

Credo Audio Switzerland - Cinema LTM



J. V. Serinus - Stereophile.com

"Here, chatting was minimal, perhaps simply because the sound was so good."

"Part of the responsibility for the space's success falls at the feet of the new Swiss-made Credo Cinema LTM loudspeakers (\$170,000/pair)."

Jason Victor Serinus - stereophile.com - Axpona 2019

Our goal:

Big listening room = big speakers = big sound? Well, unfortunately not with most large speaker systems currently available. The acoustic influences and the large hearing distance speak clearly against the use of classical point sound sources.

What we want to achieve:

- An extreme dynamic range
- Very low harmonic and modulation distortions
- A broad and homogeneous horizontal dispersion behavior
- A vertical cylindrical radiation behavior
- A correct acoustic perspective of the "sound-stage"
- A clean step and impulse response
- A linear frequency-response over the entire frequency range
- A linear and uniform impedance

- An ideal directivity-index „DI“

Technical overview:

The "Cinema LTM" is a passive filtered 3-way floor-standing speaker, with line-array technology. Each speaker comes with 32 ring radiator tweeters. A textile membrane with a diameter of 22 mm was installed in a special, extremely compact housing with neodymium drive. This allowed us to mount the tweeters extremely close to each other, which is absolutely essential for a high-performance line array. The distance is only 0.7 mm.

The fourteen high-end mid-woofers feature a 4" Kevlar diaphragm and a low-loss drive with neodymium magnets. We use our proprietary high-pass filters, so they play at very low-distortion even at high SPL and down to 100 Hz.

In addition, four passive 12" subwoofers with almost 60 mm stroke are installed per loudspeaker.

Thanks to our proprietary crossovers, the unique 4" mid-woofer and the special tweeter design, we were able to create a loudspeaker with incredible dynamic range, whose distortion values are extremely low.

Incidentally, unlike similar systems, it is easily possible to use virtually any high-end amplifier. Since the speaker is quite efficient and the impedance curve extremely linear, less powerful high-end amplifiers can be used.

The cabinet:

Especially the front, the assembly of the line-sources and their housing demanded our whole experience. The first prototypes were installed in aluminum fronts. Because the very small distances between the loudspeaker chassis and the high mechanical demands, aluminum seemed to be a good choice. But the strong resonances in the material turned out to be a no-go. Now we install a 12 mm (1/2") thick polymer plate, which is pore-free - since it is cast. The main component is bauxite, together with the other ingredients results in a very low-resonance material. The speaker chassis are clamped on to the back and additionally stabilized and stiffened with milled aluminum holders.

The cabinet is milled from 120 mm (4.7") hardwood. A well-known expression for this material also is "Panzerholz". The block is pressed from a total of 93 layers of sanded beech wood. The achieved strength is enormous and the volume weight is around 800 kg per m³ (1'764 lb. per ft³).

Technical specifications (further technical explanations below):

- Three way floor-standing speakers
- Line Array Enclosures: Sealed, mid-woofer & tweeter separated (optimized for low-compression)
- Subwoofer: Sealed (optimized for low-compression)
- Vibration-decoupled to the ground
- Tweeter: 32 x 22 mm coated textile dome, neodymium magnet
- Midwoofer: 14 x 4" fiber-glass cone (coated), neodymium magnet, low-loss suspension & drive
- Subwoofer: 4 x 12" aluminum cone, double ferrite magnet, 60 mm stroke
- Crossover: Passive proprietary 3-way filters, coils: Mundorf CFC air-core, capacitors: Mundorf MCap Supreme EVO
- Crossovers are mounted vibration-decoupled

- Handmade by Credo Audio Switzerland
- Tuning: Closed (optimized for low-compression)
- Frequency response: 16 Hz - 20 kHz, +/- 2.5dB
- Bass roll-off: 20 Hz @ 0dB / 15 Hz @ -2.5dB / 14 Hz @ -10dB
- Efficiency: 85.5 dB @ 2.83V @ 1kHz @ 1m
- Linear impedance: nominal 8 ohms, minimum 3.8 ohms at 10 kHz, max 9.1 ohms @ 200 Hz
- Recommended amplifier power: For 95 dB at 1 m distance: 18 W
- Recommended amplifier power: For 95 dB at 4 m distance: 100 - 300 W RMS
- Weight: 155 kg (342 lb.) p.p. without packing
- Size: (H x D x W): 187 cm x 70 cm x 27 cm (73.6 x 27.5 x 10.6") incl. isolation feet

Includes brushed stainless-steel feet. Custom finishes available.

Problems with "line arrays":

We have real solutions for the problems existing with line arrays, which were developed for PA purposes (eg for concerts), and make them usable for home use. Unlike existing high-end line-sources, we have addressed the known problems of this technique, which include:

- Strong side lobes at low frequencies (200 Hz - 2 kHz)
- Level drop of high frequencies (also on axis!)
- Wavy and non-linear frequency response (off-axis)
- Very narrow horizontal listening range at high frequencies (+/- 5 ° above 8 kHz)

Convince yourself at a demonstration.

Cylindrical Waveform

Basically, a line of sources will create a wavefront of sound pressure that is cylindrical at particular range of wavelengths (frequencies).

It's idealized shape is actually like a section of a cake, and the wavefront surface area, as it expands only in the horizontal plane, doubles in area for every doubling of distance. This equates to a 3 dB SPL loss of level for every doubling of distance.

While with spherical sound propagation a loss of -6 dB SPL occurs for each doubling of the distance.

Line source vs. Point-source

To put it simple, the line-sound-source has a much better efficiency than the point-source with greater listening-distance. The drivers are stressed much less and you need less amplifier power.

A calculation example with our "Cinema LTM" yields the following result:

At a distance of four meters from the loudspeaker, 36 watts are required for 95 dB SPL (no headroom included).

A point-source with identical efficiency at one meter distance, but requires 143 watts at four meters to reach 95 dB SPL.