Manual V2.25

The VST-Synthesizer

Welcome!

September 2001: The first version of AnaMark was released as a result of my hobby as software developer and musician. In the summer 2001, after playing with some softare synthesizers, I was disappointed by the lack of possibilities given by the plugins: There was no plugin, which did what I wanted and how I wanted it to be done.

Since that time, AnaMark grew continuously and was improved more and more. Many ideas and wishes of AnaMark users from several countries were taken into consideration and realized. The result is a synthesizer having its own individual character. His capabilities for *micro tuning* give room for experiments.

Dare play the uncommon!

Mark Henning

Sulzbach, July 2009

System requirements

To use AnaMark you need a PC and Windows 9x/ME/2000/XP with 800MHz or faster. A graphical resolution of 1024*768 or better is recommended. AnaMark is a VST plugin. This means, that you need a VST host (= a program which is able to deal with VST plugins).

VST = Virtual Studio Technology

Contents

1. Sound demos

The sound snippets are intended to demonstrate some of the numerous sound modification facilities of AnaMark. People know how a lowpass filter sounds and how a variation of its frequency affects the sound. There is no need to demonstrate those common things. The sound snippets therefore focus on the functions which are not so common. Sometimes, it is just a modification of a small detail. The aim was to make the effect as clearly as possible. Therefore, the sound demos are kept dry, so that the user will not be taken off by accessories.

The next paragraphs, each sound demo is explained in detail: What can be heared, and how it can be realized with AnaMark. This may help you tweaking presets according to your needs or creating some from the scratch. The MIDI file and the presets necessary to reproduce the sound demos is included.

1.1. Portamento of individual notes

AnaMark may be used monophonic and polyphonic at the same time, as each instrument is present on two MIDI channels: One MIDI channel is polyphonic (the maximum number of voices may be set up to 16), the other one is monophonic. The monophonic channel allows portamento with variable speed. Thus, it is easy to add portamento effects during a polyphonic block is playing. As both MIDI channels represent the same preset, sound modifications affect the monophonic and the polyphonic part simultaneously.

1.2. Waveshaper

The waveshaper of AnaMark provides numerous waveforms which can be combined and modified. The waveshaper intensity can be modulated, which allows morphing-like effects (first part of the sound demo). The sound can be moved in the waveshaper. In the second part of the sound demo, this is used to morph the sound from choir to synthetic voice using the modulation wheel. Finally, in the third part of the sound demo the expression pedal of an organ is simulated. The waveshaper is modulated by an LFO with variable intensity.

1.3. OSC Fine Tuning

Detuning the oscillators slightly is an easy way to introduce interesting movements into a sound. Most synthesizers have the possibilty to fine tune the OSCs statically. The advantage is, that the harmonics of the sound are the same independent of the note played. The disadvantage is, that the speed of the effect increases with the pitch of the note. Therefore, AnaMark's *Fine Tune* parameter gives you an additional possibility: The fine tuning may be given dynamically under the boundary condition of an effect speed. This ensures, that the speed of the effect no longer depends on the note.

The sound demo first shows a basic preset, where the OSC are not detuned, which sounds rather dry and static. Then, a constant fine detune is selected. The effect is faster for high pitches than for low ones. Finally, a dynamic fine detune is selected. The effect now has the same speed for notes of different pitch.

1.4. Pulse Modulation

There are some specialities concerning the oscillators. The waveform of an OSC may be constructed by two subwaveforms. The *Symmetry* parameter controls the symmetry of the resulting waveform. In contrast to other synthesizers[1], this parameter may be used for each waveform. The *Pulse* parameter controls a pulse which is overlaid with the waveform. Both parameters give interesting sounding effects. The sound demo shows a rythmic modulation of the *Pulse* parameters, which is controled by the modulation wheel.

1.5. Distortion effects using the volume limiter

AnaMark has a built-in limiter, which can be used to produce distortion effects similar to an electric guitar. The distortion amount can be changed by modulating the volume. The sound demo shows the same "'Distortion Guitar"' sound in two variants: One with high volume and one with lowered volume (= less distortion). Then this rather simple setting is used to play a power chord riff.

1.6. Dirty pitch / FlipFlop

Electronic instruments play exact frequencies, and each time a note is played, the frequency is reproduced perfectly. Some natural instruments (e.g. piano) may give reproducible timbres, but the timbres are not perfect. Depending on the skill of the player, e.g. the strings neither are able to play perfect timbres, nor is the frequency constant: The

[1] It is usually restricted to square waveforms and therefore called "'Pulse Width"'.

second time, a note is played, the frequency may differ from the first time. Additionally, the sound changes each time, as the direction of the bow's movement changes.

Each can be realized with AnaMark. Any timbre may be used. AnaMark supports the most common file formats Scala (file extension *.scl*) and Tuning files (file extension *.tun*). MIDI SysEx Tuning Messages may be used es well and provide the possibility of timbre modifications during playing.[2]

The strings can be realized easily by means of the parameter *Dirty Pitch*: It defines the amount of random pitch variation when a note is hit. This introduces some deviations into the harmonics of a song which sounds more naturally. The difference in sound between mowing the bow up and down is realized by modulating filter resonance with a *FlipFlop*. As a single stringer plays monophonic, the *Polyphony"=Controler* is used to restrict the number of voices available at the same time.

First in the sound demo, you hear two strings playing a melody, using perfect pitch and no bow up/down-imitation. Then both effects are enabled. To hear the bow up/down-imitation clearly, one string plays its melody. To hear the deviations in pitch, both strings play together. Well, they are not so skilled and should have a little bit more practice before playing in an orchestra...

1.7. Freeform envelopes

Freeform Envelopes (fig. 1.1) allow the creation of complex envelopes and modulations. It is so simple, as if you would paint a curve using a graphic software. Interesting effects and pads can be done in no time.

1.8. Key aftertouch and channel aftertouch

The *Freeform Envelopes* mentioned above may also be used for rythmic accents (fig. 1.1).

There are numerous controls you may use to modify the strength of the modulation. Depending on your needs you may chose between pitch bend wheel, modulation wheel, breath control, velocity, aftertouch and much more. The modulation wheel affects all notes currently playing, but may be changed during a note is hold. Velocity affects individual notes, but is static. Aftertouch allows both: Channel aftertouch (channel pressure) affects all notes currently playing. Key aftertouch (poly pressure) affects individual notes. Both may be changed during the notes are hold.

By the way: Almost each function which deals with time (e.g. modulation speed, delay, chorus speed) may use a constant time source or may be synchronized to the

[2] As not everybody has the possibility to use MIDI SysEx Tuning Messages, an alternative was implemented: Key Aftertouch (Poly pressure) may be used as well to modify pitch, accent and more of individual notes. see section 1.8

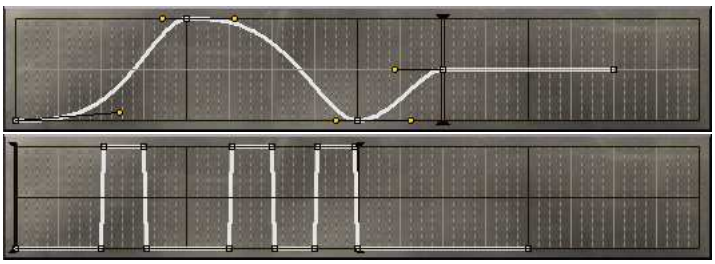

Figure 1.1.: Examples of *Freeform Envelopes*: Smooth line using Bezier curves (top) and rythmic accents (bottom)

MIDI clock. Even tempo changes are considered properly, where possible. This ensures, that rythmic accents coincide with the beat of your song.

The sound demo first plays a note with increasing modulation. Then two notes are played, and modulation strength is given by channel aftertouch, wich affects both notes. Last but not least, key aftertouch is used to modulate one note while the other keeps dry.

1.9. Special LFO waveforms

All waveforms of the oscillators may also be used for the LFO, opening a large field of possibilities. The sound demo shows how noise may be used as LFO waveform. It is played slowly and affects filter parameters and panorama, wich sounds like wind.

1.10. Modulation of LFO speed

In addition to sound parameters, the LFO themselves may be modulated. The modulation wheel may affect the LFO speed to give an organ a dynamic vibrating sound, as is shown in the first part of the sound demo. The second part shows an effect, where the LFO speed is set by an envelope.

2. Working with AnaMark

AnaMark provides more than 545 factory presets and a random preset generator. To give you a "'quickstart"', section 2.1 explains some basics. The details are explained in later sections.

It is assumed, that you are familiar with your VST-Host. In the case of problems such as e.g. how to

- give your VST-Host access to VST-plugins
- start/stop one or more instances of a VST-plugin within your VST-Host
- open the graphical editor of VST-plugins
- load/save preset or bank data from/to files
- record/play parameter automation data
- send MIDI commands to VST-plugins, as e.g. program change, control change, aftertouch

please consult the manual of your VST-Host.

2.1. Basics / Quickstart

2.1.1. Navigation

AnaMarks graphical controls are grouped pagewise. To switch from one page to another, use the navigation bar (fig. 2.1) at the top of the graphical editor. Click a button there to show a page:

- *Overview*: Fast access to commonly used parameters for sound modification (section 2.1.3)

Figure 2.1.: The navigation bar and the controls to select timbre and preset

- *OSC*: Oscillators and combination panel (section 2.2)
- *OSCMod*: Oscillator modulation (section 2.3)
- *Shaper*: Waveshaper settings (section 2.4)
- *Filter*: Filter and resonator (section 2.5)
- *FilterMod*: Filter and resonator modulation (section 2.6)
- *Vol/FX*: Volume envelope and effects (section 2.7)
- *Misc*: Miscellaneous settings and global options (section 2.8)

2.1.2. Selecting timbre and preset

AnaMark is fourfold multitimbral. This means, that each instance of AnaMark provides up to four trimbres. A *timbre* contains:

- A Preset
- A polyphonic MIDI channel
- A monophonic MIDI channel

Using different MIDI channels you can play up to four presets polyphonic **and** monophonic at the same time. The graphical editor always shows one timbre. If you want to see another timbre, use the button below *Channel* at the top right, see fig. 2.1.[1] There, a pair of values is displayed (in the figure, it is "'1(Poly)/2(Mono)"'). They denote the MIDI channels of the timbre. The first shown MIDI channel is polyphonic (up to 16 voices), and the second one is monophonic. Both MIDI channels can be used simultaneously. The monophonic channel provides portamento. Thus, a polyphonically played instrumend may have single notes with portamento (see sound demo in section 1.1).

