Introduction to HF Part 3: Aerials

ESSEX HAM

One-page summary. For the full version of this article (with diagrams), go to essexham.co.uk/introtohf

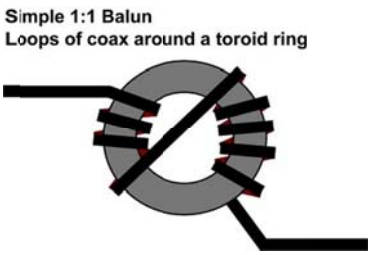
If you're running only 10-watts but have an efficient aerial, it may be better than 100-watts into a poor aerial. An aerial works best when it's tuned to the frequency you are operating on – Whether it's a vertical, horizontal dipole or a beam, if the size isn't correct for the frequency, performance will be poor.

Feeders

Coaxial cable is the easiest to work with, and even the thinner type such as RG58 can be used on HF frequencies. Coax is an un-balanced feeder, but an aerial such as a dipole is balanced (ie: 2 equal sides). Coax can be very lossy when you are trying to use it with an aerial on a frequency that it is not resonant on, (eg: a 14MHz dipole on 7MHz). However, when you use a balanced feeder like 300ohm ribbon or 450ohm ladder-line, the losses are significantly less.

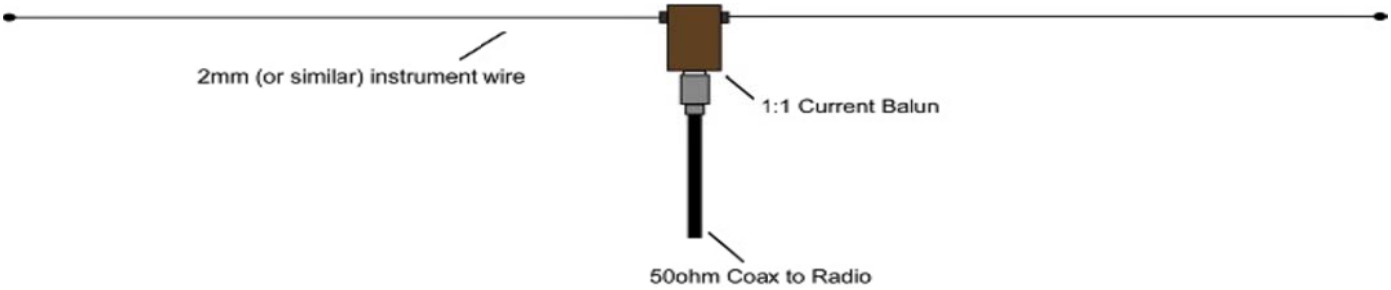
Baluns

A problem that can occur with coax is where the outer of your coax (the braid) can radiate RF and come back into your shack. A simple cure is to use a balun at the feedpoint – This converts a **BAL**anced aerial to an **UN**balanced feeder. It comprises a ring which is wound with several turns of coax, mounted in a box and usually has 2 screw terminals (for the aerial wires) and an SO239 connector for your coaxial-cable.



Dipoles

This is a common type of antenna - two pieces of wire at the end of a length of coaxial cable. In the case of a 20m dipole (15MHz), each wire will be about 5.28m long bringing the total length to around 10.6m.



A dipole usually offers a high take-off angle unless it can be raised to a 1/4wave above ground. Dipoles are usually installed flat-top, so that they are the same height at each end and in the middle.

Verticals

A vertical aerial is the type used for DX'ing on the lower HF bands due to its low-angle of take-off. There are also a number of other factors in making a vertical efficient: Is the aerial off-ground or at ground-level? Do you have an extensive radial system? Is the aerial tuned to the frequency you are operating on? Verticals can easily pick-up local noise such as electrical interference and plasma televisions.

Full-Wave Loop (eg: Delta-Loop)

These are popular because they can be installed around the top of your garden fence for stealth operation, typically low-noise and, when fed with a balanced-line, can work on many HF bands with surprising results.

For the full article (with antenna ideas) & more Getting Started Guides, go to essexham.co.uk/getstarted

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