

Asus Xonar DSX and Linux

17 January 23, 2017



(<https://delightlylinux.files.wordpress.com/2017/01/cover.png>) Buzzzzz. Whiiiiine. Zzzzzzzpt. Beep. Beep. Bi-bi-bi-bi-biiiiip.

On an inexpensive, low-end motherboard utilizing an ALC892 audio system, these are the analog sounds heard through headphones when moving the mouse.

Dragging windows. Selecting portions of an image in GIMP. Moving the mouse cursor. Every time the wired USB mouse moves, electronic interference is heard in the form of annoying beeps and buzzes.

Would a dedicated sound card improve the existing motherboard audio? I was immensely impressed with the superior audio quality of the [Asus Xonar DX sound card](https://delightlylinux.wordpress.com/2017/01/13/experience-better-sound-in-linux-with-the-asus-xonar-dx-sound-card/) (<https://delightlylinux.wordpress.com/2017/01/13/experience-better-sound-in-linux-with-the-asus-xonar-dx-sound-card/>), so I thought I would try a lower-priced version: the [Asus Xonar DSX sound card](https://www.amazon.com/gp/product/B007TMZ1MY/ref=as_li_ss_tl?ie=UTF8&psc=1&linkCode=ll1&tag=delightlylinux-20&linkId=28b573dc1e8608e2164b9d1617590deb) (https://www.amazon.com/gp/product/B007TMZ1MY/ref=as_li_ss_tl?ie=UTF8&psc=1&linkCode=ll1&tag=delightlylinux-20&linkId=28b573dc1e8608e2164b9d1617590deb).

Here are my results with Linux Mint 18.

Note: Nobody sponsors this. Any links to Amazon are affiliate links to help readers locate the items and to help cover the time spent writing this article at no cost to readers.

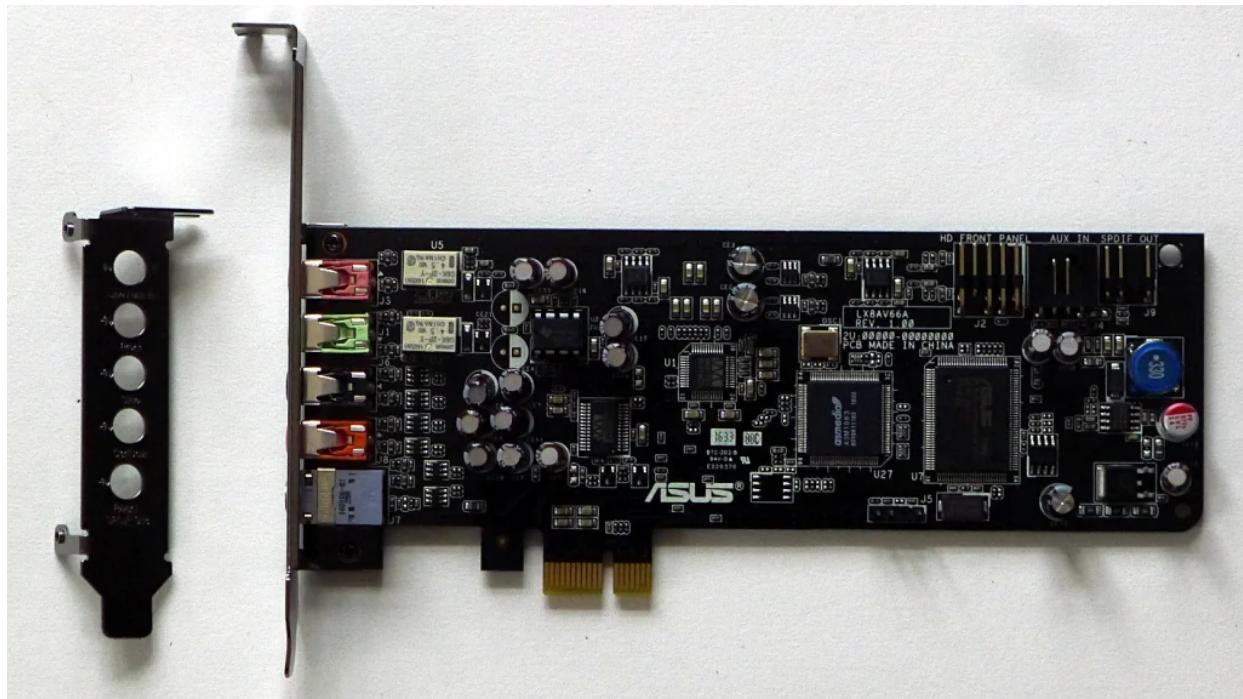
Why Not Use Another Xonar DX?

Price. The Xonar DX costs more, and since the purpose is to improve the audio on a low-end motherboard, it seemed worthwhile to save money by using a lower-cost sound card.

In addition, the Xonar DX was not available at the time of purchase, so the Xonar DSX sounded appealing. The DSX sports similar specifications to the DX but with lower numbers. It is still a 192kHz 24-bit card with a high SNR.

One advantage over the DX is the replaceable operation amplifier integrated circuit (op-amp) for sound customization. This sounds more like a gimmick than a practical audio enthusiast option, but I wanted to try it out for myself.

Asus Xonar DSX



(<https://delightlylinux.files.wordpress.com/2017/01/dsx07.jpg>)

Here is the DSX sound card out of the box. It includes a half-height bracket for smaller cases. A PCIe 1.0/2.0/3.0 slot is required. Up to 7.1 sound is possible.



(<https://delightlylinux.files.wordpress.com/2017/01/dsx02.jpg>)

Box Front. Everything I wanted in a sound card is printed on the front. So far, so good.



