays are often also used as continuous controllers. Therefore the software was changed to send for all controllers #01..#117 a value in the range of 00..127.

Fader Assignment of Controllers #118..#127

In former versions there were a couple of display bugs in the fader handling of specific faders. Aftertouch was not updated in the display when having it assigned to an instrument. Volume, Detune, Pan and Aftertouch was not updated in the display, when having it assigned to an external. These bugs are fixed with OS 1.8.

Please note, that faders assigned to externals will send their MIDI information even if the corresponding external is muted. This is no bug but intension. With this solution it is possible to control e.g. pan or volume of an external instrument, even if the keyboard of the Wave does not control it (muted).

Controlling Free Wheel Bidirectional by MIDI

In former versions against the description, it was not possible to control the free wheel, if it was assigned as a modulation control as "free wheel bidirectional". Now it can be controlled by the assignments made to Free Wheel Up and Free Wheel Down in the performance control section. Please keep in mind that MIDI information, received by the controller, assigned to Free Wheel Up (00..127) will create positive information for Free Wheel Bidirectional (00..127). Similar, MIDI information, received by the controller, assigned to Free Wheel Down (00..127) will create negative information for Free Wheel Bidirectional (00.. -127)

Bugfixes in File Access

The following bugs were fixed in the file access:

- When being in a sub folder and trying to save a file that already exists, an alert box is displayed. When pressing <cancel> and then selecting menu <close Folder>, an alert box of type "file not found" is displayed and the system is in a loop that only can be left by saving the file. With OS 1.8, the alert box is not shown anymore and the menu can be left without an issue
- When showing an alert box of type "file not found", the file extension is not displayed correctly. This bug is fixed.

Known Problems

There are still known problems, which have to be fixed. The following gives an overview on the known problems. If other issues are known, please send a note to the address mentioned in the introduction.

- Occasionally, notes are hanging. These notes can be switched off by pressing <Cancel> and <OK> simultaneously.
- There were no changes made to the database. So the stability of the database remains the same.
- MIDI Bank Select is not implemented correctly. But since the Wave offers only 2 Banks and it is possible to switch between the two banks, this bug was not fixed.
- Wave Edit: incorrect phase for additive wave generation.
- Wave Edit: Strange behaviour if auto-scale is switched on and all harmonics are set to 0.
- Wave Edit: strange behaviour of endless potentiometers.
- Wave Edit: Strange screen update in blend modus.
- Wave Edit: Incorrect initialisation of lower limit at wave table selection.
- Externals: Key window shifted by one key at definition.
- System Crash when trying to read a non DOS formatted floppy.
- Copy function shows incomplete screen update if no instrument is selected.

Global 2 Parameters

In Global Edit in the menu Global 2, there is a function "Polarity Ped1|Ped2" added which allows the user to change the polarity of pedal 1 & 2 after start up. Since only one parameter was left to this screen, one single slider handles the functionality. The following shows the screen



P.C.Voice Mode

Range: ring / shut

This parameter was available in former versions

SystemVol to Xtr.

Range: off / on

This parameter was available in former versions

Global Transpos

Range: -12 / +12

This parameter was available in version 1.680 and allows the user to transpose the whole instrument in half tones. +12 to transpose up for one octave, -12 transposes down for one octave.

Polarity Ped1|Ped2

Range: neg|neg, neg|pos, pos|neg, pos|pos

This parameter is **new** and allows the user to change the polarity of pedal 1 & 2 after start up. Since one slider is used to control two parameters, the two parameters are separated by a "|". The following table explains the values:

- *neg|neg*: Pedal 1 has **negative** polarity and pedal 2 has **negative** polarity
- *neg|pos*: Pedal 1 has **negative** polarity and pedal 2 has **positive** polarity
- *pos|neg*: Pedal 1 has **positive** polarity and pedal 2 has **negative** polarity
- *pos|pos*: Pedal 1 has **positive** polarity and pedal 2 has **positive** polarity.

Sustain Pedal

Range: opening, closing

This parameter was available in version 1.680 and allows the user to set the polarity of the sustain pedal.

Sys Ex MIDI Port

Range: off / Out A / Out B

This parameter was available in former versions.

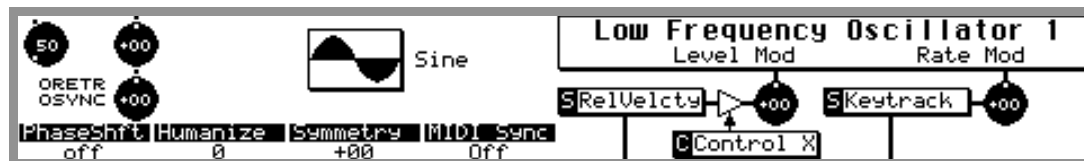
Prg Change Mode

Range: multi / individual / combined

This parameter also was available in versions 1.680.

