# SONAR 2015

# “Gloucester” Update

## *special Windows 10 edition*


## SONAR 2015 "Gloucester" Update

Windows 10 is here, and SONAR is ready. In addition to including our usual bug fixes and enhancements, the big story this month is that you can use SONAR *today* with Windows 10—you don't have to wait for "the next big update" (and until then, wonder if SONAR will work properly with the latest Windows operating system). The early reviews on Windows 10 are definitely positive, and it seems that Microsoft has taken feedback about Windows 8 to heart. Even more importantly, Microsoft is paying serious attention to audio capabilities. In this special issue of our monthly eZine, find out what's up with Windows 10—and if you're ready to upgrade your OS, SONAR is ready too. – *Bill Jackson and the Cakewalk Team*

**What Windows 10 Means to You:** You've seen what the press says about Windows 10, surfed the tech web sites for comments, and maybe even downloaded the preview so you could test it out with various programs. In this article, Cakewalk Chief Technical Officer Noel Borthwick looks at what Windows 10 means for musicians, as well as some of the details about SONAR and Windows 10.

**SONAR Benchmarks:** Does Windows 10 help or hurt performance? Are you better off waiting to upgrade just in case the performance isn't quite there yet? Cakewalk's Dean Capper hits the test bench to check out how SONAR performs under Windows 10 compared to Windows 8.1. What he found is perhaps a little surprising, but it's certainly reassuring.

**Project Template Enhancements:** Gloucester brings multiple improvements to project template management. You can start work on a project without having to name it first, as well as specify sample rate, bit depth, tempo, and meter prior to starting the project. What's more, any template can now be your default template. These improvements result in your ability to capture creative impulses just that much faster.

**Workflow Enhancements and Fixes:** This update includes multiple fixes to various aspects of SONAR, including the upsampling feature featured in last month's update as well as a graphics tweak to the Cakewalk Drum Replacer. And, video fans will be happy to find out that video file paths are no longer hard-coded, which makes it much easier to open projects across different computers.

**Review | Neutrik NP2RX-TIMBRE plug:** Cables influence the sound of guitar pickups, but with today's high impedance audio interface inputs and short, low-capacitance cables, the effect of long cords is a thing of the past. Or is it? Not with Neutrik's Timbre plug, a clever way to create a "virtual" guitar cable.

## How to Download Gloucester

Open the **Cakewalk Command Center**, then download from the core SONAR Artist, Professional, or Platinum category. Please note that a **Command Center 1.1** was introduced during July; please update to the latest version if you haven't already done so.

## What Windows 10 Means to You

**Artist, Professional, Platinum**

**By Noel Borthwick, Cakewalk Chief Technical Officer**

On July 29, at 12 AM EST, Microsoft started rolling out Windows 10 upgrades. If you signed up for the upgrade earlier, you may have already received a notification. Fortunately this time around, we have much more mature release compared to Windows 8—there's no missing start menu, and the confusing divide between "Metro" and desktop apps is history.

According to Microsoft, Windows 10 will be the last "version" of Windows. Subsequent updates will be delivered periodically to users, so we won't need to wait two or three years to see improvements. This isn't all that different from what we at Cakewalk have adopted with our "rolling updates" model; we've seen how this has led to a proliferation of new features and enhancements along with ever-improving stability, and we hope Windows users will see similar benefits. To make Windows 10 more attractive to customers and get them onto the new platform, it's even being offered free to existing Windows 7 and 8 users.

Microsoft's new management under Satya Nadella has led to some positive changes in how Microsoft communicates with its partners. Over the last few years we've seen a renewed interest in our audio domain compared to prior years. It's encouraging to see some additions to Windows 10 that were influenced directly by industry feedback, including concerns about low-latency audio and MIDI problems such as jitter and multiclient support. Even at trade shows and other industry events there has been a renewed presence from Microsoft. These are positive steps—it looks like Microsoft has put Windows 8 behind them, and are making a fresh start that's more responsive to consumer needs.