(<https://delightlylinux.files.wordpress.com/2017/01/dsx03.jpg>)

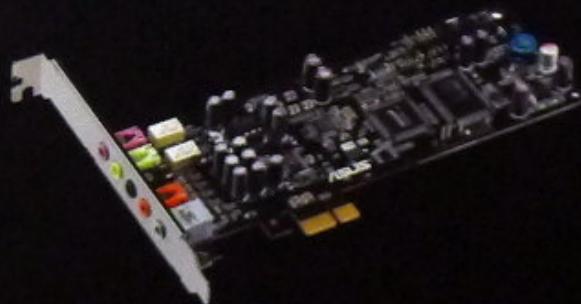
Box Back. The box says “Three swappable op-amp sockets...” However, I could only find one on the sound card, so this information might be wrong.



XONAR DSX
PCI Express 7.1 Sound Card

Simply better sound for movie-lovers, gamers, and music enthusiasts

Xonar DSX is the 7.1-channel sound card that delivers audio like you've never before heard. Experience pure output clarity with a 107dB signal-to-noise ratio and virtually no total harmonic distortion (just 0.0017%). Your new card includes DTS® Connect, DTS Neo:PC™ and DTS Interactive™ technologies, so you can easily set up a home-entertainment system that treats you to a truly cinematic experience — and with high-resolution 192KHz/24-bit audio, you'll hear every detail of the best Blu-ray soundtracks. You can even tune the audio to sound just the way you want, thanks to the three swappable operational amplifiers!



Turn your PC into home-entertainment center

Xonar DSX includes DTS Connect™ uses sophisticated technologies to convert stereo audio to high-quality surround sound via S/PDIF, so you can turn your PC into a powerful multimedia center!



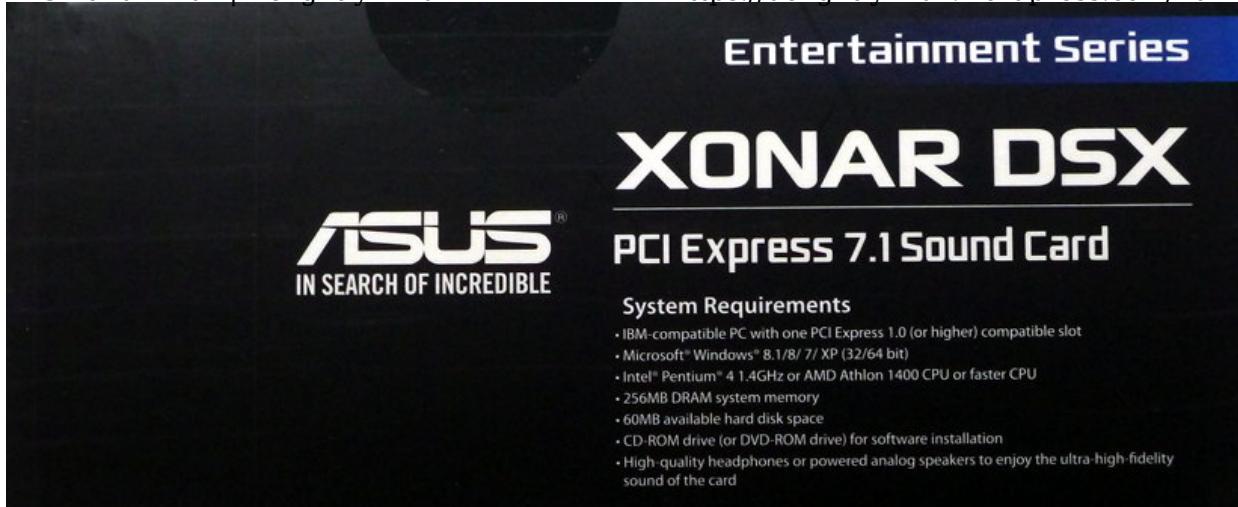
Benefit from a real-time encoder that converts multi-channel audio into a 1.5Mbit/s DTS™ stream for output via a single S/PDIF cable, so you can feed your home theater system the best available surround sound!



This great technology, based on DTS™ Surround, transforms any stereo content (MP3, WMA, CD, games and more) into simulated 7.1-channel surround via S/PDIF — meaning you'll get the most out of your multi-channel speaker setup!

(<https://delightlylinux.files.wordpress.com/2017/01/dsx04.jpg>)

The front flap flips up to provide more information. According to the manual, this card will multiplex multi-channel sound into a single S/PDIF link to an external receiver. Only one optical cable is needed to enjoy 7.1 surround sound. I did not test this.



(<https://delightlylinux.files.wordpress.com/2017/01/dsx05.jpg>)

