

GARRITAN



WWW.GARRITAN.COM

MANUAL

# STRADIVARI

## SOLO VIOLIN

Created by Giorgio Tommasini,  
Stefano Lucato & Gary Garritan

 KONTAKT 2  
LIBRARY

The Complete Virtuoso's Manual to

## Stradivari Solo Violin

created by Giorgio Tommasini, Stefano Lucato and Gary Garritan

Copyright © 2006 Garritan, Corp. All rights reserved  
First printing 2006

This guide written by: Gary Garritan and Giorgio Tommasini

Produced by:	Gary Garritan, Giorgio Tommasini & Stefano Lucato
Programming:	Giorgio Tommasini & Stefano Lucato
Recorded by:	Gary Garritan
Graphics:	Michael Sandberg & James Mireau

The information in this document is subject to change without notice and does not represent a commitment on the part of Garritan Corporation or on the part of Native Instruments GmbH. No part of this publication may be copied, reproduced or otherwise transmitted or recorded, for any purpose, without prior written permission by Garritan Corporation or Native Instruments.

Use of the Stradivari Solo Violin™ library and the contents herein are subject to the terms and conditions of the license agreement distributed with the library. You should carefully read the license agreement before using this product. The sounds presented in the Stradivari Solo Violin library are protected by copyright and cannot be distributed, whether modified or unmodified. This Stradivari Solo Violin library, User's Guide and articulation lists contained herein are also covered by copyright. Garritan is a trademark of Garritan Corp. KONTAKT™ is a trademark of Native Instruments GmbH. The information contained herein may change without notice and does not represent a commitment on the part of Garritan Corporation.

## Stradivari Solo Violin

Garritan, Corp.  
P.O. Box 400, Orcas, WA 98280 USA  
Tel: (360) 376-5766  
e-mail: [gary@garritan.com](mailto:gary@garritan.com)

Visit us on the World Wide Web at: [www.garritan.com](http://www.garritan.com)

Printed in the United States of America.

## *Welcome to the Stradivari Solo Violin*

Almost everyone familiar with music is aware of the legendary quality of violins created by Antonio Stradivari. Many have come to equate the sound of Stradivari violins as the very finest - almost perfection. The Stradivari is an instrument of extraordinary beauty. Today a genuine Stradivari is worth millions of dollars.

Many violinmakers over the past centuries have tried to imitate the Stradivari violin unsuccessfully, and scientists and instrument makers today still seek to solve the mystery of its superb sound quality.

Through innovative sampling methods, this library faithfully captures the sound of a Stradivari violin that was made in 1716. Rather than imitate the craftsmanship, we have used the latest technology to not only record and capture its sounds, but to also make a playable virtual instrument. This has been made possible with technologies developed by Giorgio Tommasini and Stefano Lucato.

Just as real Stradivari violins are so well made that they are more expressive than other violins, we wanted to produce a sample instrument library that would be more expressive than any other. The finest instruments are the ones that will allow musicians to express themselves best, whether they are three hundred years old or in the form of today's virtual instruments.

*Gary Garritan*

# TABLE OF CONTENTS

Welcome to the Stradivari Solo Violin .....	1
Forward by Craig Anderton .....	3
License Agreement .....	5
Outstanding Features .....	6
What This Package Includes .....	7
Compatible Platforms .....	7
System Requirements .....	7
About the Stradivari Violin .....	9
The Project: A Virtual Stradivari Violin .....	11
Installing the Stradivari Solo Violin Library .....	16
The Range of the Violin .....	17
Violin Playing Techniques .....	17
How to Play the Stradivari Solo Violin .....	22
Reproducing Common Playing Techniques .....	25
Shaping Attacks and Articulations .....	26
Staccato, Portamento & Legato Techniques .....	27
Bow Bouncing off the Strings .....	28
Polyphonic Mode .....	29
Bow Change Effects .....	30
Sordino .....	31
Trills .....	31
Tremolo .....	32
Pizzicato .....	33
Harmonics .....	33
Vibrato .....	33
Choice of Controllers .....	36
The Impulse Response .....	37
The Graphical Script Editor .....	37
Getting Help .....	39
The Garritan Community .....	40
The Development Team .....	41
Acknowledgements .....	43
Registration .....	44

## Forward

-By Craig Anderton

### Why play a “program” -when you can play an instrument?

Few, if any, would deny that acoustic instruments are the standard by which electronic instruments are judged. But why? And what does this have to do with Stradivari?

Acoustic instruments offer a unique level of expressiveness because their design allows for interesting techniques (articulations) — the ability of the player to create nuanced changes in the sound. Think of a drum: There’s a different sound quality depending on whether you hit the center or rim of the drum. The angle of a pick on a guitar string changes the sound, and you can blow into a saxophone to the point where you overdrive the reed. These techniques are like “instructions” that tell the instrument how to respond.

Stringed instruments allow for huge variations in playing techniques — so many, in fact, they have names: *marcato*, *pizzicato*, *arco*, and so on. Each represents a unique way the player interacts with the instrument to create a particular sound. Couple these playing articulations with dynamics, vibrato, and all the elements of the acoustic instrument’s repertoire, and the result is a supremely expressive instrument.

### TECHNOLOGY’S ANSWER

With sample-based instruments, technology was able to pretty much nail the sound of an acoustic instrument, but with one major limitation: A sample is the sonic equivalent of a photograph, not a movie. It essentially captures the sound of an instrument at a specific point in time, not a sound with a variety of expressive gestures. So you could capture, for example, a violin note with vibrato; but if you wanted a violin note without vibrato, that would require a different sample.

Samplers have traditionally handled dynamics by recording an instrument at several different levels, layering them on a keyboard, then tying each layer to the keyboard’s velocity control signals so that hitting a key harder plays back a more dynamic sample. Many string libraries even include libraries of articulations, which you can “insert” to increase the expressive options.

But these are sort of like “freeze-dried” articulations because they take just one part of technique and apply it to the sound. Real technique is a smooth continuum of playing that coaxes emotion out of the instrument. In a way, samplers require a player to be more of a programmer, and know what sound is expected in advance so its various articulations can be available when needed. It’s annoying to search through a “library of techniques,” look for a specific articulation, and apply it — rather than just *play* it. A real player just plays, by following the instructions on a score and performing in real time.

So it’s no wonder that some people find the sound of electronic instruments vaguely unsatisfying, despite their reasonably realistic sound; they rarely allow the same freedom of expressiveness as acoustic instruments.

But it doesn’t have to be that way.

## THE STRADIVARI SOLO VIOLIN APPROACH

Playing the Stradivari Solo Violin comes as close to the experience of playing a real violin as the current state of the art allows, as it delivers the kind of expressiveness that electronic musicians have begged for since sampled sound made its debut. The sound quality is, by itself, wonderful. But it becomes that much more wonderful in the hands of someone who can impart expressiveness to those sounds.

Which brings us to the bottom line: the Stradivari Solo Violin is an *instrument*, and you'll need to practice what makes it special. If you're looking for something where you can just push down keys and get sounds, fine...but you'll be happier looking elsewhere, because this isn't the instrument for you.

The Stradivari Solo Violin is for someone who's willing to move the mod wheel, rock a footpedal, take advantage of aftertouch, and exploit velocity to add crescendos, change the plucking style, alter the sound's attack, and much more. Using these gestures is the key to adding true expressiveness to the sound.

But there's another angle, too: It's more fun to really *play* an instrument. There's more of a physical connection between what you do and what comes out of the loudspeakers. If your playing moves you, you can translate movements into changes in the sound. And in addition to the "fun factor," take inspiration into account as well. When you want to "push" the sound further, you can actually push or move something physical to make that happen. Forget about layering tracks with different techniques, then trying to force them together to make the sound of one instrument; it's a lot better just to have one instrument you can play like an instrument.

The Stradivari Solo Violin has been designed with options that let you make better, more inspiring, more interesting sounds. Take the time to learn, and practice, the Stradivari Solo Violin's exceptionally useful articulation options — your music will thank you for it.

- Craig Anderton

## License Agreement

Please read the terms of the following software licensing agreement before using this sample collection. By installing and loading this product you acknowledge that you have read this license agreement, understand the agreement and agree to its terms and conditions. If you do not agree to these terms, do not install or use the sounds contained herein. This is the complete agreement between you and Garritan Corporation that supersedes any other representations or prior agreements, whether oral or in writing.

**An important thing to understand is that YOU ARE OBTAINING A LICENSE FOR YOUR USE ONLY — THEY DO NOT BELONG TO YOU.** The sounds, samples and programming in the Stradivari Solo Violin™ library remain the sole property of Garritan Corporation and are licensed (not sold) to you.

### What You Can Do:

You can use these sounds in music productions, public performances, and other reasonable musical purposes within musical compositions. You can use these sounds in your own musical compositions as much as you like without any need to pay Garritan Corporation or obtain further permission. If you do use these sounds, we ask that in any written materials or credits accompanying your music that utilizes material from Stradivari Solo Violin (CD booklet, film credits, etc), that you include the following courtesy credits: "Solo violin samples used in this recording are from the Garritan Stradivari Solo Violin™, or a similar credit where practicable.

### What You Cannot Do:

The enclosed sounds cannot be re-used in any other commercial sample library or any competitive product. You are absolutely forbidden to duplicate, copy, distribute, transfer, upload or download, trade, loan, reissue or resell this library or any of the contents in any way to anyone. You cannot redistribute them through an archive, nor a collection, nor through the Internet, nor binaries groups, nor newsgroup, nor any type of removable media nor through a network. The sounds and samples contained herein cannot be edited, modified, digitally altered, re-synthesized or manipulated without direct written consent of Garritan Corporation.

