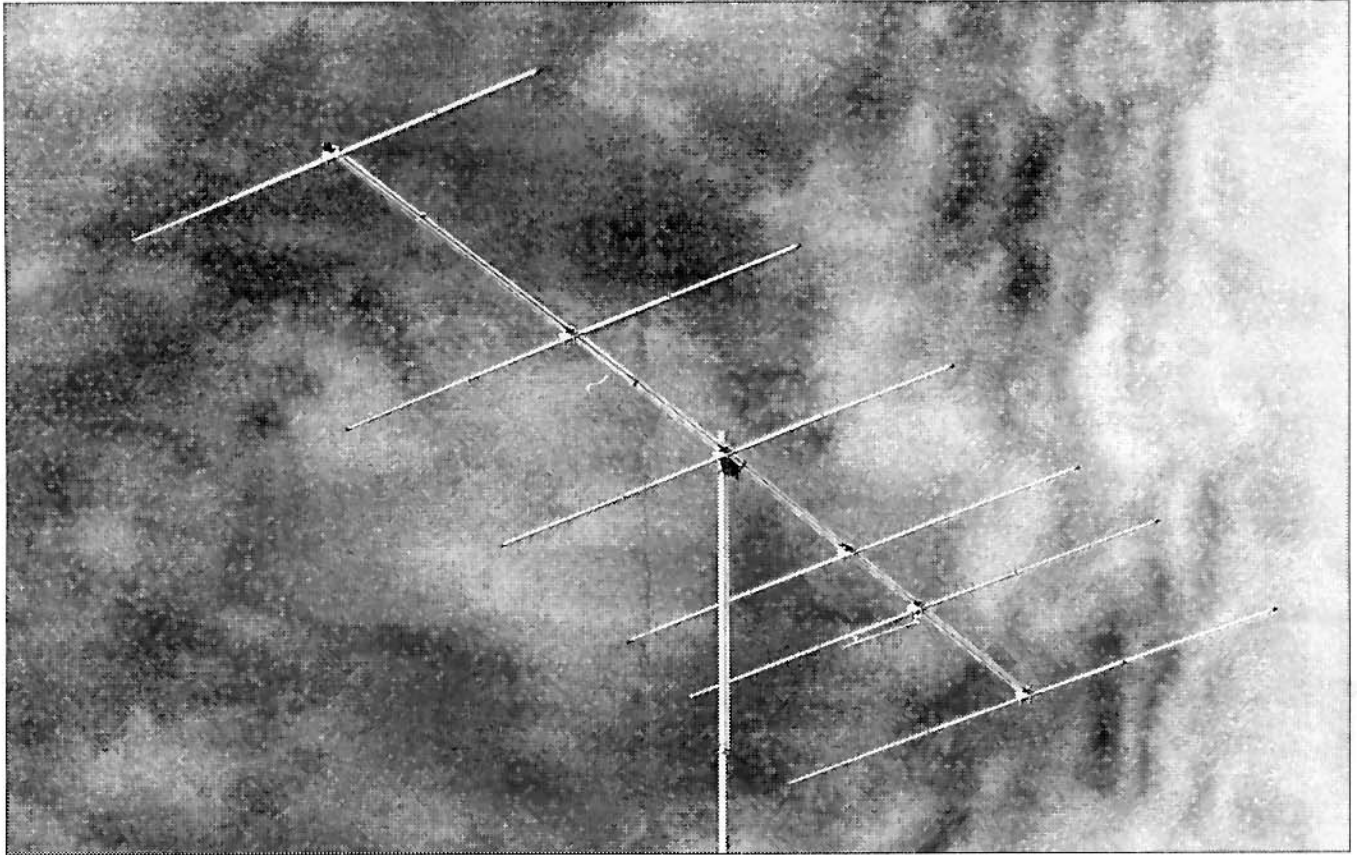


**ASSEMBLY &  
INSTALLATION**



**A50-6S**  
**6 Element / 6 Meter Beam**



**CUSHCRAFT**  
COMMUNICATIONS ANTENNAS

**WARNING**

THIS ANTENNA IS AN ELECTRICAL CONDUCTOR. CONTACT WITH POWER LINES CAN RESULT IN DEATH, OR SERIOUS INJURY. DO NOT INSTALL THIS ANTENNA WHERE THERE IS ANY POSSIBILITY OF CONTACT WITH OR HIGH VOLTAGE ARC-OVER FROM POWER CABLES OR SERVICE DROPS TO BUILDINGS. THE ANTENNA, SUPPORTING MAST AND/OR TOWER MUST NOT BE CLOSE TO ANY POWER LINES DURING INSTALLATION, REMOVAL OR IN THE EVENT PART OF THE SYSTEM SHOULD ACCIDENTALLY FALL. FOLLOW THE GUIDELINES FOR ANTENNA INSTALLATIONS RECOMMENDED BY THE U.S. CONSUMER PRODUCT SAFETY COMMISSION AND LISTED IN THE ENCLOSED PAMPHLET.