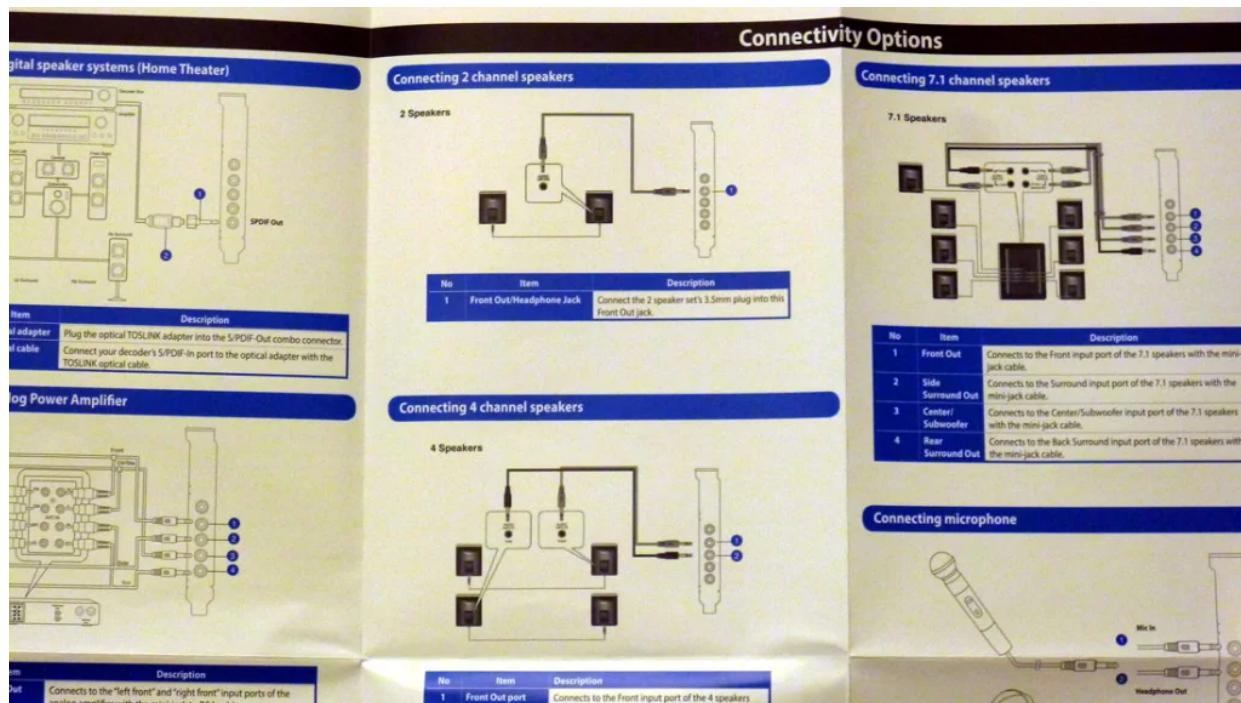
Box Side. Nowhere is Linux mentioned, but this card is 100% compatible with Linux. Just plug and play with Linux!



(<https://delightlylinux.files.wordpress.com/2017/01/dsx06.jpg>)

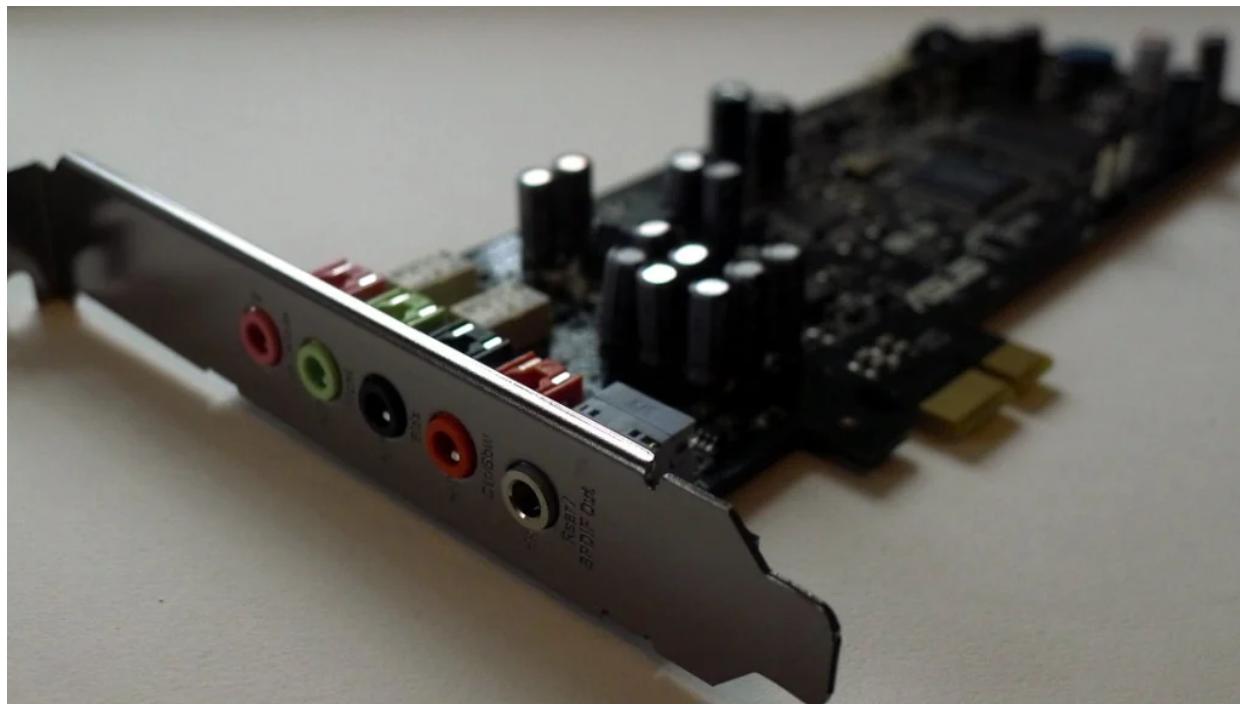
Box Interior. The packaging is good. Includes plenty of paper printed in multiple languages, a mini-optical connector, and a driver CD-ROM. The drive CD-ROM is for Windows. Linux does not support it. The date and time of the photo are 18/09/2023 05:46

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driver installation, so the CD-ROM remained in the box.



(<https://delightlylinux.files.wordpress.com/2017/01/dsx01.jpg>)

A sheet with plenty of connection pictures is included.



(<https://delightlylinux.files.wordpress.com/2017/01/dsx08.jpg>)

Five 3.5mm jacks are provided. The bottom, gray jack Rear/SPDIF is the optical jack. A mini-optical plug is included. Connect the plug into the jack, and then connect an optical cable into the plug.

Does the DSX Work with Linux?

Yes! I only tried Linux Mint 18, and the DSX was 100% plug-and-play compatible. No need for a separate driver download and installation. The DSX worked perfectly out of the box with Linux.

