

NuBiLE & SpinnerLE Manual

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1 Overview

The NuBiLE-SpinnerLE kit contains NubiLE VSTi, SpinnerLE VST for Cubase VST and compatible systems.

website: www.nubi3.com

1.1 Installation

Host software

To use NuBiLE and SpinnerLE you need a VST 2.0 compatible host-software.

Since NuBiLE and SpinnerLE are plugins, these need to be installed in such a manner that the host-application can find and use it. Normally this is done by installing NuBiLE and SpinnerLE into a specific folder, for example "VstPlugins\nubi".

Installation

Put NUBILE.DLL, NUBILE.TCV, SpinnerLE.dll and NuBiSpnrLE.chm in your VSTi Plugins folder - no other files are required.

None of the DLLs access the registry in any way - your host may however.

NUBILE.TCV contains configuration values to fine-tune the behaviour of NUBILE - Additional documentation will be provided as features are added.

There is no copy protection of any kind

Usage

After installation you should be able to select NuBiLE as an instrument, and SpinnerLE as an effect, in your host-software.

Please refer to the documentation of the host-software to get general information about using VST instruments.

Uninstallation

To uninstall NuBiLE and SpinnerLE, simply delete the NUBILE.DLL, NUBILE.TCV, SpinnerLE and NuBiSpnrLE.chm files.

No other files are installed.

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2 Background

Quite a while ago I read a thread started by "GreenDoor2" on Cubase.net. It was his opinion that there was no VSTi emulation of a Hammond Organ that actually captured the real power of the instrument.

After some disbelief and then some serious reflection I realized he was right. In short, the tone wheels on a hardware Hammond are locked in absolute synchronization - while this is not impossible to do in a VSTi; it does potentially require a lot of CPU power to manage over 100 active synchronous tone wheels.

Some years ago I set out to do a Drawbar organ VSTi and, after a few tries, I gave up - something was missing. That "something" was the very thing that Greendoor2 had identified. I set out again and the result is NuBi. At first NuBi was simply a proof of concept. A very simple one manual "toy". As time passed and more beta testers signed on, NuBi grew into a more-or-less real tonewheel organ.

Since then the project has gone through several ups and downs. Currently the project is in "full speed ahead" mode - there's much more in store in the coming months !!

Some bad news? ...

I need to spell out an important distinction that I have made in the design of NuBi. I love the way old Hammond Organs sound but my goal was not to emulate/capture this sound completely. Instead, I wanted to start with a set of known design features of the instrument (basically: drawbars, synchronous tone wheels and a percussion harmonic) and pay homage to that sound/feature set by using it as a departure point for a "New B". The final goal being a new instrument that starts where the hardware version left off.

2.1 About the Author

My name is PJ Geerlings - (my full name is Pete Jay - but it got shortened to pj for a variety of reasons) I work for Western Digital Corporation. I started there over 15 years ago but at some point was sold to Adaptec (along with 100 other people) then got laid off and went to work for QLogic - a year later I left there to work as a consultant for WDC for about two years and then was hired back full time. Full Circle. Life is really funny sometimes.

peace, - pj

3 Credits & Legal stuff

All information in this help is given at my best knowledge. I cannot guarantee that this program is working on every system under every condition. If you encounter a problem, please contact me via this email address: dev@nubi3.com.

Features & specifications subject to change without notice

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Acknowledgements:

All graphical interface design was done by Berend Vervelde - a phenomenal artist. You can visit his website at <http://home.tiscali.nl/vervelde>.

The NuBi3 website was designed by KVR member "pough" who has been very supportive of the NuBi development effort since the beginning. You can visit his personal website at www.joshgemmell.com.

I also owe a great debt to KVR member "asseca" who has spent a great deal of time to help promote the NuBi line of software. He has been invaluable in several important facets of the development as well. You can visit his website at www.asseca.com.

And finally I cannot begin to thank the many wonderful supporters of NuBi throughout the last 5 years. I feel so blessed to live in these exciting times.

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4 NuBiLE - Virtual Drawbar Organ



NuBiLE is a virtual drawbar organ for Cubase VST and compatible systems.

Current Status: **NuBiLE v1.1.0**, 11 Mar 2006.

