

**ASSEMBLY AND INSTALLATION
INSTRUCTIONS**



738XB

70 CM OSCAR BOOMER
432-438 MHz



CUSHCRAFT
COMMUNICATIONS ANTENNAS

951451 (7/94)

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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 738XB Boomer antenna is designed and manufactured to give trouble free service. This antenna will perform as specified if the instructions and suggestions in this manual are followed and care is used in the assembly and installation. When checking the components received in your antenna package use the parts listed beside each diagram. There is a master parts list on page 2. 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.*

PLANNING

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 the boss and that they must follow your instructions. If you have any doubts at all, employ a professional antenna installation company to install your antenna.

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. **EXTREME CARE MUST BE USED FOR YOUR SAFETY. YOU MUST INSURE THAT WHILE THE 738XB IS IN OPERATION NEITHER PEOPLE OR PETS CAN COME IN CONTACT WITH ANY PORTION OF YOUR ANTENNA. DEADLY VOLTAGES AND CURRENTS MAY EXIST. ALSO, SINCE THE EFFECTS OF EXPOSURE TO RF FIELDS 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 G.**

MOUNTING

The mast mount bracket will accommodate up to 2" (5.1 cm) mast. A 1-1/2" (3.8 cm) or larger heavy wall mast should be used. A good heavy duty antenna rotator will provide the best service and longest life.

Mount your 738XB at least 10 feet (3 meters) above the ground so that the antenna may be pointed straight up. The mast should be at a 45 degree angle to both element planes. Typical mounting is shown in Figure F.

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 noncorrosive 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. After the antenna is completely assembled, verify dimensions and element spacings for accuracy.

HOW TO CHECK VSWR

The 738XB does not require tuning after assembly. You may check the VSWR in order to confirm assembly was done properly. The easiest place to check the antenna is likely to be in its final mounting configuration. Orient the antenna such that it is pointing straight up. The back of the antenna should be at least 2 feet (0.6m) off the ground.

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 under test. Set the transmitter to your center operating frequency and measure the VSWR while taking care not to effect the measurement with your body. A VSWR of 2:1 or less is satisfactory and will not degrade the performance. If the VSWR is greater than 2:1, check all dimensions and connections.