*Microsoft presentation at Summer NAMM (photo courtesy Harmony Central)*

Cakewalk has always been one of the leading DAW vendors at the forefront of Windows development, and we've been following the Windows 10 development cycle from very early on. I spoke to some Microsoft contacts, and got some under the hood details on some of the Windows 10 features that are relevant to music production applications like SONAR, as well as a few areas of general interest.

**AUDIO STACK LOW LATENCY OPTIMIZATION**

There have been many significant improvements toward improving low latency performance in the Windows stack when using WASAPI (shared mode). The Windows audio stack now has as much as 15 msec lower round trip latency by default in WASAPI. Additionally, applications using WASAPI shared mode can now explicitly specify a lower buffer size to be used instead of the default system buffer size. Drivers can also now report a minimum buffer size to allow the applications to select a suitable buffer size.

Microsoft claims that one can now expect "near ASIO performance" when using WASAPI shared mode. This is a big accomplishment since in the past WASAPI shared mode had very high latencies, close to 50 ms (similar to MME drivers). Applications like SONAR that use kernel streaming or ASIO already communicate at a lower level that bypasses the Windows audio engine, so in theory the lower latency advancements in Windows 10 will not allow for lower latencies than previous versions unless you were using the Windows audio engine. However, I asked Microsoft if there had been any changes to the Windows kernel (the lowest level in the audio stack, which can make or break low latency audio processing) that affect audio processing and received this response: "Yes. There have been changes in the multimedia scheduler service and kernel components to minimize DPC spikes (particularly when in low-latency mode)." This is great news, because it could make a big difference to low-latency streaming apps like SONAR.

**AUDIO CORE ISOLATION**

Drivers and applications can "opt in" to isolate and dedicate low latency audio processing to a single CPU core, which can minimize the effect of DPC latency spiking from networking, Bluetooth, or other DPC spiking processes by preventing interruptions to audio processing. This feature looks promising, particularly because Microsoft says they're looking to expand this to multi-core scenarios that relate to DAWs like SONAR.

**NEW WinRT MIDI APIS**

Prior to Windows 10, MIDI was primarily accessible via the older MME MIDI APIs or the less common DirectMusic APIs. These APIs were desktop-only and not available to universal apps, which is Microsoft's new programming model. Windows 10 has new MIDI APIs that are suitable to universal applications, so they're applicable to Windows 10-based desktops, phones, tablets,

etc. The API also allows for multi-client access to MIDI devices, and has improved jitter-free performance.

**LATENCY MEASUREMENT TOOL**

Windows 10 now has a hardware latency measurement tool that's part of the Windows HLK package, and which you can download to measure round-trip latency.

**FLAC AND ALAC SUPPORT**

Windows 10 has native support for these two codecs. ALAC (Apple Lossless Audio Codec) should allow better interoperability with Apple devices, while FLAC uses a lossless compression algorithm to provide a better quality (and free) alternative to MP3. Hopefully, native support in Windows might steer more people into using FLAC instead of MP3.

**DESKTOP AND WINDOWS STORE APPS RUN SIDE BY SIDE**

Unlike Windows 8 where Windows Store applications always ran full screen, in Win 10 they can now run as windows side-by-side along desktop applications. This is a much smoother experience to the end user when you want to use both application types simultaneously—if this was Apple, it would be like running iOS apps alongside your desktop apps.

**CORTANA SEARCH - INTEGRATED VOICE SUPPORT**

Ported over from Windows Phone, Windows 10 now has built-in voice search capabilities—a first for a desktop OS—that lets you perform (for example) web or desktop searches using you, voice. (Cortana search is optional and can be disabled if you don't want to use it.)

**WINDOWS 10 AUTO UPDATES**

There is a somewhat controversial change to how Windows update works in WIndows 10. For Windows 10 Home users, there is no way to turn off automatic updates and they will be mandatory. Windows 10 Pro users will have a little flexibility; they'll be able to switch from the mainstream release to the "Current Branch for Business (CBB)." This will give some control over when updates are deployed. While the CBB will essentially track the consumer release, it will allow feature updates to be held back for some amount of time so you can prepare for the update.

Windows 10 Enterprise is the only OS for which users will be able to actually turn off Windows updates. By opting for the Long Term Servicing (LTS) branch, Enterprise users will be able to defer feature updates for years, electing to receive only security fixes during that time.

