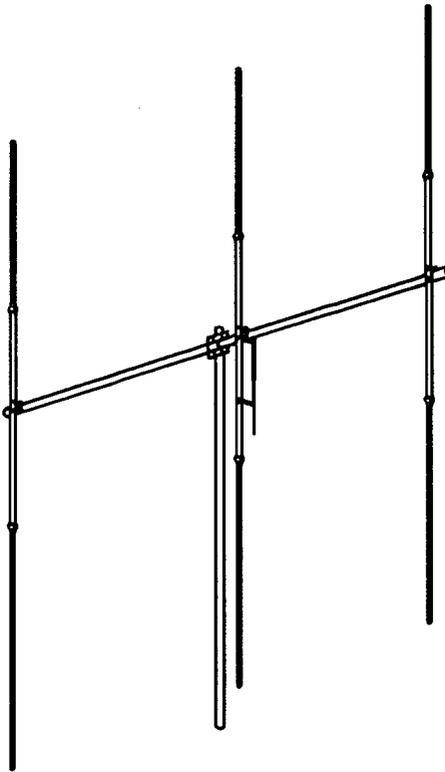


# ASSEMBLY INSTRUCTIONS



## 3 ELEMENT - 11 METER MAXIMUM BEAM



### M103C

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4091 Viscount - Memphis, Tennessee 38118 (901) 794-9494*

# MACO M103C

## PARTS LIST

<u>PART</u>	<u>QTYD</u>	<u>SIZE</u>	<u>LENGTH</u>	<u>DESCRIPTION</u>	<u>CHECKLIST</u>	
G01P	1			GAMMA MATCH	_____	
T59P	1	1-1/2"	.047"	72"	ALUM. TUBING SWAGED ONE END 6" (DIE #6- 1.370")	_____ _____
T11P	3	5/8"	.047"	72"	ALUM. TUBING SLOTTED BOTH ENDS	_____
T04P	2	1/2"	.035"	80-1/2"	ALUM. TUBING	_____
T28P	1	1-1/2"	.047"	72"	ALUM. TUBING	_____
TO1	4	1/2"	.035"	72"	ALUM. TUBING	_____
P03P	1	5"x1/4"		5"	PLATE 1-1/2" BOOM TO 1-1/2" MAST	_____
BE1P	3	1-1/2"			BOOM TO ELEMENT MOUNTS	_____
<u>HARDWARE BAG #1</u>						
NO1	14	5/16"			HEX NUTS	_____
NO2	14	5/16"			LOCKWASHERS	_____
W58P	6	5/8"			EXTRUDED ALUM. CLAMPS	_____
s21	11	1 0-24	1/2"		MACHINE SCREWS	_____
PL2	6	.437			PLASTIC CAPS - BLACK	_____
N11	12	1 0-24			SQUARE NUTS	_____
Z02P	2	1/2"		4"	GAMMA STRAPS	_____
Z08P	2				GAMMA STRAPS F/COAX. CONNECTS	_____
S42	1				FEMALE COAX CONN. W/MOUNTING NUT	_____
N12	4	#10			LOCKWASHERS	_____
PL4	1	1 1/2"			PLASTIC CAPS - BLACK	_____
PL4R	1	1 1/2"			PLASTIC CAPS - RED	_____
<u>HARDWARE BAG #2</u>						
uo2	7	1-1/2"			PLATED U-BOLTS	_____
so2	7	1-1/2"			PLATED SADDLES	_____
	1				SET OF INSTRUCTIONS	_____

WHEN ORDERING REPLACEMENT PARTS, ALWAYS GIVE PART NUMBER AND DESCRIPTION.

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 M103C

## ASSEMBLY INSTRUCTIONS

### FIGURE 1 GENERAL INSTRUCTIONS

This drawing shows a view of the antenna assembled. The M103C may be used vertically or horizontally. These instructions and FIGURES 2 through 4 show the correct assembly instructions. It is highly recommended that rope be put in the elements to prolong their life.

Upon completion of assembly, install the red plastic cap (PL4R) on the director end of the antenna, and the black plastic cap (PL4) on the reflector end. This will allow you to determine at a glance the direction of transmit and receive.

### FIGURE 2 BOOM ASSEMBLY AND MAST MOUNTING

To assemble the boom insert the swaged end of the 1-1/2" O.D. boom section (T59P) 5 inches into one end of the other 1-1/2" O.D. boom section (T28P). The overall length of the boom should be about 11' 7". Center the boom-to-mast plate (P03P) over the joint and clamp the boom sections together with the U-bolts, saddles and hardware as shown in detail 2A.

