

AUDIO

HIFI · SURROUND · HIGH END · MUSIK



SYNTHESIS ACTION
Diese Röhre packt jede Box

Werden Sie **aktiv!**

- Wie eine neue Boxen-Generation die HiFi-Welt verändert
- Überlegene Konzepte für den Raum
- Von rein analog bis voll digital und DSP-gesteuert

**ENGLISH
TRANSLATION**

14 oder 1400 Watt?

Der Endstufentest der Gegensätze:
Musical Fidelity und Pass First Watt

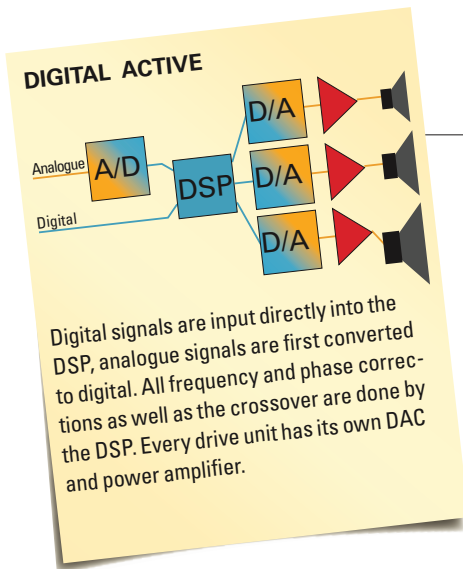
Sensation in Lab and Listening
Room: Grimm Audio's LS1

DER STREAMT SOGAR DSD
Netzwerk-Überraschung aus China:
Der Lumin Player im ersten Test

▶ Sonos, Raumfeld & Co: Alle Neuheiten
im Test, alle Konzepte im Praxis-Vergleich

Österreich € 6,70 - Schweiz sfr 12,00
Spanien € 7,95 - BeNeLux € 7,00
Griechenland € 9,00 - Italien € 7,95
Finnland € 8,85 - Slowenien € 7,95





GRIMM AUDIO LS1 25 000 EURO

The LS1 contains amplifiers and DSP-based crossovers (more about those later) as well as A/D and D/A converters. The entire processing chain is optimized for lowest jitter and to avoid pre-ringing of any kind. The user's contribution is strictly limited to supplying music. Notebooks and network players are perfectly suitable as sources, no DAC required.

Preamplifiers are equally redundant, their function effectively being carried out by the LS1 itself. Volume control can be done on any computer that has the Grimm driver software installed. If you prefer something you can hold on to, a hardware controller with 2 digital inputs is included. Two more inputs, one for analogue fodder, are located near the base of the speaker.

MORE THAN JUST A BOX.

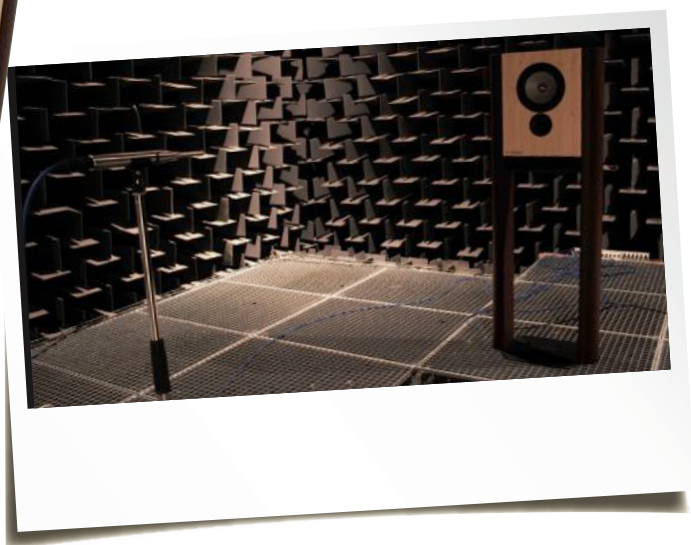
The entire user interface of the hardware controller consists of one big knob. Briefly pushing on it activates the mute function whose exact behaviour is programmable. Pushing and

turning selects between sources. Certain basic settings are not available in this manner and require a computer to be connected at least once. A compact USB interface (also included) links the PC and the speaker. The screen shots on the following pages give an impression of the system's range of features.