**TESTING WINDOWS 10 WITH SONAR**

Many of our users have been running Windows 10 preview builds with SONAR Platinum for some time now and have reported no problems. At Cakewalk, the Gloucester release of SONAR is the build that we have validated officially with Windows 10. We ran several of our validation tests and tested all our installers and inbox plug-ins for this release. We have also run the Windows 10 App certification on SONAR.

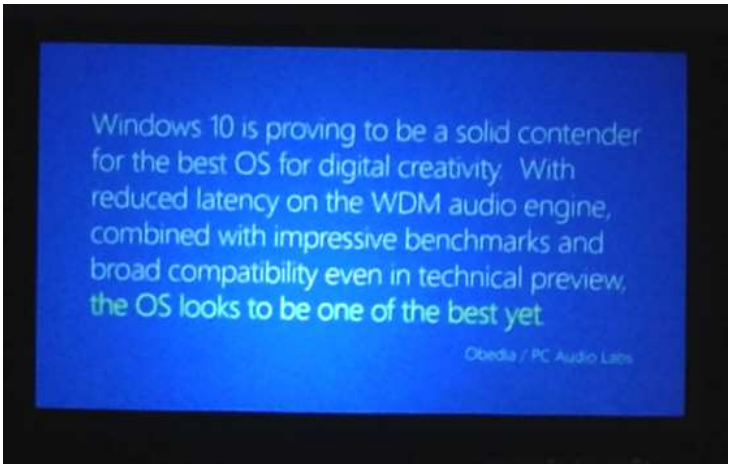
We're happy to report that everything works great, and SONAR passes Windows 10 certification with flying colors. Additionally, we noted some performance gains when running SONAR with Windows 10.

The common impression from those doing the evaluations felt that in general, Windows 10 felt snappier compared to Windows 8. The user interface, spotlight searches, opening menus, loading programs and other common operations all appeared to be faster and more fluid. Switching among desktop applications and Windows Store apps was also much more natural.

**SONAR BENCHMARKS WITH WINDOWS 10**

In addition to testing Windows 10 compatibility with SONAR, we ran some simple benchmarks to compare performance of SONAR Platinum Foxboro on the same system running Windows 8.1 and Windows 10. It's always interesting to look at benchmarks since you sometimes see results you wouldn't expect. The next article has benchmarks done by Dean Capper, but independent PC integrators PC Audio Labs, one of the major custom DAW integrators with a lot of experience building and testing DAW hardware, has done a pretty thorough Windows 10 benchmark.

Their benchmark was done using SONAR Platinum as well as other DAWs. One of the reasons SONAR was featured in their benchmark was because according to them "SONAR was used because it is very friendly to the WDM standard, and is a well-known and very efficient DAW"




The PCAudioLabs benchmark results can be found here: Windows 10 For Pro Audio. PCAudioLabs test was even featured in Microsoft's Future of Audio Keynote on Windows 10, presented by Pete Brown of Microsoft. You can see the benchmark presentation starting around 22:16. It's notable Microsoft is now listening to DAW system builders for feedback on Windows 10 performance.

*A screen from Microsoft's NAMM presentation, quoting PC Audio Labs (photo courtesy Harmony Central)*

Their benchmarks found notable improvements in low latency performance when running SONAR Platinum on Windows 10. Their test also mentioned improvements in CPU performance as well as well as disk performance in Windows 10.

**COMPATIBILITY: IT'S NOT JUST ABOUT SONAR**

Although SONAR has tested 100% compatible with Windows 10, it's important to check whether your audio interfaces and other hardware are compatible with Windows 10 before upgrading. Microsoft has a good track record of supporting older applications and drivers, and this continues with Windows 10. Their upgrade process will even point out any known incompatibilities. However, we highly recommend that you ensure your system is up to date with the latest drivers for all your hardware. Many audio interface vendors have already published Windows 10 validated drivers in advance; if available, you should use those. Many drivers may work without modification, but it's a good idea to check with the vendor first before taking the plunge and updating to Windows 10.

