Release Note: Etude Tri-Linear Array (ETLA) Loudspeaker

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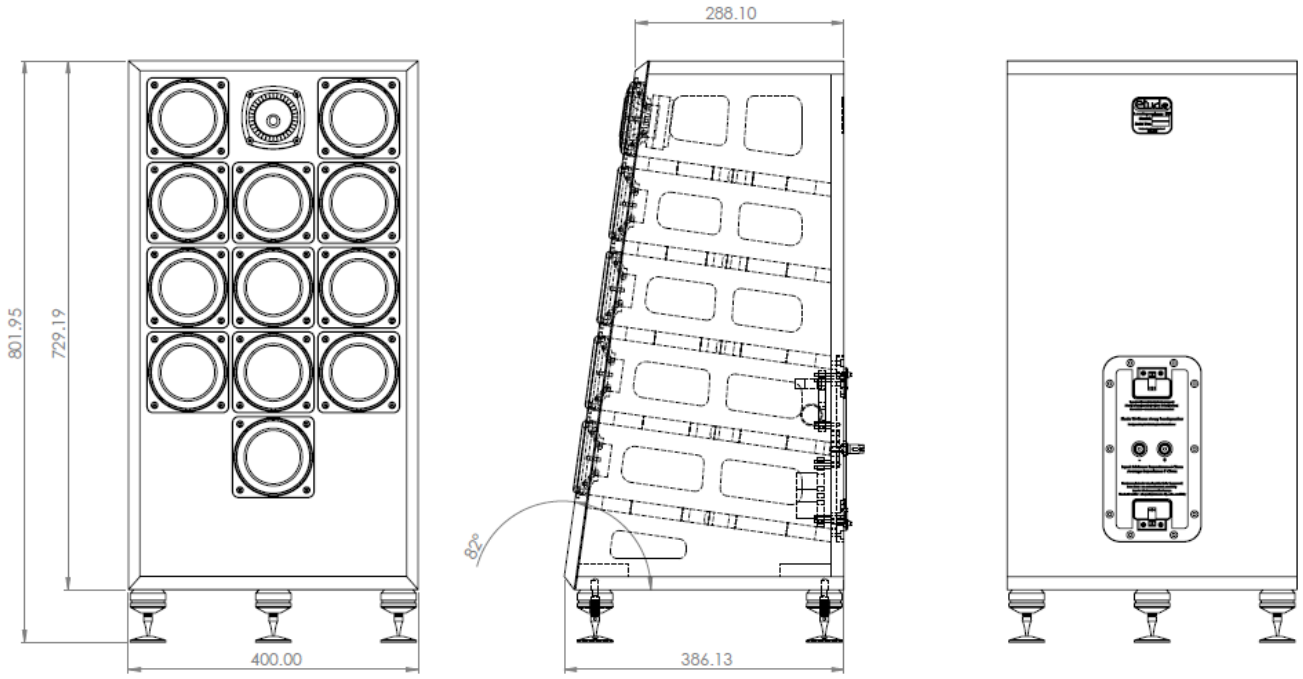


The Etude Tri-Linear Array (ETLA) is a floor standing loudspeaker about 760 mm high (with the standard M8 furniture gliders) and 400 mm wide. It has an angled baffle to enable on-axis listening from a seated position. The speaker is designed for those who desire a high sensitivity loudspeaker with wide dynamic range, excellent tonal coherence, fast and even bass response and high timbral accuracy in a squat retro-proportioned cabinet that is boundary loaded – i.e., installed close to the back wall to maximise room space and bass extension. Single figure wattage (best above 3 W) valve or solid state single ended amplifiers should be able to drive the ETLA to satisfying levels in an average UK sized living/listening room.

