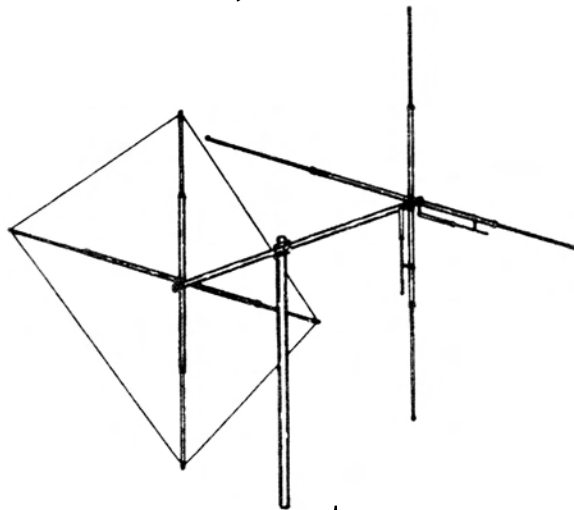


ASSEMBLY INSTRUCTIONS



SWITCHABLE POLARITY 4 ELEMENT QUAD BEAM

Y-QUAD



www.macoantennas.net

(815) 244-3500

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302 S. East Street, Mt. Carroll, IL 61053

MACO Y QUAD

PACKING LIST

<u>PART</u>	<u>QTY</u>	<u>O.D.</u>	<u>SIZE</u>	<u>LENGTH</u>	<u>DESCRIPTION</u>	<u>CHECKLIST</u>
T11P	4	5/8"	.050"	72"	ALUM TUBING SBE	_____
T01	4	1/2"	.050"	72"	ALUM TUBING	_____
T28	1	1 1/2"	.050"	72"	ALUM TUBING	_____
P01P	1		1/4" x 5" x 5"		1 1/2" BOOM TO 1 1/2" MAST	_____
W04P	1		7/14	40'	BARE COPPER WIRE	_____
FA1P	4			48"	FIBERGLAS RODS	_____
G01	2				GAMMA MATCHES	_____
Z08	4				GAMMA STRAPS F/COAX CONN	_____
S42	2				FEM COAX CONN W/MNTG NTS	_____

HARDWARE BAG 1

U02	8		1 1/2"		PLATED U-BOLTS	_____
S02	8		1 1/2"		PLATED SADDLES	_____
N03	16		5/16"		LOCK NUTS	_____

HARDWARE BAG #2

BE1P	4				BOOM TO ELEMENT MOUNT	_____
W58	8		5/8"		EXTRUDED ALUM CLAMPS	_____
S21	14		10-24 x 1/2"		MACHINE SCREWS	_____
N11	16		10-24		SQUARE NUTS	_____
N12	8		#10		LOCKWASHERS	_____
PL2	4		.437		PLASTIC CAPS – BLACK	_____
Z02	4		1/2"		GAMMA STRAPS	_____
PL4	1		1 1/2"		PLASTIC CAP – BLACK	_____
PL4R	1		1 1/2"		PLASTIC CAP – RED	_____
	1				TIP SHEET	_____
	1				WARRANTY SHEET	_____
	1				SET OF INSTRUCTIONS	_____

FIBERGLASS HARDWARE BAG

	4		8-32 X 3/4"		MACHINE SCREWS	_____
	4		#8		FLAT WASHERS	_____
	4		#8-32		NUTS	_____

Please note: In an effort to keep the price on Maco Antennas down, we have decided not to clean up all the burrs and rough edges on the parts. We recommend that you deburr and clean up each part with files, sandpaper, etc. so that they go together easily. We are aware this needs to be done but have elected not to do it to save you the money we would have to add to the price of the kit for this service.

MACO Y QUAD

ASSEMBLY INSTRUCTIONS

FIGURE 1. BOOM-TO-MAST PLATE & ELEMENT ASSEMBLY

Mark the centers of the 1-1/2" O.D. x 72" boom (T28) and the boom-to-mast plate (PO3P). Attach the plate to the boom as shown in Detail 1A using 1-1/2" U-Bolts (UOZ), Saddles (SO2), and 5/16" Nuts & Lk. Washers (NO1, N02). Do not over-tighten the U-Bolt as doing so may crush and weaken the boom.