Look and feel force another mental adjustment as the Dutchmen have shunned the usual high-end braggadocio — chrome plating, impossibly shaped cabinets, orgies of piano lacquer or what have you. The aluminium legs are available in brown and black. Matte, both. The only touch of the exotic is the box sitting between them which either comes in bamboo in two darkness grades or in shiny white Corian.

All of the electronics including the power amps are in the left leg. The power amplifiers, co-developed with Hypex, another Dutch company, take up very little space and barely warm up. With no heatsinks or ventilation slots, the stand becomes barely more

After getting one's hands on the LS1 one quickly finds that this system defies pigeonholing. Neither do the usual high-end price/performance metrics apply as in terms of functionality this speaker, made by the young Dutch company Grimm Audio, offers considerably more than conventional active speakers. Bar the actual signal source a pair of LS1 is a complete audio system, not something as pedestrian as a mere loudspeaker box.



MAXIMUM FIDELITY: The LS1's wide and flat baffle controls dispersion well before the DSP enters the game. The LS1 shows exemplary behaviour in the anechoic chamber.



**TWO OR THREE WAYS,
YOUR CHOICE:** The optional subwoofers are simply placed on the base plate. They are controlled by the DSP electronics in the left speaker leg. The woofers integrated so perfectly that they do not change the sound. They only raise the SPL capability.

**ROOM AND
PLACEMENT**

Room size

S M L

Room acoustics

D E R

Placement

H C F

Used freestanding or moderately close to the wall. The room should be evenly damped. Toe in strongly (30 or 45 degrees).

Acoustics: D=dry, E=even, R=reverberant.
Placement: H=hugging wall, C=close to wall, F=freestanding.

POINT OF VIEW



Bernhard Rietschel
Chief editor, AUDIO

My first time auditioning the Grimms was at the “North German Hi-Fi days” in Hamburg in a room with rather poor acoustics and the ubiquitous demo tunes that I have heard a thousand times before. Despite the conditions not being conducive to emotion, it only took a few bars of music from the LS1 almost to drive me to tears. Later in our own listening room my colleagues and I were again overwhelmed by their natural sound and their unimposing, profound correctness. Hi-fi lovers who not only strive after musical enjoyment but also after constant technical and sonic novelty (and who like tinker with both) may find the Grimms a bit of a catch-22. Any computer will do perfectly as a source and all the tuning and tweaking usually

HI-FI À LA GRIMM: MORE MUSIC, LESS PLAY

required to make a system sound great can be done without. As much as they themselves are technological marvels, the Grimms deprive hi-fi of its secondary function as a technical playground. It takes a certain maturity to accept this, but this becomes a lot easier after hearing the Dutch speaker strut its stuff. There is however one important thing the LS1 will not do for you: fix the room. The owner has to provide an acoustically decent environment. Grimm uses the DSP's computing power only to optimize the speaker. The designers' creed is that problems with room acoustics should be dealt with by acoustic means. This leaves plenty of rewarding work to the hi-fi buff — besides listening to music.



CONTROL CENTRE: The electronic circuitry is hidden in the left speaker leg. The connections are on the rear, as well as the filtered output for the subwoofer module.



than lukewarm even after long use. For tinkerers who love to pimp their system with accessories of all sorts the LS1 will be a tough nut. Swapping out amplifiers is impossible and the largely digital electronics have no easily modified parts. The same goes for the speaker wires which as you might expect in an active speaker are very short and not externally accessible. Indeed, Eelco Grimm, company founder and lecturer at the Utrecht School for Music and Technology, has done everything to quench any desire for further modification. Despite its complexity the design was approached in a thoroughly purist fashion.

