

The Vanguard Manual

polyphonic analog-modelled VSTi synthesizer
with arpeggiator and effect section.



a reFX software synthesizer

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1 Introduction

Thanks for trying or buying reFX's VANGUARD.

VANGUARD is polyphonic analog-modelled synthesizer with arpeggiator and effect section. Many years ago synthesizers were built using analog components for creating oscillators, envelopes and filters. These synthesizers revolutionized the music instrument market: it was possible to play synthesized sounds on a classic piano keyboard.

Synthesizers also invented new electronic music styles and they added new elements to classic styles (e.g. rock music), but there were a couple of problems with these machines: too less voices, tuning problems, no midi functionality and they were technically problematic.

VANGUARD combines the good old analog synthesizer idea with the latest technology: all analog devices of classic synthesizers are emulated by high-quality DSP (digital signal processing) functions. reFX spent a lot of time programming the synthesis functions as good as possible: the result is a warm and rich sounding synthesizer plugin with all the benefits of today's digital technology.

VANGUARD is more than a simple synthesizer: included are 31 different oscillators, 3 low frequency oscillators (LFOs), 13 filter types and a variation of effects like trancegate, delay, reverb and a built-in arpeggiator.

Main features:

- Advanced analog-modelling synthesis with 3 oscillators and up to 32 voices
- 31 different oscillators
- 3 low frequency oscillators
- 13 different filter types with resonance
- 2 ADSR envelopes
- Amplifier section with drive
- 16 step trancegate
- built-in delay with four different types
- built-in reverb
- Temporal effect parameters are tempo-sync'd to the VSTi host

VANGUARD demo version

For those of you using the VANGUARD demo version, please note the following:

- The demo version works for fifteen minutes. After this you'll have to restart your VSTi host to be able to use VANGUARD again.
- The demo version will pause the audio output every 30 seconds after 5 minutes.

The full version of VANGUARD can be ordered from: www.reFX.net

VANGUARD & VANGUARD LITE

VANGUARD and VANGUARD LITE use exact the same synthesis functions. VANGUARD LITE misses the FX-units (TranceGate, Delay & Reverb) and the MIDI-processors (Arpeggiator, Glide and Pitch). All other features (new oscillators, new filters etc.) are identical in both versions.

2 Installation

Minimum PC system requirements

- Pentium III @ 600MHz or better (and equivalents)
- Minimum 128Mb RAM
- Hard disk requirement: 6Mb
- Operating System: Windows 98/98SE/ME/2000/XP
- Graphics (minimum): 16-bit 800x600
- Host: Any that supports the VSTi interface (e.g. Cubase SX, Chainer, etc.)

Installing VANGUARD on a PC

To install VANGUARD on your PC, do the following:

1. Extract the contents of the supplied zip file
2. Start the installation tool "Vanguard Setup.exe" and follow the instructions on the screen.
3. Load your host software and load the VANGUARD VSTi
4. Make some noise. Enjoy.

Minimum Mac system requirements

- Mac G3 600 or better
- Minimum 128Mb RAM
- Hard disk requirement: 6Mb
- Operating System: Mac OS9.x, Mac OS X version 10.2 or later
- Graphics (minimum): 16-bit 800x600
- Host: must support the VSTi interface (e.g. Cubase SX)

Installing VANGUARD on a Mac

To install VANGUARD on your Mac, do the following:

1. Extract the contents of the supplied sit file
2. Mac OS9: copy the plug-ins into the hosts vstplugins folder
3. Mac OSX: mount the supplied DMG file, start the installation tool "Vanguard Setip.pgk" and follow the instructions on the screen.
4. Load your host software and load the VANGUARD VSTi
5. Make some noise. Enjoy.

3 Quickstart

This section contains a step-by-step guide how to load the VANGUARD plugin in to your your host application and how to get sound out of it. We will describe how to insert VANGUARD to a Cubase and Logic project – if you are using any other host software please read the documentation provided with your host software.

Please make sure that VANGUARD is installed properly and launch your host application. We will show you VANGUARDs basic operations with the most common sequencers.

