

# WHAT TO LOOK FOR IN A CONVERTER

**A detailed and only slightly biased guide  
from Lynx Studio Technology  
to give you a comprehensive formula  
for picking the best converter for your  
recording needs now and in the future.**

**Feel free to send us your comments, questions and  
suggestions to [sales@lynxstudio.com](mailto:sales@lynxstudio.com)**

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## What to look for in a converter

How do you choose what converter to purchase for your studio? What matters and what does not? With this White Paper, all of us at Lynx will try to help you make that decision. Of course we hope that when you carefully look at your wants and needs, you will agree that Lynx converters will work the best for you.

## What matters?

### #1 Audio Quality matters

The converter you choose will determine the basic audio quality of your recordings.

The converter should, at its most basic, convert analog to digital and back to analog with as little coloration, noise, distortion as possible. You can add these, plus limiting, compression, EQ, reverb, pitch correction with other equipment. A converter should provide your recording chain with an accurate audio signal of your sources.

The goal should be Transparency – the sound you put into the converter, should be the sound you get out of a converter. After all, when you have carefully selected your mics, mic placement and mic preamps, your converter should not change the sound you worked so hard to achieve.

So how do you know? *Two ways – left brain, right brain.*

| Left Brain                                                                                                                                                                                                 | Right Brain                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Look at the specifications. They should be clearly stated and qualified. Weighted vs non-weighted specs.                                                                                                   | Give it a listen. Let your ears make the decision.                                                                                                                                                                                                                                                                                        |
| <b>THD + Noise</b> – A measurement that tells you how much distortion and noise is in the signal. Once a signal has distortion and noise in it, there's no getting it out.                                 | Audition the converters you are considering in an environment you trust – your studio or one you are familiar with. Many retailers now offer a quality listening room for you. Many will allow you to either demo gear at your location, or give a good return policy so you can be sure the product you choose will sound right for you. |
| <b>Dynamic Range</b> – The range from the quietest signal to the loudest without distortion.                                                                                                               | Play recordings you are familiar with.                                                                                                                                                                                                                                                                                                    |
| <b>Frequency Response.</b> A flat response is a true response. If a company does not publish this spec and/or does not tell you how they achieved it, they may have unwanted emphasis at some frequencies. | Do a simple recording of a piano, acoustic guitar or voice.                                                                                                                                                                                                                                                                               |
| <b>Crosstalk.</b> How much one channel bleeds into another. This will affect how wide the stereo field feels. The smaller the number, the more the stereo field collapses.                                 | Try to playback audio that has never passed through a converter (such as old vinyl or tape)                                                                                                                                                                                                                                               |
| And if you have the equipment and knowledge, test the converter to see how it does at different sample rates.                                                                                              | Buying a converter without hearing it is like buying a car before you drive it. Bad idea. Don't make the Mail Order Bride mistake. You're going to live with this for quite some time – you'd better like how it sounds.                                                                                                                  |
| Specs missing or incomplete? This should send up a <b>Red Flag</b> on the left side of the brain.                                                                                                          | More suggestions on the last page.                                                                                                                                                                                                                                                                                                        |

*For the past 15 years, Lynx has been known for our pristine audio quality and transparency. With Aurora and Hilo, Lynx pushes the limits of the available technology to offer the best possible AD and DA conversion for your studio and audio needs. And our specs are printed, qualified and met with every Aurora and Hilo we ship.*

## #2 How you work now and in the future matters

A converter is basically a tool, one that will last a good long time. So take a look at these questions and see where you stand for now and into the future:

| Factor                        | Now | Five Years from Now |
|-------------------------------|-----|---------------------|
| Platform (Computer/Op System) |     |                     |
| DAW Applications              |     |                     |
| A to D channels needed        |     |                     |
| D to A channels needed        |     |                     |
| Connectivity                  |     |                     |
| Sample rate used              |     |                     |
| Standalone use (no computer)  |     |                     |
| Variable Analog levels        |     |                     |
| Fan or Fanless? (noise issue) |     |                     |
| Headphone output              |     |                     |
| Zero latency monitoring       |     |                     |
| Cost/Cost per channel         |     |                     |
| Other:                        |     |                     |

*It is important to have a converter that will talk to PCs as well as Macs. Aurora and Hilo do so. Some companies actively promote their position to only support Mac or only PC. They do so to maximize their own resources and minimize your choices. At Lynx, we let you make the choice.*

## #3 Connectivity matters

You can't connect to your customer if you can't connect to your computer.

Right now in the audio recording market, Mac rules the roost. Over the years the pendulum swings, although very slowly, between Mac and PC formats. Three, five, ten years from now the PC may be the dominant.

Especially in Pro Studios, you need to be ready for a number of connectivity and compatibility conditions.

