

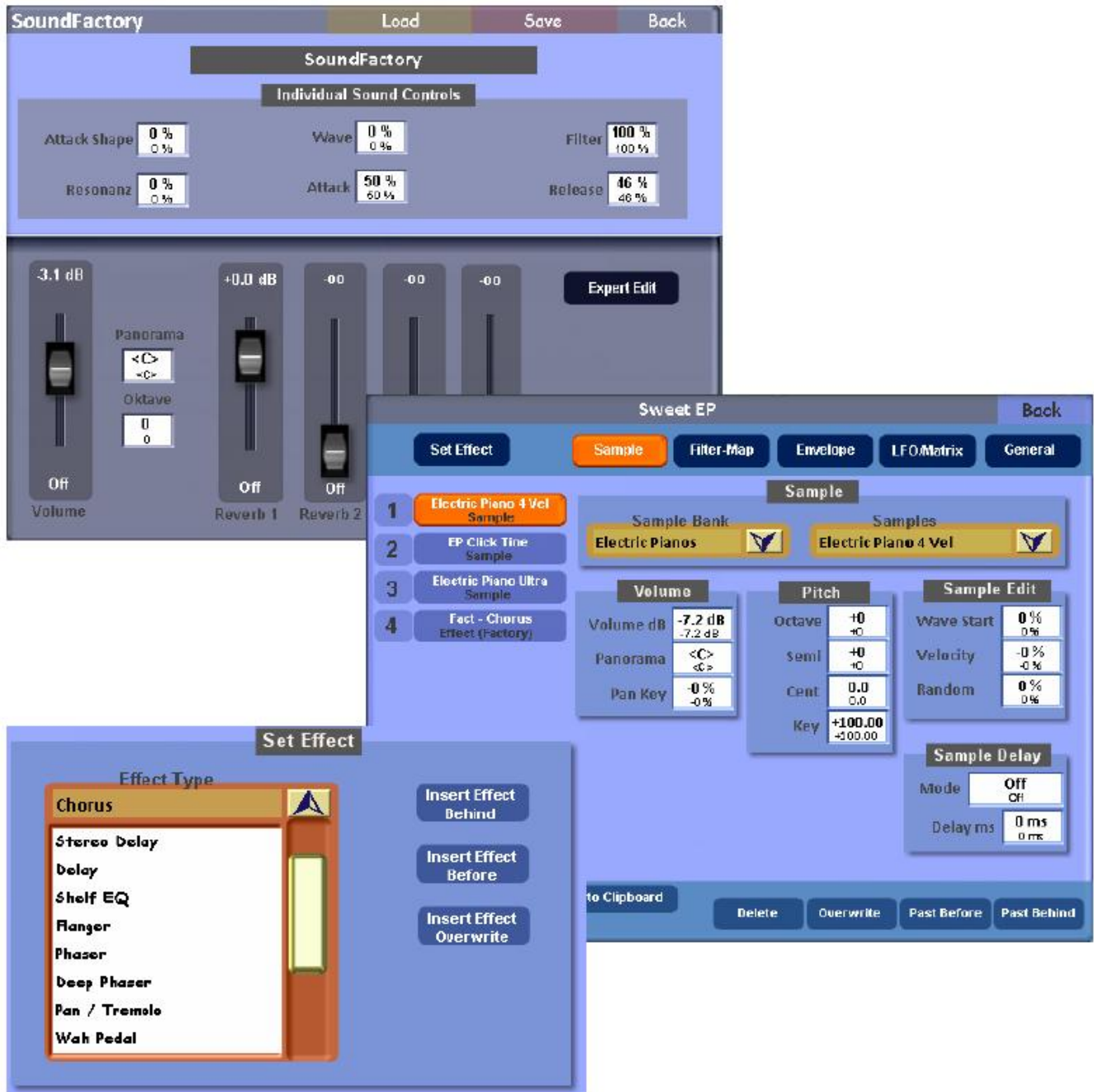


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Instruction Manual for the Sound Factory Software



Requirements: This new Software Add-On is suitable for all OAS instruments. OAS-7 Software Version 7.1 R44 is required to be installed first. Other requirements like the OpenArt-Arranger are not needed.

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Forward

Dear Customer,

We are pleased that you have purchased this special extension to your OpenArt System. This provides new sounds and new combinations of sounds. We have given you 800 Sound Layers from the existing Sounds. You can change the existing sounds exactly how you wish. With the Sound Factory you can be creative with complete freedom.

Since the range of sounds produced and the treatment of sounds is a very complex topic, we have written these operating instructions. By registering your purchase with us, we offer, as a special service, e-mail support for one month from the purchase date. Please send your enquiry with your name, address, proof of purchase, name of your instrument and the hardware number to the following e-mail address:

soundfabrik@wersi.net

Please note that we can answer questions only about the setting up of sounds.

We wish you great fun and success in setting up new sounds.

Your OAS Development Team.

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1. General Advice

1.1 "Polyphony of the Instrument" - Maximum Number of Voices

History - At the beginning of digital musical instruments only a few sounds could be produced at the same time. The available polyphony (Greek: *poly* "more" and *phony* "sounds") was low. Thus the Delta organ had 16 Voices or the CD-Line had up to 32 voices, depending upon the circuitry.

For each depressed key (note) a single voice is needed for mono while two voices are needed for stereo. With chords even more are needed. On a single manual several voices are playing at the same time and with two manuals (eg Upper 1 and 2) twice as many voices are needed. In addition, a single sound can contain many samples, each of which needs a voice. With several voices on the manuals and a MIDI-Sequencer running at the same time, a great many voices are needed. Additionally, loading sounds like Strings with a long decay puts a further strain on the polyphony. That is because the decay is continuing while new notes arrive.

Depending upon the processor in your instrument, the OpenArt System can produce several hundred voices. Should that range be exceeded, the system can adjust by cutting off quiet sounds to allow new sounds to be heard. During any substantial overload on rare occasions distortion can be heard while playing.

With the "Sound Factory" we are giving you a tool with which you can build sounds with up to 10 stereo layers. A chord of four notes therefore will require 40 voices at the same time.

Use all resources wisely. There is the expression "less is more". With music less is almost always more!!!

1.2 Volume of the Sounds

A great importance is attached to having the correct volume, since firstly it is very easy to make a sound be too loud by using all the places in the instrument where volume is controlled (mixer, panels, controls for the manuals, etc) and secondly the maximum volume is limited electronically.

If that threshold is exceeded, it causes the sound to distort. Furthermore a chord is louder than a single note and with a MIDI-Sequence 30 tracks can play at the same time. A large symphony orchestra is louder than a single violin.

Please make sure that you do not make the sounds too loud. If you set the maximum volume for a single note the sound can distort with chords or playing Styles or MIDI-Files.

The adjusted volume does NOT correspond to the heard volume. So two sounds with the same set volume can sound at quite different volumes. This is related to the frequency spectrum of the sounds.

It is best to use the sound "Grand Piano *" (Bank 90, sound 1) as a volume reference.

2. Installing the Software

Upon purchase of the software you will have received an Activation code, either by phone or e-mail. This code is for your instrument alone. Should you not yet have received the code, contact the company from which you bought the software giving them the relevant numbers of your particular instrument available from its Activation Screen.

1. After installing the current OAS software, start your instrument and touch the SETTINGS tab.
2. Then touch the ACTIVATIONS button. The display shows all the available software which can be activated on your instrument and its current state of activation.