**THE FUTURE OF WINDOWS 10**

Perhaps even more exciting than what's in Windows 10 today involve plans for its future. In the Windows 10 presentation at A3E, Microsoft tantalized us with other features under considertion: Thunderbolt 3, USB-C, Bluetooth MIDI, MIDI routing, audio aggregation, and more. With the continuous integration model it's likely that we will see these features rolled out sooner rather than later. For example, USB2 audio class driver support didn't make the Windows 10 release, but hopefully we'll see this soon.

**WINDOWS FEEDBACK?**

Microsoft has shown that it's taking user feedback seriously with Windows 10. There's even a portal where you can submit and vote on feature requests for Windows so if you have a suggestion to improve Windows for Audio Production, go to the Uservoice Feedback Site to submit your request. Paul Thurrott's site compiles a list of the top 10 feature requests.

**CONCLUSION**

Windows 10 is a mature version of Windows that builds on the performance of Windows 8.1 while addressing many of its limitations. Benchmarks show that it performs equally or better than Windows 8. The new continuous integration model, Microsoft's renewed attention to multimedia applications and the fact that it's a free update to Windows 7 and 8, should make this a no-brainer upgrade for most DAW users. Furthermore, the low latency updates to WASAPI and the audio core isolation features are promising, and we may integrate support for these new features in future SONAR updates.

**WINDOWS 10 REFERENCES**

A3E Microsoft Keynote
http://video.namm.org/general/A3E_Microsoft_Keynote.mp4

Whitepaper: Audio Latency Changes in Windows 10
https://msdn.microsoft.com/en-us/library/windows/hardware/mt298187(v=vs.85).aspx

MIDI API
https://msdn.microsoft.com/library/windows/apps/windows.devices.midi.aspx?f=255&MSPPError=-2147217396

Windows Hardware Lab Kit (With Latency checker)
https://msdn.microsoft.com/library/windows/hardware/dn930814(v=vs.85).aspx

PCAudioLabs Windows 10 Benchmark
http://pcaudiolabs.com/windows-10-for-pro-audio/

Windows 8 – A Benchmark for Music Production Applications
http://blog.cakewalk.com/windows-8-a-benchmark-for-music-production-applications

# Basic SONAR Benchmarks with Windows 10

**Artist, Professional, Platinum**

**By Dean Capper, Cakewalk Product Support Manager**

We wanted to do some simple benchmarks to find out how running SONAR under Windows 10 compared to Windows 8.1. We did our tests on a moderately powered system using a basic audio interface (TASCAM's US-322, the predecessor to the new US-2x2 and US-4x4 interfaces) set to 286 samples on input and 287 samples on output, for a total of 573 samples / 13 ms.

**THE SONARBench PROJECT**

This test project is useful to run not only because it provides information about SONAR's performance, but also gives us a 1:1 basis for comparison with results reported by users in the field. The test project includes a 12-track mix of a band plus several additional tracks with only a sine wave. Each track includes five instances of the Sonitus Multiband compressor that are initially bypassed. We enable one Sonitus plug-in at a time until the CPU is taxed enough to cause audible "glitches," and then notate the maximum number of enabled Sonitus plug-ins that SONAR can play once through without audible glitches.

The test continues by enabling more and more instances of the Sonitus Multiband until the audio engine drops out so we can note the maximum number of enabled plug-ins that allow SONAR to play without dropping out.

*Test 1:* Number of Sonitus Multiband plug-ins that can be inserted in audio tracks before glitching occurs.

**Win 10: 203**
Win 8.1: 179

Windows 10 is the clear winner here.

*Test 2:* Number of plug-ins that can be inserted before SONAR drops out.

**Win 10: 362**
**Win 8.1: 362**

For this test, there's no difference in performance.

**THE DAWBench PROJECT**

This benchmark is similar to SONARBench, but uses plug-ins that other DAWs would be able to use (in this case, the CA-2A T-Type Leveling Amplifier running as a VST3 plug-in). This test also includes a 12-track mix of a band plus several tracks with a sine wave, and CA-2A instances are enabled one per track at a time until each track uses one active CA-2A. We then repeat this until all tracks have a second CA-2A enabled or the audible glitches return, at which point we note the maximum number of active plug-ins that can be enabled without audio glitches.