The ETLA driver compliment consists of three vertical linear arrays of four 85 mm balanced mode radiator (BMR) drive units giving a maximum sensitivity of 99 dB/W and a nominal impedance of 8 ohms. The central array is topped with a selected compression tweeter, the same type as in the Etude High Sensitivity Bipole (EHSB). The tweeter contributes treble from 4-5 kHz (second order roll-in). All the BMR drive units are all loaded by the same sealed volume of air in the cabinet. The combined Q_{ts} is tailored to give an even fast bass response down to around 50 Hz – effective boundary loading can increase bass reach - down to 32 Hz (-6 dB) (Figures 1 and 2) in my listening room. The two linear arrays, flanking the tweeter topped central array, are rolled off / stepped down (1^{st} order) to give a presence dip and tune the horizontal dispersion characteristics. The roll-off or stepped down option will be user selectable and will enable adjustment of the depth of the presence dip (Figure 1). The tweeter output will also be user tuneable solderless resistor changes (Figure 2). The load related data is given in figures 3 to 5 – the ETLA is an easy load – no problems for valve amplifiers – minimum equivalent peak dissipation resistance (EPDR) is just 3.5 Ω at 54 Hz. The voicing can be tuned to the selected voicing of EHSBs thus enabling use of the ETLA in multi-channel arrangements with the EHSB – In my listening room EHSBs for the front left and right whilst ETLAs form the centre and surround left and right channels.

The 18 mm thick CNC machined higher density exterior grade MDF cabinet is extensively braced, front to back and side to side to eliminate cabinet colouration and contains no fibre of foam absorbents which can slow transient response due to their sometimes time dependent energy release. Painted (satin crackle) finish is standard. Piano lacquer and veneer options, and combinations thereof, are available at extra cost. Network components are from Jantzen, Clarity Cap, Bourns, Customcoilsnstuff and Vishay. The price for the ETLA in standard satin crackle finish and with standard M8 polypropylene tipped furniture

gliders is to be £3000 / pair direct sale. A good looking grille has also be designed for those who want one, this has not yet been costed but is anticipated to be at an additional cost of £200/pair.

Specifications:

Frequency response (in room)	32 Hz to 20 kHz (note downward sloping best fit line and ± 6 dB limits, Figure 1)
Sensitivity	ca. 99 dB/W (at 600 Hz with 4.7 Ω flank array inductor shunt)
Power handling	240 W programme (each BMR driver is 20 W rated)
Nominal impedance	8 Ω
Minimum impedance	5 Ω (at 10 Hz)
Dimensions (max. HxWxD)	760 mm (with M8 gliders) x 400 mm x 386 mm
Mass of single cabinet	ca. 25 kg

