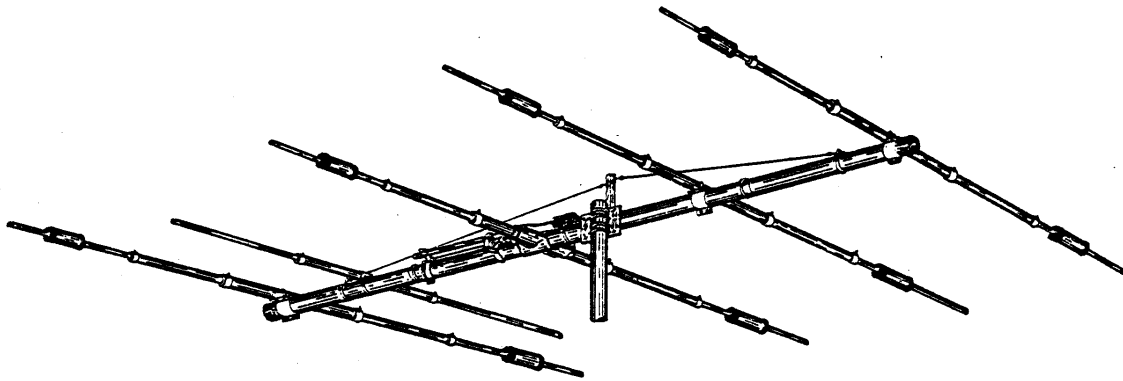


# ASSEMBLY INSTRUCTIONS

**5 Element Tribander  
10, 15, 20 Meter**



**SY-1**

 **Wilson Electronics Corp.**

4288 SO. POLARIS AVENUE • P. O. BOX 19000 • LAS VEGAS, NEVADA 89119 • (702) 739-1931 • TELEX 684-522

PARTS LIST

SYSTEM ONE

PART	QTY.	O. D.	SIZE	LENGTH	DESCRIPTION	CHECK LIST
T52P	2	2"	.067"	80"	Alum. Tubing Slotted One End	_____
T32P	2	2"	.047"	80"	Alum. Tubing Swaged 6" One End To 1.835" (Die no. 2)	_____
T53	1	1.845"	.060"	80"	Alum. Tubing	_____
T25P	3	1-1/4"	.047"	72"	Alum. Tubing Slotted Both Ends	_____
T27P	2	1-1/4"	.047"	36"	Alum. Tubing Slotted One End	_____
T20P	8	1-1/8"	.047"	54"	Alum. Tubing Swaged One End To .895" (Die no. 4) And Slotted	_____
T36P	2	7/8"	.047"	17"	Alum. Tubing Slotted One End	_____
T87P	2	7/8"	.047"	19"	Alum. Tubing Slotted One End	_____
T88P	2	7/8"	.047"	24"	Alum. Tubing Slotted One End	_____
T69P	2	7/8"	.047"	41"	Alum. Tubing Slotted One End	_____
T70P	2	3/4"	.047"	48"	Alum. Tubing	_____
T11P	1	5/8"	.047"	72"	Alum. Tubing Slotted Both Ends	_____
T71P	2	5/8"	.047"	34-1/2"	Alum. Tubing	_____
T72P	2	5/8"	.047"	32"	Alum. Tubing	_____
T73P	4	5/8"	.047"	30"	Alum. Tubing	_____
T01	2	1/2"	.041"	72"	Alum. Tubing	_____
P01P	1		5"x1/4"	8"	Plate	_____
V03P	1		1"x1"	24"	Guy Support	_____
WD2P	1		5/16	25'	Steel Guy Cable	_____
BE6P	2				Driven Element Plates	_____
BE4P	3				Boom To Element Mounts	_____
TA1P	2				Reflector Traps (Blue)	_____
TA2P	2				Radiator Traps (Red)	_____
TA3P	4				Director Traps (Green)	_____
	1		5/16"	18'	Polypropylene Rope	_____
<b>HARDWARE BAG No. 1</b>						
N01	42		5/16"		Hex Nuts	_____
N21	21		1/4"		Hex Nuts	_____
N25	4		12-24		Hex Nuts	_____
N06	5		10-24		Hex Nuts	_____
N23	2		1/4-20		Square Nuts	_____
N13	36		12-24		Square Nuts	_____
N11	2		10-24		Square Nuts	_____
N02	34		5/16"		Lockwashers	_____
N22	21		1/4"		Lockwashers	_____
N14	4		no.12		Lockwashers	_____
N12	5		no.10		Lockwashers	_____
N18P	4		5/16"	4"	Eyebolts-Welded	_____
S24	6		5/16"	1"	Hex Bolts	_____
S51	1		1/4-20	1-1/2"	Machine Screw	_____
S49	8		1/4-20	3/4"	Hex Bolts	_____
S39	2		1/4-20	1/2"	Hex Bolts	_____
S32	4		12-24	3/4"	Machine Screws	_____
S27	32		12-24	1/2"	Machine Screws	_____
S45	3		10-24	2"	Machine Screws	_____
S21	4		10-24	1/2"	Machine Screws	_____
W14P	10		1-1/4"		Extruded Alum. Clamps	_____
W10P	8		1"		Extruded Alum. Clamps	_____
W78P	3		7/8"		Extruded Alum. Clamps	_____
W34P	13		3/4"		Extruded Alum. Clamps	_____
W58P	2		5/8"		Extruded Alum. Clamps	_____
PL5	1		2"		Plastic Cap - Black	_____
PL5R	1		2"		Plastic Cap - Red	_____
PL3	8		5/8"		Plastic Caps - Black	_____
PL2	2		437"		Plastic Caps - Black	_____
W06P	2			6"	Insulated Wires - W/No. 12 Lugs Each End	_____
C20	2				Beta Tube Clamps - Metal	_____
C19	1				Boom Strap - Metal	_____
C18	1				Beta Tube Insulator Clamp - Metal	_____
F03	1				Beta Tube Insulator - Plastic	_____
F04	1				Beta Tube Insulator - Plastic	_____
S50	1				Insert Sleeve	_____
F02	2				Insulators	_____
<b>HARDWARE BAG No. 2</b>						
U01	14		2"		Plated U-Bolts	_____
U04	6		1-1/4"		Plated U-Bolts	_____
<b>HARDWARE BAG No. 3</b>						
S01	14		2"		Plated Saddles	_____
BE2P	2				Boom Guy Support Mounts	_____
BE2P	1		2"		Boom To 5.8" Sideswain Mount	_____
					Set Of Instructions	_____

When reordering replacement parts, always give part number and description.