3. Select the "Sound Factory" package. You can scroll down the list using the Scrollbar.
4. Touch "Activate Now" and the virtual typewriter appears on the display. Use that to input the Activation Code you have received.



5. Type in the seven-figure Activation Code and touch ENTER. If the code is correct, the display will show that the activation has been successful. Confirm by touching OK. Now, by the side of the name Sound Factory will be an indication that it is now activated, plus the Activation Code. It is advisable to make a note of all your activated codes in case of any problem.

An example of what will appear: **SoundFactory - Activated (0707760)**

6. You will need to restart your instrument and you will then be able to use the package with these operating instructions.

3. Selecting Sound Factory

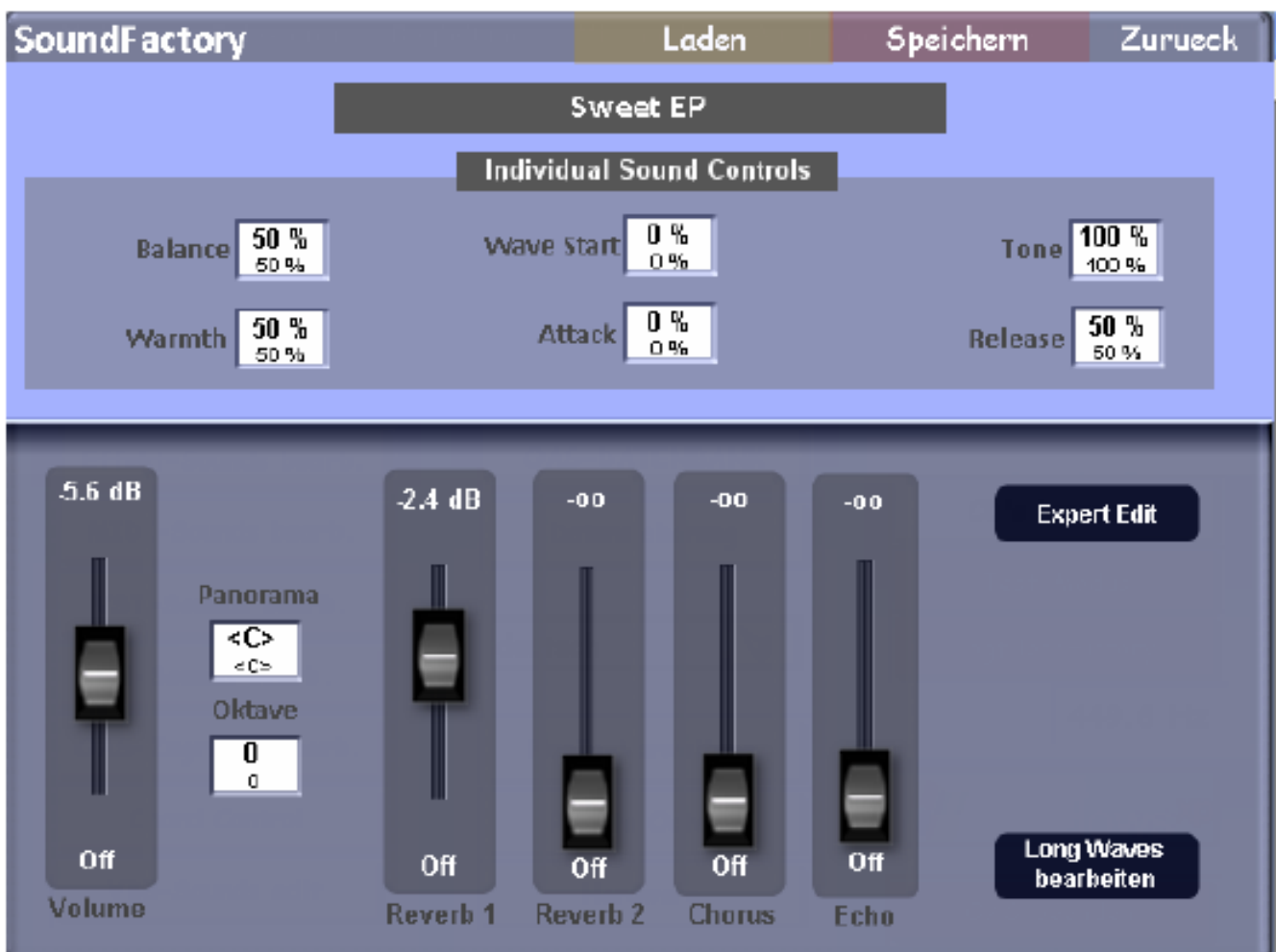
The new Sound Editor will be found under the "Edit Long Waves" button on the Settings screen under "Change Sounds".



The currently selected sound in your currently open Total Preset is then displayed. If it's not possible to display that sound, eg if it's an OX7 sound, or a sound not based on sampling technology, then the first sound in the list, the Grand Piano *, will be displayed.

Advice: It is not currently possible to work on AKAI sounds. The technical complexity is too great and would be too expensive. If Sound Factory is accepted well by many OAS customers, an update in that direction is a possibility in the future.

Warning: While the new display is opening, do not attempt to play any keyboard. The current sound is being prepared for adjustment.



Advice about the preceding "Edit Long Waves" button. In the new Sound Editor you will see the "Edit Long Waves" (Long Waves bearbeiten) button repeated in the bottom right-hand corner. This will take you back to the original Sound Editor. Any changes you make within Sound Factory must be stored within the Sound Factory before touching this "Edit Long Waves" button.

3.1. Selecting a Sound

If the sound you wish to edit was not already selected before opening Sound Factory, you can choose it now by touching the "Load" button at the top of the screen as in the original Sound Editor. The following screen then appears.



Using the Tempo/Data wheel you can move up and down the list of Long Wave sounds. By touching the required sound on the screen it will be opened up. This is the same procedure as in the OpenArt System generally.

To find a sound quickly, use the Group lists to limit the full list. For technical reasons it is not possible to pre-hear the sound. Changes you make to the sound afterwards can be checked by playing on the Upper Manual.

4. Changing Sounds

4.1. Important Advice

The Sound Factory is a professional Sound Editor which goes deeply into the structure of tone generation. It makes extensive use of the available RAM and, under certain circumstances, the software can crash. The following advice must be followed, therefore.

- While adjusting the structure of sound parameters and the copying, insertion or deletion of Layers or Effects, avoid sending data to the sound generator. That would happen if a volume drawbar or the Expression pedal were adjusted while playing a sound. With older instruments there can be wear of the volume drawbars or the Expression pedal such that values become unstable and change by themselves. It is important that stable values (preferably zero) are achieved before making any changes within Sound Factory. After insertion or deletion of a whole Layer you should wait at least one second before playing a note.
- Save your work regularly, preferably at short intervals. If, despite following all these procedures, the software should crash, upon restarting it will return to the last-saved point.
- After working for a long time with Sound Factory, it can be beneficial to switch the instrument off and start again. This clears the RAM and any other erroneous entries in the tone generator.

4.2. Standard Settings

In the lower half of the display you will find the basic adjustments of each sound characteristic. These are Volume, Panorama, Octave, Reverb 1 and 2, Chorus and Echo (Delay).



Volume : within the range ∞ to +6dB. The current value is indicated in the slider graphic. Please refer also to section 1.2.