Below *Channel* and the timbre setting, there is the preset select button (in fig. 2.1, preset no. 17 is selected, which is called "'Lovely Strings"').[2] To change the preset, click on the button which shows the current preset. A list box is displayed which contains the 64 presets of the bank. There you can select the preset directly. Furthermore, you can go to the previous or next preset by clicking the buttons "'-"' and "'+"' at the right.[3]

AnaMark's organisation of the presets is similar to that of many hardware synthesizers. There are two memories: *ROM*[4] and *RAM*[5]. The ROM contains the factory

[1] In the case you use the demo version of AnaMark, this option is not available, as the demo version is monotimbral.

[2] You may send MIDI commands as e.g. a *program change* on MIDI channel 1 as well as on MIDI channel 2. In both cases, timbre 1 is affected, and the asked preset is set.

[3] Depending on the selected skin, there may be other representations as e.g. arrows.

[4] **R**ead **O**nly **M**emory

[5] **R**andom **A**ccess **M**emory

Figure 2.2.: Section *Preset* on the *Misc* page

Figure 2.3.: *Overview* page for fast parameter access

presets, where they are protected against unintentional changes and deletion. The presets AnaMark uses for the sound, are located in the RAM. The RAM can hold a *bank* with 64 presets — this is the set of presets you see in the preset list when you click on the button for preset selection.

The acces to the RAM presets was explained before. There is no direct access to the ROM presets — you have to copy them to the RAM before you can use them. Go to the *Misc* page and have a look at the section *Preset*. There is a button labeled *Load ROM-Bank* (fig. 2.2). The button shows the last copied ROM-Bank. When you click this button, a list box is displayed, which contains the available ROM banks (each containing 64 presets). Just select the bank you wish to copy from ROM to RAM. **Important:** Click the last entry of the list to generate new presets randomly.

2.1.3. Fast accessing sound controls (Overview page)

Sometimes, it is necessary to access several parameters as fast as possible (e.g. for parameter automation) without switch between pages. Therefore, the overview page (fig. 2.3, accessible via the button *Overview* in the navigation bar) contains the most important parameters. In the case you want to go to the detail page of a parameter shown on the *Overview* page, click the corresponding vertical label.

The meaning of the parameters is described below, where the corresponding detail pages are explained.

2.1.4. Entering values

AnaMark's parameters are visualized graphically and numerically. Clicking on a value field allows entering the value directly. To get exact values out of calculations you may use '*' (multiplication) and '/' (division). Point and comma are both accepted decimal separators. The following units are used:

- **B**: Beats
- **BPM**: Beats per minute
- **BPS**: Beats per second
- **H**: Halftones
- **oc**: Octaves

The duration of a beat depends on the selected synchronization source, which may be e.g. the MIDI clock or a fixed tempo (see section 2.2.1 for details). The unit 'octaves' denotes a relative frequency. The reference is given by the sample frequency. An example: 3.4 oc means

$$\frac{\text{SampleFrequency}}{2^{3.4}} \tag{2.1}$$

If the sample frequency is e.g. 44100 Hz, then 3.4 oc will result in 4177.7 Hz. If the sample frequency is e.g. 22050 Hz, then 3.4 oc will result in 2088.8 Hz.

Entering '#' into a parameter field results in the value of the last played note, if possible. This means:

- If a field requires the input of a MIDI note, '#' will result in the last played note, e.g. 'a 2'.
- If a field requires the input of an absolute frequency, '#' will give the base frequency of the last played note, e.g. '440 Hz'.
- If a field required the input of a relative frequency (given in octaves, in relation to the sample frequency), then '#' will calculate that value from the frequency of the note played last. If the frequency of this note is e.g. 2756.25 Hz, and the sample frequency is 44100 Hz, then this will result in '4 oc', as this is $\frac{44100\,\text{Hz}}{2756.25\,\text{Hz}} = 16 = 2^4 = 4$ octaves below the sample frequency.

2.2. The oscillators (OSC page)

The OSC page can be accessed by clicking *OSC* in the navigation bar. This page contains the settings of the oscillators and the combination panel.

Figure 2.4.: The parameters of an oscillator

2.2.1. The oscillators

AnaMark has 3 oscillators. They look the same and provide the same parameters (fig. 2.4).

Wave

Wave denotes the oscillators waveform. You can set the first and the second half (positive and negative half, respectively) of the waveform independently. Have a look at the list which shows up when the buttons are clicked: There are all the common standard waveforms as well as many more:

- *None* has two different meanings. If the first half of the waveform is set to *None*, it means silence (a constant zero-line). If the second half of the waveform is set to *None* (= the default), AnaMark always uses the negative equivalent of the waveform which is selected for the positive part.
- Some waveforms have the suffix *FS* (= Fourier Synthesis). Their spectrum is limited to lower frequencies. They sound a little bit like organs.
- The waveforms of the *Cond*-group represent transitional stages from triangle to square (from the physical point of view, the curves are periodical loading/unloading curves of an condensator).
- *NoiseWht* represents a section of a white noise, *NoiseBrn* a section of a brown noise. As these sections are played periodically they do not sound like noise if used "'as is"', because real noise is unperiodical. Therefore it is necessary to remove the hearable periodicity from the sound by appropriate usage of other parameters.[6]
- *HalfSawUp* and *HalfSawDown* represent lines from bottom (−1)/top (+1) to zero. They are usually used as LFO waveforms.
- *HalfSquareUp* is +1 in the first half, and zero in the second half. *HalfTriUp* is built analogeous, but refers to a triangle wave. These waveforms are commonly used for LFO.

[6] There are many ways to do this: Slight random modulation of pitch and *Symmetry*, or using two slightly detuned oscillators playing noise

- *Sample_##* represent sampled waveforms from various sources. Waves with the same number come from the same source, but represent another part of its frequency spectrum. There are 17 sampled waveforms.

- *Feedback* is not a real waveform, but a kind of effect instead. AnaMark's output is routed into this wave and can be used to introduce feedback into your sound. To enable the feedback, the first half of the OSC waveform must be set to *Feedback*, the second half then is ignored. Setting the second half to *Feedback* has no meaning and is handled as if it would be set to *None*. You set the feedback delay by using *Coarse Tune* and *Fine Tune*. The feedback amount is set by using the *Weight* knob. See there for details. *Pulse*, *Symmetry* and *Phase* have no meaning for the feedback. There is only one feedback channel, so setting more than one OSC to *Feedback* can produce weired results (of course, the usage of simply one feedback can do this as well). The quality of the feedback may be affected by the sample rate, especially while playing high notes. So rendering the sound with 96 kHz or more may produce much better results.

Pulse

Note: In the case that you know a parameter called "'Pulse Width"' from other synthesizers: The paramater *Pulse* has **NOTHING** in common with it (in some cases it may sound similarly).

Pulse adjusts the length of silence added to the first and the second half of the played waveform, respectively. The pitch remains constant, but the character of the sound may change dramatically.

Symmetry

The parameter *Symmetry* morphs the waveform by moving the central point of the waveform. If applied to the square waveform, this parameter is equivalent to the "'Pulse Width"' parameter know from other synthesizers (There, it usually is restricted to the square waveform).

Phase

Phase adjusts the phase shifting of the OSC. To have an effect on the sound, it is necessary to use at least two oscillators and the waveshaper (see section 2.4). Additionally, some functions of the combination panel are sensitive to phase changes (see section 2.2.2).

Oscilloscope

The oscilloscope shows the waveform of the OSC, including the modifications resulting from the *Pulse*, *Symmetry* and *Phase* parameters. This optical representation is of great value for beginners who want to understand what happens to the waveform by tweaking those parameters.

Tune coarse

This is the coarse detune of the OSC relative to original pitch of the played note. It goes from −36 to +36 halftones in steps of one halftone.

If the waveform is set to Feedback, *Tune coarse* defines the coarse delay, which is always relative to the current note. Two examples to demonstrate this:

- Assume, *Tune Coarse* is set to "'0 halftones"'. If you play the note 'a' (440 Hz), the delay will be 1000 ms/440 Hz = 2.3 ms. Playing the 'a' an octave higher (880 Hz) will result in a delay time of 1000 ms/880 Hz = 1.15 ms.
- Assume, *Tune Coarse* is set to "'−12 halftones"'. If you play the note 'a' (440 Hz), the delay will be $2 \cdot 2.3$ ms = 4.6 ms. Playing the 'a' an octave higher (880 Hz) will result in a delay time of $2 \cdot 1.15$ ms = 2.3 ms.

Tune fine

Using *Tune fine*, the fine detune of the OSC can be adjusted. A slight detune can result in interesting effects and a "'moving"' sound. If *Feedback* is used, its function is similar to *Tune Coarse*.

In the first half of the knob's rotation range, the value goes from 0.000 to 1.000 halftone. The second half covers the range from 0 to 16 beats.

