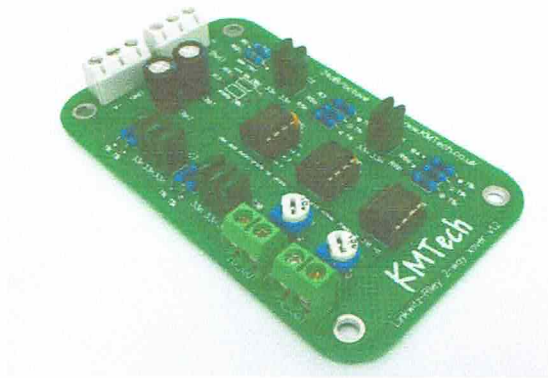
The KMTech LR 2-Way Active Crossover Filter.

V1.2 With Balanced/Unbalanced Input.

Thank you for buying our Linkwitz-Riley two way active crossover filter circuit board/kit. It should give you many years of listening enjoyment.



To build the filter you will need the following components:

3 x OPA2134 ultra-low noise dual audio grade op-amps or compatible.
3 x 8-way IC sockets (optional, can solder ICs directly to the board if you prefer).
2 x 2 way 5mm terminal blocks (optional, can solder wires directly to the board if you prefer).
2 x 3 way 5mm terminal blocks (optional, can solder wires directly to the board if you prefer).
1 x 100k resistor (all resistors 1/4 Watt, metal film 1%) (this resistor is for unbalanced input).
1 x 1k resistor (this resistor is for unbalanced input).
1x wire link (for unbalanced input).
4 x 10k resistor (these resistors are for **balanced** input).
10 x 11k resistor (for filtering, can use different values depending on required crossover frequency).
2 x 100k 6mm trimpots (or 100 ohm resistors if you prefer).
3 x 100nF ceramic capacitor.
2 x 47uF electrolytic capacitors
10 x 33nF polyester capacitor (for filtering, can use different values depending on required crossover frequency).

If you purchased the kit you will already have these components.

- All resistors should be 1% metal film for gain and frequency response accuracy (except when using balanced input mode, in which case precision resistors may be used in Ri1, Ri2, Ri3 and Ri4).
- Use these values of capacitor/resistor will give a crossover frequency of around 1.5kHz. This can be changed simply by changing the value of the eight 33nF capacitors and/or the ten 11k resistors.
- It is also recommended that all inputs & outputs use fully shielded cables that are as short as possible.

Signal Input Configuration.

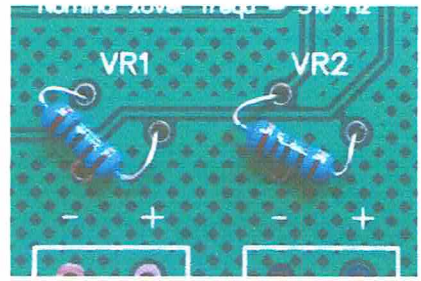
The signal input of this version (v1.2) can be configured as either balanced or unbalanced.

Balanced: To configure the signal input as balanced, install a 10k 1% metal film resistor in Ri1, Ri2, Ri3 and Ri4. Connect the balanced cable hot cold & ground into the terminals of the line-in connector. This will configure the A1 op-amp as a differential-mode receiver. The CMRR of the receiver can be improved if necessary by using precision resistors instead of 1% resistors.

Unbalanced: To configure the signal input as unbalanced, install a 1k resistor in Ri1, q 100k resistor in Ri2, a wire link in Ri4 and leave Ri3 empty. This will configure the A1 op-amp as a unity-gain hi-Z buffer. Connect the GND or – line of the input signal cable to the GND terminal on the line-in connector. Connect the + line to the line-in terminal marked "+ (hot)".

