

# The Real "ZL Special"

ARRL Antenna Book, Ninth Edition, p. 214

The "ZL Special" consists of two folded dipoles spaced 0.1 wavelengths and driven 135 degrees out of phase. The resulting pattern is substantially unidirectional. The sketch in Fig. 9-15A shows the electrical layout and physical dimensions, and Fig. 9-15B shows one possible type of construction for a fixed beam of this type. The drive point where the feed line is attached to the antenna shows an impedance of around 70 ohms, so the antenna can be fed directly with 72-ohm coaxial line or Twin-Lead, or with 300-ohm line if a quarter-wave matching transformer of 150-ohm line is used.

The ZL Special can be built as a rotary beam in two general ways. One, and perhaps the simpler, is to use self-supporting elements of aluminum tubing, as shown in the example in Fig. 9-16. The other way is to use full-length wooden sections to stretch and support wire elements.

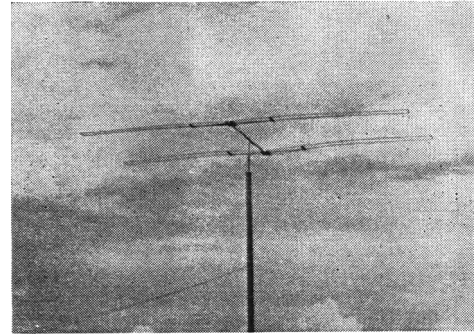


Fig. 9-16 – A 20-meter ZL Special mounted on a 32-foot pole and turned by a TV antenna rotor. This antenna was made of 1-inch diameter aluminum tubing; the boom is 8 feet long and the wooden cross arms are 8 feet long. Dimensions are A, 30 feet 10 inches; B, 31 feet 6 inches; C, 7 feet 1 inch; D, 8 feet, 7 inches; E, 7 feet 9 inches of 300-ohm Twin-Lead. The beam is fed with RG-11/U. (DLASK, W4BGP)

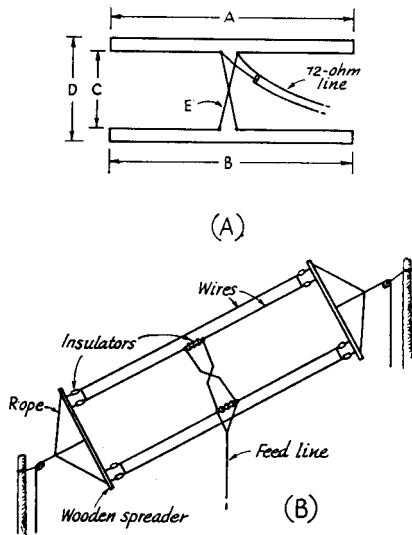


Fig. 9-15 — The ZL Special two-element driven beam (A) and a possible method of construction when used as a fixed beam (B).

Dimensions are calculated from the following, where the dimensions are in feet and the frequency in Mc.:

$$\begin{aligned} A &= 438 \div \text{Mc.} & C &= 101 \div \text{Mc.} \\ B &= 447 \div \text{Mc.} & D &= 122 \div \text{Mc.} \\ E &= 110 \div \text{Mc. (300-ohm Twin-Lead)} \end{aligned}$$



Third alternative: This photo shows a 15-meter version installed between two chimneys. It was built using wire and bamboo spreaders and with a rope arrangement to flip the antenna to favor one direction or the other. Plastic spacers were used along the wires to maintain the shape and spacing of each folded dipole. (AAIDO)