MASTER PARTS LIST

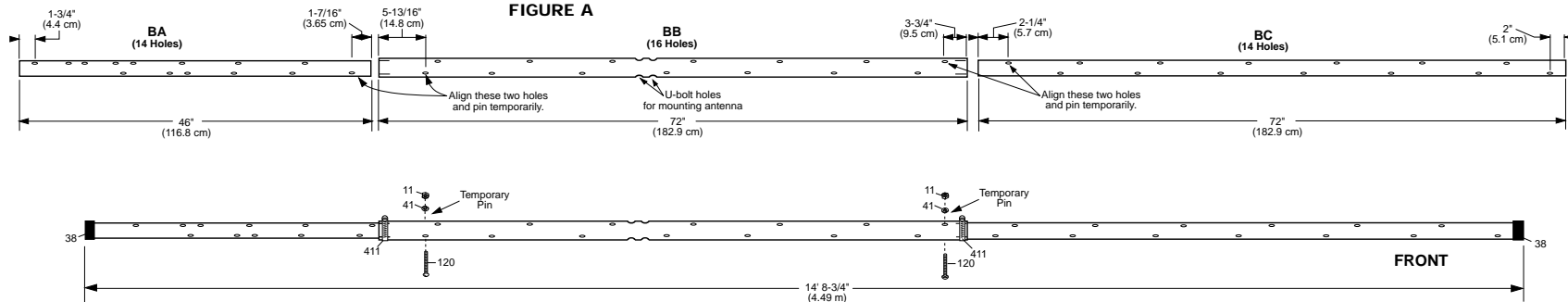
KEY	P/N	DESCRIPTION	QTY	KEY	P/N	DESCRIPTION	QTY
11	010011	8-32 stainless steel hex nut	36	H2		12-1/4" (31.1 cm) aluminum rod	1
26	190026	7/8" (2.2 cm) formed aluminum bracket	38	H3		12-7/16" (31.6 cm) aluminum rod	1
28	190028	Aluminum half washer	38	H4, H5		12-3/16" (31 cm) aluminum rod	2
32	190032	3-5/8" x 2-1/2" (9.2 x 6.4 cm) U-bolt bracket	3	H6, H7		12" (30.5 cm) aluminum rod	2
33	190033	Aluminum backing plate	1	H8		11-7/8" (30.2 cm) aluminum rod	1
38	050038	1" (2.5 cm) black plastic cap	2	H9, H10, H11		11-5/8" (29.5 cm) aluminum rod	3
41	011941	No. 8 split lock washer	36	H12		11-1/2" (29.2 cm) aluminum rod	1
66	013766	6-32 x 2" (5.1 cm) stainless steel machine screw	2	H13		11-7/16" (29 cm) aluminum rod	1
84	010084	1/4"-20 (.6 cm) stainless steel lock washer	2	H14		11-5/16" (28.7 cm) aluminum rod	1
85	010085	1/4"-20 (.6 cm) stainless steel hex nut	2	H15, H16		11-1/16" (28.1 cm) aluminum rod	2
108	351108	Male phono plug	1	H17		10-13/16" (27.5 cm) aluminum rod	1
112	010112	6-32 stainless steel hex nut	8	H18		10-9/16" (26.4 cm) aluminum rod	1
113	010113	6-32 stainless steel split lock washer	8				
115	050115	Vinyl Boot	1	V1		13-15/16" (35.4 cm) aluminum rod	1
116	240116	Silicone Package	1	V2		12-1/4" (31.1 cm) aluminum rod	1
118	010118	5/16" (.79 cm) stainless steel hex nut	2	V3		12-7/16" (31.6 cm) aluminum rod	1
119	010119	5/16" (.79 cm) stainless steel lock washer	2	V4		12-13/16" (31 cm) aluminum rod	1
120	010120	8-32 x 2" (5.1 cm) stainless steel machine screw	14	V5		12-1/4" (31.1 cm) aluminum rod	1
231	010231	8-32 x 1-3/4" (4.4 cm) stainless steel machine screw	22	V6, V7		12" (30.5 cm) aluminum rod	2
326	290326	Danger label	1	V8		11-7/8" (30.2 cm) aluminum rod	1
402	013402	5/16" (.8 cm) stainless steel flat washer	2	V9, V10, V11		11-5/8" (29.5 cm) aluminum rod	3
405	010405	4-1/2" x 2-7/16" (11.4 x 6.2 cm) stainless steel U-bolt	1	V12		11-1/2" (29.2 cm) aluminum rod	1
411	030411	1-1/4" (3.2 cm) stainless steel worm clamp	2	V13		11-7/16" (29 cm) aluminum rod	1
BA		1" x 43" (2.5 x 109.2 cm) aluminum tube, 12 holes	1	V14		11-5/16" (28.7 cm) aluminum rod	1
BB		1-1/8" x 72" (2.9 x 182.9 cm) aluminum tube, 16 holes	1	V15, V16		11-1/16" (28.1 cm) aluminum rod	2
BC		1" x 71" (2.5 x 180 cm) aluminum tube, 14 holes	1	V17		10-13/16 (27.5 cm) aluminum rod	1
BN		RG-303 coax balun assembly	2	V18		10-9/16" (26.4 cm) aluminum rod	1
FD		3/8" x 12-3/4" (1 x 32.4 cm) folded dipole assembly	2				
PS738		Polarity switch assembly aluminum box	1				
H1		13-15/16" (35.4 cm) aluminum rod	1				