4.1 Features

- A Drawbar Organ clone with pure-virtual tonewheels
- Beautiful GUI by kvr member amoebe
- 73-note range (standard 61 pitches + added low octave + 2 extra high notes)
- 9 "standard" drawbars
- 3 scale modes - includes legacy gear tuning
- 2 independant percussion voices with 4 mode algorithms
- Advanced algorithm, adjustable Key Click level on Attack and Release
- Fully configurable vibrato/chorus
- Zipper-less expression pedal support via MIDI CC# 11
- Very low CPU usage
- No Leslie sim - use your favorite (or use Spinner/SpinnerLE)
- PC-based VST hosts only

5 NuBiLE - Parameter Overview

5.1 The 9 Drawbars

The drawbars have 24 steps, instead of the usual 8 steps. This results in a more versatile control of the sine-wave mixture. Tone wheel leakage can be emulated by mixing low amounts of the higher harmonics. (H5,H6,H8)

NuBiLE outputs pure sine waves, instead of trying to emulate "dirty" mechanical tone wheels...

See the [Drawbar Details section](#) for more info...

- S1** - Octave below root note (16')
- S3** - Fifth above root note (5 1/3')
- H1** - Root note (8')
- H2** - Octave above root note (4')
- H3** - Fifth above 4' (2 2/3')
- H4** - 2 Octaves above root note (2')
- H5** - Third above 2' (1 3/5')
- H6** - Fifth above 2' (1 1/3')
- H8** - 3 Octaves above root note (1')

5.2 Vibrato

- On** - switches the Vibrato On/Off
- Mix** - sets the dry/wet Mix, *adjustable from 0 to 100 %*
at the 0% dry level there is no vibrato output,
at 100% wet only the pure Vibrato effect will be output,
the Mix-value from 1% to 99%, in combination with the Delay value, will result in the interesting Chorus effect...
- Speed** - sets the Vibrato Speed, *adjustable from 0.45 to 7.88 Hz*
- Depth** - sets the Vibrato Depth, *adjustable from 0 to 100 %*
- Delay** - sets Vibrato Delay, *adjustable from 3 to 27 mSecs*

5.3 Percussion

- On** - switches the Percussion On/Off
- voice 1**
- Level** - sets the output percussion volume, *adjustable from 0 to 62*
when at minimum, this percussion voice is Off
- Decay** - sets the time for percussion signal to decay to -40dB, *adjustable from 0.6 to 6 Secs*

- Harmonic selector** - radio buttons to select the harmonic to use for this Percussion voice
- voice 2**
- Level** - sets the output percussion volume, *adjustable from 0 to 62* when at minimum, the feature is off
- Decay** - sets the time for percussion signal to decay to -40dB, *adjustable from 0.6 to 6 Secs*
- Harmonic selector** - radio buttons to select the harmonic to use for this Percussion voice
- Mode Selector** - see the Percussion Details section for more info...

5.4 Click

- On** - switches the Click feature On/Off
- Attack** - sets the level of the click at the attack of the note, *adjustable from 0 to 62*
- Release** - sets the level of the click at the release of the note, *adjustable from 0 to 62*

Global Click Parameters

- Atk/Rel** - sets the Attack/Release time, ALWAYS enabled, *adjustable from 0.75 to 14 mSecs*
- Freq** - sets the "Carrier" frequency of Noise source, *adjustable from 60 to 640 Hz*
- Aux** - sets the Carrier FM Modulator level, *adjustable from 0.00 to 1.00*

5.5 Other Global Parameters

- highfreq** - sets Drawbar High Frequency Trim, *adjustable from 0.33 to 1.22*
- Tune** - sets the Tuning, *adjustable from -62 to 0 to 62 cents*
- FoldBack frequency** - see details section, *values: 6, 10, 12, 20 kHz*
- Scale Select** -
 - Equal Temper** - Pure 12-tone Equal
 - Gears** - Hammond Legacy gear ratios - a version of the gear-based tuning
 - Stretch** - "TruStretch" - a stretch tuning which yields *perfect* 3rd harmonics

6 NuBiLE - Details

6.1 The Drawbars

	NuBiLE 24 Step	H/W coil turns		NuBi 8 step
0	-inf	0	-inf	-inf
1	-35.88			
2	-33.66			
3	-31.50	1	-31.8	-31.5
4	-29.40			
5	-27.36			
6	-25.38	2	-25.8	-25.5
7	-23.46			
8	-21.60			
9	-19.80	4	-19.8	-20.0
10	-18.06			
11	-16.38			
12	-14.76	7	-14.9	-15.0
13	-13.20			
14	-11.70			
15	-10.26	12	-10.2	-10.5
16	-8.88			
17	-7.56			
18	-6.30	18	-6.7	-6.5
19	-5.10			
20	-3.96			
21	-2.88	27	-3.2	-3.0
22	-1.86			
23	-0.90			
24	-0.00	39	-0.0	-0.0

The original designers of the Hammond Organ were constrained to a very small number of drawbar steps - the steps that were chosen were dictated by the available taps from a transformer which produced the attenuations given above.