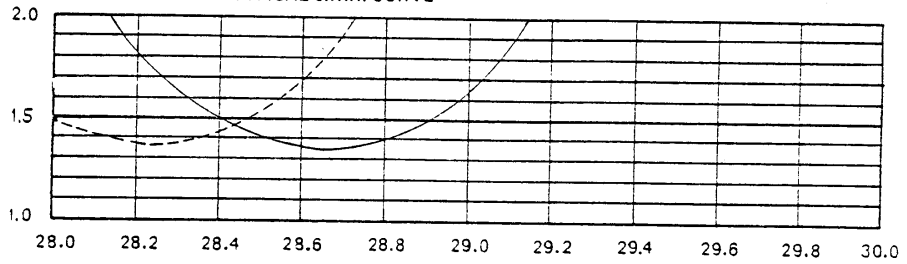
SY-1

20, 15, 10 METER TRIBANDER

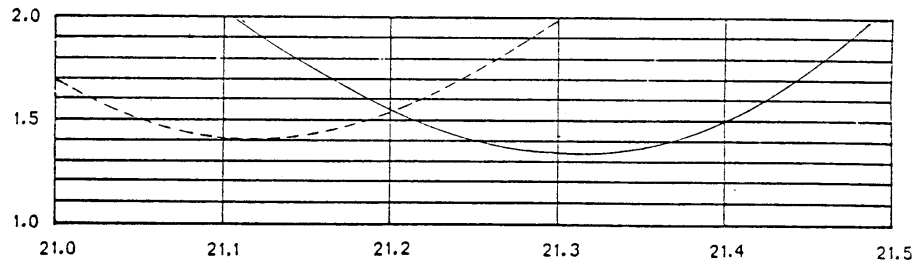
Band MHz	14-21-28	Turning Radius	18'10"
Maximum Power Input	Legal Limit	Mast Diameter	2" O.D.
Gain	10 dB	Boom Diameter	2" O.D.
VSWR (at Resonance)	1.5:1	Surface Area	8.6 Sq. Ft.
Impedance	50 ohms	Wind Loading at 80 MPH	215 Lbs.
F/B Ratio	20-25 dB	Assembled Weight (Approx.)	55 Lbs.
Boom	2" O. D. x 26'	Shipping Weight (Approx.)	60 Lbs.
No. Elements	5	Matching Method	Beta
Longest Element	27'2 1/4"		

TYPICAL S.W.R. CURVE

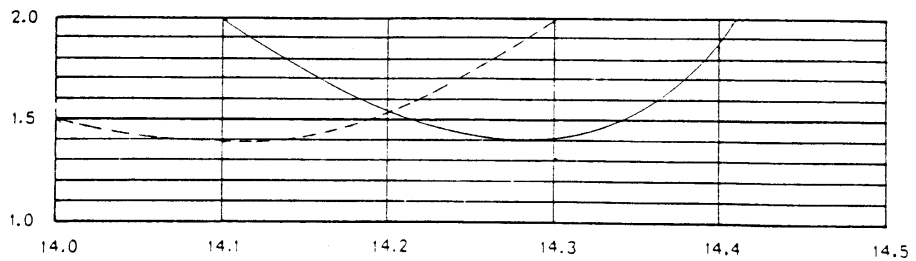
10  
METER



15  
METER



20  
METER



----- CW setting

———— PHONE setting

## PRELIMINARY INSTRUCTIONS

Your SY-1 Antenna is a sophisticated modern antenna, capable of efficient world-wide communications on three different bands: 10-meter, 15-meter, and 20-meter. It is one of the finest antennas you can buy. To realize its full capabilities, however, you must put it together correctly. All the expertise and careful engineering that went into its design will be lost if you assemble it incorrectly.

Strictly speaking, your SY-1 is not a beginner's antenna; you will find it much easier to assemble if you have had previous experience with other antennas. However, even if you have had no such experience at all, or have never even seen an antenna before, you can still assemble your SY-1 successfully on the very first try, if you will follow the instructions carefully, and pay close attention to details. Your antenna must be put together exactly as illustrated, and all dimensions must be held as closely as you can measure them. Remember, what makes an antenna work is its exact size and shape!

**A NOTE OF CAUTION:** At Wilson Electronics we try to give the customer the best buy for his money. This means we do not spend extra production time in removing burrs and sharp edges, or in cleaning chips of metal out of pieces of tubing. To do so would only increase the price of the antenna without adding anything to its performance. Therefore you must exercise caution in handling your antenna parts. Burrs and sharp edges can cut; so wear gloves when working, or remove these hazards beforehand with a file. Note also that metal chips are extremely difficult to remove from carpets and rugs; so do all your work on a smooth surface that will be easy to clean.

Begin by unpacking everything, and checking all your parts against the parts list. Do not proceed until you have determined that you have everything on the list, and each item in the quantity specified. If anything is missing, contact the Customer Service Dept. at Wilson Electronics immediately, and tell us exactly what is missing. Do not begin assembling your antenna until you have all parts in hand.

You will need tools to put your antenna together; the better equipped you are, the easier the job will be. At a very minimum you should have:

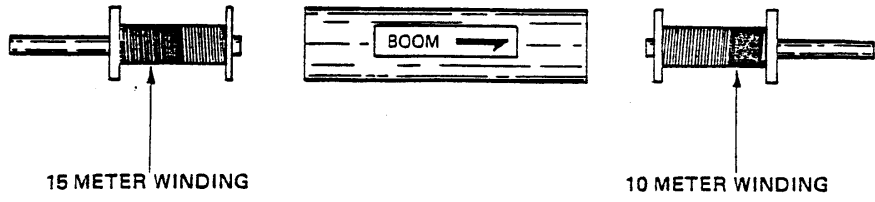
- A pencil or other marker
- A carpenter's level
- A blade-type (standard) screwdriver
- A phillips screwdriver
- A 3/8" open-end wrench
- Two 7/16" open-end wrenches
- A 1/2" open-end wrench
- A pair of pliers
- A good tape measure, at least 12' long

Read your instructions completely, and be sure you understand them, before you start. And do not begin assembling until you are sure you have ample time to finish - a partially completed antenna is especially prone to damage, and parts scattered around are easy to lose. Allow yourself about twelve hours over a two - or at most three day period. Do not rush, or attempt to work in bad weather or poor light. Your investment in money and time deserves your best efforts. A careful job is usually also the quickest, and certainly the most satisfying.

If you lose or damage any parts, or have any other problems you cannot work out by yourself, call us!! Remember we have ample stocks of spare parts, available for immediate shipment; and a staff of experienced dedicated people who understand your problems and are anxious to help you.

As you begin your assembly, keep the following points in mind:

1. Unless stated otherwise, the dimensions given are from the centerlines of the boom and elements, not from the edges.
2. The boom crosses the exact center of each element.
3. The elements must be exactly perpendicular to the boom, and parallel to each other.
4. Occasionally an exact order (or sequence) of assembly is necessary, and will be so stated. Follow the instructions carefully.
5. Tighten all hardware securely, so that nothing will loosen from wind vibration, but do not overtighten u-bolts and clamps so that you damage any of the tubing. Instead, provide an extra margin of safety by coating all hardware with silicone rubber sealant or similar compound after you have finished your assembly.
6. Be especially careful not to get the traps mixed up, or pointed in the wrong direction. These are precision parts that will work properly only when assembled correctly. They are color-coded by elements, and marked with arrows that must point towards the boom.

