OMNIANGLE OA-144
2M HORIZONTALLY POLARIZED OMNIDIRECTIONAL ANTENNA

PARTS LIST

PART NO.	QTY	DESCRIPTION
SUB14401	1	2 METER MATCHBOX
14402	2	3/4” SQUARE ALUMINUM RADIATOR
14403	2	3/16 ROUND ALUMINUM RODS
14404	1	FIBERGLASS ANGLE
14405	2	PLASTIC END CAPS
14406	1	BLACK PLASTIC TUBE
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
14413	1	OA-144 INSTRUCTION SHEET

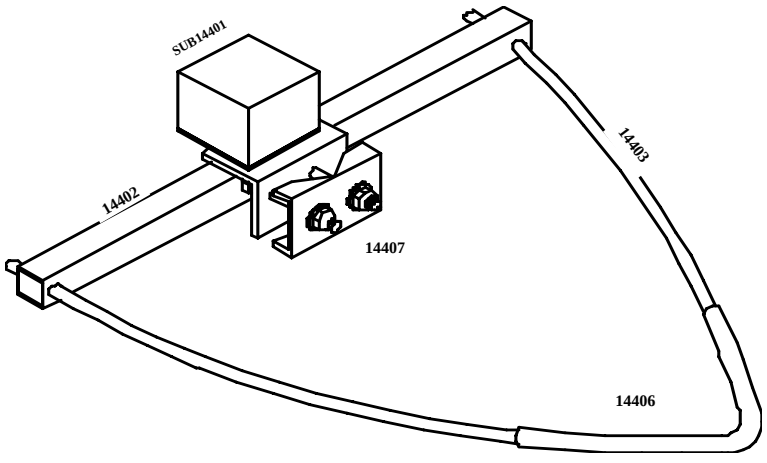


FIG. 1

ASSEMBLY

1. Refer to Fig. 2 . Select the fiberglass angle (14404) and the (2) 2 ” hex head bolts (14409). Insert the bolts through the 1/4” holes in the direction 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 1/2”.

2. Locate the (2) 3/4” square radiators (14402) and the dielectric spacer (14412). Refer to Fig. 3 and Fig. 4. Insert the spacer into the the radiators and line up the holes. Use the (2) 10-32 screws to join the radiators, angle and matchbox in that order. Tighten the screws in equal steps. Screws should turn in easily. Securely tighten the screws but avoid overtightening.

3. Locate (2) 3/16” round rods (14403) and the black plastic tube (14406). Refer to Fig. 1.Note that each radiator has a mark 4” in from one end. Push and twist the plastic tube onto the rod up to the 4” mark. This is most easily accomplished by placing the rod in a vice with the 4” mark even with the vice jaws. The jaws then act as a stop. Do the same with the remaining radiator. If you push the tube too far, slide one of the 1/4” flatwashers onto the opposite end of the radiator and move the tube back.
NOTE: Tolerances in the plastic tube sometimes makes it more difficult to insert the rods. The task can be facilitated by starting the tubing onto a rod and then heating the tube with a hairdryer. Push straight onto the rod to avoid kinking the plastic tube.

4. Refer to Fig 1. Insert one of the round ends 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: If the antenna is to be mounted on a tower leg **,** insert the radiators from the opposit side shown in Fig. 1. This places the tower leg to the outside of the antenna triangle.

5. While holding the square radiator assembly carefully push the remaining 3/16” rod into the other square radiator until 1” extends beyond the square radiator. Gentle flexing of the rod will be necessary .
6. 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.

TUNEUP

1. Mount the antenna in the clear. If mobile mounting, try to mount the antenna 20” 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. I**f 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. We suggest that the antenna be tuned 200 to 300 KHz **above** the normal operating frequency. As an example, if operation at 144.200 MHz is the most used frequency , tune the antenna to 144.4 MHz. This will result in a match of perhaps 1.25:1 at 144.200 MHz.- this will not affect antenna performance and will allow wet weather use with a low V.S.W.R.

2. The resonant frequency is adjusted by lengthening or shortening the 3/16” 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 3/16” rods close in to the square radiator. Flex the 3/16” 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. **Recent independent anechoic chamber testing confirms the superior pattern and gain of this design over traditional 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.

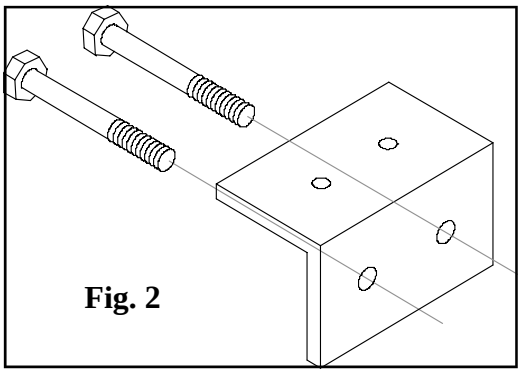


Fig. 2

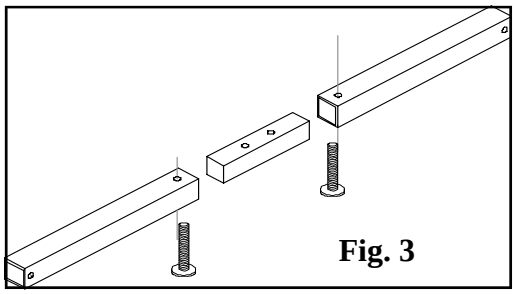
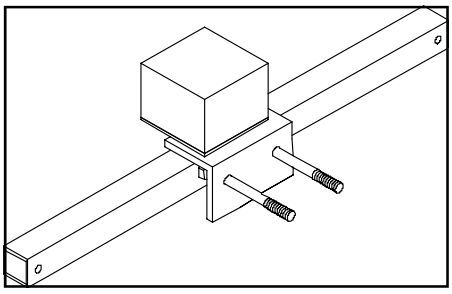
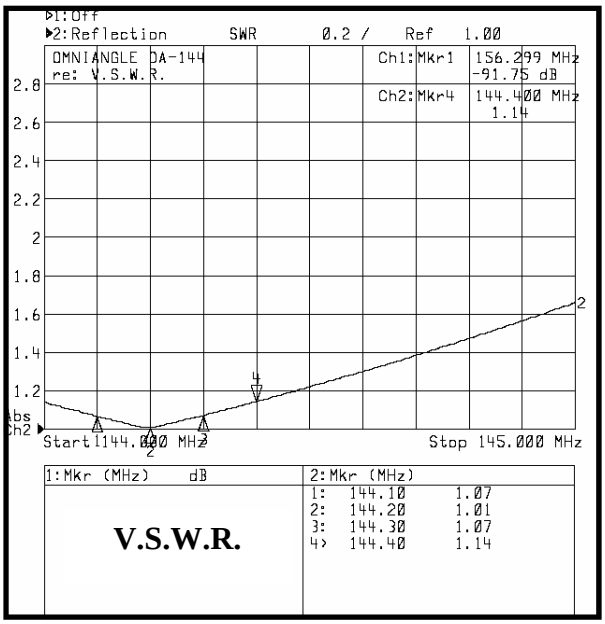


Fig. 3





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 lb
Size:.	14” X 18”
Materials:	6061-T6 Aluminum, Fiberglass
Suggested Stacking Distance	60”
Hardware:	Stainless Steel
Connector:	Silver/Teflon SO-239

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