

Active loudspeaker Grimm LS1

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Loudspeakers these days are supposed to look slim if the wife is to give the nod to the investment. Unfortunately such a trim build has its disadvantages on the acoustical front. Grimm Audio has delivered a speaker to our office which is in no mood to make compromises of any sort.

"LS1" is the moniker of Grimm Audio's new loudspeaker. The number "1" indicates that this is the very first loudspeaker by this company to see the light of day. This is to say by no means that they're new, quite the contrary. The company has been making exquisite studio gear for years. They've only not been much in the sights of the Hi-Fi market, something that going to change radically soon. As the trend towards active loudspeakers gears up, the LS1 is just the ticket.

The designer, Bruno Putzeys, decided to persue the principle that the outcome should be optimal both at the tonal and temporal levels. I find that uncommonly refreshing: Grimm has maximally drawn on the advantage that no industrial design department with abstruse visual opinions was breathing down their necks. Instead they took the freedom to tinker with the design until it maximally suited the drive units. Thus sprang forth a two-way loudspeaker with a relatively wide baffle. The crossover is DSP based and each drive unit has its own power stage. This roughly outlines what I have on test here but I had better elaborate. Item 1: the baffle. Of course the occasional housewife will say that narrow baffles look prettier. To which the acoustician replies: what about you look at it sideways then? The geometry effectively forms part and parcel of this loudspeaker concept. Drive units usually find out the hard way what sort of

environment they're being pressed into service in. The sound refracts at the edges of the enclosure and some of it gets reflected back, resulting in nasty bumps in the frequency response. The stupid thing is that those errors usually fall smack in the middle of the most critical range of the audible spectrum. A surefire trick is to widen the baffle until those reflections turn up in frequency ranges that don't hurt as much or where the image becomes diffuse anyway. On a chunky item like the LS1 the baffle assists the drivers all the way down to 300Hz, guaranteeing smooth dispersion down to below the midrange. The curvature of the two stands laterally adjoining the cabinet helps push this even further down towards the bass region where the wavelengths become so long that the waves start propagating omnidirectionally anyway. The aforementioned curvature is also added underneath the cabinet to prevent edge diffractions. The top does have a sharp edge, but what with being located underneath the woofer the tweeter is far away and the wavefront emanating from it first has to climb all the way past the woofer whose cone and surround have a rather greater influence.

The large surface area of the baffle permits quite a shallow depth. This automatically brings yet another advantage: internal resonances are shifted up to above the crossover frequency, so they'll never get excited. This saves the DSP from having to put it right. In my view this is the better option. Please note: if you mess something up in hardware, no amount of electronics is going to save the day. The nifty construction and the unfussy drive units require nothing more than low-Q IIR filters to mold the temporal behavior. Which brings us to the next interesting bit. The built-in electronics is just as delicious as the drive units. The whole affair is amplified by exquisite Hypex class D amplifiers (modified UCD180's, if you must know) which can deliver a confidence-inspiring 120W to the drive units. Both analogue and digital signals are accepted. The input panel has XLR connectors for

balanced analogue and AES/EBU signals in addition to MIDI connections, a professional feature the home user will probably never need.

Analogue signals get digitized straight away at 93.75 kHz. Grimm has quite consciously selected an odd sampling rate which is not simply related to any sampling rate from the 44.1 and 48 kHz families. The reason for this is that the sample rate converter chip doesn't work optimally at those frequencies so the sample rate was moved out of the way a bit. Speaking of sampling rates. You may safely assume that in this product the clock is really stable and clean. Clocks are one of Grimm Audio's specialities. Their CC1, a professional master clock, is a staple in studio circles and the same clock circuit is used in this loudspeaker.

These technical requirements make it an obvious choice directly to feed the loudspeaker digital audio via AES/EBU and to control the loudness with a laptop or with the wired remote that is also available. If you haven't got such an output, use the included S/PDIF adapter cable. With a clean and perfectly clocked signal delivered almost all the way to the speaker cone we're ready to rock. Well, no, the first bit of work is positioning them. When the designer has put so much effort into optimizing dispersion, getting the placement right deserves a few minutes of one's attention. Essentially the behaviour of the LS1 is very uncomplicated. Depending on the amount of toe-in you'll get a result anywhere between "very good" and "even better". In the end I decided to stick with a 45 degree toe-in, in which the acoustical axes cross a good one metre in front of me. It was a neat tip from Eelco Grimm to position the speakers in this unconventional manner as it got me effortless good sound outside the sweet spot. Other than that didn't notice any tonal changes.

This is something that only works with speakers with the kind of excellent off-axis behaviour that the LS1's have. Thus positioned they produced a clean and luxuriant sound stage the likes of which I've rarely witnessed before. The image is as sharply focused as a single unit wide-range speaker, but much less restricted, extending well past the stereo base. You can really dive into the music.