Next mark the centers of the (4) 5/8" O.D. x 72" slotted tubing (TIIP) and slide a boom-to-element mount onto each piece of tubing to the center. Now assemble these onto the boom as shown in Detail 1B, paying particular attention to the element spacing.

Make a mark 3-1/2" from one end of each of the 1/2" O.D. x 72" tubing (TOI). Using clamps (W58P) with #10-24 screws & sq. nuts (S21, N11), insert the 1/2" tubing into the slotted ends of the 5/8" tubing (TIIP) to the mark and tighten the screws. (Ref. Detail 1C - Driven Element) Now check the overall length of both elements for 17'-5" and then place the plastic end caps (PL2) on each element tip.

Make a mark 2" from the plain end of each of the (4) fiberglass arms (FAIP). No insert the arms to the mark into the 5/8" tubing on the reflector end using the clamps in the same manner as above. (Ref. Detail 1D)

FIGURE 2. REFLECTOR ASSEMBLY & MAST MOUNTING

The length of the reflector wire is critical. The easy way to get it right is to drive two nails in a board exactly 19 ft. 6 in. apart. Stretch the wire around the nails to the tightness desired when installed on the spreaders. Then splice the wire and solder. When installed the exact length of each side is important. REMEMBER: The Reflector dimensions are only preliminary. Change to get equal sides of 9' 9". Fiberglass length is not critical, however the equal wire length of 9' 9" is very critical. Remember the tightness when installed should be the same as when stretched and spliced

Next loosely assemble the #10-24 x 1/2" screws, flt. washers, lk. washers & nuts (S2 1, N11, N12, N26) onto the lugs of the (4) fiberglass arms as shown in Detail 2A.

String the wire around the arms so that it is caught between the lugs and the flatwasher at the 9'-9" marks, with the loose ends at the bottom as shown and tighten the screws. Bring the ends together and line up the marks that are 2" from each end. Now twist the loose ends together & solder as shown. (Ref. Detail 2A)

Adjust each fiberglass arm so that the reflector wire becomes taut and each leg of the square is 9'-9". A slight natural bowing of the fiberglass arms is normal. This will not affect normal operation of the antenna as long as the lengths of wire are correct. (Ref. Detail 2A)

The Y-Quad may be mounted on a 1-1/2" O.D. mast using U-Bolts, Saddles & Hardware as shown in Detail 28. If mounted on a guyed tower break up the guys every 3 feet by using egg insulators in the guy line for the top 20 feet of the guy cables. Also, the guys should be located at least 12 feet below the level of the boom. Although it is very desirable to mount the antenna on a mast so that the elements clear the top of the tower, this should not be attempted unless you are certain that your installation is sturdy enough. Experimentation has shown little, if any, affect on the operation of the antenna by mounting it 2 feet above the top of the tower, or by mounting a rotator so that it lies between the vertical elements. The first consideration should always be the mechanical stability of the antenna.

FIGURE 3. GAMMA MATCH MOUNTING

Mount the (2) gamma matches (GO1P) to the horizontal and vertical driven elements, using the gamma straps (ZO2P, ZO8P) and attaching hardware as shown. Attach your 52 ohm coaxial cables to the connectors (S42) and dress along boom and down the mast.