Note that there are steps in NuBiLE attenuation profile that track the original design to better than 0.5 dB. Since there is no longer a constraint on the number of steps, NuBiLE uses three times the original number. This allows for special effects such as tone wheel leakage if desired.

6.2 Percussion

There is probably no one perfect implementation of a percussion algorithm; the four modes provided here are an attempt to cover as much ground as possible.

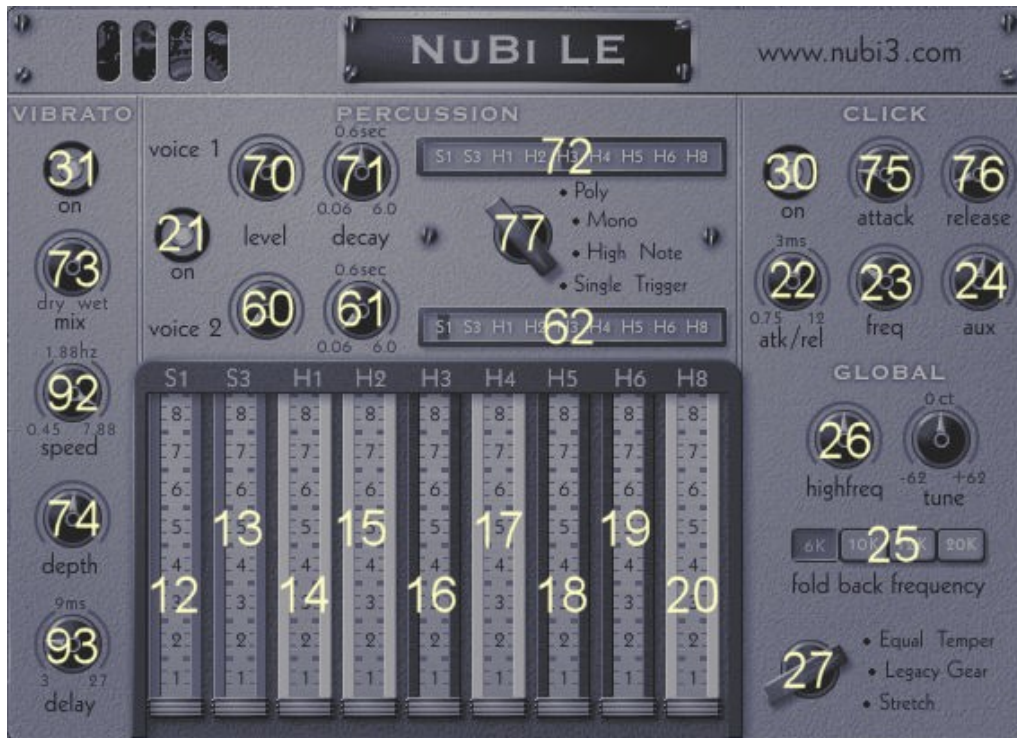
Perc Mode Sets mode for both percussion channels

- **Poly** - the percussion is fully polyphonic; every note gets a percussion event at the moment the note is first played
- **Mono** - only the 1st note of each chord cluster is "percussed"; subsequent notes played while the 1st note is held down will *not* be percussed
- **HiNote** - the highest note played will always create a percussion event, even if other notes are still held down
- **STrgr** - Single Trigger - only the 1st notes played of a chord cluster are percussed; this is "Hammond standard" - the trigger window is set nominally to 65ms

6.3 Fold Back Frequency

Foldback notes were used by the original designers of the tonewheel system to limit the actual number of tonewheels used to build the organ; a number of the highest pitches were "folded back" an octave or two to effectively "reuse" the generator for an alternate (higher) pitch - the frequency values were chosen to provide Hammond-like compatibility in the 6K case.