This antenna is designed for mounting on a 1-1/2" O.D. heavy duty mast. Mount using 1-1/2" U-bolts, saddles and hardware as shown in detail 2B.

#### **CAUTION.....**

Take care to avoid any contact with overhead power lines when raising your antenna. Serious or fatal injury could result.

### FIGURE 3 ELEMENT ASSEMBLY AND MOUNTING

To assemble the elements, use (4) of the clamps (W58P) and #10 x 1/2" screw and square nuts (S2 1, N1 1) as shown in the element assembly detail. Insert a length of the 1/2" O.D. unslotted tubing (T01P) into each end of the element sections. Adjust each end to the "B" dimensions and tighten the clamps. Check the overall length ("A" dimension). Push a 437" plastic cap (PL2) on each end of the elements.

Mount the elements onto the boom using U-bolts, saddles, and hardware (U02, S02, NO 1, N02) to fasten the boom-to-element clamp (BE 1P) as shown in the element mounting detail. From the 72" to center, end of the boom, measure in 5/8" to the outside edge of the mounting hardware and fasten the director. Refer to Figure 1 for the spacing dimensions and fasten the driven element and reflector.

Line the elements up with the use of a level or any other workable method. Double check the spacing dimensions and make sure the elements are centered in the boom-to-element clamps. Tighten all hardware taking care to line the elements up with the use of a level. Check your measurements and make sure the elements are centered on the boom.

**TIGHTEN ALL HARDWARE SNUG; DO NOT CRUSH THE TUBING. CRUSHING GREATLY WEAKENS THE TUBING.**

## ASSEMBLY INSTRUCTIONS

(continued)

### FIGURE 4    GAMMA MATCH MOUNTING

Mount the gamma match (**G01P**) to the driven element, using the gamma straps (**Z02P**, **Z08P**) and attaching hardware as shown. Attach your 52 ohm coaxial cable to the connector (**S42**) and dress along boom and down the mast. The gamma is shown pointing down - this is to let water out.