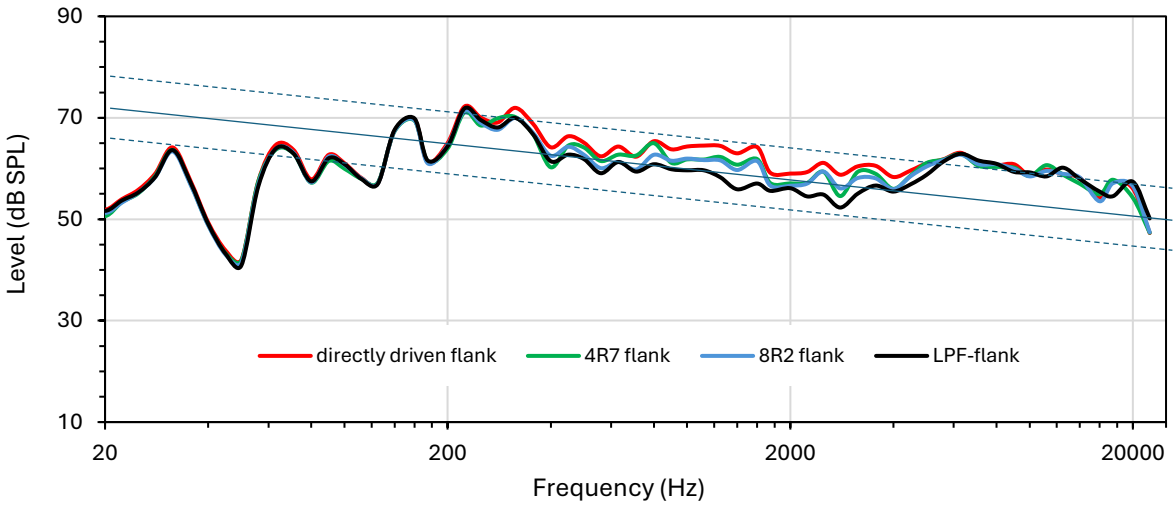


Figure 1. Sixth Octave pink noise in-room response of stereo pair showing effect of flank array inductor shunt resistance (including no inductor (directly driven flank) and inductor only (no shunt (LPF-flank)). The suck-out centred at 50 Hz is room related. Tweeter resistor fixed at 22 Ω.

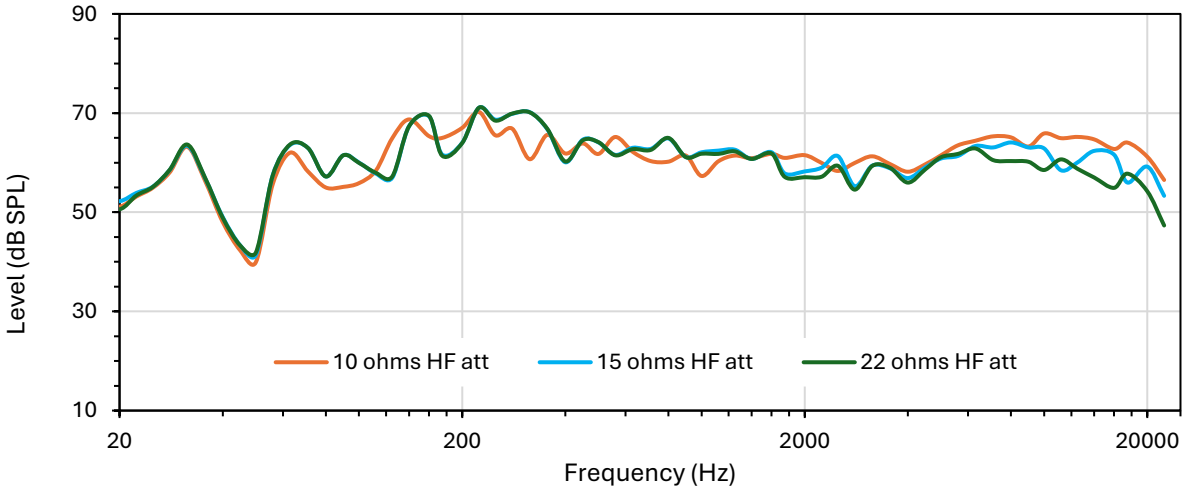


Figure 2. Sixth Octave pink noise in-room response of stereo pair showing effect of tweeter series resistance. Flank array inductor shunt resistance fixed at 4.7 Ω.