7 NuBiLE - MIDI Control Codes



param	CC	description	
Upr S1	12	S1 Drawbar (16')	- range: 0...24
Upr S3	13	S3 Drawbar (5 1/3')	- range: 0...24
Upr H1	14	H1 Drawbar (8')	- range: 0...24
Upr H2	15	H2 Drawbar (4')	- range: 0...24
Upr H3	16	H3 Drawbar (2 2/3')	- range: 0...24
Upr H4	17	H4 Drawbar (2')	- range: 0...24
Upr H5	18	H5 Drawbar (1 3/5')	- range: 0...24
Upr H6	19	H6 Drawbar (1 1/3')	- range: 0...24
Upr H8	20	H8 Drawbar (1')	- range: 0...24
PercEnb	21	Percussion On	- On/Off
PercMode	77	Percussion Mode	- Poly/Mono/High/Single
PercLvl1	70	Percussion 1 Level	- range: 0..62
PercDcy1	71	Percussion 1 Decay	- range: 0.6..6 Secs
PercHrm1	72	Percussion 1 Harmonic select	- S1/S3/H1/H2/H3/H4/H5/H6/H8
PercLvl2	60	Percussion 2 Level	- range: 0..62
PercDcy2	61	Percussion 2 Decay	- range: 0.6..6 Secs
PercHrm2	62	Percussion 2 Harmonic select	- S1/S3/H1/H2/H3/H4/H5/H6/H8

ClickEnb	30	Click On	- On/Off
ClickAtk	75	Click Attack	- range: 0..62
ClickRel	76	Click Release	- range: 0..62
VibEnb	31	Vibrato On	- On/Off
VibMix	73	Vibrato Mix	- range: 0..100 %
VibSpeed	92	Vibrato Speed	- range: 0.45..7.88 Hz
VibDepth	74	Vibrato Depth	- range: 0..100 %
VibDelay	93	Vibrato Delay	- range: 3..27 mSecs
AtkRel	22	Note Attack/Release time	- range: 0.75..14 mSecs
ClickFrq	23	Click Frequency	- range: 60..640 Hz
ClickAux	24	Click Aux (chirp)	- range: 0.00..1.00
FBckLmt	25	Fold Back Frequency	- 6/10/12/20 kHz
DBHFTrm	26	High Frequency Trim	- range: 0.33..1.22
ScaleSel	27	Scale Select	- Equal/Gears/Stretch
Tune	-	Tune	- range: -62..0..+62 cents
-	11	Expression Pedal	- range: 0..100 %
-	7	Channel Volume	- range: 0..100 %

8 NuBiLE - Configuration file (.TCV)

At startup, NuBiLE looks for a text configuration file named "**NUBILE.TCV**" in the same directory as NUBILE.DLL resides. NUBILE.TCV does not need to be present for NuBiLE to work but, if found, NuBiLE will modify it's configuration based on the values found in NUBILE.TCV

RtrXOver/, **RtrOut** and **RtrEQ** affect Spinner.

variable	min	max	comments
# EQ Adjustments	-12	+12	This sets the note-accurate 10-band equalizer; (range -12dB..+12dB) <ul style="list-style-type: none">• Set16Hz . 12.0 = default• Set80Hz . 7.0• Set400Hz . 1.5• Set1KHz . 0.0• Set3KHz . -7.5• Set4KHz . -8.0• Set6KHz . -2.5• Set8KHz . 3.0• Set10KHz . 2.5• Set19K2Hz . 4.0
RtrXOver	400	1200	sets the frequency of the virtual crossover point for the RtrOut feature (below) - the "lows" are simply all frequencies below the requested crossover point and "highs" are all frequencies above the crossover point
RtrOut	0	1	when enabled (set to 1), NuBiLE puts all the "lows" into the left channel and all the "highs" into the right channel - when disabled (set to 0) the output of NuBiLE is a stereo center-panned mono signal. RtrOut MUST be enabled for Spinner to work properly
RtrEQ	0.0	12.0	sets the amount of Horn EQ boost applied to the current tone wheel generator EQ settings - this amounts to a 2KHz band-pass filter with the maximum boost set by the value of RtrEQ
OutTrim	-3.0	15.0	sets output level gain (range -3dB..+15dB)

9 NuBiLE - Version History

v1.1.0, 11 Mar 2006

- Moved Perc Enable MIDI CC from #66 (sostenuto) to #21

v1.0.8, 20 Nov 2005

- Not responding properly to MIDI program change messages

v1.0.7, 18 Nov 2005

- current beta code

v1.0.6, 18 Nov 2005

- Program changes not "completed" in hosts that issued AllNotesOff
- before issuing a program change message

v1.0.5, 15 Nov 2005

- "NuBiLE" reported as "ToneWhls"

v1.0.4, 06 Nov 2005

- Add OutTrim Config Item

v1.0.3, 06 Nov 2005

- Alternate MIDI channel input not handled correctly

v1.0.2, 30 Oct 2005

- Changes to Presets were not reflected when project was saved
- The tuning CC (06) was being used improperly - it is now disabled

v1.0.1, 16 Oct 2005

- "ToneWhls" was displayed in the mixer - even for NuBi LE
- 08 Oct 2005 revise GUI with new control elements
- add CCMaP.JPG to distribution (MIDI CC# map over GUI image)

- 05 Oct 2005 revise mix control for smoother transition to mid point

v1.0.0, 04 Oct 2005

- First general release

10 SpinnerLE - Rotary Chorus



SpinnerLE is a Virtual Rotary Effect designed specifically for NuBiLE Virtual Organ to be used in Cubase VST and compatible systems.