A right to use Stradivari Solo Violin is granted to the original end-user only, and this license is not transferable unless there is written consent of Garritan Corporation and payment of an additional fee. The sounds of the Stradivari Solo Violin will only work with Native Instruments Kontakt 2 and will not work with any other sampler. Licensor will not be responsible if the content of this disc does not fit the particular purpose of the Licensee. Please make sure before ordering this item that it meets your needs. Information contained herein is subject to change without notice and does not represent a commitment on the part of Garritan Corporation. The sounds are licensed "as is" without warranties of any kind. Garritan Corporation, nor any agent or distributor can be held responsible for any direct or indirect or consequential loss arising from the use of this product in whatever form.

The Stradivari Solo Violin library may not be returned for any reason other than manufacturing defects. The terms of this license shall be construed in accordance with the substantive laws of the United States of America and/or the State of New York, U.S.A. All product and company names are ™ or ® trademarks of their respective owners. Our support is limited to the samples themselves. All support with respect to Kontakt must be directed to Native Instruments. The user agrees to read the manual before seeking tech support.

The RECOMMENDED REQUIREMENTS for the Sound Library is 1 GB of free hard disk space, CD or DVD Drive, Windows XP (Pentium 4 /Athlon 2.4 GHz or better is recommended), Mac OS X or higher (1.5 GHz or better is the minimum) A G5 or better is recommended. Standard MIDI controllers, i.e. a Pitch wheel, a Mod Wheel, Channel Aftertouch and a Sustain Pedal. An EXPRESSION PEDAL is also required. To play the violin, we recommend a minimum of 1 GB of RAM. Your system must meet or exceeds these requirements. Please also observe the system requirements of your host application.

## *Outstanding Features of the Stradivari Solo Violin*

The Stradivari Solo Violin sets a new standard in sample libraries. The following list sets forth some of the outstanding features in the library:

### *Quality*

- One of the very finest of violins was sampled, a hand-made Stradivari built nearly 300 years ago.
- Stradivari instruments are world renown for their extraordinary, unique sound.
- High-resolution 24bit state-of-the-art recording for the utmost accuracy and audio fidelity.

### *Innovation:*

- A truly "playable" library using exclusive processes.
- Patent-pending Harmonic Alignment process.
- Advanced scripting and convolution processes.
- Patent-pending Modal Body Resonance process.

### *Playability:*

- Unique virtuosity and versatility - Advanced programming makes this a revolutionary and truly "playable" library that is responsive to the player.
- Real-time shaping of sound providing a virtually infinite number of articulations and playing techniques. Play staccato, arco, trills, tremolo, marcato, and much more in real-time. The amount of musical control is unmatched by any other sample library.
- Real-time shaping of dynamics providing a virtually infinite number of levels, using real samples, which retain their original timbre and nuances, instead of a typical single filtered layer that mimics different dynamics.
- Real-time control of vibrato. Start from a non-vibrato sample, control when the vibrato starts, add progressively increasing vibrato, increase the vibrato rate, and/or end with non-vibrato immediately before the next note.
- Key Switching allows for easy and quick selection of various string articulations at the touch of a key.
- Release Triggers provide the natural release of the bow and body resonances.
- Flexible enough to play phrases with runs, scales, pickups, arpeggios, grace notes, turns, and other ornaments with individual notes - no pitch-shifting of played passages are necessary.



## *What This Package Includes*

- 1 CD Disc containing the installation for the Stradivari Solo Violin Sample Library.
- The Stradivari Solo Violin User's Guide.

## *Compatible Platforms*

Kontakt 2 runs on the Mac and PC operating systems. It can run as a standalone or VST or Dxi and RTAS or Audio Unit plugin, and is compatible with virtually all sequencers and hosts. In addition it can work with some notation programs.

## *System Requirements:*

- **Hard Drive Space:** 1 GB of free hard disk space.
- **Additional Drives:** CD or DVD Drive required to install.
- **Processor & Operating System:** On a PC, Windows XP, Pentium 4 /Athlon 2.4+ GHz or better is recommended. On a Mac, OS 10.2.8 or higher, G4 1.5 GHz or better; G5 2+ GHz or faster is recommended.
- **RAM:** A minimum of 1 GB of RAM is required to play the violin.
- **Soundcard:** A low latency audio card **WITH ASIO DRIVERS** is required compatible with Kontakt 2. The ASIO driver should be set to 24 bit, buffer size 256 samples (optimal) or 512 (more latency, but less CPU load).
- **MIDI:** A MIDI interface may be required if you are using a MIDI keyboard, another MIDI controller or an external sequencer that requires it. Some keyboards use USB.
- **Kontakt 2:** The entire Stradivari Solo Violin instrument is a Kontakt 2 library. Kontakt 2 is required. Kontakt 2 works on PC & Mac platforms, and works with sequencers that support VST, DXi, TRAS and Audio Units. Also check Kontakt 2 System requirements. The Kontakt2 audio engine is designed to make use of the processing power of your computer's CPU. The powerful and complex algorithms of the Kontakt 2 work best on faster CPUs.

#### • **KEYBOARD REQUIREMENTS FOR OPTIMAL USE:**

- A five, preferably six-octave keyboard, mapped or mappable from C1 to C6 or more.
- A mod wheel, mapped to cc #1 (modulation) to control transition from senza vibrato to con vibrato.
- Channel aftertouch, mapped to Aftertouch to control vibrato rate.
- A pitch wheel to control pitch.
- An expression pedal, mapped to cc #11 (expression) to control crossfading among the dynamic layers.
- A sustain pedal to activate legato with bow change.

**Important Note:** Please note that the presence of all the above controllers is a requirement for the proper functioning of the instrument.

#### **PERFORMANCE:**

Since DFD (disk streaming) is applied to all layers, the overall memory load of the entire instrument remains below one hundred MB. On a test computer with 2.6 GHz and Kontakt 2 vers 2.0.2.007, the CPU load was about 20-25% (midi processor and convolution included). Using a faster processor will increase performance and freezing tracks is recommended if your sequencer supports this option.

In addition to getting better performance with a faster processor or freezing tracks; you can also use the purge function on Kontakt 2 which will reduce the CPU load to less than half. The real breakthrough in this instrument is that all the processing occurs in real time, implying minimal delay between the midi input and the resulting audio output. This delay is determined by the convolver (2.5 msec) plus the latency of the audio card (about 5 msec). The instrument is therefore very suitable for live playing.

### *About the Stradivari Violin*

The Stradivari violin has been called the perfect musical instrument. Its expressive capabilities, the power, the crystalline beauty and that incredibly sweet sound have yet to be matched. Stradivaris have an inherent rich resonant sound from the lowest notes to the very highest. A Stradivari projects sound clearly and beautifully.

In addition to being regarded as the perfect sounding instrument, a Stradivari is a unique work of art. The physical beauty of Antonio Stradivari's instruments attests to his brilliant craftsmanship. Every Stradivari has been made entirely by hand, with a painstaking attention to minute detail. Like all great works of art, copies are mere imitations that can never match the original.

From a performer's perspective, a Stradivari is a joy to play. It is extremely responsive to the slightest touch of the player. Virtuosos extol the expressiveness of the instrument and how it can translate the player's emotions into sound. The player never has to force sound from the instrument, allowing the player to be totally at ease with what he wants to communicate with the music.

The Stradivari is also known by the Latin form "Stradivarius" or more commonly among musicians as a "Strad". A genuine Stradivari bears the following inscription in Latin: "Antonius Stradivarius Cremonensis Faciebat Anno [date]" (Antonio Stradivari, Cremona, made in the year ...). Even though a label says "Stradivarius" it may be a copy of a Stradivari model. There have been many imitations and such labels are found in thousands of instruments. There are only an estimated 520 authentic Stradivari violins in the world that have survived to this day.

Today a Stradivari typically sells for millions of dollars. The great violinists such as Itzhak Perlman, Yehudi Menuhin, Sandor Vegh and Joseph Fuchs, have all played Stradivari violins. The tone of the Stradivari is extremely beautiful, passionate, inspiring and powerful. Stradivari perfected the design of the stringed instrument. In fact, the Stradivari is the accepted form of the "modern" violin and most of the stringed instruments that follow are based upon the Stradivari.

#### **WHAT MAKES A STRADIVARI A STRADIVARI?**

There are many theories as to what makes the Stradivari the most splendid of instruments ever made. Perhaps it is the perfect geometry of the instrument with its arching back or the craftsmanship of masterful shaving of the wood to the perfect thickness and thinness required, or the placement of the f-holes, or the internal support structure. Some say it was the wood that was utilized. Stradivari used choice maple and Alpine spruce from the forests. Scientists speculate that a "little ice age" that gripped Europe during the time Stradivari lived may have enhanced the quality of the wood. Or that reduced solar activity in the 17th Century made for

denser wood with ideal acoustical properties. Some even suggested that Stradivari used very old wood from the ancient castles and cathedrals to craft his instruments. Some believe Stradivari may have treated the wood in a special way, or soaked it in water, or dried it with a special technique, or used wood seasoning, or stored it for long periods of time. Others surmise that it was the varnish which contained ingredients no longer available in this generation. Or perhaps it was the properties of the filler or the sealer. Legend has it that some sort of 'secret ingredient' was used to give the instrument its famed tone. Or maybe it is the effects of wood aging and the result of centuries of playing. Exact copies have been made down to the minutest of detail and measurement, yet they have not been the same as an original Stradivari violin.