- *Fine tune* set in halftones:
  The value is simply added to *Tune coarse*. E.g. a total detune of −0.2 halftones is achieved by setting *Tune coarse* "'−1 Halftone"' and *Tune fine* to "'0.800 Halftones"', as: $(-1) + 0.8 = -0.2$
- *Fine tune* set in beats:
  This gives a dynamic detune, which depends on the current pitch and results in temporal constant detune. As an example for better explanation:
  To start from an "'empty"' preset, go to the *Misc* page. In the section *Clipbrd* click on *Clear*, and then click on *Paste*.
  Go to the *OSC* page. For OSC1 and OSC2 set:
  - *Wave* to *sine*
  - *Pulse*, *Symmetry* and *Weight* to 1.0

- *Phase* and *Coarse Detune* to 0.0
- *Tune Fine* to 0.0

Mute OSC3 by setting *Wave* to *None*. In the *Combination Panel*, set both functions to *Mix*. Set *Detune Sync* to "'120 BPM"'. Now, set *Tune Fine* of OSC2 as follows:

- 0.0: The sound is static.
- 0.05 H: Play notes of different pitches. The speed of the phaser effect rises with the pitch of the note.
- 1 B: Play notes of different pitches. The speed of the phaser effect is the same for all notes.

Weight

The weight of the OSC-signal denotes the impact amount of the OSC on the resulting signal. This is **not** just a simple multiplication (= changing the volume). The algorithm depends on the function set in the *Combination Panel* and provides a true fade in/out.

If used with the *Feedback* waveform, this parameter controls the amount of the feedback. If it is too high, the sound will distort nasty and may also turn into crude noise!

Detune Sync (synchronization source)

Using *Detune Sync* you can select the synchronization source for the *Tune Fine* parameters of the OSC. A synchronization source defines the length of a beat. E.g. "'2*MIDI"' means: If the MIDI clock speed is 120 BPM, the modulation is set to $2 * 120\,\text{BPM} = 240\,\text{BPM}$. The synchronization remains exact even if the MIDI tempo changes during a note is played.

Oversample

Some waveforms may produce aliasing, especially when higher notes are played. Activating the Oversample capability strongly reduces these artefacts in most cases. Nevertheless, in some cases it may change your sound completely, e.g. if the OSC use noise waveforms or if the waveshaper is placed beyond the filter.

The menu *Oversample* gives you the following three options:

- **OFF**: No OSC oversampling.
- **Always**: OSC oversampling for each note, independent of frequency.
- **Frequency**: OSC oversampling depending on the frequency of the note. Below the button, you can define the minimum frequency for oversampling (labeled *Octave*).

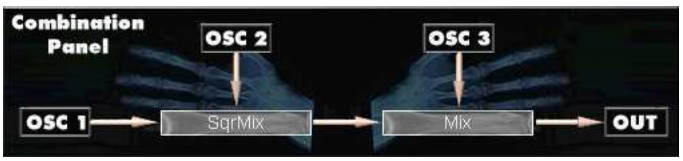

Figure 2.5.: The *Combination Panel* provides numerous possibilities to combine the signals of the OSC.

If the frequency of the note is below this value, OSC oversampling is disabled. This is given in the unit oc (= octaves), as it is a relative frequency, referred to the sample rate. Using this setting, you can optimize the CPU performance of your presets: For lower notes, where aliasing artefacts are not audible, OSC oversampling is disabled (faster calculation of the sound). OSC oversampling is used only for high notes, where the aliasing artefacts would become audible otherwise.
Important: AnaMark decides the OSC oversampling state, when a note starts. This state remains, even when the pitch of the note crosses the limiting frequency, e.g. due to Pitch Bend or portamento! To solve this problem, adjust the *Octave* setting.
Hint to find the right *Octave* value easily: Disable OSC oversampling and try to find the highest note, where aliasing artefacts are below your hearing threshold level (or whatever limit criteria you wish to apply). You may compare the sound of the note with OSC oversampling and the sound without OSC oversampling by switching *Oversample* from **OFF** to **Always** and vice versa. You may lower this note to give some room for Pitch Bend or portamento. Play this note. Then set *Oversample* to **Frequency** and enter '#' into the parameter field *Octave*.

2.2.2. Combining the oscillators (Combination Panel)

The sound is constructed stepwise: First, the current signal equals OSC1, then OSC2 is "'added"'. The result is taken as the "'new"' current signal, and OSC3 is "'added"'. You can use the *Combination Panel* (see fig. 2.5) to set these combination functions:

- **Mix / SqrMix**: Two variants of additive mixing: The first uses the normal signals, the second one uses the squared signales.
- **Ring / Ring 2**: Two variants of ring modulation.
- **Diff**: An experimental way of subtractive sound synthesis.
- **Min / Max**: At each position the values of the current signal and the oscillator to be added are compared and the minimum / maximum is taken.

- **FM**: The "'added"' oscillator modulates the frequency of the current signal. Using portamento and pitch modulation may give unexpected results.
- **XFM / XFM 2**: Two varians of cross modulation. Using portamento and pitch modulation may give unexpected results.
- **PM**: The "'added"' oscillator modulates the phase of the current signal.
- **Reflection / Reflection 2**: Both values are compared. If the second one is in the "'range"' of the first one, its value is taken as is. If it exceeds the "'range"', it is reflected on its border. By modulating the *Weight* parameter of the newly added OSC, you may get interesting changes in sound. In the second variant, the sign of the newly added OSC is set to the sign of the current signal.
- **Rate Variation / Rate Variation 2**: The newly added OSC modulates the samplerate of the current signal. Usually, small values are used for *Weight*. Large values will result in a distorted sound. In the second variant, the sign of the newly added OSC is ignored.
- **Bit Depth / Bit Depth 2**: The newly added OSC modulates the resolution (bit depth) of the current signal. In the second variant, the sign of the newly added OSC is ignored.
- **Blend**: Depending on the OSC's phase, the waveform of the current signal and the OSC are mixed dynamically: At the beginning of each OSC period, the current signal is at the max and the OSC's volume is set to zero. Until the end of the period, the signal and the OSC are faded out and in, respectively. Detuning the OSC and changing its phase gives interesting results.
- **Var Blend**: Has an effect only then, if it is set for OSC3. The value of OSC3 modulates the mix between the current signal and OSC2. Detuning OSC3 and changing its phase gives interesting results.
- **Complex**: The signal and the newly added OSC are combined to a complex number (they represent its real and imaginary part, respectively). The angle of the complex number is computed. The angle is converted, so that the result of walking the unit circle will give a triangular waveform. To "'build"' the unit circle: Set OSC1 and OSC2 to the *sine* waveform. Set the phase of OSC2 to 0.25.
  Changing e.g. the weight of one OSC will morph this circle into an ellipse.
- **Complex Soft**: Similar to *Complex*, but walking the unit circle will result in a sine waveform. The sound is softer.

Figure 2.6.: Parameters of the modulation OSC (LFO).

2.3. Modulating the OSC (OSCMod page)

The modulation section provides numerous modulation sources, e.g. velocity, pitch, modulation OSC (LFO) and envelopes. They can be combined and assigned to the modulation destinations using modulation combiners.

2.3.1. Modulation OSC (LFO)

Each of the two modulation OSC provides the following parameters (fig. 2.6):

Wave

The waveform of the modulation OSC. For more details about the available waveforms see section 2.2.1. The value of the waveforms ranges from -1 to $+1$.

Speed

The duration of a period in beats.

Phase

The starting phase of the waveform. If you turn the knob to the max, the display shows the value *random*. This means, that the modulation starts at a random point of the selected waveform.

Delay / Hold / Continue

The effect of the possible settings is explained by means of fig. 2.7:

The horizontal axis represents the time. "'Preset"' marks the time the current preset was selected. "'Note 1"' and "'Note 2"' denote the times two notes are hit. The vertical axis represents the output values of the modulation OSC.

Delay/Hold: The value of the knob gives the time in beats, which lies between hitting a note and the start of the modulation OSC. If *Continue* is selected, the knob has no meaning.

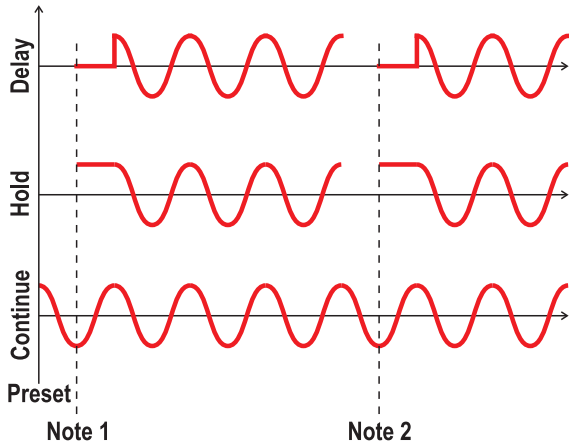

Figure 2.7.: The signal of a modulation OSC using the options *Delay*, *Hold* and *Continue*. The basic waveform of the modulation OSC which was used in this diagram for example purposes is a cosine.

Once / First Key

If *Once* is active, the waveform is played once per note. This option is available for *Delay* and *Hold* only.

The option *Once* changes to *First Key* when the modulation OSC is set to *Continue*. *First Key* tells the modulation OSC not to start at preset selection, but at the first note played after preset selection.

For further details, see fig. 2.8.

Sync

This is the synchronization source of the modulation OSC, see section 2.2.1 for further information.

2.3.2. Modulation envelopes

There are two modulation envelopes (fig. 2.9) which allow the easy creation of complex modulations.

Each envelope is divided into 4 bars (= dark lines), each bar into 4 beats (= light lines) and each beat into 41/4 beats (= dashed lines). The envelope points can be adjusted to 1/16 beat.

The curve of the modulation envelope is divided into 3 parts:

- **Once played part**: This is the part, which lies before the *Loop Start*. It is played once after hitting a note.