Current Status: **SpinnerLE v1.0.0**, 11 Mar 2006.
SpinnerLE can also be used as a stand-alone VST effect.

10.1 Features

- Two-band rotary chorus (aka "leslie simulation")
- Beautiful GUI by kvr member amoebz
- Includes a realstec Valve Effects section
- Includes a HF Rotor-Horn Filter section
- Very low CPU usage
- PC-based VST hosts only

11 SpinnerLE - Parameter Overview

11.1 Global Controls (down the middle of the GUI)

- Engage** - allows the user to stop the rotors at the forward most point
- Slow/Fast** - speeds up to "Fast" and slows down to "Slow" the rotors (*uses "ModWheel"*
- *MIDI CC #1*)

11.2 High Frequency Rotor controls

- Fast** - sets the Fast Speed RPM, *adjustable from 160 to 640 RPM*
- Acceleration** - sets the Acceleration time from Slow to Fast speed, *adjustable from 0.4 to 6.4 Secs*
- Slow** - sets the Slow Speed RPM, *adjustable from 6 to 150 RPM*
- Deceleration** - sets the Deceleration time from Fast to Slow speed, *adjustable from 0.4 to 6.4 Secs*
- Level** - sets the LF Rotor level, *adjustable from 0 to 100 %*

11.3 Low Frequency Rotor controls

- Fast** - sets the Fast Speed RPM, *adjustable from 160 to 640 RPM*
- Acceleration** - sets the Acceleration time from Slow to Fast speed, *adjustable from 0.4 to 6.4 Secs*
- Slow** - sets the Slow Speed RPM, *adjustable from 6 to 150 RPM*
- Deceleration** - sets the Deceleration time from Fast to Slow speed, *adjustable from 0.4 to 6.4 Secs*
- Level** - sets the HF Rotor level, *adjustable from 0 to 100 %*

11.4 Valve Effects controls

- On** - switches the Valve Effects On/Off
- Drive** - sets the input level sent to the Valve Effects amplifier, a higher Drive level will result in more distortion, *adjustable from -20 to 0 dB*
- Level** - sets the Valve Effects output volume, *adjustable from -16 to +6 dB*

11.5 Horn Filter control

- On** - Switches the Horn Filter On/Off
- Frequency** - sets the Horn Filter Frequency, *adjustable from 400 to 3200 Hz*
- Q** - sets the Horn Filter Q factor, *adjustable from 0.6 to 6*
the gain of the filter circuit is adjusted downward as the value of Q is increased

12 SpinnerLE - MIDI Control Codes



param	CC	description	
SpdSwx	1	Slow/Fast both Rotors	- Slow/Fast
RtrEng	69	Stop/Engage both Rotors	- Stopped/Engaged
LFHiSpd	86	LF Rotor Fast RPM	- range: 160...640 RPM
LFLoSpd	85	LF Rotor Slow RPM	- range: 6...150 RPM
LFAcc	87	LF Rotor Fast Accelerate	- range: 0.4...6.4 Secs
LFDec	88	LF Rotor Slow Decelerate	- range: 0.4...6.4 Secs
LFLvl	42	LF Rotor Output Level	- range: 0...100
HFHiSpd	82	HF Rotor Fast RPM	- range: 160...640 RPM
HFLoSpd	81	HF Rotor Slow RPM	- range: 6...150 RPM
HFAcc	83	HF Rotor Fast Accelerate	- range: 0.4...6.4 Secs
HFDec	84	HF Rotor Slow Decelerate	

			- range: 0.4...6.4 Secs
HFLvl	41	HF Rotor Output Level	- range: 0...100
VFXEnb	44	Valve Effects On	- On/Off
VFXDrv	47	Valve Effects Input Drive	- range: -20...0 dB
VFXLvl	49	Valve Effects Output Level	- range: -16...+6 dB
HrnEnb	78	Horn Filter On	- On/Off
HrnEQFrq	79	Horn Filter Frequency	- range: 400...3200 Hz
HrnEQQ	80	Horn Filter Q factor	- range: 0.6...6

13 SpinnerLE - Version History

v1.0.0, 11 Mar 2006

- First general release