Your Cushcraft 6 meter beam is designed and manufactured to give top performance and trouble free service. The antenna will perform as specified if the instructions and suggestions are followed and care is used in assembly and installation. When checking the components received in your antenna package use the parts lists in each section. It is easiest to identify the various dimensions of tubing by separating them into groups of the same diameter and length. If you are unable to locate any tube or component, check the inside of all tubing. **IMPORTANT:** save the weight label from the outside of the carton. Each antenna is weighed at the factory to verify the parts count. If you claim a missing part, you will be asked for the weight verification label. There is a master parts list on page 2.

**LOCATION**

Location of the antenna is very important. Surrounding objects such as trees, power lines, other antennas, etc. will seriously reduce efficiency. To minimize the effects of surrounding objects, mount the antenna as high and in the clear as possible. If metal guy wires are used, they should be broken with strain insulators. **YOU MUST INSURE THAT NEITHER PEOPLE NOR PETS CAN COME IN CONTACT WITH YOUR ANTENNA WHILE IT IS IN OPERATION. DEADLY VOLTAGES AND CURRENTS MAY EXIST. ALSO, SINCE THE EFFECTS OF EXPOSURE TO RF ARE NOT FULLY UNDERSTOOD, LONG TERM EXPOSURE TO INTENSE RF FIELDS IS NOT RECOMMENDED. THERE IS A WARNING STICKER WHICH MUST BE ATTACHED TO THE BOOM AS SHOWN IN FIGURE E.**

Plan your installation carefully. If you use volunteer helpers be sure that they are qualified to assist you. Make certain that everyone involved understands that you are in charge and that they must follow your instructions. If you have any doubts at all employ a professional antenna installation company to install your antenna.

**MOUNTING**

The mast mount bracket will accommodate up to a 2" OD (5.1 cm) mast. A 1-1/2" OD (3.8 cm) or larger heavy wall tubing mast should be used. A good heavy duty antenna rotator will provide the best service and longest life. Often it is desirable to mount several antennas on one mast. To keep possible interaction to a minimum, place your antennas as far apart as you can.

**SYSTEM GROUNDING**

Direct grounding of the antenna, mast and tower is very important. This serves as protection from lightning strikes and static buildup, and from high voltage which is present in the radio equipment connected to the antenna. A good electrical connection should be made to one or more ground rods (or other extensive ground system) directly at the base of the tower or mast, using at least #10AWG ground wire and non-corrosive hardware. For details and safety standards, consult the National Electrical Code. You should also use a coaxial lightning arrester. Cushcraft offers several different models, such as LAC-1, LAC-2 and the LAC-4 series.

**ASSEMBLY**

Assemble your antenna by following the directions and illustrations in steps 1 through 5. Vertical polarization is normally used for FM. Other modes use horizontal polarization. After the antenna is completely assembled, verify dimensions and element spacings for accuracy. Then, return to the section below for final tuning.

**TUNING PROCEDURE**

The A50-6S does not normally require tuning after assembly. However, if you wish to check the VSWR before installation, please observe the following procedures. To prevent detuning the antenna, it should be tuned in place or at least 20 feet (6.1 meters) above ground and clear of surrounding objects. Keep all metal obstructions such as guy wires and other antennas at least 20 feet (6.1 m) away since they will nullify any adjustment and degraded performance will result.

Run the coax cable from your transmitter to the area in which the antenna is going to be tested. The length of this cable or your feedline is not critical. Connect a good quality VSWR bridge to the end of this cable. Connect a short length of cable [10 ft (305 cm) or less] from the VSWR bridge to the antenna. Set the transmitter to your center operating frequency. When you read VSWR, be sure you move far enough away from the antenna so that your body does not effect the reading.