ADJUSTING STANDING WAVE RATIO

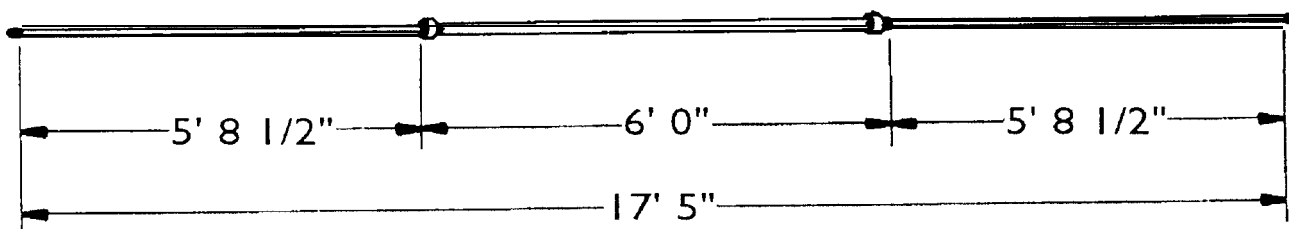
Refer to Figure 3. The dimensions given are approximate and should be used as a starting point. The following instruction covers the adjustment of one gamma match. To adjust the second gamma match simply repeat this procedure. The gamma match has (2) adjustments. First is the capacitor adjust and second is the slider adjust. First connect a S.W.R. bridge to the coax. between your transmitter and the antenna and check the S.W.R. If adjustment is required first loosen the clamp on the gamma match and the screws holding the slider (Gamma straps ZO2P). Next move the capacitor adjustment first one direction then the other until a minimum S.W.R. reading is obtained. If S.W.R. is not yet satisfactory, first move the slider out 2" away from the boom. If