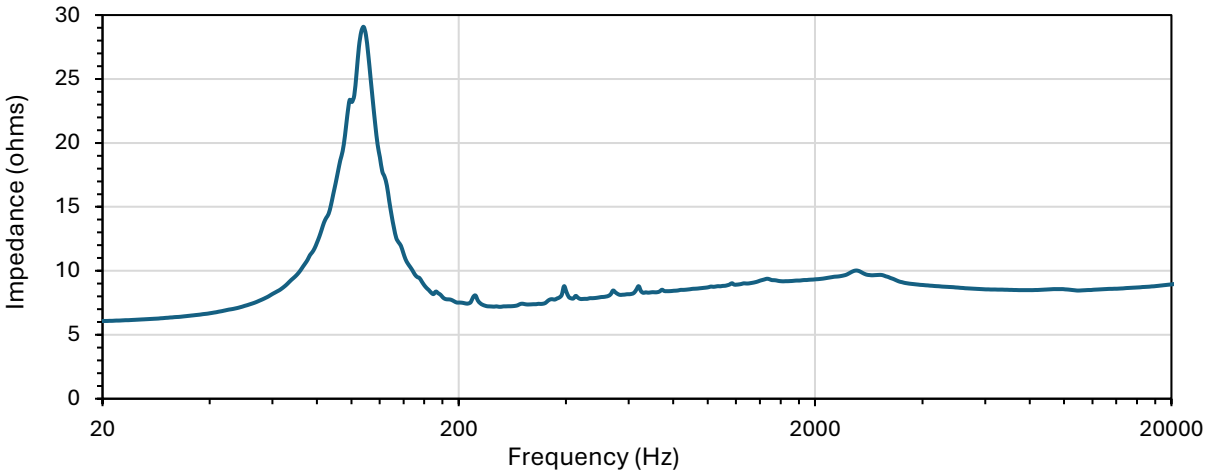


Figure 3. Impedance versus frequency, average impedance is 8.9 Ω, maximum impedance is 29 Ω at 108 Hz, minimum impedance is 5.9 Ω at 10 Hz.

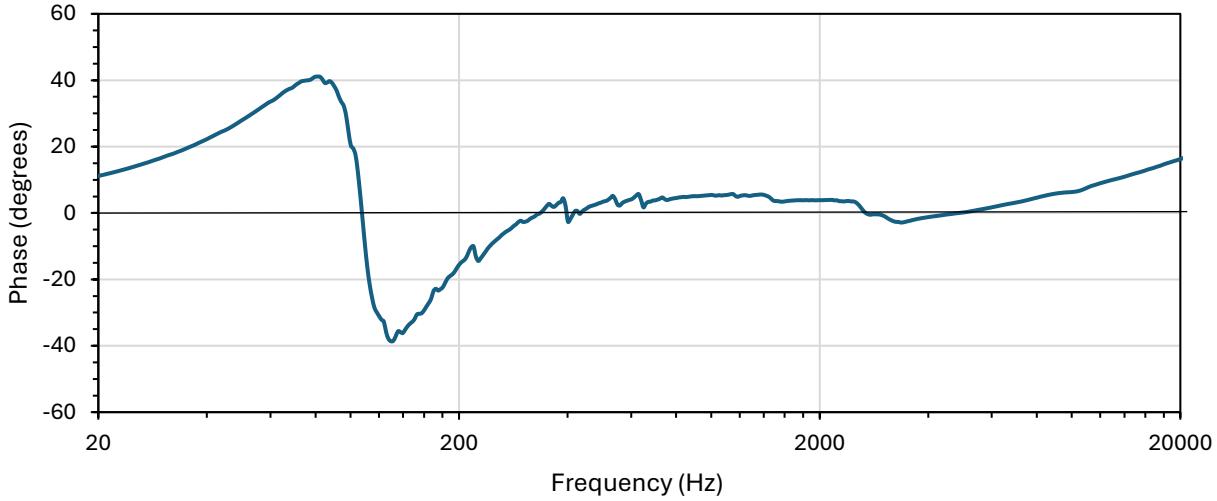


Figure 4. Phase angle versus frequency. Essentially linear phase (±6°) from 267 Hz to 9.4 kHz. Maximum positive phase angle is +41° at 81.5 Hz and maximum negative phase angle is -36° at 129.6 Hz.