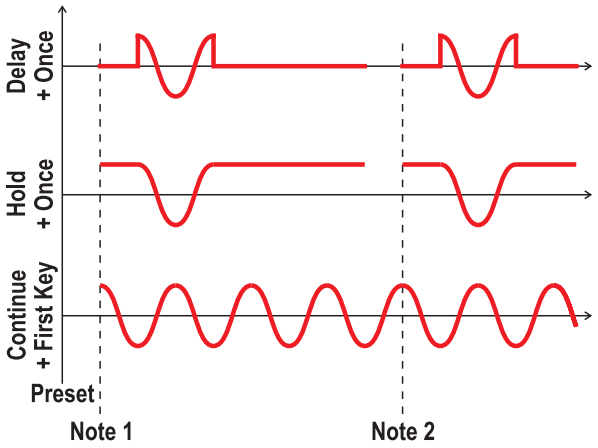

Figure 2.8.: Effect of *Once* and *First Key* on the output value of a modulation OSC. The basic waveform of the modulation OSC which was used in this diagram for example purposes is a cosine.

- **Loop**: This is the part, which lies between the *Loop Start* and the *Loop End*.
- **Release** : After releasing the note, the envelope is continued after the *Loop End*. To avoid clicks and audible steps, some smoothing of the envelope is done in realtime. You can use several envelope points in the release-part.

New points can be added to the envelope by left clicking between two existing points. There is a maximum number of 50 points. To remove a point, right click on it.

If you click the left mouse button, while the mouse cursor is at a point, you can draw the point as long as you hold the left mouse button down. If you additionally press the SHIFT-key, the value (= y position) of the point is locked. If you press the ALT-key while moving a point, the point always snaps to the nearest 1/4 beat. This makes creating "'rythmic"' envelopes much easier.

On the right side, the field *value* shows the value (= y position) of the currently marked point. You can mark a point by simply left clicking it.[7] If you click the *value*, you can enter a new value for the selected point. That means, that you can easily adjust the values of the points very exactly.

If you press the SHIFT key and right click, while the cursor is between two envelope points, the state of this envelope part switches between *linear* and *freeform*. In the freeform mode, you may create more smooth envelopes by moving the two circular parameter points. Just play a little bit around with it to get a feeling.

To set the *Loop Start* to a point, left click that point and press the CTRL key. Right

[7] Hint: To prevent the value of being changed unintentionally, you may also press the SHIFT-key.

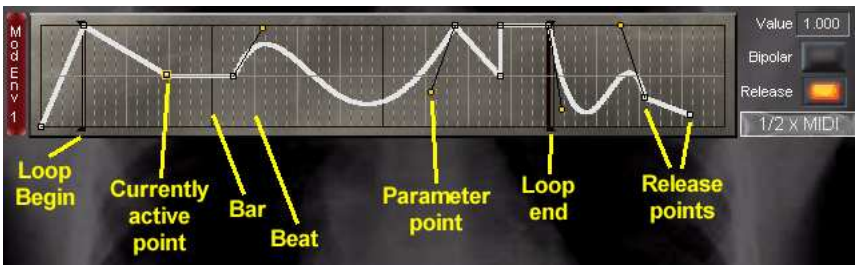

Figure 2.9.: The elements of a modulation envelope.

Figure 2.10.: Elements of the combiner section.

click a point while CTRL is pressed to set the *Loop End*. You can also set the *Loop Start* to the same point as the *Loop End*.

The envelope works unipolar. That means, the values are in the range 0–+1. If the button *Bipolar* is activated, the value range is −1–+1.

If you uncheck *Release*, the *Release Points* are not active (they are displayed grayed). That means, the envelope remains in the loop when a note is released.

To set the synchronization source of the envelope, use the button below the *Release* button (For further information, see section 2.2.1.).

There is an internal clipboard to copy and paste modulation envelopes. To copy an envelope, press SHIFT+CTRL while left clicking on it. To paste the envelope saved in the clipboard, press SHIFT+CTRL while right clicking on it.

2.3.3. Modulation combiners

A modulation combiner (fig. 2.10) takes the values of up to 2 sources and combines them to a new one. The result ist weighted and used to modulate the destination. There are 5 combiners.

The most values can be used positive as well as negative/inverted. Possible sources are:

- **Velo (Velocity)**: velocity and square velocity

- **Note**: MIDI note number of the current note. The value is mapped onto the range 0–1.
- **Modulation**: The modulation wheel (MIDI Controller 1)
- **Breath (BreathCtrl)**: The breath control (MIDI Controller 2)
- **Pitch bend**
- **Aftertouch**: There are two types of aftertouch: *key aftertouch* (*polyphonic key*) and *channel pressure* (*channel aftertouch*). Both variants are perceived.
- **ModOSC**: The two modulation OSC
- **ModEnv**: The two modulation envelopes
- **Comb**: The unweighted values of the other combiners
- **Rand (Random)**: One random number in the range 0–1 and one in the range −1–1. Those numbers are recalculated for each note.
- **Value (Fixed Values)**: Constant values. Those can be set using the value field labeled *Fixed Values* at the right.
- **FlipFlop**: The values are used alternately: When the first note is hit, the first value is used. For the second note, the second value is used. Then it restarts: For the third note, the first value is used again. For the fourth note, the second value is used again, and so on.
- **TripFlop**: As *FlipFlop*, but three values are alternated: a, b, c, a, b, c, a, b, c...
- **ModOSC1S / ModOSC2S**: This value represents the start value of the modulation OSC. It may change from note to note when the phase of the modulation OSC is set to random.

The available operators are:

- **Src 1**: The value of source 1. source 2 is ignored.
- **+**: Adds the values of source 1 and source 2.
- **x**: Multiplies the values of source 1 and source 2.

Possible destinations are the weight-, pitch-, pulse- and symmetry-parameters of the 3 OSC as well as the speeds of both modulation OSC (ModOSC). E.g.: "'Weight (1)"' means the weight of OSC 1, "'Weight (13)"' means that the weights of OSC 1 and OSC 3 are modulated.

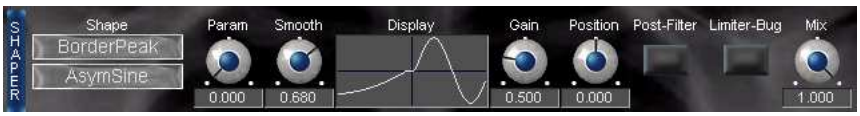

Figure 2.11.: Controls of the waveshaper

The knob at the bottom sets the amount of modulation (The result is multiplied with that value). If your destination is an OSC pitch, the display of this value is changed so that you can see the modulation amount in halftones. If your destination is the speed of a modulation OSC, the display changes to show you the modulation amount in beats.

Note: The destinations pulse, symmetry and weight are limited to the range 0–+1. The speeds of the modulation OSCs are restricted to a minimum value of 1/16 beat. Values which exceeds are cut to these ranges.

If you select the same destination more than once, the "'last"' combiner overwrites the others. If you want to combine two combiners, you need a third combiner where you select the output values of the previous mentioned combiners as sources.

Hint You can use the envelopes as simple static arpeggiators, e.g.: Set the destination to "'Pitch (123)"', so that all OSC are modulated together. Set source 1 and 2 to "'Envelope 1"', the operator to '+' and the weight to 10.0 halftones. This results in a total range of 20 halftones. Now build a envelope, which is 0 for the first 1/4 beat, and then changes immediately to the value 0.6, where it remains for another 1/4 beat. Loop it. This results in an octave arpeggi, as: $20\,\text{halftones} \cdot 0.6 = 12\,\text{halftones}$

2.4. Waveshaper page

The waveshaper (fig. 2.11) transforms the signal (this does not change the pitch). If the incoming signal is a pure square, it keeps unaffected.

Below the waveshaper controls, the modulation envelopes and modulation combiners of the filter modulation page are mirrored to make the creation of waveshaper modulations easier.

Shape

This defines the waveshaping curve. The usage is the same as the wave selection of the oscillators: The top option menu defines the left half, the bottom option menu defines the right half of the shape. The right half is automatically set to the shape of the left half, when *None* is selected (This is in analogy to the usage of the oscillators). The setting *Linear* means, that the signal keeps unchanged. Neverthells it is limited. See the explanations of the parameter *Gain* for more informations about this (section 2.4).

Param

The parameter modifies the selected shape. If it is set to the minimum, the shape is unchanged. The way of modification depends on the selected shape.

Smooth

This value smooths the shape and reduces aliasing artefacts which may occur due to sharp edges in the shape.

Display

The display visualizes the result of the settings *Shape*, *Param* and *Smooth*.

Gain

Gain sets the volume of the input signal. The waveshaper works on incoming signal values in the range −1–+1. Values out of range are cut down. Some examples:

If the input signal is created by one single oscillator, its range is −1–+1. Thus, Gain can be set to 1 without limiting the signal.

In the case 3 oscillators are added together (Using *Mix* in the *Combination Panel*), the value range is −3–+3 and *Gain* values larger than 0.333 may lead to a limiting of the signal.

Two oscillators, combined by frequency modulation (FM) have a value range of −1–+1. When using FM, the second oscillators modulates the way the first oscillator is running, but the signal itself comes from the first oscillator only.

Position

The parameter *Position* denotes the position of the input signal in the waveshaper. Especially if there are different shapes used for the left and the right half, modulating this value can give interesting effects. If the input signal is moved too far to the left or right, it is limited.

Post-Filter

Usually, the waveshaping of the signal will be done before entering the filter. If you check the button *Post-Filter*, the waveshaping will take effect on the filtered signal.

Figure 2.12.: Filter and resonator parameters

Limiter-Bug

Due to a bug, the first version of AnaMark produced distortions while limiting the signal. This functionality is kept as a feature, because of downward compability and as it produces interesting results.

Mix

The parameter *Mix* denotes the mixing ratio of the unshaped (dry) signal and the shaped (wet) signal.

