In addition, a collinear of any appreciable size almost always runs into feed-line and phasing problems which limit its *attainable* gain to something in the neighborhood of 20 db.

The corner reflector's wide horizontal angle has helped keep it in the little-used stack—although K2TKN has employed this cnaracteristic to good advantage in a beacon-antenna design.

The biggest reason parabolic dishes have become so popular, however, is their independence of frequency. An 8-foot dish, for example, is equally adaptable to operation at 100 mc or 10,000 mc. The difference is that it will have only 6 db gain and something like an 80-degree beamwidth at 100 mc, while at 10,000 mc the gain has climbed to 46 db and the beam has narrowed down to about 4/5 of a degree wide—just wide enough to hit the moon!

None of the other antenna designs listed in the chart, except the horn, have this characteristic. And the horn is not particularly amenable to changes of orientation, so necesary in ham work.

Note that for those antennas in which size is not fixed precisely by the frequency of operation, two standard sizes have been employed in preparing the chart. This is to give you some idea of the way in which gain varies with physical size, and also shows you approximately how much space would be required for any of the designs. In the chart, the symbol A represents actual physical surface area, L represents total height, and N represents the number of elements employed in the array. Out of respect for the printer, wavelength is represented by W rather than the more usual Greek lambda!

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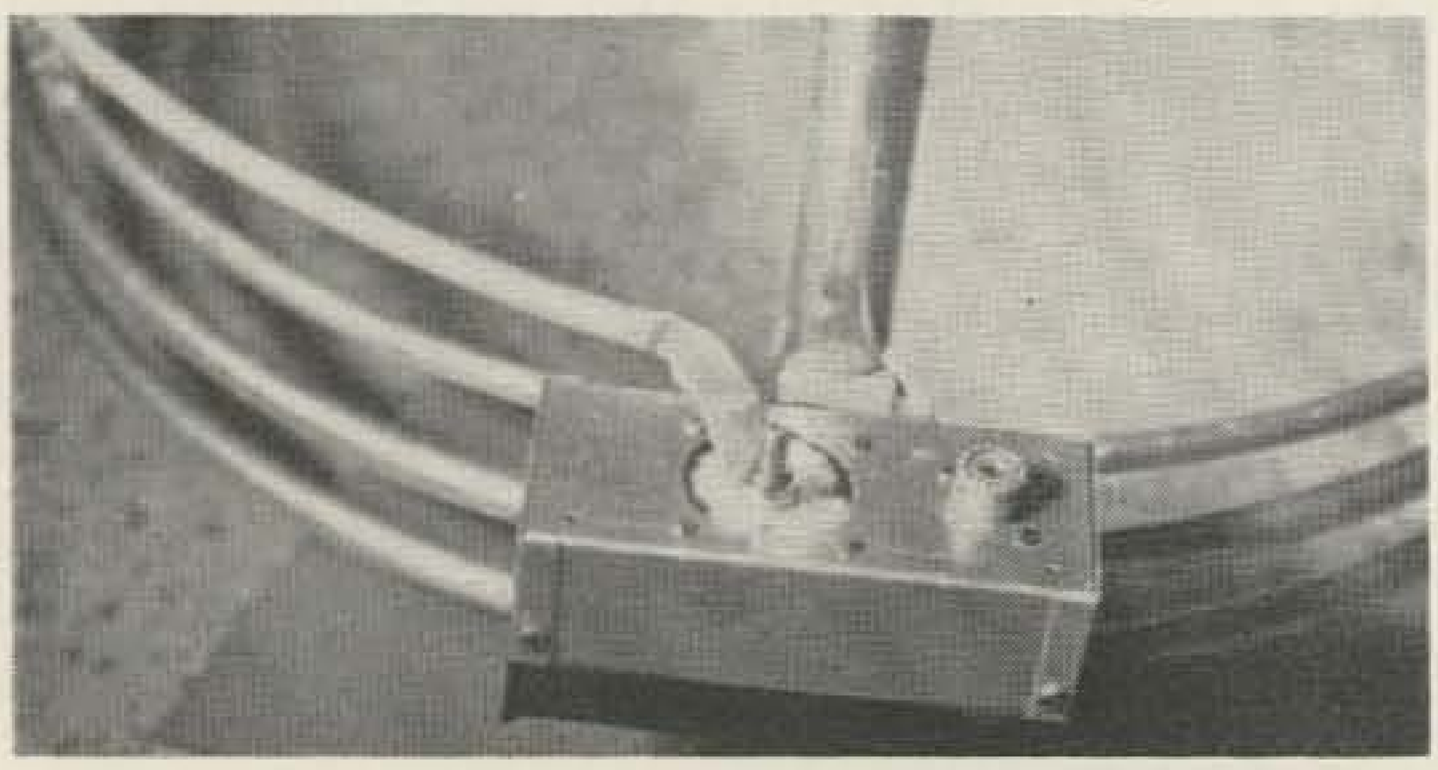
Table I. Comparison of Antenna Gains and Apertures