Using VANGUARD with Steinberg Cubase SX/Nuendo

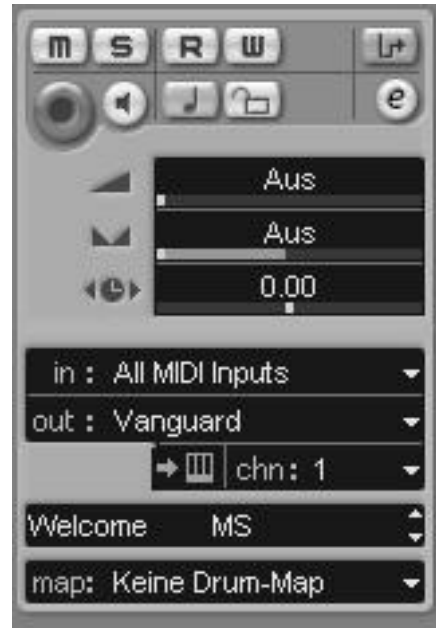
Cubase and Nuendo are working with instrument slots, please open your “VSTi Rack” from the devices menu and klick on an empty slot. A list with your installed instruments appears, now choose VANGUARD and it will be loaded.



Not it's time to create a new midi track and route the output of this track to VANGUARDs midi input.

If you have a proper configured system you should be able to hear sound coming out of your new plugin by playing on your midi keyboard.

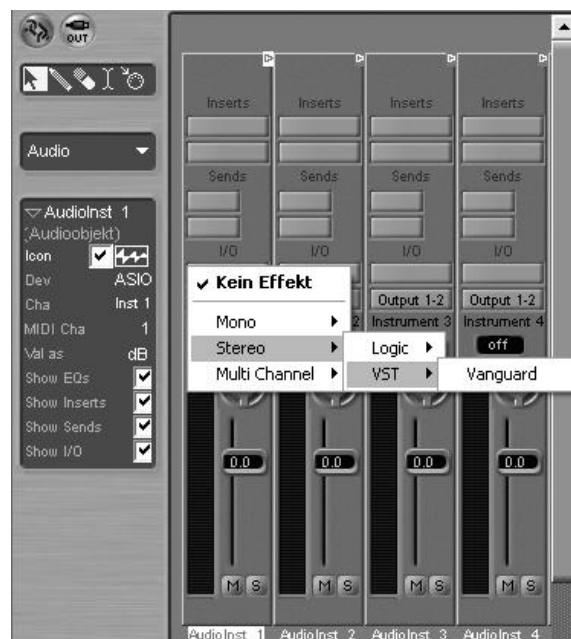
To select the next the preset simply click on the "ArrowUp" icon, if you liked the previous preset more use the "ArrowDown" button. To open the whole list with all presets click on the preset name and the list will be opened.



Using VANGUARD with emagic Logic

Create a new song and doubleclick on one of the "AudioInst" tracks, Logics mixer will appear. Now move the mouse pointer to the first grey field above the AudioInst channels meter and press and hold it.

You will see a list with your installed plugins, select "Stereo->VST" and "VANGUARD". Select the midi track in Logic's arrange window and start playing on your midi keyboard.



To step to the next preset click on the arrow down followed by "Next Setting" and go back with "Previous Setting". If you want to display the list of all sounds, press the left mouse button on the "PROG: 01" field.

General information

VANGUARD is a single timbral instrument and it receives on every midi channel, so there is no need to set a specific channel – VANGUARD will receive midi in any case.

VANGUARD comes with 128 high quality and ready-to-go presets, so it might be a good idea to step through the factory bank and hear what VANGUARD has to offer.

Saving presets and banks

Presets are loaded and saved using the mechanism provided by your host software. If you are unfamiliar with this procedure, then you will have to consult the documentation provided with your host software. Banks of 128 patches can be saved and loaded, as well as individual patches (or instruments as VST refers to them). VANGUARD always loads with its internal default bank of patches.

To create a new bank, simply edit the patches in VANGUARD then save the bank. Individual patches are saved from and loading into the active patch slot.

Special features

VANGUARD can be automated using MIDI Controllers, you will find a list of supported controllers and their modulation targets at the end of this document.

VANGUARD can also be automated using the automation functionality from your sequencer, please read the manual refer to your host sequencers manual to learn more about automation.

4 Reference

Basic Functions

After VANGUARD is loaded you will see the plugin with the editor disabled, it looks like a classic 19" rack synthesizer.



You'll find the basic functions on this panel.

1. Master Volume

Sets the main volume of the instrument.