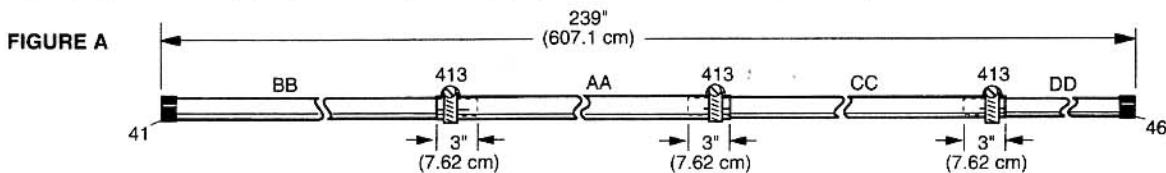
Measure the VSWR. If it is high, move the Reddi-Match clamp (69) by 1/4" (.6 cm) in one direction and check the VSWR. If the VSWR improved, then continue moving the Reddi-Match clamp in the same direction. If the VSWR deteriorated then move the Reddi-Match clamp in the opposite direction. Repeat this procedure until no further improvement can be made. You have matched your antenna to 50 Ohms. Then tighten all connections. Tape the feedline to the boom and mast.

## MASTER PARTS LIST

KEY	P/N	DESCRIPTION	QUANTITY
9	010009	8-32 x 5/8" (1.6 cm) stainless steel machine screw	2
11	010011	8-32 stainless steel hex nut	3
27	050027	5/8" (1.6 cm) plastic caps	12
32	190032	3-1/2" (8.9 cm) heavy duty U-bolt brackets	6
33	190033	3-1/2" (8.9 cm) U-bolt backing plate	5
41	050041	1-5/8" (4.1 cm) plastic cap	1
46	050046	1-1/2" (3.8 cm) plastic cap	1
63	170063	3-1/2" (8.9 cm) V-block	4
69	200069	Formed aluminum tuning strap	1
115	050115	Connector boot	1
116	240116	Silicone package	1
118	010118	5/16" (.8 cm) stainless steel hex nut	20
119	010119	5/16" (.8 cm) stainless steel lock washers	20
130	190130	6" x 6" (15.2 x 15.2 cm) mounting plate	1
326	290326	Danger label	1
404	010404	2" x 3" (5.1 x 7.6 cm) stainless steel U-bolt	4
405	010405	2" x 4-1/2" (5.1 x 11.4 cm) stainless steel U-bolt	6
409	030409	3/4" (1.9 cm) stainless steel worm clamps	12
413	030413	1-3/4" (4.4 cm) stainless steel worm clamps	3
941	011941	#8 stainless steel split lock washer	3
AA		1-3/4" x 72" (4.4 x 183 cm) aluminum tubing, slotted both ends	1
BB		1-5/8" x 72" (4.1 x 183 cm) aluminum tubing	1
CC		1-5/8" x 72" (4.1 x 183 cm) aluminum tubing, slotted one end	1
DD		1-1/2" x 32" (3.8 x 81.3 cm) aluminum tubing	1
EA		3/4" x 48" (1.9 x 121.9 cm) aluminum tubing slotted both ends	6
EB		5/8" x 38-1/2" (1.6 x 97.8 cm) aluminum tubing	2
EC		5/8" x 35" (1.6 x 88.9 cm) aluminum tubing	2
ED		5/8" x 33-1/2" (1.6 x 85.1 cm) aluminum tubing	2
EE		5/8" x 33" (1.6 x 83.8 cm) aluminum tubing	2
EF		5/8" x 32-1/2" (1.6 x 82.6 cm) aluminum tubing	2
EG		5/8" x 26" (1.6 x 66.0 cm) aluminum tubing	2
CB		Connector Bracket	1
RM		Reddi Match tube Assembly	1

