

# 215WB

## 2 METER BROADBAND BOOMER SSB/CW FM YAGI

144-148 MHz



951294

Your Cushcraft 215WB is 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. **IMPORTANT! 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 6.

## 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.

**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.**

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.

## MOUNTING

The 215WB provides excellent gain, clean pattern and low SWR across the entire 2 meter band.

**VERTICAL (FM):** If you plan to mount the 215WB for vertical polarization, best results can be obtained by mounting the antenna at the top of the mast. Center the boom-to-mast plate midway between elements 8 and 9 as shown in Figure F. Install the 215WB with the elements on the side of the mast opposite from the mounting plate. A vertically polarized 215WB on a metal mast will have a VSWR of under 2:1 from 144.5 to 148.0 MHz. See page 7 for suggested dual and quad array configurations.

**HORIZONTAL (CW/SSB):** Mount your 215WB horizontally and as high as possible, with the boom-to-mast plate midway between elements 8 and 9. It can easily be mounted above a larger antenna at a minimum distance of 3'. See page 7 for suggested dual and quad array configurations.

## 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.

## TUNING PROCEDURE

The 215WB does not normally require tuning after assembly. If you wish to check the SWR before installation, please observe the following procedures. Temporarily mount the antenna with the boom vertical, reflector at least one foot (30 cm) off the ground on a non-metallic support (wooden box), to prevent detuning the antenna. Guy the top of the boom. Do not use line with wire in it (some clotheslines have a wire core). Keep other antennas, metal objects and guy lines clear of the antenna under test. Do not attempt to tune the Yagi near the ground with the boom parallel to the ground since ground effects will nullify any adjustment and degraded performance will result.

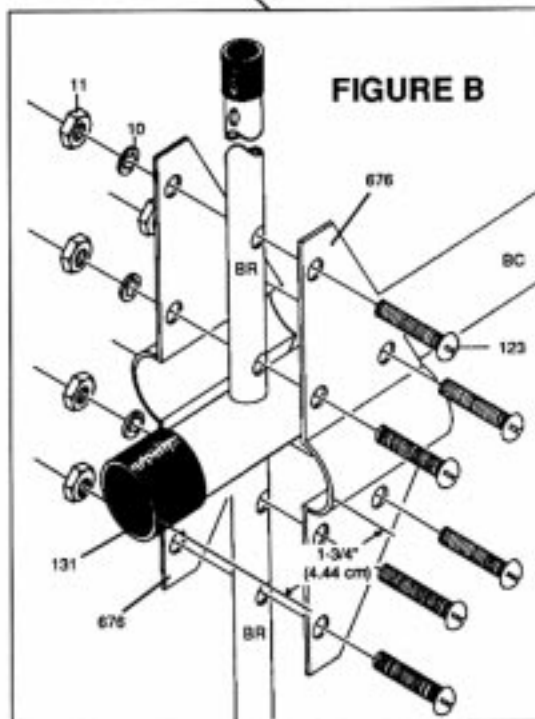
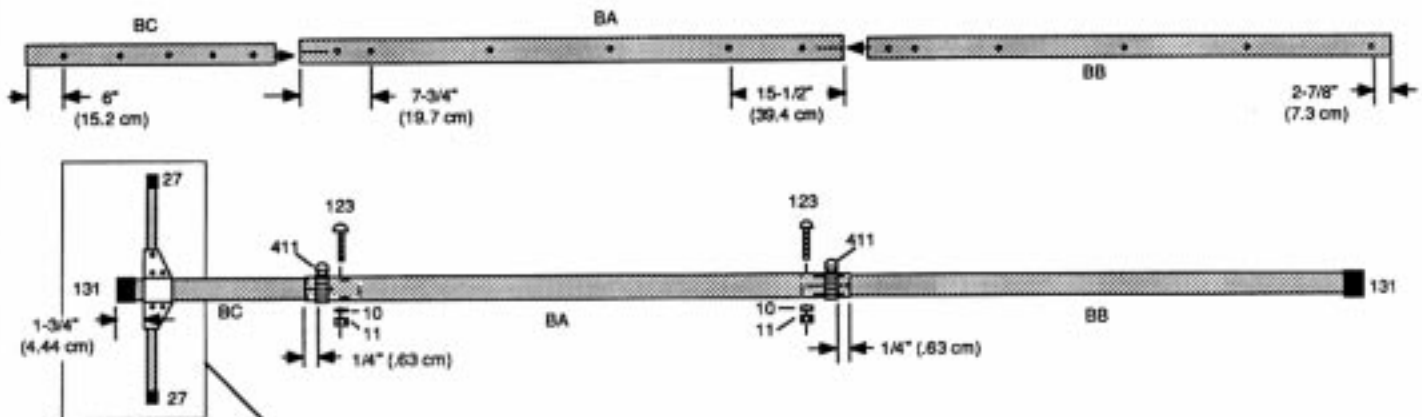
Run the coax cable from your transmitter to the area in which the antenna is going to be tested. The length of this cable or your feedline is not critical. Connect a good quality SWR bridge to the end of this cable. Connect a short length of cable [2' (61 cm) or less] from the SWR bridge to the antenna. Set the transmitter to your center operating frequency. When you read SWR, be sure you move far enough away from the antenna so that you body does not affect the reading.