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738XB

FIGURE A



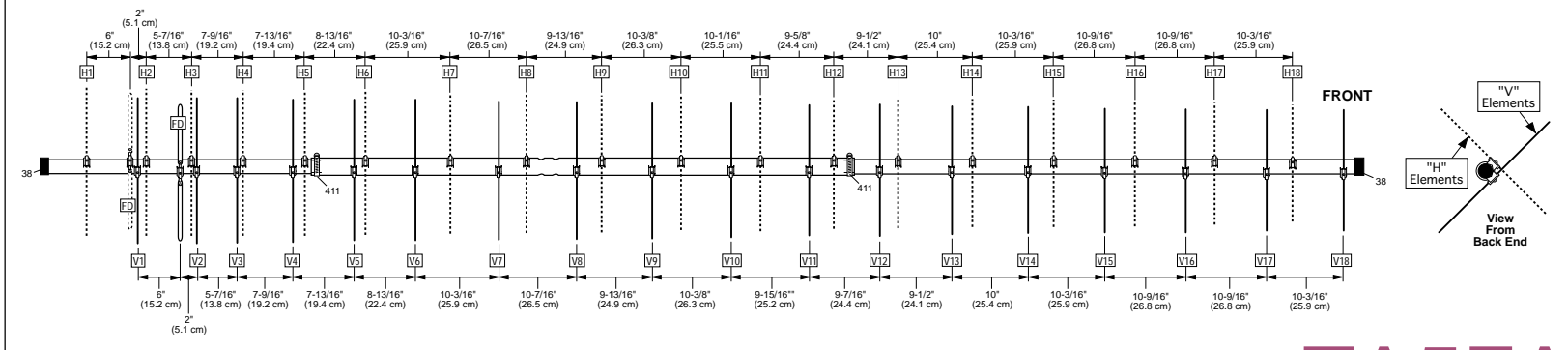
#1 - ASSEMBLE BOOM

Use care in laying out the boom sections in order. The number of holes and undrilled spaces at the ends of the boom sections are good guides. Align the sections and secure them with the hardware shown (Figure A). Note that the first hole in each section will line up with the first hole in the adjacent section. Temporarily place a machine screw through the overlapping holes and secure it with a nut. Do this for each of the two joints. Measure the overall boom length 14 feet, 8-3/4" inches (4.49 m) as a check.

KEY	P/N	DESC.	SIZE	QTY
BA		ALUM TUBE (12 holes)	1" x 46" (2.5 x 116.8 cm)	1
BB		ALUM TUBE (16 holes)	1-1/8" x 72" (2.8 x 182.9 cm)	1
BC		ALUM TUBE (14 holes)	1" x 72" (2.5 x 182.9 cm)	1
11	010011	SS HEX NUT	8-32	2

KEY	P/N	DESC.	SIZE	QTY
38	050038	PLASTIC CAP	1" (2.5 cm)	2
41	011941	SS LOCK WASHER	#8	2
120	010120	SS MACHINE SCREW	8-32 x 2" (5.1 cm)	2
411	030411	SS WORM CLAMP	1-1/4" (3.2 cm)	2