Like the first benchmark, additional CA-2A instances are enabled until the audio engine drops out completely. We then note the maximum number of plug-ins that can play twice through the audio loop without a dropout.

*Test 1:* Number of plug-ins (CA-2A VST3) that can be inserted before before glitching occurs.

Win 10: 50
**Win 8.1: 52**

Statistically, the results are essentially equal; the discrepancy is likely attributable to jitter.

*Test 2:* Number of plug-ins (CA-2A VST3) before dropout.

**Win 10: 103**
Win 8.1: 85

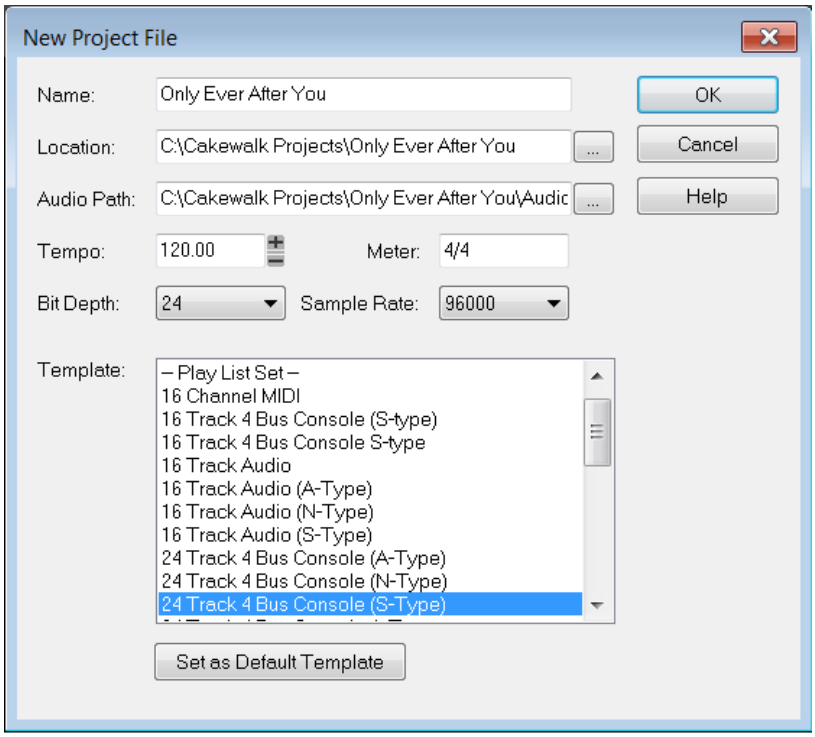
Windows 10 is the clear winner here.

# Project Template Enhancements

**Artist, Professional, Platinum**

SONAR now handles project templates and creating new projects with much more flexibility—which gets you making music faster.

### ANY TEMPLATE CAN BE YOUR DEFAULT TEMPLATE




It's no longer necessary to save a special normal.cwt template. When you choose *File > New* to open the New Project dialog box, you can click on any project template, then click on Set as Default Template. This places an asterisk next to the template to remind you which is the currently chosen template.

### START PROJECTS WITHOUT HAVING TO NAME THEM

You no longer need to name a new project before proceeding. If you don't provide a name, project audio data storage defaults to the global audio folder. When you later save the project, you can specify a different audio folder in the Save As dialog box.

If you provide a project name, although the Location and Audio Path fields will populate automatically with recommended paths based on the project name, you can change the paths as desired.

### SPECIFY PROJECT SETTINGS UPON CREATION

When you start a new project from a template, you can specify the project's Sample Rate, Bit Depth, Tempo, and Meter. You no longer need to change these after starting the project.

## Fixes and Workflow Enhancements

**Artist, Professional, Platinum**

### Audio & MIDI Engine

- Video paths are no longer hard-coded. It's now possible to reference video files within the project folder when projects are opened on different machines.
- Non-default bounce buffer sizes no longer cause playback issues with upsampling enabled on an effect in a rack.
- Fixed issue where disabled ProChannel could allocate excess memory.
- Upsample on Render now renders tempo-based plug-ins correctly.
- Fixed issue where upsampling didn't appear in the menu when first launching SONAR.