Octave : within the range \pm two octaves.

Panorama : here the stereo position left to right can be determined.

Reverb 1/2, Chorus, Echo (Delay) : the extent of these effects can be determined here.

Advice: You can use the Tempo/Data wheel to change most of the values in the Sound Editor windows. The values for Volume, Panorama, Reverb, Chorus and Echo can also be changed using the virtual slider in the display.

Expert Edit: Touching the button labelled "Expert Edit" will take you to the heart of the Sound Factory. Further advice is given in section 4.4 about the Expert Mode.

Important Information: In all the number displays you will see two values. The larger figure shows the current value, which is also that heard. The smaller figure indicates the old, not yet changed value. Therefore, whenever you make a change you can always see what the previous value was and return to that if needed.



Example: The Decay value was changed to 2.70 seconds. Its previous value was 5.77 s.

Important: As soon as the Layer is changed, the current and previous values swap places. Tracing the original value which has been adjusted is therefore not 100% possible later.

4.3. Changing the Individual Sound Controls

The Programmers of the Sound Controls have provided six possible variations for typical sounds. These provide effects such as Chorus, Tremolo, Echo (Delay), Filter settings, Attack, Release and many more besides. The vast range of possibilities precludes the provision of an exact list and description. By trying out some changes you will quickly come to understand how it all works.

Touch the appropriate display to highlight it and change the value with the Tempo/Data wheel.



Advice: These sound controls can also be adjusted in Play Mode and stored in a Total Preset. The values for the sound stored in the Total Preset are then overwritten. The original sound remains unchanged, however.

4.4. Expert Mode

Behind this title of Expert Mode lies the heart of the Sound Factory. Here some very complex changes can be made to the sounds.

4.4.1 The Structure of Sounds

The modern sound system of your instrument contains several kinds of sound generators. In addition to the sampling method there are also synthesiser tone-generators, the drawbar sine generator system and the additional effects of reverb, chorus etc. The sounds stored in the instrument can be compounded from different systems of sound generation and can come from up to 10 such sources, each referred to as a Layer. The adjustment of layers and the addition of effects can be worked on using the Sound Factory.

Now not all sounds consist of 10 Layers, since for most solo instruments, for example, a single layer is sufficient. For other sounds, like a piano, several Layers are needed. Or a sound consists of a combination of several sounds, like an orchestra sound or a saxophone section. You don't notice the number of Layers when playing. Each sound is just a sound, whether it has several Layers or only one.

Reverb, Chorus, Echo (Delay) and other Effects

Your instrument has four available Effects. These are called Reverb 1, Reverb 2, Echo (Delay) and Chorus. By mixing you can determine how much of each effect you would like to hear. The basic adjustments were described in section 4.2.

Additionally you can build your own Insert-Effects into each sound. These Insert-Effects occupy one of the 10 Layers available in each case.

Here is a short overview, to demonstrate within which ranges a Layer can be worked on.

Sample: Here the appropriate sample from the Sample-Pool is selected for the Layer. Additionally the volume, panorama, tuning values as well as further editing of the Sample can be made here.

Filter-Map: Here the Filter is adjusted. Also very interesting are the functions Key Map, where the sample can be limited to a certain range on the keyboard, and Velocity Switch where the sample sounds only within a certain key velocity range.

Envelope: Here the traditional ADSR (Attack, Decay, Sustain, Release) envelope can be adjusted, as well as Fade.

LFO-Matrix: The Matrix offers a powerful tool with which the dynamics of the sound and many other values can be adjusted. Additionally, the LFO3 can be adjusted, which works particularly in this Layer.

Globals: The values within this area are valid directly for all Layers. Here the LFOs 1 and 2 as well as the Pitch Bend value can be adjusted.

Special Features of the Effects: As soon as an Effect is inserted into a Layer, the sample processing functions specified above are not available any longer. Instead you see the individual adjustments which can be made to the selected effect.

4.4.2. Advice About the Individual Sound Controls

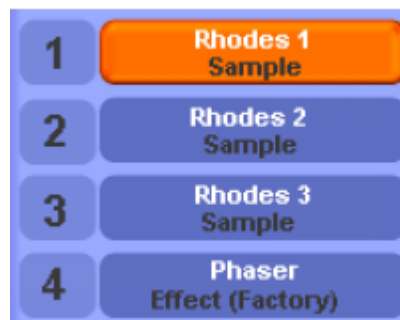
As you know from section 4.3, each sound contains 6 special Sound Control parameters. These values are fixed and cannot be changed or adapted.

Which controls affect your new sound depends upon the original sound. If you would like to add another Layer to your sound you can copy an existing Layer from the original sound and insert this into your new sound.

If you then copy and inset a Layer from another sound, some of the sound controls from the new Layer will have no effect or may have undesirable effects.

4.4.3. Structure of the User Interface

Display and Selection of a Layer: On the left of the table is the number of each layer and the currently selected one is highlighted in red. A maximum of 10 Layers can be shown. By touching the appropriate name that Layer is selected.



Switching off Layers (MUTE): Touching the appropriate button 1 - 10 will switch the individual Layer off. You can therefore concentrate on an individual Layer resulting finally in a better sound. If you do not need a Layer any longer it must be deleted.



Special Features: Some sound Layers cannot be edited or deleted. Then it's possibly a synthesised sound Layer or from some inserted Effects.

Selecting the Working Area: As described in the previous section, five different working areas are available. At least one area is always selected. Depending upon the area selected, the centre part of the display changes.



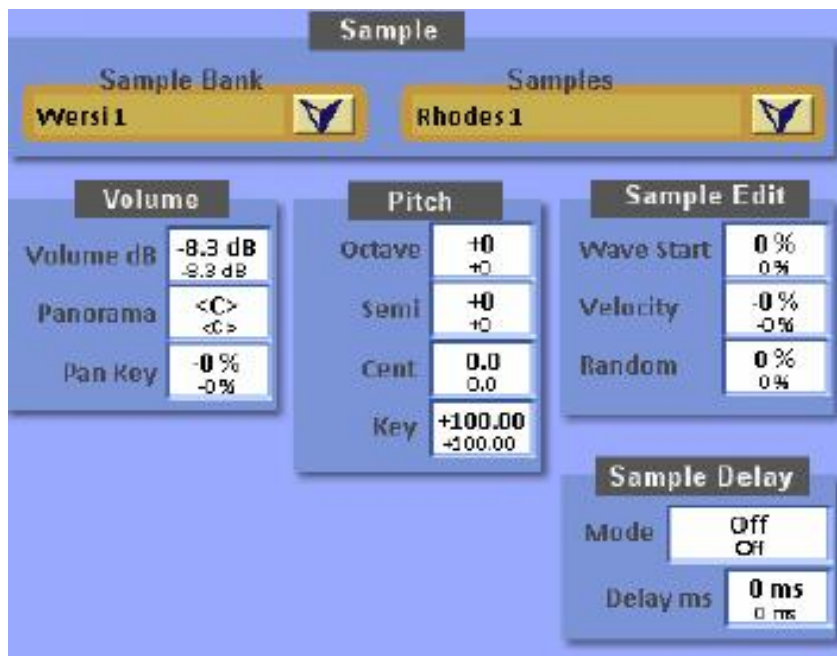
Insert from Effects: With the button "Set Effect" you can insert Effects.



