

Editorial – Feed line variety

A **feed line** is any pair of conductors used for conveying an RF (radio frequency) signal from a transceiver to a component (antenna, tuner, meter, amplifier, etc.) in an antenna system. Through the years, amateurs have used a variety of feed line types, and the two most common categories can be generalized as *balanced* and *unbalanced*. Balanced means the two conductors are of identical material, geometry, and size, where unbalanced means the two conductors differ in any of these respects. Let's explore the two classifications, by popularity.

Coax

Coax (coaxial cable) is so-called because its two conductors are typically cylindrical in shape and share the same axis (co-axial). It's the most common type of amateur radio transmission line in use today because of its low cost and high resistance to coupling and RFI (radio frequency interference) noise. These characteristics make coax easy to work with since it relieves the operator from the concern of routing it near metal or even near other signal sources such as household mains current. Here are the most common models of 50-ohm coax in amateur use today, not in any particular order:

- **RG-8X** : highly recommended for HF under 100 feet and VHF under 50 feet (lossy)
- **RG-8** : highly recommended for HF and VHF under 100 feet (mildly lossy)
- **LMR-400** : highly recommended for HF and VHF under 200 feet (expensive)
- **LMR-240** : highly recommended for HF under 100 feet and VHF under 50 feet (mildly lossy)
- **RG-213** : recommended for HF under 200 feet and VHF under 100 feet (mildly lossy and expensive)
- **RG-174** : recommended for mobile installations under 20 feet (very lossy)
- **RG-58** : only recommended for lengths under 20 feet (very lossy)

Hardline coax

One type of coax that's used on repeater, broadcast, and other high-power or loss-critical installations is **hardline**, so-called because it uses a solid (often corrugated) shield around the dielectric instead of a braid. One hardline model known as *Heli*ax contains an air dielectric, whose center conductor is held in place by a plastic spiral.



75-ohm alternatives

Most modern amateur radio transceivers and components require an attachment to transmission lines that exhibit a 50-ohm impedance. But 75-ohm coax (used primarily for cable TV) can also be used for amateur radio feed lines, provided the operator understands how it affects the antenna system.

- **RG-6**
- **RG-59**

Coax designations

Most coax cables are marked with prefixes, suffixes, or other lettering that identifies properties of the particular model, especially of the outer jacket. Unfortunately, there is not a standard designation agreed upon by different manufacturers, but among the more common suffixes are /U ("utility"), DB (direct burial), UF (ultra-flexible), and more. Other jacket types include some that are rodent-resistant (distasteful to rodents) and fire-resistant.

Parallel line

A set of two parallel wires can also make up a transmission line pair, and is called *balanced* because both of its conductors are identical in material, shape, length, and density. It typically exhibits lower loss than does coax, but is very susceptible to coupling with (and interference from) nearby conductive objects. These include

- **Ladder line / window line** (300-ohm and 450-ohm varieties are the most common)
- **Twin-lead / ribbon** (once common on TV sets, typically 300 ohms)
- **Open wire line** (OWL) (typically 600 ohms)
- **Twisted pair** (impedance varies between 100 ohms and 150 ohms)

Anything to add? Email editor@utaharc.org