K3WBH gives us another approach to designing v.h.f. and u.h.f. arrays using techniques developed for the low bands.

Using Lower Frequency Antenna Techniques At V.H.F. And U.H.F.

BY T.E. WHITE*, K3WBH

One thing usually overlooked by the v.h.f. amateur in choosing antenna types is what is called the "wavelength factor." The amount of signal voltage in a radiating or receiving element, be it wire or tubing, is directly proportional to its physical length. And, presuming delivery of signal via the feed line, the larger (longer) the antenna the higher the voltage at the receiver terminals ("if you can't hear 'em you can't work 'em.")

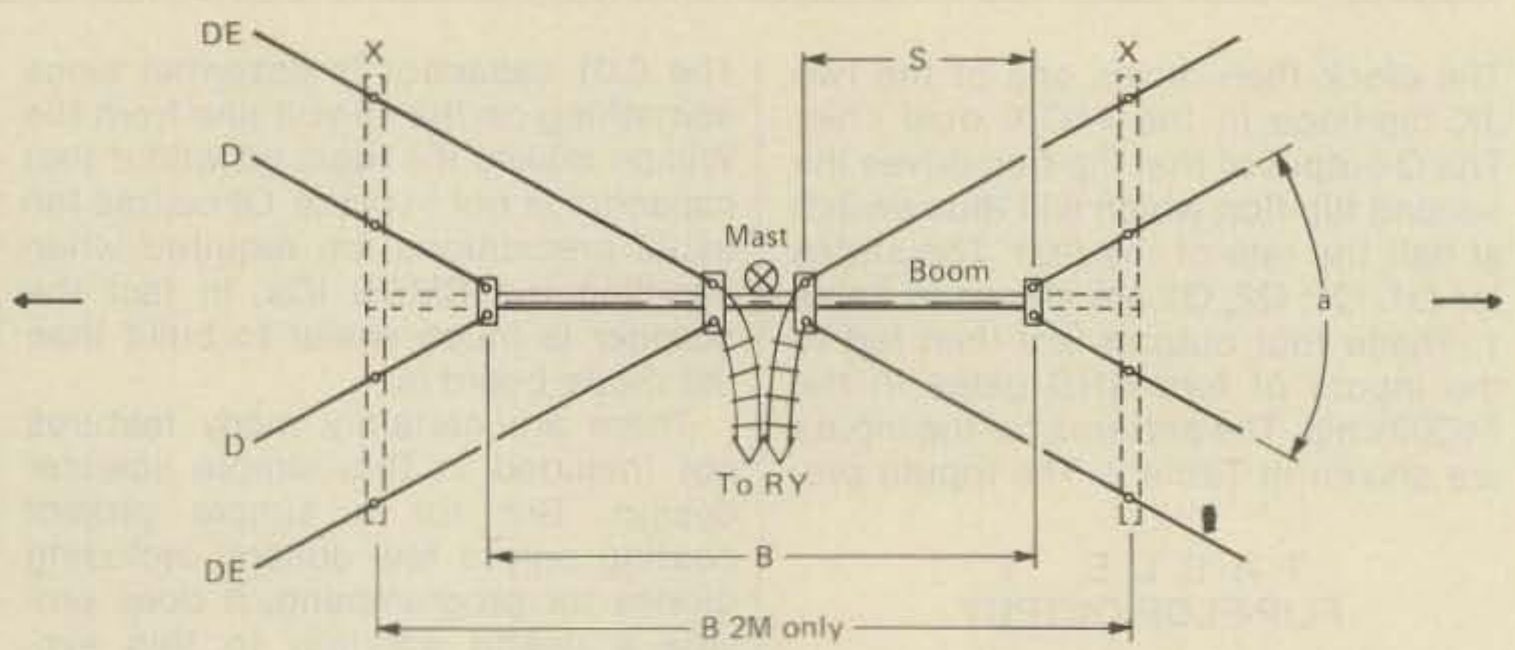
Therefore there is no reason not to use the so-called "long wire" family of antennas well into v.-u.h.f. Here are some examples, ranging from simple to not so simple.