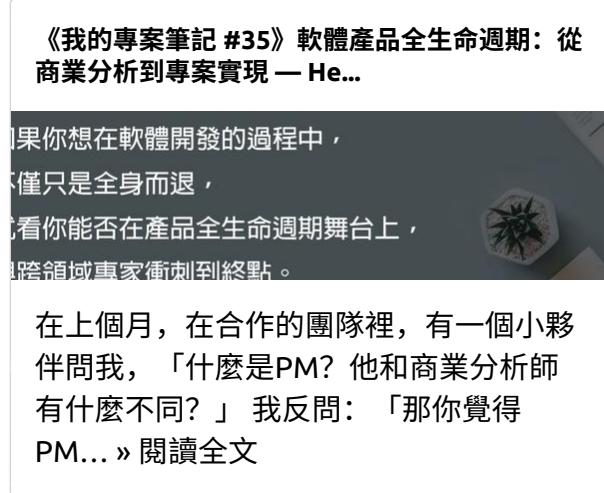
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《我的專案筆記 #35》軟體產品全生命週期：從商業分析到專案實現 — He...

如果你想在軟體開發的過程中，不僅只是全身而退，看看你能否在產品全生命週期舞台上，跨領域專家衝刺到終點。

在上個月，在合作的團隊裡，有一個小夥伴問我，「什麼是PM？他和商業分析師有什麼不同？」我反問：「那你覺得PM...」

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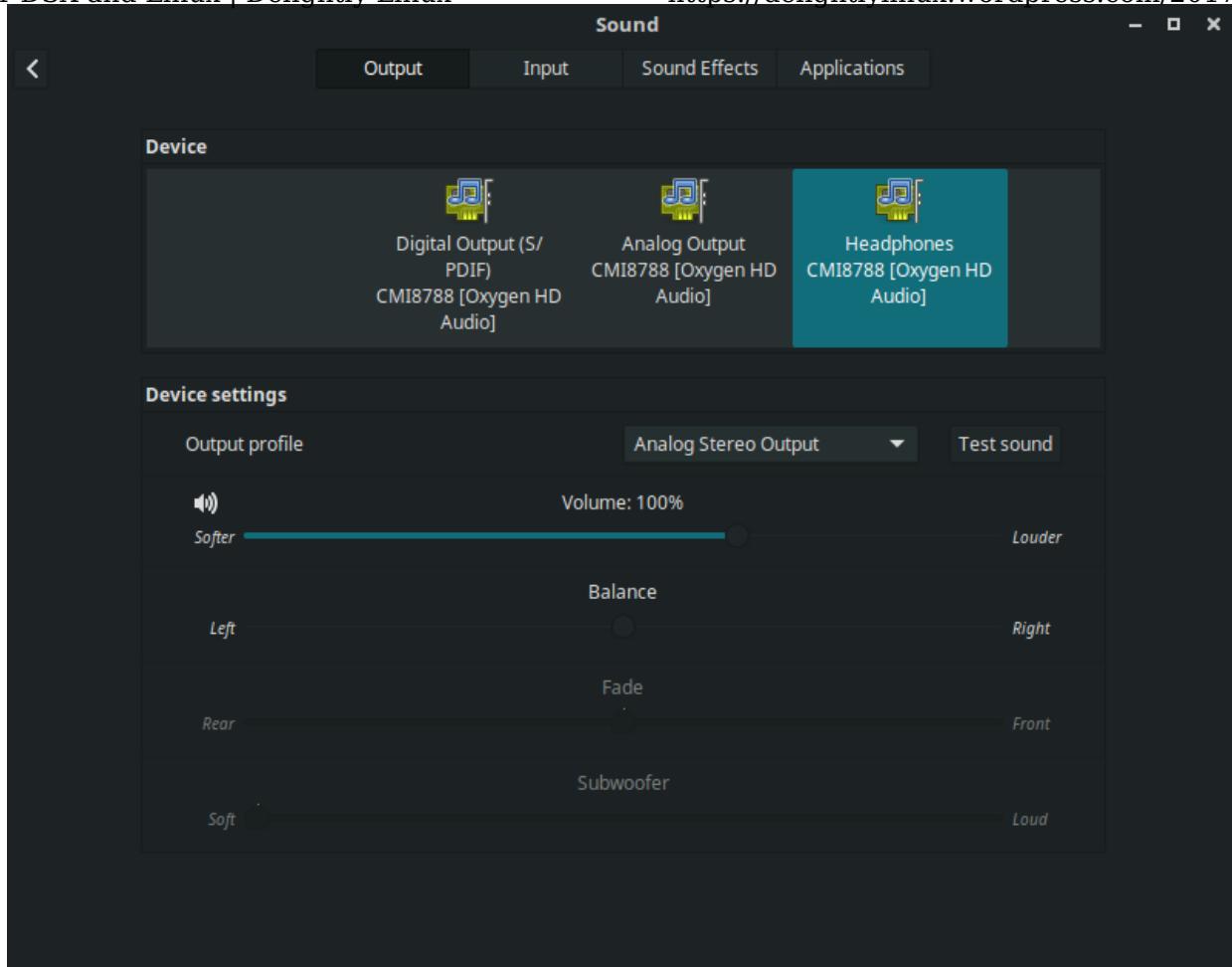


Multi-channel audio also worked. However, the custom control software that enables special effects only available in the Windows software.

Let There Be Sound!

Sound quality is good. In fact, it is every bit as good as advertised. Music and any form of audio sounds clear and clean, and the card plays back 24-bit, 192kHz FLAC music without problems. (If using Linux, you will need to perform a few adjustments to allow this.)

Linux Mint 18 recognized the sound card immediately as CMI8788.