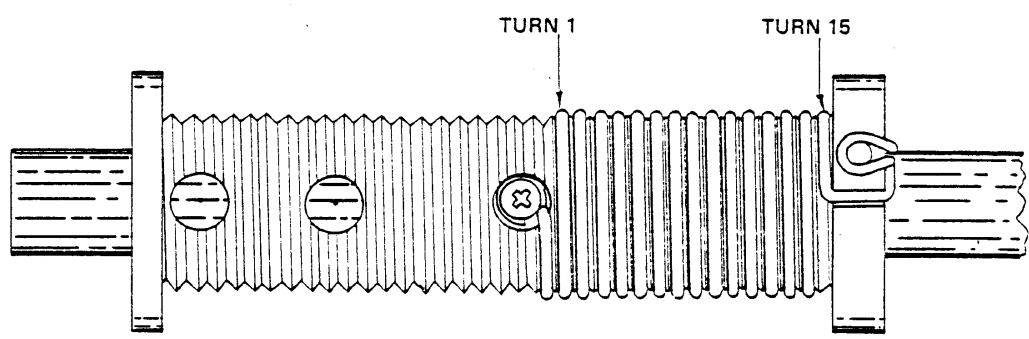


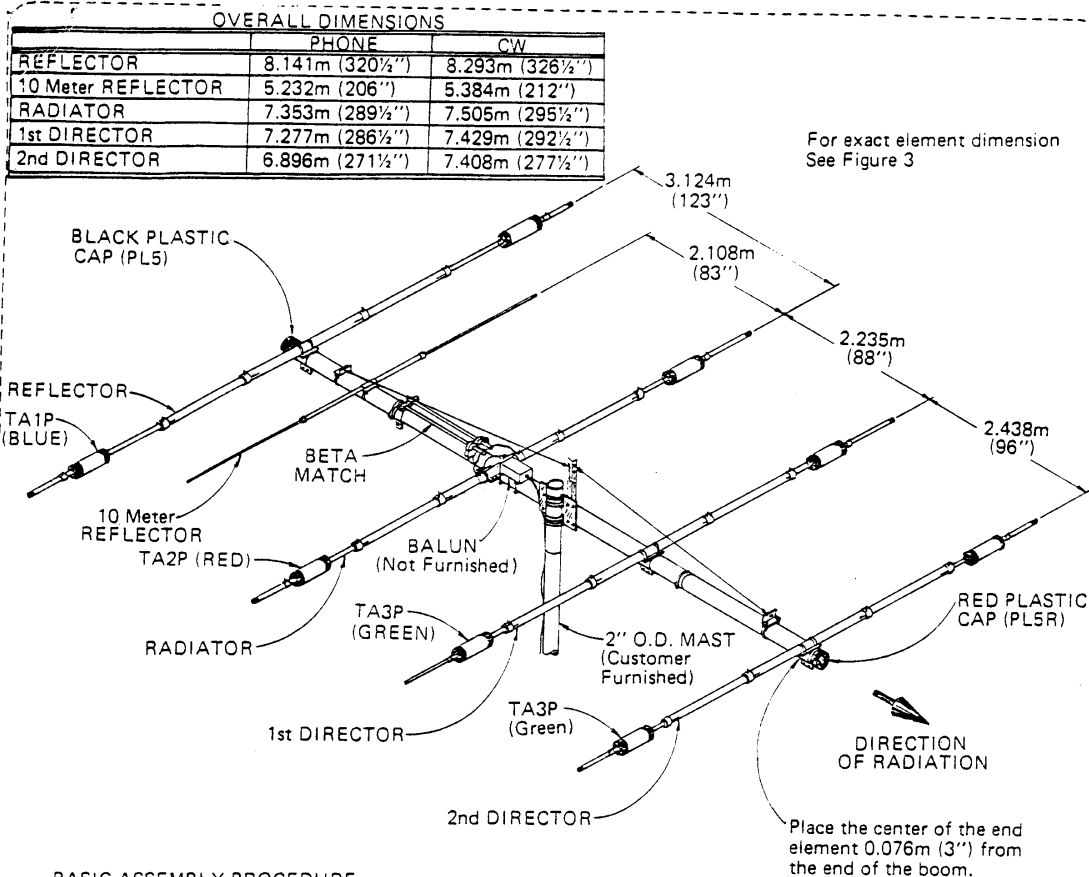
INSTRUCTIONS FOR DISASSEMBLING TRAP

IN THE EVENT IT IS EVER NECESSARY TO IDENTIFY THE TRAP ASSEMBLIES, PROCEED AS FOLLOWS:

REMOVE THE PLASTIC CAPS FROM ENDS OF TRAPS.  
 REMOVE SCREWS FROM ENDS OF TRAPS.

