

X-Fi Sound Cards Producing Crackling and Popping Sounds During Game Play

Keywords / Key Phrases: crackling, popping, X-Fi, distorted sound, gaming, clock speed, x-fi sound card producing distorted sounds

Summary:

- ✓ **Applicable to the following Sound Blaster products:** PCI-E X-Fi Professional Audio, X-Fi Platinum Fatal1ty Champion(SB0466/SB0256/SB046A/SB0256), X-Fi Elite Pro(SB0550/SB0510/SB055A/SB0510), X-Fi Fatal1ty (SB0466/SB0510/SB0468/SB0469), X-Fi Xtreme Gamer(SB0730/SB073A), X-Fi Xtreme Audio(SB0790), X-Fi XtremeGamer Fatal1ty Pro(SB046A/SB0466), X-Fi Xtreme Audio Notebook(SB0710/SB0711), X-Fi Platinum(SB0460/SB0251), X-Fi Xtreme Music(SB0460/SB0463/SB0464/SB0465), PCI Express X-Fi Xtreme Audio(SB1040), X-Fi Titanium Fatal1ty Champion(SB0886), X-Fi Titanium Fatal1ty Pro(SB0886), PCI-Express X-Fi Titanium-16MB X-RAM(SB0880), X-Fi Digital Audio, X-Fi Titanium HD(SB1270)
- ✓ Some causes of crackling and popping during sound playback are particular PC settings or a particular way a PC is setup. Please try the following suggestions as they apply to the PC, the audio card is installed in.

- A game's audio samples may have levels, or DC biases, that are unusually high. These samples can overload the X-Fi audio enhancement algorithms which result in output streams that clip, or exceed, the allowable output signal swing.
- Try reducing the game's audio level. Where this is not possible, try reducing the master volume level in Windows.
- Very lengthy handling of Interrupt Service Routines (ISR) and Deferred Procedure Calls (DPC) by the graphics driver on nForce motherboards (Asus, MSI, and Gigabyte are some motherboard vendors that use this chipset), particularly when nVidia SLI graphics are used. One game where this problem has been observed is the game **Far Cry**, though other games may be affected as well. These times have been observed to be as long as 100 milliseconds and causes the audio data buffers handed to the sound card driver by the application to become stale.

A third party tool called **nHancer** has been found to make it possible to mitigate this problem by retuning the graphics driver. We recommend setting the AFR (Alternate Frame Rendering) mode in nHancer to reduce the maximum interrupt deferral times (called DPC) to the 10-25 millisecond range. This problem is not

unique to the X-Fi; it causes crackling/distortion with a number of other audio products tested.

Note: nHancer is a 3rd party application. As such, Creative Labs cannot support, warranty or guarantee the functionality, usability or accuracy of **nHancer**. Please direct any and all questions or concerns to the makers of **nHancer**.

- X-Fi requests for PCI bus service are being "retried", or deferred, an extraordinary number of times, presumably while the graphics system is using system memory when playing **Battlefield 2** during complex graphic scenes. It may also occur in other games, and is associated most often with nVidia nForce chipsets with SLI graphics. The Sound Blaster X-Fi sound card can withstand up to about 450 bus retries on occasion, but in some cases there are over 8,000 bus retries for a single request, for a total deferral time of up to 2 milliseconds (240 nanoseconds per retry). These deferrals can cause audio defects in non-Creative PCI sound cards as well.

Please try the following to lower the number of bus retries per request:

- Invoke dual-channel memory mode on the motherboard. Systems that are not configured in dual-channel mode can experience crackling during games. For more information about invoking dual-channel mode, please refer to your motherboard manufacturer.
 - Flashing the BIOS or changing the CMOS can cause the memory and PCI performance to improve. Occasionally, this can cause performance to degrade. For more information about specific versions or for information about updates, please contact your motherboard manufacturer.
 - Ensure that the SATA hard drive is not conflicting with PCI memory resources. Changing to a different controller may help.
 - Sometimes removing one SLI graphics card, rebooting with the X-Fi, then shutting down and reinstalling the second graphics card fixes the problem.
- In a small number of cases, the game crackling issues were found to be caused by the X-Fi driver related implementation.

