

APS Software Version 1.6 Addendum

Overview

Thank you for downloading E-MU's new Audio Production Studio (APS) Version 1.6 software. E-MU is proud to continue its support for the APS and its users with this update. APS Version 1.6 was designed to emulate the behavior of Version 1.5 as much as possible, but that didn't stop us from adding a host of great new features.

Version 1.6 Software is for Windows 2000 and XP Operating Systems only. Users running Windows 95/98/ME should install Version 1.5 instead.

- Windows 2000 and Windows XP Support
- 2ms Minimum ASIO Latency
- ASIO 2.0 Direct Monitoring
- Multiple MIDI Application Support for Synthesizers
- 340 MB SoundFont Sample Support
- MMA Downloadable Sample Support (1.x & 2.x)
- Sound Blaster AWE NRPN Implementation
- SoundFont Bank Manager Individual Synthesizer SoundFont/DLS Configurations
- Microsoft Multimedia Extensions (MME) Mixer

System Requirements

The APS card works with the following standards:

- Windows® 2000 and Windows XP
- Sound Blaster MIDI and General MIDI
- Sound Blaster PCI
- Microsoft® DirectSound® and derivatives
- PCI 2.1 compliant
- ASIO™
- SoundFont® 2.1

Installation Notes

Windows Driver Signature

When you install the APS drivers, you will see a dialog box that looks like:



The APS drivers are not signed because the driver does not support some of the consumer audio features that the Microsoft driver signing program requires, most notably Digital Rights Management.

However, the APS drivers have been rigorously tested using the same test procedures that a signed driver requires, and it passes in all important categories, including those that measure the relative stability of the driver. So, it is perfectly safe to install these drivers on your computer.

► To use APS with Sound Blaster Live, Sound Blaster Audigy, or Sound Blaster Audigy 2

If you intend to use these products in the same system, we highly recommend you install drivers and software for these products BEFORE installing drivers and software for APS. Doing this in the reverse order may result in an installation that does not properly work with the APS.

New Features

The following are the new features supported by APS V1.6:

Windows 2000 and Windows XP Support

The APS V1.6 driver is a native Windows Driver Model (WDM) driver that runs under these operating systems. We recommend you install all the latest Service Packages for your operating system, as well as DirectX 8.1, before installing APS V1.6 software.

The driver and application suite has been tested on a variety of system configurations, including those using Dual Processors and Hyper Threaded Processors, and have been shown to work reliably in these environments when sufficient RAM is present. (256MB and up.)

2ms Minimum ASIO Latency

The APS V1.6 driver allows you to set the ASIO buffer latency as low as 2 ms, an improvement over APS V1.5's low limit of 10 ms.

ASIO 2.0 Direct Monitoring

The APS V1.6 driver supports the direct monitoring feature of the ASIO 2.0 specification.

Users will note that as they activate monitor inputs and adjust monitor levels, this ultimately ends up controlling the E-Control mixer strip monitoring functions.

To use Direct Monitoring, you should first run E-Control and add all Analog and Digital strips before running your ASIO 2.0 compliant application.

Multiple MIDI Application Support for Synthesizers

The APS V1.6 driver allows you to run multiple MIDI applications that access the same Synthesizer simultaneously and seamlessly.

This is an improvement over APS V1.5, which, for example, would not allow use of the SoundFont Bank Manager virtual keyboard while running a MIDI sequencer.

Each MIDI application accessing the same Synthesizer (either Synth A or Synth B) gets its own set of 16 MIDI channels, so MIDI state is preserved between all applications.

340 MB SoundFont Sample Support

The APS V1.6 driver now allows you to load as much as 340 MB of SoundFont samples into host memory, an improvement over APS V1.5's limit of 32 MB.

To achieve this upper limit, you should have at least 1 GB of RAM installed in your system. This is because of the way Windows allocates available memory to running applications.

Additional information on configuring memory for APS can be found on page 9.

MMA Downloadable Sample (DLS) Support

The APS V1.6 SoundFont Bank Manager now allows you to load sample banks in the DLS 1.x or DLS 2.x format, as well as “RIFF MIDI” files that contain embedded DLS 1.x or 2.x sample banks.

Sound Blaster AWE NRPN Implementation

The APS V1.6 driver supports the Sound Blaster AWE NRPN implementation, along with the original E-mu APS NRPN implementation.

The Sound Blaster AWE NRPN implementation is used in a number of external MIDI controllers and software applications.

