An 80 & 40 Meter Inverted V

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With declining activity on the higher frequencies occasioned by the present sun spot cycle, many amateurs, who are equipped with a 10-15-20 meter beam antenna mounted on a tower, are considering taking advantage of increased activity on the 40 and 80 meter bands. The installation described here makes use of the available tower and permits single feedline operation on the two bands.

BASICALLY, the system is a multiband antenna in the familiar inverted "V" configuration. The material is inexpensive, consisting of bare copper ground wire (.065" dia.), available in any hardware store, six-egg insulators, an SO-239 chassis coax connector and some nylon rope. A length of RG-8/U, 52-ohm coax line, serves as the feed line.

Installation consists of first tying a small pulley, with a length of clothes line reaching to the ground, to the top section of the tower. From there on it's just a matter of tying the assembled feed point to the clothes line and hauling away! The feed point used, illustrated in the photographs, utilizing an SO-239 connector, offers a good match and may be soldered together in a very short time.

Feed Point Construction

To construct the feed point, begin by assembling the egg insulators to the coax connector. Start with an eleven inch length of copper ground wire by stringing one end through one of the four holes in the connector flange, leaving ½" bent over. Do not solder yet. Run the remaining end through the far holes of the first egg insulator, through the nearest connector hole and pull the insulator tight against the flange as a 90° bend is made in the wire. Loop the wire 1¾" from the flange (to form ½ of the feed point support) and again, run the end through the same connector hole, making another 90° bend to accommodate the second egg