Delete - Copy - Insert: In this area you can delete, copy or insert a Layer.



4.4.4. Sample



Sample

In this area you can select the Sample you wish to add to your sound. Here there is an enormous selection of sound material for you to use.

Function	Data	Description
Sample Bank	0 to 128	The Layer is divided into different groups (Banks). You will find a list at the end of this manual.
Samples (Layers)	0 to 127	Each Bank can hold up to 128 Layers.

Advice: Sounds from synthesisers cannot be worked on.

Volume

In this area you can adjust the Volume of each individual Layer. Further the Panorama and Volume settings of the Layers can be related to pitch.

Function	Data	Description
Volume	∞ to +12 dB	The default value is 0 dB. The volume will be shown as the stored value in the Layer. The Volume can be changed between infinity and +12 dB. Values over 0dB should be used only in exceptional cases.
Panorama	L64 - <C> - R64	The default position is C (centre) and the value can be changed from full left (L64) to full right (R64).
Pan Key	-100% to + 100%	The default value is 0%. With this feature the different keys on the keyboard can affect the stereo distribution. At positive values low frequency sounds are to the left and high frequency sounds to the right of the keyboard. Negative values reverse this effect. A zero value distributes all keys equally between left and right (ie they appear central).

WaveEdit (Sample Edit) and Sample Delay

Within this area either the start of the Layer or the whole Layer can be varied. Using the WaveStart function the starting point shifts within the Layers. For example, with a percussive instrument like a guitar the pluck sound is faded out if the Layer is started after the pluck sound. By selecting Velocity and Random the starting point can be varied.

The value of Delay can be adjusted to start the entire Layer milliseconds later. Interesting Doppler effects can be obtained like this.

Function	Data	Description
WaveStart	0% to 100%	The default value is 0%. At higher values, the starting point in the Layer is shifted further into the sample.
Velocity	-100% to +100%	The default value is 0%. At higher values not only is the start adjusted as with WaveStart but it is movable by the velocity with which the key is struck. Positive values move the start point forward the harder the key is struck; negative values have the reverse effect.
Random	0 to 100	The default value is 0%. Here the starting point jumps randomly to another value with each keystroke. The higher the value the further the jump can be.
Delay ms	1 to 1000 ms	The default Mode value is Off. In that case the entire Layer starts immediately. You can adjust the start delay up to 1000 ms (1 second). Other Modes are: Time; Tempo; Note Off.

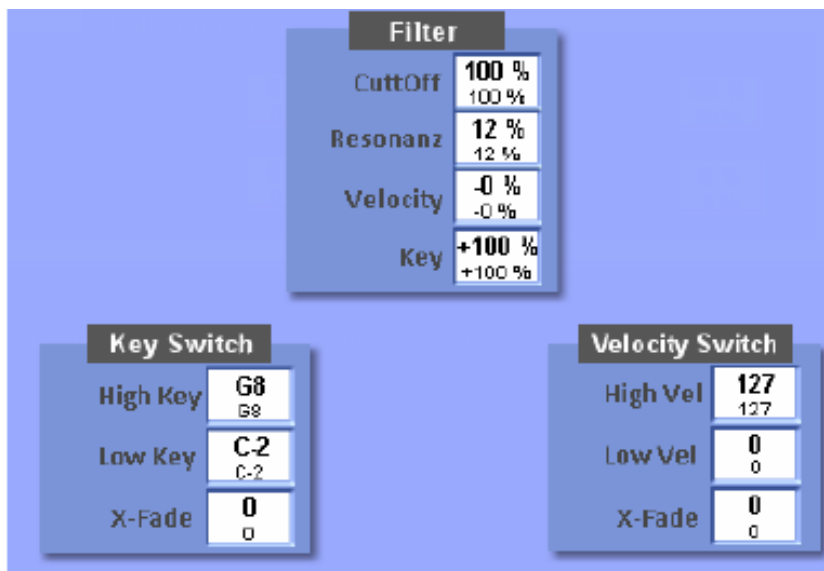
Pitch

In this area the pitch of the Layers can be changed.

Function	Data	Description
Octave	-4 to +4	The default value is 0. In that case the Layer is played in the original octave position but that can be changed by four octaves up or down.
Semi	-12 to +12	The default value is 0. The Layer can be adjusted for pitch in semi-tone steps.
Cent	-50 to +50 (In 0.1 steps)	The default value is 0. The Layer can be adjusted in a range of ± 50 cent which is a quarter tone. This is useful to adjust any beating which may occur between Layers.
Key	-100 to +300	The default value is +100. Then the different keys show "normal" pitch on the keyboard. With a value of 0 each key on the keyboard stays at the same pitch. This is useful for Effect Layers like applause, gunshots etc where the pitch doesn't change. -100 provides a reverse "normal" pitch and values greater than 100 spread the pitch between keys more widely.

Advice: Using the area Octave the original pitch of a Layer can be changed. As a result two things happen. Firstly you shift the Layer away from the natural playing area of the instrument. The sound no longer is anything like the natural instrument, since that cannot play notes within the range now set and there are no Samples within that range. Secondly some very high frequencies can occur causing unpleasant effects. The result is a transformation of the existing Samples beyond what is technically feasible.

4.4.5. Filter-Map



Filter

In this area you can adjust the Filter Cut-Off Frequency and the resonance of the Filter. The Filter has two additional parameters. With Velocity you can set the Filter to have a stronger attack on opening or closing. With Keys you can close or open the Filters on different keys.

Function	Data	Explanation
Cut-Off	0% to 100%	The default value is 100%. At this value the Filter is completely open.
Resonance	0% to 100%	The default value is 0%. At this value there is no Resonance.
Velocity	-100% to +100%	The default value is 0%. At this value Velocity has no influence on the Filter. With positive values the Filter is closed but opens if a stronger keystroke is played. With negative values that effect is reversed. Values in the range 60% to 80% are normal.
Keys	-100% to +300%	The default value is 0. At this value different keys have no effect on the Filter. With positive values the Filter is closed at low frequencies and opens at higher frequencies. With negative values that is reversed.

Advice: Remember that the adjustment under Cut-Off already has a substantial influence on both Velocity and Keys. Therefore closing the Filter and applying a stronger dynamic will work only if the Cut-Off value is low.

VelocitySwitch

In this area you can assign different Layers with a different dynamic setting.

Function	Data	Explanation
Lowest Velocity	0 to 127	The Layer sounds from this value of velocity.
Highest Velocity	0 to 127	The Layer sounds up to this value of velocity.
Velocity Fade	0 to 127	This provides a flowing transition between the Layers. This means: at a setting of 10 the Layer will fade in or out within the next 10 velocity levels.

VelocitySwitch Example 1 - Structure of a natural sound

Many timbres of different qualities and dynamics occur in a natural sound. Thus a guitar could have a quiet attack, a middle-strength attack or a loud attack. These would be three Layers having different values between 0 and 127.

Example:	Layer 1	Quiet Attack	0 to 80
	Layer 2	Middle Attack	81 to 110
	Layer 3	Loud Attack	111 to 127

VelocitySwitch Example 2 - Switch between different timbres

You can also use these functions in order to switch between entirely different Layers using Dynamics.

Example:	Layer 1	Strings	0 to 100
	Layer 2	Brass Section	101 to 127

Advice: Remember to switch Dynamics on in your instrument to hear the effect.

