How to Maximize Samplitude 9 and Sequoia 9 Performance under XP

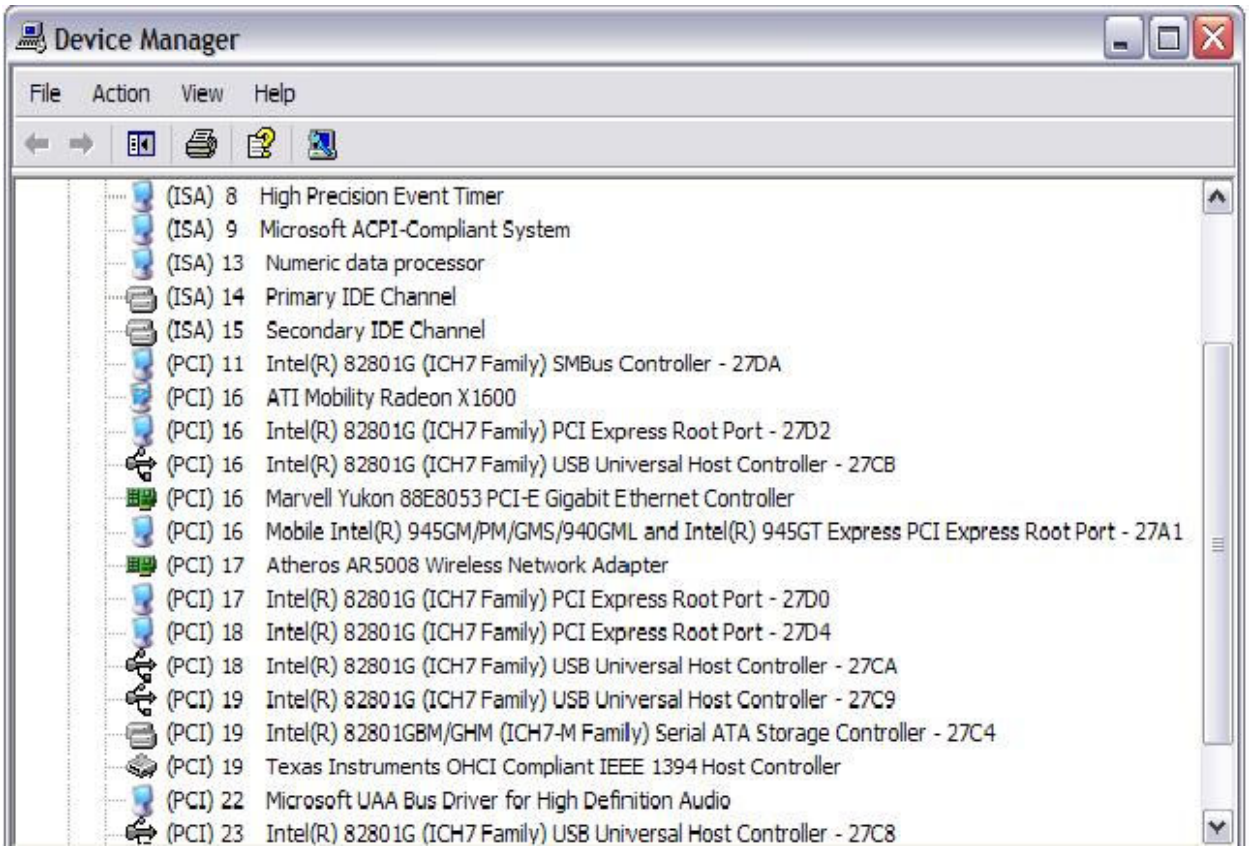
By Tom Sailor *(with excerpts from the Samplitude and Sequoia Manual)*

Computer Optimizations

Here are some mandatory things you should know to ensure that your system is optimized for audio and general good health….also brush your teeth three times a day! Seriously, there are still many users who do not know that these things should be done…and it is always good to check them from time to time to ensure that nothing has changed on your system…

We recommend doing the basic tweaks first for a system…we don't believe in shutting off every non pro audio aspect of a computer…Windows should be allowed to be Windows…and your computer should be able to be a computer…if a particular piece of software requires a ridiculous amount of Window components to be turned off then it isn't a very well coded piece of software is it?

Check for IRQ Conflicts



Go to Control Panel/System/Hardware/Device Manager

Select View: By Resource Connection

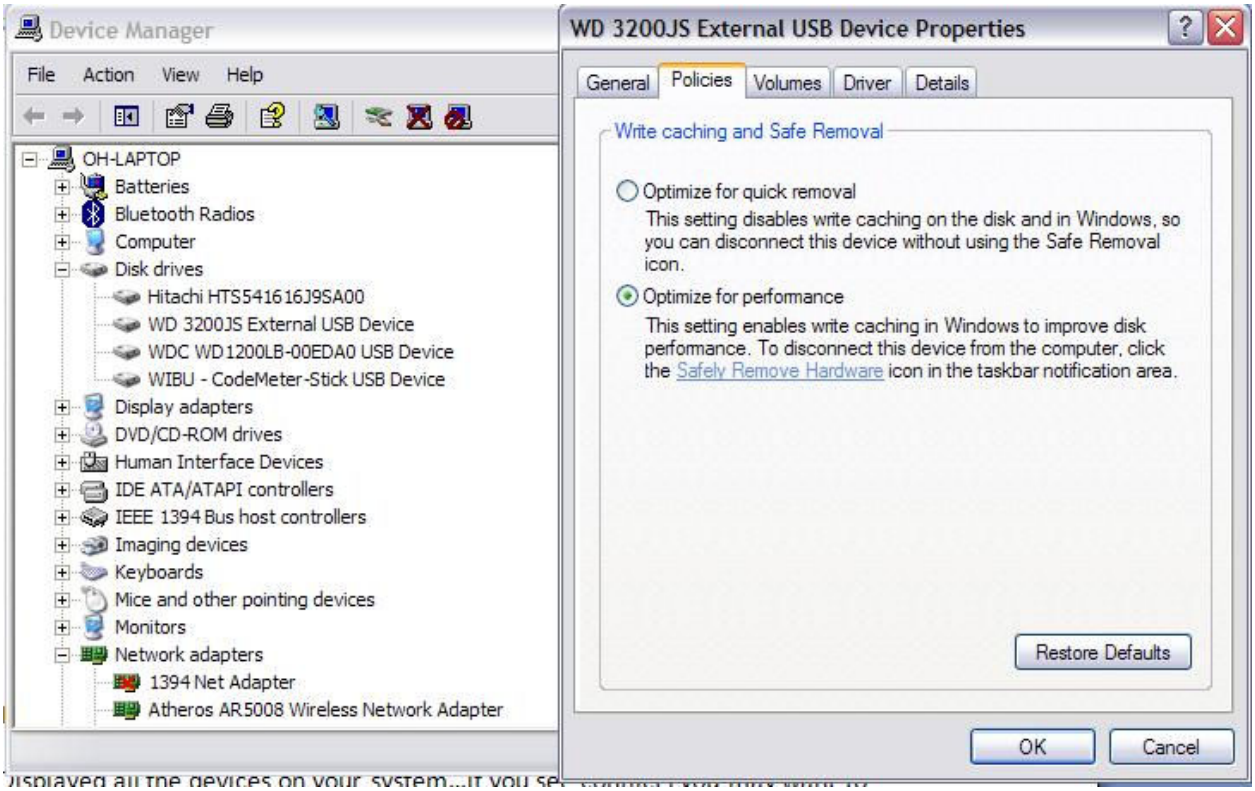
For more info go here: http://kadaitcha.cx/irq_conflicts.html

Here will be Displayed all the devices on your system…if you see conflicts you may want to jockey PCI cards and USB devices to rectify conflicts. Be sure to Uninstall the driver first before removing it. You should even reboot the machine after the device is removed and run a good Registry Cleaner (http://www.registrycleanerscompared.com/?gclid=CMKnyJXLnI4CFQlQWAodyB8PaA)

…then turn off the machine and install the device in the new location.

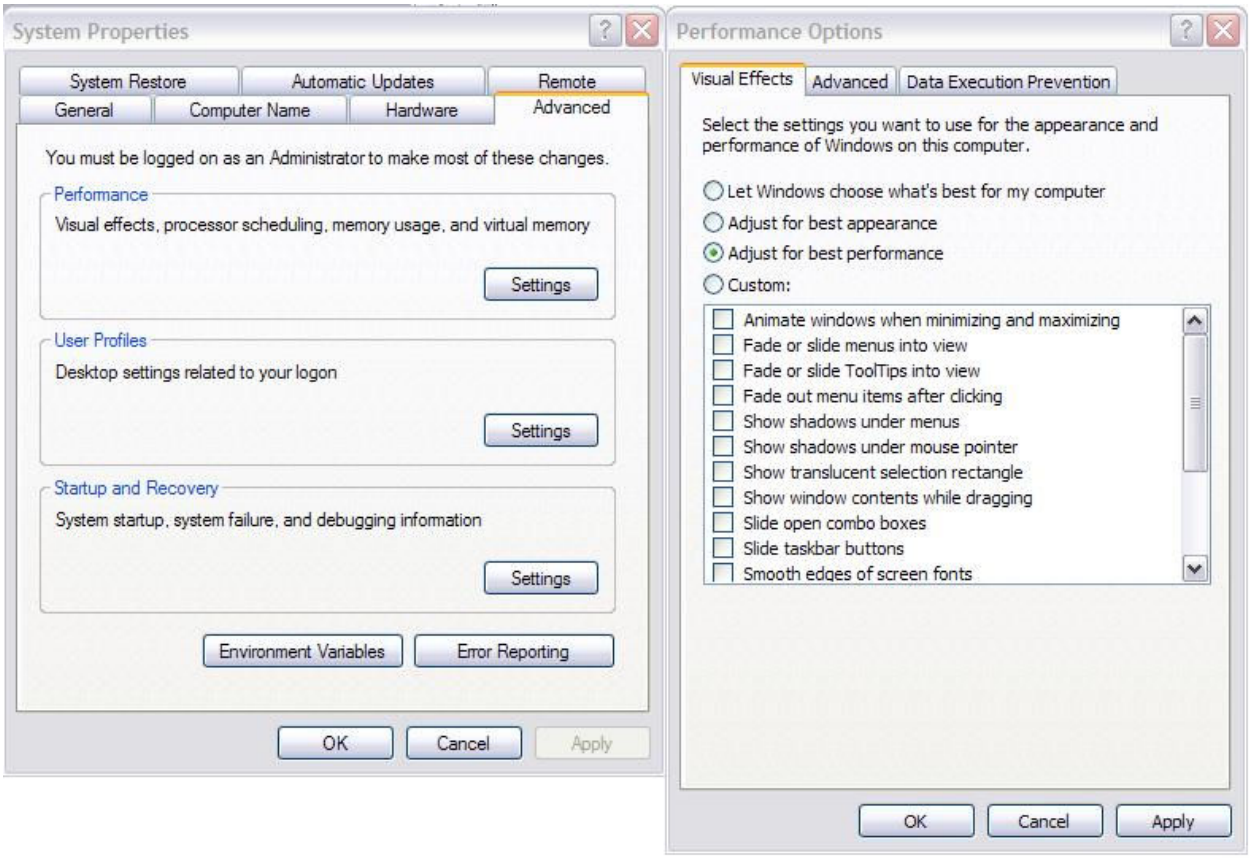
Laptops are another story…you should check this setting on a Laptop before ever buying one…you are stuck with the settings that come with the machine. Your only chance to improve a laptop is to disable devices. Some Firewire Audio interfaces also improve performance when you disable the 1394 Firewire Networking...