With its tremendous computing power the 48-bit DSP could have ironed any combination of chassis flat but Grimm chose to limit its use to the bare essentials and to try optimizing behaviour using traditional means first.

The cabinet shape — clearly wider and shallower than usual — is a consequence of the laws of acoustics.

A wide baffle promotes constant directivity, especially in the midrange. The semicylindrical shape of the lateral stands prevents edge diffractions and further improves the frequency response.

SEAS DRIVE UNITS

It wouldn't make much sense for a small company like Grimm to make their own chassis, so the Dutchmen get theirs from Seas in Norway. The 8 inch LF unit with the phase plug and the wide dispersion dome tweeter are drawn from the Excel and DXT product ranges respectively, both of which enjoy an excellent reputation among experts. Even before equalisation this two-way system has a homogenous output free from troublesome frequency or phase problems. This is important because even though a DSP can smooth over quite a lot it is powerless against an uneven directivity as its EQ curve affects on and off axis responses equally.

CHARMING SOLUTION:

The included controller shows the volume on its display. The big wheel also serves to select the inputs and activate the mute function.



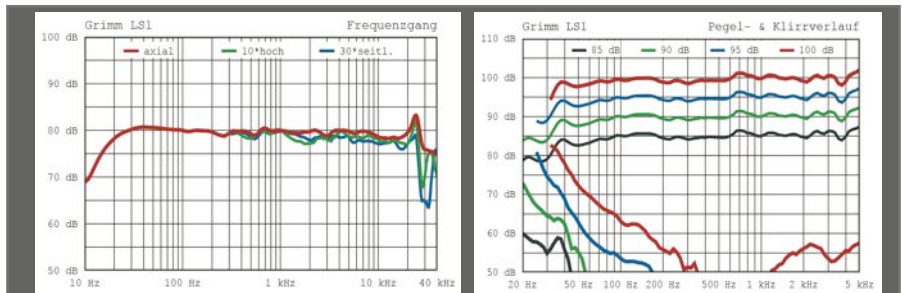
Signal filtering is a two-stage process. First, the frequency responses of both drivers are EQ'ed flat to well beyond their assigned frequency range. This results in two branches that the Linkwitz-Riley crossover can then consider as ideal. It can proceed just to divide the spectrum and correct for any differences in efficiency.

This tactic insures that the acoustical output closely matches the electrical signal, something rarely found in active speakers and certainly never in passive ones. Effectively the LS1's excellent behaviour in both frequency and time domains is more reminiscent of electronics than of loudspeakers. Refer to the box on the same page for more.

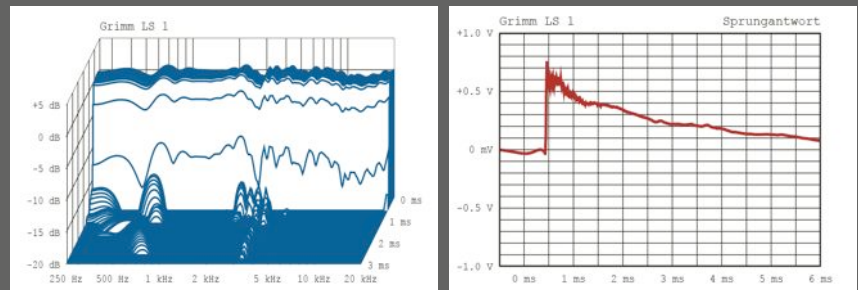
Adding a subwoofer turns the speaker into a 3-way system. Third party subs will work but it's particularly simple with the company's own subwoofers which sit snugly on the base plate and which are a perfect match with the speakers, both acoustically and optically. Mind you that at 7000 euros this add-on is not cheap.

The 10" Peerless-powered subs have their own power amps and are wired to the LS1's electronics with a pair of short cables. Turning the subwoofer on does not change the sound but the headroom is considerably heightened as is listening pleasure.