LFO - MIDI Sync

Entering the LFO page shows two additional parameters for LFO 1 and one additional parameter for LFO 2. LF1 now also has a phase shift parameter, which will work with MIDI sync and the retrigger function (see below). The phase shift parameter for the retrigger functionality also is added to the LFO 2. And now both of the LFOs offer MIDI synchronisation, controlled by slider #4. MIDI synchronisation individually is available for both LFOs but depending on the phase shift parameter might influence each other nevertheless. Therefore the functionality of these two new parameters makes the LFOs rather complex.



All parameters except “PhaseShft” and “MIDI_Sync” correspond to the former parameters of the Wave and will not repeated here. So the explanations concentrate on the new parameters.

<PhaseShft>

Range: off / 002...360

Phase Shift shifts the phase of the LFO for the entered amount of degrees. If the function is set to *off*, no phase lock will occur. The function depends on the settings of “Retrigger” and “MIDI sync”. The following Table will give an explanation of the behaviour of the function depending on the settings of the functions mentioned before. (Please note that the description of “MIDI-Sync” and “MIDI-Beat-Sync” will follow below.)

Trigger	MIDI Sync	Description	Remarks
<i>Retrig</i>	<i>off</i>	The start phase of the LFO wave is adjusted with the PhaseShft. Therefore the sawtooth can start with the lowest value by each key. In former versions it always started with the zero point.	LFO 1 & 2
<i>Retrig</i>	<i>MIDI-Sync</i>	The start phase of the LFO is synchronized with the MIDI clock according to the description above. E.g. a sawtooth will start	LFO 1 & 2

Trigger	MIDI Sync	Description	Remarks
		with the lowest value synchronized to MIDI	
<i>Retrig</i>	<i>MIDI-Beat</i>	The start phase of the LFO will be synchronized with the bar according to the description above. E.g. a sawtooth will start with the lowest value at each beat.	LFO 1 & 2
<i>no Trig.</i>	<i>off</i>	LFO 2 is synchronized with LFO 1 but has a phase shifting according to the settings.	Only LFO 2 (LFO 1 will ignore the setting)
<i>no Trig.</i>	<i>MIDI-Sync, MIDI-Beat</i>	The phase shift has no functionality since the MIDI trigger has higher priority.	LFO 1 & 2
<i>Sync</i>	<i>off</i>	LFO 2 will be synchronized with LFO 1 and all LFOs of the different voices are synchronized.	Only LFO 2 (LFO 1 will ignore the setting)
<i>Sync</i>	<i>MIDI-Sync, MIDI-Beat</i>	The phase shift has no functionality since the MIDI trigger has higher priority.	LFO 1 & 2

The following is the priority of the settings of the two parameters:

- 1st Priority: MIDI-Sync
- 2nd Priority: Retrig
- 3rd Priority: Synch LFO2 to LFO 1

In other words, e.g. LFO 2 only is synchronized to LFO 1, if no retrigger is set to LFO 2 and LFO 2 is not synchronized to MIDI.

Remark: If LFO 2 is not set to "retrig" and has no MIDI synchronisation, but a phase shift is set, then it is synchronized to LFO1. If in this case LFO 1 is synchronized to MIDI, LFO 2 automatically is synchronized to MIDI too. As mentioned above, this is a rather complex situation.

<MIDI Sync>

Range: off / MIDI Sync / MIDI Beat

This function allows a synchronisation of the LFO to external MIDI clock signals.

- *MIDI Sync:* This function synchronizes the LFO to the MIDI clock. When active, the *Rate* value will have a new function because it will divide or multiply the LFO speed according to the MIDI clock (see table below).

- **MIDI Beat:** This function also synchronizes the LFO to the MIDI clock but will synchronize it to a single beat (1 quarter of a bar). Depending on the start commands of the attached sequencer, the LFO will synchronize to the beats.

Please note, that the trigger functions "sync" and "retrig" also are available in this mode. Please also note that having MIDI sync set to *MIDI Beat* and trigger is set to "retrig" it might seem that all LFOs of all voices are synchronized. But having a big divider setting (see table below) will show that in fact they are not synchronized. E.g. with such settings you might get effects that the LFO of voice #2 has a phase shift of 180° to voice #1. As mentioned above, the LFOs became rather complex.