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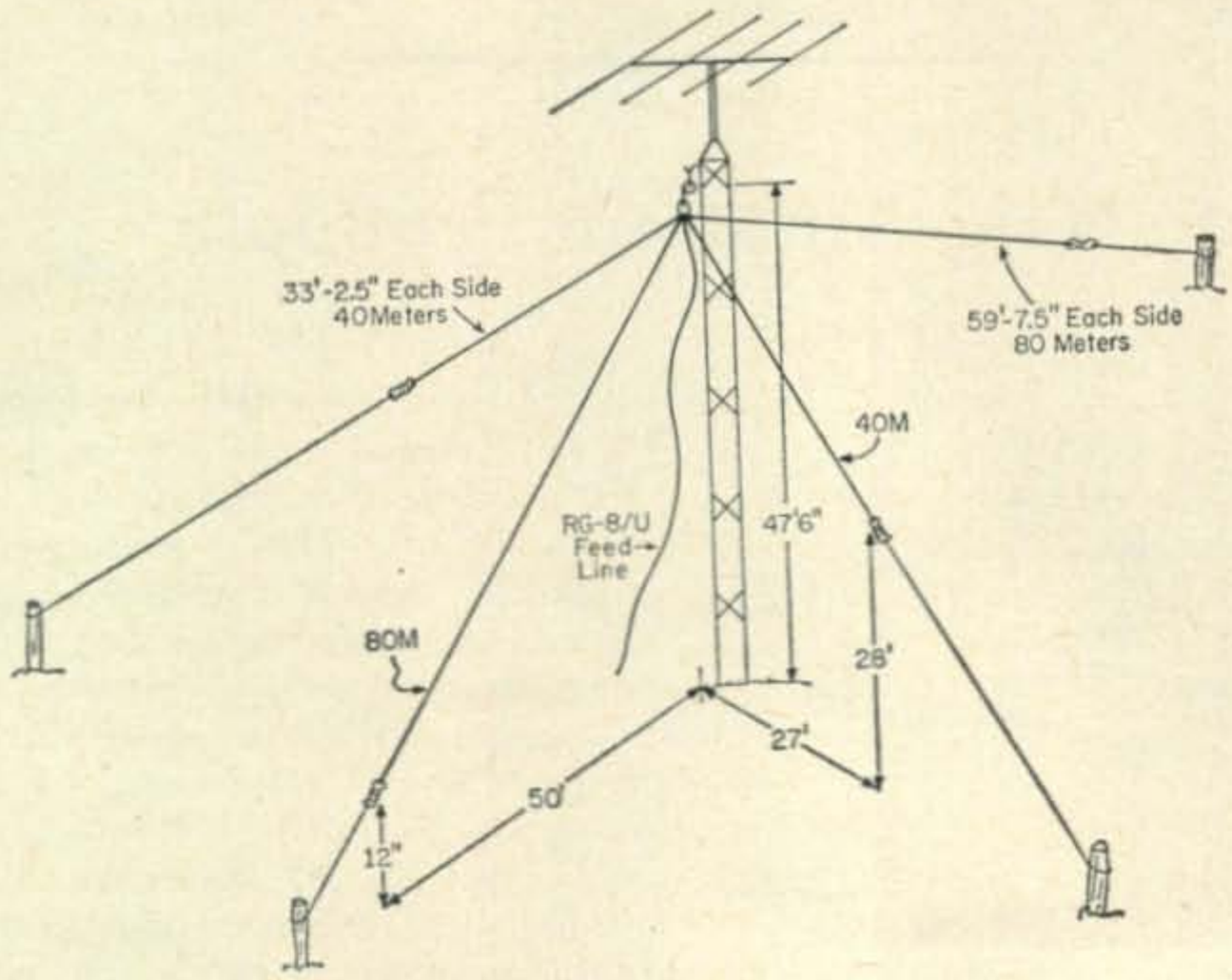
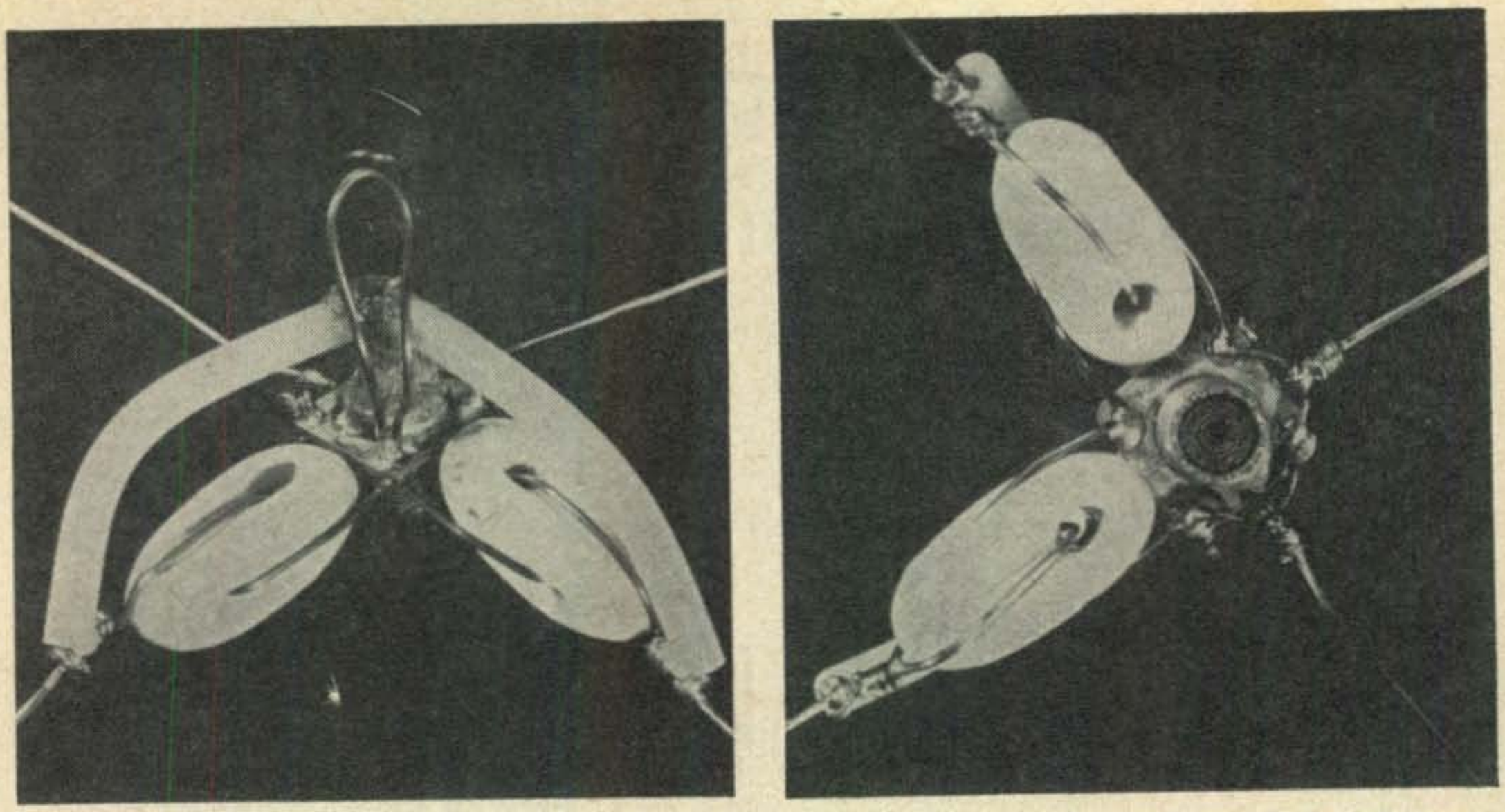


Fig. 1—View of the tower illustrating the installation of 2 inverted V antennas. Choice of terminating points should be made, wherever possible, to maintain a 90 degree relationship between the two antennas.