Download and install the latest drivers from the Creative website which can resolve crackling in some PCs.

Note: In some cases, the latest drivers are **Beta** drivers which may help correct this issue. Please be aware that Technical Support cannot assist with troubleshooting **Beta** drivers. Install any Beta drivers or software at your own risk. For instructions to uninstall **Beta** drivers, please [click here](#).

Uninstalling Beta Sound Card Drivers

- Download and install and archive utility, such as WinRAR.

Note: Archive utilities, such as **WinRAR**, are 3rd party applications. As such, Creative Labs cannot support, warranty or guarantee the functionality, usability or accuracy of the application. Please direct any and all questions or concerns to the makers of the application.

- Download the driver file that is currently installed on the PC.
 - Create a folder and extract the contents of the driver update to that folder.
 - Locate and run the file **CTZAPXX.EXE** in the **Drivers** folder.
 - Select the options **Driver Uninstallation** and **Overwrite existing shared Creative audio driver files**.
 - Click **OK**.
- Overclocking of nVidia based graphics cards can cause crackling issues in Battlefield 2 and other gaming titles. It has been found that the card's Memory Clock Speed most directly affects the intensity and frequency of the crackling in Battlefield 2.

Try installing the **nTune** application from [nVidia's website](#) to give individual controls for memory clock speed and GPU clock speed.

Note: **nTune** is a 3rd party application. As such, Creative Labs cannot support, warranty or guarantee the functionality, usability or accuracy of **nTune**. Please direct any and all questions or concerns to **nVidia**.

The slower the Memory Clock Speed, the fewer and more subtle the crackles. When turning the Memory Clock Speed down as far as the application permits, crackling can disappear entirely. It is recommended that any overclocking be reduced and, if necessary, underclock the graphics card no more than necessary to resolve any audio crackling issues.

Modifying the clock settings on an nVidia GeForce SLI graphics card (for other brands of graphics cards, please consult the documentation for that card or contact the manufacturer):

- Right click the **Desktop**.
- From the context menu, choose **Properties**. The **Display Properties** window appears.
- Click the **Settings** tab.
- Click the **Advanced** button.
- In the new window, click the nVidia tab (the one with the nVidia logo).
- In the list that appears, click **Clock Frequency Settings**.

- Select the **Manual** radio button.
- In the **Settings** drop-down menu, choose "Performance (3D)".
- Adjust the **Memory Clock Speed** to your specifications.
- Click **Test Changes**.
- Click **Apply**.

Note: Changing the default clock speed on a graphics card can have unexpected results. Please consult your graphics card documentation for further details.

Feedback on User Escalations

Further to the reported cases of crackling issues reported by owners of Sound Blaster X-Fi cards, we have extensively tested both Creative and non-Creative audio cards on motherboards where the issues were reported in an effort to isolate the root cause. The findings indicate that circumstances causing these audio glitches only arise on nVidia's nForce 4 range of motherboards.

The Sound Blaster X-Fi card was designed to meet PCI bus standards and tolerances and this is the only range of motherboards that operate in this manner. A full technical description is detailed below, but in brief, the PCI bus data requests are not being serviced leading to "gaps" in the audio, resulting in sudden dropouts to no audio and back again which gives rise to what is perceived as crackling.

As we have identified the resolution of this issue to be beyond our control, we would advise customers experiencing this issue to escalate their concerns to nVidia in an effort to seek a possible solution.

Technical Details

We have observed through direct observation of the PCI bus on the nVidia nForce 4 motherboards that when the crackle symptoms are occurring, the Sound Blaster X-Fi card PCI bus master memory requests for audio data are being held off (not serviced) for very long intervals.

We have observed peak holdoffs of up to 2 milliseconds in some cases. This is unusual chipset behavior that is beyond the ability of a hardware audio accelerator to compensate for in its internal buffering. The Sound Blaster X-Fi tolerance for these PCI holdoffs is approximately 120 microseconds peak holdoff, with a 1 microsecond average holdoff.

These design tolerances are based on observation of real PCI bus behavior on leading motherboards over a period of many motherboard hardware generations.

The nForce 4 motherboard is the first motherboard on which these extremely long PCI

service holdoffs have been observed by Creative, where another PCI device in the system was not causing the holdoff.

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