## #1 - BOOM ASSEMBLY

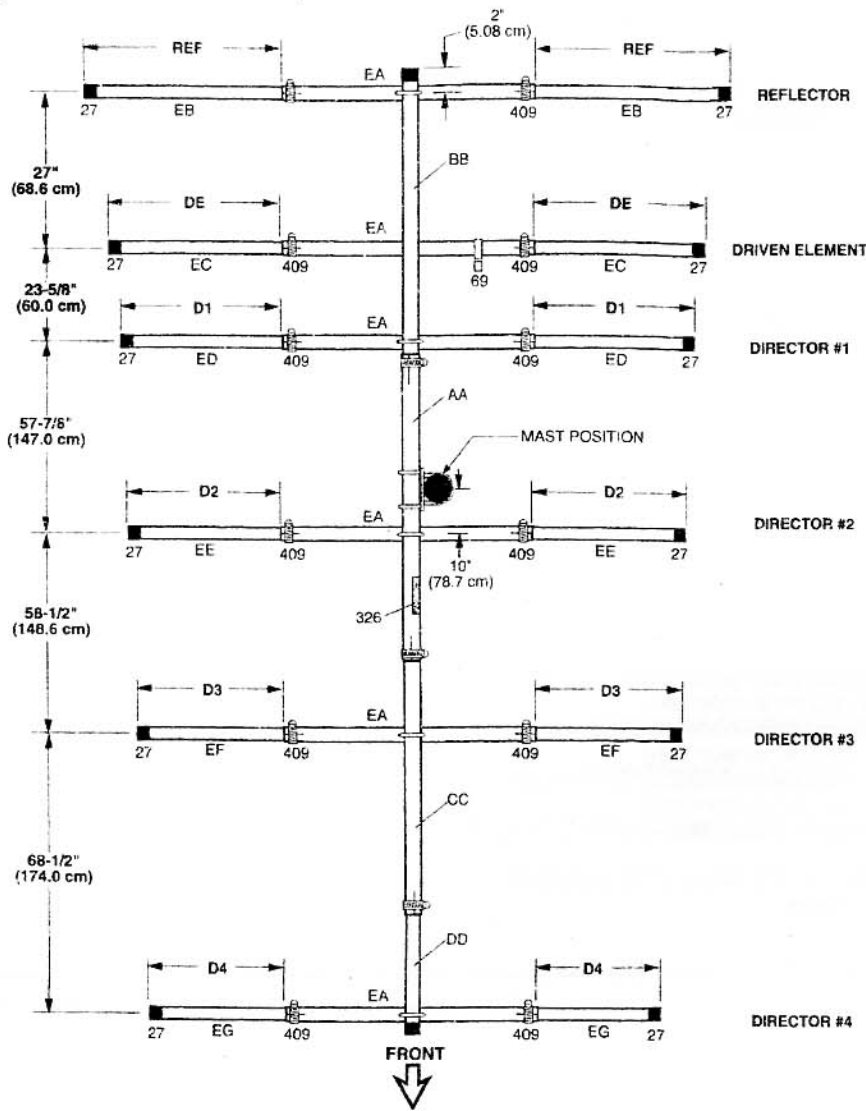
Slide clamp (413) over both ends of the AA tube. Place a mark 3 inches (7.6 cm) in from one end of the BB, CC and DD tubes. Slide the BB tube into AA up to the 3" mark and tighten clamp. Slide the CC tube into the other end of AA up to the 3" mark and tighten clamp. Slide DD 3" into CC. Secure with clamp (413). Push the plastic cap (41) onto the end of BB and plastic cap (46) onto the end of DD.



KEY	P/N	DISPLAY	DESC	SIZE	QTY	KEY	P/N	DISPLAY	DESC	SIZE	QTY
AA			ALUM TUBE	1-3/4" x 72" (4.4 x 183 cm)	1	41	050041		PLASTIC CAP	1-5/8" (4.1 cm)	1
BB			ALUM TUBING	1-5/8" x 72" (4.1 x 183 cm)	1	46	050046		PLASTIC CAP	1-1/2" (3.8 cm)	1
CC			ALUM TUBING	1-5/8" x 72" (4.1 x 183 cm)	1	413	030413		WORM CLAMP	1-3/4" (4.4 cm)	3
DD			ALUM TUBING	1-1/2" x 32" (3.8 x 81.3 cm)	1						

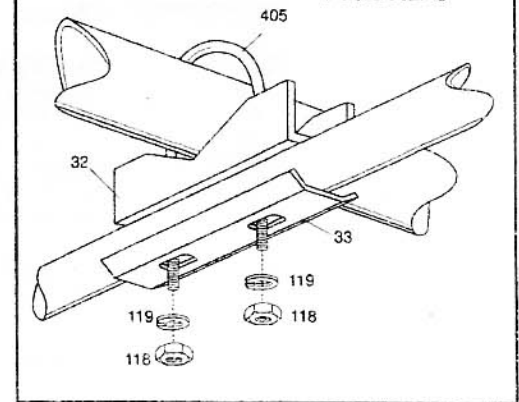
## #2 - ELEMENT ASSEMBLY & MOUNTING (For Vertical or Horizontal Polarization)

**FIGURE B  
(Horizontal Polarization)**



The elements are made up of one pre-drilled and slotted 3/4" (1.9 cm) O.D. center tube and two pre-cut 5/8" (1.59 cm) O.D. end tubes. Assemble the elements using Figure B for horizontal polarization or Figure B-2 for vertical polarization. Slide the tuning strap (69) on one of the EA tubes. This will be the driven element. Place telescope clamps (409) loosely on the slotted ends of all EA tubes. Note that the EC tubes must be used with the EA tube on which you placed the tuning strap (69). Attach caps (27) to the end of each element. Mount the elements to the boom (Figure C). Refer to Figure D for mounting the driven element with the connector bracket. Mount the connector with the threads (socket) pointing to the mast mount. Adjust the antenna to your preferred portion of the 6 meter band using Table 1 if you've chosen horizontal polarization or Table 2 for vertical polarization. Tighten all fasteners.