FIGURE B

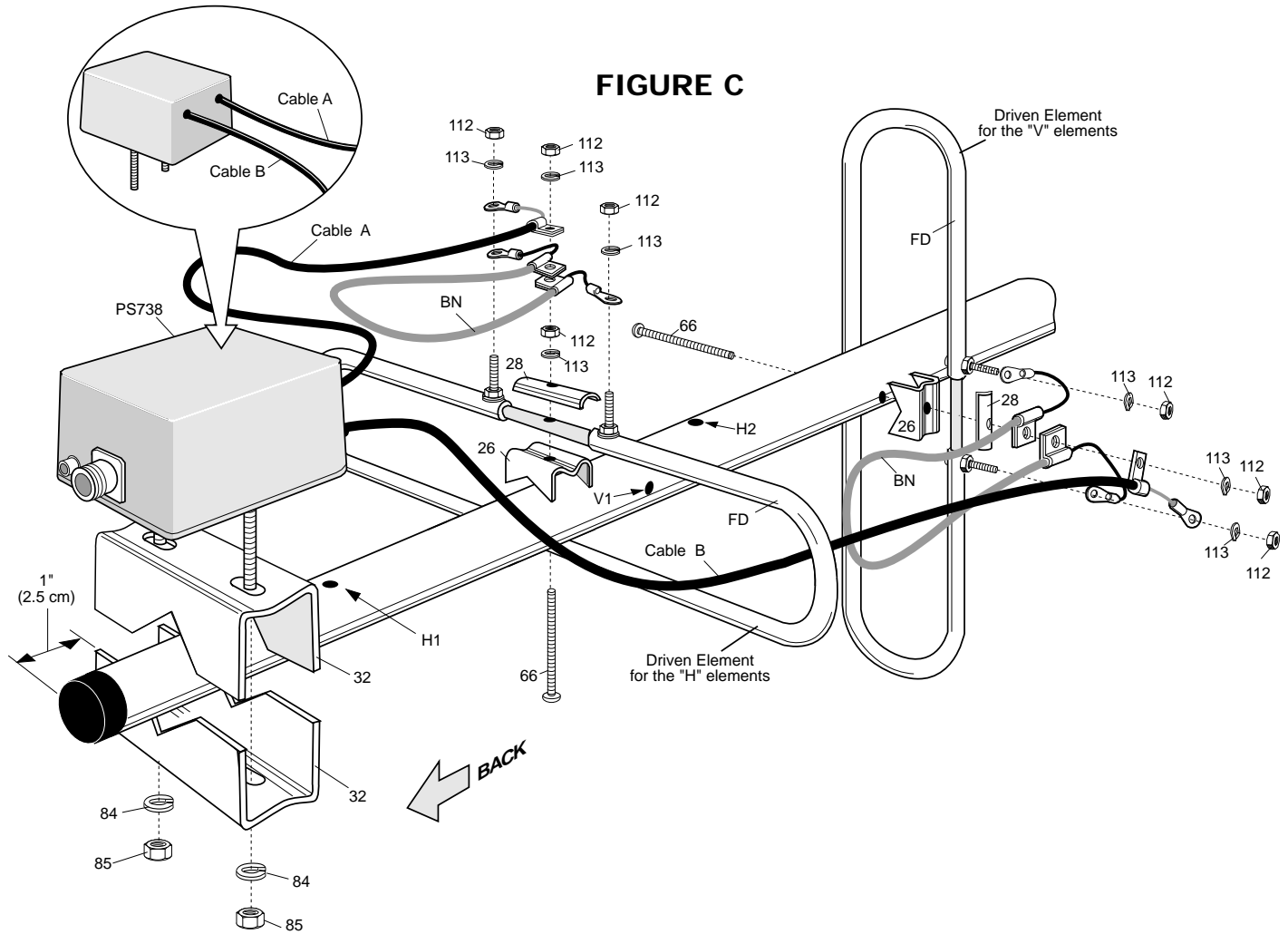


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#2 - ASSEMBLE AND ATTACH DRIVEN ELEMENTS

Slide one finished assembly (FD) over the rear of the boom and fasten it in the more forward position as shown in figure C. Attach the second FD in the position closer to the back of the antenna and tighten hardware.

Attach the PS738 switching unit to the rear of the boom with drain holes down. Install baluns (BN) over three terminals on the each dipole. The baluns should loop toward rear of antenna. When attaching the two feed cables leading from the PS738 be sure that they are connected to the correct dipole. Study Figure C carefully to be sure. Tighten all hardware.



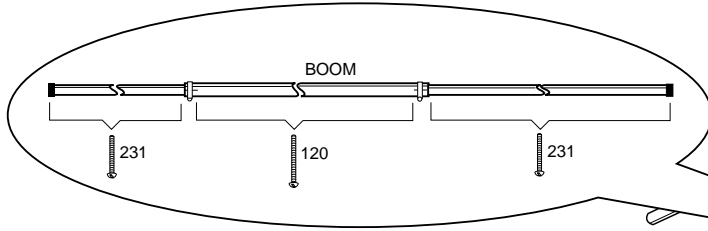
KEY	P/N	DISPLAY	DESC	SIZE	QTY
26	190026		MOUNTING BRACKET	7/8" (2.2 cm)	2
28	190028		HALF WASHER		2
32	190032		U-BOLT BRACKET	3-5/8" x 2-1/2" (9.2 x 6.4 cm)	2
66	013766		SS MACHINE SCREW	6-32 x 2" (5.1 cm)	2
84	010084		SS LOCK WASHER	1/4"-20 (.6 cm)	2
85	010085		SS HEX NUT	1/4"-20 (.6 cm)	2

KEY	P/N	DISPLAY	DESC	SIZE	QTY
112	010112		SS HEX NUT	6-32	6
113	010113		SS LOCK WASHER	6-32	6
BN			BALUN ASSEMBLY		2
FD			FOLDED DIPOLE	3/8" x 12-3/4" (1 X 324 cm)	2
PS738			POLARITY SWITCH ASS'Y		1

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#3 - MOUNT ELEMENTS

Two sets of elements are provide with the antenna. Each set is mounted 90 degrees to the other. Note that the two sets of elements are not the same. Lengths are shown in Table A. Using Figure B for positioning, attach the elements using the hardware shown in Figure D. Element lengths within 1/16" (.16 cm) of the stated length are acceptable. Check elements again to assure that they are in the correct position and tighten the hardware. Tape feed cable A and B and baluns in place.



