



Product Parameters and Specifications
Model: Legatia L641-3 Three-Way Component Set

Legatia™ L641-3

The Legatia™ L641-3 is an incredible three-way component system which pairs the Legatia™ L1V2 tweeter with an ultra wide-bandwidth and tonally correct midrange driver, known as the Legatia™ L4, and the transient L6 midbass. Like its smaller sibling the Legatia™ L631-3, the L641-3 set begins with a pair of Legatia™ L1V2 tweeters, which accurately reproduce treble tones in the critical bandwidth of the set, in a small diameter 20mm soft-dome package that fits in the palm of your hand. The L1V2 tweeter is a small diameter impregnated silk soft-dome high frequency driver which can be listened to for hours without listener fatigue typical of metal dome drivers, and drivers with larger moving mass and larger diameter. The L1V2 tweeter reproduces treble in a way that must be heard to be believed. The dedicated midrange driver in this component system is the Legatia™ L4, one of the widest bandwidth, and best-sounding 4-inch midranges on the market today; our crowning achievement. The L4 was developed after two years of rigorous real-world testing, against designs costing up to six times as much as the L4 model. The final component utilized in this incredible system is the Legatia™ L6 midbass driver. In this arrangement, the L6 is used strictly for midbass operation. The low moving mass, high Qts L6 ensures snappy attack and immediate decay of the frequencies below 200 Hz in infinite baffle configuration, with extension into the bass frequencies. If you can accommodate the larger L4 midrange over the L3 midrange, this component system is for you; it is the best small-format component system we make.



Photo 1: L641-3 three-way component set. Tweeter is also available in black anodized finish.



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Legatia™ L641-3 in more detail

The Legatia™ L641-3 is our best small-format three-way system that uses a combination of the Legatia™ L1V2 20mm soft dome tweeter, the Legatia™ L4 4.65-inch midrange, and the Legatia™ L6 large format 7.1-inch midbass. The three-way system offers improved power handling over the Legatia™ L61-2 set, and further offers the sensitive and dynamic L4 as a dedicated midrange driver for precise imaging, staging, and tonality. A very easy way to get a three-way system in your car using just a single 4-channel amplifier is detailed here: <http://hybrid-audio.com/White%20Paper%20-%203%20Way%20Quasi-Active%20Crossover%20System.pdf>. The Legatia™ L641-3 set is the set we use in all of our high-end competition and demonstration vehicles with kickpanel-mounted midrange units for precise two-seat imaging character.

Tweeter

The Legatia™ L1V2 is a 20mm (3/4-inch) dome-type tweeter which has a very good linear response and exceptional transient response. The design offers a wide dispersion pattern to make for flexible installation and speaker location, and the phase linearity of the design ensures phase coherent imaging and staging cues in the car audiophile system.

The L1V2 starts with an impregnated fine cloth silk dome diaphragm for a linear, smooth sound, with a treated silk surround to damp edge modes and resonances. The L1V2 is efficient, exhibits low distortion, and has a wide dispersion; the dome is of exceptionally low mass and has an extremely high power handling with the recommended filtering, or using the available two-way passive crossover system for the L31-2x component system. The L1V2 dome design is much less susceptible to mechanical deformation than other designs, and yet yields a smooth response over the extent of its range.

For more information about the L1V2 tweeter, please visit here: <http://hybrid-audio.com/Legatia%20L1V2.pdf>.

Midrange

The Legatia™ L4 is a very unique driver that satisfies a need in the high-end car audio community for a small diameter, super wide-bandwidth midrange driver for the ultimate in point-source midrange applications. The L4 is a 118mm (4.65-inch) cone-type wide-bandwidth midrange; the cone is an untreated pressed paper with extremely low moving mass. The cone design offers a wide dispersion pattern to make for flexible installation and speaker location. What makes the L4 different than the L3 is the addition of a phase plug pole piece extension at the center of the cone. The highest frequencies of audio emanate from the area around the center of the cone and the lower frequencies are produced by the area of the cone that is farther from the center. Due to the shape of a conventional loudspeaker cone, the higher frequency sound waves tend to collide at a focal point, causing phase distortion. The phase plug pole piece extension improves the L4's performance and clarity by deflecting delicate midrange and treble tones forward of the driver, while minimizing distortion and improving the driver's ability to reproduce a wider bandwidth; this is the reason why the L4 has an extremely wide bandwidth into the upper treble frequencies.

You will find no composite or metal cone materials used on the L4, as our approach to point-sourcing is to allow the midrange or midbass driver to effectively play into treble frequencies. The paper cone is critical to tame unwanted cone modes, resonances, and the classic "cone breakup" associated with all composite and most polypropylene cones, but still be rigid enough for upper midbass attack. The "point source" design ensures stable stereo imaging across the fundamental frequencies which define image placement and definition. Rounding out the face



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of the driver is an inverted high-loss rubber surround that, in concert with the spider, provides the compliance needed for this 118mm midrange to play middle and upper midbass frequencies. You'll also know a higher-end Hybrid Audio midrange and midbass design by its inverted surround; this design feature allows for the use of a smaller height grille, and more flexibility in mounting options.