**FIGURE C**



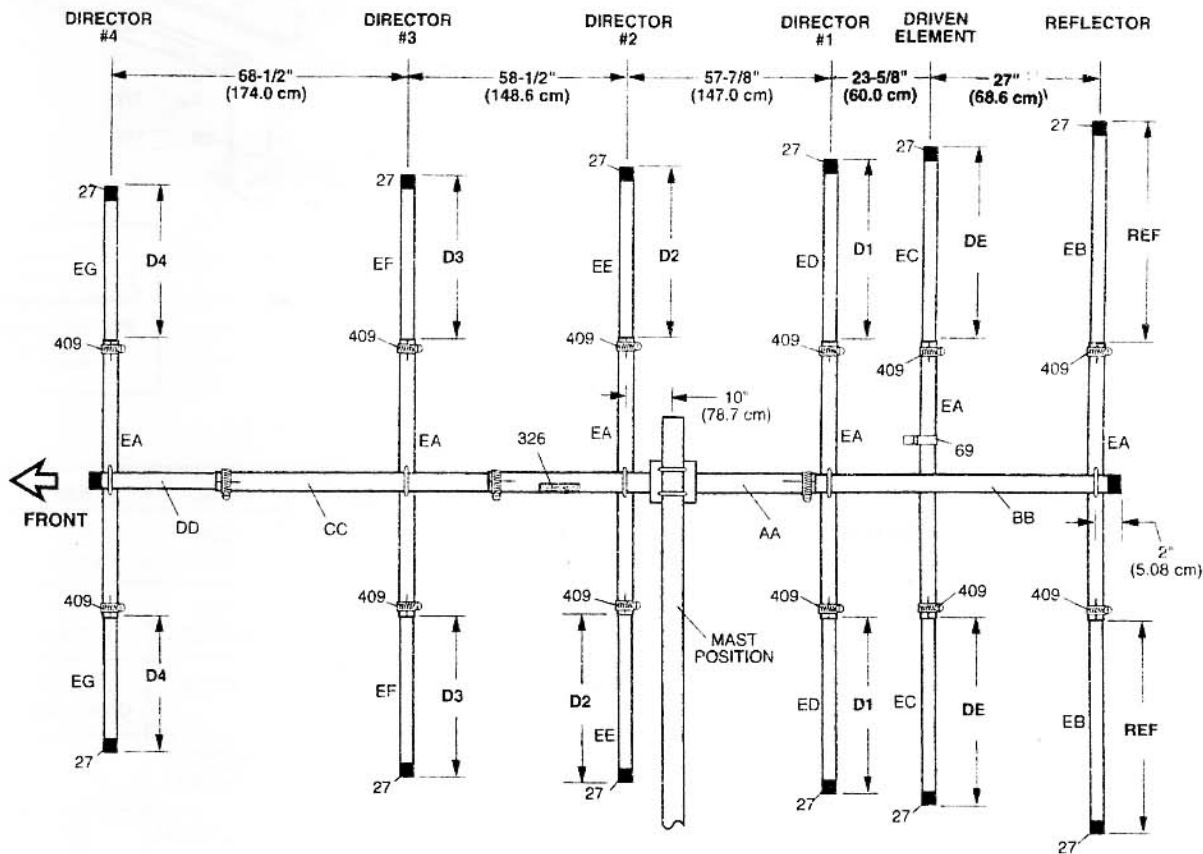
**Table 1**

Horizontal Polarization			
	50-51 MHz	51-53 MHz	53-54 MHz
REF in.	35	33	32
(cm)	(88.9)	(83.8)	(81.3)
DE in.	30	27-1/4	26-1/4
(cm)	(76.2)	(69.2)	(66.7)
D1 in.	29-1/2	26-1/2	25-1/2
(cm)	(74.9)	(67.3)	(64.1)
D2 in.	28-1/2	26-1/2	26-1/2
(cm)	(72.4)	(67.3)	(67.3)
D3 in.	28	26	26
(cm)	(71.1)	(66.0)	(66.0)
D4 in.	23-1/4	21-1/4	21-1/4
(cm)	(59.1)	(54.0)	(54.0)
SET in.	17-7/8	18-1/4	19-1/4
(cm)	(45.4)	(46.4)	(48.9)
X in.	3-3/4	3-7/8	3-1/2
(cm)	(9.5)	(9.8)	(8.9)

