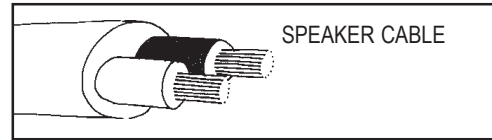
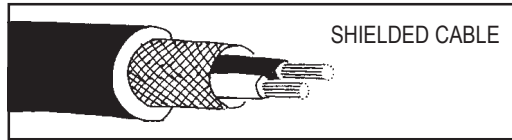


Shielded cable and speaker cable

There are two different types of cable used in leads:



1. Shielded cable, which has wire braid around the outside, and one or two wires running down the inside; and
2. Speaker cable, which has two thick copper or steel wires side by side.

Both cables can look similar from the outside, since they are sheathed in heavy duty plastic or rubber. They are definitely *not* interchangeable.

Rule #3: (Burn this one into your mind, because it is really important)

“You can only use speaker cable between the amplifier outputs and the speakers. Nowhere else!”

Every lead that comes *before* the amplifiers must be made from shielded cable, and preferably be Balanced (see next section). From the longest microphone lead to the shortest patch lead, you *must* use shielded cable.

This also applies to any leads that the band use to plug into their amplifiers. Keyboard racks, guitar racks, drum machine setups - check their wiring carefully.

If you don't use shielded cable, you will let all sorts of electrical noise get into the system, and also R.F.I. (Radio Frequency Interference). This will play havoc with any wireless microphones you may be using, and can also mix CB radio, TV and taxis in with the band!

Worse still, excessive RFI can severely damage amplifiers and High Frequency horn drivers.

Balanced and Unbalanced Lines



An **Unbalanced** lead has criss crossed woven wire braid around a **single** wire running down the centre.



A **Balanced** lead has criss crossed wire braid around **two wires** running down the centre.

In both cases the outside braid is shielding to protect the centre wire(s) from electrical noise and interference. For convenience we call the Positive (+) ‘In Phase’ signal HOT, and the Negative (-) ‘Out-of-Phase’ signal COLD. They are actually the same temperature!

The **Unbalanced** lead has the HOT (+) signal running down the centre wire, and both the COLD (-) and the audio Ground running down the outside braid together.

The **Balanced** lead has the HOT (+) and the COLD (-) signal running down each of the centre 2 wires, and **ONLY** the audio Ground running down the outside braid.

Why Bother With All This?

The answer is NOISE. When we discussed the gain stages of mixers earlier on, the main concern was keeping the noise floor as low as possible, because from there onwards any noise that is present will be amplified throughout the whole system. Well, since the microphones and leads come *before* the channel, our aim is to keep these as quiet as possible for the same reason.

Microphone signals are measured in millivolts (thousandths of a volt), and the gain stage of the mixer amplifies this to around 1 volt. A long length of cable like a multicore snake, often



— “ —
You can only use speaker cable between the amplifier outputs and the speakers -NOWHERE ELSE!
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