Optimize External Hard Drive Performance



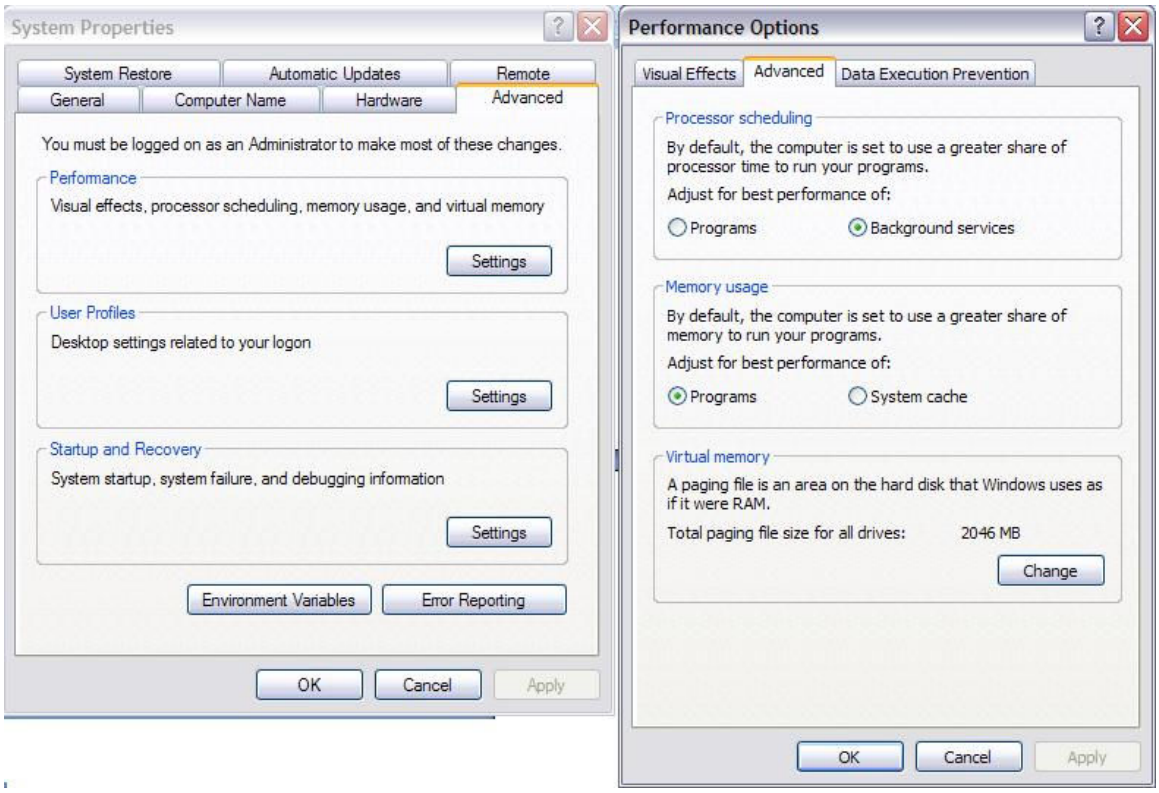
Go to the Device Manager and ensure that any external hard drive at set correctly.

Set Visual Effects for Best Performance



Start > Settings > Control Panel > System > Advanced > Performance Settings > Advanced Tab > Visual Effects

Processor Scheduling



Start > Settings > Control Panel > System > Advanced > Performance Settings > Advanced Tab > Background Services

This is a very important tip and could make a significant difference to how low you can set your samples per buffer for your soundcard.

A lower samples per buffer setting means lower latency, which is better for vsti's and ASIO monitoring (if you use it).

Processor scheduling should be set to background services and not Programs. This has the effect of switching from more frequent and smaller CPU time slices (applications), to less frequent and longer CPU time slices (background services).

This allows the audio application or driver to "hang on" to the CPU for longer without interruption.

In addition, the background services setting also reduces the amount of "priority boost" that foreground window's threads receive.

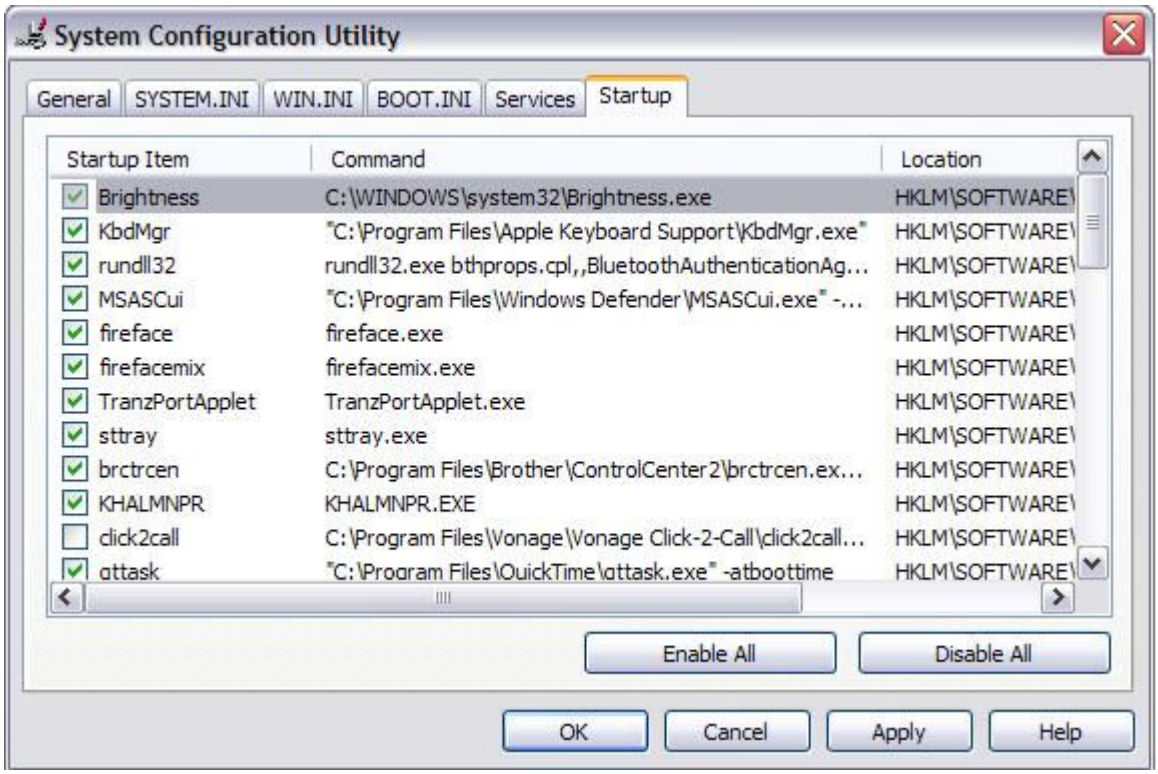
Download and Run AutoRuns

This utility, which has the most comprehensive knowledge of auto-starting locations of any startup monitor, shows you what programs are configured to run during system bootup or login, and shows you the entries in the order Windows processes them.

For more info and to download go here:

http://www.microsoft.com/technet/sysinternals/Utilities/AutoRuns.mspx

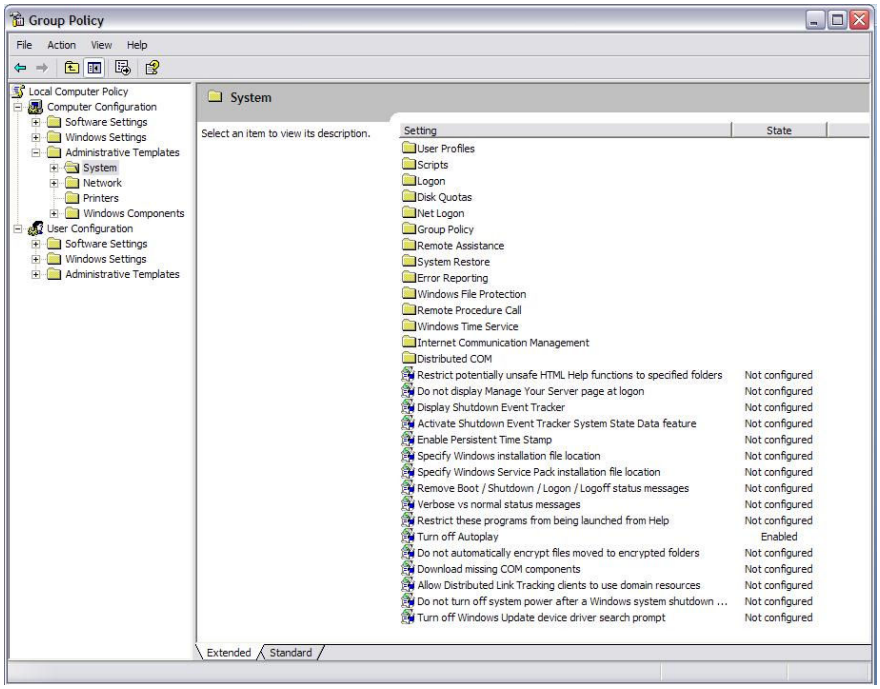
Run MSConfig

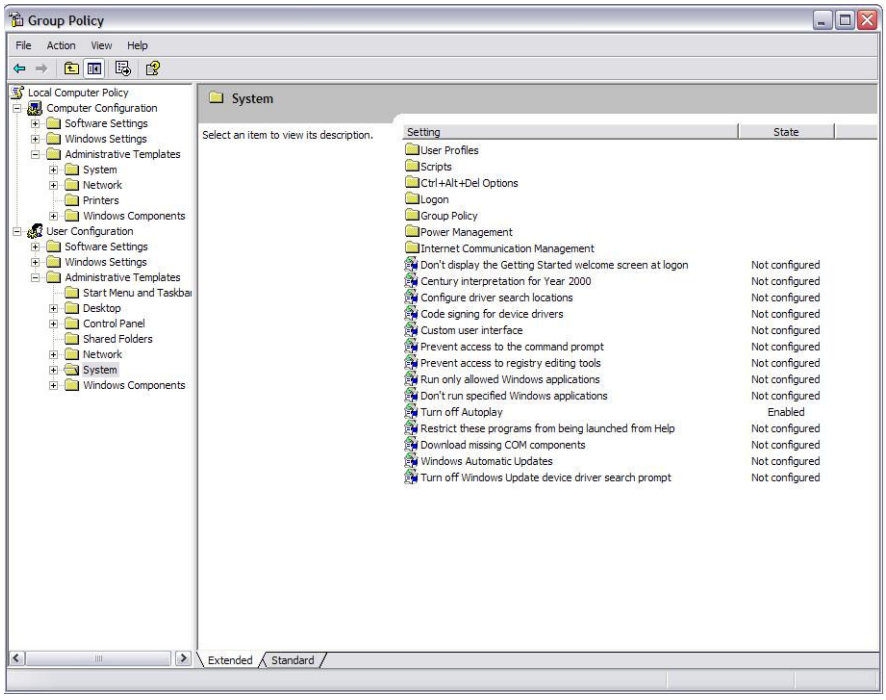


Uncheck all unnecessary items at Startup…

For more info about MSConfig go here: http://www.netsquirrel.com/msconfig/

Run GPEDIT.MSC (Only for XP PRO)



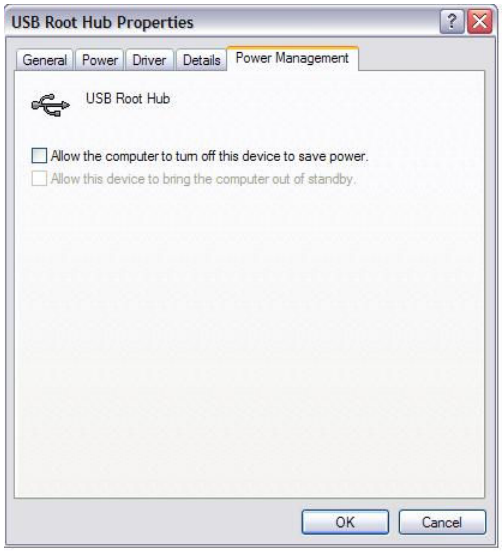


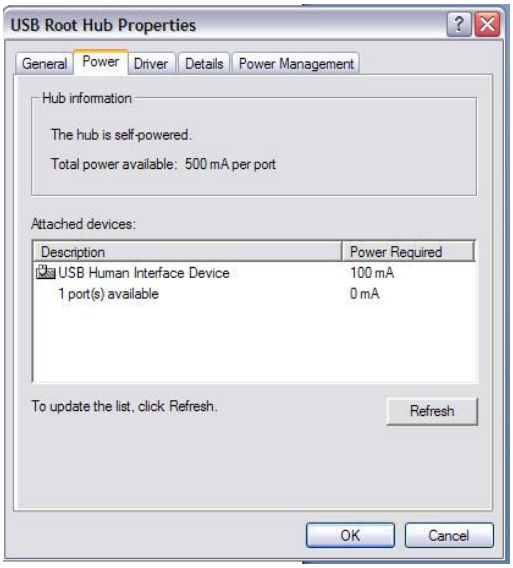
Enable Turn Off AutoPlay…You can also turn off Automatic Updates here

For more info go here:

http://www.howtogeek.com/howto/windows/disable-autoplay-of-audio-cds-and-usb-drives/

USB Power Management





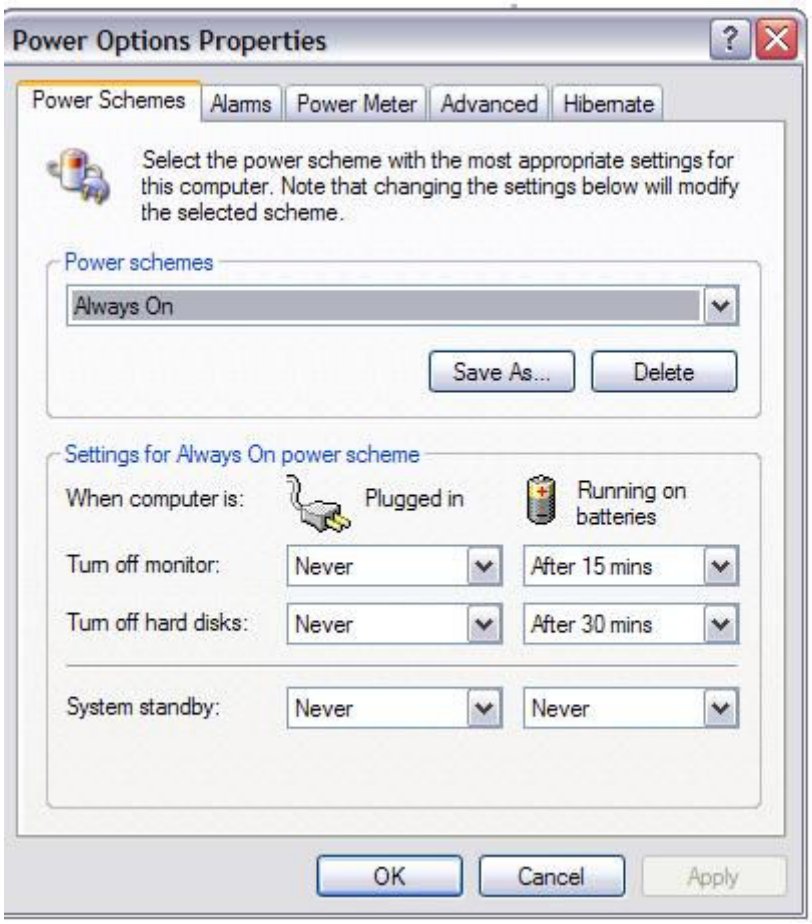
Make sure you do this…don't allow the computer to turn off USB Root Hub devices…

For more info go here:

http://tech.yahoo.com/gd/pc-troubleshooting-solve-usb-power-problems/166344

Power Options (under Control Panel)

Also ensure that Always on and all settings are set to Never for your Power Options



MusicXP.net

Please refer to the below web site for some additional great pointers on how to configure a PC for Pro Audio Performance. www.musicxp.net

Latest WIBU and CodeMeter Downloads

CodeMeter Maintenance

http://www.orangehillaudio.com/pdfs/CodeMeterMaintenance.pdf

Latest Runtimes

http://www.orangehillaudio.com/support/?page_id=9

Everything You Need to Know About the CodeMeter

ftp://ftp.orangehillaudio.com/pub/Everything%20about%20the%20CodeMeter.pdf

Multi-Processor Support

Microsoft multiprocessor patch

http://support.microsoft.com/kb/896256

The AMD Dual-Core Optimizer

http://www.amd.com/us-en/Processors/Techni...1_13118,00.html

ASIO – What is it good for? And when and where to use it…

There seems to be an incredible amount of confusion regarding the need and application of using the ASIO driver format. Let's put is simply:

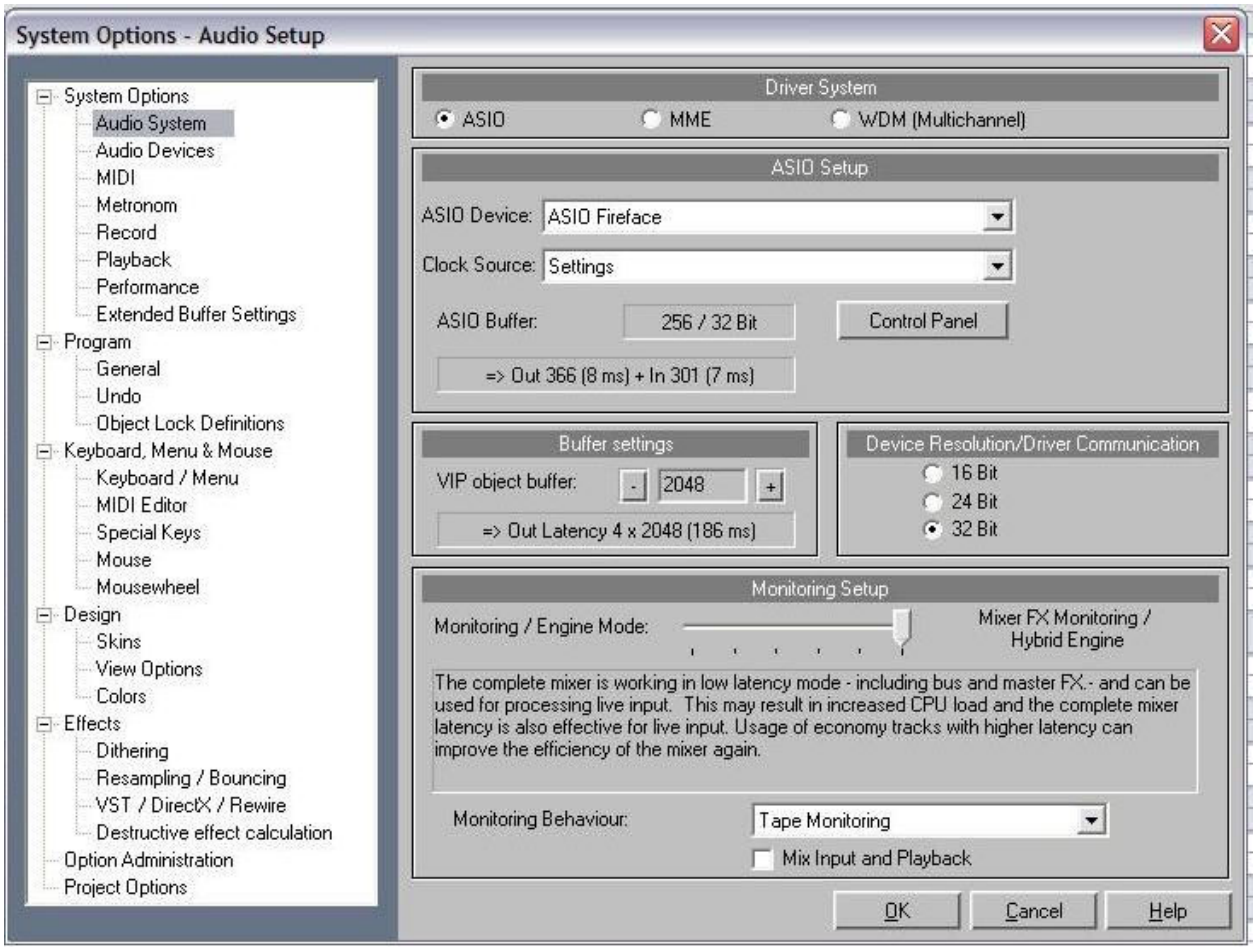
ASIO is ONLY necessary in these instances:

1- Low Latency Live Input Effect Monitoring of VST Plug Ins and VSTi's.
2- ASIO Direct Monitoring – Tape Style Punch In (only supported by some sound cards correctly)
3- ADAT Sync Transfers of multiple ADAT tape passes (Also known as ASIO Sync)
4- Hearing Effect Trails when hitting Stop on the Transport (Only Available in the Hybrid Engine)
5- The CPU load of the system drops, thereby freeing up resources for effects.
6- Driver-side synchronization between recording and playback. This fully synchronizes the timing of overdubbed recordings.
7- ASIO is suited to editing multi-channel audio. All bit-resolution and multi-channel problems which may appear with WDM drivers under Win2K/XP are avoided from the outset.