2.5. Filter-Page

On the filter page, you can adjust filter and resonance effects (fig. 2.12).

Type

The *Type* Button shows a schematic amplitude-frequency diagram of the current filter. Click it to see a list of available filter types. There are: "'No filter"' (horizontal line), 3 lowpass, 3 highpass, one bandpass and one notch filter.

Level

The *Level* denotes the slope of the filter.

Param

Param is the abbrevation of "'parameter"'. If the graphic of the *Type* contains a **P**, you can use it to manipulate the filter. Depending on the filter used, this affects the height of ripples or a second filter frequency.

Freq

Freq denotes the filter frequency. Some filters tend to distort if the frequency is low and the level is high. This may be reduced by lowering the volume.

Filter : Res

In addition to a filter, this section includes a resonator. Use *Filter : Res* to adjust the mixing ratio between the filter and the resonator output signal.

Res. Freq (Button)

If this button is enabled, the base frequency of the resonator can be set independent from the frequency of the filter. If the button is disabled, the resonators base frequency is the same than the filter frequency.

Note: Even if the button is disabled, you can modulate the resonator frequency and the filter frequency separately.

Res. Freq (Knob)

Here you can set the resonator base frequency, if the *Res. Freq* button is enabled.

Resonance

This is the sharpness of the resonance. The resonator is independent of the filter used. This means, that resonance remains active even if "'No filter"' is selected.

KeybMid

The filter and resonator frequencies can be set depending on the note, so that e.g. higher notes have a higher frequency than notes with a lower pitch. *KeybMid* is the "'middle"', the note at which the frequency is equal to the setting of the frequency knobs.

KeybSlope

This is the amount of the frequency change by the distance between the played note and the note set by *KeybMid*. If the value is set to 0.0, the filter frequency is independent of the played note.

If you turn the knob to the centre position (= 1.0), the frequency rises parallel with the pitch (refered to *KeybMid*). This means: If the played note is one octave higher than *KeybMid*, the filter frequency is doubled.

2.6. Filter modulation (FilterMod page)

The parameters of the FilterMod page are similar to those of the OSCMod page (see section 2.3). Possible modulation destinations are:

- **Shaper Gain**: Waveshaper *Gain*

- **Shaper Position**: Waveshaper *Position*
- **Shaper Mix**: Waveshaper *Mix*
- **F+R Freq**: Filter and resonator frequency, simultaneously
- **F+R NFreq**: Filter and resonator frequency, simultaneously. A natural scale is used (see below).
- **Filt. Freq**: Filter frequency
- **Filt. NFreq**: Filter frequency using a natural scale (see below).
- **Res. Freq**: Resonator frequency
- **Res. NFreq**: Resonator frequency using a natural scale (see below).
- **Param.**: Filter parameter *Param*
- **Res. Weight**: Ratio *Filter : Res*
- **Resonance**: Resonance sharpness
- **Panorama**
- **ModOSC1**: Speed of modulation OSC1
- **ModOSC2**: Speed of modulation OSC2

Usually, the modulation amount for frequency modulation is set absolutely. This means, that the amount is always e.g. 1000 Hz. If you use the natural scale you can give the modulation amount in halftones. This means: If 'a' (440 Hz) is played and you set the modulation amount to 12 H, the frequency will be modulated by an amount of 440 Hz. If you play the 'a' one octave higher (880 Hz), the frequency will be modulated by an amount of 880 Hz.

2.7. Vol/FX page

2.7.1. Volume envelope (Vol Env)

The usage of the volume envelope is similar to the other envelopes, see section 2.3 for details. There is only one difference: The *Release Point* always controls the fade out — if the *Release* button is deactivated, the fade out is overlapped by the continuing loop.

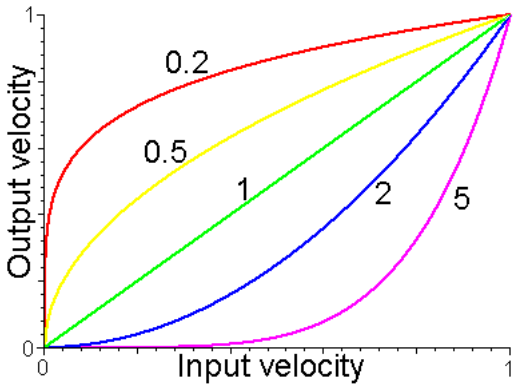

Figure 2.13.: Functional dependance between *Input velocity* and *Output velocity* for several *Dynamic* values.

2.7.2. Keyboard envelope (Keyb Env)

Dynamic

The *Dynamic* parameter maps the input velocity (= the velocity send to AnaMark as part of the MIDI "'Note On"' command) to the output velocity (= the velocity, the internal AnaMark functions "'see"'). AnaMark uses the output velocity as modulation source and to calculate volume. The value 1 means "'linear dynamic"'. The higher the distance between the value of *Dynamic* and 1, the higher the nonlinearity (see fig. 2.13).

VolKeybMid / VolKeybSlope

The volume of a preset may vary noticeably over the keyboard range due to e.g. the filter settings. This change volume may be reduced by these two parameters. *VolKeybSlope* is the modification of the volume in dB/octave. *VolKeybMid* is the note, *VolKeybSlope* is referred to.

2.7.3. Master

Volume

This controls the main volume of the preset.[8] There is a built-in limiter which avoids volume peaks. Distortions may be produced when *VOlume* is set too high.

[8] Note, that the *Volume* is a preset specific volume. It is independent on the channel volume, you set using the MIDI-Controller 7!

Figure 2.14.: Different effects and their parameters. *Top*: Parameters of the effects One Shot Delay, Delay, X-Delay, Spread Delay, Diff. Delay, Pan.Diff. Delay, Multi-Delay. *Middle*: Parameters of the effects Chorus, Flanger, Phaser. *Bottom*: Parameters of the effect Freq-Boost.

Panorama

The *Panorama* sets the volume ratio between the left and the right audio channels. To modulate the *Panorama*, see section 2.6.

2.7.4. Effects (FX1 / FX2)

AnaMark provides several effects (fig. 2.14). The ratio dry signal : effect signal is set using the parameter *Mix*. There are 2 effect sections, which are arranged in a serial order: The first one takes the dry signal and applies the effect on it. The second one takes the output of the first FX section and applies the effect on it. The output of the second FX section is what you hear.

Effects with a **(S)** in their name, are synchronized to the MIDI clock. Note that delay effects are restarted at tempo changes. This may produce clicks if it happens when an audible portion of signal is processed by the effect.

One Shot Delay

The sound is echoed once with a given delay. You can set the delay times and the gains for the left and right channel separately.

Delay / X-Delay

These are standard delays. You can set the delay times and the gains for the left and right channel separately. Use small delay times (10 ms–50 ms) and high gain values to produce reverb effects.

Sometimes pure delays produce a metallic sound. To reduce this, increase the *High-Damp* which lowers the feedback of high frequencies.

Spread Delay / Diff. Delay / Pan.Diff. Delay

Some special delays — you can set the delay times and the gains for the left and right channel separately. Use small delay times (10 ms–50 ms) and high gain values to produce reverb effects. Additionally you can modify the stereo-sound using the *Spread* parameter. Use the *High-Damp* to lower the feedback of high frequencies.

To get into the differences of these delay effects, take a sound with a heavy attack phase, a short sustain, and a short-release (e.g. a base drum) and try the different settings.

Multi-Delay

This is an extended delay effect for producing delay sounds having a larger spread.

Chorus

The *Delay* and the *Speed* of the chorus effect are the same for both channels. The *Depth* can be set individually. Delay times from 20 ms to 40 ms give good results. The *Spread* parameter sets the phase difference between both channels.

Flanger

The meaning of the parameters is as explained for the chorus effect. Short delay times (< 1 ms) result in a sharper sound.

Phaser

The meaning of the parameters is as explained for the chorus effect. In general, a delay time of 0 ms results in sharper phaser effects than larger values.

Freq-Boost

The frequency booster can be used to raise e.g. the bass frequencies. It is not possible to reduce frequencies, as it uses an additive filter. In some cases it is necessary to compensate the increase of volume produced by this effect. Therefore the last knob on the right can be used to adjust the output volume. As rule of thumb: If you increase e.g. the bass frequencies by 5 dB, set *Volume* to -5 dB.

Figure 2.15.: The parameters of the section *Pitch*.

2.8. Miscellaneous settings and global options (Misc page)

2.8.1. Pitch

The parameters of the section *Pitch* are shown in fig. 2.15.

Pitch bend

This sets the pitch bend amount ranging from 0 to 24 halftones. Below the value 0 the control shows *TUN* — this is further explained in detail in section 2.8.5.

Portamento

If a "'Note On"' command is received on the monophonic channel while another note is still playing, the pitch glides from the first note to the second one. The time which is needed to do the complete glide is set with the *Portamento* parameter.

PortaSync

PortaSync is the synchronization source for portamento (see section 2.2.1 for more details).

Dirty Pitch

This gives the maximum detune amount when a note is hit. The detune of a note is set randomly within in the range

(NoteFrequency - DirtyPitch) – (NoteFrequency + DirtyPitch)

Usually, electronic instruments have a constant per-note frequency. This means, e.g. if 'a' is tuned to 440 Hz, then each 'a' played will have 440 Hz. The behaviour of many natural instruments is different, as e.g. strings, bass and guitar: The frequency varies a little bit. So, e.g., a first played 'a' may have 440.5 Hz, the second played 'a' may have 439.8 Hz and so on.

Figure 2.16.: Functions of the preset clipboard.

Figure 2.17.: The controls of the section *Preset*.