	15 METERS	10 METERS
REFLECTOR.....	25 turns	15 turns
RADIATOR.....	24 turns	14 turns
DIRECTOR.....	23 turns	14 turns





**BASIC ASSEMBLY PROCEDURE:**

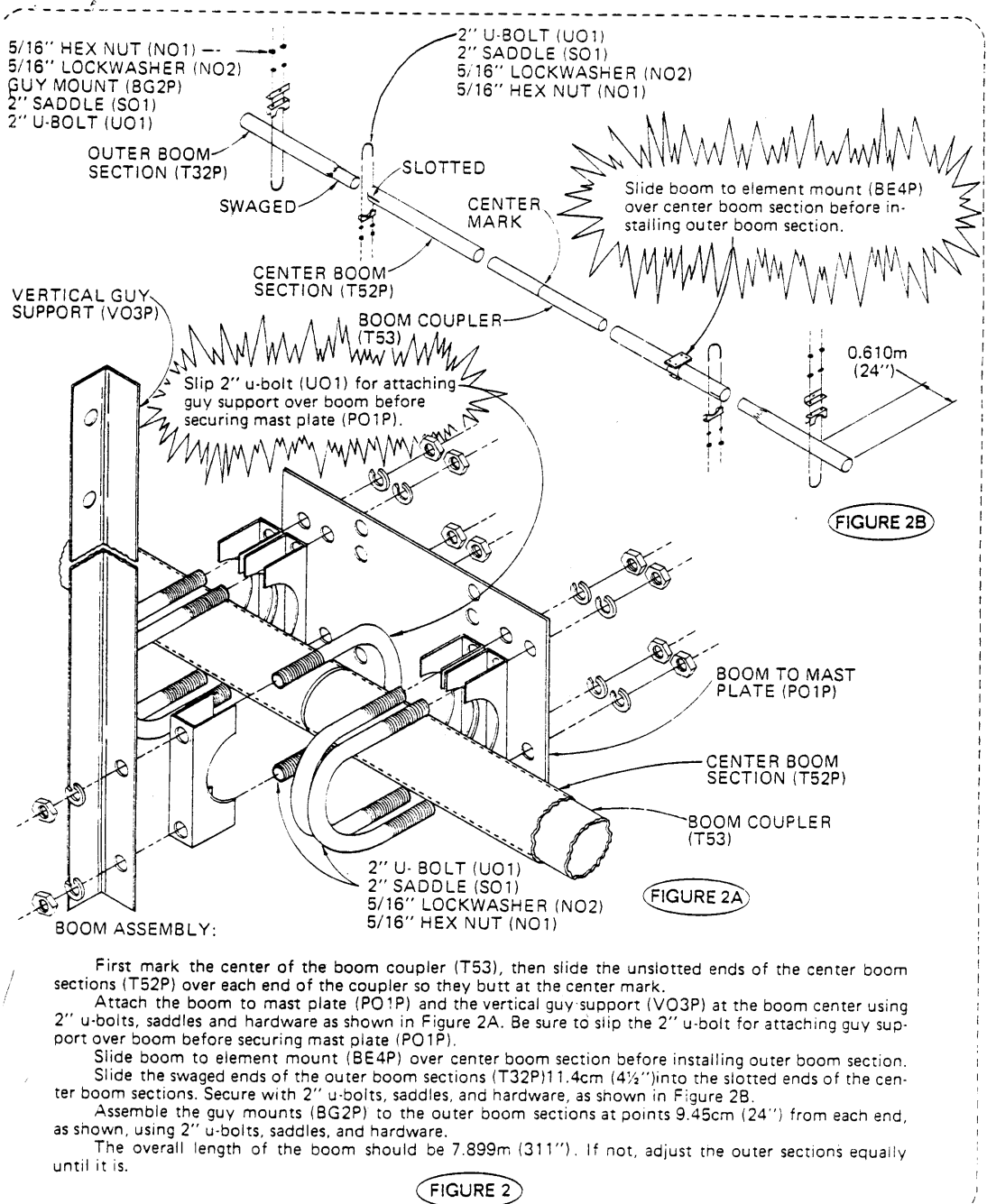
This figure shows what the antenna should look like when assembled. Specific assembly details are shown on following pages. Your basic order of assembly should be:

1. Put the boom together as shown in Figure 2.
2. Then assemble each element as shown in Figures 3 & 4. Do the radiator first; and then each of the others in any order you choose. Mount each element loosely on the boom as soon as it is assembled. Locate them only approximately, and do not put the plastic caps on the ends at this time.
3. After the elements are all in place, move them to their exact positions, set them square to the boom and parallel to each other, and tighten all bolts and clamps. Recheck all dimensions, and correct any errors.
4. Assemble the beta match per Figures 5 & 6.
5. Install the guy cables per Figure 7A.
6. Recheck all dimensions again, and check the tightness of all bolts and clamps. Coat all bolts, screws, and nuts with silicone sealant. Put plastic caps on the ends of boom and elements.
7. Attach your coaxial cable to the balun (if used), or form into a choke as illustrated, and secure to the boom with tape.
8. Install the antenna on the mast per Figure 7B. Dress your coaxial cable down the mast and secure in several places with tape.

FIGURE 1

DRAWN S. H. H. H.  
APPROVED S. H. H. H.

**SY-1**



First mark the center of the boom coupler (T53), then slide the unslotted ends of the center boom sections (T52P) over each end of the coupler so they butt at the center mark.

Attach the boom to mast plate (PO1P) and the vertical guy support (VO3P) at the boom center using 2" u-bolts, saddles and hardware as shown in Figure 2A. Be sure to slip the 2" u-bolt for attaching guy support over boom before securing mast plate (PO1P).

Slide boom to element mount (BE4P) over center boom section before installing outer boom section.

Slide the swaged ends of the outer boom sections (T32P) 11.4cm (4½") into the slotted ends of the center boom sections. Secure with 2" u-bolts, saddles, and hardware, as shown in Figure 2B.

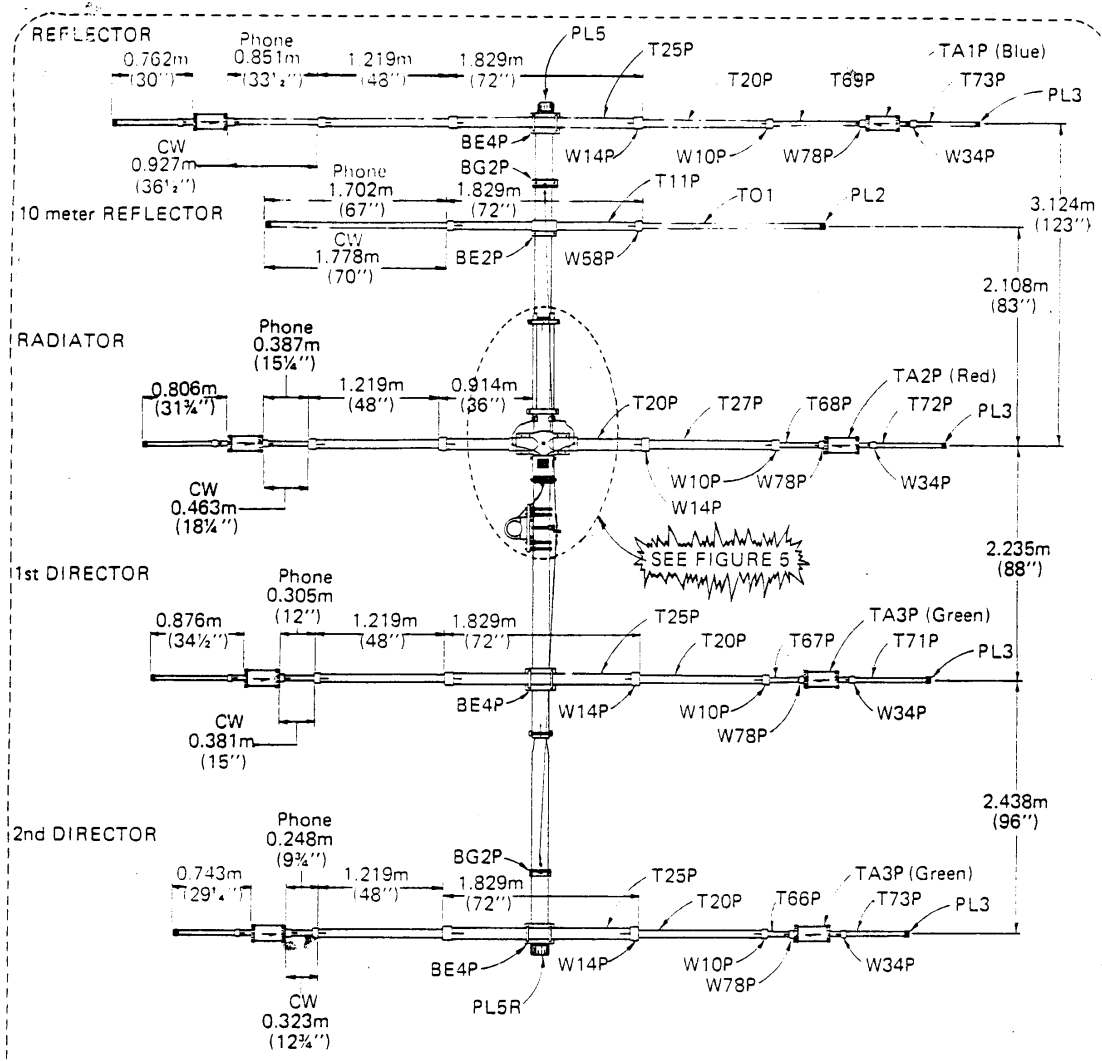
Assemble the guy mounts (BG2P) to the outer boom sections at points 9.45cm (24") from each end, as shown, using 2" u-bolts, saddles, and hardware.