2. MIDI Indicator

The MIDI Indicator lights up, when VANGUARD receives incoming MIDI messages.

3. Soundname

This is the name of the sound that is currently loaded. If you click on the soundname a list of all 128 loaded patches will appear for direct selection.

4. Sound Information Line

Displays which components of VANGUARD are used (from left to right):



- osc0/1/2/3: the number of oscillators used by the sound
- filter type: e.g. "lp 12" for low pass 12 db
- trg: Trancegate
- dly: Delay
- rev: Reverb
- arp: Arpeggiator
- gld: Glide

If you move the mouse pointer over other control elements the information line will turn into a status line where you can set the value of the actual parameter.

5. Next Preset/Previous Preset

Use these two buttons to select the next or previous preset.

6. Preset/Bank Load & Save

To load and save your soundbanks or single presets, use these four buttons.

7. FX Bypass Switch

Toggles the effects bypass globally on and off (delay and reverb).

8. Arpeggiator Bypass Switch

The "arp" switch can be used to bypass the arpeggiator for all presets.

9. Edit Page

Switch the edit page on and off. If the edit is on you'll see the full VANGUARD user interface:



10. Setup Page

If you press on the "setup" knob the backside of VANGUARD will appear:



Signal Flow

The synthesis of VANGUARD is separated into different sections.

The sound is produced by the oscillators. VANGUARD offers more than the typical analog style saw-pulse-sine waveforms: it also comes with a couple of variations and noise oscillators.

The filter has 13 types, including low-pass, high-band pass with different slopes.

Three LFOs (low frequency oscillators) can be used to modulate the pitch and pulsewidth of the corresponding oscillator or the filter cutoff frequency.

Two envelopes control the oscillators and the filter before the signal ends up in the amplifier.

After the sound is generated effects can be added: The trancegate creates rhythmic sounds and a delay and reverb can be added.

In addition to the synthesis and audio functions VANGUARD has a built arpeggiator with several patterns and playing modes.

OSC - The Oscillators

As mentioned above VANGUARD has up to three oscillators per voice. You'll find the oscillator section on the top left:



Each of the three oscillators has its own volume and semitone tuning knobs. "vol" controls the volume and "semi" sets the tuning in semitones: the "semi" setting has a range from -36 to +36 semitones (-/+3 octaves).

To select the waveform for each oscillator click on the green wave field and a list will appear.



Selecting the first waveform “---” switches off the oscillator, the 31 available waveforms are:

Name	Description
square	Square waveform, pulsewidth 50%
square2	Square waveform, PW 67% and 33%
sawtooth	Sawtooth waveform
peak	Square with minimal PW of 1%
peak pwm	Same as peak, but PW can be modulated
combed sqr	A combed Square Waveform, version 1
combed sqr2	A combed Square Waveform, version 2
combed sqr3	A combed Square Waveform, version 3
saw i/o	Two serial waveforms: Saw & Sine
sine	Classic Sine waveform
pulse pwm	Pulse waveform, pwm can be modulated
pulse dbl pwm	Two Pulse waveforms, modulateable
pulse tpl pwm	Three Pulse waveforms, modulateable
bi-pulse	Two pulse waveforms, one PWM is static
fm pulse	Square, pulsewidth modulates the pitch
pwm saw	Sawtooth with pulsewidth modulation
bi-saw	2 serial Saw waveforms, one pw is static
syncd saw	Saw, pwm defines the re-sync of the osc
ajx saw	Classic Saw oscillator version 1
ajx saw2	Classic Saw oscillator version 2
ajx saw3	Classic Saw oscillator version 3
tri/saw morph	Triangle/saw morph, modulated by PWM
sin/peak morph	Sine/Peak morph, modulated by PWM
sine fm	Sine, pulsewidth modulates the pitch
sine am	Sine, pulsewidth modulates the amplitude
r2d2	Random pitched waveform
digital	PWM morphed digital sounding Sawtooth
syncd noise	PWM synced noise
c64 noise	Pitchable noise oscillator
hi-pass noise	Hi-Pass filtered noise
White noise	White noise

Above the three oscillators is the “retrig” switch. If “retrig” is switched on, the oscillators will restart when a new note is played – otherwise they are free running, it means the phase will not be resetted.