There are many theories - some based in folklore and some scientifically researched and subject to meticulous measurement and analyses - but no one has been able to explain the secret to the sound of a Stradivari. Whatever the secret, it went with Stradivari to the grave.

## ABOUT ANTONIO STRADIVARI

Antonio Stradivari is regarded as one of the most celebrated craftsmen in history and took the art of violin making to a higher level than anyone could have imagined. His instruments are regarded as the very finest stringed instruments ever created 300 years later. The world's greatest musicians still perform on his instruments.

Antonio Stradivari was born in 1644 in Cremona, Italy. In his early adult years, Stradivari learned his craft as an apprentice to Nicolò Amati (c.1658), the then greatest violinmaker of the time. The Amati family had its roots in violin making since the early 1500's. After his apprenticeship, Stradivari established a shop in Cremona, Italy and began making instruments. His fame as an instrument-maker soon became widespread and he became famous during his lifetime. Stradivari made instruments on commission for the Kings of England and Spain, for cardinals, distinguished musicians and collectors throughout Europe. Stradivari also made harps, viols, guitars, mandolins, violas, and cellos.

Stradivari's earliest known label is dated 1666 and his last 1737. He worked into his nineties and produced over a thousand instruments in his lifetime. Antonio Stradivari died in Cremona, Italy on December 18, 1737. Two of his sons, Francesco Stradivari (1671-1743) and Omobono Stradivari (1679-1742), worked with him and continued his work after his death, producing a number of fine instruments. Some experts eulogize that the art of creating fine sounding violins was lost soon after Antonius Stradivari died.



## *The Project: A Virtual Stradivari Solo Violin*

Until now, a realistic and first-rate solo string library was unattainable in the sampling world. The goal of the Stradivari Solo Violin is simply to provide the highest quality and most comprehensive violin library - one that is extremely thorough, realistic, and playable.

The Stradivari Solo Violin has been in the making for nearly five years. We wanted to focus our attention on the most expressive musical instrument - the violin. Moreover, the very best violin - the Stradivari.

The main objectives were:

- 1) Implementation on a conventional sampler
- 2) Real time playability
- 3) Real time, continuous transition (morphing) across several dynamics of the same note
- 4) Real time, continuous transition between vibrato levels
- 5) Real time control of the vibrato intensity & rate
- 6) Real time, portamento & legato
- 7) Real time shaping of most articulations
- 8) Timbral characteristics indistinguishable from the original samples

Real time, continuous transition (morphing) across several dynamics of the same note has never been done with solo samples. Conventional samplers merely switch among different samples when different notes are played. This means that one may choose to play, for example, a pianissimo (pp), or a fortissimo (ff) note, but cannot change the dynamics while the note is sustaining, which is absolutely necessary to mimic the behavior of a real instrument. A real violinist will crescendo on the same note while changing the rate and intensity of vibrato - all simultaneously.

Traditional sample libraries use discontinuous samples that transition between different dynamic levels (*pp*, *mp*, *mf*, *ff*) or different vibrato levels. This causes the listener to hear two distinct instruments (doubling) during transitions, with disjointed tones and phasing issues. Using traditional methods, it simply is not possible to have smooth transitions applied to solo instruments samples. The diagram below illustrates what a user hears during these sampling transitions.

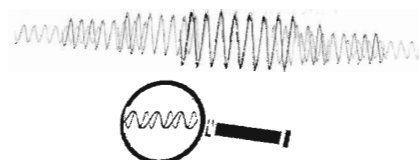


Fig 1: The resulting sound would be that of two separate instruments.

Fig. 1 above shows a zoomed view of the waveforms of two different samples of the same note. Solo violin, senza-vibrato, C3 mf & C3 mp, unprocessed. There is no obvious phase coherence between the two.

The problem has been solved using an entirely new processing technique developed by Giorgio Tommasini known as "Harmonic Alignment". This patent-pending approach aligns sound samples.

The samples corresponding to different dynamics of the same note are processed in order to temporally match the phase of all harmonics. This results in a set of sounds timbrally indistinguishable from the original samples, but that can be played simultaneously with no doubling and no phase artifacts.



Fig 2: The Harmonically Aligned sounds can 'morph' into each other.

In Fig. 2, after processing with the phase alignment technique; the samples 'morph' into each other seamlessly with no doubling, phasing or sonic discontinuity. The resulting sound is that of a single instrument with extraordinary levels of realism and expressiveness while preserving the natural characteristics of the instrument.

There will be the natural timbre changes while the note is playing in response to a continuous midi controller, across a virtually infinite number of dynamic levels, ranging from pianissimo to fortissimo. In addition, the new "Modal Body Resonance" technology allows for precise vibrato control. This is the first time any sample-based library has used this technology and is another milestone in virtual instrumentation.

The powerful Native Instruments Kontakt 2 sampler allows for real time, portamento & legato. A proprietary midi processor, developed as a Kontakt 2 script, affects in real time all calculations concerning portamento direction, extent & rate by detecting overlap, timing, and velocity of the note flow. Sophisticated programming allows for a completely automated portamento and legato in response to very basic playing techniques.

Real time shaping of articulations is achieved by using a modular sample structure, involving separate attacks, sustains and release-triggered notes, with individual response to various midi controllers.

All the above solutions have been simultaneously implemented to create the first instrument of a solo strings series, the Stradivari Solo Violin

## THE VIRTUAL STRADIVARI SOLO VIOLIN INSTRUMENT

The Stradivari Solo Violin is a sample-based virtual instrument. It was designed as a library for Native Instrument's Kontakt 2 sample software. This choice was motivated by the availability of a powerful script midi processor, a fully programmable sampler, plus an efficient convolution engine on a single piece of software.

The Stradivari Solo instrument fully utilizes all the following elements.

**1) The midi processor.** The processor acts as an artificial intelligence interface between the player and the sampler, converting simple midi input into a sophisticated series of commands. For example, a simple note overlap will be converted to a portamento between the previous and the next overlapping note. The portamento rate and timing are determined by both the pitch interval and the note-on velocity, varying from full portamento, to partial portamento, to a pure legato depending on velocities. Additional features are: automatic activation of mono or poly mode, based on the time difference between consecutive notes, partially automated trill and tremolo mode, automatic vibrato inhibition during portamento and pitchbends, automated bow change in sustain mode, and "intelligent" release triggered notes. The midi processor simulates the complex behaviour of a real instrument starting from relatively simple playing techniques.

**2) The sampler.** Using the sampler, Stradivari Solo Violin is the first virtual solo instrument that allows for continuous transition across various dynamics by crossfading solo samples with no phase artifacts. The samples are pre-processed by a very complex transformation, which essentially synchronizes the phase of all sustain samples for a note while preserving the original sound quality. These pre-processed samples are the basis for getting full expression control.

**3) The convolution engine.** Convolution is normally used to add room ambience to a sound. The Stradivari Solo Violin is the first commercially available instrument that makes use of convolution with a specifically designed instrument modal resonance impulse response to recreate realistic vibrato & portamento from senza-vibrato sounds. The harmonic-aligned samples are convolved with the body's modal impulse response as the basis for full vibrato control.



## THE PHILOSOPHY OF THE INSTRUMENT:

### REAL TIME SOUND SHAPING

The Stradivari Solo Violin adopts a new approach to recreate the very complex articulations that a real violin can perform. It uses real-time sound shaping, a rather flexible approach to a sample-based instrument. Real-time sound shaping is achieved by using a sequence of three elements for each played note: the attack, the sustain, and the release-triggered note.

Different types of attacks are used, a short “off the string” (bow bounces on the string) and a longer “on the string” attack (bow stays on the string). All notes are chromatically sampled with multiple takes. A programming script randomizes the choice of the take for each attack type guaranteeing substantial variety and virtually eliminating the machine-gun effect arising from repetitions of the same sample.

Sustains are chromatically sampled and unlooped. Each sample is about eight seconds long. Every sustain note, *senza-vibrato* (without vibrato) and *con-vibrato* (with vibrato), has been sampled at different dynamic levels. All sustains corresponding to the same note have been harmonically aligned and layered in different groupings, to permit crossfading between layers with no phase artifacts. This means a continuous transition across the dynamics may be carried out while the note is playing, exactly as it happens with the real instrument. Real-time shaping of the dynamics with a virtually infinite number of levels is therefore possible, using real samples which retain their original timbre and nuances, instead of just filtering a single layer to mimic different dynamics.

Continuous transition from *senza-vibrato* to *vibrato* is also made possible by advanced programming in addition to convolution with a modal impulse response. The result is a realistic *vibrato*, where the onset, and the intensity and rate are under user control. It is thus possible to start from a *senza-vibrato* sample, add a progressively increasing amount of *vibrato*, increase the *vibrato* rate, and finally end with a *senza-vibrato* tail, immediately before the next articulation. Real-time shaping of *vibrato* is essential to the expressive sound of a violin.

To achieve the effect of the bow bouncing off the string, release-triggers are used. The midi processor script controls when they are to be played when they should be stopped or continued, or to reproduce the behavior of the real instrument.

Separation between attacks and sustain allows for special effects. You can play sharp attacks followed by *pp* sustains (like a *sforzando*), or very soft attacks followed by strong sustains (*portato*). A large variety of effects can be obtained, mimicking practically all playing techniques, using a limited choice of attacks and sustains.

Keyswitch-based articulations give additional expressiveness. One can switch to *sordino*, *pizzicato*, harmonics, trills & tremolo pressing a single key. The sustain pedal triggers bow change mode, with or without *portamento* and *legato*.