the reading has gone up move the slider back to the original position and the 2" towards the boom. Now readjust the capacitor for minimum S. W.R. You should now be able to determine which direction to move the slider. Repeat the above procedure moving the slider in smaller increments until a satisfactory S.W.R. reading is obtained. Tighten all hardware. Disconnect the S.W.R. bridge & reconnect your coax. cable.

NOTE:

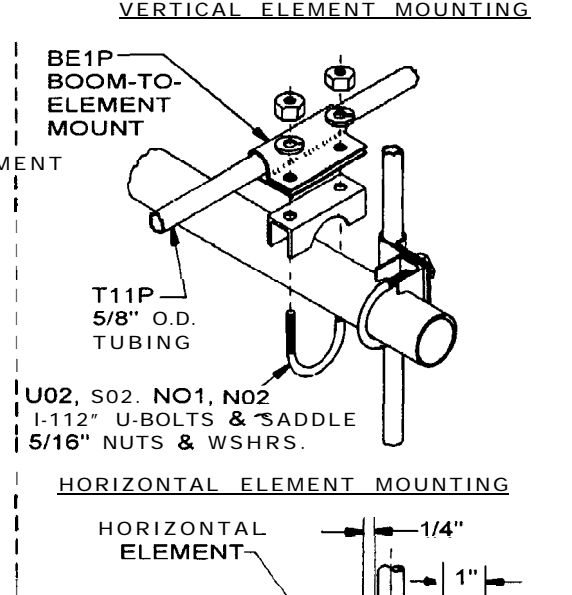
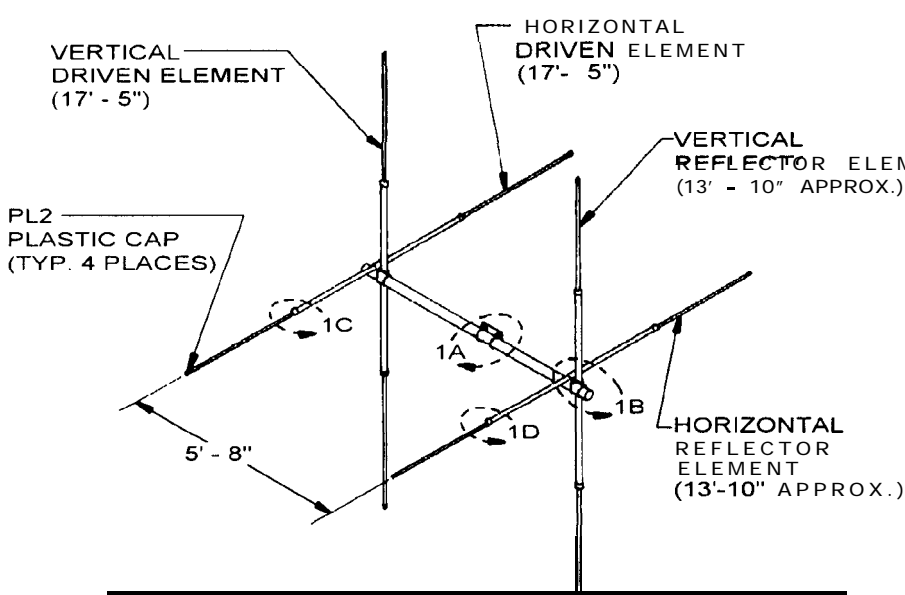
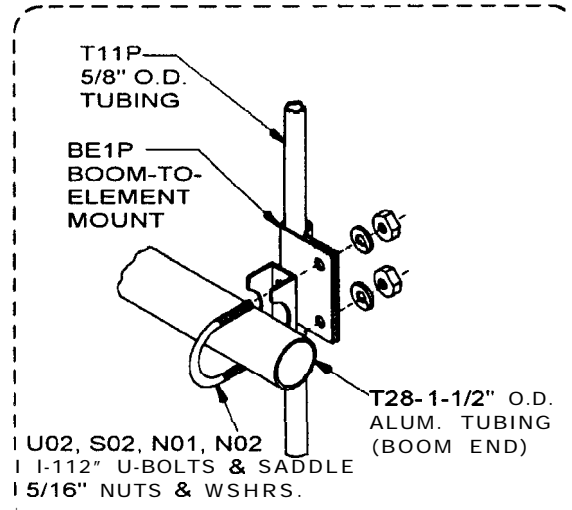
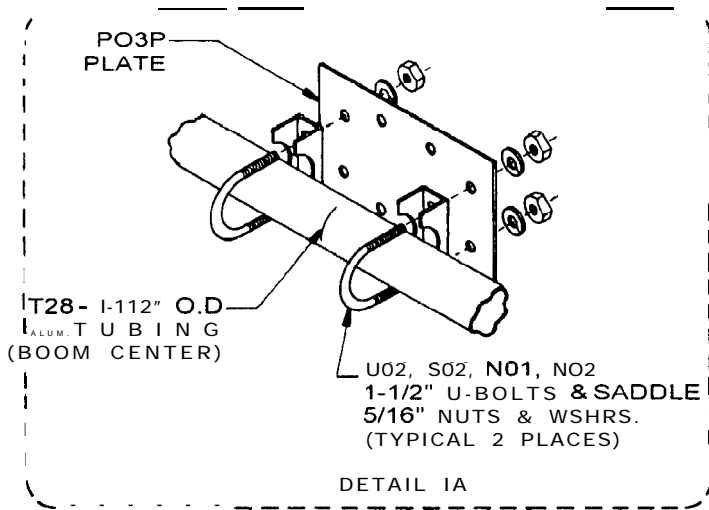
Upon completion of assembly place the Red Plastic Cap (PL4R) on the Driven Element end of the boom and the Black Plastic Cap on the Reflector end of the boom. This will allow you to determine at a glance the direction of transmit & receive.