LAB REPORT



The LS1's response plots, taken in a semi-anechoic space, are extremely linear. Especially noteworthy is the close match between on-axis (red) and off-axis (30° lateral in blue, and 10° vertical in green). The software configurable bass response can go as low as an unreal 17 Hz (-3dB). The mid range shows almost no distortion even at 100 dB SPL (red curve, diagram on right). There is no compression at 100 dB; the highest achievable SPL is 105 dB.



The waterfall plot (left) shows the speaker settling back into silence after being driven with a broadband signal that is abruptly turned off. Ideally the space in front of the topmost lines would be completely void. In practice however many speakers show a clearly prolonged decay with a few pronounced resonances. The LS1 decays extremely fast over the entire frequency range. Equally impressive is the step response (right). The rising edge is undistorted, all frequencies are emitted simultaneously.

POINT OF VIEW

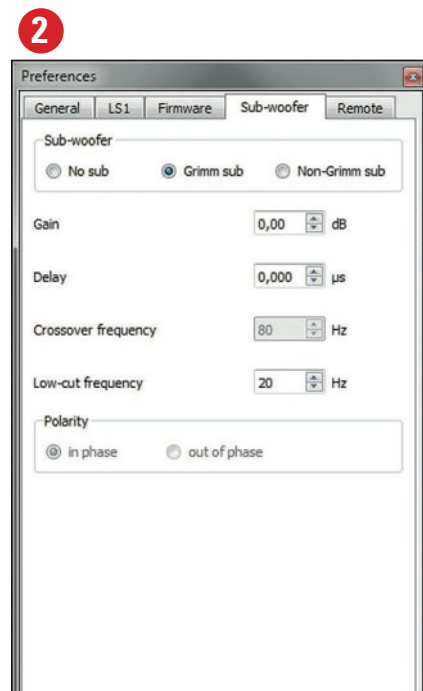


Johannes Maier
Editor, AUDIO

From an electronics point of view I should correct Wolfram Eifert's use of the term "newcomer". While Grimm's amplifier maven might still be called a young fellow (he was born in 1973) he was already building valve amps in his schoolboy days. After graduating Cum Laude he landed a job at Philips where he developed his "Universal Class D" amplifier. Thus, the author had the honour of being introduced to the UCD circuit and its optimized pulse width/density scheme and the mathematics of feedback loops by the man himself (Stereoplay 2002/2). At that point Putzeys seemed seriously to be considering chucking his engineering career to go and study theology. History records that he stuck with his ampli-

PUTZEYS' GREAT LOVES ARE HI-FI, MATHS AND THEOLOGY

fiers and that he went on to continue developing them for the Dutch manufacturer Hypex. After his becoming part of Grimm Audio those resulted in an active loudspeaker. I think we can spot a trend here. Let us have a theoretical look at a standard hi-fi system. The electronics try to reproduce exactly the voltage of a music signal, while the magnetically driven loudspeaker chassis respond to changes in current. And doesn't it just have to be the loudspeaker, that relatively nonideal component, that's charged with converting the voltage into current... The electronics of the Grimms show better than ever how DSPs are capable of mitigating this state of affairs. If he can make this technology trickle down into more budget friendly spheres, Putzeys will have truly brought heaven a step closer.