### ADJUSTING THE STANDING WAVE RATIO (SWR)

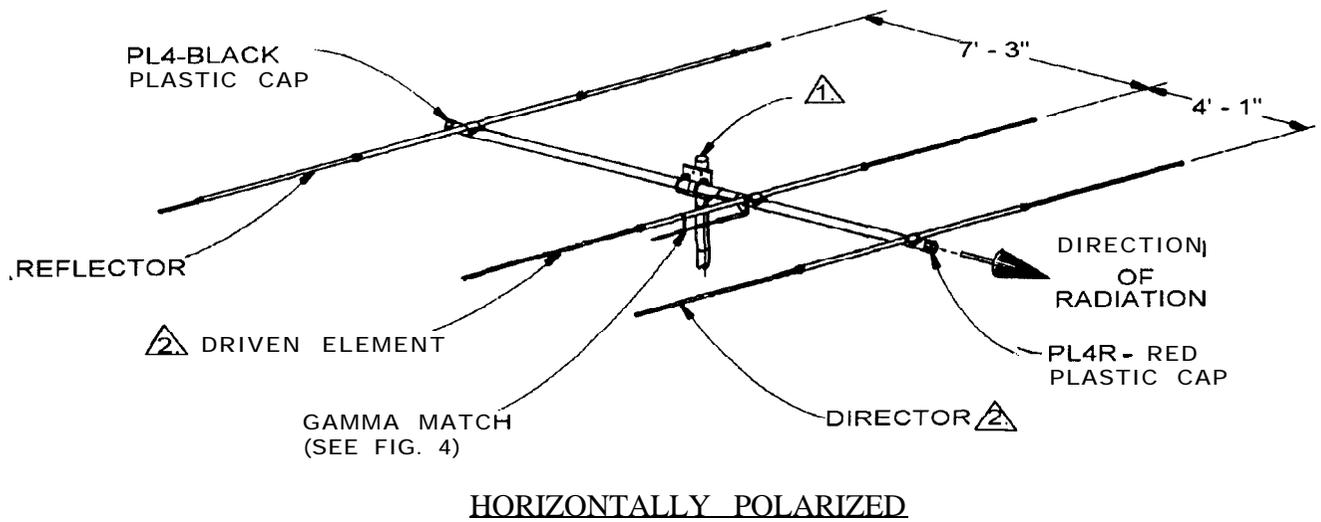
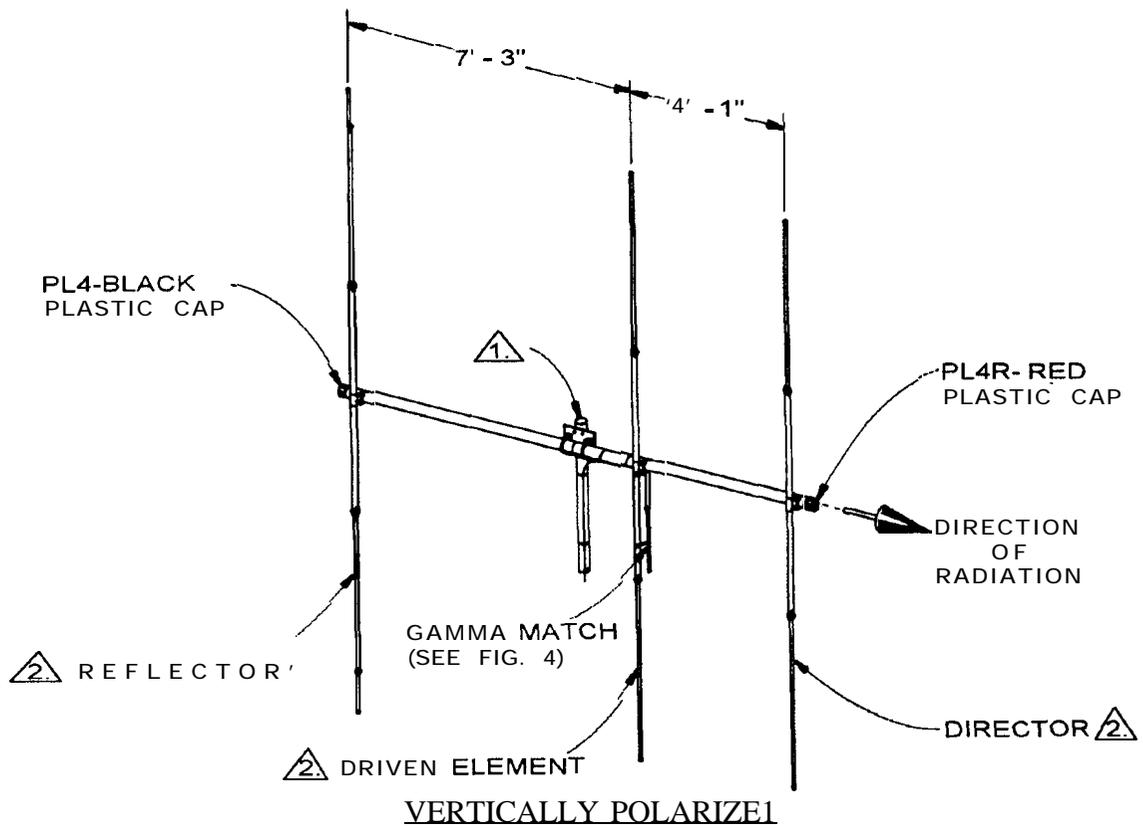
Refer to Figure 4. The dimensions given are approximate and should be used as a starting point. The gamma match has 2 adjustments. First is the capacitor adjust and second is the slider adjust. Connect a SWR bridge coax between your transmitter and the antenna and check the SWR. If adjustment is required, loosen the clamp on the gamma match and the screws holding the slider (gamma straps (**Z02P**)). Next move the capacitor adjustment first one direction, then the other until a minimum **SWR reading** is obtained. If SWR is not yet satisfactory, move the slider out 2" away from the boom. If the reading has gone up move the slider back to the original position and then 2" towards the boom. Now readjust the capacitor for minimum SWR. 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 SWR is obtained. Tighten all hardware. Disconnect the SWR bridge and reconnect your coaxial cable.

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#### **NOTE!**

When assembling for vertical use, set antenna on a pole about 8 to 9 feet above the ground horizontally and adjust SWR for 1.7. When you turn the antenna vertical and mount it on the tower, etc., the SWR will drop to 1.5 or less . This is good; QUIT!