CAUTION

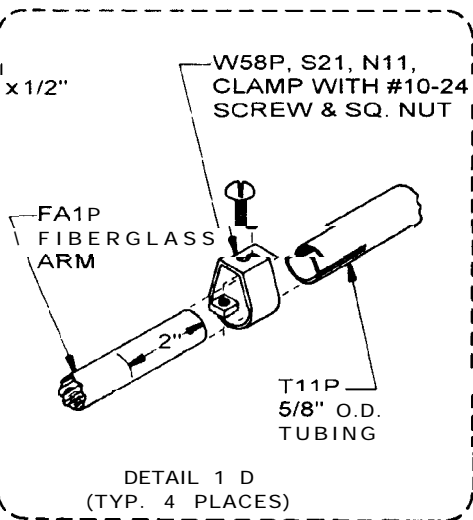
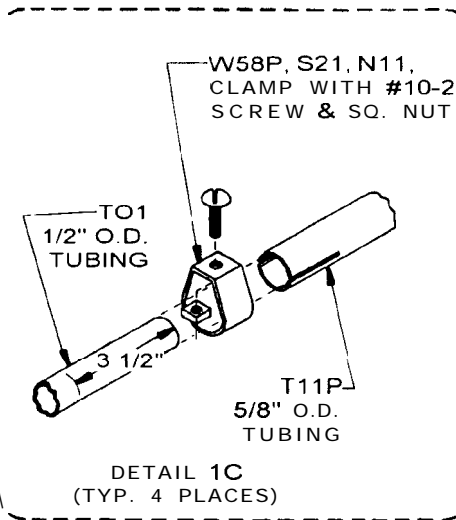
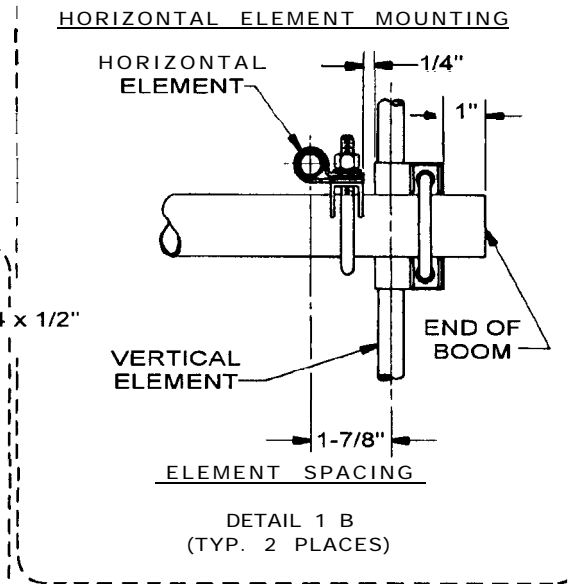
Take care to avoid an contact with overhead powerlines when raising your antenna. Serious or fatal injury could result.