If necessary move the sliding straps (125) on both sides of the driven element towards the end of the dipole by 1/4". Check the SWR. If it increased, move the straps back to their original position, then go 1/4" towards the center of the driven element. Check the SWR again. If the reading improved, keep moving both straps equally in the same direction until no further improvement is observed. Tighten all connections on the T-match Driven Element assembly. Do not attempt to tune this Yagi by other methods. Ground effects will nullify any adjustments and degraded performance will result.

## #1 - ASSEMBLE BOOM

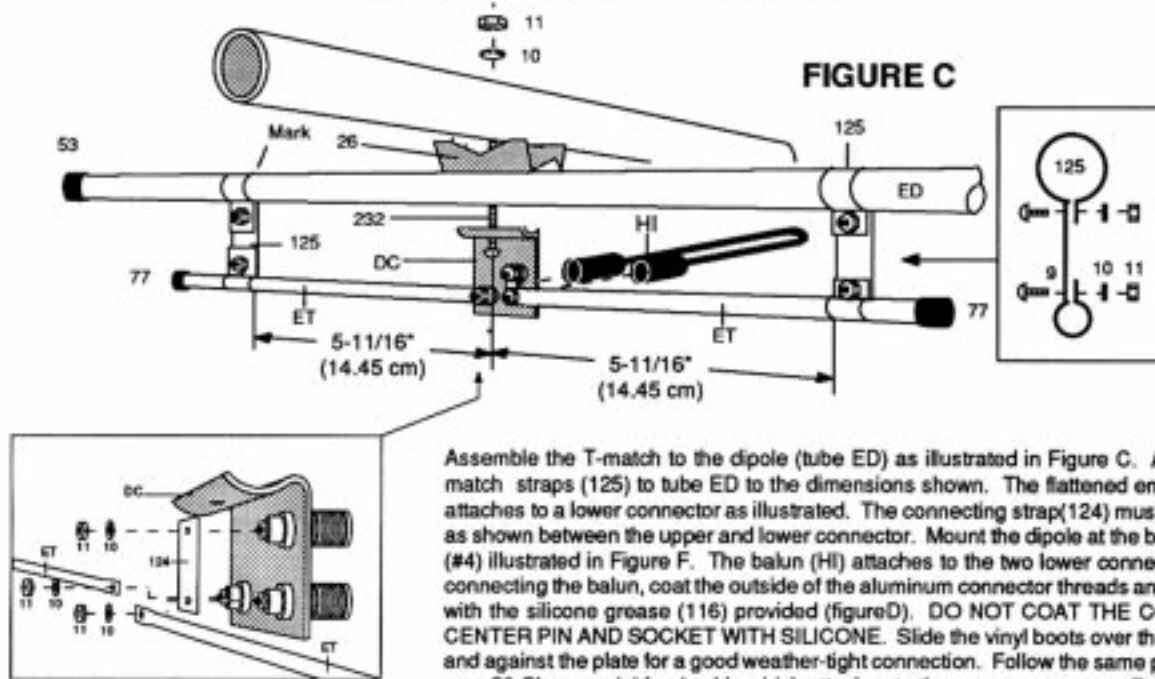
Assemble the boom as shown below. Slide worm clamps (411) onto the slotted ends of tube BA. Insert the end of tube BB into the end of tube BA until the first set of drilled holes are aligned. Refer to figure A to be sure the correct ends of all three tubes are joined. Fasten the two tubes with screw (123), lock washer (10) and nut (11). Do the same with tube BC. Tighten the screws and worm clamps. Next, assemble the trigon as illustrated in figure B. Align the trigon supports with the locking screws and element holes in the boom. Be sure to tighten nuts (11). Push the large end caps (131) onto each end of the boom and the small end caps (27) onto each end of the trigon tubes.