KeySwitch

In this area you can distribute different Layers along the keyboard.

Function	Data	Explanation
Lowest Key	C-2 to G8	The Layer sounds from this key.
Highest Key	C-2 to G8	The Layer sounds up to this key.
Key Fade	0 to 127	Using this value, flowing transitions between the Layers can be set up. That means: with a value of 7 the Layer fades in or out within 7 semi-tones.

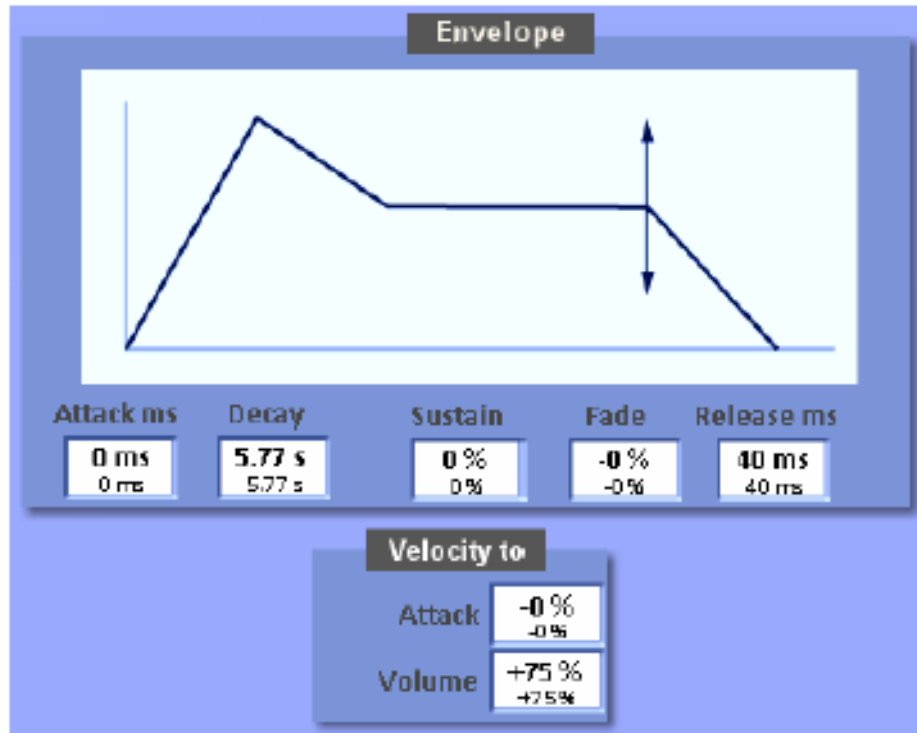
KeySwitch Example -

With some sounds it can be useful to distribute different instruments across the keyboard. In Sound Factory this is frequently used when building an Orchestra sound.

Example:	Layer 1	Timpani	C-2 to A2
	Layer 2	French Horns	C-2 to C#3
	Layer 3	Trumpets	D3 to G8
	Layer 4	Strings	C-2 to G8

Advice: A 5-octave keyboard (61 keys) has the notes C1 to C6

4.4.6. Envelope



Envelope

The Envelope consists of five areas: Attack (rise), Decay (drop), Sustain (hold), Fade (crossfade) and Release (after the key is released). Long Attack times result in a sound which swells to full volume while short Attack times cause a percussive sound.

Function	Data	Explanation
Attack ms	0 to 32 (s)	The Attack phase begins upon pressing down the key. The Attack time indicates how long it takes for sound to rise to its initial maximum volume level.
Decay ms	0 to 32 (s)	Directly after the initial maximum volume level is reached the Decay phase begins. The Decay time specifies how long it takes for the sound to drop to its initial Sustain level.
Sustain %	0 to 100	The Sustain level indicates the volume level while the key is held down, as a percentage of the initial maximum volume level after the Attack. The Sustain phase is reached only if the applied Decay time is shorter than the time during which the key is held down.
Fade %	-100 to +100	With a value of 0 (central) the Sustain phase of the envelope remains level so long as the key is depressed. A negative value causes the volume of the sound during the Sustain phase to drop down to zero while a positive value causes the sound to rise back to the initial maximum volume level after the Attack. The values below or above zero indicate the speed at which that minimum or maximum is reached, high values causing a fast change.
Release ms	0 to 32 (s)	The Release phase begins as soon as the key is released. The sound volume then drops to zero, the Release time here specifying how long that sound takes to drop to zero.

Velocity to

The Envelope can be affected by the Dynamics (Velocity). Thus the Attack and Volume can be changed.

Function	Data	Description
Attack %	-100 to +100	In the envelope the Attack can be further adjusted to zero or weakened by "Velocity to". With a low Velocity the sound is gently faded in and with a high Velocity the sound appears immediately. The Attack is therefore adapted dynamically. With negative values the Attack is automatically produced the harder the key is struck.
Volume %	-100 to +100	Here the Dynamic Volume levels of the Layers can be adjusted. At a value of zero no dynamic effect occurs. Positive values increase the dynamic effect and negative values reverse the dynamic effect.

4.4.7. LFO/Matrix and LFO3

The screenshot shows two control panels. The top panel is titled "Matrix" and contains a 6x5 grid of settings. The columns are labeled "Source", "Modifier", "Modify", "Destination", and "Depth". The rows are numbered 1 through 6. All "Source", "Modifier", "Destination", and "Depth" settings are set to "Off Std". All "Modify" settings are set to "-0.0 %". The bottom panel is titled "Layer LFO3" and contains four settings: "Wave" is set to "Sine", "Phase" is set to "0°", "Sync" is set to "Each Note", and "Rate Hz" is set to "5.48 Hz".

	Source	Modifier	Modify	Destination	Depth
1	Off Std	Off Std	-0.0 % -0.0 %	Off Std	+1.0 % Std
2	Off Std	Off Std	-0.0 % -0.0 %	Off Std	-0.0 % Std
3	Off Std	Off Std	-0.0 % -0.0 %	Off Std	-0.0 % Std
4	Off Std	Off Std	-0.0 % -0.0 %	Off Std	-0.0 % Std
5	Off Std	Off Std	-0.0 % -0.0 %	Off Std	-0.0 % Std
6	Off Std	Off Std	-0.0 % -0.0 %	Off Std	-0.0 % Std

Layer LFO3	
Wave	Sine Sine
Phase	0° 0°
Sync	Each Note Each Note
Rate Hz	5.48 Hz 5.48 Hz

The 6 lines of the Matrix form a complex system to affect the sound still further.

Source: Here you select which Source you wish to use to affect the Layer.

Modifier: Here a further controller can be used, allocated with the Source.

Modify: Here the value adjusts the amount by which the Source will be affected.

Destination: Here you select which function you want to adjust.

Depth: Here you select the strength of the change.

Important Advice: There are more possibilities with the Source and Modifier functions than the following table describes. We don't specify all possible values as some require special programming and, if used wrongly, can result in unwanted effects.