SoundFont Bank Manager Individual Synthesizer SoundFont/DLS Configurations

The APS V1.6 SoundFont Bank Manager now allows you to load individual SoundFont files into the individual A and B synthesizers. However, this feature is not activated by default, so as to not confuse those who are used to the previous behavior.

To activate this feature, located under View, select **SoundFont Devices** and uncheck the option labeled **Load In All Devices**. From there, you may select which SoundFont device you want to configure by highlighting the synthesizer listed in the Device Panel.

Note that when running in this mode, snapshot files (*.SBS) that are saved will represent the currently selected synthesizer, not all synthesizers installed in the system as it is with the default mode.

Microsoft Multimedia Extensions (MME) Mixer

The APS V1.6 driver supports MME Mixer driver model. Consequentially, the Microsoft mixer will now allow you to control parameters that, in APS V1.5, were only available in E-Control.

This makes it possible to use APS with Microsoft Windows applications that require access to Monitoring and Recording controls.

Reset DSP

The APS V1.6 E-Control application has an option to “reset” the audio processor. The reason for this is that APS V1.6 exposes the audio processor DSP functionality to other clients, such as the Microsoft Mixer interface. Such clients could introduce errors in the DSP state, either due to a software bug, or simply due to a desire to configure the DSP in a way that is not compatible with E-Control.

Such an action could possibly cause a disconnect between the E-Control program and the DSP parameters. APS V1.5 did not have need for such an option because E-Control was the one and only piece of software that could possibly program the DSP.

This Reset DSP option is present in the Start menu. This option may be used when the Windows is running in “safe” mode, in the unlikely event that the system is unable to boot normally due to such a corruption.

Known Issues and Limitations



Your privileges must be set to the “Administrator” group in Windows in order to use the Reset option. Set your User to the “Administrator” group, located under “User Accounts” in the Windows Control Panel.

Multichannel Audio and SONAR

APS is a stereo card, and therefore does not natively support the Microsoft multichannel streaming format (WAVEFORMATEXTENSIBLE). The Microsoft Kernel Mixer will render such content to stereo.

The greatest drawback to APS customers is that all of the APS outputs are not exposed to the WDM Kernel Streaming layer, and are therefore not exposed to Cakewalk SONAR when using Kernel Streaming audio rendering.

For using APS with Cakewalk SONAR, we recommend using SONAR version 2.2, which has ASIO support.

Microsoft Mixer Limits

The Microsoft Mixer support is a convenience when using standard Windows applications, but it is by no means a replacement for E-Control.

We highly recommend that in the music-authoring environment, the user refrain from using the Microsoft Mixer and instead use the E-Control application and/or the ASIO 2 driver feature.

The following are the major issues with the Microsoft Mixer Program.

- The Microsoft Mixer program does not expose features such as an auxiliary bus, insert effects, and non-standard parameters such as trim pots and solo.
- The Microsoft Mixer does not support the notion of dynamically added mixer strips, like E-Control does. For this reason, the Microsoft Mixer will only expose those physical input strips that were showing in E-Control at the time the Microsoft Mixer program was launched. To see new strips that you create in E-Control, simply shut down and restart the Microsoft Mixer.
- User strips will never appear in the Microsoft Mixer.
- The Microsoft Mixer does not expose all possible record sources that are available in E-Control.
- The Microsoft Mixer's "Wave" strip does not control hardware at all. It simply maintains software state which is applied as Wave Out / Direct-Sound / KS streams are added. For this reason, the "Wave" strip does not attenuate ASIO streams, or in any way correspond to the "Wave" strip in E-Control.
- The Microsoft Mixer's "CD" strip also does not control hardware at all. it simply attenuates the signal that comes across through CDDA digital extraction (see CD listening section below). For this reason, the "CD" strip does not in any way correspond to the "CD" strip in E-Control.
- Due to UI constraints, the settings in the Microsoft Mixer may not properly reflect those in the E-Control at all times.

ASIO 2.0 Direct Monitoring Limits

The APS does not support routing with its Direct Monitoring feature. All ASIO direct monitoring will be heard through the outputs set by E-Control as the Main Mix.

APS inputs that are stereo in nature (D1, D2) do not support ASIO 2.0 Direct Monitoring Pan, when they are used as mono sources.