2.8.2. Preset clipboard

These functions provide acces to AnaMark's clipboard for presets (fig. 2.16):

- **Copy**: Copy the current preset to the clipboard
- **Paste**: Paste a preset from the clipboard to the current one
- **Swap**: Swap the data between the clipboard and the current preset
- **Clear**: Copy an "'empty preset"' to the clipboard

NOTE: Clipboard operations always affect the current shown preset data, not the stored one! If a preset was changed (and not yet stored using *Store Preset*, see section 2.8.3), then *Copy* copies the changes to the clipboard.

2.8.3. Preset

The controls of the section *Preset* are shown in fig. 2.17.

Store Preset

Stores the changes of the current preset. This function is necessary only if the option *Auto Store Preset Changes* is deaktivated (see section 2.8.6).

Load ROM-Bank

AnaMark provides 8 banks, and each of them contains 64 factory presets. A click on *Load ROM-Bank* opens a list box. There you can select the bank you want to load from the AnaMark ROM. Loading a ROM bank will overwrite all current presets! AnaMark remembers the last loaded ROM bank.

A list of all presets can be found in appendix D.

Figure 2.18.: The settings of the section *Timbre*.

2.8.4. Timbre

This part contains settings of the current timbre (fig. 2.18). They are not saved with the single program but with the complete bank.

Polyphony

Use the *Polyphony* parameter to limit the number available of voices. Note that 1 Voice means a single voice (= monophonic) without portamento. If you turn the knob to the left end, the value *MonoPorta* is shown. This means "'one voice with portamento"'. It is done by simply routing the incoming MIDI data to the monophonic channel of the timbre.

High Quality

Certain settings may produce audible aliasing if high notes are played. Activate *High Quality* to smooth the sound by means of an antialiasing algorithm. As this setting takes very much processing time, you should use it for rendering your final version offline (= not in realtime).

Important: This function may affect the sound and the volume of presets which use noise waveforms, such as e.g. snares. It may be helpfull to use separate timbres for those presets, as this setting is timbre specific.

2.8.5. Tuning (Using scales and microtuning maps)

AnaMark provides the possibility to use your own tunings (see fig. 2.19). A tuning is a set of defitions refering a note to its frequency, as e.g. A3 = 440 Hz. The tuning settings are bank specific. They are saved with the bank data, but not with single presets.

There are 2 scales per timbre. The connection between the 8 scales cannot be changed: timbre 1 is connected to scales 1 and 2, timbre 2 to scales 3 and 4 etc. Accessing the scales by MIDI SysEx uses preset numbers 0–7, by *MultipleScalesFile* uses MIDI channels 1–8.

Figure 2.19.: The parameters of the section *Tuning*.

Scale morphing using Pitch Bend

The scale of a timbre is used as default. If *Pitch Bend* is set to *TUN* the tuning can be morphed between the two scales: Both scales define a note-individual Pitch Bend Range. Thus the second scale is called *Pitch Bend Destination Scale*.

Tuning Base

Using the *Tuning Base*, you can shift the complete tuning up or down. This setting is applied to the note frequency after calculating the frequency according to the *Tuning Source*.

Tuning Source

Here you can handle the source of the tuning:

- **VST-Host**: The tuning is given by your VST host. Note, that there are many VST hosts which do not support micro tuning.
- **Tuning File**: AnaMark supports tuning files. These are text files which include the frequency definition for each note. The directory "'AnaMark Tuning Files"' contains some example tuning files. The following formats are supported:
  - AnaMark Tuning Files (.TUN V2.00; file extension *.tun*).[9] There is one scale per file. After loading it is assigned to each scale available.
  - Embedded AnaMark Tuning Files (embedded .TUN V2.00; file extension e. g. *.tun.html*). These are AnaMark Tuning Files embedded in a file together with other data such as a web site.
  - AnaMark Multiple Scales Files (file extension *.msf*). There are multiple scales per file as well as their assignment to MIDI channels.
  - Scala Tuning Files (file extension *.scl*) and Keyboard Mappings (file extension *.kbm*).

[9] The format is downwards compatible to the former format versions AnaMark / VAZ 1.5 Plus Tuning Files (.TUN V1.00) and VAZ 1.5 Plus Tuning Files (.TUN V0.00); The file extension is *.tun* or *.txt*.

Figure 2.20.: The parameters of the section *Setup*.

- **Export Tuning**: This exports the current active tuning map to a file. The following formats are supported:
  - AnaMark Tuning Files (.TUN V0.00 to .TUN V2.00). The first scale of the current timbre is exported.
  - AnaMark Multiple Scales Files. All scales are exported. Equivalent scales are written as one scale but assigned to several MIDI channels.
  - As a standard MIDI file (MIDI SysEx command). The first scale of the current timbre is exported.

For developers and users who want to create or edit tuning files on their own: The formats AnaMark Tuning File and AnaMark Multiple Scales File are well documented. You can find the specifications, free tools and free source code here:

http://www.mark-henning.de/eternity/tuningspecs.html

Note: There is a very good freeware editor for generating tuning files: Scala. This can be found in the WWW at:

http://www.huygens-fokker.org/scala/

2.8.6. Setup

This section contains global settings (fig. 2.20).

Knob-Mode

There are two options:

- **circular**: The knobs behave like real knobs. To change the value, you have to move the mouse circular around the knob. If you increase the radius of the circle, the value changes slowlier (e.g. to make fine changes).
- **linear**: The knobs behave like vertical sliders. To change the value, you have to move the mouse vertically. If you press SHIFT, the value changes faster. If you press CTRL, the value changes slowlier.

OSC-Oversampling

The setting *OSC-Oversampling* can have one of the following values:

- **Never**: AnaMark ignores the preset settings and never uses the oversample functionality. Thus, AnaMark uses less CPU power.
- **Individual**: Oversampling is performed according to the individual settings of the preset.
- **Always**: If the oversampling option of a preset is set to **Frequency**, then OSC oversampling is applied for each note (= as if the oversampling option was set to **Always**).

If your computer has not enough CPU power for realtime rendering, deactivate oversampling. You may activate it when your song is finished and you do the offline rendering.

When you close AnaMark, the state of this setting is saved and will be restored the next time you start AnaMark.

Auto Store Preset Changes

If *Auto Store Preset Changes* is active, then all changes made to a preset are stored immediately. Otherwise, the function *Store Preset* has to be used to store preset data, as the changes will be lost when another preset is selected.

Mono Timbral

You can run AnaMark either in multitimbral mode (4 timbres) or in monotimbral mode by using this button. Note, that this setting is global and will affect all instances of AnaMark. You have to restart your music software to let this change take effect.

This setting can be used to reduce the number of audio channels coming from AnaMark (8 in multitimbral mode, 2 in monotimbral mode). This may reduce the amount of CPU power your VST host needs to mix the audio channels together.

Select Skin

A mouse click opens a menu where you can select a skin to change the look of the graphical editor. The procedure of adding new skins and creating your own ones is explained in section C.

DC-Filter

Some oscillator combination functions and the waveshaper may lead to a DC offset (the mean value of the waveform deviates from zero). This may e.g. cause trouble in the audio mixer of your VST host. Thus, there is a built-in DC filter, which removes the DC offset from the sound.

2.8.7. Detecting the version number

Click the AnaMark logo at the bottom right of the *Misc* page to see the version number.

A. Supported MIDI SysEx commands

The following MIDI-SysEx-Messages are supported:

SysEx command	*Send*	*Receive*
Bulk Tuning Dump Request	-	X
Bulk Tuning Dump Reply	X[1]	X
Single Note Tuning Change	-	X[3]
Bulk Tuning Dump Request (Bank)	-	X
Key Based Tuning Dump	X[2]	X
Scale Octave Tuning Dump (1 Byte)	-	X
Scale Octave Tuning Dump (2 Byte)	-	X
Single Note Tuning Change (Bank)	-	X[3]
Scale Octave Tuning (1 Byte)	-	X[3]
Scale Octave Tuning (2 Byte)	-	X[3]

[1] Used to answer *Bulk Tuning Dump Request* and *Bulk Tuning Dump Request (Bank)*.
[2] Used to export the tuning data as MIDI file.
[3] Affects the tuning in realtime.

B. Supported MIDI controllers

The following MIDI controllers are supported:

No.	*Name*	*Value x*	*Remarks*
1	Modulation	0–127	-
2	Breath Control	0–127	-
5	Portamento time	0–127	in 1/16 beats
7	Channel Volume	0–127	-
9	Filter Parameter	0–127	-
10	Panorama	0–127	$x = 64$ means $1 : 1$
11	Filter : Resonator	0–126	$x = 63$ means $1 : 1$
12	OSC1 Pulse	0–127	-
13	OSC1 Symmetry	0–127	-
14	OSC3 Pulse	0–127	-
15	OSC3 Symmetry	0–127	-
44	OSC2 Pulse	0–127	-
45	OSC2 Symmetry	0–127	-
70	OSC2 Phase	0–127	-
71	OSC2 Weight	0–127	-
72	OSC3 Phase	0–127	-
73	OSC3 Weight	0–127	-
74	OSC1 Phase	0–127	-
75	OSC1 Weight	0–127	-
76	OSC Modulation ModOSC1 Speed	0–127	in 1/16 beats
77	Effect 1 Mix	0–127	-
78	OSC Modulation ModOSC1 Delay	0–127	in 1/16 beats
80	OSC Modulation ModOSC2 Speed	0–127	in 1/16 beats
82	Waveshaper Parameter	0–127	-
83	Waveshaper Gain	0–127	-
85	Resonance Sharpness	0–127	-

No.	*Name*	*Value x*	*Remarks*
86	Filter/Resonator Frequency	0–127	-
87	Resonator Frequency	0–127	-
88	Effect 2 Mix	0–127	-
89	Waveshaper Smooth	0–127	-
90	Waveshaper Mix	0–127	-
118	Polyphony	0	Maps the polyphonic MIDI channel onto its monophonic equivalent. Portamento is enabled.
118	Polyphony	1–16	Limits the number of available voices. Portamento is disabled.

