

## B A Z O O K A (Coaxial Dipole Antenna)

According to WA4UJQ this antenna has a bandwidth of around 500 KHz and an SWR of under 2:1 at the band edges. The SWR is absolutely flat when the antenna is trimmed to the proper length for the design frequency.

Over a 5-year period K7UAE reported an average gain of 1.5 dB over a simple dipole and a -6 dB noise figure due to static charge build-up common to the open wire construction of the simple dipole. This coaxial dipole antenna is covered by a vinyl jacket which greatly reduces the static charge build-up whose discharges cause popping noises in the receiver. The antenna also greatly reduces harmonics of the operating frequency.

In summary, the antenna's advantages are: (1) broad bandwidth, (2) almost unaffected by environment (trees, buildings, etc.), (3) positive gain, (4) attenuation of harmonics, (5) decrease in static charge build-up, and (6) essentially non-directional.

By proper choice of the design frequency, one may have an SWR on one band edge equivalent to that of the opposite band edge. If that is the objective the design frequency should be somewhere in the top half of the band. For example, for the 75-80 meter band the design frequency should be about 3.920. At the 4 MHz end the SWR will be about 1.5:1 and about the same at 3.5 MHz. That is without the aid of a "match box". Antenna parameters may, however, vary slightly from one location to another.

For antenna lengths see the drawing and the accompanying table. For illustrative purposes an 80 meter antenna will be used. Any 52 ohm coaxial cable, either 58A/U or 8A/U, may be used for construction of the antenna and its feedline. 58A/U is a very good choice and is usable at maximum legal power without fear of breakdown.

For an 80 meter antenna, measure 30'-6" out on each side of the center point of a 120'-0" length of coax. Solder the inner conductor to the outer conductor of the coax at each of the two measured points (B) to form the 52 ohm matching section and the balun. After soldering, tape and waterproof those points. Next, at the ends of the antenna (C), 60'-0" each side of the center point and ~~29'-6" outward from the two points (B) already soldered~~, short the inner and outer conductors by soldering them together. Waterproofing of those ends is not done until later, after the tuning is completed.

At the center of the antenna (A), remove ONE INCH MAXIMUM of vinyl jacket,  $\frac{1}{2}$  inch each side of the center point, and cut the shield at the center all the way around the coax. DO NOT CUT the insulation or the center conductor. Form the ends of the cut shield into two leads. Join one of the leads to the center conductor of the feedline, solder and tape it, then join the other lead to the shield of the feedline. Solder and tape it also, and waterproof both connections. "Use Heat-Sinks in soldering these points" *E.M.K. WA4MFU*  
"avoid melting or softening the Foam"

Although random lengths may be used for the feedline, lengths of 57', 87' and 103' are about optimum for 75-80 meters. The same coax type should be used for the antenna and the feedline. Separate feedlines must be used for each antenna.

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After the antenna is erected, measure the SWR and trim the antenna to length at the desired frequency. The SWR will be an absolutely flat 1:1 when the antenna is the proper length. Be sure and solder the ends of the antenna, shield to center conductor, before measuring the SWR and, after trimming is completed, waterproof the ends. That completes the antenna installation.

The antenna can be erected as "flat top" or "inverted V". A satisfactory center support for an inverted V can be provided by a piece of PVC or Plexiglass 3" x 5" x 3/8" with holes drilled at each top corner for hanging and another three holes in a triangular pattern, two for center support of the antenna and one near the bottom for the feedline. See the sketch for details.

Band	Total Length	Center Point (A) to Point (B)	Point (B) to (C)	Center Point (A) to Point (C)
75-80m	120'-0"	106' <u>30'-6"</u>	29'-6"	60'-0"
*40m	63'-0"	16'-9"	14'-9"	31'-6"
20m	33'-6"	8'-9"	8'-0"	16'-9"
15m	22'-10"	5'-7"	5'-10"	11'-5"
10m	17'-2"	4'-2"	4'-5"	8'-7"
11m	17'-11"	4'- <sup>2</sup> / <sub>12</sub> "	4'-8 <sup>1</sup> / <sub>2</sub> "	8'-11"

\* Feedline for 40m should be in multiples of 16'.