You will notice that ASIO is mostly only good for Tracking, Live Input Effects monitoring and Tape Style Punch Recording...with the only practical use for Mixdown is the Effect Trails feature at play stop and Surround Mixing.

Mixing your session will allow you to increase your ASIO buffers to high amounts of sample buffers or completely switching driver models to MME or WDM. This should allow you to maximize your system performance and lessen the CPU load while utilizing large amounts of Plug ins for DSP effects. Unfortunately, MME will soon disappear thanks to Vista only supporting the WDM driver model.

Press Y and Open your System/Audio Options



The installed sound cards/outputs (devices) are listed in the white window at the top of the dialog.

Device communication: Here you can specify the bit resolution for communicating with the audio driver for recording and playback. The preset value correlates to the value on the sound card installed on your system. If the output device is not able to display at the desired resolution, an appropriate lower solution will be dithered and sent to the driver.

Driver system: For the necessary communication between Sequoia and your sound card a so-called driver system is used. You have the choice between MME, multi-channel MME, and ASIO. MME is the standard Windows multimedia driver system. If your sound card supports 24/32-bit audio playback, but still experiences problems when playing high-resolution audio files, use the multi-channel MME (WDM-compatible). However, if your sound card model uses ASIO drivers,

you have some distinct advantages over MME…*See ASIO, What is it good for and when to use it above.*

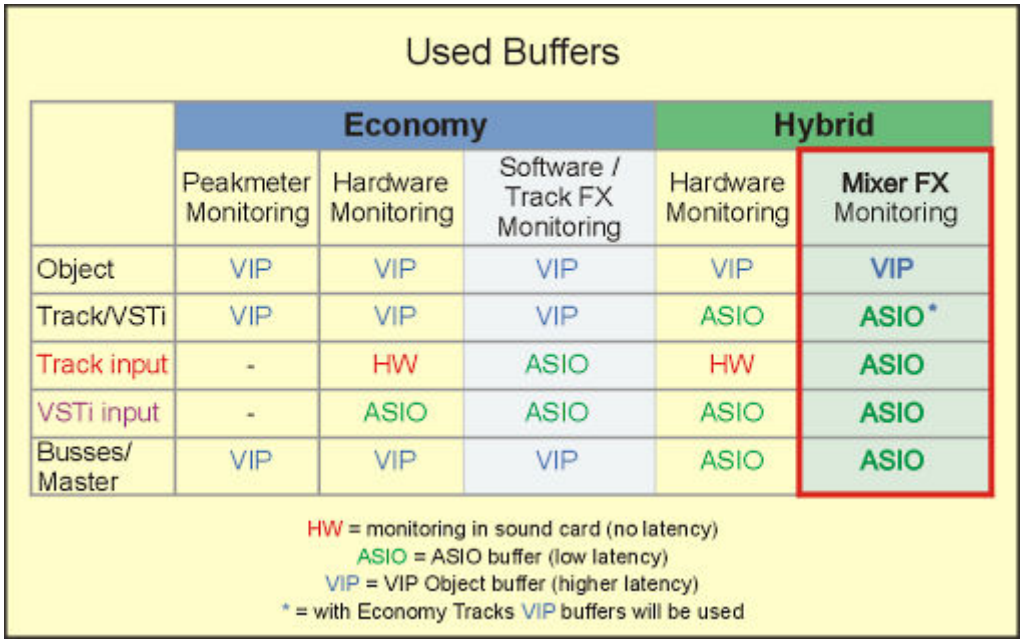
VIP Object Buffer: The VIP object buffer size should be in the range of 1024 and 8096 samples. As error-free playback is usually more important than fast reaction times, this value should be increased when playing lots of tracks. However you will notice that the GUI will become less responsive. For the MME driver system this is the only decisive buffer size for playback, while with ASIO the part of the audio data is processed with the VIP buffer size that concerns playback of objects and tracks from the hard disk as well as playback of Economy Tracks in the Hybrid Engine. Refer to the **Extended Buffer Settings** to learn more to see how various project Presets alter the settings of your VIP buffer and other Hard Drive Buffers.

Otherwise, the ASIO buffer size in the ASIO system mainly determines the latency and stability of the system. The VIP object buffer size has to be the same size as the ASIO buffer size, if the Hybrid Engine is used; it even has to be double.

Buffer settings: The buffer settings regulate the way the audio data packets are transferred to the sound card. When the buffer size sinks, so does the playback delay (latency). However, for buffer blocks that are too small the processor may be overloaded, which can result in audio playback errors. Increasing the buffer size increases the stability but also increases the memory requirements and response times of your system.

Monitoring/Engine Mode

As of version 9 we now have Two Audio Engines…the new Hybrid Engine and the Economy (Classic) Engine. Both engines have their strengths and weaknesses. They Hybrid Engine is designed for the best low latency performance, live input effects processing and monitoring (Yielding Higher CPU Loads). The Economy Engine (sometimes referred to as the Classic Engine), is there for older project compatibility and lower CPU loads.



No Audio Monitoring (Peakmeter only): Displays the input level, but cannot be heard. This mode is useful, for instance, if an external mixer is used for audio routing.

Hardware monitoring: Audio monitoring via sound card or external mixer hardware. With MME drivers, this is also the only monitoring type possible. With ASIO, many sound cards can directly process functions such as mute/solo, volume and pan. This allows for minimum latency even with large ASIO or VIP buffers, although no effects can be applied to the input signal.

Software monitoring / Economy engine: Audio monitoring taking into account the recording track levels and playing of software instruments. This monitoring option is only available when using ASIO drivers. No effects are applied to the input signals, latency and CPU load remains the same, thus is also low with complex projects.

Track FX Monitoring: Audio monitoring including the track effects of the record track. This monitoring option is only available when using ASIO drivers. This allows you to apply effects directly to input signals without taking bus or master effects into account.

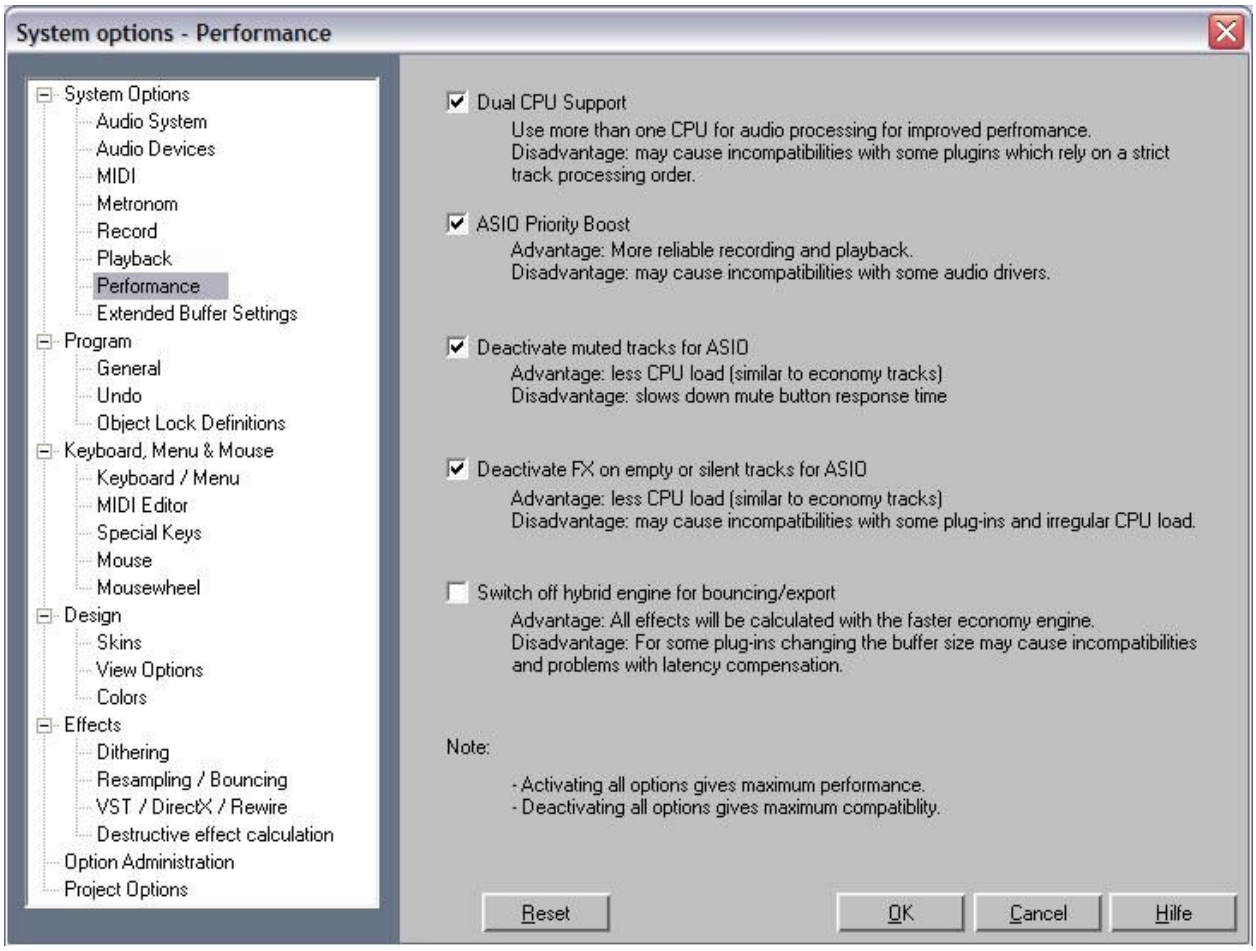
Mixer FX monitoring/Hybrid Engine: The Hybrid Audio Engine is based on the ASIO driver system and ensures lower input/output delay at equally high performance for optimizing the system, specially intended for use with software instruments and other plug-ins. It enables audio monitoring via the complete mixer, and also processes short-latency playback tracks in the mixer. This way you can also mix data from the hard drive with the lowest possible playback delay. We recommend this mode for input signals as well as for live mixing with hardware controllers, whereby access to all bus and master effects is guaranteed.