Function	Data	Explanation
Source	Random Velocity Key Mod. Wheel Aftertouch Pitchbend LFO1 LFO2 LFO3	-Random values between 0 and 127 -Dynamic values between 0 and 127 -Keyboard values between 0 and 127 -Mod. Wheel values between 0 and 127 -Aftertouch values between 0 and 127 -Pitchbend values between 0, 63 (middle) and 127 -Gate LFO1 values between 0 and 127 -Gate LFO2 values between 0 and 127 -Gate LFO3 values between 0 and 127
Modifier	Random Velocity Key Mod. Wheel Aftertouch PitchBend LFO1 LFO2 LFO3 EG Delay	With the so-called Modifier you can affect the source again. So you can delay the vibrato by using the value EG Delay or change the LFO velocity with a Dynamics change.
Modify %	-100 to +100	The Modifier comes with values adjustable between -100 and +100. Eg the Modifier can be adjusted on Keys or EG Delay within a range of 0 to 32 seconds.
Destination	Pitch Cut-Off Resonance Amp Panorama LFO3 Rate	-Changes the pitch (eg frequency of the vibrato) -Opens or closes the Filter -Sets the Resonance of the Filter -Changes the volume (eg the depth of the vibrato) -Sets the Panorama -Sets the LFO3 speed
Depth %	-100 to +100	Most parameters have a range between -100 and +100. For Pitch the range is from a few cents to 12 semi-tones.

Example: Frequency of the Vibrato in an instrument.

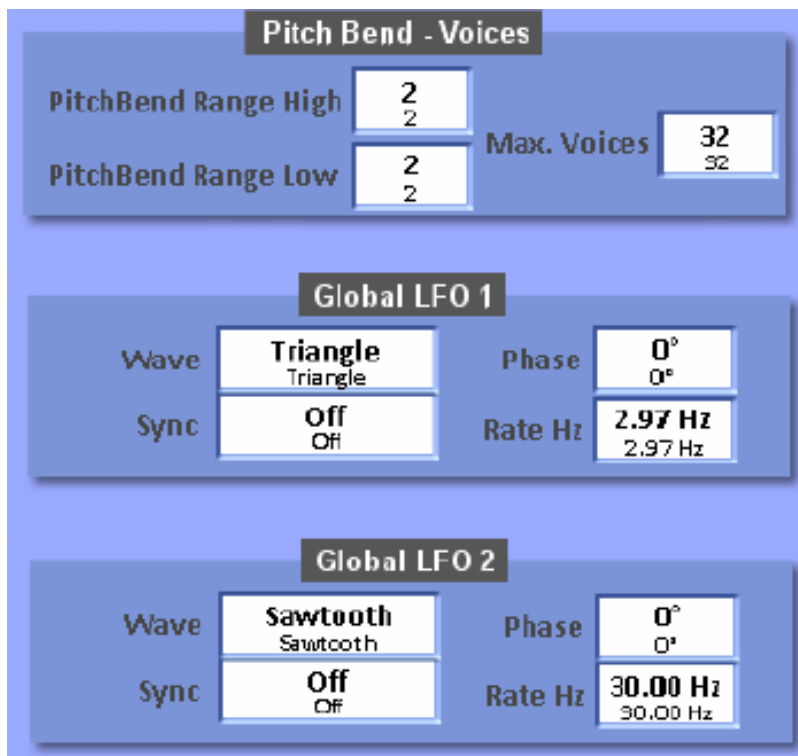
With the Aftertouch the speed (rate) of the LFO3 can be changed.

The Mod. Wheel strengthens the Vibrato (Depth).

The LFO3 controls the pitch with a delay (EG Delay) of 600ms.

Source	Modifier	Modify	Destination	Depth
Aftertouch	-	0	LFO3 Rate	+2.4
Mod. Wheel	LFO3	100	Pitch	0.35
LFO3	EG Delay	600ms	Pitch	0.29

4.4.8. Globals (General)



Pitch Bend - Voices

Function	Data	Explanation
Pitch Bend Range High	0 to 12 12Q Harm 24	Affects how the Pitch Wheel affects the sound when pushed forward. 0 has no effect. As the number increases so the pitch bends higher. 12Q goes higher than 12 . Harm provides three steps - perfect 4 th , major 3 rd , minor 3 rd (octave). 24 provides twice the range of 12 .
Pitch Bend Range Low	0 to 12 12Q Harm 24	As above but when the Pitch Wheel is pulled back.
Max. Voices	1 to 64	Here the maximum number of voices which the sound may use can be set. If that number is exceeded, earlier and quieter voices are removed in order to play new notes. See also Section 1.1 "The Polyphony of the Instrument".

Global LFO1 and LFO2

The system provides two global LFOs which can be used in all Layers. Additionally another LFO3 is available in each Layer.

Function	Data	Explanation
Wave	Constant Sine Triangle Sawtooth Square S+H Random S+H Alternate Random Drift Slow Drift	Here various LFO waveforms are provided.
Rate Hz	1 to 30 seconds 1.07 Hz to 30 Hz	Time in 0.01 s steps. [1 Hz = 1 s, 10 Hz = 0.1 s] Frequency in 0.01 Hz steps. Sync Tempo provides other Rates.
Sync.	Off First Note Each Note Tempo + Note Tempo + Beat	Off: The LFO runs freely. At each keypress the current LFO is applied. First Note: The first note starts in the adjusted phase. Each Note: each note starts in the adjusted phase.
Phase	0° to 360° Random	Setting of the initial phase between 0° and 360°. Random setting of the initial phase.

Global LFO2 (as LFO1)

4.4.9. Effects

A characteristic of the Sound Factory is the use of Insert-Effects which can then be used additionally to the well-known continuous effects (Reverb 1, Reverb 2, Chorus and Echo (Delay)).

General Points about Effects: Some existing structures have Effects already inserted. These cannot be deleted from an existing sound. Otherwise, for example, adjusting individual Sound Controls could change the function such that the sound is partly destroyed.



Touching the above button produces the following display.



Inserting Effects:

1. In the Layers List, select the Layer into which you wish to place the Effect and whether the Effect is to occur within that Layer, before that Layer or after that Layer.
2. Select from the drop-down list the desired Effect.
3. Select one of the following functions for the Layer:
 - a) Insert Effect Behind: the Effect is inserted after the selected Layer.
 - b) Insert Effect Before: the Effect is inserted before the selected Layer.
 - c) Insert Effect Overwrite: the selected Layer is deleted and replaced by the Effect.
4. Finally all the possible adjustments which can be made to the inserted Effect appear automatically. Please select the adjustments from the following list:

Function	Function	Range of Values	Information
Chorus	Mix	0 to 100%	The value MIX blends the original sound and the Effect. This value refers to all features of the Effect.
	Rate	1.00 Hz to 20.00 Hz	Speed of the Effect
	Depth	0 to 100%	Intensity of the Effect
	Pre Delay	0.0 to 24.0 ms	Delay before the Effect starts.
Chorus Ensemble	Mix	0 to 100%	
	Rate	1.00 Hz to 20.00 Hz	
	Depth	0 to 100%	
	Shimmer	0 to 100%	
	Width	0 to 100%	
Space Chorus	Mix	0 to 100%	
	Rate	1.00 Hz to 20.00 Hz	
	Depth	0 to 100%	
	Pre Delay	0.0 to 24.0 ms	In 0.1 steps
	Crossover	0 to 100%	
Detune	Mix	0 to 100%	
	Detune	0 to 50 Cent	
	Latency	5 to 40 ms	
Delay Stereo	Mix	0 to 100%	
	Sync	Sync On/Off	Sync On: the actual speed in Echo and the note lengths in Delay are synchronised with the Effect.
	Delay	0.002 to 1.510 ms	
	Feedback	L/R -50% to 0% to 50%	
	Balance	L 0.50 to 1.00 to R 0.5	
	HF-Damp	100 to 0%	