KEY	P/N		DESC.	SIZE	QTY
11	010011		SS HEX NUT	8-32	36
26	190026		ALUMINUM BRACKET	7/8" (2.2 cm)	36
28	190028		ALUM HALF WASHER		36
41	010941		SS SPLIT WASHER	#8	36
120	010120		SS MACHINE SCREW	8-32 x 2" (5.1 cm)	14
231	010231		SS MACHINE SCREW	8-32 x 1-3/4" (4.4 cm)	22

FIGURE D

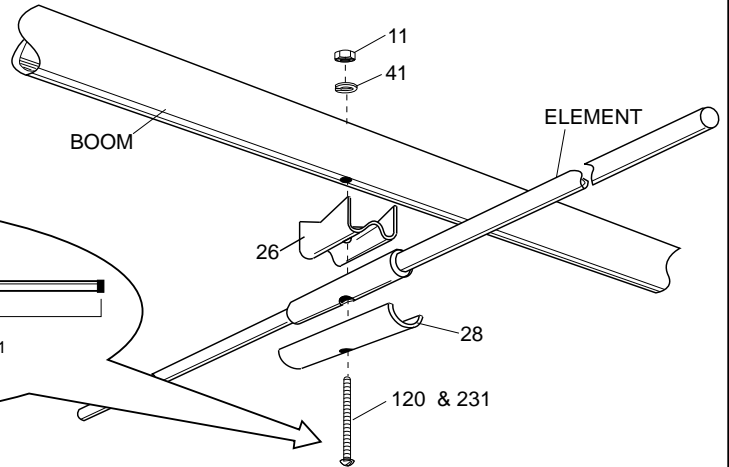


TABLE A (ELEMENTS)

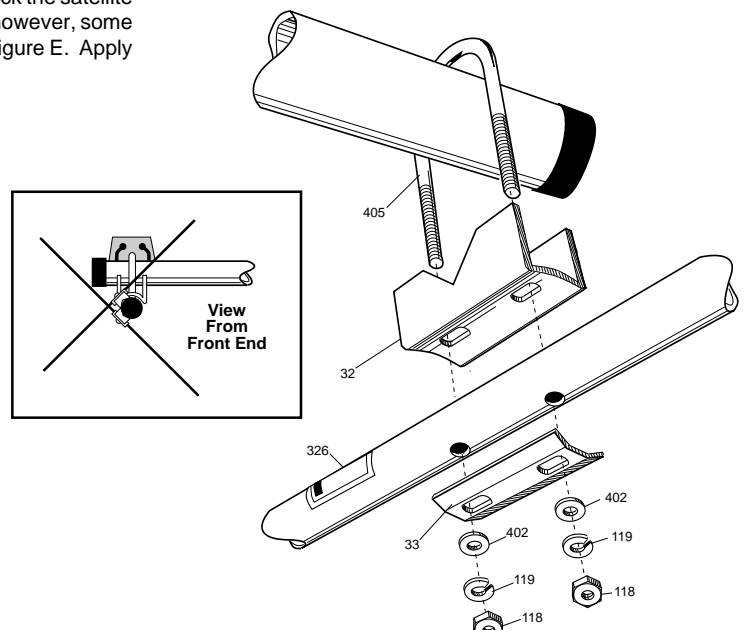
H1	13-15/16"	1	V1	13-15/16" (35.4 cm)	1
H2	12-1/4" (31.1 cm)	1	V2	12-1/4" (31.1 cm)	1
H3	12-7/16" (31.6 cm)	1	V3	12-7/16" (31.6 cm)	1
H4, H5	12-3/16" (31 cm)	2	V4	12-13/16" (31 cm)	1
H6, H7	12" (30.5 cm)	2	V5	12-1/4" (31.1 cm)	1
H8	11-7/8" (30.2 cm)	1	V6, V7	12" (30.5 cm)	2
H9, H10, H11	11-5/8" (29.5 cm)	3	V8	11-7/8" (30.2 cm)	1
H12	11-1/2" (29.2 cm)	1	V9, V10, V11	11-5/8" (29.5 cm)	3
H13	11-7/16" (29 cm)	1	V12	11-1/2" (29.2 cm)	1
H14	11-5/16" (28.7 cm)	1	V13	11-7/16" (29 cm)	1
H15, H16	11-1/16" (28.1 cm)	2	V14	11-5/16" (28.7 cm)	1
H17	10-13/16" (27.5 cm)	1	V15, V16	11-1/16" (28.1 cm)	2
H18	10-9/16" (26.4 cm)	1	V17	10-13/16 (27.5 cm)	1
			V18	10-9/16" (26.4 cm)	1

#4 - BOOM TO MAST ASSEMBLY

It is common to mount your 738XB parallel to your 2M Yagi so that they track the satellite simultaneously. Typically cross mounting booms are made of fiberglass, however, some use aluminum. Attach antenna to cross boom using hardware shown in Figure E. Apply danger label (326) to the antenna boom where it may be easily seen.