Fig. 1 shows a long wire, broken and fed ¼ wavelength from the shack end. 300 ohm line makes an almost perfect match. Even 450 open wire line could be used. For receiving and low power transmitting, a simple resistive balun (fig. 2) gets you down to your 50 ohm rig connection. Maximum signal is off the far end, due to some reflection at the shack or building end, so orient the wire to your most desired direction. This is an excellent skywire for working up or down a coastal stretch as from R.I. to Va., during temperature inversion openings. Radiation angle is quite low.

Fig. 3 shows a flippable Vee arrangement for the same sort of frequently used path, like northeast to southwest, where you are "in the middle" and desire to work stations 180 degrees opposed, perhaps in the same QSO, or for relay purposes.

A d.p.d.t. weatherproof relay at the antenna is controlled from the shack. The non-metallic braces (X) are needed on 2 meters only. LAy them out so they support the DE's at about 2/3 of their lengths outward, and size boom length accordingly. DE inner ends are mounted on insulating blocks but D's are on metal saddles. Wire connections from relay to feed points should be short as possible.

These first two are not super-gain antennas but you'll be surprised at what you can hear and work when the



	144	220	420
DE	80	52	29
D	76	50	27½
S	20	13	7
a	60°	60°	60°
"B" length	See text	28	16
"B" diameter	¾	½	½
el. dia	⅜	½	⅛
Connecting wire	#16 sp 1"	#16 sp ¾"	#18 sp ½"

X – Mount ⅔ of way out DE's and ⅓ out D's approx.

Fig. 3- A double vee antenna.

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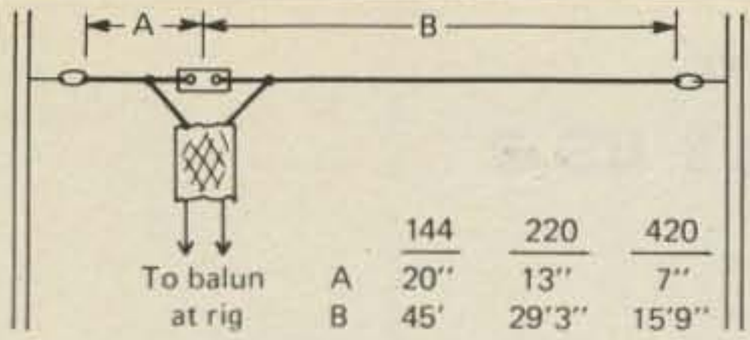

Fig. 1- A v.h.f.-u.h.f. long wire antenna

band is "open."

The 420 antenna of fig. 4 is a bit more complex but worth the effort for low-angle DX. A stacked rotary rhombic for v.h.f. is rather unwieldy (some have been built) but ideal on u.h.f.

Umbrella guys of polypropelene with small turnbuckles support the bays. The booms are 12 ft. by 3/4 dia. fiberglass. The mast section above the rotor must also be non-metallic. (No, the fact of running the feeder back to the mast between the bays does not upset pattern or impedance.)

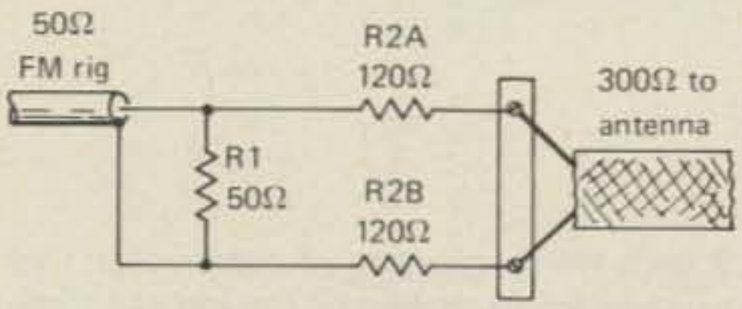

Fig. 2- A simple resistive balun.

It is best to lay out each diamond by chalking a pattern line on the shop floor, and bend the four halves along it. Make a base line 140 in. long and a perpendicular at 70 in. No. 8 semi-hard drawn aluminum wire is cut in four 168 in. lengths, bent at midpoint and positioned properly.

