

Technical Description

Jamo E 7 system



Jamo[®]
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Technical Description

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1. General description

The goal with our new E 7 series loudspeakers has been to bring audiophile quality loudspeaker technology to the mass market. Furthermore our requirement from the start has been that this new series should perform equally well with music as movies and have the eye pleasing aesthetics that allow most people to integrate these loudspeakers in their everyday living rooms without sacrificing their interior decor. A task that proved to require new and ingenious solutions as well as ground breaking technology from our EISA award winning D 7 series.

These are loudspeakers designed by engineers with a passion for music in all its forms. Anybody who listens to these designs will hear that. We wanted this new range to exceed all sonic expectations in the class... we think that's exactly what it does.

One of the biggest challenges when designing speakers is preventing unwanted cabinet vibrations from clouding or colouring the sound. High frequencies are particularly susceptible so we came up with the first ingenious solution... **Decoupled Tweeter Technology (DTT)**.

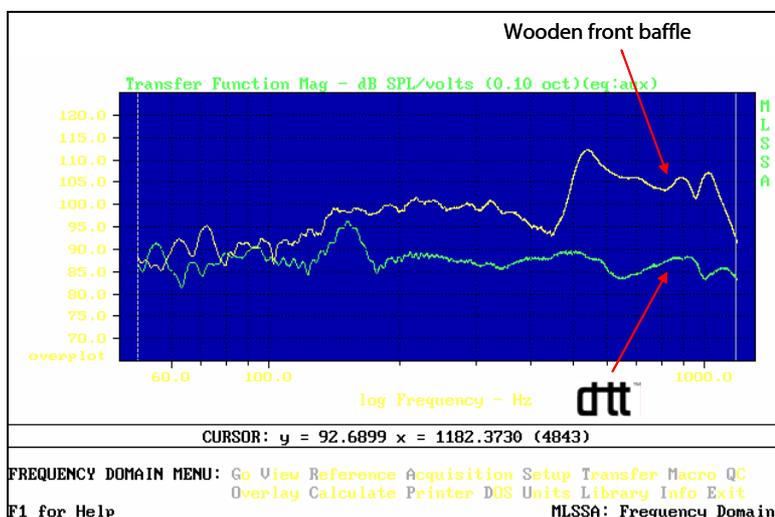
By decoupling the tweeter from the rest of the loudspeaker, vibrations transmitted from the front baffle to the tweeter are reduced by more than 20 dB resulting in an uncommonly detailed and realistic reproduction of high frequencies.

Firstly the tweeter is decoupled from the aluminium front baffle using a special rubber compound called EPDM (Ethylene Propylene Diene Monomer) which has extremely good acoustical properties. Secondly the aluminium front baffle is not just screwed onto the wooden front baffle but mounted using natural rubber rawlplugs which further prevents vibrations being transmitted.

The loudspeaker cabinets themselves are constructed from solid MDF and the front baffle is angled by 2 degrees in order to further enhance the rigidity of the cabinets. The two floorstanding models in the range also have internal bracings adding further to the structural stiffness of the whole construction. Please refer to section 4 for more information about the cabinets.



Exploded view of the Decoupled Tweeter Technology.



Difference between vibrations in a normal front baffle and vibrations in a front baffle employing Decoupled Tweeter technology.

2. The products

2.1 E 700

E 700 is a very compact 2-way bass reflex speaker with a 4" mid/woofer and a 1" soft dome tweeter using our new DTT (Decoupled Tweeter Technology), see more details about DTT and the drive units below.

The compact drivers improve the dynamics: As they weigh less they can move faster. Of course under the precondition that they are equipped with very powerful motors (magnet/voice coil) as is the case here.

The crossover frequency is 2,500 Hz.

Every diaphragm has a break up point and it is important that the driver is used in a range where break ups are controllable or do not appear. By choosing newly developed drive units made from a special fibre glass and glue compound, we have eliminated many of the known challenges regarding break-ups in the diaphragm material. For example the inevitable diaphragm break ups can be controlled and distributed more evenly across the whole diaphragm thereby avoiding uncontrolled colouring of the sound at certain frequencies.

When used as a surround speaker in an E 7 solution, the E 700's voicing ensures that seamless timbre matching is guaranteed when the sound pans across the room.



Decoupled Tweeter Technology solid aluminium front baffle.

2.2 E 750

E 750 is a tall slim line 3-way speaker utilising a bass reflex system and a rear firing woofer. The E 750 is equipped with the same 1" soft dome DTT tweeter as found in the E 700, and the rest of the series for that matter. The bass/midrange driver is a 5¼" and the rear firing woofer is a 5½".

The crossover frequencies are 150 Hz and 2,500 Hz.

The rear firing woofer on the E 750/E770 have been specifically designed to deliver increased bass output but with a very linear response, even when placed relatively close to a wall. Furthermore this design will result in a general level of 3-6 dB increased output (depending on the distance from the front wall and the side walls) which means that the drive unit can obtain the same relative volume level but with less excursion, thereby minimising the overall distortion.