DRIVEN ELEMENT DETAIL



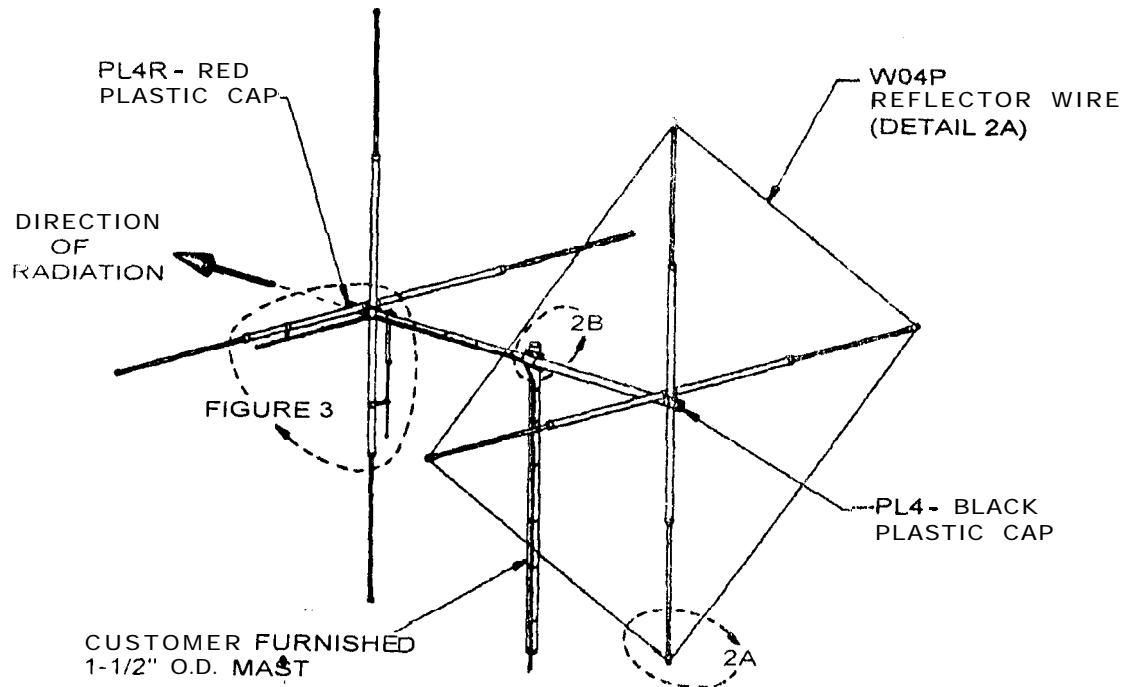
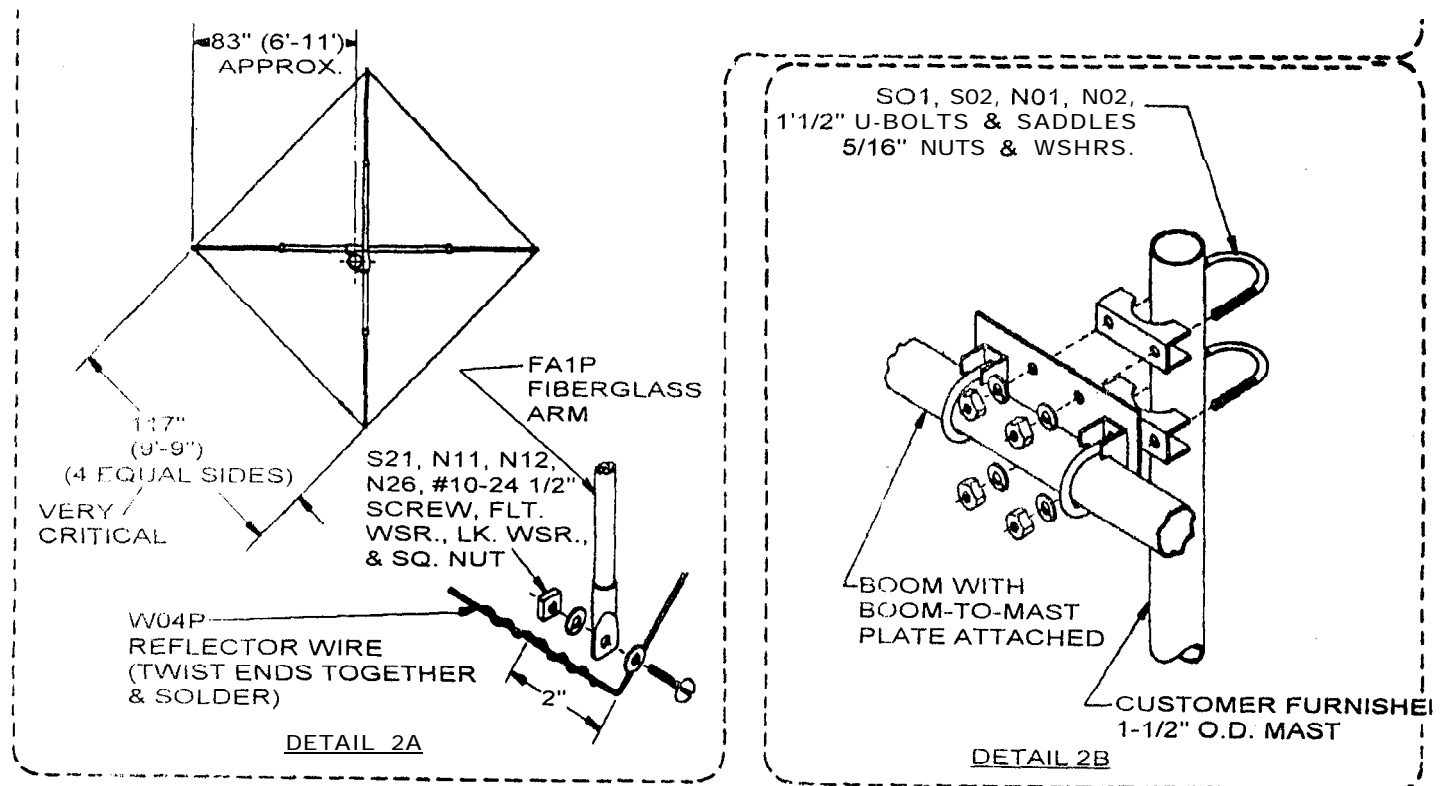
Please read the Assembly and Troubleshooting Tips at the end of this instruction booklet before assembling elements.



