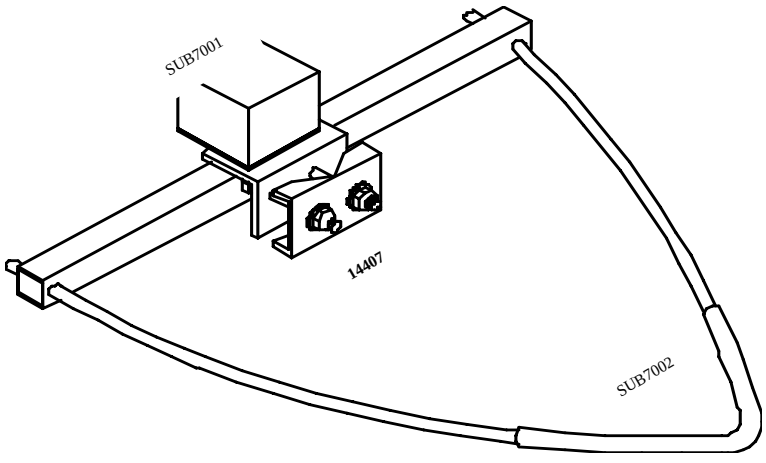
OMNIANGLE OA-70
4M HORIZONTALLY POLARIZED OMNIDIRECTIONAL ANTENNA

PARTS LIST

PART NO.	QTY	DESCRIPTION
SUB7001	1	4 METER MATCHBOX
7002	2	3/4” SQUARE ALUMINUM RADIATOR
7003	2	1/4” ROUND ALUMINUM TUBES
14404	1	FIBERGLASS ANGLE
14405	2	PLASTIC END CAPS
14407	1	ALUM. BACKUP PLATE
14408	2	S.S. 10-32X1 1/2” SCREW
14409	2	S.S. 1/4-20X2” HEX HEAD BOLT
14410	2	S.S. 1/4-20 HEX NUT
14411	2	S.S. 1/4” FLATWASHER
14412	1	5/8” X4” SQ. DIELECTRIC SPACER
7013	1	OA-70 INSTRUCTION SHEET
5004	2	PLASTIC CAP PLUGS
SUB7002	1	SHROUDED TIP ASSEMBLY
5005	1	NAIL CENTER PUNCH

FIG. 1



ASSEMBLY

1. Locate the square radiator assembly. Temporarily remove the fiberglass angle (14404). Refer to Fig.2 and insert the 1/4" bolts (14409) as shown
NOTE: The supplied bolts are satisfactory for support masts up to 1 1/4" diameter. Substitute 2 1/2" stainless bolts for a larger mast up to 1 5/8".
2. Reassemble the angle onto the square radiator assembly. Use the (2) 10-32 screws to join the radiators, angle and matchbox in that order. Tighten the screws in equal steps so as not to strip the hardware. Screws should turn in easily. Securely tighten the screws but avoid overtightening.
3. Locate the (2) 1/4" radiator tubes (7003), and the shrouded tip assembly (SUB7002). Identify the tube ends that have been drilled out and join the 1/4" tubes with the tip assembly. Insert the tip assembly into each tube until it bottoms out.
NOTE: If portable operation is intended, you may not wish to permanently attach these pieces. The curvature of the tubes will hold them in place
4. Using the included nail or a center punch and a hammer, dimple the 1/4" tube in one or two places where the 1/4"tube overlaps the 3/16" tube.
NOTE: During assembly avoid bending the black tube more than 45 degrees- it will put a permanent kink in the tube. Although it will not affect performance, it destroys the smooth contour of the antenna tip.
5. Refer to Fig 1. Insert one of the radiators into one of the holes at the end of the square radiators. Insert the rod until 1" extends out the far side of the square radiator
NOTE: For most installations, insert the 1/4" tubes as shown in Fig.1. For tower mounting insert the tubes from the opposite direction so the mast clamp is to the outside of the antenna.
6. While holding the square radiator assembly carefully push the remaining 1/4" tube into the other square radiator until 1" extends beyond the square radiator. This is most easily done by placing the end of the square radiator that already has the tube inserted on the ground and lightly stepping on the 1/4" tube to hold the assembly in place while the remaining tube is flexed and inserted into its hole.
7. Refer to Fig 1 and Fig. 2. Assemble the back plate (14407) onto the 1/4" bolts with (2) flatwashers (14411) and (2) 1/4-20 hex nuts (14410). Slip the backup plate over the support mast and tighten the nuts equally. As you tighten, adjust the antenna and backup plate square to the mast. **Do not** overtighten, this will only warp the fiberglass angle and backup plate.
8. Place the two rubber end caps over the open ends of the 5/16" radiators.