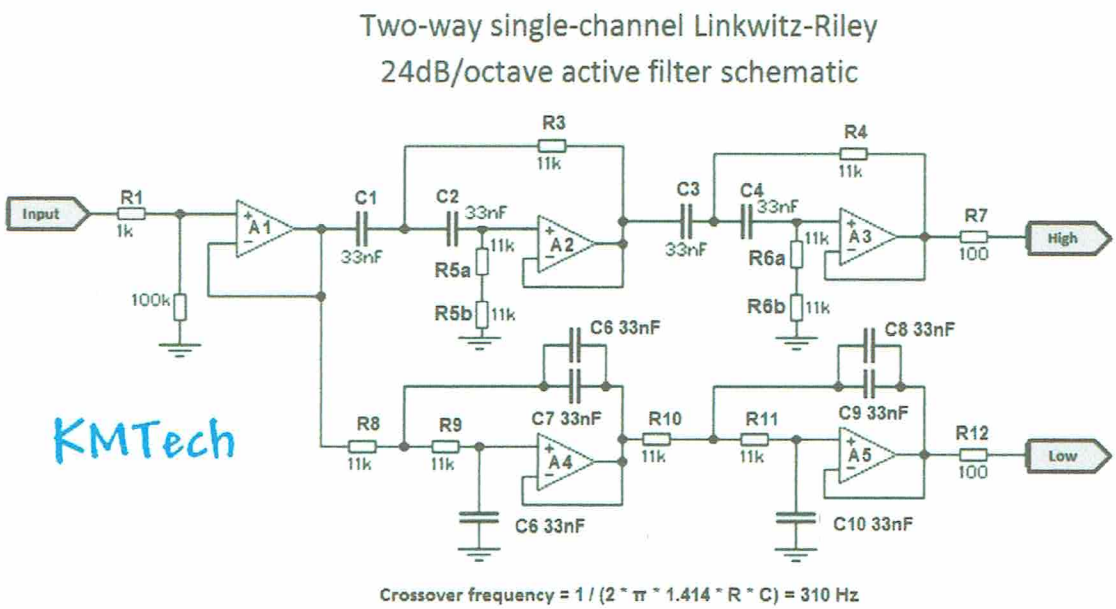
Signal Output Configuration.

The two signal outputs (high frequency and low frequency) can be fitted with 6mm trimpots or fixed resistors. If using fixed resistors, we recommend 100R resistors are wired as shown in the picture on the right.



Schematic.

The schematic below shows v1.1 of the filter, which is almost identical to v1.2. The only differences are the signal input and signal output resistor arrangements.



Assembly Instructions

All component values are clearly marked on the circuit board.

1. All parts must be clean and free from dirt and grease.
2. Try to secure the work firmly.

3. "Tin" the iron tip with a small amount of solder. Do this immediately, with new tips being used for the first time.
4. Clean the tip of the hot soldering iron on a damp sponge.
5. Add a tiny amount of fresh solder to the cleansed tip.
6. Heat all parts of the joint with the iron for under a second or so.
7. Continue heating, then apply sufficient solder only, to form an adequate joint.
8. Remove and return the iron safely to its stand.
9. It only takes two or three seconds at most, to solder the average PCB joint.
10. Do not move parts until the solder has cooled.
11. ABOVE ALL, SAFETY FIRST!

Important – this board should be installed into a secure dry enclosure.

POWER SUPPLY CONSIDERATIONS

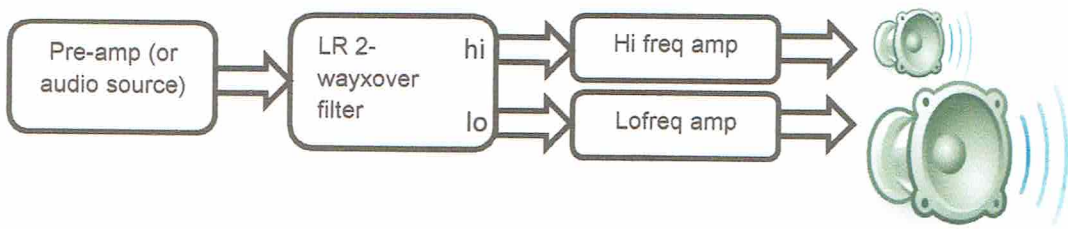
You will need a dual DC power supply of between 2 x 6V and 2 x 12V. It may be possible to use the same power supply that the pre-amp is using, providing the voltage is suitable. We sell an excellent quality power supply board that is perfectly suited for this

Usage.

This filter should be connected between the pre-amp (or audio source if you don't have a pre-amp), and the power amps. You will need two mono power amps (we have a very affordable LM3886 based amp on eBay), the output of one power amp can be connected directly to the high frequency speaker. The output of the other amp can be connected directly to the low frequency speaker. No passive crossover filters are necessary.

Only line-level audio signals should be connected to the input of the device or damage may occur.

A block diagram of a complete channel is shown below.



ONLY SUITABLY QUALIFIED PERSONS SHOULD INSTALL THIS EQUIPMENT (RISK OF HAZARDOUS VOLTAGES AND CURRENTS).

If you have any questions about this product please send a message to info@kmtech.co.uk.