Top and bottom views of the inverted V feedpoint. The supporting loops may be clearly seen in the left view.

insulator. Now string the wire through the third coax hole, again leaving ½" bent over. Each of the egg insulators serve to support, respectively, one end of the 40 and 80 meter "V" antenna legs. For the remaining elements, repeat the procedure, starting with a 6½" length of wire, leaving enough room, about ½" from the flange, to solder the legs of the 40 and 80 "V"'s. The bent over ½" ends can now be twisted and all four flange holes soldered.

The center conductor is connected to the insulated legs by soldering a bare ½" length of coax center conductor wire into the terminal provided on the fitting, then connecting and soldering to it, two 4" conductor lengths at 90° as shown in the photographs. The 4" conductors are made of the polyethylene coated center conductor of RG-8/U coax, with ½" of the polyethylene stripped from the ends for soldering. A water tight seal of the center conductor from the flange may be made by melting polyethylene over the exposed wire with a soldering iron.

Dimensions

Figure 1 illustrates antenna leg dimensions arrived at after considerable experimentation. The eighty meter "V" forms a plane almost perpendicular to the earth, while the 40 meter "V" is slanted somewhat. The installation was guided by two limiting factors: (1) a desire to keep the planes formed by the antennas 90° apart and (2) the location of existing trees, rain gutter supports and poles to which the nylon support ropes were attached at my QTH.

After connecting and soldering the insulated and non-insulated legs the array is ready for raising. A good deal of frustration, brought about by tangled copper wire and nylon string, can be avoided by the simple precaution of stretching out the wires fanwise on the ground before raising the feed point. It will also help to weight the support strings if your XYL, junior ops or neighborhood sidewalk supervisors are not willing to hold them during the raising.

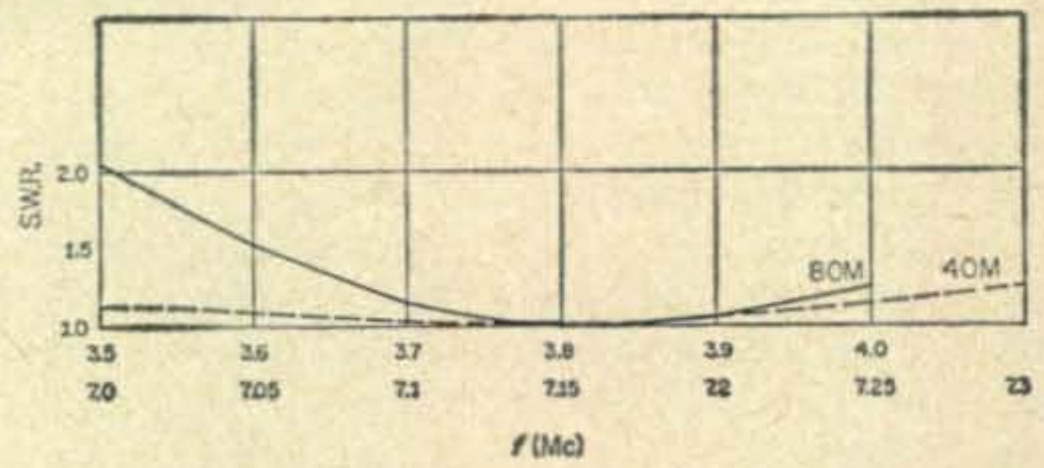


Fig. 2—Curves showing the s.w.r. of the 40-80 meter inverted V for the installation at K8LTU. The s.w.r. varies as the element angles are shifted.

S.W.R.

You'll find that the s.w.r. will vary with each change in the plane angle or the "V" angle. A check for the lowest s.w.r. reading will indicate the resonant frequency. This frequency can be adjusted as needed by soldering equal lengths of wire at the two insulators nearest the ground. Leave the ends dangling, and recheck the s.w.r. reading, after each trimming at the resonant frequency. When a satisfactory reading is obtained the antenna legs are cut and the adjusted wire lengths soldered in permanently.

Results obtained have been far superior to those attained with horizontal dipoles. Since the "V"'s present a more omni-directional pattern, more stations were heard and worked. Outside of attaching the pulley, no tower climbing is required. All four nylon support points are tied down at heights no greater than 9 feet, easily reached by stepladder. As the feed line does not strain the antennas, wire stretching is practically nil. Maintenance is of course, greatly simplified by the pulley arrangement. ■