Function	Function	Range of Values	Information
Delay Ping Pong	Mix	0 to 100%	
	Sync	Sync On/Off	Sync On: the actual speed in Echo and the note lengths in Delay are synchronised with the Effect.
	Delay	0.002 to 1.510 ms	
	Feedback	0 to 100%	
	Balance	L 0.50 to 1.00 to R 0.50	
	HF-Damp	100 to 0%	
EQ Shelving	Output	-12.0 dB to +12.0 dB	
	Bass	-12.0 dB to +12.0 dB	
	Treble	-12.0 dB to +12.0 dB	
Flanger	Mix	0 to 100%	
	Rate	1.00 Hz to 20.00 Hz	
	Depth	0.00 ms to 12.00 ms	
	Feedback	0 to 100%	
	Pre Delay	0.00 ms to 12.00 ms	
Phaser	Mix	0 to 100%	
	Rate	1.00 Hz to 20.00 Hz	
	Depth	0 to 100%	
	Feedback	0 to 100%	
	Stereo	0 to 360°	
	Centre	0 to 100%	
Deep Phaser	Mix	0 to 100%	
	Rate	1.00 Hz to 20.00 Hz	
	Depth	0 to 100%	
	Feedback	0 to 100%	
	Centre	0 to 360°	
	Envelope Mode	-100% to +100%	
	Envelope Rate	0 to 100%	
Tremolo	Mix	0 to 100%	
	Rate	1.00 Hz to 20.00 Hz	
	Phase	0 to 360°	
	Shape	-100% to +100%	

Function	Function	Range of Values	Information
Wah Wah	Mix	0 to 100%	
	Sync	On/Off	With Sync On: the Wah Wah is synchronised to the Tempo
	Rate	0.05 Hz to 20.00 Hz	
	Depth	0 to 100%	
	Pedal	-100% to +100%	
	Mode	Auto or Pedal	
	Reso	0 to 100%	
	Tracking	-100% to +100%	
Reverb	Mix	0 to 100%	
	Time	0.5 s to 10.0 s	
	Low EQ	0 to 100%	
	High EQ	100 to 0%	
Reverb	Mix	0 to 100%	
	Time	0.5 s to 10.0 s	
	Pre Delay	1 ms to 400 ms	
	High Damp	100 to 0%	
	Low EQ	0 to 100%	
	High EQ	100 to 0%	
Early Reflections	Mix	0 to 100%	
	Time	0 ms to 250 ms	
	Low EQ	0 to 100%	
	High EQ	100 to 0%	
Distortion	Mix	0 to 100%	
	Model	0 to 7	Amplifier Models: AC, Vintage, 2x12, 4x12, Axis, Dark1, Dark2, Radio
	Drive	0 to 100%	
	Feedback	0 to 100%	
	Treble	-100% to +100%	
	Mode	Mono, Stereo	

4.4.10 Delete, Copy and Insert Layers

At the bottom of the display are the functions for Copying, Inserting and Deleting Layers.



Layer to Clipboard: The actual selected Layer is copied onto the Clipboard.

Free to Clipboard: A completely empty Layer is copied onto the Clipboard.

Delete: The selected Layer (Sample or Effect) is deleted.

Overwrite: With Overwrite, the Layer currently on the Clipboard is copied over the currently selected Layer.

Paste Before: With Paste Before, the Layer currently on the Clipboard is copied before the currently selected Layer. The previous Layer is placed after.

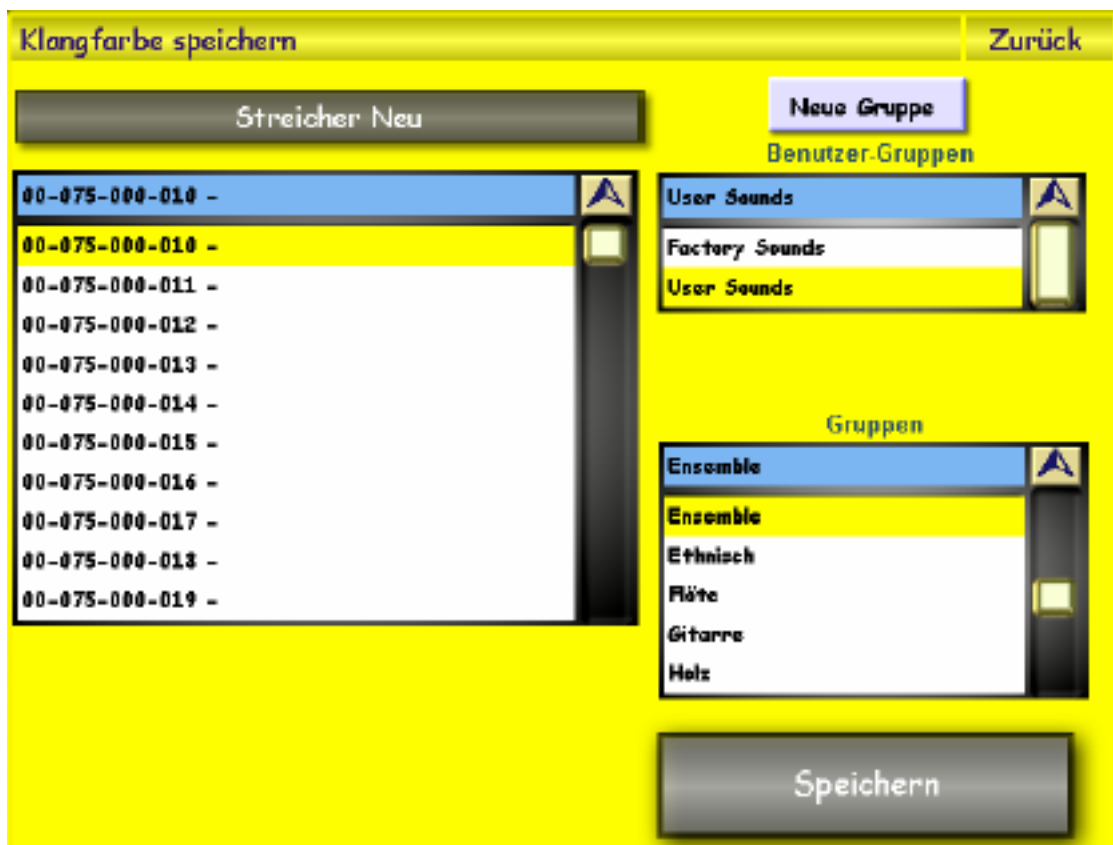
Paste Behind: With Paste Behind, the Layer currently on the Clipboard is copied after the currently selected Layer. If a Layer already exists after that it is pushed further back.

Important Advice: In the OpenArt System, the tone generators used have many other complicated functions available which are not provided within Sound Factory. These can be found in the individual Sound Controls.

If you copy and insert a Layer from another sound, some of the Sound Control functions of the new Layer will be copied on to the new Layer and exhibit no effect or an adverse effect. In this situation it is possible to copy a Layer not from an existing sound but by using the "Free to Clipboard" function.

5. Saving New Sounds

In order to store the changed sound, you touch Save and the following display appears. Here you can select where you wish to store the changed sound.



The new sound will be stored in the User Sound area. You can overwrite the old sound or choose a new storage location.