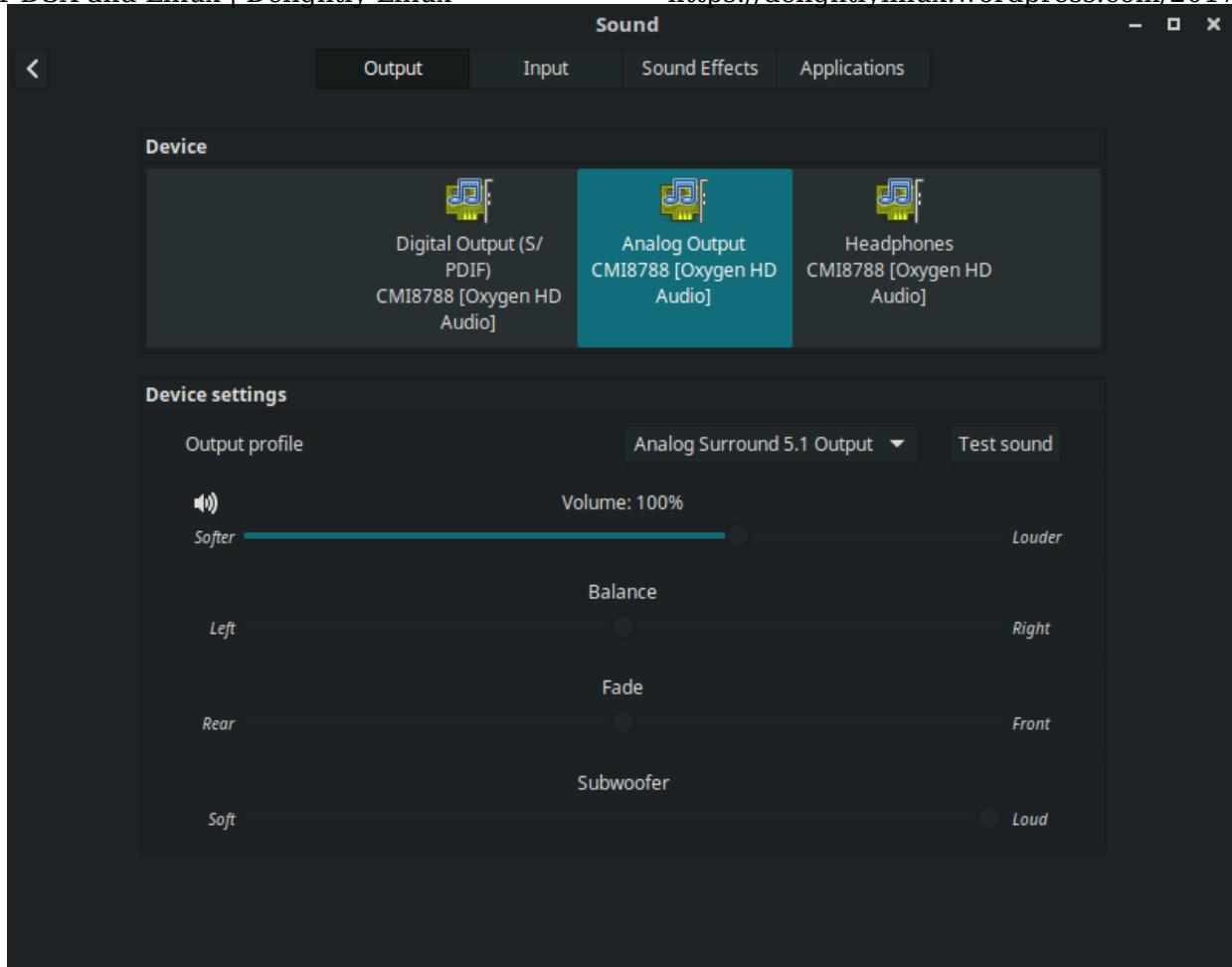


(<https://delightlylinux.files.wordpress.com/2017/01/dsx101.png>)

Sound dialog in Linux Mint 18. The Xonar DSX adds three devices: **Digital Output**, **Analog Output**, and **Headphones**.

The audio device you select is important since that determines which audio jacks are in use. Digital Output is for the optical connection. **Analog Output** and **Headphones** are related, but different.

Both share the same Front output jack, but they will sound different. If Headphones is chosen, then you are limited to stereo output that sound louder. If Analog Output is chosen, then you can select multi-channel audio.



(<https://delightfullylinux.files.wordpress.com/2017/01/dsx11.png>)

Analog Output allows multi-channel audio while Headphones does not. Here, Analog Surround 5.1 Output is selected.