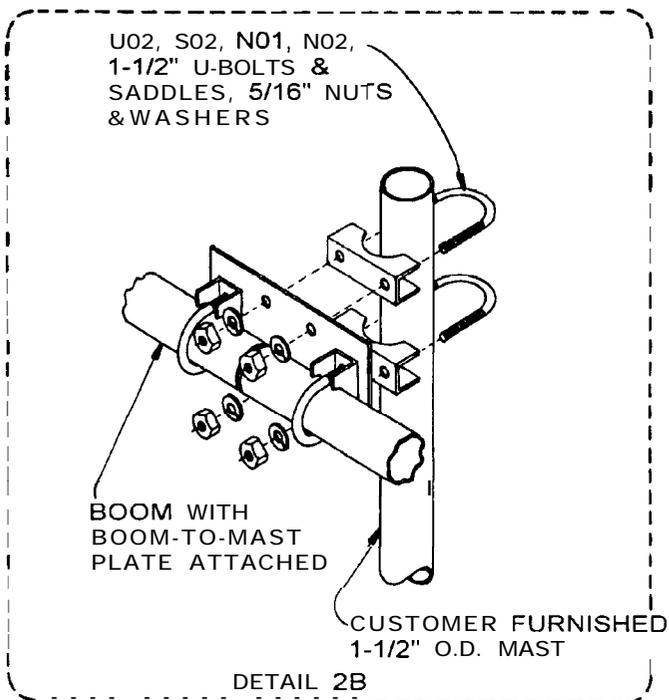
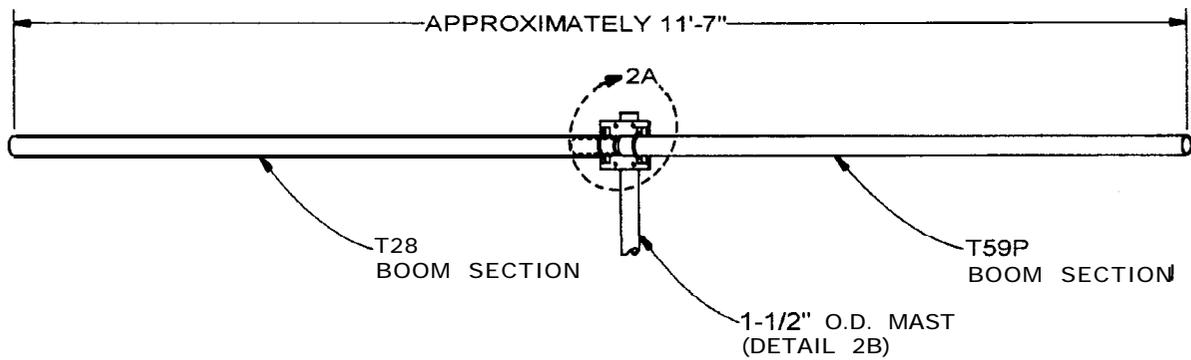
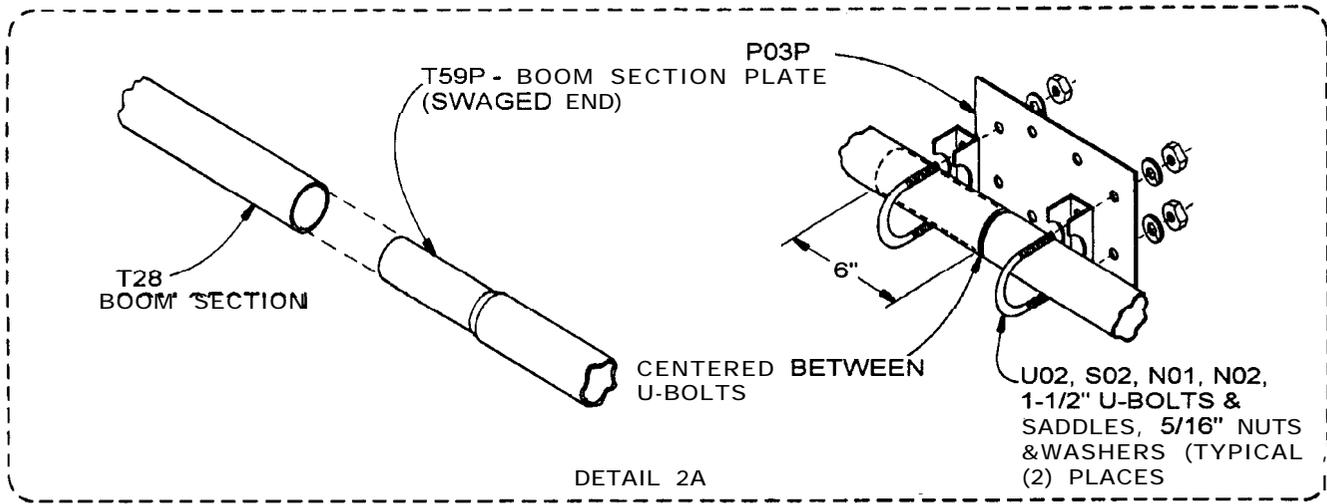
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▲ FOR DETAILS OF BOOM ASSEMBLY AND MAST MOUNTING, SEE FIG. 2  
 ▲ FOR DETAILS OF ELEMENT ASSEMBLY AND MOUNTING, SEE FIG. 2