The “fat” knob sets the detune level of the oscillators. When “fat” is set to 0 the oscillators will always be in tune. All other values than 0

will force the oscillators to have separate detuned outputs on the left and right channel: the higher the "fat" setting is, the more detuned it is. Using moderate values will make your patches "phatter" and more analog sounding.

LFO - The Low Frequency Oscillators

Next to the oscillator section you can find the LFOs.

VANGUARD has three independent triangle oscillators. Select the LFO you want by edit with the "1", "2" or "3" switch.



Please note that the LFOs are hard wired to the corresponding oscillator: LFO 1 can only modulate the pitch and pulsewidth of the first oscillator, LFO 2 is for oscillator 2 and LFO 3 handles –of course– for oscillator 3. All three LFOs can modulate the cutoff frequency of the filter.

"speed" sets the speed of the LFO which is a value between 0 and 60 hertz.

"detune" modulates the pitch of the corresponding oscillator. Negative values will slow down the pitch, positive will speed them up.

"pwm" is responsible for the pulsewidth. According to the "detune" parameter it affects the pulsewidth negative or positive.

"cutoff" modulates the cutoff frequency of the filter.

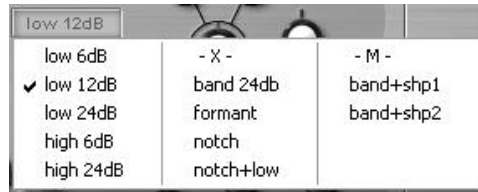
According to the "retrig" switch of the three oscillators the LFOs will restart when a new note is played if it is switched on.

FILTER – The Multimode Filter Section

VANGUARD is equipped with 13 different filter types including standard low pass and high pass variations and a selection of several notch- and band pass filters.



To select a filtertype just click on the green type field and the list of filters will appear.



Filter Table

Name	Type	Description
low 6db	Low Pass 6db	Classic low pass filter with 6db/octave slope
low 12db	Low Pass 12db	Classic low pass filter with 6db/octave slope
low 24db	Low Pass 24db	Classic low pass filter with 6db/octave slope
high 6db	High Pass 6db	High pass filter with 6db/octave slope
high 24db	High Pass 24db	High pass filter with 24db/octave slope
- X -	Band Pass X	A steep dual bandpass filter version 1
band 24db	Band Pass 24db	Band pass filter with 24db/octave slope
formant	Formant Filter	Formant filter for reproducing resonance peaks
notch	Notch filter	A standard notch filter
notch+low	Notch+Low Pass	A combined notch and low pass filter
- M -	Band Pass M	A steep dual bandpass filter version 2
band+shp1	Band + Shp 1	Wave shaping band pass filter version 1 (soft)
band+shp2	Band + Shp 2	Wave shaping band pass filter version 2 (hard)

The "cutoff" knob sets the cutoff frequency of the filter. The cutoff frequency can be anything between 0 and 22.050 hertz. When the filter mode is set to "low 12db" and cutoff = 10kHz everything beyond 10kHz will pass the filter without any changes – all frequencies above 10kHz will be filtered with a 12db per octave steep slope.

The cutoff frequency can be assigned to the notes and/or velocity, the "keytrk" and "veltrk" knobs can be used to set the depth of the relation. Every value greater than 0% will increase the cutoff frequency, every value lower will decrease it. A positive "keytrk" setting will force the filter to follow the notes you are playing: the higher the notes are, the higher is the cutoff frequency.

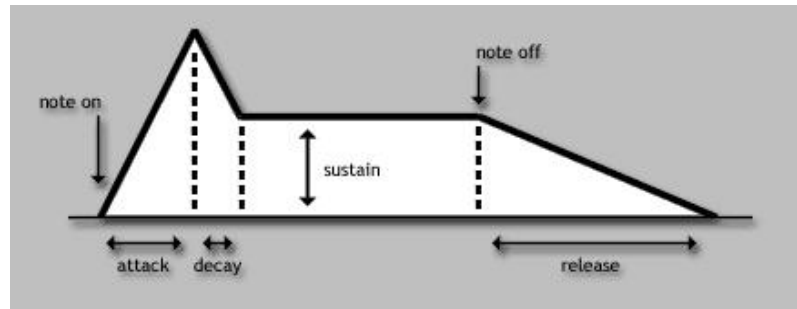
According to the “keytrk” parameter works the “veltrk” function: The greater the velocity the lower is the cutoff frequency when “veltrk” is set to a negative value.