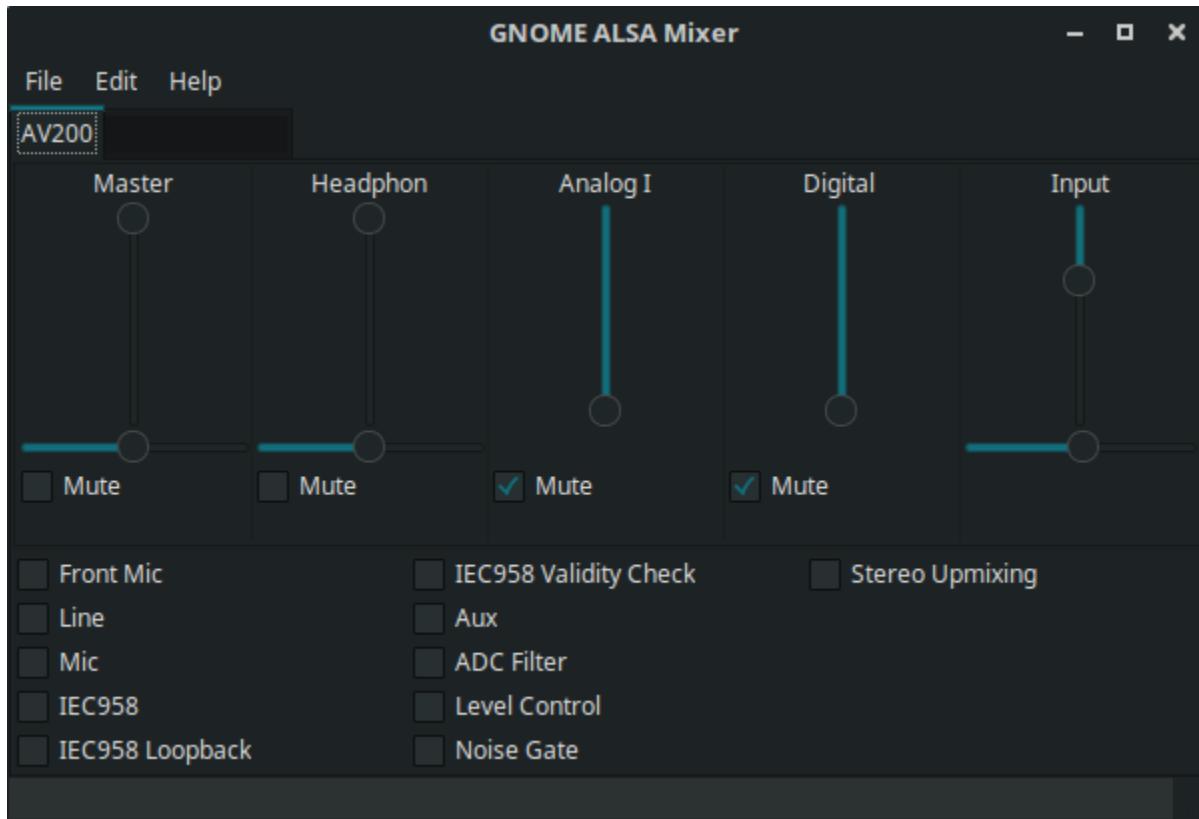
Take note of which output profile is chosen when using Analog Output. Music will sound different since different audio channels will be routed to different jacks.

Headphones was too loud and flat for my tastes. Since I am using an external amplifier, this is not needed. I wanted plain line-out stereo, so I used Analog Output with the 4.0 output profile. This produced very good stereo results.

Software Mixers

For best control, I recommend installing **gnome-alsamixer**.

```
sudo apt-get install gnome-alsamixer
```

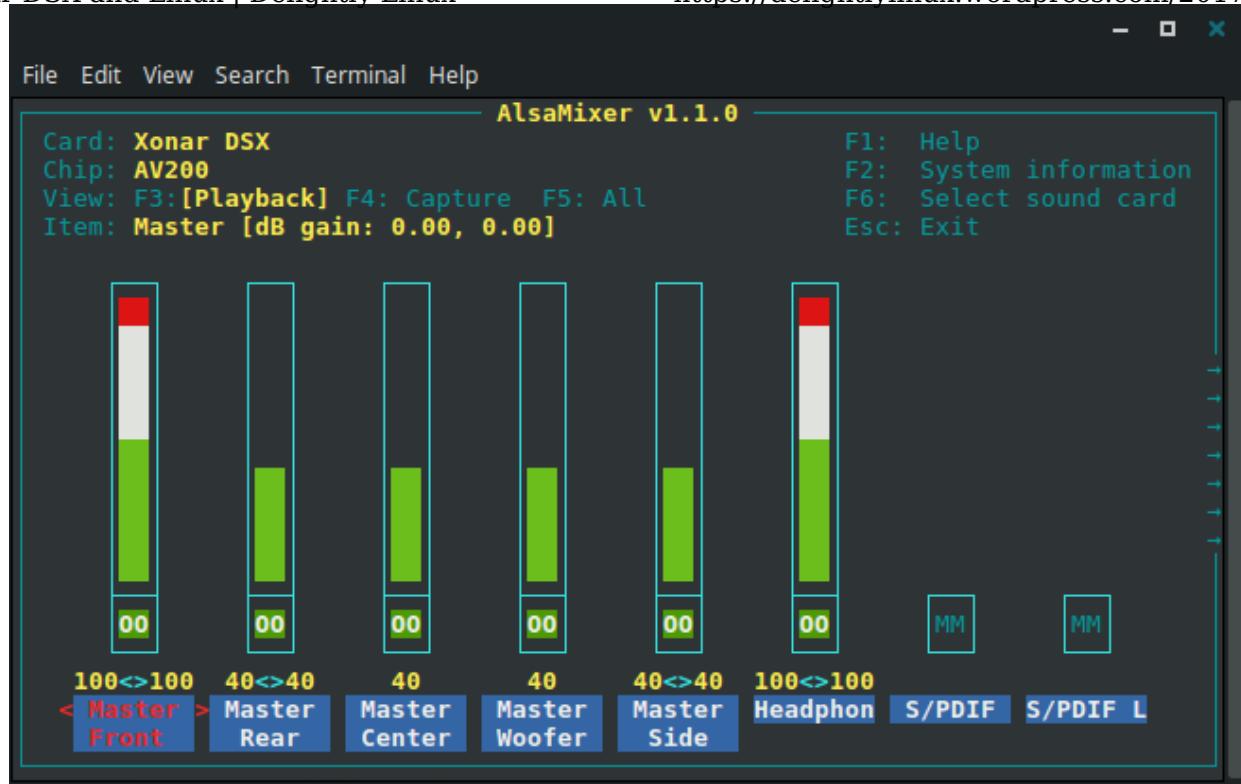


(<https://delightfullylinux.files.wordpress.com/2017/01/dsx12.png>)

GNOME ALSA Mixer. The AV200 tab controls the Xonar DSX.

Unlike the Xonar DX, I did not need to adjust the master volume of the DSX before hearing sufficient audio levels.

From the command line, **alsamixer** also works.



(<https://delightlylinux.files.wordpress.com/2017/01/dsx131.png>)

The Xonar DSX can be controlled using alsamixer.