Also, monitoring the individual mono sides of APS stereo inputs is such that monitored audio may only be heard out the respective speaker. For example, D1 Left may only be monitored from main out left, and D1 Right may only be monitored from main out right. To minimize confusion, we recommend configuring sequencer tracks that use APS stereo inputs as stereo tracks.

Due to UI constraints, ASIO monitoring level state is not reflected in the E-Control Mixer.

Direct Monitoring will not work as expected on “overloaded” ASIO record sources. (When E-Control Record section is set to ASIO mode).

Cubase SX

Support for the SoundFont features in APS requires Cubase SX version 1.03 at a minimum.

APS does not support ASIO 2.0 Direct Monitoring Pan for individual mono (L/R) sides of stereo input sources (D1, D2). With this, we recommend only using APS Stereo input sources (D1, D2) with Cubase Stereo tracks.

However, in the event that you absolutely need to use APS Stereo input sources with Cubase Mono tracks, and that you want to use the Direct Monitoring feature, you should configure Cubase SX to use the -6db Pan Curve (under Project Settings). Not doing so will result in anomalous behavior when using the Direct Monitoring feature.

When loading a Cubase SX Project (.CPR) file, Cubase will automatically unload all SoundFont files that may have been loaded by the SoundFont Bank Manager. This may prove to be inconvenient for those who use the SoundFont bank manager for configuring SoundFont data. Note, however, that Cubase SX does support loading SoundFont files directly into the APS synthesizers, and also the saving and restoring of loaded SoundFont states within the Cubase Project file itself. So, you may want to use Cubase SX itself in place of SoundFont Bank Manager.

When selecting Reset All under Devices / Device Setup, Cubase SX will hang. This is known to happen in Cubase SX version 1.05 and lower. We are working with Steinberg on a resolution to this issue.

Hibernation and Standby Modes

Our testing shows that APS may not properly function after the system restores from hibernation or standby modes. We recommend users do complete shutdowns when powering off your computer.

E-Control ASIO Recording Override

APS version 1.5 allows the user to override any pair of ASIO record sources, to allow them to record any record source available in E-Control using ASIO.

APS version 1.6 still supports this feature, but all recording is at 0 db, so the user does not have the option to change the record volume in this mode like they did in version 1.5.

Also, when overriding the ASIO record source, the ASIO 2.0 Direct Monitoring feature will not work on the overridden source.

CD Listening and E-Control CD Input

Modern operating systems, such as Windows XP, enable CD Listening by running software that extracts the digital audio data directly from the CD (in the same way it would read a file from a CD-ROM) and then renders the audio through the standard audio driver, which under Windows XP would be DirectSound.

This process is called CD Digital Audio (CDDA) digital extraction.

This feature is quite convenient in that it permits the user to install audio products and listen to CDs without needing to concern themselves with external cabling.

However, this does lead to confusion when using audio hardware designed and installed for such external cabling, such as the APS.

For example, if your CD player is using CDDA digital extraction, you will not be able to attenuate the signal using E-Control CD Strip. In fact, you will find that you would need to use the E-Control Wave Strip in order to attenuate the signal, which in the absence of the above explanation would be a bit confusing.

The only way to make it so the CD Strip in E-Control attenuates CD signal, you need to do two things.

1. Be sure the CD S/PDIF cable is properly connected.
2. Make sure your CD Media Player is configured to NOT use CDDA digital extraction.

In Windows Media Player 8, for example, this can be configured in the following manner:

1. Under the Tools / Options / Devices, select the CD player whose digital output you have connected to the E-Card.
2. Click on Properties. Under playback, select the "Analog" option.
 - Note that in this panel, "Digital" implies "Digital extraction", not CD Digital cabling.

You may need to perform this second step in different CD Media Players you may be using.

SoundFont Features under Windows XP



Note: This **WINDOWS** directory may be different, depending on how Windows is installed.

Gaming Applications

APS has been tested and proven to work in a gaming environment as an ordinary 2-channel card.

However, it does not support DirectSound 3D or EAX technologies. For these kinds of features, we would recommend the Sound Blaster Audigy 2 product.

Digital Rights Management

As a professional audio card, the APS V1.6 driver does not support the Microsoft Digital Rights Management protocol. As such, attempting to play copy-protected WMA files through APS may not work.

If you are having trouble getting SoundFont features to work with various programs (Vienna SF Studio, SONAR, Cubase, etc.), you are advised to read the following.

