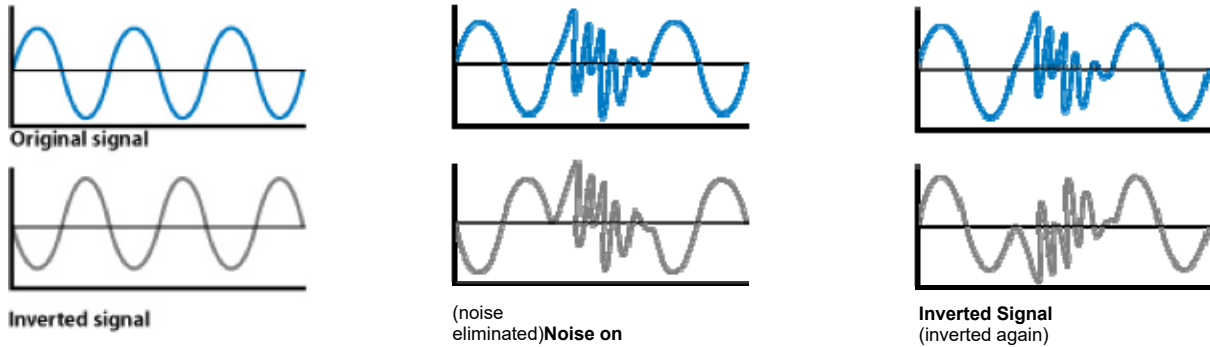


Technical Guide – Balanced Audio Signals

Audio signal cables can be either *balanced* or *unbalanced*, depending on their intended use. For long cable runs, especially when using low microphone levels, a two wire + screen balanced audio circuit reduces noise (XLR). Balanced audio cables use phase cancellation to eliminate noise whilst maintaining the original audio signal.

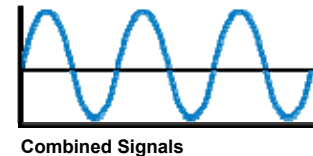


A balanced audio cable sends the same audio signal on two wires but inverts the *phase* of one signal by 180 degrees.

When noise is introduced into the cable, it is introduced equally to both the original and the inverted signal.

At its destination, the inverted signal is inverted again putting both signals back in phase. This causes the noise signals to be out of phase cancelling each other out.

The original signal gets a little stronger because it is sent on two wires and combined. This compensates for the reduction in signal strength that occurs naturally on a long cable run and any noise introduced into the cable along its length is virtually eliminated.

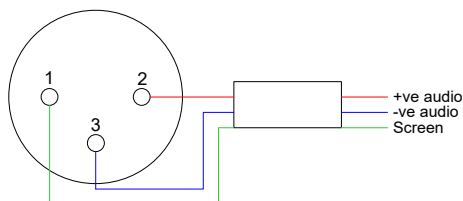


Note: Unbalanced cables have no way of eliminating noise and are therefore not as robust for long-distance cable runs, microphone signals, and other professional applications. Unbalanced cables are only suitable for runs up to 10m & can still be affected by RF interference.

Balanced cable runs are suitable at mic level 1 to 5 mV for runs up to 100m (sometimes further depending on the quality of cable installed).

Line level 775mV signals should be treated in the same manner as microphone levels, although running slightly longer unbalanced lengths shouldn't be such a problem as they would be with a microphone signal due to the signal to noise level. We would however recommend all signal cables are run balanced whenever they can be.

Wiring an XLR plug for balanced use



Wiring an XLR plug for unbalanced use