**Table 2**

Vertical Polarization				
	50-51 MHz	51-52 MHz	52-53 MHz	53-54 MHz
REF in.	36	36	35	34
(cm)	(91.4)	(91.4)	(88.9)	(86.4)
DE in.	32-1/4	31-1/4	30	28-1/4
(cm)	(81.9)	(81.9)	(76.2)	(71.8)
D1 in.	30	30	29-1/2	28-1/2
(cm)	(76.2)	(76.2)	(74.9)	(72.4)
D2 in.	28-7/8	28-7/8	28-1/2	27-1/2
(cm)	(73.3)	(73.3)	(72.4)	(69.9)
D3 in.	28-3/8	28-3/8	28	27
(cm)	(72.1)	(72.1)	(71.1)	(68.6)
D4 in.	24-1/4	24-1/4	23-1/4	22-1/4
(cm)	(61.6)	(61.6)	(59.1)	(56.5)
SET in.	16	15	16-1/4	18
(cm)	(40.6)	(38.1)	(41.3)	(45.7)
X in.	3-1/4	4-7/8	4-1/2	4-3/4
(cm)	(8.3)	(12.4)	(11.4)	(12.1)

**FIGURE B-2**  
(Vertical Polarization)



KEY	P/N	DISPLAY	DESC	SIZE	QTY	KEY	P/N	DISPLAY	DESC	SIZE	QTY
EA			ALUM TUBING	3/4" x 48" (1.9 x 121.9 cm)	5	32	190032		U-BOLT BRACKET	3-1/2" (8.9 cm)	6
EB			ALUM TUBING	5/8" x 36-1/2" (1.6 x 97.8 cm)	2	33	190033		BACKING PLATE	3-1/2" (8.9 cm)	5
EC			ALUM TUBING	5/8" x 35" (1.6 x 88.9 cm)	2	69	200069		TUNING STRAP		1
ED			ALUM TUBING	5/8" x 33-1/2" (1.6 x 85.1 cm)	2	118	010118		HEX NUT	5/16" (.8 cm)	12
EE			ALUM TUBING	5/8" x 33" (1.6 x 83.8 cm)	2	119	010119		LOCK WASHER	5/16" (.8 cm)	12
EF			ALUM TUBING	5/8" x 32-1/2" (1.6 x 82.5 cm)	2	326	290326		DANGER LABEL		1
EG			ALUM TUBING	5/8" x 26" (1.6 x 66.0 cm)	2	405	010405		U-BOLT	2" X 4-1/2" (5.1 x 11.4 cm)	6
27	050027		PLASTIC CAP	5/8" (1.6 cm)	12	409	030409		WORM CLAMP	3/4" (1.9 cm)	12

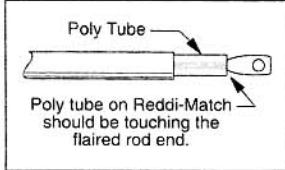
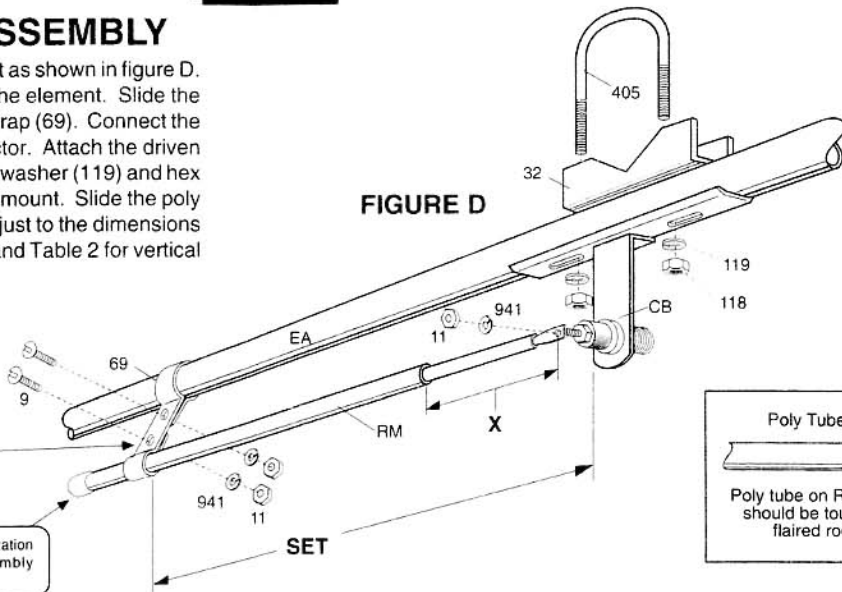
### #3 - REDDI-MATCH ASSEMBLY