TUNEUP

1. Mount the antenna in the clear. If mobile mounting, try to mount the antenna 36" or more above the vehicle roof. This will ensure maximum gain close to the horizon and an impedance match close to that of free space. Connect an antenna analyzer, VHF V.S.W.R. bridge or VHF wattmeter through a short length of coaxial cable. **If using a transmitter, we suggest using low power for tuneup until you get the antenna adjusted.**

Note: All horizontal omni antennas we are familiar with tend to detune when subjected to rain or even foggy conditions. Those tested became unusable under these conditions because of high V.S.W.R. The Omniangles have virtually eliminated this problem by virtue of their wide bandwidth and plastic coatings. However, a small amount of detuning may still occur in extreme conditions. We suggest that the antenna be tuned 50 to 100 KHz **above** the normal operating frequency. As an example, if operation at 70.1 MHz is the most used frequency , tune the antenna to 70.30 MHz. This will result in a match of perhaps 1.2:1 at 70.1 MHz.- this will not affect antenna performance and will allow wet weather use with a very low V.S.W.R.

2. The resonant frequency is adjusted by lengthening or shortening the 1/4" rods- Lengthening the rods will lower the resonant frequency. To move a rod; hold the square radiator with one hand while grasping one of the 1/4" rods close in to the square radiator. Flex the 1/4" rod to

relieve pressure on the mounting hole. At the same time slide the rod in or out as required. When unflexed, the rod will stay put.
Note: Be sure to lengthen or shorten the rods in **equal** increments.

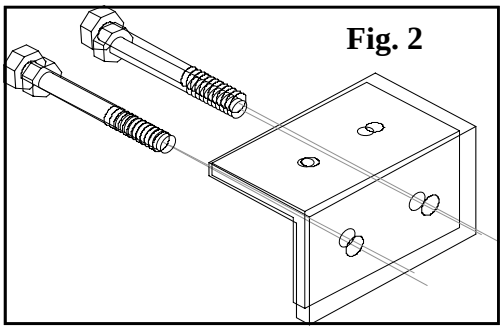
3. Refer to the specification section of this manual for optimum stacking distance.

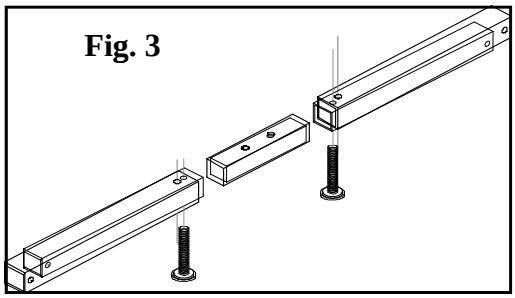
HOW THE ANTENNA WORKS

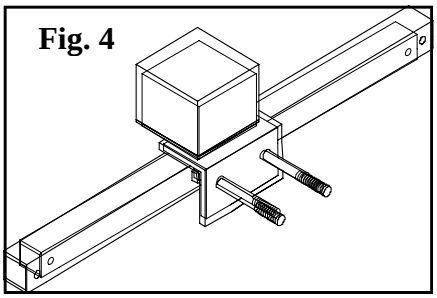
Halo or loop antennas attempt to achieve an omni pattern by shortening a half wave dipole and forming it into a loop. Resonance is restored by capacity loading the far ends of the loop. The intent is to equally distribute current throughout the length of the antenna. Still, the current diminishes towards the end resulting in an egg shaped pattern. The other side effect of shortening is a severe reduction in usable bandwidth and a susceptibility to detuning with rain.

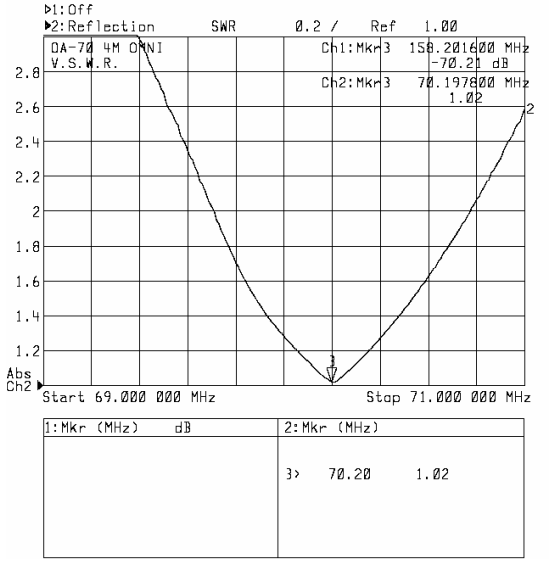
The Omniangle antennas are approximately 30% longer than a half wave. It is this electrical length in combination with the isosceles triangle shape that yields a near perfect omnidirectional pattern, much wider bandwidth, and considerably less rain detuning. Indpendent anechoic chamber testing confirms this antenna to have superior pattern and gain over traditional square and round loops.

Because the antenna is longer than a half wave, it is no longer resonant. The matchbox efficiently converts the feedpoint impedance (approximately 10 +J90 Ohms) to 50 Ohms resistive. Finally, a teflon current mode balun ensures equal current to both sides of the antenna.









V.S.W.R.

SPECIFICATIONS

Polarity:	Horizontal
Pattern:	Within +/- 0.8 dB omnidirectional
Design Z:	50 Ohms
V.S.W.R. Bandwidth:	See Analyzer Plot
Power Handling:	160W
Weight:	1.5 lbs
Size:.	26” X 34”
Materials:	6061-T6 Aluminum, Fiberglass
Suggested Stacking Distance	108”
Hardware:	Stainless Steel
Connector:	Silver/Teflon SO-239

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