### BECOMING A VIRTUOSO

The very best sampled solo violin library is at your command and you are the virtuoso. This library was developed with “playability” in mind. With these captivating samples you can impart *vibrato*, shape phrases, direct intensity and instantly direct changes in playing techniques – just like a true virtuoso. Achieving a realistic and commanding performance is a learned skill that requires knowledge of orchestration, string playing techniques, nuances of the instruments and performance skills. A real virtuoso spends a lifetime learning their instrument. There is a story about Fritz Kreisler (1888-1962), one of the most beloved and greatest violinists of all time. After a performance, someone came up to the virtuoso and remarked “I would give my life to play as you do”, for which the violinist replied “I already did.” Although one does not have to make the sacrifice that Fritz Kreisler did, becoming an accomplished Stradivari Solo Violin player does involve practice and discipline.

To this end, one should develop a mastery of the performance controllers on the keyboard. The capabilities of this virtual instrument can be as wide-ranging as your imagination. As you acquire a mastery of this library, you will develop your own playing style and will “feel” the instrument. Try to think like a violinist instead of a keyboardist. With the number of performance choices, high quality samples and expressive controls available, you can become more creative and explore uncharted musical dimensions. The most exquisite virtual violin is now at your fingertips.



# Installing the Stradivari Solo Violin Library

Before you start:

You must have KONTAKT 2™ installed. KONTAKT 2 embodies the features needed to realize an instrument of this complexity and flexibility.

- You must meet the necessary hardware requirements for Kontakt 2 and have enough hard disc space and sufficient memory. Check with Native Instruments for details and system requirements.

## How to Load the Samples

Much of the material presented in these paragraphs will be familiar to veteran Kontakt™ users. Installing the Stradivari Solo Library is very easy. Simply copy the Solo Stradivari .nki, along with the Samples & Impulse Response folders, from the enclosed disc to the desired directory on your hard drive. To load the instrument simply drag and drop the Solo Stradivari .nki file into the virtual instrument rack.

## Audio and Midi Setup

This must be accomplished before any attempt to play the instrument. Load an instance of Kontakt2, click on File in the left upper corner, then select Audio / Midi setup. Click on Soundcard, set Interface to “ASIO”, Sample Rate to “44100”, Output Device to your soundcard ASIO. Click on ASIO Config, and set Sample Type to “24 bit” (if supported, otherwise to “16 bit”), Buffer Size to “256 or 512 samples”. Some soundcards allow for different buffer sizes. In this case, choose a number between 200 and 600 samples. Now click on MIDI, go to Input Interface and select your soundcard MIDI IO. Click OK, and you’re done.



# The Range of the Violin

The range of the Stradivari Solo Violin is from G3 to E7 (on some keyboards this may translate to G2 to E6).

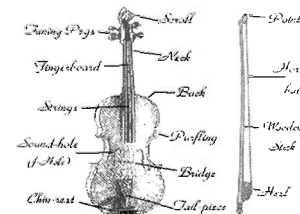


# Violin Playing Techniques

The term “articulation” is often misunderstood. In sampling it is used to describe discrete snapshots of sound. With real players it is a set of instructions on how to play specific playing techniques. It provides instructions on how a tone is attacked, sustained and released - that is, how the performer “articulates” it from beginning to end - and also refers to the resulting sound itself. Some tones have sharp attacks, brief durations, and quick releases. Others emerge slowly, last for several seconds, and decay gradually. The range of playing techniques may seem staggering at first blush, but the variety affords many musical expressions.

The term “bowing” refers to the way in which a string player uses the bow. Bowing is responsible for the length of a tone, its articulation (separate or connected), and its volume (dynamics). Bowing lends a distinctive character to the sound of the instrument, so much so that some have even described it as “the soul of the instrument.” To quote a common saying: “The left hand makes the notes, but the right hand makes the music.”

The bow is the implement used for playing a stringed instrument and has many rough horsehairs stretched from one end to the other. When a string player scrapes these across a tense string, the string naturally vibrates. Typically, the player moves the bow across the strings in an up and down fashion, hence the terms “up-bow” (starting at the tip and marked V) and



“down-bow” (starting at the handle and marked ▢). She or he may draw the entire length of the bow across the string or only a portion, such as near the tip (“point”) or the handle (“heel” or “frog”). These and other bow strokes, as well as bowing speed and the amount of pressure applied greatly shape the sound of the instrument. It takes years of practice for a string player to acquire good bowing technique. It also takes a certain degree of mastery to play the various bowing choices and to understand why a certain note should be played up-bow or down-bow, slurred or separated.

The various articulations, bowings, and playing techniques involve some aspect of the parts of a stringed instrument and/or the bow.

**Legato Playing** - A beautiful, lyrical and effortless legato passage is one of the hallmarks of stringed instruments. Legato literally means, “smooth” and refers to the seamless connection of tones. When a string performer plays a legato passage, the notes are individually played without exaggerated attacks, so that one note appears to flow smoothly into the next. With legato phrasing, the sustained notes are usually played with a single bow stroke (or with bow strokes that do not expose the change of direction). Legato is often notated with a phrase mark (slur) over or under the melodic passage. Alternatively, the term “legato” may appear at the beginning of the passage, particularly if the use of a slur is too cumbersome.

**Détaché Playing** - The opposite of legato is where each tone is deliberately separated from the next, as in the case of détaché articulation. Détaché playing involves a change of bow direction for each successive note. Détaché means “somewhat detached, but without interruption” (The opposite of détaché is where each tone is smoothly connected to the next, as in the case of legato playing).

**Sordino (Muted)** - With the mute engaged, a string instrument’s timbre changes dramatically. The tone quality of muted strings is difficult to describe, although “soft,” “silky” and “velvety” are commonly used adjectives. The mute is a small wooden piece (clamp) that dampens the strings near the bridge. It absorbs some of the vibrations, reducing the strength of the upper partials (overtones) and thus “smoothing out” the sound. Sordino is often indicated with the abbreviation “*Sord*” or more fully “*Con Sordino*” (“with the mute”). The marking “*Senza Sordino*” (“without mute”) instructs the player to remove the mute.

**Staccato** - Staccato is Italian for “separated” or “detached.” Staccato tones have a clearly articulated attack and are not connected like legato tones. Played on the string, the bow starts and stops on each successive tone, which results in a clear separation of tones. Staccato is used frequently in rhythmically charged passages. The notation for staccato is typically a dot or vertical stroke (*staccatissimo*) above or below the note.

**Martelé (It. Martellato)** - Martelé, which means “hammered,” is a short, separated and heavily accented bow stroke, which remains on the string. Instruments designated *Short Martelé* have a short attack.

**Marcato** - Marcato is a pronounced on-the-string bow stroke with a sharp attack. This articulation is often used in aggressive and emphatic passages and is typically played at louder dynamic levels. In common practice, the player often uses the down-bow to accent the notes.

**Sforzando (Sforzato, sfz)** - Sforzando means “forced” and denotes playing with an exaggerated accent. The player usually reads this as an instruction to attack the string with the strongest accent possible.

**Spiccato** - Spiccato is Italian for “clearly articulated” and refers to a technique of playing with a bouncing bow. Some regard it as “off-the-string staccato.” With this technique, the player bounces the bow off the string, rather than pulling or pushing the bow across the string. Spiccato is often used in light, spry and quick passages, as well as in softer dynamic ranges. Nimble fingers and a flexible wrist are required. According to some orchestration pedagogues, spiccato has up-bow and down-bow versions, called *staccato volante* and *saltando*, respectively.

**Sautillé (It. Saltando)** - This advanced technique is essentially spiccato played at a faster tempo, such that the bow literally springs off the string on its own. Some refer to this articulation as “spontaneous spiccato” to reflect the apparently spontaneous action of the bow.

**Portato (Fr. Louré or Piqué)** - Some call this a “brush stroke” and for good reason. Each note in a group, which is played under a single on-the-string bow stroke, is slowly “pushed” and slightly separated from the others, as if the player was brushing the string. This technique produces a lightly dragged or drunken effect, which some characterize as a series of sighs. The typical notation of portato is a dash (tenuto mark) above or below each note with a slur spanning the group of notes, often at the same pitch.

**Pizzicato** - Pizzicato is Italian for “plucked.” A player plucks the strings typically with the flesh of the finger, though for a more metallic effect the fingernail may be used instead. In the score, a change from bowing to pizzicato is indicated with the abbreviation “pizz.” The word “arco” most often appears after a pizzicato passage to indicate that the player should resume using the bow (“arco” is Italian for “bow”).

**Secco Pizzicato (Stopped Pizzicato)** - The sound of a secco pizzicato tone is stopped immediately after the string is plucked to prevent it from sustaining.

**Tremolo (Tremolando, trem)** - The word “tremolo” is Italian and means “to quiver” or “to tremble.” Tremolos are divided into two main categories--bowed and fingered (“slurred”) - and are subdivided into “measured” and “unmeasured,” corresponding to the speed of the tremolo. Bowed unmeasured tremolo involves moving the bow back and forth on the same note in rapid succession. The effect sounds as if the player is furiously scrubbing the string with the bow. This technique sounds shimmering when played *pianissimo* and agitating at *forte*. For a lighter or heavier sound, the player may draw the bow “at the point” or “at the frog,” respectively.