First, be sure you install the SoundFont Edit Engine patch provided on the website where you got this driver update. Next, check the version number of the following file in your Windows directory:

C:\WINDOWS\SYSTEM32\SFMAN32.DLL

If you cannot see this file, do the following from any Explorer window:

1. **Tools -> Folder Options -> View.**
2. Uncheck "Hide Protected Operating System Files".
3. You will be given a warning. Select **Yes**.

If this file is version 5.12.1.xxx or greater, there is no need to read on; simply contact the manufacturer of the program you are having trouble with. If this file is version 4.6.0.xxx, read on.

A copy of a file called "SFMAN32.DLL" was installed in the same folder where the APS SoundFont Bank Manager is located.

► To Find this Folder:

1. **Start -> Program -> E-mu APS.**
2. Right-click on **SoundFont Bank Manager**.
3. Select **Properties** in the dialog that follows, click on **Find Target**. In this window, you should see the above mentioned file. If you do not, do the following:
4. **Tools -> Folder Options -> View**
5. Uncheck, "Hide Protected Operating System Files".
6. You will be given a warning. Select **Yes**.
7. This file needs to be **COPIED** into the directory containing ANY program that needs to use SoundFont features.

Details on the Technical Issues

Windows XP has fully-featured Sound Blaster Live! driver files as part of the OS install, and therefore protected by the OS file protection system. This means any attempt to replace one of these files with an unsigned version will result in the operating system automatically and silently replacing that file with the older version.

As mentioned earlier, APS is not a signed driver. Also, the Sound Blaster Live's version of SFMAN32.DLL (version 4.6.0.xxx) is not compatible with the APS driver. (APS driver needs version 5.12.1.xxx or greater.) For these reasons, we need to resort to the above mentioned workaround.

FOR ADVANCED USERS ONLY:

Optimizing your Computer's Memory for SoundFonts

The Windows Memory Management registry settings can be adjusted to increase the maximum SoundFont Bank size for a given amount of RAM.

WARNING: Back up your system before changing any settings. If you use Registry Editor incorrectly, you may cause serious problems that may require you to reinstall your operating system. E-MU Systems cannot guarantee that you can solve problems that result from using the Registry Editor incorrectly. Use Registry Editor at your own risk.

Here are the details regarding Windows Memory Management registry settings vs. SoundFont memory limits. The following registry settings change the way Windows allocates memory for all the different OS components. The following is the key to the Memory Management registry using regedit.exe:

HKLM\System\CurrentControlSet\Control\Session Manager\Memory Management

These are the settings our internal engineering staff came up with, to maximize memory use for loading SoundFont files.

Physical RAM (MB)	NonPagedPoolSize	PagedPoolSize	SystemPages
(a) <= 512	0	0xFFFFFFFF	<default>
(b) > 512 & < 1536	0x8000000	0xFFFFFFFF	0

For a system with 512 MB or less physical RAM installed, use the settings specified in (a). The maximum amount of SoundFont bank that can be loaded in this configuration is about 340 MB.

For a system with 768 MB or 1 GB or less than 1.5 GB physical RAM, use the settings in (b). The maximum amount of SoundFont banks that can be loaded in this configuration varies between ~340 MB and ~480 MB.

For systems with more than 1.5 GB of physical RAM, do nothing. Your system is already optimized.

► Step by Step Instructions for Windows Memory Optimization

1. Click on Start, then select Run.
2. Type "regedit". Up will come a small tree view.
3. Look for the main tree branch called "HKEY_LOCAL_MACHINE" and open it.
4. Open the branches in the following path:
System\CurrentControlSet\Control\Session Manager\Memory Management
5. Find the key labeled "PagedPoolSize". Double-click on this key.
6. Type in the following under Value: 0xFFFFFFFF (*note that is 8 F's*).
7. Click on OK.

If you have more than 512 MB but less than 1.5G, do the following in addition:

8. Find the key labeled "NonPagedPoolSize". Double-click on this key.
9. Type in the following under Value: 0x80000000 (*note that is 6 0's*).
10. Find the key labeled "SystemPages". Double-click on this key.
11. Type in the following under Value: 0

As a reference, and more details on what this setting actually does and how it might affect your system, refer to this website.

<http://support.microsoft.com/default.aspx?scid=KB;EN-US;Q247904>

You'll note these are very similar to the kinds of settings one might make when memory-mapping very large database files, for use in a database server. In fact, there really isn't a big difference between memory mapping database files and loading SoundFonts, from a computer memory perspective.



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