The overall length of the boom should be 7.899m (311"). If not, adjust the outer sections equally until it is.

FIGURE 2

AWN *[Signature]*  
 PROVED *[Signature]*

SY-1



**ELEMENT ASSEMBLY:**

This figure shows a top view of the assembled antenna, and gives part numbers and principal dimensions for assembling and installing the elements. Refer to the parts list (sheet 1) for complete descriptions and specifications and to Figure 4 & 5 for specific assembly details and hardware call outs.

All elements are symmetrical, and the dimensions given apply to both ends. Dimensions given are from end of tubing to end of tubing. See Figure 1 for the correct locations of the elements on the boom.

**NOTE:** The arrow on the trap must point towards the boom. The dimensions on the ends of the elements are from the rubber on the trap to the end of the tubing - measure with plastic cap on the end of the element removed.

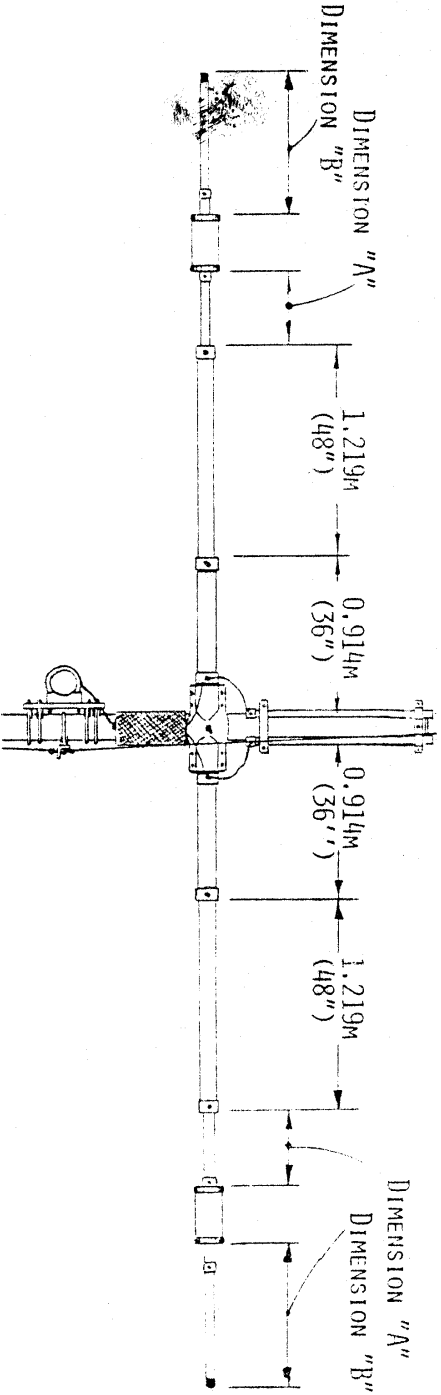
**FIGURE 3**

DRAWN *[Signature]*  
 CHECKED *[Signature]*

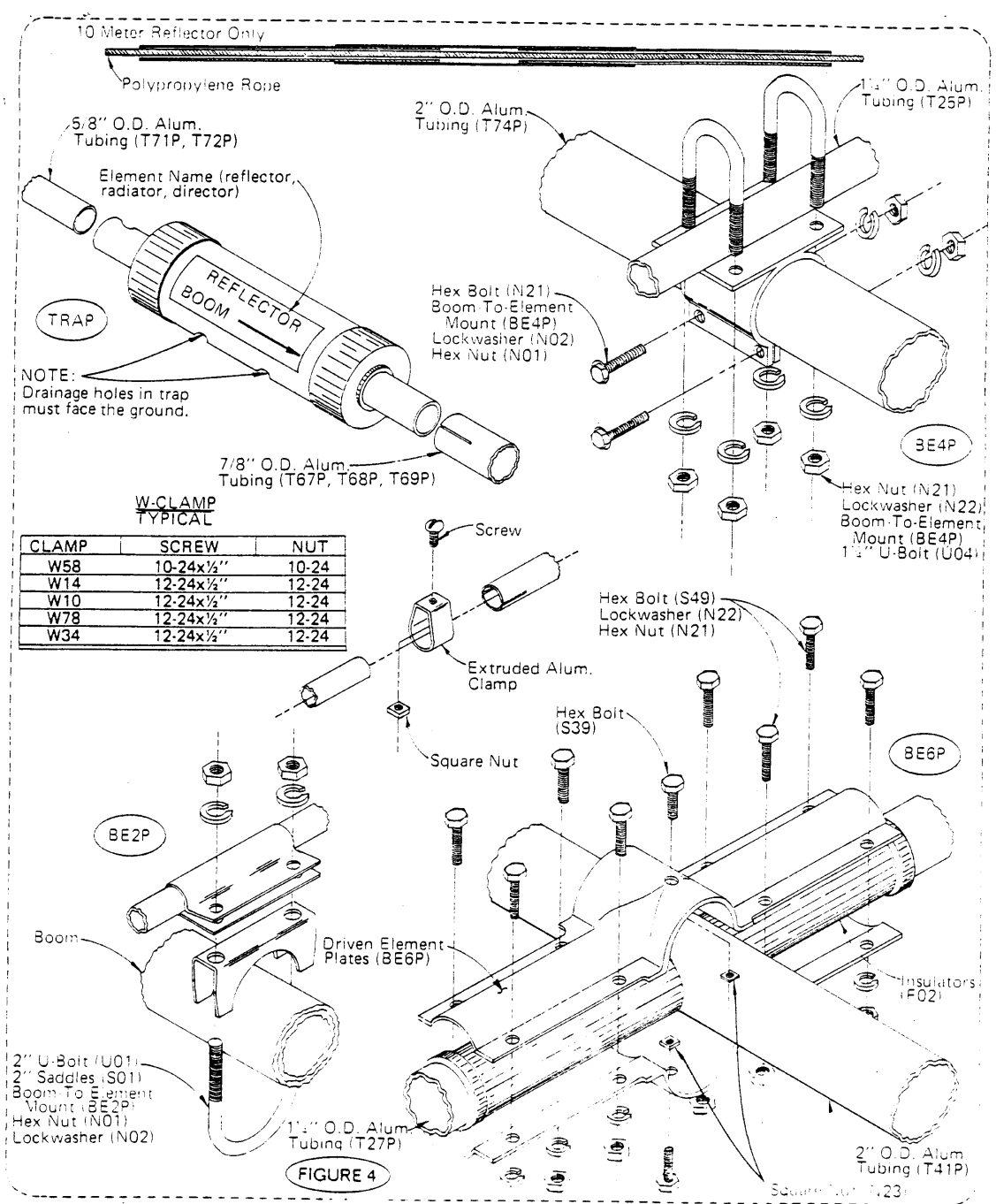
**SY-1**



**NEW Radiator Dimensions for the  
SYSTEM ONE and SYSTEM TWO  
Antennas**



FREQUENCY	14.250	14.200	CW
Dimension 'A'	0.387m (15 1/4")	0.387m (15 1/4")	0.436m (18 1/4")
