

BALUNS:

What are they?

Why use one?

How do they work?

What kinds are there?

Some necessary terms:

Balanced- constructed symmetrically with respect to the feed point. Includes antennae, transmission lines and transmitter output connection.

Unbalanced- has unsymmetrical construction. Applies to same items listed above.

Balun- a device designed to properly interface unbalanced circuits to balanced circuits. "Balun" is derived from "BALanced to UNbalanced."

Feedpoint- point of connection to an antenna, may be balanced or unbalanced.

Balanced line- two parallel conductors that feed the antenna.

Unbalanced line- also called coaxial cable. All current is supposed to flow inside of the outer shield.

There are two varieties of the balun, the voltage balun and the current balun.

Why use a Balun?

The main reason to use a balun is to reduce feedline radiation. Feedline radiation can distort the radiation pattern of the antenna- the direction we want the rf to travel. This can produce nulls in the pattern- directions that nothing can be received or transmitted. The second reason is that it is undesirable to have RF flow on the outer shield of the coaxial cable back into the shack.

There are several methods of matching. Three widely used methods are the Gamma match, T match and bazooka. Their length of dimensions depends primarily on the frequency, and will not be considered this evening.

Advantages of the balun:

Not as frequency dependant, can be used at many different frequencies.

Can be used with higher SWR if well constructed and air core.

Disadvantages:

A small amount of inductance or impedance is introduced into the antenna system.

High SWR will destroy poorly constructed baluns, even at lower power levels. The cores will absorb the energy and saturate easily. This may mask an antenna problem, with the core being matched as a load. There is usually a power and SWR rating for the balun.

How it works:

Choke action cannot explain everything. There is transformer action on the "cold" side that cancels the current flow that would otherwise continue down the outer shield.

Why not make your own? A high quality balun can be constructed for far less than the price of an inexpensive commercially available unit. My baluns cost about \$15.00 in materials, and are constructed with heavier stainless hardware. With recycled copper, this makes a very inexpensive antenna.

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October 2001