In general, "Hybrid" refers to a system in which two separate technologies are combined with one another. The Hybrid Audio Engine in Sequoia includes a combination of a low latency and the classical Sequoia playback engine with higher latency where a clearly defined signal flow between the two exists. The Low Latency Engine reduces response times when calculating track effects and enables Live Monitoring at lower latencies. The integrated classical playback engine on the other hand increases performance which allows the integration of sophisticated object effects, object auxiliaries, and object surround functions. The Hybrid Audio Engine is based on the ASIO driver system and, thanks to its low input/output delay at the same performance levels, optimizes the system especially when working with software instruments and other plug-ins.

Go to System Settings (keyboard shortcut "Y") >"Audio Setup" > "Driver System" and select "ASIO". While ASIO generally ensures that latency, independent of the hardware load, does not accept values that are too large, a low latency function can also be used if you tick the "Hybrid Engine"/"Performance Mixer" box in the Monitoring settings. The hybrid engine facilitates audio monitoring including track effects in the record track and also calculates the playback tracks at short latency times. Thus the entire Mixer can operate in Low Latency mode, including the bus and master effects, and can be used for editing input signals.

ASIO software monitoring is essential for working with VST instruments. We recommend activating the Hybrid Engine for lowest possible delay times. However, this results in an increased CPU load and that the full latency of the Mixer effects also affecting the incoming input signal. Use of Economy Tracks with higher latency may again improve the efficiency of the mixer as they are then edited with the larger VIP object buffers.

Select Performance

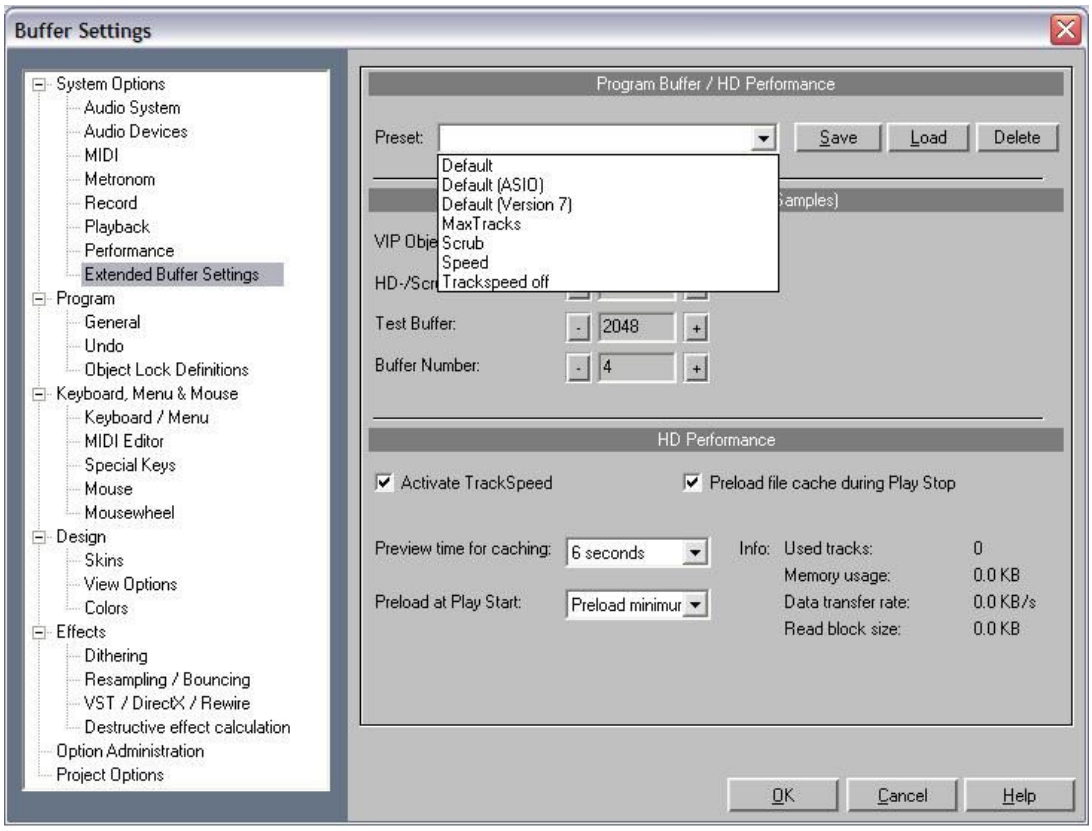


The tips about the Advantages and Disadvantages are clearly stated in the above dialogue box.

Many users are frustrated about the Dual CPU Support Option and unfortunately at the time of this writing the certain plugins support of Dual Processors is in question. So Users Beware. While certain Plug Ins are obviously of excellent quality and the choice of many Pro Users, we are at the mercy of all third party plug ins and how well they support multi processors.

Samplitude's own built in Effects offer many of the same quality effects and the come stock with the Pro version and do not exhibit these problems. Challenge yourself on a mix and see what results you are capable of achieving using only Samplitude's included DSP…I guarantee you will be impressed.

Select Extended Buffer Settings



Program Buffer/HD Performance

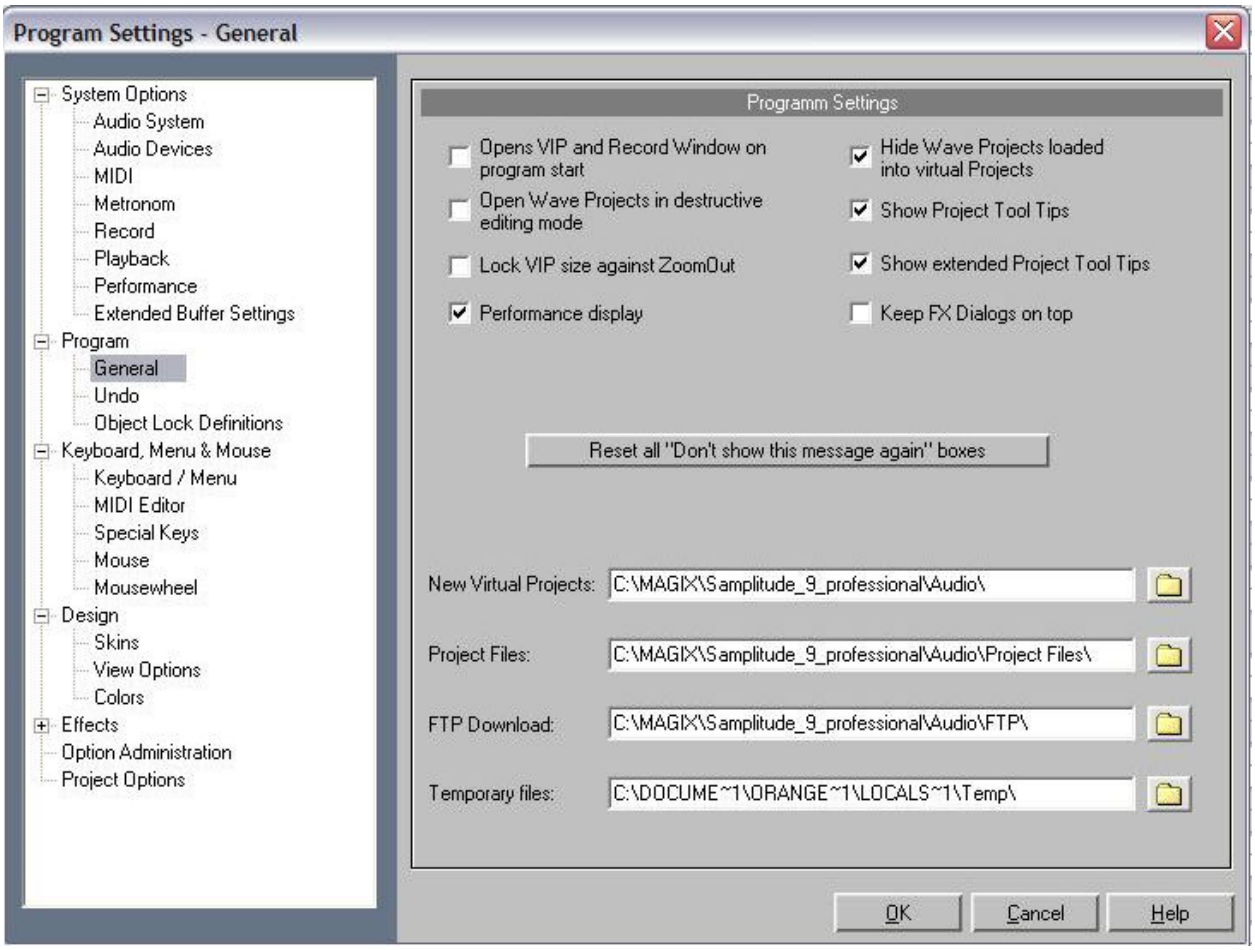
Choose the Preset that best suits your current work flow. Experiment with these settings and save them as your own Presets.

VIP Object Buffer: The VIP object buffer size should be in the range of 1024 and 8096 samples. As error-free playback is usually more important than fast reaction times, this value should be increased when playing lots of tracks. However you will notice that the GUI will become less responsive. For the MME driver system this is the only decisive buffer size for playback, while with ASIO the part of the audio data is processed with the VIP buffer size that concerns playback of objects and tracks from the hard disk as well as playback of Economy Tracks in the Hybrid Engine.