Dimension 'B'	0.806m (31-3/4")	0.845m (33 1/4")	0.806m (31-3/4")



NOTE:  
Drainage holes in trap  
must face the ground.

W-CLAMP  
TYPICAL

CLAMP	SCREW	NUT
W58	10-24x½"	10-24
W14	12-24x½"	12-24
W10	12-24x½"	12-24
W78	12-24x½"	12-24
W34	12-24x½"	12-24

FIGURE 4

DRAWN *[Signature]*  
APPROVED *[Signature]*

SY-1

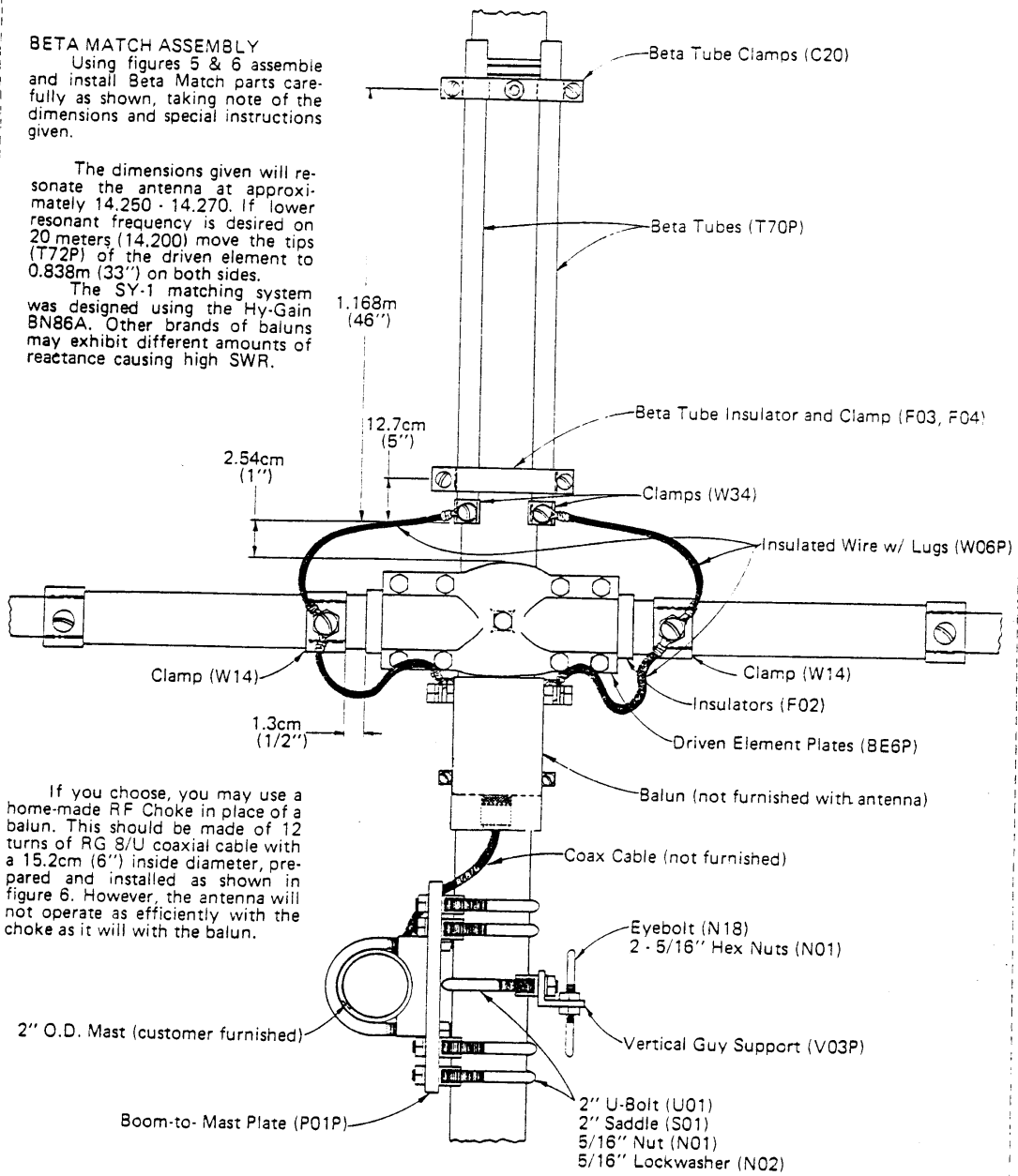
Sheet 8 of 11

**BETA MATCH ASSEMBLY**

Using figures 5 & 6 assemble and install Beta Match parts carefully as shown, taking note of the dimensions and special instructions given.

The dimensions given will resonate the antenna at approximately 14.250 - 14.270. If lower resonant frequency is desired on 20 meters (14,200) move the tips (T72P) of the driven element to 0.838m (33") on both sides.

The SY-1 matching system was designed using the Hy-Gain BN86A. Other brands of baluns may exhibit different amounts of reactance causing high SWR.



If you choose, you may use a home-made RF Choke in place of a balun. This should be made of 12 turns of RG 8/U coaxial cable with a 15.2cm (6") inside diameter, prepared and installed as shown in figure 6. However, the antenna will not operate as efficiently with the choke as it will with the balun.