While your main setup may be Pro Tools HD, you might have a customer who wants to use Logic in a Mac via AES/EBU one day, then the next a customer brings in a Nuendo session on a hard drive for a PC. And five years from now, who knows what the dominant software and connectivity option might be? One thing we know for sure is that it will be different.

The converter you choose must offer the ability to offer the variety of what you will need today with the hardware needed to expand its connectivity options.

So here are the connectivity options for now and in the future:

| Connectivity | Now | In five years |
|--------------|-----|---------------|
| AES/EBU      |     |               |
| ADAT         |     |               |
| Pro Tools HD |     |               |
| USB          |     |               |
| FireWire     |     |               |
| AES50        |     |               |
| Thunderbolt  |     |               |
| Dante        |     |               |
| MADI         |     |               |
|              |     |               |
|              |     |               |

*Lynx converters are designed and built with your current and future needs in mind. Inherent in the design is the ability to add features and improvements via free firmware updates. The open-ended connectivity scheme allows us to incorporate new protocols as they become available. Although Thunderbolt was years in the future when Aurora was designed, a Thunderbolt card is now available for both Aurora and Hilo converters.*

## #4 The Word clock

Nowhere is there more confusion but maybe this will help:

Clocking is the heart, the time-keeper if you will, of a digital device. It needs to be solid and stable, with an absolute minimum of jitter (timing differences). Our clock crystals and circuits achieve this super low jitter and the exclusive Lynx SynchroLock technology will remove jitter from an incoming clock at a 3000:1 ratio. Jitter in the digital domain translates into distortion in the analog domain. Most devices give a specification for distortion when clocked internally, but fail to perform as well when clocked externally. It is important to know how the device you select will perform under all circumstances you intended on using it.

*Virtually every external clock tested with Aurora and Hilo converters actually increases, not decreases, jitter in Lynx converters. This includes popular expensive esoteric external clocks now available.*

## #5 Intangibles matter

**Company Reputation** – How many converters has this company successfully designed and marketed?

**Holy Grail #1 – Analog design.** Analog design within a digital converter is a combination of experience, knowledge, tricks of the trade and inspiration. Knowing the parts to use, how to use them, how and where to connect and control them is not easy. With every generation of converter development, the design is improved.

The analog section of the converter is the product of long term design experience, quality components and manufacturing and a few engineering tricks learned over the decades. There is no crash course or easy street to quality analog reproduction. While we are often asked what A/D chips we use, it is in the analog section where the magic happens...cleanliness of design and PCB layout, filtering, power and grounding scheme and so on. All these make for a great signal entering the A/D converter chip and ultimately to your recording.

**Holy Grail #2 - Company support.** Call or email the manufacturer before you buy. Is there a phone number on the company's website? See what kind of response you get. Do you get to talk to a real person that is knowledgeable about audio? Are software and firmware updates free for the life of the product?

And finally...

## #6 Trust your ears

The first, second and third most important deciding factor is **HOW DOES IT SOUND?** You will live with this converter for a long time. The recordings you make, the reputation you maintain, are based on the quality of your work, so make sure you get the right tool for now and in the future.

Here are a few suggestions:

1. Listen where you are accustomed to listening.

Your retailer should be able to help you arrange a listening session in your studio or one you are used to. Remember the room itself is crucial, so remove that variable.

2. Listen to a variety of tracks.

Loud, soft, acoustic, rock, classical. And individual instruments. Whenever possible also listen to sources that have never hit digital, like LPs or analog tape.

3. If possible listen to a live source through the converters you are considering. What is the most "natural?"

4. Make it a blind test. Find a way to not let preconceived notions taint your opinion.

5. Bring a friend whose ears you trust.

6. Listen to the reverb tails

Listen to some of the beautiful reverbs that you have access to. Listen to how long the converter processes the end of the reverbs. Is there a smooth long tail off, or at some point does the reverb just go away?

7. Listen to the pops, thumps, sizzles, clunks, etc. Throw everything but the kitchen sink at them.

8. A little more difficult – multiple AD/DA passes

Take an audio track, record it, the rerecord it several times, passing the audio through the AD/DA process several times. This will multiply any anomalies, coloration, noise, etc. that are inherent in a converter. A very tough test.

Then your ears will tell you which to buy. You have a lot of good options – so take your time and trust your ears.

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So there you are – a detailed guide describing our thoughts here at Lynx about how to choose a converter for your studio. We have tried to be fair and only slightly biased toward Lynx in this white paper. Of course we are confident that when you fully look at the various converters on the market – and there are a lot of good ones out there – that you'll give Aurora and Hilo a good look and listen.

And many of you, like thousands of studios worldwide, will decide that Lynx converter's combination of audio quality, reliability, versatility, longevity (and any other –ity you can think of) will make them your converter of choice.

Feel free to call us at 714-545-4700 or email to [sales@lynxstudio.com](mailto:sales@lynxstudio.com) with any questions.