Track Speed and Stable Playback

Intelligent cache management means that the hard disk installed will be used to its fullest capacity - confining to history the old problem of too few tracks while producing with 24 bit/96 kHz. Stable playback: Arrangement playback has priority over all other operations such as opening menus. No more crashing or bumping playbacks.

Go to the General Tab



Make sure you set your New Virtual Projects and Project Files to a Secondary Hard Drive. I recommend trying to keep the same path settings that are displayed above but have that same directory on your "D" Drive for example…Your Temporary files should be on a location that has plenty of free space as well…

Path settings

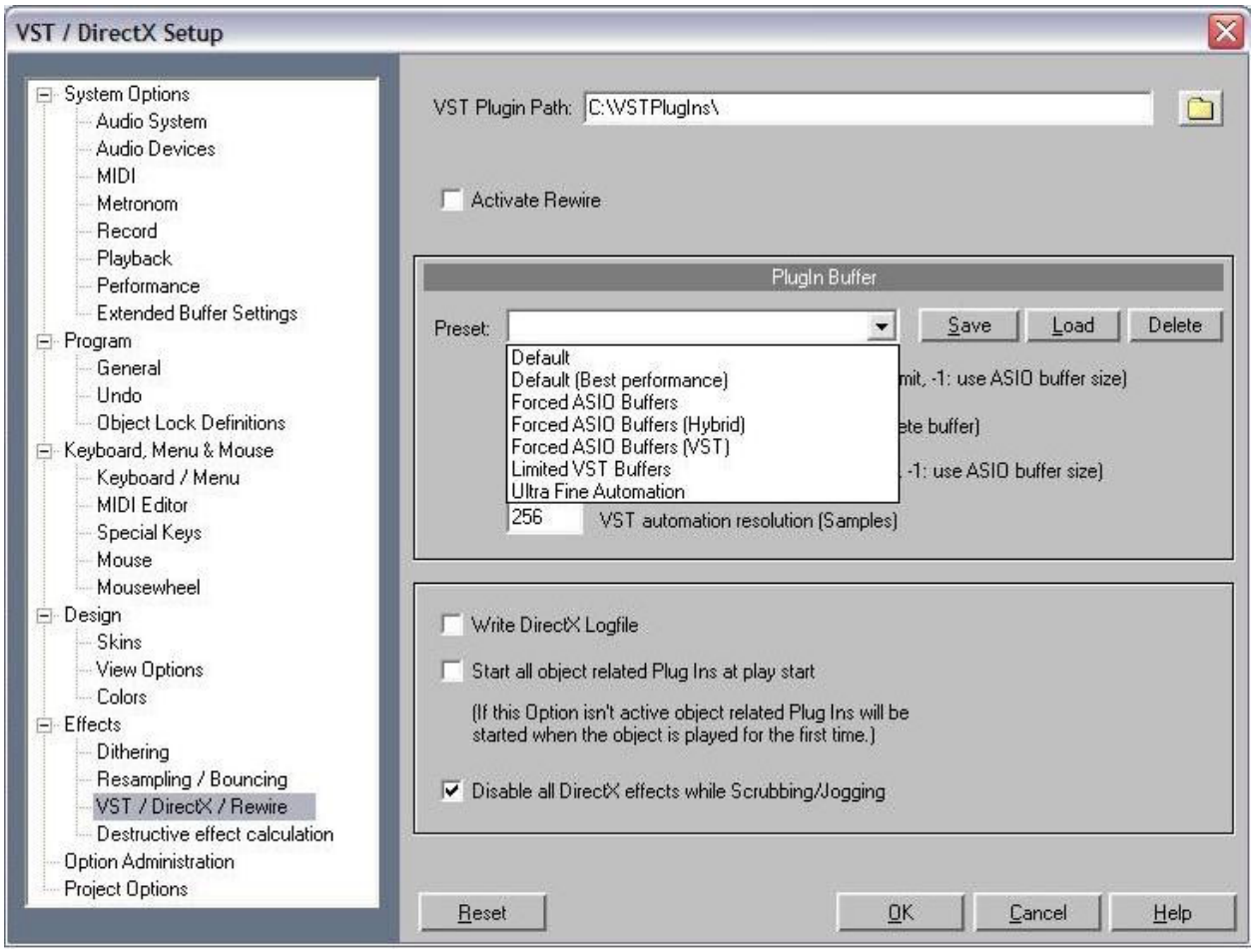
New Virtual Projects: all new VIPS and recorded or imported wave files are saved here.

Project Files: All other wave files saved on the hard drive that cannot be allocated to a specific VIP are saved here.

FTP download: All files downloaded via the integrated FTP client are saved here.

Temporary files: Default folder for temporary files. This folder should be on a hard drive or partition with sufficient free storage space.

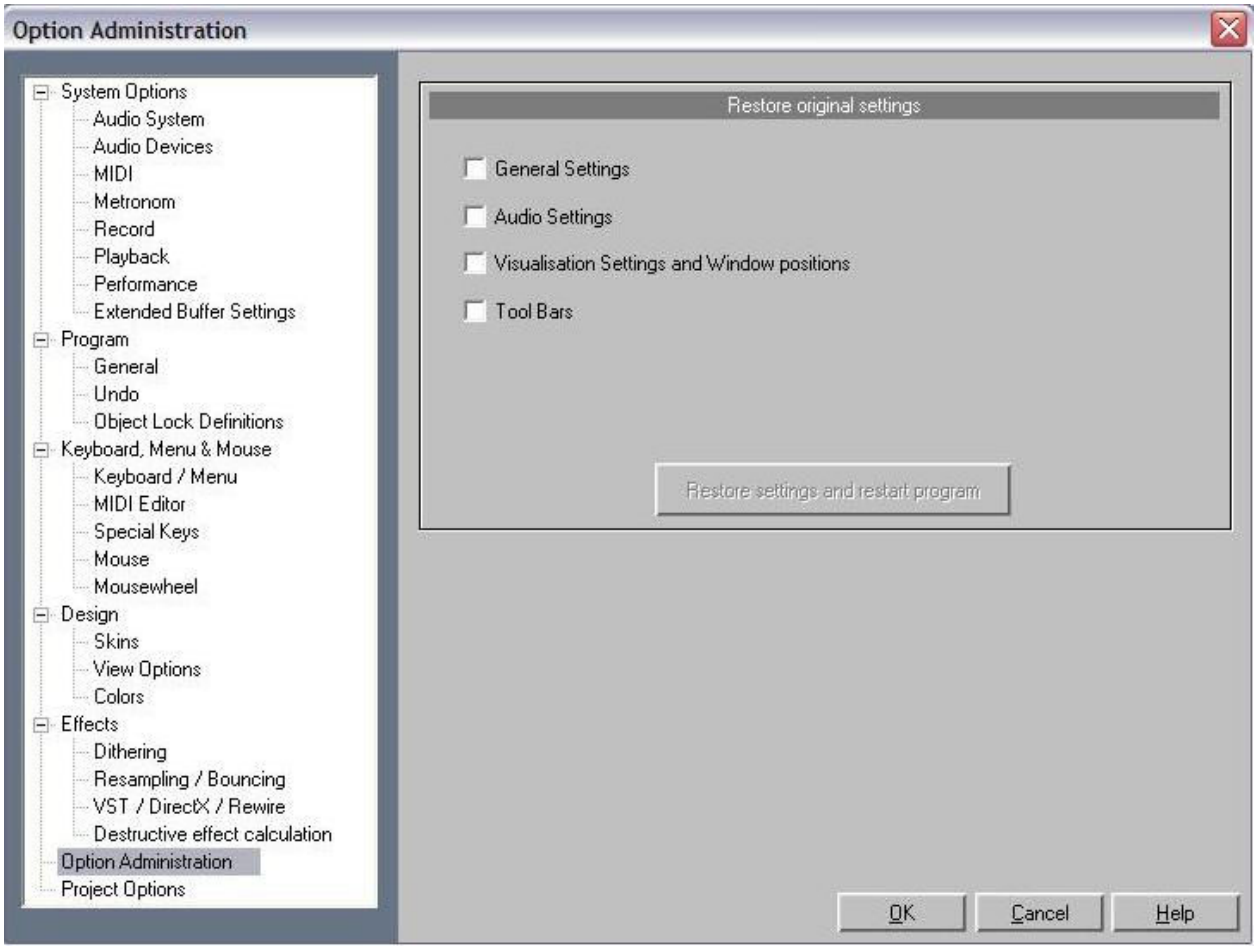
Select Effects: VST/DirectX/Rewire



Here you can select various presets depending on your particular work demands. For low latency use the Hybrid buffer and make sure you use the Hybrid Engine…for Max Trax use Best Performance…and feel free to experiment as each system is different as well as each session.

Another thing to “potentially” consider is check the Start all objects related Plug Ins at play start…helpful if you have plug ins on objects that make clicks or are not loading properly…