This is supported by a bone dry bass with enough extension for virtually any kind of music. The frequency range is software controllable and can be extended further down, albeit at the expense of power handling. Bass fetishists might prefer to wait until the matching subwoofer becomes available. This is simply connected to the subwoofer output and comes fully preconfigured to complement the LS1 exactly, in both the amplitude and time domains. Of course other subwoofers will also work but you'll have to adjust everything yourself and accept a less than perfect crossover.

In the past I've always had a hard time with perfectly neutral speakers. Mostly I felt a certain boredom and annoyance at the lacklustre musical performance. The LS1's showed me that you can build a speaker that is a hundred percent honest and yet never ceases to invite foot-tapping. Its ability to project a large but nevertheless cogent and clearly defined space is absolutely breathtaking. Livingston Layers' whistling at the start of "Isn't She Lovely" almost startled me into believing that there was a real human being whistling and not just a loudspeaker. Just incredible! Probably the perfect impulse response has a significant hand in getting this wonderful rhythmic and spatial impression across.

As you might expect the direct connection between the PC and the speakers through a USB-S/PDIF interface was quite the thing

for me. That way you're digitally sending the music all the way until just before the speaker cones, where it's only converted into analogue right before the amplifiers. Microdynamics and smoothness are ratcheted up another notch and the minutest details are carved out even more impressively. And another thing: on these loudspeakers you can listen for hours on end without fatigue. This benefits both the professional user (who no longer has to return home with grated ears) and the Hi-Fi lover at home.

Price: approx. 10.000 Euros

- Distributed by: Audio Import GmbH, Wermelskirchen
- Telephone: 02196 883136
- Internet: www.audio-import-hifi.de
- W x H x D: 520 x 1150 x 160 mm
- Driver complement: 1 x 8"-Midwoofer
1 x 1.1" Textile dome
- Operating principle: 2-way active with DSP
- Inputs: 1 x analogue XLR
1 x AES/EBU
1 x MIDI
- Outputs: 1 x Sub out
1 x MIDI-Playthrough

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This is probably the most "correct" loudspeaker I've ever laid ears on. The combined honesty, neutrality and pleasing musicality is at a level that I haven't come across before.

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(caption) A discreet white LED in the dot on the name is the only visual feedback.

(caption) The legs are held in place by a magnet until they are locked in place with a bolt.

(caption) The loudspeaker's form factor appears unusual but it's part of the acoustical concept.

(caption) The tweeter was located under the woofer very much on purpose.

(caption) The high frequency dome goes smoothly all the way to 30kHz. The crossover frequency of 1.2kHz is unusually but advantageously low.

(caption) A Seas Excel driver is responsible for the lows and mids.

(caption) Clearly noticeable: the narrow-band distortion spike at 7kHz goes away when remeasured off axis.

(caption) Said spike is mainly the gentle second harmonic distortion, while the more annoying higher harmonics are almost unmeasurable.

(caption) The digital input is AES, an SP/DIF adapter cable is included. In that case you'll need the MIDI ports for volume control and loop-through, but otherwise there's always analogue.

(caption) The frequency response is perfectly smooth and flat. The concept proves itself magnificently. Off-axis behaviour is incredible: in spite of the waveguide, even at 30 degrees (red) the tweeter still goes all the way past 20kHz. Also the usual hole around the crossover frequency (1.2kHz) is nowhere to be seen.

(caption) Particularly impressive is the impulse response. It comes close to that of a very good tweeter on its own.

Associated equipment:

Logitech Squeezebox Touch, RipNAS Z500

Apple Macbook Pro, OSX 10.7.2, PureMusic 1.82

Musical Fidelity M1 CLIC, RipNAS Z500

D/A converter: Auralic ARK-MX+, Metrum Acoustics Octave NOS Mini DAC

Preamp: MaValve Preamp Four Line

USB cable: Audioquest Carbon

Analogue interlink: Van Den Hul

Music

Peter Gabriel, Half Blood (FLAC, 48kHz, 24 bit)

Elvis Costello, North (FLAC, 88.2 kHz, 24 Bit)

Xiomara Laugart, Xiomara (FLAC, 96 kHz, 24 Bit)

Small World Project, Small Is Beautiful (FLAC, 96 kHz, 24 Bit)

Rodrigo Y Gabriela, Rodrigo Y Gabriela (FLAC, 44.1 kHz, 16 Bit)

Air, Talkie Walkie (FLAC, 44,1 kHz, 16 Bit)

The Reverend Peyton's Big Damn Band, My Whole Fam Damnily
(FLAC, 44.1 kHz, 16 Bit)