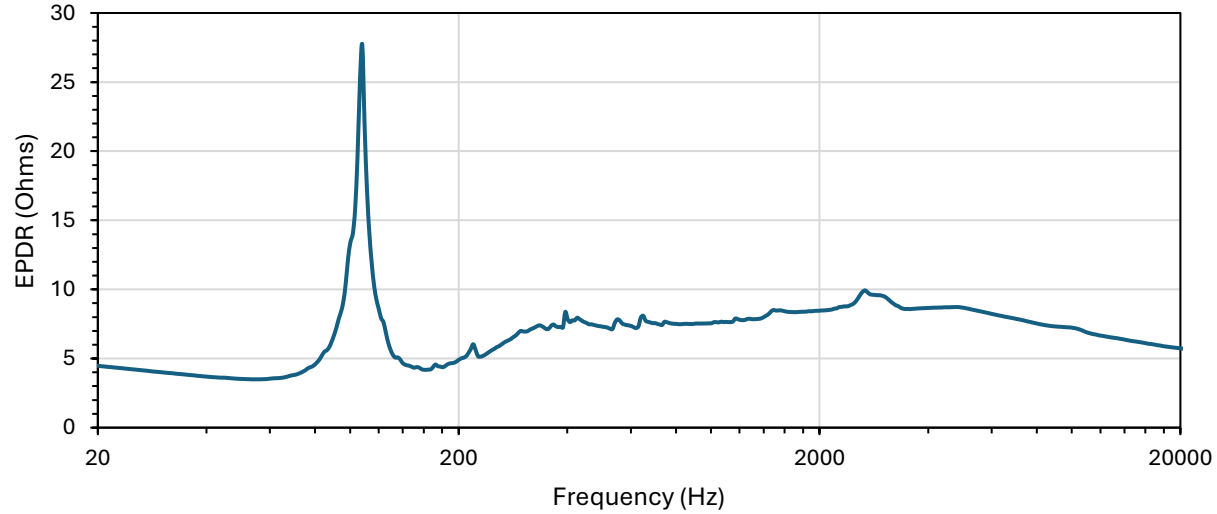
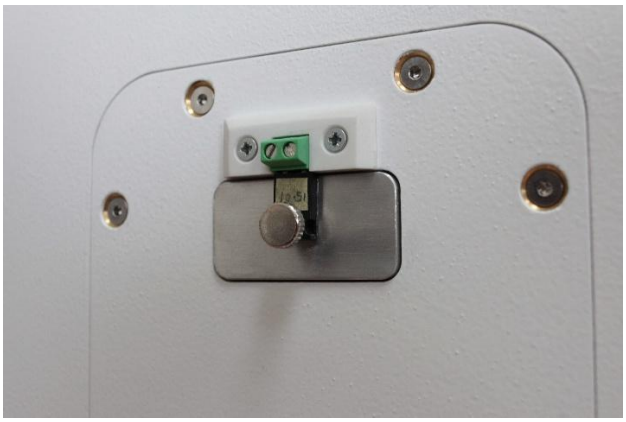


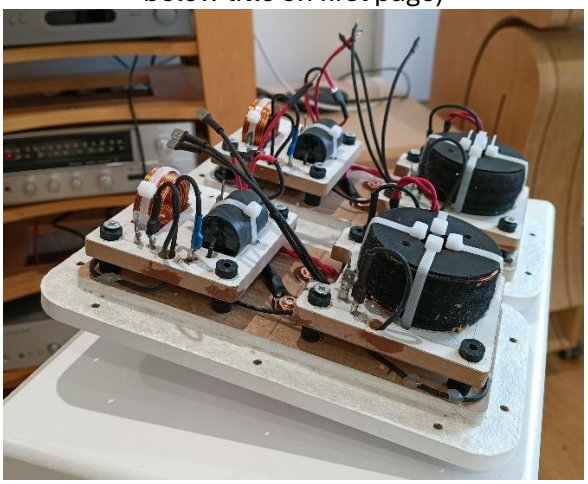
Figure 5. Equivalent peak dissipation resistance (EPDR) versus frequency. Minimum EPDR is a moderate 3.5 Ω at 54 Hz. EPDR is steadily above 6 Ω from about 260 Hz to 17 KHz. A relatively easy load overall - no issues for valve amplifiers.

Front view

Rear view showing laser etched and filled logo / ID plate and tweeter and presence dip trim resistors. Note an escutcheon plate for the connection panel will be added (see line drawing below title on first page)



Trim resistor fixed to heatsink with thumb screw and electrically connected via a commercial terminal block bonded to a bespoke fixing plate.



Filter networks (note the Clarity Cap ESA capacitor is wrapped in a butyl rubber sleeve to further reduce vibration). Both boards are isolated from the panel by elastomeric mounts.

Due to the ongoing quest for improvement, specifications (including components) are liable to change without notice.

CML Music

Home of Curvi and Etude Loudspeakers

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