After configuration, the Xonar DSX will output the bitrate and sampling rate of the source music files.

```
File Edit View Search Terminal Help
Every 1.0s: cat /proc/asound/card0/pcm0p/sub0/hw_params

access: MMAP_INTERLEAVED
format: S32_LE
subformat: STD
channels: 2
rate: 192000 (192000/1)
period_size: 11904
buffer_size: 48000
```

(<https://delightlylinux.files.wordpress.com/2017/01/dsx14.png>)

Asus Xonar DSX playing back a true 24-bit, 192kHz FLAC file. Note the `/sub0/` in the command above.

This is necessary for the DSX but not the DX.

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By default, media players, such as Audacious and VLC, will probably use PulseAudio, which resamples the audio. For configuration details about playing back files at their native bitrates and sampling rates, please see the [Xonar DX article](https://delightlylinux.wordpress.com/2017/01/13/experience-better-sound-in-linux-with-the-asus-xonar-dx-sound-card/) (<https://delightlylinux.wordpress.com/2017/01/13/experience-better-sound-in-linux-with-the-asus-xonar-dx-sound-card/>). The procedure is identical.

Listening Tests

Analog sound is used throughout.

I also tried this card in Windows 7 using a different motherboard that had an ALC1150 audio system. I tried to benchmark the DSX using RMAA ([RightMark Audio Analyzer](http://audio.rightmark.org/index_new.shtml) (http://audio.rightmark.org/index_new.shtml)), but I had no success. For some reason, RMAA would always return clipping errors during the benchmark, and the resulting numbers would be horribly low and conflicting.

So, I tried a different testing method: How well does it sound to my ears? I connected an external amplifier, turned the volume up to maximum level, and listened to the silence using earphones. Did I hear any background hiss or noise? Was it silent? Any EMI?

No music or sound played when listening for noise, hiss, and silence, *which was important!*

I performed this test also with the ALC892, ALC1150, and Xonar DX for comparison. Here are my finds:

Xonar DSX vs. ALC892

Music

Significant improvement. Music definitely sounds cleaner and clearer with the Xonar DSX than with the on-board ALC892 audio system.

Hiss and Noise

Still present, but less audible than the ALC892. The ALC892 background noise and hiss is loud and sounds like a waterfall. Even at 50% volume, the ALC892 noise is heard, and it can even be heard (slightly) during music playback.

With the DSX, background noise and hiss is still present. No, this is not the amplifier. The amplifier is noise-free even at maximum volume. The DSX still has background noise and hiss at high levels, but not as much as the ALC892.

EMI Beeps

On the ALC892 motherboard, mouse movements can be heard through the earphones at higher listening levels. In fact, the EMI noise can be heard slightly during music playback, which is annoying if you know

I think the EMI is more of an issue with the motherboard. Only the Xonar DX practically eliminates the EMI beeping.

Xonar DSX vs. ALC1150

Music

Honestly, I could not hear a difference. The DSX sounded just as good as the ALC1150. The DSX was tested in a system with a higher-end ALC1150 motherboard, which already sounded good.

Hiss and Noise

The DSX still had slight hiss, but so did the ALC1150 at max volume. However, hiss and noise levels are faint, and you would need to turn the volume up to maximum in order to hear them. At normal listening levels, hiss and noise are nonexistent most of the time, but careful listening at certain levels do reveal hiss and noise during music playback.

EMI Beeps.

None. Neither for the DSX or the ALC1150. This is a different motherboard without that issue.

Xonar DSX vs. Xonar DX: Which is Better?

The Asus Xonar DX is the definite winner. It is not even a contest. The Xonar DX is the superior sound card in every way.

Music

Both the DSX and the DX play back sound with clarity, but the DX plays sound with ZERO noise. Noise, despite being faint, is still audible with the DSX. The DX sounds significantly better than the ALC892, but only slightly better than the ALC1150 on a quality motherboard.

Hiss and Noise

The Xonar DX produces no noise at max volume, while the Xonar DSX produces faint noise and hiss. The DX is clearly made from better components.

EMI

None except when used on the ALC892 motherboard. The DSX still produces EMI beeping even if it is fainter than the ALC892, but the Xonar DX eliminates the EMI beeping completely. Maybe I could hear it.
15 of 21 8/7/2023, 05:46