**Trills (Trillo)** - Trills involve a rapid alternation of a given tone with its neighboring note. Trills are usually accomplished with one bow stroke, as most of the trill action is accomplished with the left hand. It is often indicated by the sign “tr”, or a long wavy line. A Half-Step Trill is the alternation between two notes that are a half step apart. A Whole-Step Trill is the alternation between two notes that are a whole step apart. Trills can be played at various intervals depending on the skill of the player.

**Portamento (Slides)** - Portamento is a controlled sliding from one tone to another (literally “carrying”). The effect is a continuous change of pitch between the two tones. This technique is common to strings as players often slide to a note for expressive purposes. The proper use of portamento can produce virtuosic performances.

**Glissando, gliss** - Whereas Portamento is the sliding of one note into another target note, glissando involves sliding the finger along the string of the instrument without an intended target note and usually over a longer span of notes.

**Ricochet (Fr. Jeté)** - Employing this technique, the player drops the bow on the string, causing the bow to bounce freely and quickly on the string. Depending on the height or velocity of the drop, the bow may bounce and rebound three to six times before coming to rest.

**Harmonics** - The sound of harmonics is significantly different from that of stopped strings. Harmonics possess a flute-like timbre and sound at times fragile and ethereal. Natural Harmonics correspond to the natural overtone series of a vibrating object, such as a violin string. Each string has a “natural” series of harmonics based on the fundamental pitch of the open string.

**Ornaments and Other Playing Techniques** - Ornaments are techniques of performance that serve as a decoration or embellishment to enhance melodic, harmonic or rhythmic interest. All of the following playing techniques are possible with the Stradivari Solo Violin:

- **Appoggiatura** - A temporary replacement of a note by a neighboring note.
- **Arpeggio** - The playing of the notes in a chord in succession, rather than simultaneously.
- **Mordent** - The alternation of a main note with its upper or lower neighboring note.
- **Turn** - An ornament or embellishment consisting of multiple notes, where the neighboring upper, target note, and lower neighboring notes are played in successive fashion.
- **Grace Note** - A note marked in small type to indicate that a quick additional note(s) is to be played and its time value is subtracted from the target note.
- **Coloratura** - The use of rapid scales, arpeggios, trills, and the like, in virtuoso fashion.
- **Double-Stops** - Double stopping, although not technically considered an ornament *per se*, is a playing technique where two notes are played simultaneously, requiring the player to draw the bow across two adjacent strings. Double stops work best when they are short and bowed aggressively.

In the following pages, we will describe how to play many of these techniques.

## How to Play the Stradivari Solo Violin

The Stradivari Solo Violin will enable you to produce realistic performances. The Stradivari Solo Violin offers a standardized control system to enable you to play many articulations in real-time. With practice, you can perform many virtuosistic techniques, as a real violinist does, and you can hear the musical results while you play. This chapter introduces you to the performance controllers that offer you a wide range of playing techniques.

### KEYSWITCHES

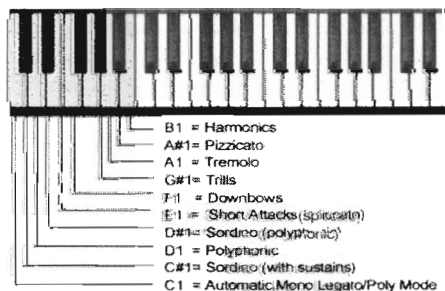
Keyswitching allows you to quickly and easily change techniques while you are playing. With a simple touch of a key located on the keyboard below the normal range of the instruments, you can rapidly switch between different playing techniques on the fly without having to stop or load multiple samples. When you press a key in the Key Switch area, the instrument will change to the desired mode patch.

Example: Press the "F" Keyswitch for downbows



All patches initially load using the first keyswitch as the default (C1: automatic mono legato/polyphonic mode) and any keyswitch remains active until another keyswitch message is received. Although it may be tempting to use your mouse to trigger one of the displayed Keyswitches in Kontakt 2, it is seldom recommended. The player's graphic representation of keys, wheels, and knobs are primarily there for convenient testing. It is *not* recommended to use the mouse to trigger a key switch you want to record to a sequencer track or notation staff – the mouse action will not be recorded. When recording a track or entering notation, use your external MIDI keyboard to record the key switch note or manually enter the key switch note into your tracks.

The Stradivari instrument is controlled by 12 keyswitches (C1 -B1), according to the following scheme.



- **C1: Automatic Mono Legato/Polyphonic mode** (default mode) uses short attacks, normal sustains (senza sordino), release triggered notes. The midi script automatically plays in polyphonic mode (up to 4 notes can be simultaneously played) if the time interval between key presses is below 20 milliseconds. Polyphonic mode always involves attacks, sustains & release triggered notes.

If the time delay between the start of overlapping notes is above this threshold, the instrument will automatically play in mono mode. In this case the transition between subsequent notes will be portamento or legato, depending on the note-on velocity of the second note. On low note-on velocities, you will get slow portamento. On higher note-on velocities, the portamento will progressively disappear, and the legato effect will take over.

- **C#1: Con Sordino.** Essentially identical to C1 but with sordino sustains.
- **D1: Polyphonic mode.** Fixed polyphonic mode allows for effects as double stops, chords etc.
- **D#1: Con Sordino Polyphonic mode.**
- **E1: Spiccato Attacks.** Selects a short attack for the beginning of a phrase. Attack sharpness and intensity are linked to note-on velocity.
- **F1: Downbows Attacks.** Selects a longer, louder attack for the beginning of a phrase. Attack sharpness and intensity are linked to note-on velocity.
- **G#1: Trills.** Trills are played as a real violinist would do, by holding the main note down, while rhythmically playing the trill note. The main note will be automatically muted every time the trill note is down. This trill technique may also be used for a slurred legato effect. Trill starts with an attack, and upon release of the last note, it ends with a release triggered note. Repeated trills, with automatic switch to sustain mono mode, are feasible as well.
- **A1: Tremolo.** Tremolo is obtained by rapidly playing the same note which triggers overlapping downbow attacks on both note-on and note-off. It can also be used to get fast repeat note passages with attacks. Sustains are automatically activated when holding a note down for more than 90 milliseconds, which allows automatic switch to mono mode. Repeat tremolos, with automatic switch to sustain mono mode are feasible as well.
- **A#1: Pizzicato.** Four dynamics, responding to note-on velocity.
- **B1: Harmonics.** This includes all the natural harmonics for each string. Non-existing harmonic sounds are muted on the keyboard.

Although structurally very complex, the instrument becomes remarkably easy to play for anyone familiar with a digital keyboard. Many functions are intuitive, other are easily discovered and mastered. However, to fully exploit the expressiveness of the Stradivari Violin, one should be aware of some peculiarities which differentiate the playing technique from, say, a conventional sample-based instrument.

Remember that you are not going to play any pre-formed sample. If you simply press a key, without acting on the expression pedal or the modulation wheel, you will probably get just a lifeless *senza vibrato* sound with a constant timbre, corresponding to a single dynamic layer.

Make sure your expression and sustain pedals are connected to the keyboard and properly mapped to cntrl #11 (expression) and sustain pedal, respectively.

Be certain that your keyboard extends down to C1, and is equipped with both a pitch wheel and mod wheel, properly mapped to pitch wheel and cc#1 (modulation), respectively.

## *How to Reproduce the Most Common Playing Techniques*

Most, if not all, the violin playing techniques described above can be reproduced with the Stradivari Solo Violin. In this paragraph you will find some suggestions to start with. Don't forget, however, that best results will be obtained by mastering the instrument through real time playing, and using your own musical instinct and creativity. After all, the best violinists were not violin makers. And Bartolomeo Cristofori could presumably not even imagine a Scriabin's Sonata when he invented the fortepiano. Exploring the infinite possibilities of a musical instrument is a task of the player. You have the instrument. Don't be afraid of experimenting with it.

### GETTING STARTED:

1. Activate the C1 keyswitch (default).
2. Set the mod wheel to the minimum level.
3. Play a single note with the expression pedal at the minimum, then gradually push it to its full extent.

You will hear a *senza-vibrato pp* dynamic first, gradually morphing into a *mp, mf, ff* sound. The rate of transition across the dynamics will be related to the speed by which you increase the foot pressure.

4. Now play the same note gradually moving the mod wheel to its full extent.

You will hear a transition from *senza-vibrato* to full vibrato.

5. Now play the same note, add vibrato and apply a progressively increasing pressure (aftertouch) on the key.

You will hear a progressive increase of vibrato rate, from 5.6 Hz up to about 9 Hz.

6. Repeat step 3, but this time pushing the expression pedal forth and back.

You will hear a *senza-vibrato pp* dynamic first, gradually morphing into a *ff* sound, then gradually back to *pp*.

7. Repeat steps 4 and 5 pushing forth and back on the mod wheel, then applying an increasing/ decreasing pressure on the key.

You will hear a progressively more intense vibrato morphing with a *senza-vibrato*, at an increasing/decreasing vibrato rate.

8. Now play the same note by acting on all three controllers in a coordinated way.

You will discover that you have gained full control on dynamics and vibrato of the Stradivari Solo Violin.

## SHAPING ATTACKS & ARTICULATIONS:

Each note of the Stradivari Solo Violin is shaped in real-time from an attack, a sustain, and a release-triggered sample. The default attack is a bouncing spiccato, very suitable as a general purpose, light and fast attack. It was sampled as down and upbow with four different takes for each chromatic note. Automatic round-robin on subsequent notes virtually eliminates the machine gun effect.

The intensity and sharpness of the attack are mainly linked to note-on velocity, while the subsequent sustain is controlled by the expression pedal. This gives the possibility of reproducing different articulations.