The motor of the design is conventional dynamic and very complimentary, utilizing a 1-inch voice coil, ferrite magnet, and a unique T-yoke to improve the speaker's power handling. The basket is a high-quality cast aluminum design, and contains a 118mm wide flange providing for the mounting of the driver via four screw holes (the use of 3 - 4mm screws is ideal). The overall dimensions of the driver are very amenable for use in the car audio environment, boasting a depth of just 54mm, just 8mm more than the L3, for the ultimate in mounting flexibility. The terminations are standard spade terminals which have been gold plated to optimize contact, and give the end user flexibility in low-temperature soldered options and crimp terminations.

Mechanical and electrical parameters are amenable to a variety of different installations and speaker locations. The high Qts and low Mms of the driver will allow it to be used in a purely infinite baffle configuration. Hybrid Audio and select Team Hybrids competitors have also had great success using this driver in a dipole configuration, a.k.a. completely "free-air", in larger vented enclosures, arrays, and in folded horns and transmission lines. It is important to note that sealed enclosures are not required; in fact, the L4 works optimally in areas where a large volume of area is available, such as in kick panel, floor boards, or foot wells, underneath dashboards, etc. You do not have to build enclosures for these speakers to perform as intended; a simple baffle attached to the car's chassis with available airspace at the rear of the baffle is all that is required; this driver quickly solves the universal installation quandary of having to build enclosures for car stereo speakers. Finally, the size of the unit allows it to be mounted in typical locations within a vehicle, including kick panels, floor boards, and in some cases a-pillars and dash pods, as long as there is adequate airspace behind the driver to allow it to maintain proper damping and acoustic suspension.

The Legatia™ L4 might be slightly larger than the famed L3, but its performance makes up for the larger footprint area. If you can fit the larger L4 midrange, it is well worth your time to utilize this component system. In our unabashed opinion, it is the best 4-inch car audio midrange on the market today. Our years of developing and refining drivers to win world championships can now be yours for your own vehicle!

Midbass

The Legatia™ L6 is a 181mm (7.1-inch) large format wide-bandwidth midbass driver to compliment this three-way system design. The Legatia™ L6 is a cone-type driver consisting of a pressed paper diaphragm with extremely low moving mass. The cone has been treated with a water resistant element for door mounting, and other areas prone to occasional contact with water. The cone design offers a wide dispersion pattern to make for flexible installation and speaker location. The L6 comes equipped with a phase plug pole piece extension at the center of the cone. The highest frequencies of audio emanate from the area around the center of the cone and the lower frequencies are produced by the area of the cone that is farther from the center. Due to the shape of a conventional loudspeaker cone, the higher frequency sound waves tend to collide at a focal point, causing phase distortion. The phase plug pole piece extension improves the L6's performance and clarity by deflecting delicate midrange tones forward of the driver, while minimizing distortion and improving the driver's ability to reproduce a wider bandwidth; this is the reason why the L6 has an extremely wide bandwidth



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into the upper midrange frequencies. This means that if the end user ever decides to go to a strict two-way front stage system, no additional components will be required.

Like other Legatia midrange designs, you will find no composite or metal cone materials used on the L6, as our approach to point-sourcing is to allow the midrange or midbass driver to effectively play into upper midrange and lower treble frequencies. The paper cone is critical to tame unwanted cone modes, resonances, and the classic "cone breakup" associated with all composite and most polypropylene cones, but still be rigid enough for midbass and upper subbass attack. The "point source" design ensures stable stereo imaging across the fundamental frequencies which define image placement and definition.

Rounding out the face of the driver is an inverted high-loss rubber surround that, in concert with the spider, provides the compliance needed for the L6 midbass to adequately present a real sense of "bass up front" in this three-way front stage system.

The basket is a high-quality cast aluminum design, and contains a 181mm wide flange providing for the mounting of the driver via four screw holes (the use of 4mm cap head screws is ideal). The overall dimensions of the driver are very amenable for use in the car audio environment, boasting a depth of just 81.5mm for the ultimate in mounting flexibility. The terminations are 5-way binding posts which have been gold plated to optimize contact, and give the end user flexibility in tinned wire or binding post terminations.

Mechanical and electrical parameters are amenable to a variety of different installations and speaker locations. The high Qts and low Mms of the driver will allow it to be used in a purely infinite baffle configuration. Hybrid Audio and select Team Hybrids competitors have also had great success using this driver in a dipole configuration, a.k.a. completely "free-air", in larger vented enclosures, arrays, and in folded horns and transmission lines. It is important to note that sealed enclosures are not required; in fact, the L6 works optimally in areas where a large volume of area is available, such as in kick panel, floor boards, or foot wells, underneath dashboards, etc. You do not have to build enclosures for these speakers to perform as intended; a simple baffle secured to the car's chassis with available airspace at the rear of the baffle is all that is required; this driver quickly solves the universal installation quandary of having to build enclosures for car stereo speakers. Finally, the size of the unit allows it to be mounted in typical locations within a vehicle, including kick panels, floor boards, door panels, and in some cases custom dashboard locations, as long as there is adequate airspace behind the driver to allow it to maintain proper damping and acoustic suspension.

The Legatia™ L6 is the ideal multi-purpose high-end speaker driver. At home in virtually any arrangement, the L6 is Hybrid Audio's flagship midbass driver, boasting exceptional performance and a design philosophy that goes hand in hand with foolproof high-end audio.

Summary

The Legatia™ 641-3 takes the performance of the L631-3 system, and improves on it with a wider bandwidth L4 midrange that can play more efficiently in its bandwidth, opening up new possibilities for kickpanel mounting and perhaps even custom dashboard and a-pillar installations. If you can fit the larger L4 midrange, this is our best small-format three-way component system.