Result Summary

Xonar DX > (Xonar DSX = ALC1150) > ALC892

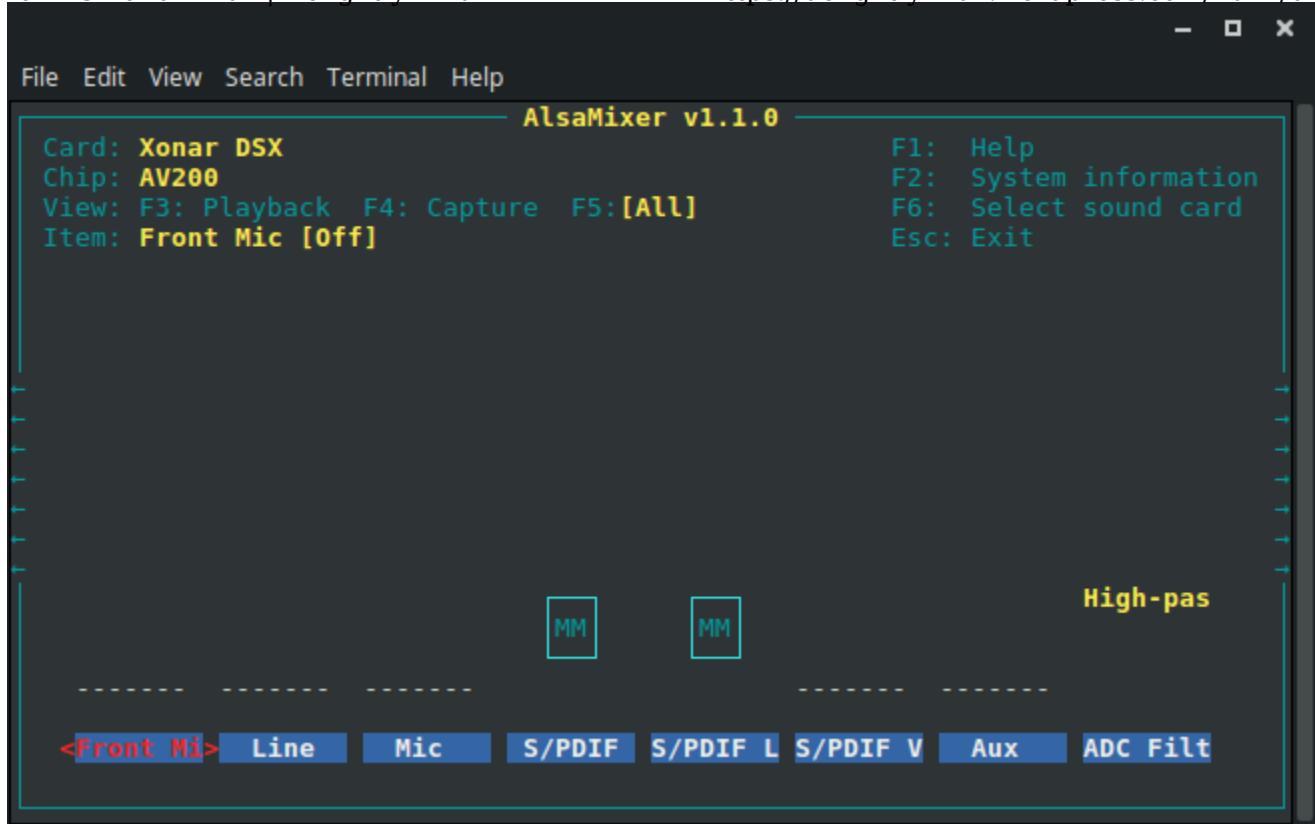
Where > means “better than,” and = means “equal to.”

Did the Beeping Disappear?

No.

Recall the opening *Beep, beep, beep?* One purpose of obtaining this card was to eliminate that noise. It had no effect. The mouse EMI was still present, but not as loud as the ALC892.

I muted all line and mic inputs from all of the software mixers that I could find. While this helped a little, the EMI beeping still occurred.



Despite muting all inputs, EMI beeping during mouse movement was still heard from the ALC892 motherboard.

Why Not Use an Audio Isolator?

If connecting the DSX, DX, motherboard audio, or any other sound card to external audio equipment using the analog outputs from the computer, always use an audio isolator, such as the [Mpow ground loop isolator](https://www.amazon.com/gp/product/B019393MV2/ref=as_li_ss_tl?ie=UTF8&psc=1&linkCode=ll1&tag=delightlylinux-20&linkId=d150e1ac8e35f6d0f3ced1b1b1ad8ab2) (https://www.amazon.com/gp/product/B019393MV2/ref=as_li_ss_tl?ie=UTF8&psc=1&linkCode=ll1&tag=delightlylinux-20&linkId=d150e1ac8e35f6d0f3ced1b1b1ad8ab2).



(<https://delightlylinux.files.wordpress.com/2017/01/io2.jpg>)

It's a small device that requires no power. Each end contains one stereo 3.5mm jack. Just plug a cable into each end, and it prevents hum and noise. Just make sure to place the isolator itself away from the computer or else it can pick up and reintroduce electrical noise into the audio signal.

For the tests above, I used a direct connection and also a test using the audio isolator. There was no difference in hiss and noise generated by the sound card. The isolator prevents ground loop noise and other computer-generated noise. It did not remove the EMI beeping noises generated from the ALC892 motherboard.

If connecting multiple analog outputs from different computers to external audio gear, isolators are a must. Be aware that these are wonderful devices for cleaning up audio signals, but they will not magically erase hiss and background noise from sound cards or motherboard audio that produce low-quality sound. The sound heard will only be as good as the source.

What About the Op-Amp?

There is one 8-pin DIP socket located on the DSX that lets you replace the existing NE5532P op-amp with a different type in order to customize the sound signature the card produces.



(<https://delightfullylinux.files.wordpress.com/2017/01/dsx09.jpg>)

The op-amp can be replaced in order to customize the sound quality. Despite what the box says about “three swappable op-amps,” I could only find this one.

Lacking extra op-amps, I was unable to test this feature. The card includes a Texas Instruments NE5532P (<http://www.ti.com/lit/ds/symlink/ne5532.pdf>).

Conclusion

Knowing what I know now about the differences between the Xonar DX and the Xonar DSX, I would have chosen another Xonar DX even though the DX is the more expensive sound card. Apparently, you get what you pay for.

The Xonar DSX is still a good sound card, and it is a much needed improvement over the ALC892. The entire goal was to produce better audio for an inexpensive system that utilized the ALC892 sound system, and the Xonar DSX filled that goal well. The only problem is that after hearing the pure silence that the Xonar DX is capable of, I prefer the Xonar DX over the DSX.

The Xonar DX boasts a higher SNR than the DSX, and, from my listening tests, the small difference in SNR numbers (107dB for DSX vs. 116dB for DX) makes a tremendous difference in real life.

Is the Asus Xonar DSX a bad sound card? Not at all. It can produce some pleasing sound from low bass to high trebles with minimal noise. Others might experience different results. On my hardware with what I had available, the Xonar DSX sounded good, but the Xonar DX sounded better. Much better.

Those looking to improve the audio on Linux systems should be pleased with the Xonar DSX (and jubilant with the Xonar DX). Excellent Linux compatibility and hassle-free operation are worth the price.

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