Mount the Reddi-Match to the driven element as shown in figure D. The tuning strap (69) should already be on the element. Slide the Reddi-Match tube (RM) through the tuning strap (69). Connect the flattened rod end to the screw on the connector. Attach the driven element to the boom using U-bolt (405), lock washer (119) and hex nut (118) with the connector facing the mast mount. Slide the poly tube over the rod up to the flattened end. Adjust to the dimensions shown in Table 1 for horizontal polarization and Table 2 for vertical polarization. Tighten all fasteners.

After the Reddi-Match tube has been attached to the driven element, adjust the angle of the tuning strap (69) to a point which brings the Reddi-Match tube into parallel with the driven element.

NOTE: For vertical polarization the Reddi-Match assembly should point skyward.

FIGURE D



KEY	P/N	DISPLAY	DESC	SIZE	QTY
9	010009		SS MACHINE SCREW	8-32 X 5/8" (1.6 cm)	2
941	011941		SS LOCK WASHER	#8	3
11	010011		SS HEX NUT	8-32	3
32	190032		U-BOLT BRACKET	3-1/2" (8.9 cm)	1
69	200069		TUNING STRAP		1

KEY	P/N	DISPLAY	DESC	SIZE	QTY
118	010118		HEX NUT	5/16" (.8 cm)	2
119	010119		LOCK WASHER	5/16" (.8 cm)	2
405	010405		U-BOLTS	2"x 4-1/2" (5.1 x 11.4 cm)	1
CB			CONNECTOR BRACKET		1
RM			REDDI MATCH TUBE	19" (48.3 cm)	1

### #4 - BOOM TO MAST ASSEMBLY

Assemble and mount the mast mounting plate to the boom at the balance point. Refer to figure B for the approximate balance point and figure E for assembly. Attach the mounting plate (130) to the AA section of the boom using U-bolts (404), V-blocks (63), washers (119) and nuts (118). Attach the assembled antenna to the mast using the U-bolts (404), V-blocks (63), washers (119) and nuts (118). Affix danger label (326).

KEY	P/N	DISPLAY	DESC	SIZE	QTY
63	170063		V-BLOCK	3-1/2" (8.9 cm)	4
118	010118		HEX NUT	5/16" (.8 cm)	8
119	010119		LOCK WASHER	5/16" (.8 cm)	8
130	190130		MOUNTING PLATE	6" x 6" (15.2 x 15.2 cm)	1
326	290326		DANGER LABEL		1
404	010404		U-BOLT	2" x 3" (5.08 x 7.6 cm)	4