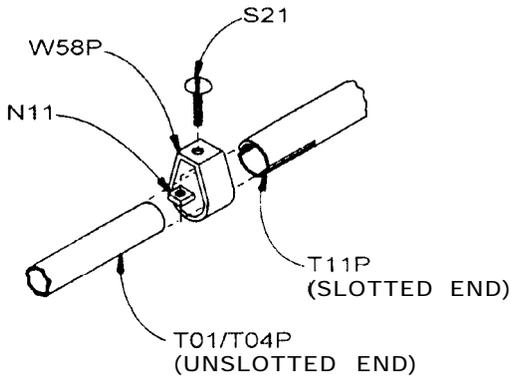
GENERAL ASSEMBLY

FIGURE 1



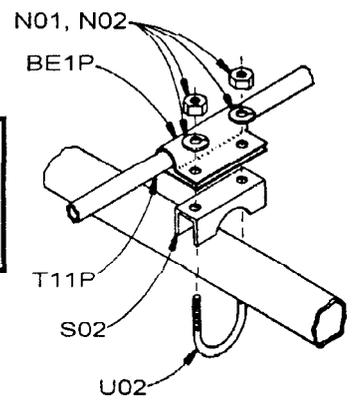
BOOM ASSEMBLY & MAST MOUNTING

FIGURE 2

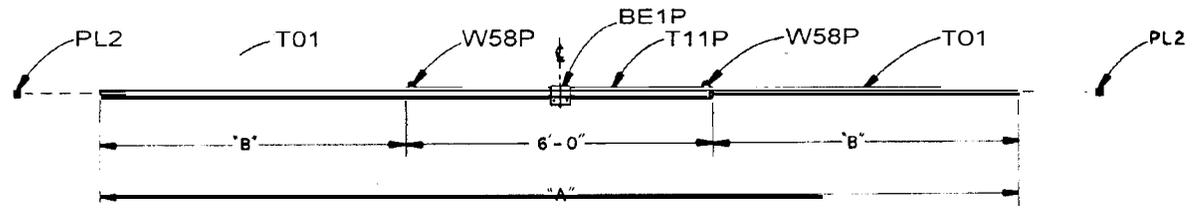


ELEMENT ASSEMBLY DETAILS

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



ELEMENT MOUNTING DETAIL



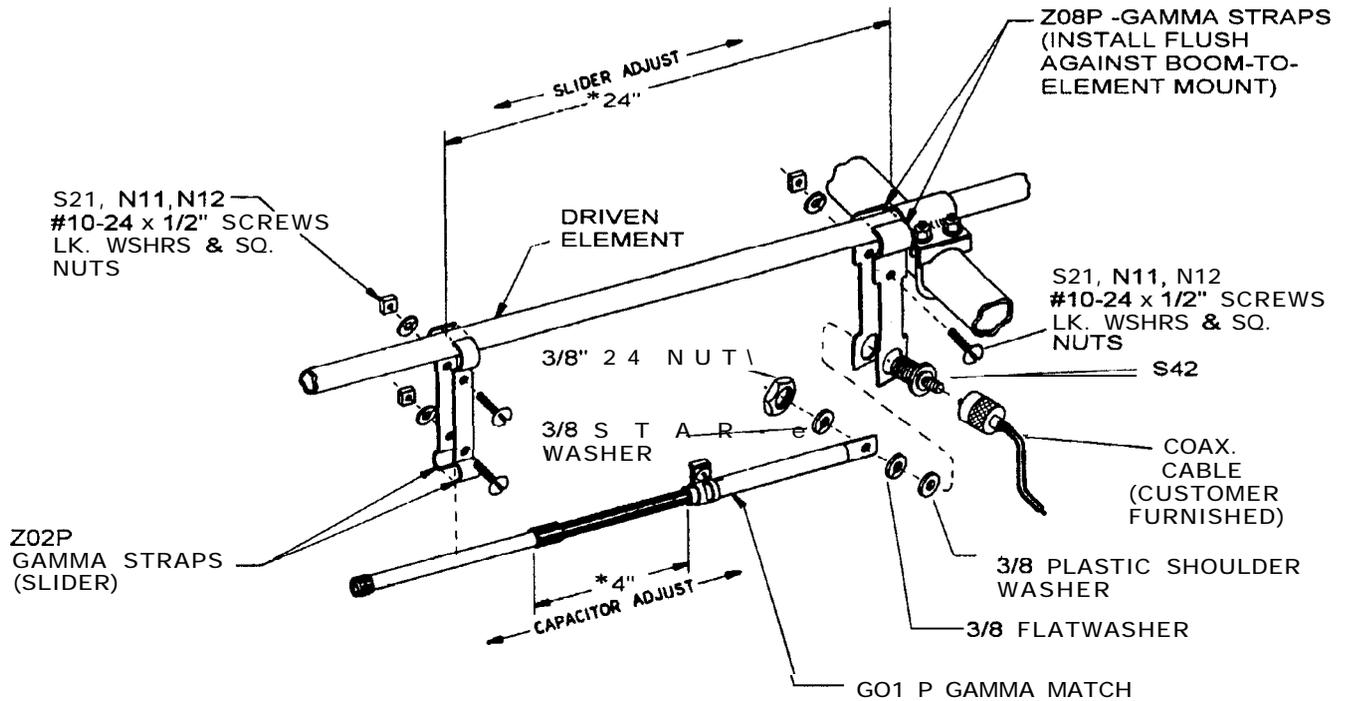
**NOTE!** Assemble for the middle of the desired channels, that is 27.200 for regular channel CB's as this is channel 20.

FREQUENCY (MHz)	REFLECTOR		DRIV. ELEM.		DIRECTOR	
	"A"	"B"	"A"	"B"	"A"	"B"
26.500/26.999	18'-6"	6'-3"	17'-6"	5'-9"	16'-9"	5'-4.5"
27.000/27.199	18'-5"	6'-2.5"	17'-5"	5'-8.5"	16'-8"	5'-4"
27.200/27.399	18'-3"	6'-1.5"	17'-4"	5'-8"	16'-6"	5'-3"
27.400/27.599	18'-2"	6'-1"	17'-3"	5'-7.5"	16'-5"	5'-2.5"
27.600/27.799	18'-1"	6'-.5"	17'-1"	5'-6.5"	16'-4"	5'-2"
27.800/27.999	17'-11"	5'-11.5"	17'-0"	5'-6"	16'-3"	5'-1.5"
28.000/28.199	17'-10"	5'-11"	16'-10"	5'-5"	16'-1"	5'-0.5"
28.200/28.399	17'-8"	5'-10"	16'-9"	5'-4.5"	16'-0"	5'-0"