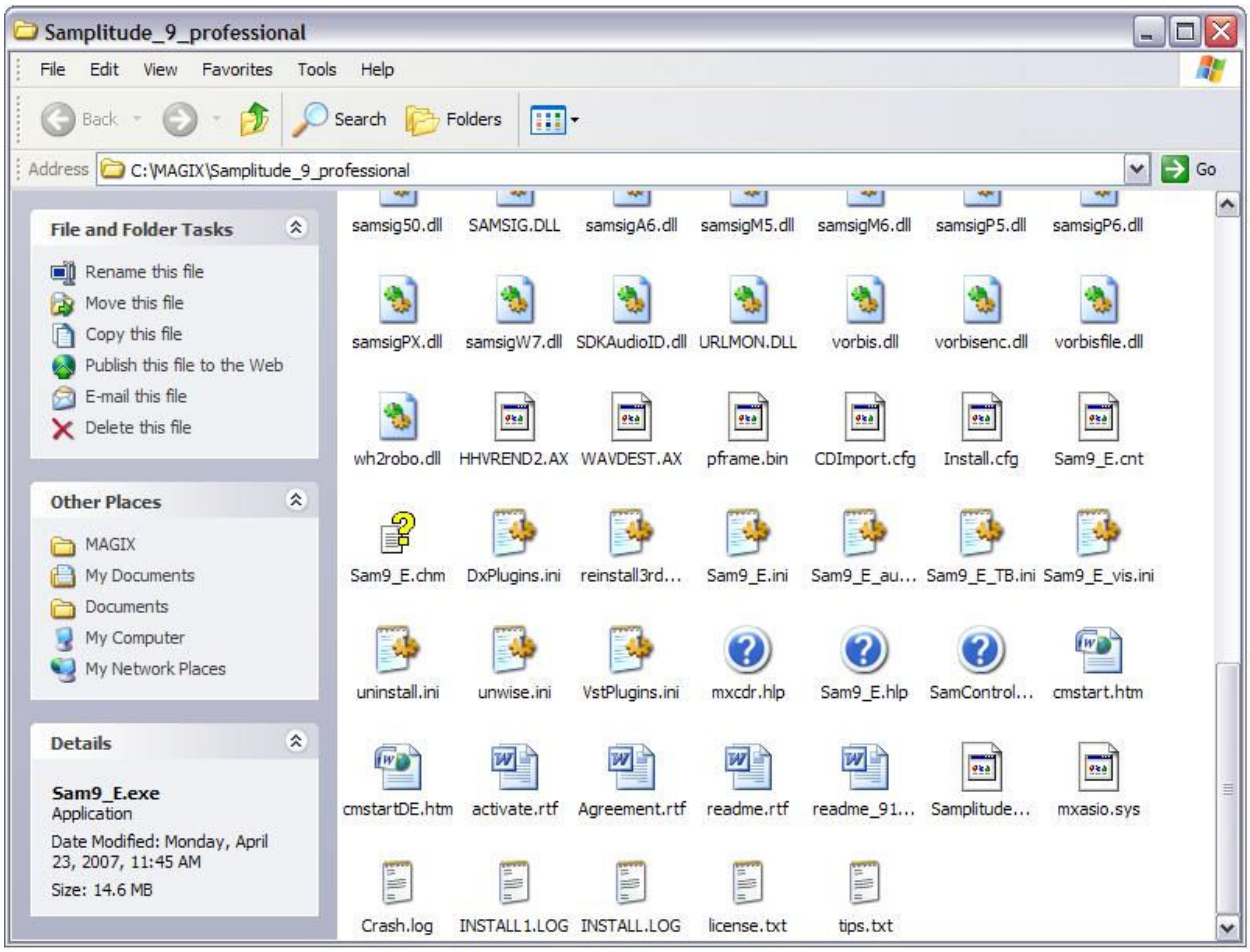
Select Option Administration



If you see Samplitude starting to act weird or can't resolve a problem sometimes it is necessary to reinitialize the program…this can happen when installing a patch and the ini may become corrupted.

With the new system options management page you can reset toolbars, audio settings, visualization settings, and general settings. Here, the corresponding ini. files are deleted/reset and the program restarts. CAUTION: This will remove all your preferences so only do this if you want to quickly trash the ini file…otherwise refer the to Manual Removal of INI files below…

Manual Deleting of the INI files

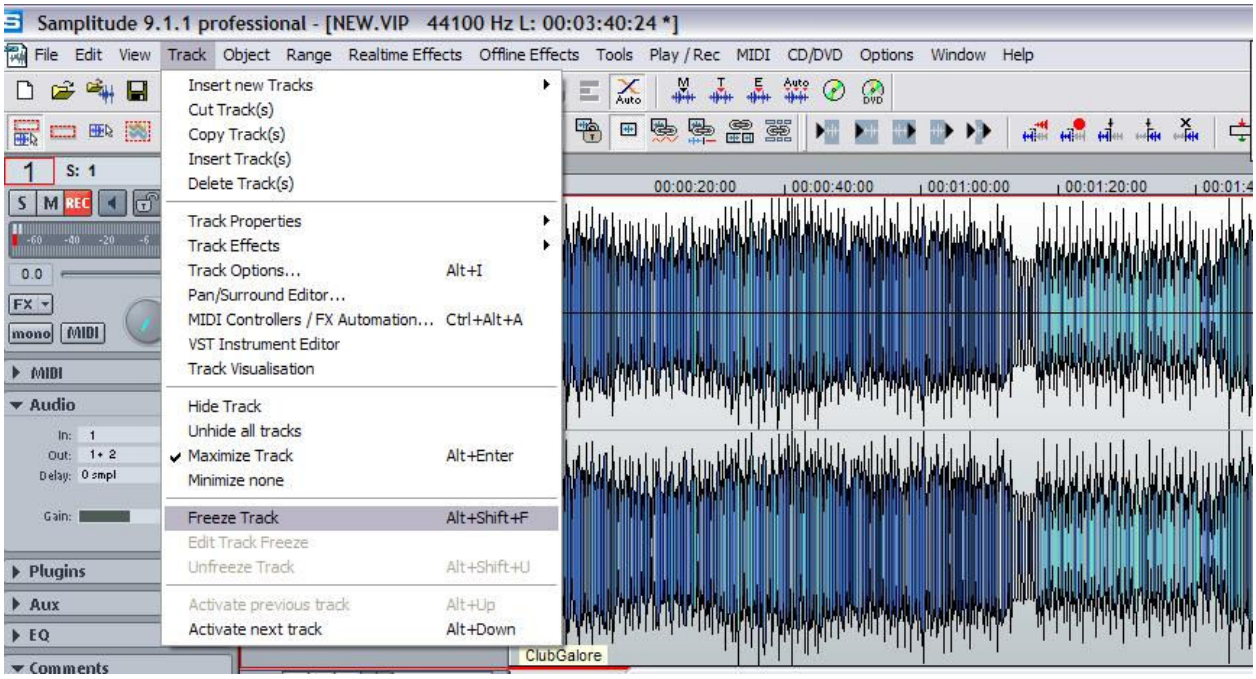


Make sure Samplitude is not open when performing this action.

Make sure your file extensions are showing…
Here is how: http://www.fileinfo.net/help/windows-show-extensions.html

You can cut the Sam9_E (General) the Sam9_E_audio (Audio) to re initialize the program in the event of a problem. You can paste the ini files to your desktop in case you want to return to the previous settings. Once Samplitude has been re-launched new ini files will be created. You will have to re-do your preferences and close Samplitude to create the new ini files.

Track Freezing



Samplitude has THE most comprehensive Freezing Options known today. No other application can Freeze Tracks, Auxes, Busses, VSTi's and do it so quickly. Freezing will allow you to regain precious CPU power when track counts and plug ins begin to escalate in your session. You basically have limitless possibilities with DSP and can also free up processor dependant plugins like a UAD-1.

Freeze Track /Edit Track Freeze/Unfreeze Track

The selected track is saved as a wave file replacing all objects of the active track. The object and track effects are also added, so that the CPU load resulting from CPU intensive effects and plug-ins is reduced.

The benefit of Track Freeze is that the frozen tracks are saved in a separate VIP and can be recalled anytime. This means that you can even work flexible with less powerful PCs and keep resource usage to a minimum.

Track freeze for AUX busses/submix busses

Bus/aux bus tracks can be frozen just like regular tracks. This enables a complete group of tracks to release the required CPU load including all effects, fades, crossfades and automation settings in one step.

Submix bus

- Tracks routed onto the submix bus are not changed but remain instead.
- The submix bus is muted (menu "Track" > "Track options" > "Mute bus input").
- The file created while freezing is inserted into the AUX track as an audio object.
- Changes made to the tracks after freezing which are routed to the submix bus have no effect on the signal output while playing.

AUX bus

- Only AUX send settings in tracks are taken into account (not in objects)
- Tracks routed onto the frozen AUX bus are not changed but remain unchanged instead.
- The AUX bus input is muted (Menu "Track" > "Track properties" > "Mute bus input").
- The color of the AUX send fader (mixer) in the affected tracks is blue.
- An asterisk is added before the name above the AUX send faders (mixer).
- The file created while freezing is inserted into the submix track as an audio object.
- Changes made after freezing to the tracks transmitting to the AUX bus are not updated in the file created while freezing. Therefore, if objects are moved into tracks transmitting to an AUX bus, the audio signal on the corresponding AUX will remain the same.

Freeze Objects

This function renders each individual Object to a new audio file which then replaces the original Object in the VIP. This is advantageous if, for example, you want to activate very system-draining real-time plug-ins. The original Object always remains preserved and can be re-edited using the "Edit Object Freeze" or can be recalled using "Object Unfreeze".

If more than one Object is selected, the function will be applied to each individual Object. Fade-in, Fade-out and Object volume are not calculated, as these properties are taken over by every new Object.

Note: To make a single Object out of a many Objects, select the appropriate Objects in the track and use the "Glue Objects" function.

Edit object freeze

Opens the root VIP of the frozen Object. This VIP contains tracks with the original Object(s).

In the case of "Glue Objects" the root VIP contains more than one Object, whereas for "Object Freeze" it contains only one.

Warning: The length of the root VIP can not be changed, as the length is set by the Object to which the "Freeze" or "Glue" function was applied.

Object unfreeze

The function can only be used on Objects which were created by "Glue Objects" or "Freeze Objects".

It recalls the Object(s) stored in the root VIP. Changes made in the root VIP will be included.

Tip: If tracks are added to the root VIP, it is not possible to use "Unfreeze Object".

The root VIP is the project which was created by freezing a track or Object.

Freezing instruments (Freeze)

Software instruments require CPU power for playback, which at some point can be quite considerable and is required during every playback. Therefore, please use the Freeze function to release the CPU power for VSTi tracks temporarily. You retain full control over the MIDI Objects of this track, which can be restored ("de-frozen") at any time.

To "freeze" an instrument, select the "Track Freeze" option in the track menu (keyboard combination: Ctrl+Shift+F). After a short processing time, all MIDI and audio Objects are replaced by a single, resource-friendly 32bit stereo audio Object, which is now played back instead of the original Object and the instrument. The existing automation data and track effects are already included in this Freeze Object.

The actual instrument of this track is no longer addressed by MIDI files of this track and can even be deactivated, provided that it is not used by other MIDI tracks.

Select "Track Unfreeze" (Ctrl+Shift+U) to change the original MIDI data at a later point in time that was 'frozen". The track is now returned to the state in which it was 'frozen', but again requires the initial CPU power for processing the instrument.

Alternatively, you can use the feature "Edit Track Freeze". In this case a new single-track VIP is opened with the original track. This track cannot be played together with your arrangement. As soon as you save this project, a new Freeze Object is processed and included in the original project.

Freeze also works with single outputs in different tracks than the main output track (Instrument outputs 1+2). You can also freeze these tracks if they do not contain MIDI information and do not hold Objects. The MIDI data that has been routed to the track or to the individual output of the instrument automatically creates an audio file that is now played instead of the original instrument. In order to prevent double playback of the data, deactivate the single output of the instrument manually in the frozen track.

