



Reference Sound System

- Technical Features -

Lundahl LIVE Reference Sound System

We are proud to present what we believe is one of the world's most transparent audio reproduction systems – The **Lundahl LIVE Reference Sound System**.

The Lundahl LIVE reference system entails products manufactured by Lundahl Sound Systems as well as products from selected partnering brands, representing some of the highest performing audio products commercially available. The design of the Lundahl LIVE Reference System takes its basis in a combination of products and components with some specific technical features, that when combined has enabled a range of important synergies to materialize.

In this text you can read more about how we have engineered the Lundahl LIVE Reference System and some of the key enabling technologies that has enabled the sonic qualities of the system.

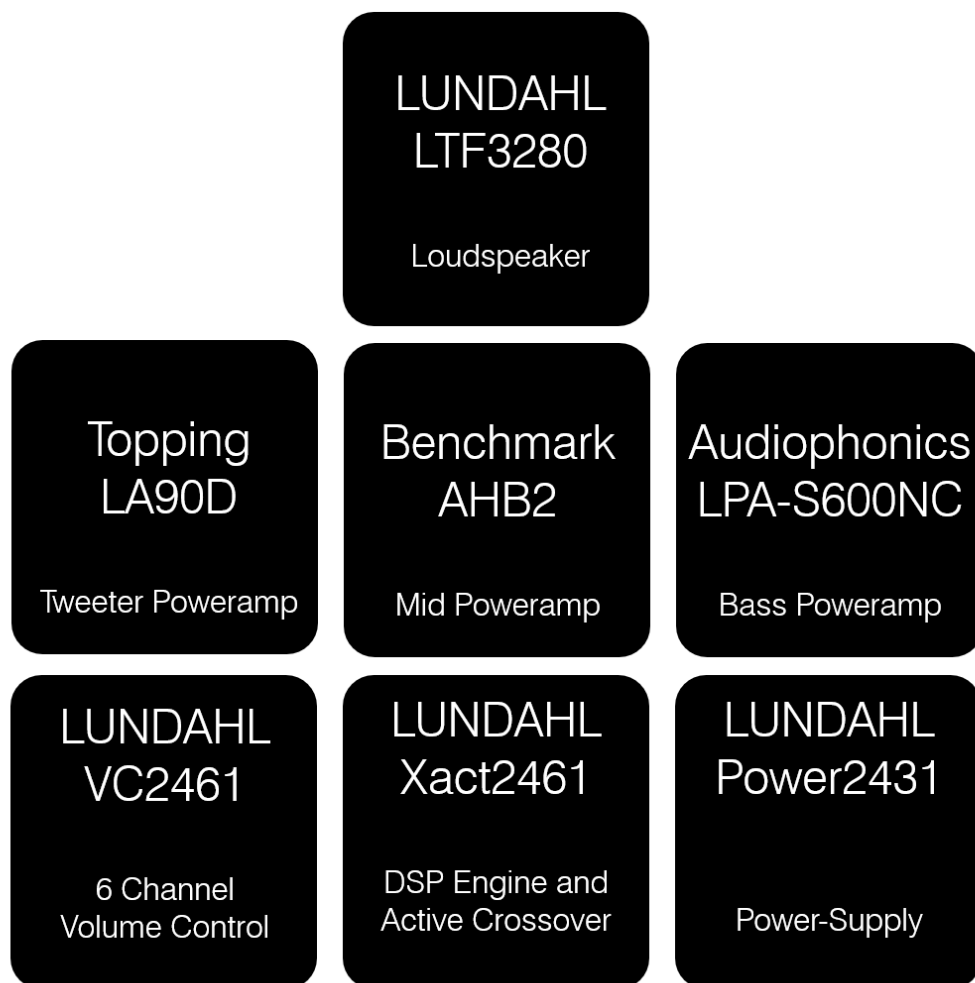


Figure 1. Schematic Representation of the main building blocks of the Lundahl LIVE Reference Sound System. The system is connected by cables from Supra and Canare for loudspeakers and line level signals respectively. The system comprises all that is needed for audio-reproduction except for a signal source (analogue or digital).



Lundahl LIVE – Key Features

ACTIVE

The Lundahl LIVE Reference System is an active sound system. This means that each of the loudspeaker's drivers has a dedicated power amplifier - as such, the amplifiers are connected directly to the terminals of the drivers without the usual lossy passive crossover components. An active system has many benefits versus a passive system. One of the most important advantages of an active system is its ability to provide high acceleration of the cones in the loudspeaker drivers. The result is clearly audible, especially on transients.

DIGITAL

The heart of the Lundahl LIVE sound system is the **Lundahl Xact2461 Digital Signal Processor and Cross-over**. This is what has enabled technical features such as steep cross-overs (48dB/octave), precise equalization of the sound pressure level throughout the entire audioband (+/-1.5dB from 24Hz-21kHz) as well as linear phase sound reproduction. Together, these technical features translate to a listening experience of a precise and holographic soundstage, which also can be maintained at high listening volumes.

ANALOGUE

The volume of the Lundahl LIVE Reference Sound System is adjusted in the analogue domain in the **Lundahl VC2461 Multichannel Volume Control**. Hence, the digital processing is always performed on the maximum input level of the digital signal which preserves that the bit depth of the source always is preserved, allowing highest possible resolution of the digital audio signal.