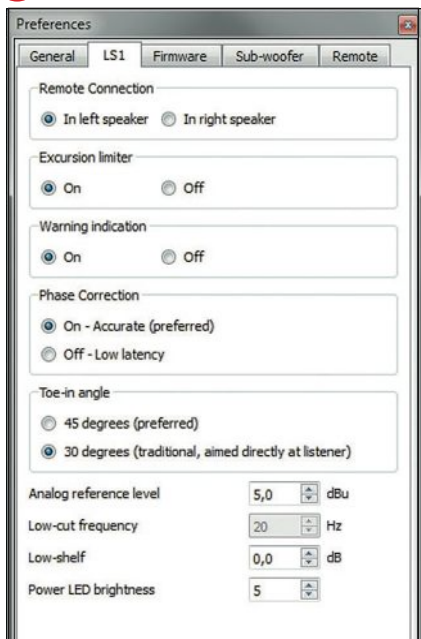
Which, I daresay, was nothing short of gigantic. Like the collective editorial staff the author could not get enough of the LS1's perfect temper. The fact that the listening sessions took all of two weeks was in no way due to any uncertainties of opinion but to the sensationally lively and clean sound. Neutrality and detail tended to be good in the more affordable models in this month's active speaker feature as well but none of them came even close to the naturalness of the Grimms. They alone pulled off the feat of illuminating the musical structure down to great depths whilst remaining completely

untechnical. Nothing ever sounded of loudspeaker. There was no hint of artifice in their outstanding clarity which never got in the way of a round and full-bodied delivery. First rate too were the subwoofers, which were perfectly integrated. A specially gripping demonstration of the LS1's abilities is the melancholic "Sunshine Tonight" by the American singer-songwriter Ben Weaver (Fargo Records). At the same time spacious yet holographically precise, an image of the singer and his guitar appeared between the speakers with such realism that all present were certain they'd



LIAISON BETWEEN SPEAKER AND COMPUTER: A small USB interface handles communication when setting up the electronics in the speaker with the proprietary software.

3



never heard this lively piece of music replayed so convincingly. Particularly as regards the most decisive audiophile characteristics, to wit neutrality and accuracy, the LS1 is by far the best speaker this magazine has had the pleasure of reviewing in over 35 years. This, dear reader, is not a reviewer waxing lyrically but one taking a deep bow to a total concept that aims for fidelity like no other.

1 MAIN WINDOW: The big volume control wheel is replicated on the main screen. The mute function is also shown. Presets are opened with the “file” button, top left.

2 SUBWOOFER MENU: The place for all presets regarding the low end, e.g. for the crossover frequency, for polarity and for the low cut.

3 BASIC SETUP: Some basic presets such as activation of the limiters or the LEDs or the toe-in angle are saved here.

WRAP UP



Wolfram Eifert
Staff writer, AUDIO

This has to be digested first: From a standing start the Dutch newcomer Grimm Audio strikes home in a spectacular way. The LS1 shows the entire hi-fi world what incredible results can be achieved with DSPs and the clever use of class-D amps. All with a rather inconspicuous speaker that fits into almost every room.



CHARACTERISTICS

GRIMM AUDIO	
Manufacturer	LS1 Grimm Audio Strijpsestraat 94 NL-5616 GS Eindhoven +31-40-213 1562
www.	grimmaudio.com
List price	25000 Euro (including subwoofer)
Warranty	2 years
Size W / H / D	52 / 115 / 16 cm
Weight	68 kg (including subwoofer)
Veneer/foil/lacquer	• / - / •
Colors	Bamboo veneer light or dark, Corian white
Operation	closed box, 2 or 3 ways
Room adjustment	bass level
Particularities	DSP control

AUDIOGRAM

	Extremely natural and open sound with superior homogeneity	●	—
Neutrality (2x)	115	██████████	
Detail (2x)	115	██████████	
Localization	105	██████████	
Spatiality	105	██████████	
Micro-dynamics	105	██████████	
Max. SPL	90	██████████	
Quality of bass	95	██████████	
Bass depth	100	██████████	
Finish	very good		

AUDIO SOUND QUALITY 106 POINTS
PRICE/PERFORMANCE PHENOMENAL

Grimm

AUDIO

driven to improve



*„The LS1 is the most exciting, strange,
beautiful, ridiculously convenient
piece of non-audiophile audiophile gear*

I have ever seen or heard...

This system is a bit science fiction really.”

Bogdan Roscic
President
Sony Classical

LS1

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