1. Activate either C1 (default) or E1 (spiccato) keyswitches
2. Set the mod wheel to the minimum.
3. Play a note by very short strikes, while progressively increasing note-on velocity.

You will hear just the pure *spiccato* attack with its true release, when the bow bounces off the string.

Now try a different effect,

4. Activate the C1 or E1 keyswitch.
5. Set the expression pedal to the minimum.
6. Play a note by longer strikes, while progressively increasing note-on velocity, to let the attack flow into the sustain.

You will hear a soft *sforzato* attacks, as if the player would immediately decrease bow pressure after a short attack.

Try the opposite approach:

7. Activate the C1 or E1 keyswitch.
8. Set the expression pedal to a somewhat low value.
9. Play a note using a low note-on velocity, and holding the key down.
10. Immediately start to press the expression pedal, bringing the dynamic from *pp* to *mf* or *ff*.

You will hear a *portato* attack, a very light attack flowing into a stronger sustain.

Interesting nuances can be obtained by playing the attacks while acting on the pitchwheel (slight detuning before the attack starts, rapidly flowing into the correct pitch), and the modulation wheel (getting a staccato-vibrato by adding a fast, rapidly increasing vibrato immediately after the attack).

The other built-in attack is the *downbow*, a heavier, longer attack ending on the string. It was sampled as four different takes for each chromatic note. Most suitable for dramatic effects, it merges fluently into the sustain, with or without vibrato.

Select this attack by the F1 keyswitch and repeat all sequences described above. You will hear a series of short, *marcato*-like attacks and downbows with stronger or lighter accent. Again, use the pitchwheel before the attack, and the mod wheel (and channel aftertouch) immediately after the attack for a virtually endless variety.

**TIP:** Either the Spiccato or Downbow attacks will remain in effect until another attack is selected by the E1 or F1 keyswitch

## STACCATO, PORTAMENTO & LEGATO TECHNIQUES:

All attacks played so far were examples of staccato techniques, since the played note was a starting one. How to get portamento & legato, then? Here's where the real fun begins:

1. Activate C1 (default) keyswitch.
2. Play a note, holding down the key to get the sustain.
3. Play a different note with low note-on velocity while still holding down the first key.

You will hear the first attack and sustain, followed by a smooth portamento to the second note.

Now repeat the above sequence several times, gradually increasing the velocity of the second note.

You will hear a progressively shorter, faster portamento, getting into a true legato at higher velocities.

What if you play a third note while holding down the second one? This will immediately trigger a second portamento/legato towards the last note played. Thus, portamento & legato are easily obtained by overlapping notes with a time interval of at least 20 milliseconds. This also means that the Stradivari Violin operates by

default in mono mode, that is, only one note played at the time, and in portamento/legato mode, which means that the attacks will only be played with the first note of a sequence. Conversely, if several notes are played simultaneously (within 20 msec), the instrument will automatically switch to polyphonic mode, and a double (or triple) stop will be played instead. This will be better described in a next paragraph.

Try the following sequence:

1. Activate C1 (default) keyswitch.
2. Play an attack, holding down the key to get the sustain.
3. Play a different note with overlap on the first note to get portamento/legato.
4. Release all keys.
5. Play a new note, holding down the key to get the sustain.
6. Overlap a second note.
7. Release all keys.

You have performed a sequence: staccato – legato – staccato – legato.

In fact, by releasing all keys, you set the instrument in a staccato mode, that is, the next note will be played with an attack. Overlapping notes sets the instrument in portamento/legato mode. In the latter mode each incoming note-on velocity determines the portamento rate and the automatic switch to legato on higher velocities.

**TIP:** Very realistic glissandi may be obtained by overlapping two notes over a wide interval, using a low note-on velocity, and interrupting the portamento by releasing all keys before it reaches the destination note.

## THE BOW BOUNCING OFF THE STRINGS:

Releasing all keys has the additional effect of outputting a release-triggered sample corresponding to the last released key. This sample corresponds to the sound of the bow bouncing off the string. The midi processor uses advanced artificial intelligence technology to handle this sample on the basis of the incoming new note. In fact, when a new note is played on the same string, the release-triggered sample needs to be muted. Conversely, if the new note is played on another string, the release-triggered sample must keep on playing. Also, after a double stop, the release-triggered samples of both notes should be played upon releasing all keys. This is the behavior of the real instrument, and it's exactly what happens with the Stradivari Solo Violin, greatly enhancing the overall realism.

The volume of the release-triggered sample is linked to CC #11. This means that by acting on the expression pedal one can enhance or decrease this effect. Try for example the following sequence:

1. Activate C1 (default) keyswitch.
2. Set the Expression Pedal to an intermediate position.
3. Play a single note (attack & sustain)
4. Release the key, and simultaneously press the Expression Pedal to its full extent.

The result will be that of a mp/mf note played with an attack, followed by a strong bouncing of the bow off the string, as it happens with the last, accented note of a phrase on the real instrument.

## POLYPHONIC MODE (keyswitch D1):

The default (keyswitch C1) mode of the instrument is an automatic switch between mono and polyphonic, depending on the time interval between overlapping notes. When two or more notes are played simultaneously, i.e. within 20 msec, they will be played as a chord. This means that the instrument will temporarily switch to polyphonic mode.

On the next note, however, it will return to the default mode.

And if you want to play a polyphonic sequence? Polyphonic mode is activated by keyswitch D1. In this mode, attacks are always played, no portamento/legato is activated, and all notes are outputted exactly as they are played.

Try the following sequence:

1. Activate D1 (Poly Mode) keyswitch.
2. Play an arpeggio, with a slight overlap of subsequent notes, which means releasing the previous key shortly after playing the new note.

At the release of each key, you will hear the bow bouncing off each string, as it occurs with the real instrument. Very realistic arpeggios, and any combination of arpeggios and chords can be easily obtained.

**TIP:** Please note that while double and triple stops can be effectively played in the default C1 mode, arpeggios will be played with portamento/legato and without the release-triggered samples. In fact, Polyphonic mode may yield more realistic effects when playing notes on different strings, such as chords and arpeggios.

## BOW-CHANGE EFFECTS:

Since the bow has a definite length, no sustain may last forever. A violin player often changes the direction of the bow, either for prolonging notes, or for getting a particular (*detaché*) effect.

The bow change effect is reproduced with the Stradivari Solo Violin by using the Sustain Pedal (CC #64).

Try the following:

1. Activate C1 (default) keyswitch.
2. Set the Expression Pedal to an intermediate position.
3. Set the Mod Wheel to an intermediate position.
4. Play a note, holding down the key
5. Press the Sustain Pedal
6. Release the key and play it again.

You will hear the bow change effect. The Midi Processor prolongs the first note until you retrigger it, in a kind of legato mode. However, the retriggered note is preceded by a bow change attack, and is slightly and transiently pitch-modulated downwards, mimicking the behavior of the real instrument. Both the intensity of the attack and the degree of pitch modulation are linked to the Expression Pedal, so they are much more evident at higher dynamics.

The bow change effect works also on overlapped notes, thus mimicking a portamento followed by a bow change. Check it by the following sequence:

1. Activate C1 (default) keyswitch.
2. Set the Expression Pedal to an intermediate position.
3. Set the Mod Wheel to an intermediate position.
4. Play a note, holding down the key
5. Press the Sustain Pedal
6. Play a different note

As long as you hold down the Sustain Pedal, the instrument will remain in the bowchange mode, and any subsequent note will be played with the bowchange effect. Releasing the Sustain Pedal will restore the previous mode.

**TIP:** Realistic effects can be obtained by proper use of the Expression Pedal and the Mod Wheel during and after the bow change. Real violinists may either decrease, maintain, or increase the bow pressure and/or speed immediately before the bow change. This can be reproduced by pulling back or forth the Expression Pedal before retriggering the note. Also, you may prefer to decrease vibrato intensity during the bow change, to increase it immediately thereafter. Please consider that this technique needs much experimentation to get optimal results.

## CON SORDINO (Mutes):

Keyswitch C#1 activates *Con Sordino* playing. This patch works exactly as the default C1, but using con-sordino sustains that have been chromatically sampled at two different dynamics (*mp* & *mf*). Conversely, keyswitch D#1 activates *Con Sordino* playing in polyphonic mode.

## TRILLS (Trillo):

Keyswitch G#1 activates *trill* mode. Trills are played as a real violinist plays them, holding down the main note while repeatedly playing the trill note. The Midi Processor automatically mutes the main note when the trill note is pressed, and retriggers it upon release of the trill note. This approach allows for real time flexibility in both trill rate and accent, which would be impossible to achieve using actual trill samples. Any trill interval can be used. Moreover, both the main and the trill note may be changed during a trillo sequence. The last held note will always work as the main note.

The instrument will remain in trill mode until a different keyswitch is activated.

Try the following sequence:

1. Activate G#1 (trillo) keyswitch.
2. Play a note, holding it down.
3. Play a second note, one semitone up the first note, then release it.
4. Play a third note, one semitone down the first note, then release it.

You will hear a precise turn around the first note.

**TIPS:** 1. Please note that the trill mode has been conceived for real time playing. If some degree of portamento is desired between subsequent notes, this can be more easily achieved in default C1 mode, playing trillo as a pianist would do. A sequencer may greatly facilitate this task, by allowing strict control on note overlap and velocity. 2. The sustain pedal is not active on this patch.

## TREMOLO (Tremolando):

Keyswitch A1 activates *tremolo* mode. Tremolo is obtained by rapidly pressing and releasing the note, in a way conceptually similar to what the violinist does by using a fast to and fro motion of the bow.