KEY	P/N	DISPLAY	DESC	SIZE	QTY
32	190032		U-BOLT BRACKET	3-5/8 x 2-1/2 (9.2 x 6.4 cm)	1
33	190033		BACKING PLATE	3-1/2" (8.9 cm)	1
118	010118		SS HEX NUT	5/16" (.8 cm)	2
119	010119		SS LOCK WASHER	5/16" (.8 cm)	2
326	290326		DANGER LABEL		1
402	013402		SS FLAT WASHER	5/16" (.8 cm)	2
405	010405		SS U-BOLT	5/16" x 4-1/2" x 2-7/16" (.8 x 11.4 x 6.2 cm)	1

FIGURE E



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#5 - ATTACH FEED AND POLARITY SWITCH LINES

Your Cushcraft 738XB polarity switch may be activated by applying +12V (min +9V at connector) to the center pin of the phono jack on the PS738. When no voltage is applied the antenna exhibits left circular polarization. With +12 applied the polarization is right circular. The feedline and power cable should be attached to the polarity switch box (PS738) and then dressed along the boom, on the side opposite where the elements cross, toward the mast mounting plate then toward your rotor and to the shack. Be careful to leave enough cable around the rotor so there will be slack at the points of maximum travel both horizontally and vertically. Tape both cables securely in place.

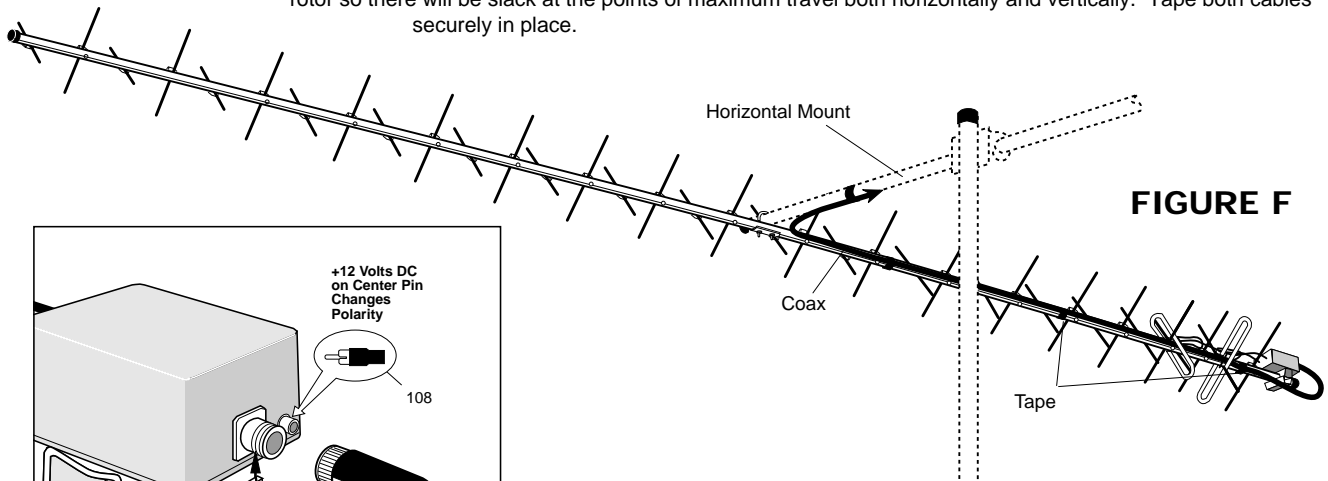


FIGURE F

KEY	P/N	DISPLAY	DESC	SIZE	QTY
115	050115		CONN BOOT		1
116	240116		SILICONE PACKAGE		1
108	351108		PHONO PLUG		1

SPECIFICATIONS			
MODEL	738XB	Boom Length, ft (m)	14.42 (4.39)
Frequency, MHz	432-438	Longest Element, in (cm)	39.94 (35.4)
No. Elements	38	Turning Radius, ft (m)	8.5 (2.6)
Forward Gain, dBdc	15.5	Mast Size Range, in (cm)	1.5-2.0 (3.8-5.0)
Front to Back Ratio, dB	25	Wind Load, ft ² (m ²)	1.4 (.13)
Ellipticity dB at boresight	2	Weight, lb (kg)	7.6 (3.5)
SWR 1.2:1 Typical		Polarity switch	Included
2:1 Bandwidth, MHz	6		
Power Rating, Watts PEP	250		
3dB Beamwidth, Degrees E Plane	24		

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 purchasers 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



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