Type of Antenna	db Gain	Aperture
Isotropic point source	0	$0.07956W^2$
Small loop or halo	1.761	$0.1193W^2$
Half-wave dipole	2.148	$0.1305W^2$
Stacked haloes	10 log (2L/W)	LW/6.28
4, ½ wave apart	4.77	$0.2387W^2$
Parabolic reflector		
1 wavelength dia.	6.74 to 7.7	0.5A to 0.6A
2 wavelength dia.	13.0 to 13.7	
Optimum horn		
1 wavelength square	10	0.81A
2 wavelengths square	16	
Corner reflector		
1 wavelength square	10	0.71A
2 wave, 60° angle	13	0.5A
Broadside array (collinear)		
1 wavelength square	11 (max)	A (max)
2 wavelength square	17 (max)	

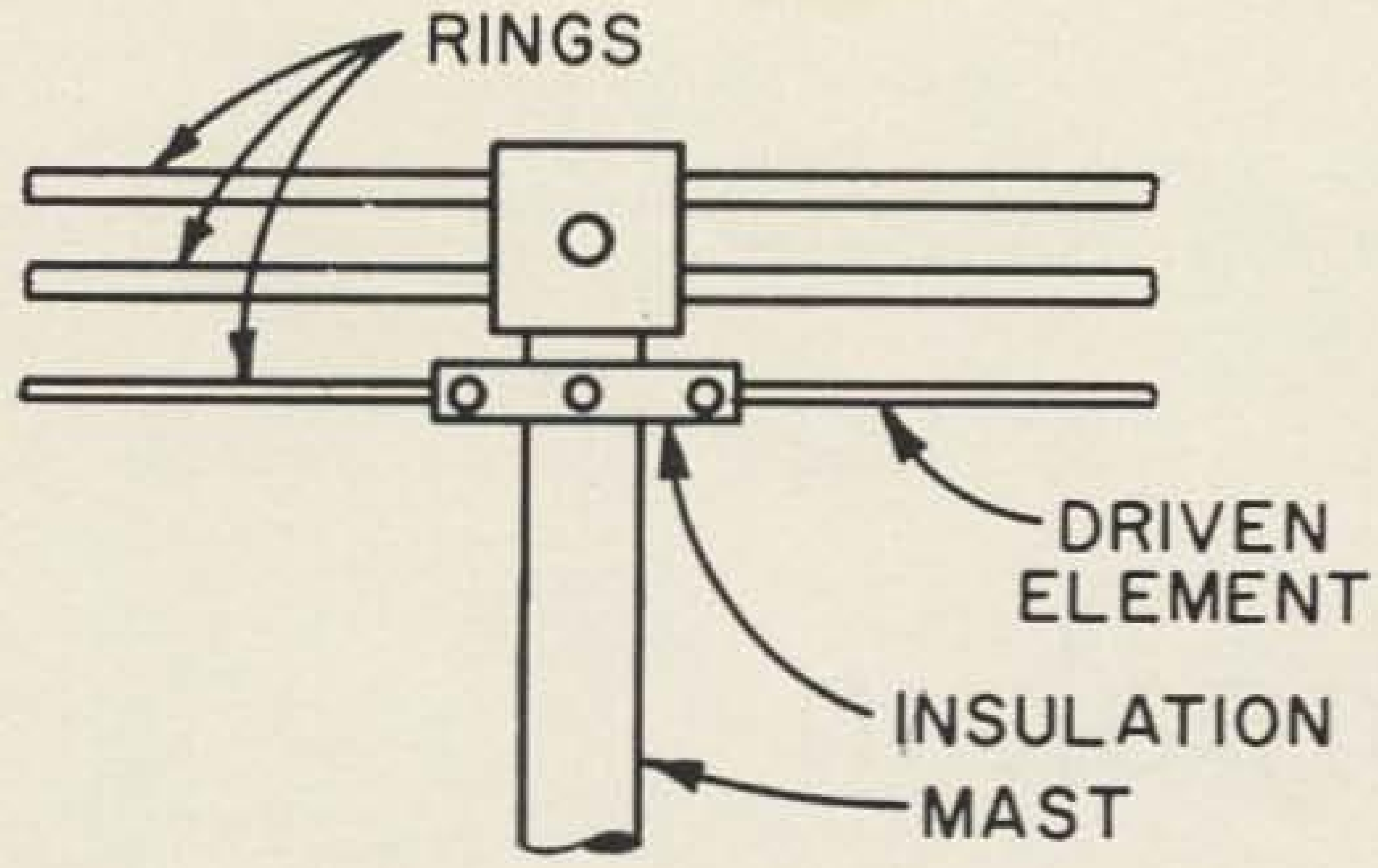
Modification of the Saturn 6

Ralph Bradford K5LPE
Ernest Williams W5CWS

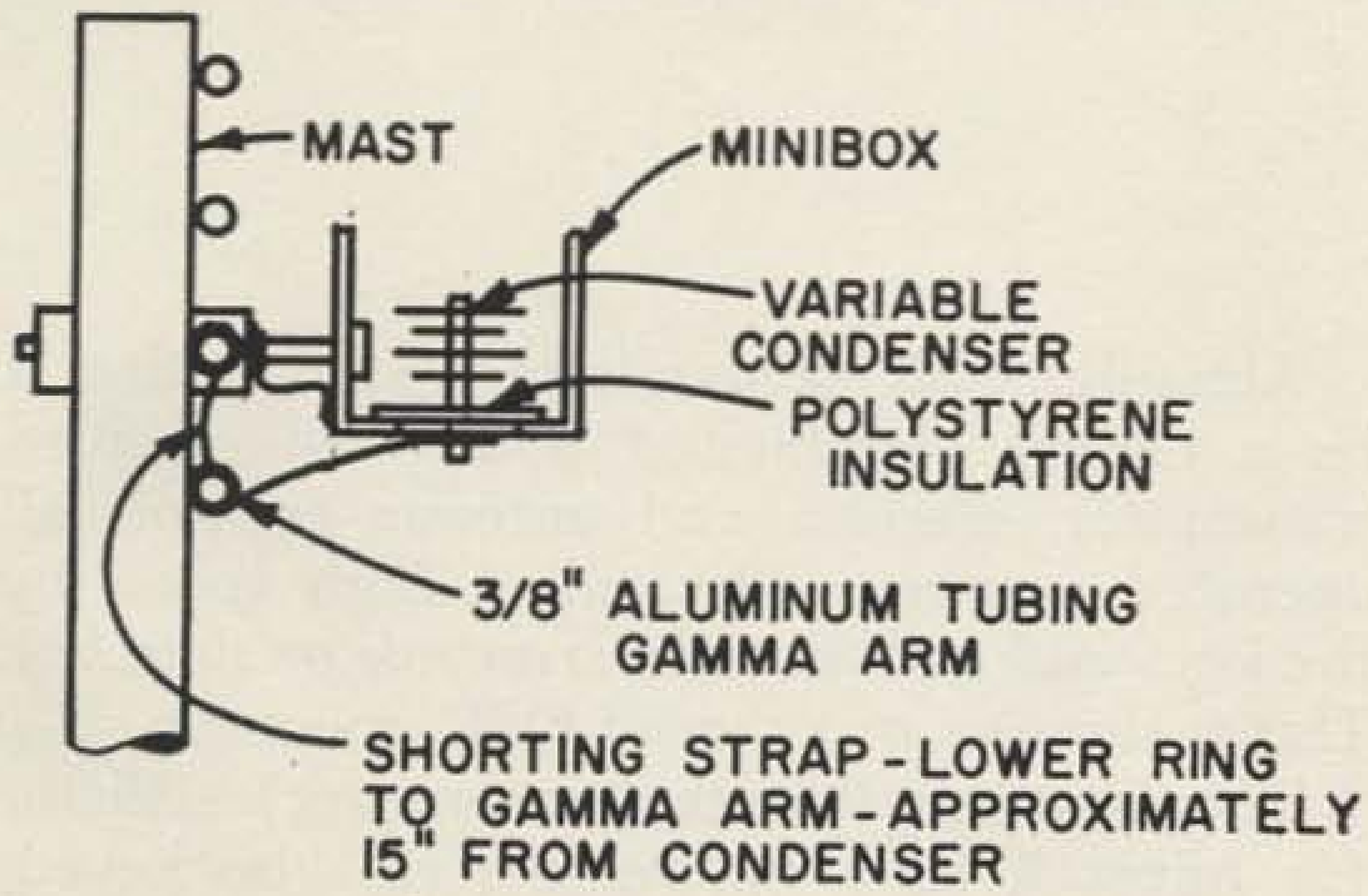
The authors acquired a pair of Saturn 6 halo antennas with the idea of using them in



club and Mars nets. They were tuned to the desired frequency and the Q section prepared as recommended by the manufacturer. Results were very poor. In good weather a high swr was obtained and during rainy weather the swr was even higher. Experimentation followed resulting in a modification employing a Gamma match. Bud Minibox 5″ l 2-¼″ w 2-¼″ h was used as an enclosure for the variable condenser and coax connector. A 1-½″ hole and a ⅝″ hole were cut in the bottom of the U-shaped part of the box. A piece of 1/16″ poly-



ORIGINAL ARRANGEMENT



AS MODIFIED

styrene was attached to the box over the 1-½″ hole using 4-40 volts and epoxy resin. A small 50 mmfd variable condenser was mounted in the center of the polystyrene. The coax connector mounted in the ⅝″ hole. Two holes were drilled in the side of the same unit and connected across the two bolts holding the lower ring sections to the insulation material. The center bolt holding the insulation material to the mast must be grounded to the minibox. The coax connector is connected to one side of the condenser inside the minibox. A ⅜″ diameter piece of aluminum tubing is connected to the condenser on the outside of the minibox. This tubing is extended to a position under the lower ring of the halo and then bent to follow the curvature of the halo. It is 15″ long and is spaced ¾″ below the lower ring of the halo. Closer spacing of the tubing will require a different length of tubing. Do not allow this tubing to touch the minibox or mast. Using this modification, the authors have obtained a 1:1 swr and in rainy weather a 1.5:1 ratio.