Single 600 ohm noninductive resistors are hard to come by. Use 2-300 or 3-200 in series mounted on a piece of cycolac or similar, with bolts for ends of rhombic and eyebolt for guy. The beam pattern is fairly sharp, which is a good thing on this radar-shared band.

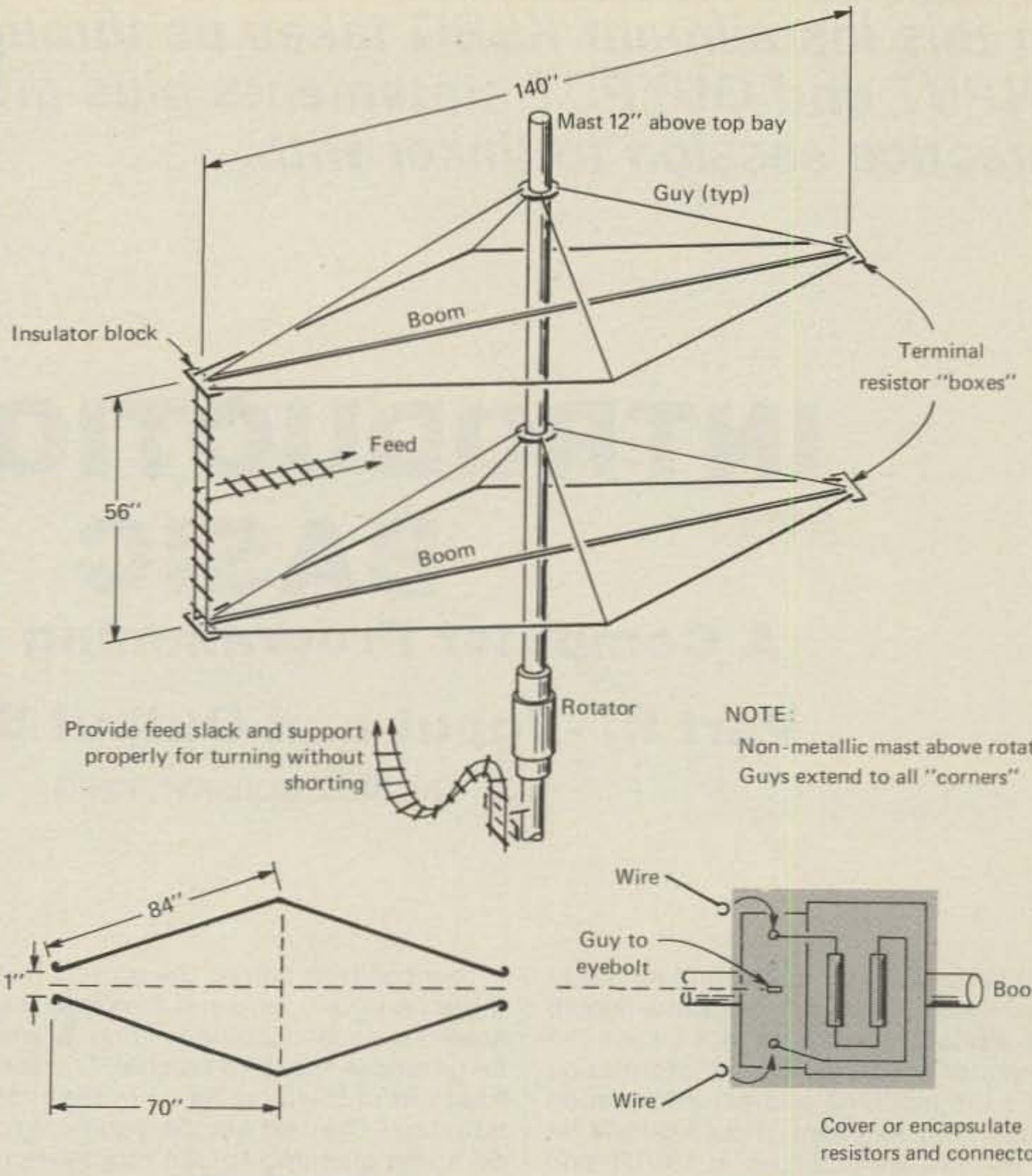

Fig. 4- A stacked rotary rhombic for 420 MHz.