“reso” is the resonance where the frequencies at the cutoff position are boosted. With lower resonance values the cutoff frequencies are attenuated, with higher resonances the filter will start to oscillate and “howl” – it will sound like tuned feedback.

ENV - The Envelopes

VANGUARD offers two envelopes, marked with the numbers "1" and "2". Both envelopes use the classic ADSR pattern using linear segments.

Description of the envelope



The ADSR envelope consists out of four segments: attack, decay, sustain, release.

When a new note is played the envelope starts at zero and it takes the attack time to get to the maximum level. After that the decay-phase starts and the level will descend for the decay time. Sustain will not change the level – it lasts for the sustain time until the note is released. When the note is released the release phase will start and it takes the release time until the level reaches zero.

Envelopes are mainly used to modulate the volume of the oscillators and the filter cutoff frequency – VANGUARD offers you also the option to use the envelopes on pulsewidth, detune, resonance and pitch.

Each envelope can modulate up to four targets simultaneously.

Envelopes and their modulation targets

Envelope 1	Modulation Target	Value Range
level	Oscillator Volume	-127..+127
pwm	Oscillator Pulsewidth	-127..+127
cutoff	Filter Cutoff Frequency	-127..+127
detune	Oscillator Detune	-100..+100 cent

Envelope 2	Modulation Target	Value Range
reso	Filter Resonance	-127..+127
pwm	Oscillator Pulsewidth	-127..+127
cutoff	Filter Cutoff Frequency	-127..+127
pitch	Oscillator Pitch	-48..+48 semitones

Negative levels will invert the envelope, that means for example a negative cutoff value in the envelope will reduce the cutoff frequency with the defined envelope.

Please remember that low values for attack and release can cause clicks and pops. This also happens with real analog synthesizers – sometimes fast envelopes are too fast and all you can do to prevent crackles is increasing the attack and/or release time.

AMP – The Amplifier

After the audio signal is synthesized, modulated and filtered it ends in the amplifier section.

“drive” adds high gain – the higher the drive, the more distorted the signal will be. “drive” emulates a guitar-overdrive effect. The output will be very aggressive and loud, but it will also lose its brilliance, better use it carefully!



Next to drive is the “volume” knob – please remind that the “master volume” setting on the upper panel is scaled with the volume. Set both volumes to 127 for the highest output.

“veltrk” is velocity tracking. Set “veltrk” to 0 if you don’t want the velocity to control the output volume – all notes will be played at the same volume, independently of the velocity. Positive values will make the amp louder the higher the velocity is – negative values will make it more quietly the higher the velocity is.

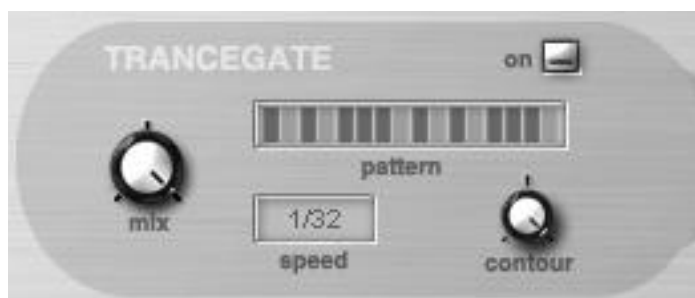
“pan” sets the panorama position of the output signal. According to the knob it can be set smoothly from hard left to center and to hard right.

“spread” adds auto panning to the signal. Auto panning is off when spread is set to 0 – the higher the value the wider the signal will be spread from left to right.

TRANCEGATE – An automated and synchronized Gate

The trancegate offers an easy solution for creating typical trance rhythmic sounds.

VANGUARDS' trancegate is based on a 16-step on/off pattern. Use your mouse to switch the 16 segments on or off.



"mix" sets the depth of the gate: lower values will moderate affect the amplitude of the signal – the higher the value is the more the sound is gated. The maximum setting of 127 will force the trancegate to act as a classic on/off gate.

Trancegate is a tempo synchronized effect, the speed connected to your song tempo. Click on the "speed" field to set the trancegate tempo. One segment represents 1/1, , 1/8, 1/16, 1/32 or 1/64 note duration. Triolic and punctuated values are also possible: "T" stands for trilolic and "D" for punctuated note lengths.