This approach allows for real time flexibility in both tremolo rate and accent, which would be impossible to achieve using actual tremolo samples. When the time elapsed between consecutive notes is above a certain threshold (about 90 milliseconds), the instrument automatically switches to temporary mono/polyphonic mode analogous to the default C1. This allows you to play multiple tremolos within a legato sequence, without the need of repeatedly deactivating and reactivating tremolo mode by keyswitching. The instrument will remain in tremolo mode until a different keyswitch is activated.

Try the following sequence:

1. Activate A1 (tremolo) keyswitch.
2. Repeatedly and rapidly play a note.
3. Hold down the same note.
4. Play another note, holding down the key.
5. Repeatedly and rapidly play a different note.

You will hear a tremolo followed by a sustain note, then a portamento to the second note, finally a tremolo on the third note. This will be obtained without the need of keyswitching C1 to restore the default portamento/legato mode.

**TIPS:** 1. Realistic *crescendo* or *decrescendo* can be created by acting on the expression pedal while executing the tremolo. 2. Very low tremolo rates cannot be obtained, since the instrument will switch to a temporary mono/poly mode, and a sustain note will be played instead. 3. The sustain pedal is not active on this patch.

## PIZZICATO:

Keyswitch A#1 activates *pizzicato* mode.

Pizzicato has been chromatically sampled at four dynamics. The patch responds to note-on velocity, and each note is played until the key is released. Most realistic effects are obtained by proper use of the pitch and mod wheel.

**TIPS:** 1. Don't forget to set the mod wheel to zero for general use. Pizzicato is often used with no vibrato. 2. The sustain pedal is not active on this patch.

## HARMONICS:

Keyswitch B1 activates *harmonics* mode. This includes all natural harmonics for each string.

**TIP:** Non-existing harmonic sounds are muted on the keyboard.

## VIBRATO EFFECTS:

Vibrato intensity is linked to the Mod Wheel (cc #1). This means that you may gradually morph from a senza-vibrato sound to full vibrato by acting on this controller. The vibrato rate is controlled by Channel Aftertouch. You may vary the vibrato rate from the basic 5.6 Hz to approximately 9 Hz by progressively increasing the pressure on *any* key. You can further modulate vibrato by acting on the Pitchwheel.

You therefore shape the vibrato waveform in real-time by using the mod wheel and aftertouch controllers. **You have to use these controllers** in order to get a realistic vibrato. This concept cannot be over-emphasized. In fact, the vibrato of a real violin is never too steady, neither in depth or frequency, and its waveform is also slightly variable over time. This can only be mimicked by acting on the above controllers. In this respect, the behavior of the Stradivari Solo Violin is fundamentally different from a conventional library using sampled vibrato.

Try the following sequence:

1. Activate C1 (default) keyswitch.
2. Set the Expression Pedal to an intermediate position.
3. Set the Mod Wheel to the maximum value.
4. Play a note, holding down the key.
5. Apply minimal pressure to the key (Channel Aftertouch)

You will hear a steady vibrato, approximately 5.6 Hz, rather dull and inexpressive. Modify the sequence in the following way:

1. Activate C1 (default) keyswitch.
2. Set the Expression Pedal to an intermediate position.
3. Set the Mod Wheel to an intermediate position.
4. Play a note, holding down the key.
5. Slowly move the Mod Wheel back & forth while the note is being played.
6. At the same time apply variable pressure on the key.

You will now hear a much more expressive and realistic vibrato, with variable depth and variable rate. By simultaneously acting on the expression pedal, you may also change the dynamics during vibrato, adding further expressiveness. A true virtuoso may also slightly move the Pitchwheel at the same time, adding a slight detuning to the vibrato note.

Despite the apparent complexity, mastering these vibrato techniques is essential to mastering the instrument.

**NOTE:** The default range of vibrato rate will be probably suitable to most needs. There are circumstances, however, such as the necessity for a slower rate, or an excessive sensitivity of Aftertouch, where a lower range may be preferable.

**TIP:** The offset of vibrato rate is linked to cc#67. If you have a slider that can be mapped to cc#67, you may directly control this parameter in real time. The *minimum* vibrato rate will range from approximately 4.6 – to 7.0 Hz. You may also easily modify the offset of vibrato rate by acting on the left knob in the Script Panel, which reflects and has the same effect of cc#67. The default value is 74.

**1. Inhibition of vibrato during portamento.** Usually, when executing a portamento, a violin player will not add vibrato. You will notice that the Stradivari Solo Violin behaves in the same way, i.e. the midi processor automatically switches off vibrato during portamento and restores it to the actual value of the Mod Wheel immediately thereafter.

**2. Inhibition of vibrato during rapid pitch changes.** A violin player may choose to maintain vibrato while slightly detuning a note. However, when performing a more rapid and defined pitch change, vibrato is usually avoided. The Stradivari Solo Violin exactly reproduces this behavior. You will notice that slow detuning by the Pitchwheel does not inhibit the ongoing vibrato. More rapid changes will transiently switch off vibrato, restoring it to the actual value of the Mod Wheel upon stabilization of the pitch.

**TIP:** You may easily modify the threshold rate for vibrato inhibition by acting on the right knob in the Script Panel. The default value is 200, and the allowed range is 100 (vibrato inhibition on small Pitchwheel changes) to 1000 (persistence of vibrato even on large pitchbends)

Start using these pitchbend effects to create very expressive sequences:

1. Activate C1 (default) keyswitch.
2. Set the Expression Pedal to an intermediate position.
3. Set the Mod Wheel to an intermediate position.
4. Play a note, holding down the key.
5. While keeping down the key, start a negative pitchbend, slowly moving the Pitchwheel to about a quarter of the full run.
6. Play an overlapping note two semitones below the first, and simultaneously return the Pitchwheel to its rest position

You should hear a very realistic effect, starting from a first note with vibrato, a smooth pitchbend/portamento without vibrato, down to the second note with vibrato.

Try more complex sequences using up and down pitchbends and different note intervals. Also try a slight decrease of the dynamics by pulling back the expression pedal during the pitchbend. It's not too difficult and you will likely master this technique in a relatively short time.

And you're coming close to the basic philosophy of the instrument - complete control of pitch, vibrato, portamento and dynamics in real-time, to effectively reproduce almost any articulation of the real instrument.

## MORE ON THE PITCHWHEEL:

The Pitchwheel is mapped to a nonlinear, quasi-exponential scale, to allow for subtle pitch modulation around the standard note pitch, while maintaining the usual +/- two-semitone range for more dramatic pitchbends.

It is always active, even during portamentos, to allow for complete pitch control. This means that you can play a slightly sharp-ending portamento followed by a quick retuning, or you can compensate an initial pitchbend, bringing the pitchwheel to the rest position during portamento, as described above.

This helps overcome the limitations of keyboards and provides continuous (and not only discrete) pitch control.

Bowed string instruments, being fretless, may generate notes at any pitch within the instrument range. Moreover, the pitch can be continuously varied while the note is being played. The advanced technologies employed in the Stradivari Solo Violin come closer to the "continuous pitch control" requirement that guarantees realism.

## CHOICE OF CONTROLLERS:

The choice of the controllers was dictated mainly by their general availability on most keyboards, and their suggested use conforms to the standard practice. The suggested setup may not be the most efficient, but it turned out to be suitable to most purposes. We report some considerations on the advantages and limitations of the controllers employed.

**Expression Pedal:** This necessary controller is a relatively inexpensive and intuitive midi controller of widespread use, especially among live musicians. In its simplest form, its main limitations consist of a rather slow response and of the fact that it remains in the latest played position. More advanced pedals may overcome these limitations.

**TIP:** Check that your expression pedal has a linear response.

**Channel Aftertouch.** While available on most keyboards, it is not a very user-friendly controller and is implemented differently on different keyboards. It may be difficult to apply a constant pressure of the desired value. It may be also fatiguing on a constant use. While unsuitable for controlling the vibrato intensity, it proved a reasonable approach for vibrato rate control.

**TIP:** If supported by your keyboard, a second expression pedal can be an excellent alternative. It may be linked to vibrato intensity, while vibrato rate may be controlled by the modwheel. Yes, you've got to use both feet, but it is exactly what you're doing when driving a car.

## *The Impulse Responses:*

You will find several instrument body impulse responses (IR) in the corresponding folder. They are supplied as 24-bit wave files of limited length (*i.e.* below 400 milliseconds). This allows you to use the Kontakt 2 convolution engine with a low (2.9 millisecond) latency, very suitable for real time playing.

The choice of the impulse depends on your application, and the overall setup. If you are going to use the Stradivari SoloViolin as a standalone instrument without any additional effects (reverb or room convolution), those IR labeled as "ambience" are most suitable. Conversely, if the violin is used in a sequencer setup with a Hall convolution applied to the output, "dry" IR will yield best results.

**TIP:** Convolution with a large ambience is best carried out with an independent convolver, applied to the output of the instrument(s). This convolver may be set to much longer latencies than those required by the instrument body IR handled by the Kontakt 2 convolution engine. This dual convolver approach involves much less CPU load.

## *The Script Graphical Interface:*

Kontakt 2 includes a powerful and flexible MIDI script processor. By clicking on the Script Editor Button, you will open the Script Graphical Interface.