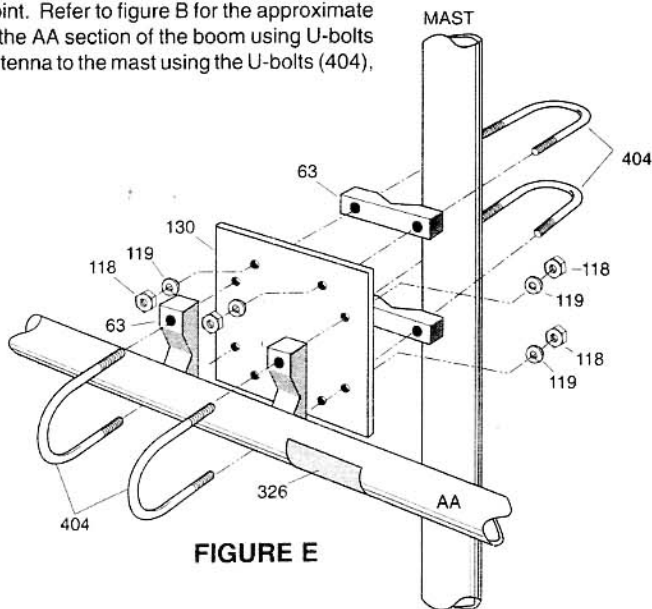




FIGURE E

# A50-6S

KEY	P/N	DISPLAY	DESC	SIZE	QTY
115	050115		CONNECTOR BOOT		1
116	240116		SILICONE PACKAGE		1

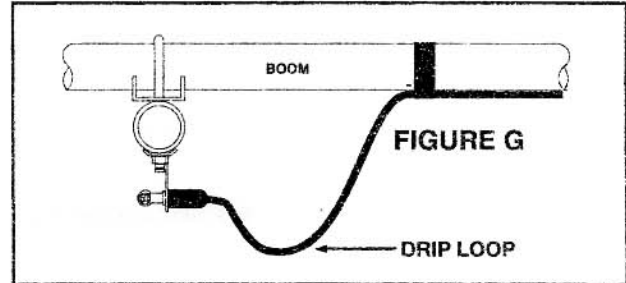
## #5 - FEEDLINE ASSEMBLY

The antenna is designed for use with 50 Ohm coaxial cable terminated with a PL-259 connector. Any length of feedline can be used with your A50-6S. The shortest length of cable will have the least loss. A connector boot is included for use with your new antenna. (Figure F) Slide the boot over the cable before attaching your PL-259. Coat only the outside connector threads and shell with silicone grease. Do not coat the center pin or receptacle. After the PL-259 is firmly screwed on to the antenna connector, slide the vinyl boot over the connector and against the mast bracket for a good weather tight connection. Tape the feedline to the boom and down the mast. It's a good idea to form a drip loop in the coax to help protect the connector from water damage (figure G).

FIGURE F



COAT WITH SILICONE GREASE  
(DO NOT coat the center pin or socket!)



## SPECIFICATIONS

Frequency	50-54 MHz
Number of Elements	6
Forward Gain	11.8 dBd
Front to Back Ratio	26 dB
SWR Typical	1.2:1
2:1 Bandwidth	>1 MHz
Power Rating	1000 Watts
3 dB Beamwidth (E Plane)	48°
Boom Length	20 ft. (6.1 m)
Longest Element	120" (304.8 cm)
Turning Radius	11.5 ft. (3.51 m)
Mast Size Range	1.5" - 2" (3.8-5.1 cm)
Wind Load	4.46 ft <sup>2</sup> (.41 m <sup>2</sup> )
Weight	16 lb. (8.2 kg)

### LIMITED WARRANTY

Cushcraft Corporation, P.O. Box 4680, Manchester, New Hampshire 03108, warrants to the original consumer purchaser for one year from date of purchase that each Cushcraft antenna is free of defects in material or workmanship. If, in the judgement of Cushcraft, any such antenna is defective, then Cushcraft Corporation will, at its option, repair or replace the antenna at its expense within thirty days of the date the antenna is returned (at purchaser's expense) to Cushcraft or one of its authorized representatives. This warranty is in lieu of all other expressed warranties, any implied warranty is limited in duration to one year. Cushcraft Corporation shall not be liable for any incidental or consequential damages which may result from a defect. Some states do not allow limitations on how long an implied warranty lasts or exclusions or limitations of incidental or consequential damages, so the above limitation and exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. This warranty does not extend to any products which have been subject to misuse, neglect, accident or improper installation. Any repairs or alterations outside of the Cushcraft factory will nullify this warranty.

**SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE**

If you have technical questions and have access to the World Wide Web you can visit Cushcraft's **TECHEXPRESS** support service (<http://www.cushcraft.com>). The site enables the user to place parts orders, ask technical questions, locate part numbers, initiate warranty inquiries and review *Frequently Asked Questions*. Our technical support staff can be reached by phone at (603) 627-7877 (8 AM to 5 PM Eastern time or voice mail after hours), faxed at (603) 627-1764 or can be e-mailed at [techsup@cushcraft.com](mailto:techsup@cushcraft.com).

**Limited Warranty**

Cushcraft Corporation, 48 Perimeter Road, Manchester, New Hampshire 03103, warrants to the original consumer purchaser for one year from date of purchase that each Cushcraft antenna is free of defects in material or workmanship. If, in the judgement of Cushcraft, any such antenna is defective, then Cushcraft will, at its option, repair or replace the antenna at its expense within thirty days of the date the antenna is returned (at purchaser's expense) to Cushcraft or one of its authorized representatives. This warranty is in lieu of all other expressed warranties. Any implied warranty is limited in duration to one year. Cushcraft Corporation shall not be liable for any incidental or consequential damages which may result from a defect. Some states do not allow a limitation on how long an implied warranty lasts or exclusions or limitations of incidental or consequential damages, so the above limitation and exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. This warranty does not extend to any products which have been subject to misuse, neglect, accident or improper installation. Any repairs or alterations outside of the Cushcraft factory will nullify this warranty.



**CUSHCRAFT**  
COMMUNICATIONS ANTENNAS

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