### Console View

Fixed issue where Plot EQ on/off button was remaining visible when hidden from the Console View strips. (CWBRN-31304)

### Drum Replacer

Drum Replacer no longer draws incorrectly in some cases after maximizing.

### FX Chains

Fixed issue where FX Chain was not drawing correctly when docked in the multidock. (CWBRN-14275)

### Import / Export & File I/O

Switching sample rates between projects no longer causes crashes. (CWBRN-6463)

### Lanes / Comping

- Fixed issue where clip recording position could get offset while recording within loop markers.
- Fixed issue where deleting the first take while soloed did not un-mute the other takes.
- Last take lane now persists in mute state.

### Miscellaneous

MIDI note events with 0 length can no longer cause a crash during playback.

**Selection & Tools**

- Fixed issue where in some cases ctrl-right-clicking on a clip could cause clip gain and hidden mouse.
- Right-click lasso can't evoke the gain envelope unexpectedly.

**Track View - Strips & Clips**

- Fixed issue where adding fades to clips could cause the waveform to draw incorrectly when tempo changes were present. (CWBRN-5332, CWBRN-6355, CWBRN-13544)
- Fixed issue where under certain conditions smart tool was not able to slip edit clips with small fades. (CWBRN-5396, CWBRN-4157)
- Clip Lock icon obscuring the Clip name is no longer an issue. (CWBRN-23592)
- Edit filter now displays categorization of VST3 plugin parameters properly for Clip FX.
- Fixed issue where edge editing clips in take lanes could cause drawing issues and a crash.
- In some cases, removing the track icon from the track header could cause the track layout not to display correctly; this is now fixed. (CWBRN-20926)

**User Interface**

Fixed issue where larger text and item display settings in Windows could cause SONAR controls not to draw or operate correctly.

## Review: Neutrik NP2RX-TIMBRE Plug

By Craig Anderton

According to Cakewalk's surveys, a lot of guitarists use SONAR. And presumably, many of them are plugging into an audio interface's high-impedance input. This causes minimum loading of the guitar signal, thus transferring it into your computer with the highest possible fidelity.

However, this removes a significant part of the guitar's signal processing chain—the cable. Without getting too much into theory and putting everyone to sleep, cable has capacitance and a tone control has capacitance as well. The effect of capacitance is often summarized as rolling off high frequencies, but this isn't entirely accurate. With passive pickups, the capacitor forms a resonant circuit with the inductive nature of the pickup coil, which can actually create a midrange boost.

Hey!! *Wake up!!* We're getting to the good part.

One reason why guitarists experiment with different tone control capacitor values is because, whether they know it or not, they're changing where that boost occurs. The tone control capacitor affects a frequency range where the boost often contributes to a guitar's "warm" sound, but that's not the only possibility. Using smaller capacitors can give a less "dark" sound, or do a very gentle high-frequency rolloff with little (if any) boost. Adding a smaller capacitor will have the most effect if any existing tone capacitor is taken out of the circuit by rotating the tone control fully clockwise.

Which brings us to Neutrik's NP2RX-TIMBRE plug. This right-angle plug can replace the plug on an existing cable (or of course, be part of one you create from scratch). The knob opposite the plug shaft has four positions: No parallel capacitor, or your choice of three capacitors, all in the single-digit nanoFarad range. Each one has a slightly different sound, and the videos on the Neutrik site are pretty convincing. Although the plug is demoed in the video plugged into a Les Paul, the right-angle plug still works with a Strat. This type of plug is particularly well-suited to SGs, semi-hollow guitars like the ES-335 family, and anything else with a "front-facing" jack. However you can also plug into an amp or interface; the only advantage to plugging into the guitar is easy access to the knob.

For a typical “street” price of around $20, you really couldn’t save much by making a little box and buying the needed components…nor would the results be as tidy. Providing you have some basic soldering and DIY chops, this plug is a simple and effective way to make DI inputs a little more like what we deal with in the real world. If you like what you hear in the demo videos, you’ll like what it does for your guitar.

**SONAR 2015**
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