The small grey panels on the left have been conceived to provide you information on the actual mode of operation of the instrument. Default parameters are: "Normal", "Mono", "Spiccato Attack", corresponding to the default C1 Keyswitch. The upper left panel shows the keyswitch-activated mode. By pressing C#1, on the next played note it will show "Sordino", G#1 will show "Trill", and so forth. This is very useful to check if you're playing the desired patch.



The right upper panel displays the number of simultaneously played note “Mono”, “Poly2”, “Poly3”, “Poly4”, or the connection type between overlapping notes: “Complete Port”, “Partial Port”, “Legato”.

The middle panel shows the attack type: “Spiccato Attack”, “Downbow Attack”.

The lower panel shows “Bow Change” upon pressing the Sustain Pedal (cc #64)

On the right, you’ll see two knobs. The left knob controls the Vibrato Rate Offset. By turning this knob you can modify the *minimum* vibrato rate, from the default 5.6 Hz down to 4.6 Hz or up to 7.0 Hz. The default value for this knob is 74, and the range is from 0 to 127. This knob reflects and has the same effect of cc#67, as previously described. The right knob controls the Threshold for vibrato inhibition during pitchbends. The default value is 200, and the allowed range is 100 (vibrato inhibition on small Pitchwheel changes) to 1000 (persistence of vibrato even on large pitchbends).

**A WORD OF CAUTION:** Please keep in mind that all the sustains of the same note have been processed by a very complex algorithm including deconvolution and phase alignment. Moreover, the instrument has been properly programmed to maintain phase coherence under any circumstance. Any attempt to modify either the samples or the programming may easily lead to catastrophic results. Group filtering will have similar consequences. That’s why we strongly suggest refraining from modifying the original instrument. This does not apply to the final sound, which can be filtered, convolved or processed in any way without any adverse effect on phase coherence. Thus, *instrument effects* can be safely and effectively applied to the Stradivari Solo Violin.

## Getting Help

The first place to look for a solution to any problem you may be experiencing is in this manual. Please read the manual before contacting support. Next, check any readme files which contain important information and all last minute changes that haven’t been available when printing this guide.

**Important:** For support for the Native Instruments KONTAKT 2, please contact: support@native-instruments.com or Native Instruments Tech Support at: (323) 467-2693 (US) or +49-3061103520 (EU).

If you can’t find a solution to your problem by any of the above methods, please email us at support@garritan.com. The best way to get the help you need is by giving us plenty of information about the problem you are having and your computer details. We do ask you to read this guide thoroughly and exhaust the other avenues of support before contacting us.

**Regarding Third Party Customer Service:** Please do not call Garritan Libraries for technical support regarding Kontakt 2 or any other third-party application or program. All Kontakt 2 support issues are handled by Native Instruments. Please contact the respective companies for support on their applications.

The Stradivari Solo Violin is a dynamic library that is evolving and growing. Please check the support area of our website at [www.garritan.com](http://www.garritan.com) for the latest up-to-date information, FAQs, helpful hints, notation files, troubleshooting advice, tips and techniques, plug-ins, special programming, informative links and many tutorials. Another resource is the support forums at [www.garritan.com/forum.html](http://www.garritan.com/forum.html).

**For the Latest...** please visit our website at [www.garritan.com](http://www.garritan.com).

## *The Garritan Community*

Learn, Share Music & Stay up to date

I welcome you to join the Garritan Community.

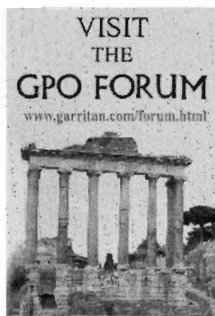
Owning Stradivari Solo Violin gives you much more than a product. One of the most valuable benefits is membership into a community of musicians.

The Garritan Forum is where Stradivari Solo Violin users and other Garritan library users from around the world come to discuss everything related to music. It's the perfect way to find the latest news and announcements, ask questions and share your music made with the Stradivari Solo Violin. If you want to browse, share your thoughts about the Stradivari Solo Violin, impart knowledge, listen to demos, learn, and interact with other Stradivari Solo Violin users - this is the place! You can also communicate privately with other musicians (PM), respond to polls, participate in real-time chats, read how-to tutorials, and get support and help from others. There is a wealth of information among the tens of thousands of posts in the forum and a convenient 'search' feature to find what you are looking for.

The Garritan forum can be accessed at: <http://www.garritan.com/forum.html>

You don't have to register to browse posts, but before you can post, you will have to sign up. Registration is fast, simple and absolutely free so please, join our community today!

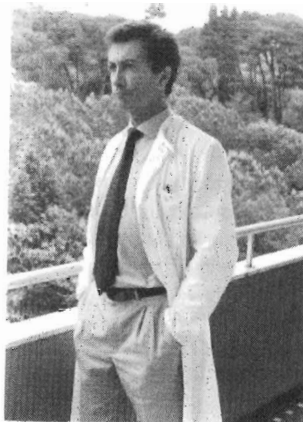
In addition to the official Garritan Forum, there are other independent communities where you can find valuable information and interact with other users. I urge you to contribute and be a part of the Garritan Community where you will find an indispensable resource for musicians



## *The Development Team:*

The Stradivari Solo Violin has been developed by an Italian team in collaboration with Gary Garritan, who also provided the Stradivari samples. Collaboration began in 2001 with the aim of developing expressive ways of playing this rare and exquisite instrument. There was extensive research, experimenting, trial and error in order to have better sound quality while maintaining the advantages of the new approach to expressive sampling. The founders of this team were:

**Giorgio Tommasini**, born in Milano, 1947. He played guitar and bass in various groups of the fabulous Sixties. In 1972 he obtained a degree in Medicine & Surgery at the Milano University "magna cum laude", and subsequently got specializations in Cardiology and Geriatric Medicine. He worked in several hospitals as a clinician and founded and was responsible for three different Cardiac



Catheterization Laboratories. In 1996 he created and directed a Cardiovascular Division of a 400 bed hospital. He was actively involved in research on ischemic heart disease, writing more than 150 peer-reviewed scientific papers and presentations at international meetings. He was one of the first to apply computers in Cardiology, developed new concepts, discoveries and patents in the field of coronary flow measurements, new indices of myocardial ischemia and automatic quantification of coronary stenoses. In 1980 developed a novel scheme of therapy for acute myocardial infarction that now belongs, at least in part, to current good medical practice. In 1992 he invented a new, panoramic approach to coronary angiography that was subsequently adopted by Philips and other

medical X-ray groups. Giorgio became interested in samplers to get accompaniment for his piano playing in 1986. Very unsatisfied by the lack of expressiveness of all available sample-based instruments, he began to think of methods to overcome this limitation. The "phase alignment technique", now patent-pending, was the first result of this new research in an entirely different field. For the first time it was possible to crossfade different dynamics with no phase artifact. The development of a controlled vibrato technique was the next step. It was now feasible to crossfade from senza vibrato to vibrato across several dynamics. New research on "determination of modal resonances and the impulse response of an instrument by analysis of pitched sounds, and application to the synthesis of portamento & vibrato with samplers" (now patent-pending) eventually resulted in a drastic refinement of the method.

**Stefano Lucato**, a talented professional musician and sound engineer, greatly contributed to the very innovative programming which characterizes the Stradivari Solo Violin Library. The collaboration with Stefano yielded the extraordinary, innovative programming upon which the solo violin is based. Stefano Lucato was



born in Gornate Olona, a quiet Italian country village in 1968. A priest of the nearby church discovered Stefano's predisposition to music, hearing the boy playing organ at 7, and provided him a teacher in exchange for the agreement to play at Sunday Masses. Play became passion. The encounter with the music world brought him across a long path including several successful records and an active collaboration with the National Broadcasting Corporation. Stefano presently works mainly as a composer and arranger, and is an acknowledged master in audio editing, mastering and development of new techniques of sound synthesis.

**Gary Garritan** is an award-winning developer of high-quality and innovative soundware. Garritan sample libraries have won accolades from celebrity musicians and music press alike. The libraries have been used in a variety of applications: from popular TV shows, film and attractions to video games, live concerts and ballets. In addition, hundreds of schools and universities have chosen Garritan Libraries for use with their music curriculums.

Collaboration with Giorgio Tommasini began in 2001. The aim was to develop expressive ways of playing the rare and exquisite solo strings that Garritan recorded. There was extensive research, experimenting, and trial and error in order to have a better sound quality while maintaining the advantages of this new approach to expressive sampling.

## *Acknowledgements*

Producing the Stradivari Solo Violin would not have been possible without the combined help, talent and support of many extraordinary people. I am grateful to those who have contributed and would like to thank them all.

I am extremely grateful to Pauline Kim who played the Stradivari violin in this library. A special thanks to Sigbritt Ekström (Giorgio's wonderful wife, for her magic support to the whole enterprise) and thanks to Gianni Nuzzi (music producer, for his precious contribution with the video demo and many other things). Thank you to Dario Cazzani (violinist, for his great contribution to understanding and reproducing violin articulations).

Thanks to James Mireau for graphic design and cover art. And also thanks to the beta testers and demo makers, especially Robert Davis, Jim Ortner, Trond Bjornard, Jerry Wickham, Fabio Vicentini, Roberto Ferrari and Francesco Marchetti. Thanks also to Tom Hopkins, Jeff Hurchalla, David Viens and Matthew Olson.

Thanks to Mark Simon and David Burnett, for hosting the Garritan Forums on Northern Sounds to exchange ideas and support one another.

A special thanks to Daniel Haver, Martin Jann, Frank Etling, Julian Ringel and everyone at Native Instruments for developing the fantastic sample engine that powers the Stradivari Solo Violin.