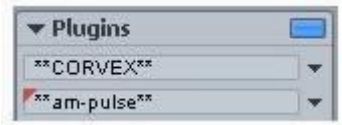
To edit Freeze data you cannot only use the Track Freeze Edit Function as there are is no MIDI data available on this track that could be edited. Therefore, "unfreeze" the track and edit the MIDI data of the send track. You can then refreeze the track.

Note: As long as the instrument is not entirely unloaded from the track it remains loaded into the RAM memory of the system. Samplers or instruments that require considerable amounts of memory also require this when their Insert Tracks have been frozen**. The new "Inactive" state for VST instruments and VST effects helps solve this dilemma!**

The new "Inactive" state for VST instruments and VST effects

Plug-ins can now be completely deactivated so that memory space can be freed up. When reactivating the plug-ins the last state is restored in its entirety.

If you set VST plug-ins to "Inactive" by pressing "Shift+Alt+Click" in the plug-in slot of the corresponding track, these plug-ins are completely removed from RAM. This way, no more resources are used in conjunction with the hardware systems like "PowerCore" or "UAD".



-is automatically set when deleting the plugin (important for undo). With this behavior also Powercore resources should be cleared

-activated when doing Freeze VSTi

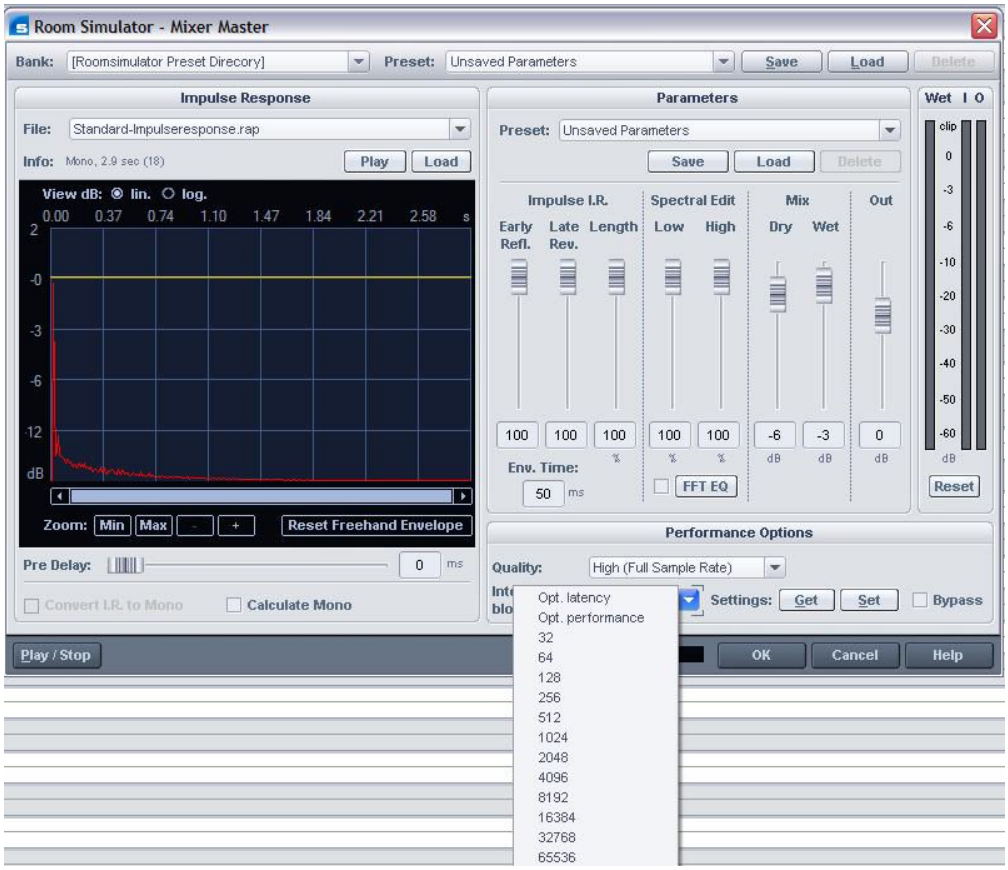
-shown as **Plug-In name**

-is reset when turning on the VSTi again

-can be loaded and saved

-Plug-In can manually be set to inactive using Shift+Alt-Click on object,track or master slots to switch the plugin off

Room Simulator Optimization



Since 9.1 the Room Sim has undergone major improvements for low latency and better CPU utilization.

Performance Options

Internal Block Length: Parameter for block length defaults upon which the folding operation is calculated internally.

Short block lengths increase the number of arithmetic operations required. This increases the load on the CPU. Large block length leads to irregular CPU load.

The optimum for real-time processing tends to be about 16,384 to 32,768 samples.

For use in the AUX, track or master without low latency, the setting of 8192 or lower is recommended on faster systems (from Pentium 1800 or Athlon XP) for acceptable response latency.

For use in low-latency conditions, the value can be reduced to 32 on faster systems (from Pentium 2800).

Hint: It doesn't make sense to set a value smaller than the set buffer size. If the value corresponds to the ASIO buffer size, the room simulator processing is latency-free (only with "higher quality").

With latencies smaller than 4096, the restriction is that the FFT filter can no longer be used. With custom impulse responses you can also apply the FFT filter destructively to the impulse response before applying the room simulation.

When using the room simulator for destructive processing, the parameter is raised internally, as processing with a lower latency would in this case result in a useless increase of the necessary CPU operations.

Quality: In the two **normal** modes, room simulation is calculated at half the sample rate. This is perfectly sufficient in most cases, since natural or digital impulse responses typically possess components of less than 10 kHz. (you can check this in the integrated FFT filter's spectral editor). Many older reverb devices at half the sample rate computation above the frequency range that is inefficient use of the CPU.

Both **normal** modes differ only in the quality of the resample used for sample rate decrease. The "normal" resampling quality is nevertheless quite high. Only in exceptional cases should **normal** plus mode be used (and in which arithmetic performance increases slightly).

High mode calculates the entire frequency range, doubling the load on the CPU when compared with **normal** mode.

Retrieve, Set: Saves and set the quality options globally. Different settings are recommended for use in objects, tracks, etc.

Quality

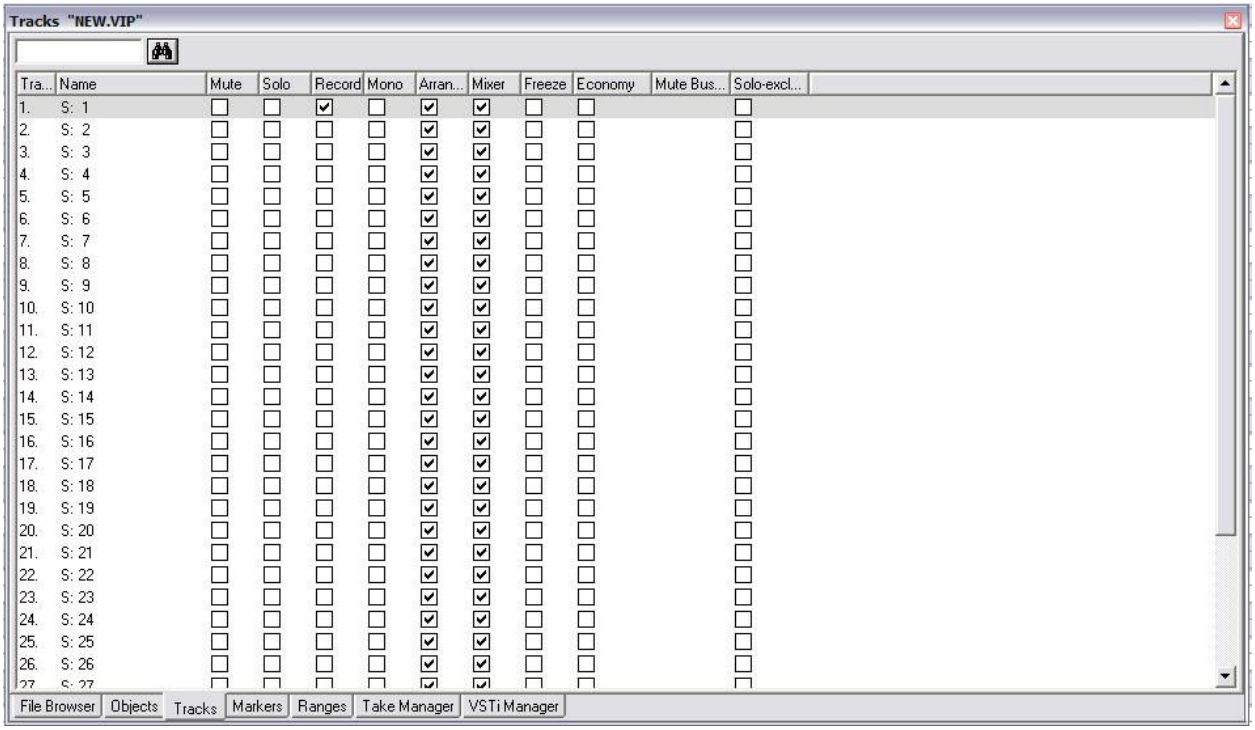
"High Quality" setting Double (Factor 2:1)

Latency

Low internal buffer size (2048 samples): Increase of ca. 50 percent (factor 1.5)

Very low internal buffer size (128 samples): Increase of ca. 150-200 percent (factor 3-4)

Economy Tracks



You know about Freezing Tracks…well look at Economy Tracks like they are Refrigerated Tacks.

To save system resources you can set up a track with effects that will not be used for input monitoring as an Economy Track. Go to "Track > Track Properties > Economy Track.

This allows you to actually set the latency on a per track level and free up resources for only the needed live input channels you may want to use. As your project grows you can still achieve lower latencies when using this incredible feature.

Once you have selected the ASIO Hybrid Engine or MME as a driver system, you can remove individual tracks from the Low Latency Engine and route the signal via the High Latency Engine. This way your system's processor is not overworked; on the other hand, however, delay time during playback monitoring does increase. *Tracks, whose properties in Hybrid Mode are set to "High Latency Processing", are marked with a green dot in the volume display of the corresponding channel in the Mixer as well as in the Track Editor.*

Hint: Muted Economy Tracks do not use up system performance for processing effects or preloading from hard disk, and thus replace the "Mute inactive" status known from previous Sequoia versions. The Hybrid Engine compensates the latency of track effects in economy tracks so far that the total latency of the mixer for other tracks does not increase.

Tutorial Videos

http://support.magix.net/boards/samplitude//index.php?showtopic=12479

http://support.magix.net/boards/samplitude//index.php?showtopic=12091

http://www.youtube.com/results?search_query=Samplitude&search=Search