### FIGURE A



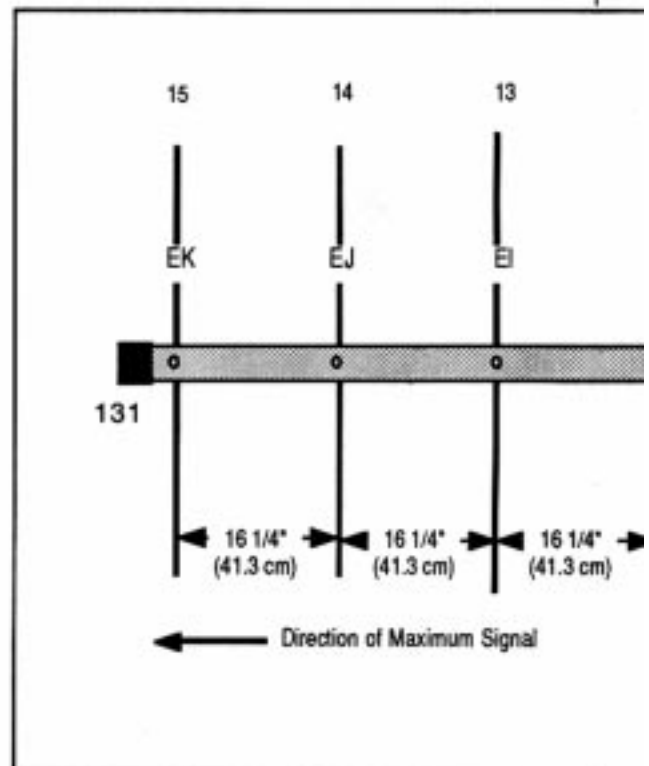
KEY	P/N	DISPLAY	DESC	SIZE	QTY
BA			ALUM TUBING	1 1/4" x 72" (3.2 x 182.9 cm)	1
BB			ALUM TUBING	1 1/8" x 72" (2.9 x 182.9 cm)	1
BC			ALUM TUBING	1 1/8" x 48" (2.9 x 121.9 cm)	1
BR			ALUM TUBING	5/8" x 12" (1.6 x 30.5 cm)	2
10	010010		SS LOCK WASHER	#8	8
11	010011		SS HEX NUT	8-32	8
27	050027		PLASTIC CAP	5/8" (1.59 cm)	2
123	010123		SS SCREW	8-32 x 1-1/2" (3.8 cm)	6
131	050131		PLASTIC CAP	1 1/8" (2.86 cm)	2
411	030411		SS WORM CLAMP	1 3/8" (3.5 cm)	2
676	191676		REFLECTOR BRACKET		2