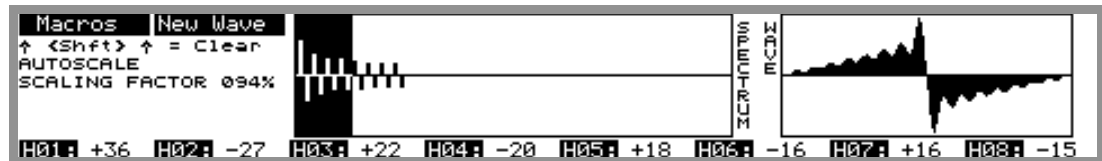
When synchronized to MIDI, the LFO rate function changed. It will act as a multiplier or divider of the frequency of the MIDI clock. The following table gives an overview of the settings:

From rate...	... to rate	Divider /Multiplier
0	0	/ 9
1	8	/ 8
9	16	/ 7
17	24	/ 6
25	32	/ 5
33	40	/ 4
41	48	/ 3
49	56	/ 2
57	64	/ 1 = x 1
65	72	/ 1 = x 1
73	80	x 2
81	88	x 3
89	96	x 4
97	104	x 5
104	112	x 6
113	120	x 7
121	127	x 8

Harmonic Edit

To start from scratch, the best way is to clear all harmonics. This can be done by selecting the macro "Scale Wave..." from the menu "Macros", set the range to 0% and press <ok>. Or the macro "Delete Harmonics..." has to be selected and the threshold has to be set to 100%.

Now there is an easier way. OS 1.8 implements a "silence function" that can be invoked by simply pressing <Shift> at the same time as you press the button above the menu "Macros". The result is an empty wave with all harmonics set to zero. To indicate this function, there is an extra line added to the screen, reading "**↑ <Shft> ↑ = Clear**" in the first line below the menus.



Wave Analysis

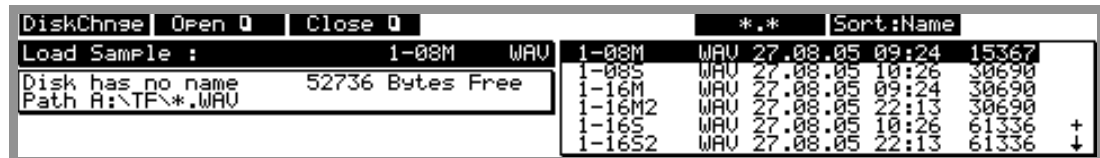
Additional to the former Steinberg Avalon and sound designer I format (see p. 4.7 in Wavetable Design) the Wave now is able to read WAV formatted files. There are a couple of remarks to be added to this statement:

- Only .WAV files **without** data compression can be analyzed.
- Only .WAV files with a resolution of a multiple of 8 bit can be analyzed (8 bit, 16 bit, 24 bit, 32 bit, ...)
- Only .WAV files up to a size of 640kB can be analyzed. This is a limitation of the physical memory of the Wave.
- If more than one channel is stored in the .WAV file, only the first channel will be analyzed (e.g. left channel for stereo samples).
- If the resolution is more than 16 bit, only the two most significant bytes of the samples (most significant 16 bits) will be analyzed. The lower significant bytes will be ignored.

Please note that the sample format is recognized based on the file extension of the file to be analyzed.

- *.WAV indicate a WAV file.
- *.SD indicate a sound designer I file.
- *.SMP indicate an Avalon file.

To allow the .WAV file, the file selection had to be slightly changed. When analyzing a file (e.g. by time mode), the file selection primary filters the .WAV files.



The screenshot shows a file selection window with a menu bar containing 'DiskChange', 'Open O', and 'Close Q'. The main area displays a list of files with columns for file name, extension, date, time, and size. The files listed are all WAV files with various sample rates and durations. The file '1-1652.WAV' is highlighted with a mouse cursor.

File Name	Extension	Date	Time	Size
1-08M	WAV	27.08.05	09:24	15367
1-08S	WAV	27.08.05	10:26	30690
1-16M	WAV	27.08.05	09:24	30690
1-16M2	WAV	27.08.05	22:13	30690
1-16S	WAV	27.08.05	10:26	61336
1-16S2	WAV	27.08.05	22:13	61336

To load *.SD or *.SMP files, the user has to press <*. *> which will show all files in the directory. Then the desired *.SD or *.SMP file can be selected. *Remark:* The Wave will **not** be able to analyze any *.XYZ file except the defined three types.

Please also note, after selecting a .WAV file with 16 bit or higher resolution to be analyzed, the user will have a selection to perform an 8 bit or 16 bit analysis. The Wave will show an alert box containing the following information:

Wave 16 bit analysis
analyze 16 bit (ok) or
reduce to 8 bit (cancel) ?
CANCEL / OK

Pressing <OK> will perform a 16 bit analysis and <CANCEL> will perform an 8 bit analysis. When the 8 bit analysis will add some high frequencies to the result, which might be helpful in noisy samples, the 16 bit analysis might result in a smoother wave table which might be desired for harmonic samples. Just try the different options.