If there are two or more segments next to each other they are handled as one – e.g. a trancegate 1/16 speed and a row of four segments the gate will open for a note duration.

"contour" is the last parameter and it defines how fast (or slow...) the gate opens and closes. Higher values will open the gate faster.

The trancegate can be switched on or off using the "on" button on the top right.

Delay & Reverb Effects

After the signal passed the amplifier and trancegate a delay and reverb can be added. Both effect blocks are routed in series, the signal flows first into the the delay and than into the reverb.

Delay – Adding Echos

The delay emulates a classic band-echo, but easier to control and –of course- without a tape.

“mix” sets the output volume of the delay – the higher, the louder.



VANGUARDs delay offers four different delay types: mono, stereo, cross and widen. “mono” adds a simple monophonic delay line to the signal, “stereo” adds two delay lines, fed by main stereo output signal. “cross” is a variation of the “stereo” delay, the difference is that the feedback of the left channels will be send into the right channel and vice versa. “Widen” will only delay the input from the right channel – the left channel will not be delayed. “widen” can be used to create deep and wide sounding delays. To select the desired delay type just click on the “type” box and a list will appear.

The delay is automatically tempo synchronized and it uses the same settings as the trancegate. Click on the “speed” field to set the delay tempo, which can be 1/1, , , 1/8, 1/16, 1/32 or 1/64 note duration. Triolic and punctuated values are also possible: “T” stands for trilolic and “D” for punctuated note lengths. If the delay is in “widen” mode a list of delays in milliseconds will automatically appear, because it makes no sense to link the “widen” delay with the song tempo.

“feedback” determines the amount of a delayed signal to be sent back to the input.

“damp” damps the signal, it cut offs higher frequencies and it works like a low-pass filter. A value of 0 will not change the delayed signal – the higher the value the more high frequencies will be cut off.

With the “on” button on the top right you can swith the delay on or off.

Reverb – Room Simulation

The Reverb simulates reflections from surrounding walls or objects, it is a room simulator. With a reverb your sounds will be more natural, deeper and wider – but be careful: adding too much reverb or too big room sizes can end up in a muddy signal.

“mix” sets the output volume of the reverb – the higher, the louder.

“The predelay is the time between the reception of the signal and of the reverb feedback by the listener. Use high predelay values if you want to simulate a great distance between a wall and the listener for example. Lower values will simulate small rooms.



“room size” defines the actual size of the room.

“damp” damps the signal, it cut offs higher frequencies and it works like a low-pass filter. A value of 0 will not change the delayed signal – the higher the value the more high frequencies will be cut off (same as “damp” in the delay section).

“width” is responsible for the stereo width. The reverb is feeded with a mono input, the stereo input will automatically converted to mono. The output of the reverb is stereo and the “width” parameter will define more spatially rooms.

The “on” button enables or disables the reverb.

ARP – The Arpeggiator

What is it? Basically it takes the notes from a chord (or any other combination of keys) and splits them into single notes to form patterns. An arpeggiator gives you fresh inspiration: switch it on, press some keys on your keyboard and listen to the melody.

VANGUARDs' arpeggiator has five different play modes: "up" plays the patterns ascending and "down" descending. "alter" plays alternating ascending and descending notes and "ordered" recognizes the order of the incoming midi notes and plays the notes in the given order. "random" plays random sequences. To select the arpeggiator mode just click on the green "mode" box.



The arpeggiator is –of course– tempo synchronized. Click on the "speed" field to set the tempo, which can be 1/1, , 1/8, 1/16, 1/32 or 1/64 note duration. Triolic and punctuated values are also possible: "T" is for triolic and "D" for punctuated note lengths.

With "gate" you can adjust the note lengths. If the speed is set to 1/8 and the gate to 1/16 the arpeggiator will play 1/16 note followed by 1/16 pause.

"octaves" defines over how many octaves the notes are spread.

If "retrig" is switched on, the arpeggiator will restart the pattern when a new note is played – otherwise the current pattern continues.

The "on" button switches the arpeggiator on or off.

GLIDE – Fading Between Two Notes

With glide enabled VANGUARD switches to monophonic mode, so only one note can be played at a time. If you press a second key before releasing the first, VANGUARD will automatically glide from the 'old' to the 'new' note.