Rear firing woofer on E 750/E 770.

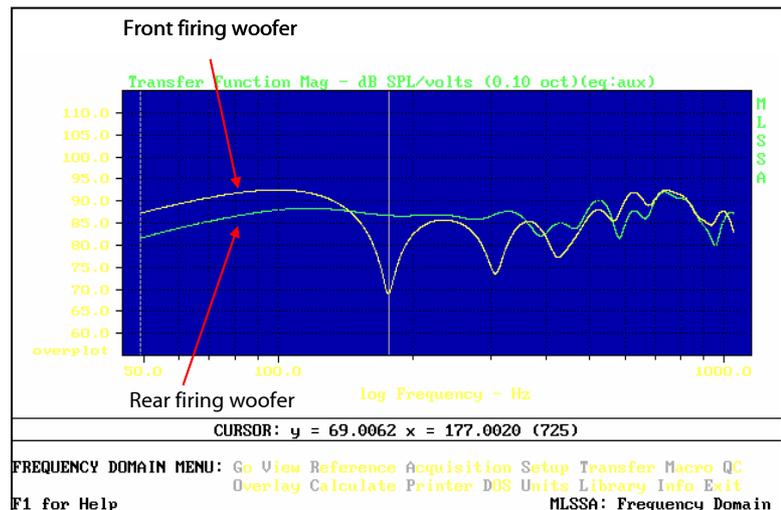
The low crossover frequency of the woofer (150 Hz) also make sure that the drive unit performs in the frequency range were it is designed to perform best, delivering a deep powerful bass equally at home with music and movies.

2.3 E 770

The range-topping floorstanding model in the E 7 series is the **E 770**, similar in proportion and driver complement to the E 750 but physically larger at nearly 1m high and even better endowed in the driver department. The same 1" DTT tweeter is used, naturally, but here it's partnered with a front facing 6½" mid/bass unit and a ported 6½" woofer.

The crossover frequencies are similar as with the E 750 150 Hz and 2,500 Hz.

By utilising a rear firing woofer on the E 750/E 770 the in room bass response is also easier to control as the natural quarter wave frequency cancellation is minimised.



The in room frequency response of a traditional front firing woofer and a rear firing woofer respectively.

This model offers a low frequency response that reaches down to 35 Hz, allied to 90 dB sensitivity.

2.4 E 7CEN

Vocal clarity is all important in any centre-channel loudspeaker so using the Decoupled Tweeter Technology in the **E 7CEN** was the natural step. Here for timbral accuracy, it's partnered by a pair of the same 4" mid/bass drivers you'll find in the E 700 and augmented with a flowed port at the rear

The crossover frequency is 2,500 Hz.

With a height of just over 14 cm the E 7CEN is extremely compact and thereby easy to place in the listening room.

2.5 E 7SUB

The **E 7SUB** is equipped with a very powerful 10" woofer and equipped with a solid class AB amplifier, capable of delivering peak power of up to 675 watt.

Thanks to the heavy MDF board sealed cabinet, the powerful amplifier and the high excursion woofer, the **E 7SUB** delivers a deep, precise and detailed reproduction of the low register - perfectly matching the sound from the rest of the E 7 series.

With a frequency response that reaches down to 25 Hz the E 7SUB is not only designed for movies but for music too. This subwoofer is just as comfortable portraying subtle musical nuances as it is churning out high-level gunfire, explosions and earthquakes.



E 7SUB

However, under certain circumstances the capability of being able to reproduce very low frequencies can create a problem, which is why we have chosen to implement the Boundary Gain Compensation technology also found in our EISA award winning D 7SUB.

Boundary Gain Compensation compensates for the room influence at low frequencies, as any room amplifies the lowest frequencies. The Boundary Gain Compensation starts at 55 Hz -3dB and drops to -10 dB at 25 Hz.

The magnitude of the room's amplification depends on the room and where you are positioned – normally it increases the closer you get to a wall, which also means that the problem get worse the smaller the room.

This can result in too high bass level from approx. 60 Hz and increasing downwards. In the range between 20-30Hz it peaks up to 5-10dB in an average room.

At first impression this could sound really impressive, but especially when listening to music the sound can be "boomy" and rather annoying.