BOOM TO MAST PLATE & ELEMENT ASSEMBLY

FIGURE 1

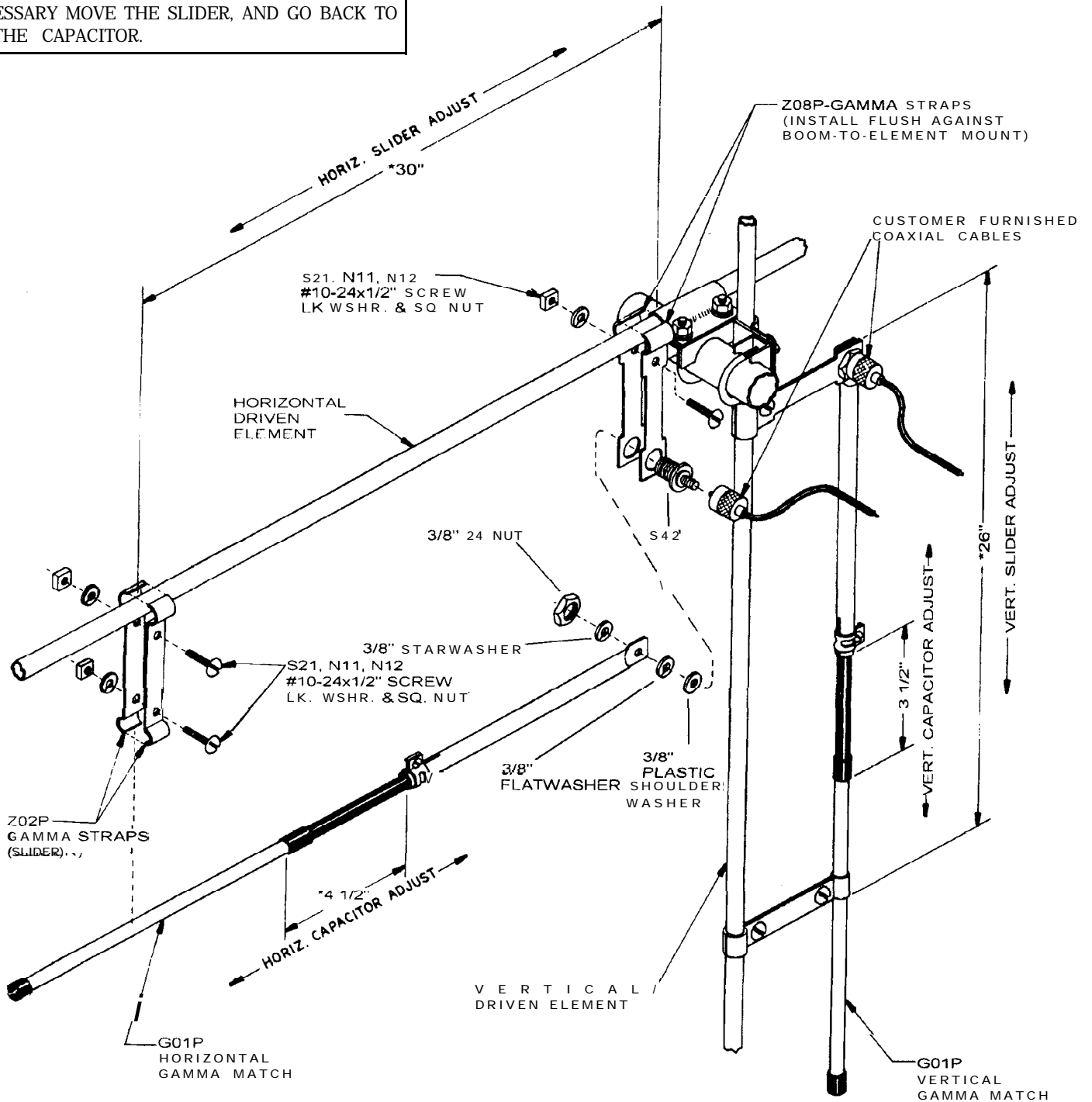
REFLECTOR DIMENSIONS ARE ONLY PRELIMINARY. CHANGE TO GET EQUAL SIDES OF 9'9". FIBERGLASS LENGTH IS NOT CRITICAL. HOWEVER THE EQUAL WIRE LENGTH OF 9'9" IS VERY CRITICAL.