## #2 - ASSEMBLE T-MATCH



Assemble the T-match to the dipole (tube ED) as illustrated in Figure C. Attach the T-match straps (125) to tube ED to the dimensions shown. The flattened end of tube ET attaches to a lower connector as illustrated. The connecting strap (124) must be attached as shown between the upper and lower connector. Mount the dipole at the boom position (#4) illustrated in Figure F. The balun (HI) attaches to the two lower connectors. When connecting the balun, coat the outside of the aluminum connector threads and the PL-259 with the silicone grease (116) provided (figure D). **DO NOT COAT THE CONNECTOR CENTER PIN AND SOCKET WITH SILICONE.** Slide the vinyl boots over the connectors and against the plate for a good weather-tight connection. Follow the same procedure for your 50 Ohm coaxial feed cable which attaches to the upper connector. Be sure to slide the vinyl boot over the cable before attaching the PL-259 connector.







KEY	P/N	DISPLAY	DESC	SIZE	QTY
ED			ALUM TUBING	1/2" x 39 1/16" (1.3 x 99.2 cm)	1
ET			ALUM TUBING	3/8" x 8 1/2" (.96 x 21.6 cm)	2
HI			BALUN		1
DC			CONNECTOR BRACKET		1
9	010009		SS MACHINE SCREW	8-32 x 5/8" (1.6 cm)	4
10	010010		SS LOCK WASHER	#8	8
11	010011		SS HEX NUT	8-32	8
26	190026		ALUM BRACKET	7/8" (2.2 cm)	1
77	050077		PLASTIC CAP	3/8" (.95 cm)	2
124	190124		CONNECTOR STRAP		1
125	200125		T-MATCH STRAP		2
232	010232		SS MACHINE SCREW	8-32 x 2 1/2" (6.4 cm)	1
53	050053		PLASTIC CAP	1/2" (1.27 cm)	2
115	050115		VINYL BOOT		1
116	240116		SILICONE PACKAGE		1



### #3 - MOUNT ELEMENTS

The solid rod elements are bundled together. Follow figures E and F and Chart A when attaching the elements to the boom. Double check to be sure the correct length element has been mounted at each element location. Use the 2 1/2" machine screws (232) to fasten elements 7 through 10 to the mid-boom section.

**CAUTION! DIRECTORS 10 THROUGH 15 ARE LONGER THAN THE MIDDLE DIRECTORS. IT IS VERY IMPORTANT TO PROPERLY POSITION THE ELEMENTS AS SHOWN IN FIGURE F. FAILURE TO DO SO WILL RESULT IN DEGRADED PERFORMANCE.**

KEY	P/N	DISPLAY	DESC	SIZE	QTY
10	010010		INT. TOOTH LOCK WASHER	#8	28
11	010011		SS HEX NUT	8-32	14
26	190026		ALUMINUM BRACKET	7/8" (2.2 cm)	14
28	190028		ALUMINUM HALF WASHER		14
120	010120		SS MACHINE SCREW	8-32 x 2" (3.1 cm)	10
232	010232		SS MACHINE SCREW	8-32 x 2 1/2" (6.4 cm)	4

#### CHART A

KEY	Element No.	LENGTH	
		INCHES	CM
EA	1,2	38 3/4	98.4
EB	3	40 3/16	102.1
EC	5	37 5/8	95.6
EE	6	36 9/16	92.9
EF	7	36 1/4	92.1
EG	8	35 3/4	90.8
EH	9	35 1/4	89.5
EI	10-13	34 5/8	87.9
EJ	14	35 1/4	89.5
EK	15	35 3/4	90.8