To change the name you touch the grey name area and use the virtual typewriter to type the new name.

Finally touch Save to store the new sound. You can assign your new sound to a User Group to make it easier to find later. Select the appropriate User Group from the drop-down lists provided. You can set up a new User Group for these new sounds if you wish.

Advice: the numbers shown, eg 087-000-005, correspond to the MIDI-PRG CHANGE number with which you can select the sound when in MIDI (Banks 75 - 79).

6. List of the Sound Banks

Number	Name	Layer Number	Information
9	Grand Pianos	15	Only if the Sound Package "Grand Pianos" is activated.
10	Acoustic Pianos	2	
12	Electric Pianos	9	
15	Clavinets	2	
16	Organs	5	
19	Harpsichord	3	
20	Tuned Percussion	8	
30	Synth Basses	5	
33	Acoustic Basses	2	
36	Electric Basses	12	
40	Acoustic Guitars	12	
45	Electric Guitars	8	
50	Strings Section	6	
51	FL2-Edition		Only if the Sound Package "Franz Lambert Edition 2" is activated.
58	Orchestra Misc	4	
59	Orchestra Misc	39	
60	Vocal	4	
70	Brass Sections	5	
74	FL1-Edition		Only if the Sound Package "Franz Lambert Edition 1" is activated.
75	Solo Brass	6	
80	Woodwind	10	
81	Analog Sounds 1	43	
82	Analog Sounds 2	38	
83	Drawbars	12	
88	Accordion	35	Only if the Sound Package "Best of Accordions" is activated.
89	Accompaniment	81	
90	Ethnic	8	
91	Sacral	49	Only if the Sound Package "Sacral" is activated.
92	Theatre	18	Only if the Sound Package "Theatre Organ" is activated.
93	CD-Sounds	29	Only if the Sound Package "CD-Line" is activated.
95	Wersi 1	124	
96	Wersi 2	106	
100	Synth Textures	11	
101	Digital Polys	9	
102	Synth Bells	3	
104	Arpeggios	7	
105	Noise	8	
110	Attack Partial	22	
111	Sustain Partial	4	
112	Color Partial	33	
113	Percussive Partial	66	
120	Sound Effects	15	

7. Examples and Advice

7.1. Synthesising New Sounds Without Samples

If you want to produce new sounds always start from an existing sound. It can also be interesting to construct a sound virtually from scratch. In which case use sound 126 in Bank 93 as a starting-point. Then you select the desired Sample for the First Layer and continue through the many possibilities for adjustment.

The individual Sound Controls in that sound are adjusted to the following default values:

1. **Start:** Here you change the Samplestart setting in the Sample. You can begin at the start of the appropriate Samples in order to, for example, fade out an Attack sound.
2. **Wave:** Here you can change the Formant of the Samples. Very extreme sound changes can result.
3. **Filter:** Here the Cut-Off is adjusted. The default value is 127 when the Filter is completely open.
4. **Resonance:** Here the Resonance of the Filter is controlled. The default value is 0. The Resonance has only one effect if the Filter is not completely open.
5. **Attack:** Here the Attack of the Layer can be extended or shortened. The default value is 63 (centre). If the Attack value in the Layer is zero, values under 63 entered here have no influence on the Attack.
6. **Release:** Here the Release can be lengthened or shortened. The default value is 63 (centre). If the Release value in the Layer is zero, values under 63 entered here have no influence on the Release.

Advice about Individual Sound Controls: These adjustments affect all Layers in the particular sound. Two different Attack values in the Layer remain different until the shortest or longest Attack is reached.

7.2 Sounds With Layers Having Different Dynamic Settings

With the Function **Velocity Switch** you can build sounds in which individual Layers can be switched on or off by applying different velocities when playing the keys (Dynamics). Examples in your instrument are:

- A. Take the sound Jazz Vocals Mixed (Bank 90, PRG 90). There are two Layers, "JazzVocal Dooh" and "JazzVocal Baah" with different Dynamic settings which can be reversed between these two Layers.

JazzVocal Dooh:	Velocity Switch is 0 to 111
JazzVocal Baah:	Velocity Switch is 112 to 127
- B. Take the sound Natural Guitar (Bank 90, PRG 4). There are three different values used to produce three Layers.

Acoustic Guitar 1:	Velocity Switch is 0 to 107
Acoustic Guitar 2:	Velocity Switch is 107 to 127
Acoustic Guitar 3:	Velocity Switch is 121 to 127
- C. Take the sound Sax - Brass 16 (Bank 93, PRG 33). This is switched to a saxophone group alone or a Brass section in addition.

Brass Section 1:	Velocity Switch is 120 to 127
Brass Section 2:	Velocity Switch is 120 to 127
Tenor Sax mf:	Velocity Switch is 0 to 127
Alto Sax mf:	Velocity Switch is 0 to 127

7.3 Sounds With Layers From Different Sound Sections

Using the function **Key Map** you can build your sound so that different Layers are distributed to different areas of the keyboard.

- A. Take the sound Vocal 2 (Bank 90, PRG 11) where there are several Layers distributed along the keyboard.

Vocal Girl: Key Map C-2 to A4

Vocal Yeah: Key Map A#4 to A4

Vocal Girl: Key Map F#5 to G8

- B. Take the sound Orchestra (Bank 90, PRG 40) where there are several Layers distributed along the keyboard. Additionally the Layers Timpani Piano and Timpani Forte are controlled by Velocity Switch.

W-Strings: Key Map C-2 to G8. Velocity Switch is 0 to 127.

Strings hard: Key Map B2 to G8. Velocity Switch is 0 to 127.

Trumpet F: Key Map D3 to G8. Velocity Switch is 0 to 127.

Trombone F: Key Map C-2 to C#3. Velocity Switch is 0 to 127.

Timpani Piano: Key Map C-2 to A2. Velocity Switch is 0 to 118.

Timpani Forte: Key Map C-2 to A2. Velocity Switch is 119 to 127.

7.4 Copying Layers From Other Sounds

To copy an individual Layer from another sound, please proceed as follows:

1. First select the sound from which you wish to copy a Layer.
2. Select the required Layer and touch the button "Layer to Clipboard".
3. Now select the sound into which you wish to place that Layer.
4. Select the Layer in that sound you wish to replace (Overwrite) or the Layer before or after which you wish to insert the new Layer.
5. Now touch the button "Overwrite" or "Insert Before" or "Insert After" as appropriate.

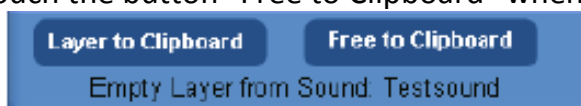
General Advice when copying Layers between Sounds: The OpenArt Sound System is very complex and offers programmers hundreds of possibilities by combining Layers from a number of sources which affects individual sound controls. Within Sound Factory not all possible functions are represented. If a Layer is copied between two sounds, all possible functions are copied. If this causes undesirable results you can use the individual Sound Controls to adjust the result.

Therefore it can often be better to use a Free Layer instead of copying a Layer from another sound. See section 7.5.

7.5. Using Free Layers

You must fill the Free Layer completely, ie use an existing Sample, its Envelope and all other functions must be set or left at default values.

1. Touch the button "Free to Clipboard" when the following appears in the display:



2. Now you can insert the Layer into the sound using Overwrite, Paste Before or Paste Behind.



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