**FIGURE 5**  
**SY-1**

DRAWN *[Signature]*  
APPROVED *[Signature]*

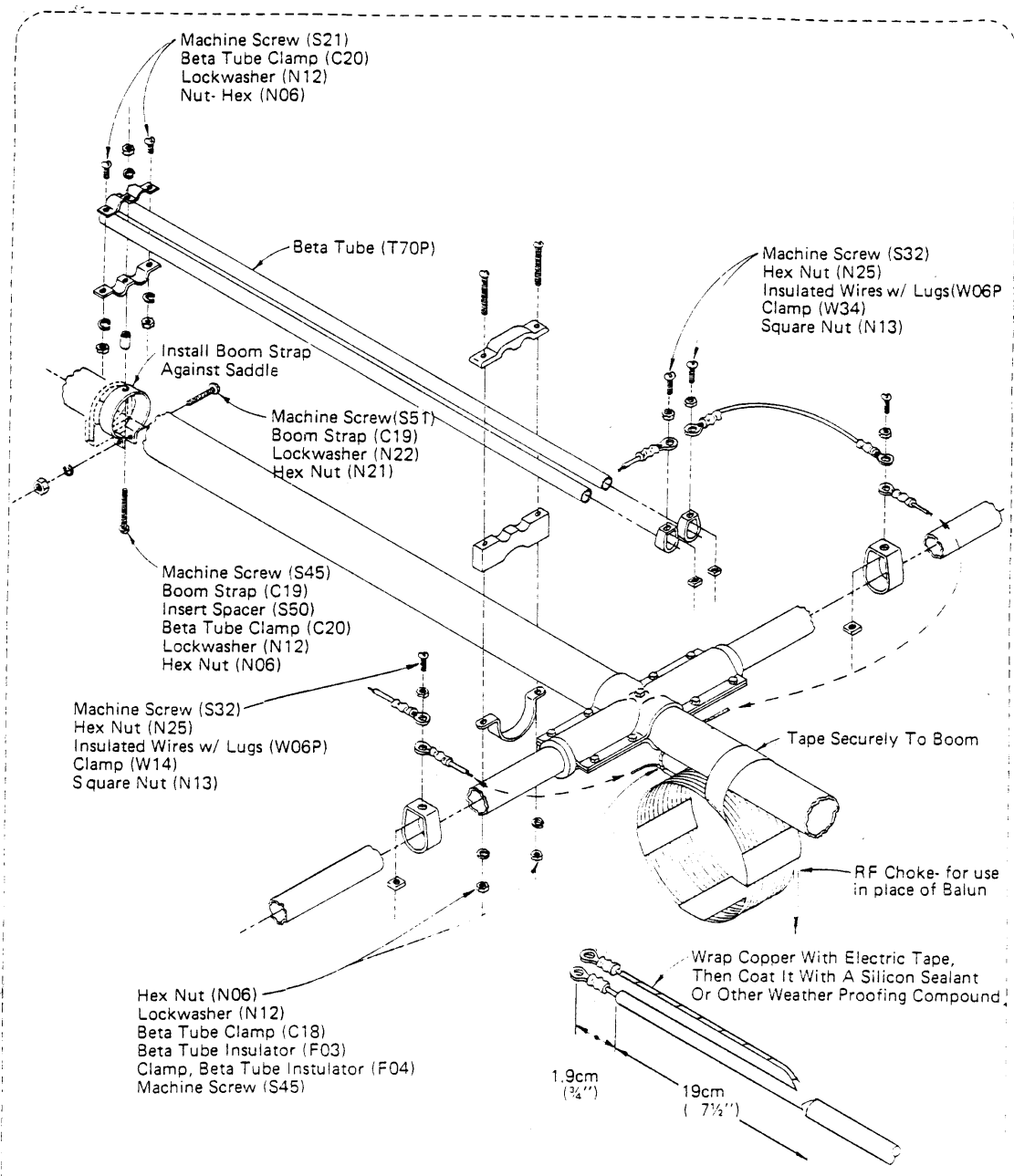


FIGURE 6  
SY-1

DRAWN  
APPROVED

A manufacturing defect has been found in some of the BN-50A's recently shipped. This has caused problems of high SWR in the proper operation of the SY-1 and the SY-2 Tri-band antennas.

The antenna engineering department of Wilson Electronics advises that the tri-banders will operate properly if the coax is connected directly to the driven element. The most efficient operation will result if the RF Choke is used and constructed in the following manner: Wind 12 turns of RG-8U around a 6" diameter object. This will require approximately 24 ft. of coax cable including the pigtail leads and the male coax connector (PL-259).

We were also advised of tests conducted with other baluns and pass along this information to you. The "W2AU" balun appears inadequate on our tests, yet the HY-Gain BN-86 proved to work efficiently.

If you have any of the 3N-50A's, or experience customer dissatisfaction due to the balun, you may call the Customer Service TOLL-FREE number (800/634-6188) for an RGA (Return Goods Authorization) number. At your option we will exchange, credit, or refund the charge for the baluns.

If you have any further questions, please do not hesitate to call and inquire.

Wilson Electronics Corp.

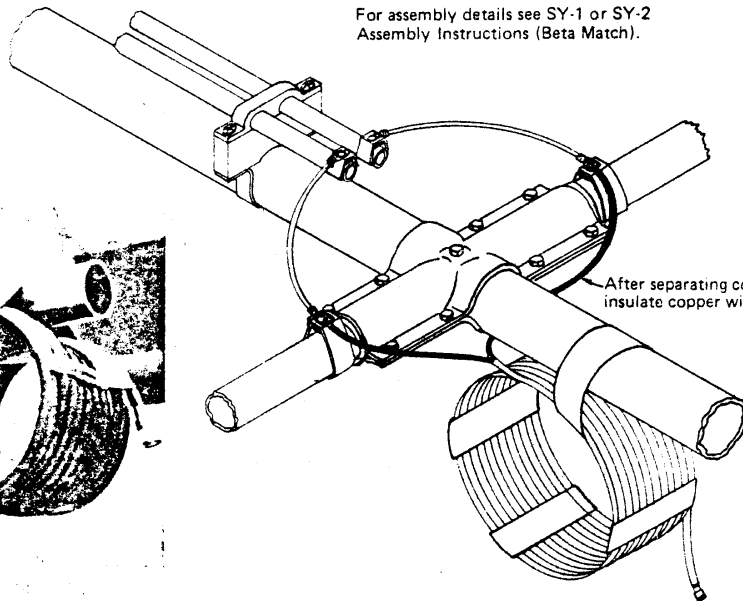
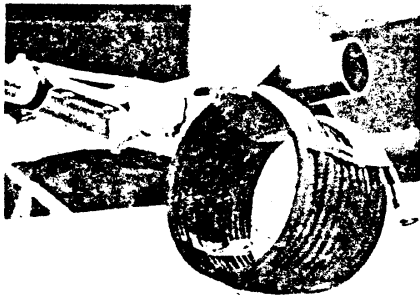
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JUL 1 1977