SILENT

The nominal output level from the **Lundahl Xact2461 Digital Signal Processor and Cross-over** is 7Vrms on all six channels. This is many times higher output levels than most line-stage audio products, which means that no additional gain is needed prior to the power-amps.

The decision to amplify the signal as early as possible in the signal chain has enabled us to control the volume without adding any gain or buffer stages. The **Lundahl VC2461 Multichannel Volume Control** is therefore a passive volume control, which imply that noise and distortion can be kept at exceptionally low levels providing a 100% transparent attenuation of the audio signals.



DISCRETE

Most traditional active audio systems have all components such as e.g. cross-overs and amplification built into the loudspeaker cabinet. The Lundahl LIVE reference System is taking quite an opposite approach, as the system comprises discrete products throughout the entire signal chain. Hence, the **Lundahl LTF3280** loudspeakers do not contain any electronics (apart from some of the world's best transducers). A fully discrete system is not only enabling superior sound quality, but also makes it possible to upgrade and or repair any product in the Lundahl LIVE Reference System at any future point in time.

HARDENED

The cone materials of all transducers utilized in the **LTF3280 Loudspeakers** are all made of hard and stiff materials (Tweeter: beryllium; Midrange: sapphire; Bass: magnesium/aluminium alloy). One of the main benefits of stiff cone materials is that they act as perfect pistons their respective passbands, where they excel in audible performance and rock-bottom distortion figures. The drawback with stiff cone materials is that when the cone break-up frequency indeed is reached, inferiorly high SPL levels and excess distortion is generated. It is therefore important to attenuate the signal well before the break-up frequency occurs in hard cone materials. The digital part of the Lundahl LIVE reference System is hereby an enabling technology: the **Lundahl Xact2461 Digital Signal Processor and Cross-over** is deploying 48dB/octave cross-overs as well as additional equalization in critical audio-bands to eliminate any unwanted artefacts from the cone break-up modes (all this is done without any loss and with maintained linearity of phase thanks to the immense processing power of the **Lundahl Xact2461 Digital Signal Processor and Cross-over**). The combination of stiff cone materials and high-performing digital processing is one of the main reasons why the Lundahl LIVE Reference Sound System excels in transparency.



POWERED

The active and discrete design concept of the Lundahl LIVE Reference Sound System allows for an optimal matching of amplifier technology and output power with the respective drivers in the **Lundahl LTF3280** loudspeakers.

Midrange Amplification: The dual ceramic midrange drivers in the loudspeaker **LTF3280** are coupled in parallel and the impedance dips below 3 ohms in this configuration. The now somewhat legendary amplifier **AHB2** from **Benchmark Media Systems Inc.** is an ideal choice for midrange amplification, not only because its class leading distortion and noise figures, but also for its unique ability to drive low impedance loads without any inferior impact on distortion.

High Frequency Amplification: The beryllium tweeters in the **LTF3280** loudspeakers are fed by a **Topping LA90D** class AB amplifier, which is delivering even better objective performance in terms of distortion and noise than the **Benchmark AHB2**. The stellar performance figures is however traded for power and the **LA90D** is not capable of delivering more than 50W per channel before clipping. This, however, is not a problem in the Lundahl LIVE Reference System because the **LA90D** only is utilized to amplify the high frequencies, which is requiring a fraction of the power versus the rest of the system.

Low Frequency Amplification: The 10" bass drivers are (naturally) the most power-hungry drivers in the **Lundahl LTF3280** speakers. The amplification is therefore conducted by the powerful **LPA-S600NC** from Audiophonics, which is a 2*600W Class-D stereo amplifier which is based on Hypex' world renowned NCore technology. **The LPA-S600NC** allows the Lundahl LIVE Reference System to accurately reproduce frequencies as low as 24Hz @ -3dB at SPL levels well above 100dB.

All in all, each **Lundahl LTF3280** speaker is fed by a total of ~900W, delivered by some of the best performing power-amps that is available today.



CONTROLLED

The **LTF3280 Loudspeakers** features a waveguide that is seamlessly integrated into the front-baffle. The purpose of the waveguide is to harmonize the sonic signature of the on-axis response to the off-axis response, enabling controlled directivity of the sound field. The main benefit of a directivity-controlled speaker is that the power response in the room is more even, which yields a more natural sound reproduction. Further, with controlled directivity there is less need for room acoustic treatment as well as and experienced reduced or eliminated listening fatigue. A secondary beneficial effect of the waveguide is that it also provides a small acoustic loading which implies that less power is needed to drive the tweeter between 1-4kHz. Less power means less distortion, which is of crucial importance between 1-4kHz, a frequency band where human hearing is the most sensitive.

PRECISE

The Lundahl LIVE Reference Sound System exhibits an on-axis anechoic response of +/-1.5dB between 30 and 20kHz. The phase is linear from approximately 200Hz and well into the ultrasonic region.

BALANCED

All products within the Lundahl Live Reference System are fully balanced, providing optimal signal to noise ratio, common mode noise rejection and suppression of ground loops.

CONNECTED

To avoid induced disturbances from the ambient and to reduce crosstalk between cables, the Lundahl LIVE Reference Sound System is connected by high quality cables in star-quad configurations for line level signals as well as for the loudspeaker cables.

For more information visit www.lundahlsoundsystems.com.

We are eager to support you in your next hifi-endeavour!