REFLECTOR ASSEMBLY & MAST MOUNTING

FIGURE 2

* NOTE. THESE DIMENSIONS ARE APPROXIMATE. REFER TO THE INSTRUCTIONS OF; ADJUSTING THE S.W.R. TO DETERMINE EXACT SETTINGS. THERE ARE 2 SEPARATE GAMMA ADJUSTMENTS, 1. CAPACITOR ADJUSTMENT, 2. SLIDER POSITION. **DO NOT MOVE BOTH AT THE SAME TIME.** MOVE THE CAPACITOR FIRST, THEN, IF NECESSARY MOVE THE SLIDER, AND GO BACK TO THE CAPACITOR.



Y QUAD

DANGER

**High Voltage
Overhead**



Caution:

**TAKE CARE TO AVOID ANY CONTACT WITH
OVERHEAD POWERLINES WHEN RAISING,
INSTALLING, OR REPAIRING YOUR
ANTENNA, TOWER, OR ROTOR.**

DEATH WILL OCCUR!

Installing and rigging towers, masts and antennas require specialized skills and experience. Information supplied by MACo assumes that all products will be installed by personnel having these skills and have installed similar products before. No one should attempt to install towers or masts without these knowledgeable skills.

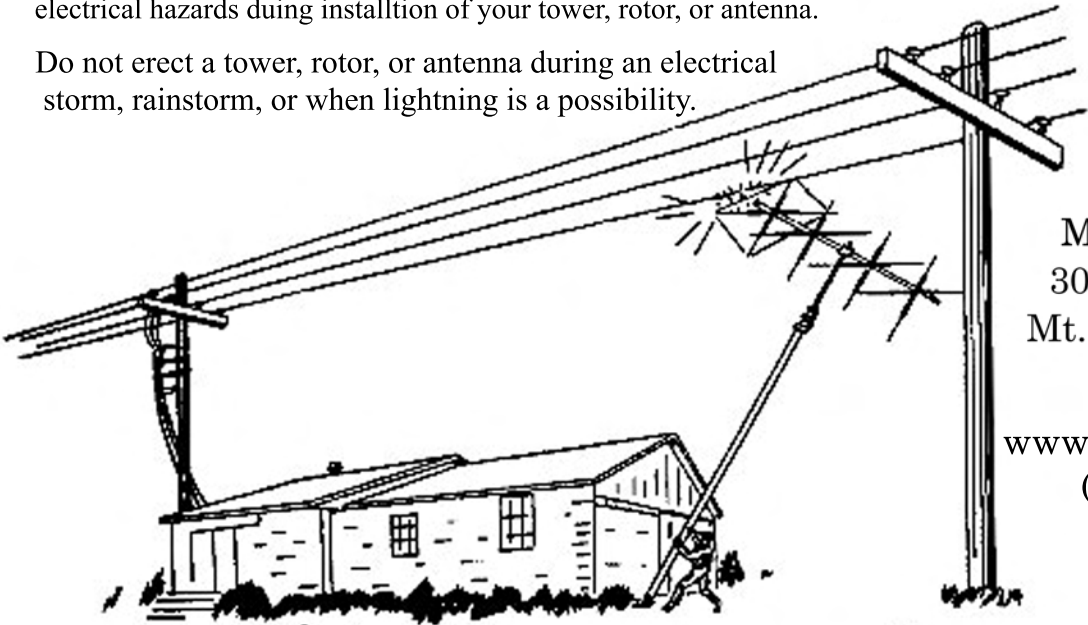
MACo assumes no liability if faulty or dangerous installation practices are used. There are available, trained and experienced personnel to assist in installation, maintenance, or disassembly. Contact your local installer if consultation or assistance is required.

All tower and antenna installations should be thoroughly inspected at least twice a year by qualified, experienced, and trained personnel to insure proper performance and safety standards.

Electrical Warning

An additional warning precaution is given to be careful of surrounding high voltage power wires and other electrical hazards during installation of your tower, rotor, or antenna.

Do not erect a tower, rotor, or antenna during an electrical storm, rainstorm, or when lightning is a possibility.



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