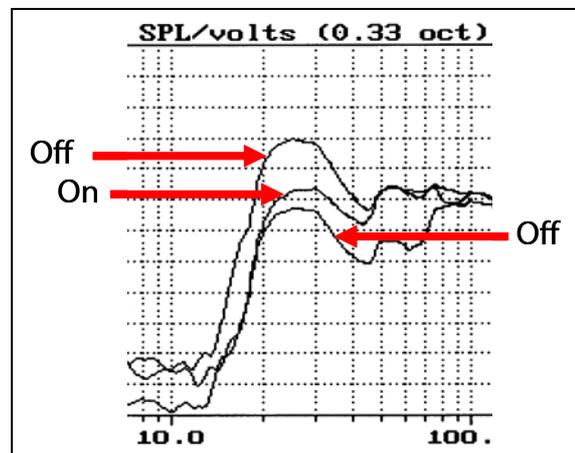


Illustration of how the Boundary Gain Compensation technology works. Note that in both off positions the peak around 20-30 Hz is much higher than 40-100 Hz, whereas in the on position the bass response is more linear.

With the usual adjustment possibilities such as cut-off frequency and volume level it will be impossible to obtain a linear in-room frequency response. However the Boundary Gain Compensation switch will allow an additional fine tuning possibility which will compensate non optimal placement of the listening position in most rooms.

Boundary Gain Compensation together with the normal set of controls (phase, cut-off frequency and volume level) makes it easier to integrate the E 7SUB in your listening room no matter whether you are using large floorstanding speakers like the E 770 or small high quality compact speakers such as the E 700.

Most of today's subwoofers have an auto on/standby feature whereby the subwoofer switches itself on if it senses a signal and switches in standby mode again a certain time after it has last sensed a signal. However, in movies (or typically classical music) with relatively quiet passages many subwoofer tends to switch to standby mode thereby "missing" the start of a new action packed sequence like for example an explosion or a kettledrum. Besides the auto on/standby mode we have therefore implemented a mode were the subwoofer is always on.



Extensive range of adjustment possibilities, including Boundary Gain Compensation, on the E 7SUB

3. Driver explanation

3.1 Tweeter

The new 1" soft dome DTT tweeter chosen for the E 7 series features an extremely efficient neodymium magnet (10 times more powerful than a conventional magnet). Because the magnet can be reduced in size, it can be placed inside the voice coil of the loudspeaker unit, allowing the magnet force to be concentrated around the voice coil – exactly where it is needed.

Furthermore, the use of a neodymium magnet was required on the E 7 series because of the limitations in space and weight for the realisation of the Decoupled Tweeter Technology. Please refer to the exploded view of the DTT principle on page 3.

3.2 Midrange/Woofers

The 4", 5¼", 5½" and 6½" midrange/woofers found in the E 700, E 750, E 770 and the E 7CEN feature diaphragms made of a special fibre glass/glue compound. This material helps to control and distribute wave modes evenly, thereby ensuring minimal coloration and a very transparent midrange.

The natural rubber surround we use linearises frequency response yet further.

3.3 (Sub)Woofer

The 10" woofer features an air dried paper cone with a massive surround allowing and a very powerful double magnet for high excursion with minimum distortion.



Drive units made from woven fibre glass/glue compound with natural rubber surround.

4. Cabinets

The MDF board used for the E 700 and the E 7CEN is 16mm thick all around. This together with the compact size, the solid brushed aluminium front baffle, the 2 degrees angle of the front baffle and the Decoupled Tweeter Technology makes for a very resonance dead base for the drivers to work in.

The E 750 and E 770 employ 19mm MDF board. Furthermore we have made the cabinet even more inert by adding internal bracings and at the same time a separate enclosure for the mid/bass drivers.

The E 7SUB utilises 22mm MDF board all round. This together with internal bracing and a separate enclosure for the electronics makes for a very solid cabinet with a minimum of cabinet vibrations. As with the rest of the E 7 series the front baffle is angled 2 degrees for even more rigidity.

5. Technical specifications



	E 700	E 750	E 770	E 7CEN	E 7SUB
System	Basreflex	Basreflex	Basreflex	Basreflex	Closed
Woofers	4"	5 ½"	6 ½"	2 x 4"	10"
Midrange		5 ¼"	6 ½"		
Tweeter	1" (neodyn.)	1" (neodyn.)	1" (neodyn.)	1" (neodyn.)	
Long term power (W)	100	140	150	100	
Short term power (W)	140	200	220	140	
Sensitivity (dB/2.8V/1 m)	85	89	90	87	
Frequency range (Hz)	70-20k	42-20k	35-20k	80-20k	25-150
Crossover frequency (Hz)	2500	150-2500	150-2500	2500	
Impedance (Ohm)	6	6	6	6	22k
Phase					Adj. 0-180 deg.
Cut off frequency (Hz)					40-150
Amplifier rated output (W)					675 W peak
Limiter					Yes
Boundary gain compensation					Yes
Weight kg/lb	3.0/6.6	14.5/31.9	17.2/37.9	5.8/12.8	21.0/46.3
Dimensions (H x W x D)	140x238x165	185x912x315	195x998x320	440x142x170	375x375x375
mm/in	5.5x9.4x6.5	7.3x35.9x12.4	7.7x39.3x12.6	17.3x5.6x6.7	14.8x14.8x14.8
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