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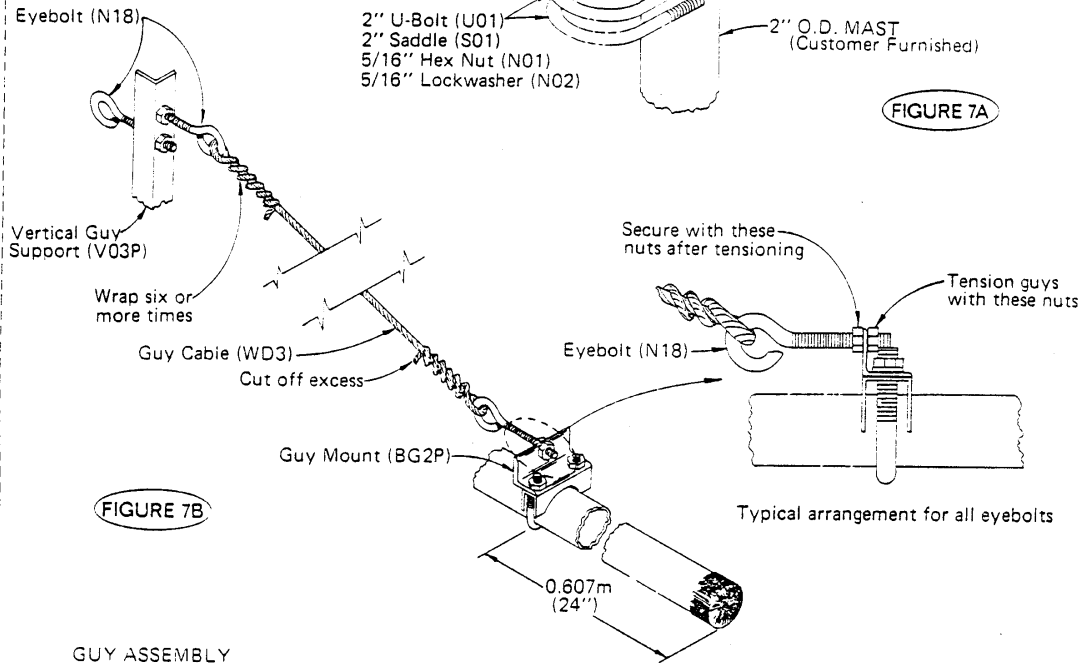
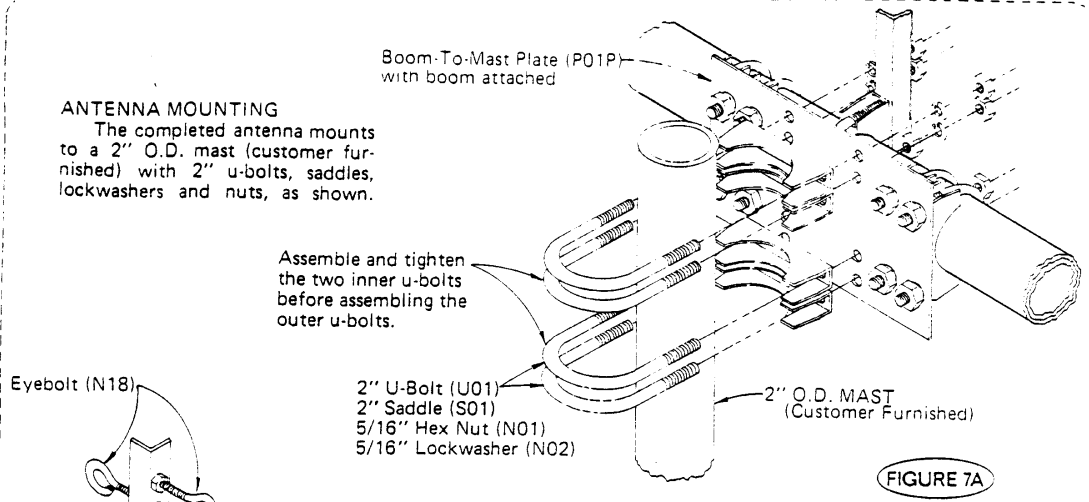
For assembly details see SY-1 or SY-2  
Assembly Instructions (Beta Match).

Handwritten notes: "P.E. 1-1-77 SURV. 90 TA"



**ANTENNA MOUNTING**

The completed antenna mounts to a 2" O.D. mast (customer furnished) with 2" u-bolts, saddles, lockwashers and nuts, as shown.



**GUY ASSEMBLY**

Cut two pieces of guy cable, 3.81m (12'-6") long.

Assemble one 5/16" hex nut (N01) to each of the four eye bolts (N18P). Turn the nut all the way up to the eye - as far as it will go with light pressure only. These will be used to secure the eye bolts after guy tensioning.

Install two eye bolts in the top holes of the vertical guy support (V03P) - one eye in each direction. Install one eye bolt in the top hole of each of the two guy mounts (BG2P) - with the eyes towards the center of the boom. Install each bolt by inserting the end about 12mm (1/2") through the hole, and threading a hex nut about six turns onto the end.

Install the guy cables between the eyes, as shown in this figure and in figure 1. Allow approximately equal lengths of cable to extend through the eyes on each end, pull tight enough to remove the slack only, wrap six or more times, and cut off the excess.

Tension the guys by tightening the nuts on the ends of the eyebolts. Tighten equally on both ends of each guy, and secure with the nuts on the opposite sides.

**FIGURE 7**

DRAWN *[Signature]*  
APPROVED *[Signature]*

**SY-1**



## ONE YEAR LIMITED WARRANTY ANTENNAS

WILSON ELECTRONICS CORP. ("WILSON") warrants that your new ANTENNA has been manufactured free of defects in design, material and workmanship. If this product fails to give satisfactory service due to defects covered by warranty, including any warranty implied by law such as WARRANTIES OF MERCHANTABILITY OR FITNESS, for a period of ONE YEAR FROM THE DATE OF PURCHASE, "WILSON" will, at its option, replace or repair the unit, or any defective part free of charge.

To obtain warranty service, return the ANTENNA to your dealer, or should this be inconvenient, pack it securely, and send it with proof of purchase date and a letter explaining the problem, shipping cost prepaid, to CUSTOMER SERVICE DEPT., WILSON ELECTRONICS CORP., #288 SO. POLARIS, LAS VEGAS, NEVADA 89103.

### IMPORTANT

Please note: A written "Return Goods Authorization" must first be obtained from "WILSON" prior to shipping anything to the plant, with a copy of the authorization included inside the carton. Warranty service covers only repair or replacement of the ANTENNA only. "WILSON" is not responsible for costs of removal or reinstallation, or shipping to the place of repair. The warranty period is not extended due to repair or replacement.

"WILSON" reserves the right to make reasonable charges for service if there is evidence of damage due to alteration, misuse or installation not according to the enclosed instructions.

"WILSON" IS NOT RESPONSIBLE FOR DAMAGE TO OTHER EQUIPMENT OR PROPERTY OR FOR ANY OTHER CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND, WHETHER BASED ON CONTRACT, NEGLIGENCE OR STRICT LIABILITY. MAXIMUM LIABILITY SHALL NOT, IN ANY CASE, EXCEED THE PURCHASE PRICE OF THE UNIT.

(Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusion may not apply to you.)

(This warranty gives you specific legal rights. You may also have other rights which may vary from state to state.)



**Wilson Electronics Corp.**

4288 South Polaris Avenue, Las Vegas, Nevada 89103