Edwin T. Karl K2VGD
63 Cranberry Street
Central Islip NY 11722

The 75-80m Broadbander

Some time ago, I operated with an all band multi-element dipole antenna. The antenna worked quite well (for a dipole antenna) but generally left me in the bottom of pileups on 20 and 15 meters. This eventually led me to a more competitive antenna for the higher frequencies. The multi-band dipole became redundant (and worse yet, tended to distort the quad's pattern).

However, I wanted to increase the bandwidth of the 80 meter dipole, as my operation generally is evenly divided between CW and SSB operation. After some thought, the elements of the dipole for 15 and 10 were removed, and an attempt was made to extend the 20 meter element to a length suitable for 75 meter operation. Reason told me that if you could combine dipoles for 20 and 40, etc., why not 80 and 75?

Due to space limitations in the K2VGD estate, the 80 meter antenna was folded into a "Z" shape, to fit a plot 75' wide. The apex of the antenna system was at 30 feet and the ends were attached to 4 television-type aluminum masts, fastened to the fence. In attaching the 75 meter antenna, I ran the elements backwards across the two masts, thus overlapping the last 20 feet of each element. As one element was insulated, no problems with shorting were anticipated. The antenna is fed with a random length of RG-8/U and a W2AU balun.

In testing the design, the lowest swr was expected at 3550 and 3900 (the design length of the antennas). Much to my surprise the antenna exhibited high swr below 3650, but less than 1.5 to 1 between 3650 and 4000 kHz, with no peaks or dips within this portion of the band. After several days of experimentation, the length of the CW section approached the length necessary for operation at 3400, with the 75 meter antenna cut for 3900. The swr plot is included in Fig. 1.

While I make no pretense of having the exact technical explanation of the results, it would appear that the ends of the antenna, in overlapping, inductively and capacitively couple the two elements to one another in such a way as to cancel the reactance that would be present at the feedpoint. Element lengths do not appear to follow theory exactly, which in all probability is due to the fact that the ends are ten feet off the ground, and the apex is but 30 feet high, far from the ideal ¼ wave height. However, there has been no evidence of very high take-off angles, as no difficulty is encountered working either with the West Coast, Europe or even as far away as New Zealand on 75 (5x8 in ZL-land with 900 W PEP).

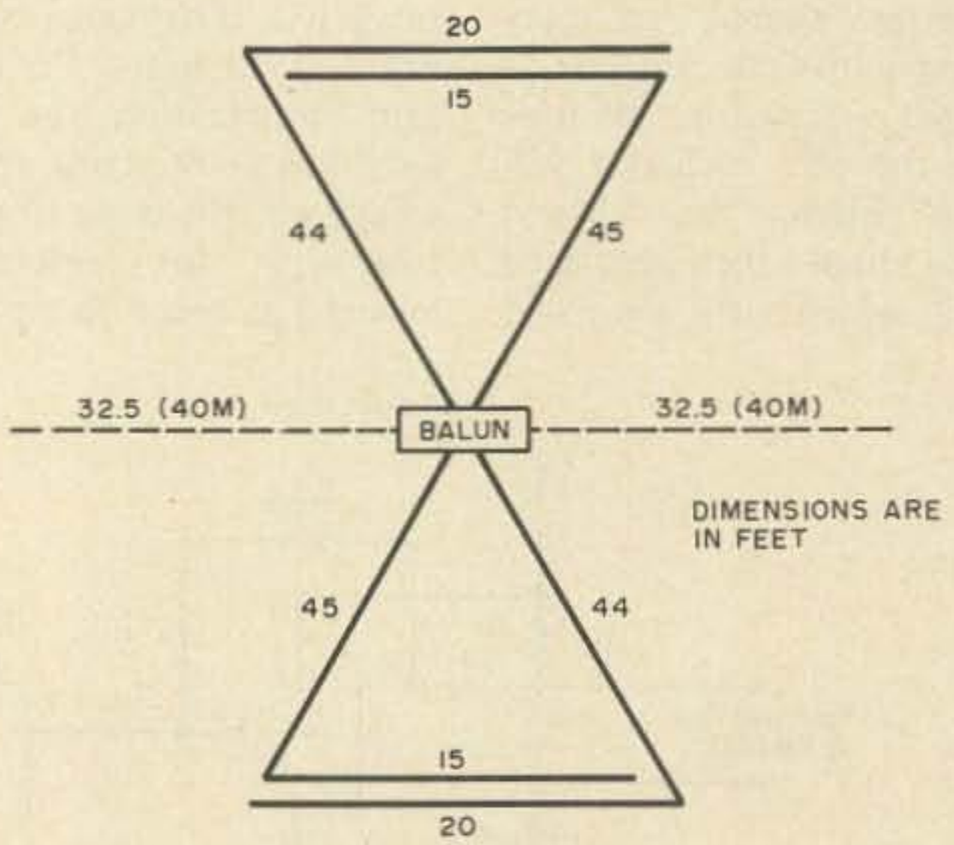
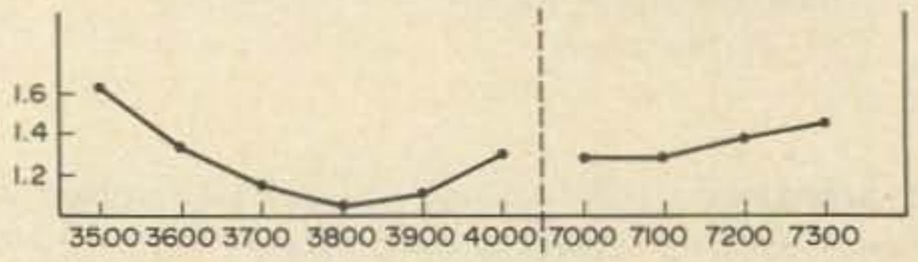


Fig. 1. Vertical view with swr plot.



The 40 meter dipole does not appear to be affected by the 80 meter elements. If anything, it seems to have broader than normal characteristics.

No attempt is made to convince others that "this is THE antenna" for 80 meters, but rather, with the declining propagation on the higher bands, to encourage experimentation by others in limited space, broadband systems. Most of these types of antennas use wire elements, and thus are relatively inexpensive. ■