28.400/28.599	17'-7"	5'-9.5"	16'-8"	5'-4"	15'-11"	4'-11.5"
28.600/28.799	17'-5"	5'-8.5"	16'-7"	5'-3.5"	15'-10"	4'-11"
28.800/29.999	17'-4"	5'-8"	16'-5"	5'-2.5"	15'-8"	4'-10"
29.000/29.199	17'-2"	5'-7"	16'-3"	5'-1.5"	15'-7"	4'-9.5"
29.200/29.399	17'-1"	5'-6.5"	16'-2"	5'-1"	15'-6"	4'-9"
29.400/29.599	16'-11"	5'-5.5"	16'-1"	5'-0.5"	15'-4"	4'-8"
29.600/29.799	16'- 10"	5'-5"	16'-0"	5'-0"	15'-3"	4'-7.5"
29.800/30.000	16'-9"	5'-4.5"	15'-10"	4'-11"	15'-2"	4'-7"

ELEMENT ASSEMBLY & MOUNTING

FIGURE 3

**\*NOTE:** THESE DIMENSIONS ARE APPROXIMATE. REFER TO THE INSTRUCTIONS ON 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.



## GAMMA MATCH MOUNTING



Mount the gamma match (GO 1P) to the driven element, using the gamma straps (Z02P, Z08P) and attaching hardware as shown. Attach your 52 ohm coaxial cable to the connector (S42) and dress along boom and down the mast. The gamma is shown pointing down - this is to let water out.

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