The glide speed is tempo synchronized. Click on the "speed" field to set the glide speed, which can be 1/1, , 1/8, 1/16, 1/32 or 1/64 note duration. Triolic and punctuated values are also possible: again, "T" stands for triolic and "D" for punctuated note lengths. If you set the glide time to "instant" the new note is played immediately without any gliding.

The “on” button enables or disables the glide function.

PITCH – Bending & Vibrato

“pb range” sets the pitchbend range. The pitchbend range can be between 1 and 24 semitones, that means a setting of 12 e.g. will bend one octave up. With a value of 0 the pitch bend wheel will be ignored.

Aftertouch controls the vibrato. “vib speed” defines the speed and “vib depth” the depth of the vibrato, the higher the value the more pitch modulation is applied. A vibrato depth of 100% represents one semitone. Please remember that the vibrato is hardwired to the aftertouch midi controller.

VOICES – Setting Limitations

“voices” defines the maximum number of notes that can be played simultaneously. Please bear in mind that a higher number of voices causes higher cpu consumption – too less voices will save cpu power but in some situations playing notes might be cut off. VANGUARD can handle from 1 to 32 voices per instance – 16 voices is the default setting for most patches. The “voices” setting is stored for every patch.

The Setup Page

If you click on the “setup” button VANGUARD will flip to the backside and you’ll see the credits for this product and your personal serial number.

The backside is not only a graphical gimmick: it also contains functionality! VANGUARD offers a lot of tempo synchronized effects and it receives the song tempo automatically from your sequencer, but –if you like- you can set your own tempo based on bpm (beats-per-minute) independently from your host software. Some sequencers may not transmit the correct tempo so this function can be useful to set it manually.

5 Appendix

MIDI Control

Appendix A – MIDI Implementation Chart

VANGUARD supports the following midi messages:

Function		Txd	Rxd	Remarks
Basic Channel	Default:	x	1-16	Messages are always received on all channels
	Change:	x	1-16	
Mode	Default	x	Mode 1	OMNI Mode is always on
	Messages	x	x	
Note number	Sound range	x	0-127	
Velocity	Note On:	x	o	
	Note Off:	x	x	
Aftertouch	Keys:	x	x	
	Channels:	x	o	
Pitchbend		x	o	
Control Change		o	o	
Program Change	Actual No.	x	o	
System Exclusive		x	x	
System Common	Song Pos:	x	x	
	Song Sel:	x	x	
	Tune:	x	x	
System Real Time	Clock:	x	x	
	Commands:	x	x	
Aux Messages	Local On/Off:	x	x	
	All Notes Off:	x	o	
	Act. Sensing:	x	x	
	Reset:	x	x	

Txd: Transmits MIDI message

Rxd: Receives MIDI message

o = implemented

x = not supported

Appendix B – MIDI Continuous Controller Support

In addition to the messages specified in the MIDI Implementation Chart, the following MIDI Continuous Controller (MIDI CC) messages are recognised and affect their associated parameters. By sending MIDI CC messages you can change these parameters at any time from your VSTi host.

VANGUARD supports the following midi controller messages:

CC	Parameter	Notes
1	Modwheel	Adds to cutoff frequency
7	Volume	
8	AMP Spread	
10	AMP Pan	
11	Expression	
21	Trancegate Contour	
22	Vibrato Speed	
23	Vibrato Depth	
71	Filter Resonance	
74	Filter Cutoff Frequency	

Appendix C – VANGUARD Credits

Created and programmed by Michael Kleps & Markus Feil.

Manual written and produced by Mathias Reichert.

Front graphics by Shaun Ellwood.
www.decoderdesign.com

Vengeance Factory soundbank created by Manuel Schleis.
www.vengeance-sound.de

DHS Signature soundbank created by Carlos Demichelis.
www.soundwavers.com

MF Artificial Pleasures soundbank created by Markus Feil.

Appendix D – Support Info

We have tried to keep VANGUARD as bug-free as possible, but you never can be 100% certain things work as they should in the world of software. So, if you encounter any problems, or you have suggestions for future revisions, don't hesitate to contact our technical support at:

support@refx.net

Or come and visit us at:

www.refx.net

Thank you.