C. Changing the look of the graphical editor (Skinning)

The look of the graphical editor can be adjusted according to your wishes by using already existing alternative skins or creating skins on your own.

During installation, a subfolder called *AnaMark_Skin* is created in the destination directory. *AnaMark_Skin* contains the data of several predefined skins, whereas each skin is located in its own subfolder.

C.1. Usage of existing skins

After installation, there are already some predefined alternative skins you can select using the Skin-Selector (section 2.8.6). To add a new skin, just copy the files of the skin to a new subfolder in *AnaMark_Skin*.

C.2. Create your own skins

It is recommended to create a new skin by modifying an already existing one instead of starting from the scratch.

The meaning of the graphic files can easily be estimated by the file name or by simply opening the file. If the corresponding graphic file of a graphical element is missing, a built-in default graphic is used. Those built-in graphics may change in future versions of AnaMark. Therefore, a skin should never rely on them, but provide a complete set of files. The files are:

File[1]	*Size*[2]	*Usage*
Background *Background_OSC* *Background_OSCMod* *Background_WaveShaper* *Background_Filter* *Background_FilterMod* *Background_VolFX* *Background_Misc*	640 × 510	These are the backgrounds of each page. **Background** denotes the background of the *Overview* page. The other files refer to the pages mentioned in the file name. If a background of a page is missing, **Background** is used as default. This means: To make each page have the same background, it is sufficient to provide the file **Background**; the other files are not needed.
ButtonMinus ButtonPlus	19 × 38	Buttons to go to the previous/next preset.
CombinationPanel	507 × 113	Combination Panel
EnvelopeDisplay	531 × 96	Background of the envelope display
FilterMap HighlightenedFilterMap	46 × 378	These files contain graphical representations of the filters. **HighlightenedFilterMap** is used to image the currently selected filter type both in the editor and the filter selection menu. The unselected filters in the filter selection menu are displayed by means of **FilterMap**.
HorzLine	640 × 5	Horizontal line
KnobMap *KnobMap_OSC* *KnobMap_OSCMod* *KnobMap_WaveShaper* *KnobMap_Filter* *KnobMap_FilterMod* *KnobMap_VolFX* *KnobMap_Misc*	40 × 2200	Rotational knobs. Each section may have its own knobs. If the individual file of a section is missing in a skin, **KnobMap** is used as default.
OnOffButton	40 × 54	On/Off buttons
OptionsMenuBig	139 × 19	Big button for option menus
OptionsMenuMedium	113 × 19	Medium button for option menus
OptionsMenuSmall	87 × 19	Small button for option menus
Preview	320 × 255	Preview image of the skin which is used in the Skin-Selector.

File[1]	*Size*[2]	*Usage*
VertLabel *VertLabel_OSC* *VertLabel_OSCMod* *VertLabel_WaveShaper* *VertLabel_Filter* *VertLabel_FilterMod* *VertLabel_VolFX* *VertLabel_Misc*	14×33	Background of the vertical labels. Each group may have its own background. If the individual background of a section is missing, **VertLabel** is used, if available. If **VertLabel** is missing too, the color settings in the file **Skin.ini** are used. In the graphical editor, the vertical labels have different heights. Nevertheless, the dimensions of the files are the same. The images are enlarged by repeating the middle row.
VertLine	5×90	Vertical line

Alle graphic files have to be in uncompressed windows bitmap format (file extension *.bmp*. The dimensions of the files must be identical with those given in the table above.

Additionally, there is a file called *Skin.ini*. It contains the skin name and the name of the creator, and color definitions of e.g. label texts and envelope lines. Furthermore, the transparency settings are contained. This file is a simple text file which can be edited by Notepad or any other text editor. The *Skin.ini* files of the predefined skins contain detailed explanations for each entry.

[1]The file extension is *.bmp*. Filenames printed in italics denote optional files.
[2]Image size height $\times$ width in pixels.

D. List of the factory presets

The preset names contain information about modulation possibilities provided by the preset. The following symbols are used:

- **(J)** - *Modulation Wheel* active (MIDI Controller 1)
- **(B)** - *Breath Control* active (MIDI Controller 2)
- **(A)** - Modulation using *Aftertouch*

List of the available factory preset banks:

- Henning
- Mystahr/MH
- EasyMode
- EM / Bonus
- Liqih 1
- Liqih 2
- Liqih 3
- AnaMark V2
- AnaMark V1

Bank: **Henning**

Presets by Mark Henning

01. Synth Hard Fretless	33. Alarm
02. Alter Leierkasten	34. Choir of soft voices
03. Atmospheric UKW	35. Dry Tschik
04. U96 Pad	36. Glassy
05. Bells alone	37. Morphing Strings - Organ
06. Bright HitNRun	38. Old Organ (J)
07. Church avantgarde	39. Plate Oboe
08. Church Pipes (J)	40. Resonance Walking
09. Clav (J)	41. Soft deep'n'high 2 (JBA)
10. Coming Down (J)	42. String Ensemble (J)
11. Creamy bells	43. Xylophon
12. Crude Tech Lead	44. Flute in space
13. Dawn Melody	45. FX - Crazy Bells
14. Door Bell	46. FX - Ugly Beast
15. Engine Startup	47. Hollow Speaker
16. Evolution Bass (J)	48. Jumping Alarm Pad
17. FX - Play a song	49. Munny Lead
18. FX - Uiuhuuu peeping	50. Ocean swelling (Dirty)
19. Harmonium	51. Ocean swelling (Harmony)
20. Hiss (Play short'n'long)	52. Octave playing Bass
21. Kuckuck	53. Sleep softly
22. Landscape in the dark	54. Thunder Organ (J)
23. Little Mellow Thing	55. Thunderless Organ (J)
24. Mellow Horn Pad	56. Arpeggi-Pad
25. Metallic Piano	57. Bright Voices
26. Mood Organ (J)	58. FM vintage
27. NovaSweeper	59. FX - Imprisoned Ghosts
28. Plug (J)	60. Heavy Pop-Clav (J)
29. Rythm Electric Pad	61. Missa pipes
30. SciFi Fx n HardPad	62. Mountain's high (J)
31. Screaming FX-Pad	63. Oooo... (J)
32. Space-Accordeon	64. Sugar Sweep

Bank: **Mystahr/MH**

Presets by Mark Henning; Presets called "'-MY"' by Mystahr

01. Bobo Shaper	33. Arctic Whales -MY
02. Organic Voice	34. Atlantic Whales -MY
03. Kabalyptic	35. Band organ -MY
04. Synth EGuitar (J)	36. Careful now -MY
05. Bright Popcorn (J)	37. Chopped OB -MY
06. Eyh!	38. Vermin -MY
07. Eyoboah	39. Crazed party -MY
08. Electric Saw (J)	40. Dirtbag -MY
09. The current	41. Dirty Brass -MY
10. Rythmic Tic	42. Dirty teching -MY
11. Dingdingding	43. Flatch pad -MY
12. The Giant Hogweed	44. Ghost Marshes -MY
13. Bepo	45. Gritty kitty -MY
14. Generator (J)	46. Growl owl -MY
15. Hit Sharp	47. Hyperbolik -MY
16. Attack-Only Bass	48. Landslide -MY (J)
17. Flanger-Noise	49. Nurse Ratchet -MY
18. Attack'n'Hold	50. Phase Pit -MY
19. Sirene's Moloch	51. Airstrings -MY
20. Living Shaper	52. Wobblebass -MY
21. Twenty-one	53. Running Miles -MY
22. Crying electrons (J)	54. Sequatch -MY
23. Pingpong Noise	55. Sink the MO2 -MY
24. Melodic Police	56. Skinned Milk -MY
25. Pu-a-ua-ua	57. Soft Moles -MY
26. Aengstroem	58. Streamer -MY
27. Unearthly Calm	59. Thundirt -MY
28. Unearthly Calm II	60. Tisstatic -MY
29. Turns to light Rezz	61. Toy Phasers -MY
30. Play with tails -MY	62. Unibells -MY
31. Alien Drums -MY	63. Waving Space -MY
32. Angry bugs -MY	64. Rings of the Arctic -MY

Bank: **EasyMode**

Presets by EasyMode

01. Analog Gate	33. Noise Gated
02. EM-Salterium	34. Sweeped Gate
03. Monster	35. Snap Drum 1
04. PanSweep	36. Snap Drum 2
05. ChumChum	37. Hammer
06. DoubleSalt	38. Bd+Bass
07. Secret	39. Bass-Play
08. Scratchy	40. Orion FX
09. Random UI	41. Fall
10. Hammer of Hell	42. Animal
11. Power Bass (J)	43. FX LFO
12. FlipFlop Bass	44. Deep Pad Nine
13. Generator	45. LFO-Pad
14. Ping	46. Voice in a room
15. E-Bass	47. Bass-Sweeper
16. Electric Blubber (J)	48. EM-Drone (J)
17. Try with Oversample	49. EM-Bass
18. Perc EM 1 (J)	50. EM-Sweeper
19. Perc FX (J)	51. Arac-FX
20. Sequenced	52. EM-FX
21. Quaek-Plug	53. Come and go
22. Aaah + Bells	54. Mars
23. Dodo-Pad	55. Sylvester Drone
24. Sweeper's (Un)sweet	56. Sylvester Pad-Drone
25. O-Oua-Oua	57. Slash-Pad
26. Very strange one...	58. Mars-Police's Sirene
27. Rezz Vowels	59. Thunder / Explode
28. Crying or flying bomber	60. EM-Animals
29. Rythmic Droning	61. EM-Animal 2
30. Complex Gate 1	62. EM-Sweep FX
31. Analog Gate 2	63. Play diff Pitch
32. Complex Gate 2	64. Alien-Call

