

More on bi-wiring, bi-amping etc (July 2006)

The attached diagrams show how, in the author's experience, the sound of loudspeakers can be increasingly improved, though with increasing complexity & costs. Only shown is one speaker cabinet which assumed to have a treble and bass 'drivers' (because they drive the sound waves, each over a specific frequency range where they are most effective), sometimes called 'tweeters' & 'woofers' that are connected respectively to a treble Xover (high pass filter) and a bass Xover (low pass filter). All of the descriptions can be generalised to more drivers, such as a specific mid-range one, and so to tri-wiring etc

With **single wiring, fig A**, a single cable (consisting of a pair of + & - wires) connects each channel of the amplifier to a single pair (+ & -) of terminals on each speaker. Although the treble and bass Xovers are almost always electrically separate, loudspeakers that have only such a single pair of + & - terminals have **internal links** between the treble and bass Xovers made permanently INSIDE the cabinet – such speakers CANNOT be biwired etc.

Many modern high quality speakers have (as in **fig B**) the treble and bass Xovers connected by **external links** (often gold-plated bars, shown as dotted lines in fig B between the **two** pairs (+ & -) of terminal sockets on the back of each speaker. If the external links are left in place, then such speakers can be single wired, as in fig B.

With **biwiring (fig C)** the external links are removed and each of the treble and bass Xovers are connected (via their pairs of + & - terminals) back to the amplifier by separate wires - producing, in the author's experience, increased clarity of both drivers at relatively low cost & effort. For amplifiers with only one pair (+ & -) of output terminals on each channel, it means connecting both + wires of the biwire cables to the same terminal eg by soldering them to the same 'banana' (4 mm) plug to be inserted into the + output socket of the amplifier. Likewise for the two - wires of the biwire cables.

If the amplifier has 2 pairs (+ & -) of output terminals per channel (often they are labelled "A" & "B"), as in **fig D**, then this makes the biwire connections easier, though essentially the same - the 2 + terminals (and the 2 - ones) can be connected inside the amplifier through a switch on the front of the amplifier. If both A and B terminals are activated, the one pair (say A) can be connected to the bass terminals of the speaker by one cable, and the other (say B) to the treble terminals by the other cable, without the need for soldering.

Biamping (fig E) involves connecting each drive unit, through its Xover, to a separate power amplifier. In addition to increasing the overall power (and cost!) of the system, the bass and treble signals remain separate right back to the source, reducing interaction between them & so clarity of the sound from the speakers. There a number of ways of connecting the extra power amplifiers. Historically, it has been achieved by having 2 stereo power amplifiers, each one dedicated to a speaker. Nowadays it can be done more simply through a multi-channel amp as used in home theatre systems, though these should be chosen carefully to ensure sufficient quality.

The final upgrade is **active (fig F)** where the speaker's internal Xovers (passive filters) are removed or bypassed and the Xovers (filters) done actively before the power amps so the power amplifiers are connected directly to drive units, increasing the 'control' of them. Also active filtering uses 'active' (powered) transistors etc that can be done more precisely – the ultimate active filtering is digital where it can be done very precisely using computer technology (eg DEQX). Legend's Kumbar Wirris have external passive Xovers so the drive units are already connected directly to the terminals for easy upgrade to DEQX active.

If you require more explanation/information, please email info@legendspeakers.com.au

WIRING LOUDSPEAKERS

(right speaker shown - left similarly)