Bank: **EM / Bonus**

Presets by Mark Henning; Presets called "'EM"' by EasyMode; Nr. 35–64 leer

01. BigPlate Strings	33. Spaceship
02. Bottle Voice	34. Wuoa
03. Deep Brass Pad	35. Init
04. Disharmonic LowPad	36. Init
05. EQSoundNoise	37. Init
06. Head full of drugs	38. Init
07. In a small room	39. Init
08. NoisePlug	40. Init
09. Organlike Pad	41. Init
10. Rotary Organ	42. Init
11. Sad Pad	43. Init
12. SmashItDown	44. Init
13. Street Organ	45. Init
14. Ugly Strings	46. Init
15. Factory Sit 2 (J)	47. Init
16. Universe	48. Init
17. Moin (J)	49. Init
18. Deep Surprise 1	50. Init
19. Deep Surprise 2	51. Init
20. Deep Surprise 3	52. Init
21. Rezz Up and down	53. Init
22. EM - Pure Analog Filter	54. Init
23. EM - Bell's Sweeper	55. Init
24. EM - OneSided	56. Init
25. EM - Disharm Pad (JB)	57. Init
26. EM - Noiser's Melody	58. Init
27. EM - Middle Bass	59. Init
28. EM - Whu-Whu	60. Init
29. EM - LightBass or FX	61. Init
30. EM - Noise-Pad	62. Init
31. BongBong	63. Init
32. BowBow 2	64. Init

Bank: **Liqih 1**

Presets by Liqih

01. Alfano	33. Rich PM Pad
02. Dingler	34. Velocity PM Key
03. Jazzera	35. Transistor Pad
04. Smooth Bow	36. Various PM Cymbals
05. Finland (J)	37. Church Morphing Pad
06. Singer Pad	38. Velocity Echo Pad
07. Atmospherisma (JB)	39. RND Echo Pick
08. Clarinets Pad	40. Dripping Bells Sound
09. Strings Force (J)	41. Plucking The Synth
10. Quality Brass	42. Orbiter Pad
11. Arpeggiable (J)	43. Warm Sweeping Pad
12. Roomish Bass (J)	44. Sound Of The Cave
13. Simulanza	45. Phasing Cool Lead
14. Pshycoline (J)	46. Voices Echo Pad
15. Quality Fast (J)	47. Sweeping Echo Pop
16. Nastiest Goes (J)	48. Expressive Key
17. Suadenzim	49. Trafo Sweep Pad
18. Xylodump	50. Cinema Sound
19. Factory Sit (J)	51. Puffies Pop Chords
20. Grab Bass Cup	52. Velocity Swell Pad (J)
21. Deep Ambience	53. Crazy Variate
22. Large String Pad (J)	54. Techfast
23. Sick Horn	55. Strings Drone (J)
24. Harmonica	56. Fat Strings (J)
25. Complexity	57. Trafo Bells Loop
26. Mellow Many Purpose	58. Fancy Lead
27. Funny Bass (J)	59. Organic Drone (J)
28. Pin Foo	60. One Note Sing Drone
29. Old String Pad	61. Storming Echo Pad
30. Gorgle String Pad	62. Percussions Pad
31. Talking Pad	63. Sweeping Pulse Gap
32. Quality PM Pad	64. Beautiful Background

Bank: **Liqih 2**

Presets by Liqih

01. Chords	33. Attack Trumpet
02. Holalla	34. Standard Whawha
03. Get To Funky	35. Electroncello
04. Groovy Lead Bass	36. Groove Pad 1
05. Computer Gnacky	37. FX Pad
06. Glitch Lead	38. Large Sweep
07. Glitch Stereo	39. Multi Sweep
08. Mellow	40. Orchestra
09. Cpu Pad	41. Spread Pad
10. Electrobells	42. Chorus Chorus
11. Woddy Plucks	43. Best Move
12. Oberheim	44. Mega Move
13. Heavygroover SMC	45. Dynamic Whawah
14. Lovely Strings	46. Sweet Church
15. Footstompbass	47. Glitch Space
16. LightBass	48. Stokhausen Horns
17. ModBass	49. Glitch Bomber
18. Piano Harp	50. Glitch Drums
19. Glitch Paddie	51. Glitch Slow Walk
20. ResBass	52. Bass Move
21. Tremoliano	53. Coolest Noises
22. Attack Pad	54. Breath Guitar
23. Reso Dark Pad	55. Soloist / Didgerido
24. Snare ? Hu	56. Hammond 1
25. Hangar Drone	57. Hammond 2
26. Harmonics Drone	58. Hammond 3
27. Rhythmic Drone	59. Cosmo Sound
28. Simply Sound	60. Dance Chords
29. North Pole Sea	61. Vintage Pad
30. Scratch	62. Quaee Sweep
31. Phatbass	63. Complex Drops
32. Vocaler	64. Open Move

Bank: **Liqih 3**

Presets by Liqih

01. Am Scale	33. Fresh Trumpet
02. Feedback A	34. Too Pad
03. Feedback B	35. Electrolow
04. Vowels Soloist	36. Groove Pad 2
05. Rock	37. DA Fly
06. Double Playing	38. Strumgong
07. Feedback C	39. Talking Pad
08. Stereo Rhodes	40. Techno Booster
09. Feedback D	41. Modulatte Pad
10. Feedback E	42. Hop Dup
11. Toys Noise	43. Glitch Walk
12. Undamped Piano	44. Pluking
13. Camera Strings	45. Register Pedale
14. Wobaba	46. Teko Move
15. Drone Rumble	47. Glitch Space
16. Freedom Sight	48. Fearless Soundtrack
17. What Beast	49. Piano Epoca
18. Drums ! Pu	50. Glitch Drumone
19. Breath Fiddle	51. Strumcrap
20. One Key	52. Drumming Up
21. Classicus	53. Coldest Strings
22. Smooth Horns	54. Vintage Keyboard
23. Stereo Brass	55. Melting Tones
24. Snare ? Su	56. The Cool Bass
25. Salterium	57. Sympa Pad
26. Dark Space Pad	58. Sounding Planets
27. Glitch Drone	59. Fluttish Pad
28. HiHat ? ++	60. Blowed Chords
29. Space Creatures 1	61. Spring Drone
30. Space Creatures 2	62. Cheeua Sweep
31. Verybass	63. Best Long
32. Multi Sound	64. Vibrato Remembrance

Bank: **AnaMark V2**

Presets by Mark Henning

01. PhaserBass (J)	33. Dirty Brass
02. Complex Sine	34. Accordeon
03. BlubbBass (J)	35. Flute
04. ShapeMod Bass	36. Feedback Bass
05. Distorted Attack (J)	37. FM-Lead
06. Delay Saw	38. Pseudo-Saw
07. Power Key (JB)	39. Snare
08. Wide Feedback	40. Basedrum
09. Feedback String (J)	41. SynthClav
10. Synth Lead (J)	42. No Reception (J)
11. Flanger Pad (J)	43. Circular Saw
12. BellsBehindLead (J)	44. SynthTrumpet (J)
13. Organ 1	45. Organ in da room (J)
14. Hall Organ (J)	46. Lightsine's Bass
15. Picking EGuitar (J)	47. C64-Lead (J)
16. Spread Overdrive	48. Basedrum-Square
17. Delayed HiHat	49. C64-Lead 2
18. Pluck	50. Aliased Lead
19. Aua (J)	51. Floating Bass
20. Rythm Long Pad	52. Weird jumping Bass
21. BowBow	53. Crazy Rythm
22. LowAttack String (J)	54. RezzBass
23. SynthBrass	55. VeloPercOrgan
24. Claps 'n' Snare	56. Sharp Pad (J)
25. Claps 'n' Snare 2	57. ModOrgan (J)
26. LeadPluck	58. Complete Melody
27. Strong Overall (J)	59. Bad Pad (J)
28. Electric XFM (J)	60. PlugBass FM
29. Organ 2	61. Flanged EGuitar
30. Eternal Stereo Noise	62. FluteString (J)
31. Soft Accordeon	63. EPiano
32. Metallic Rev. Saw	64. Deep Electric Sine-Pad

Bank: **AnaMark V1**

Presets by Mark Henning

01. Basedrum	33. Quadro Sine
02. Deep Basedrum	34. Synth-Strings
03. High-Bass	35. Half Sine's Sweeper
04. Heavy Attack	36. Heavy Bumping Voice
05. Pseudo-Delay Bass	37. White Circle
06. Electric Bass	38. Step-Bass
07. Modulated Bass	39. Deep Snare n Noise
08. Crazy Bass	40. Analogue Soft-Base
09. Light Dirty Bass	41. Didn't overdrive
10. Electric Attack Bass	42. Beat Sweeping Pad
11. Quasi-Square Bass	43. Arp E-Bass
12. Syn Pad	44. DeArp. E-Bass
13. Rezz Voice	45. Disharmonic Bells
14. Quint Pad Or Sitar	46. Jumpy Symmetry
15. Eastern Lead	47. Rezz Up and down
16. Bass'n'Base	48. RoomBass
17. Extreme Overdrive	49. Little Shot
18. Drive-Bass	50. Smells like Reed spi
19. Short Bass	51. Simple SAW-Bass
20. Deep Pad Or Horn	52. Strange Rythm
21. Deep Snare	53. Elite Squad
22. Sweep Snare	54. Squad Lead
23. E-Bass	55. E-Guitar (Lead)
24. Light Chorus Bass	56. Arp E-Guitar (Lead)
25. C64 Square-Sound	57. C64-like BassnBase
26. C64 Bass	58. Once Quirly
27. Paddy Square Bass	59. Distortion Guitar
28. Hidden Seven	60. 7th Flute of a 7th
29. Two Sines Bass	61. Accordeon
30. Boom-Bass-Tic	62. Cloud No. 7
31. Distorted Pluck-Bass	63. SweepBass
32. Octa-Twins	64. SnareClaps