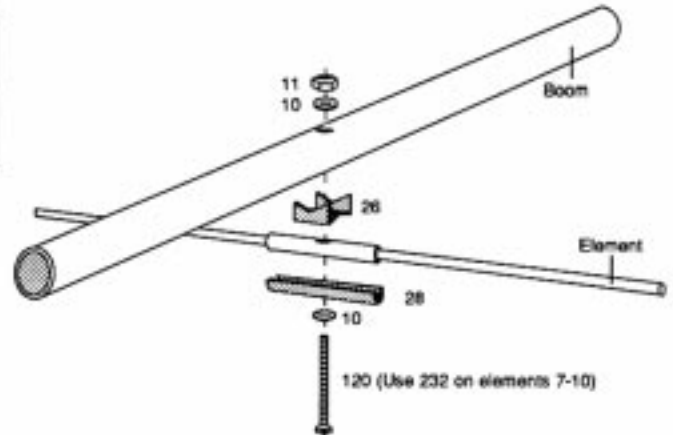


FIGURE E

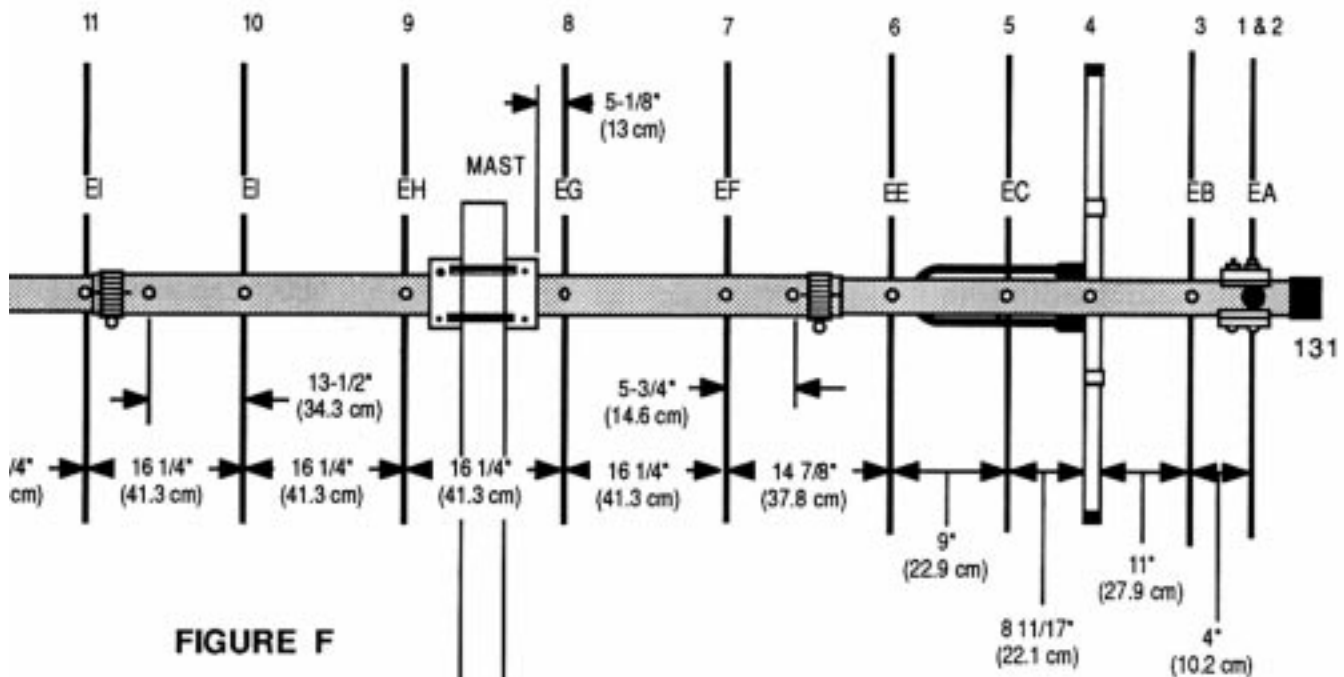











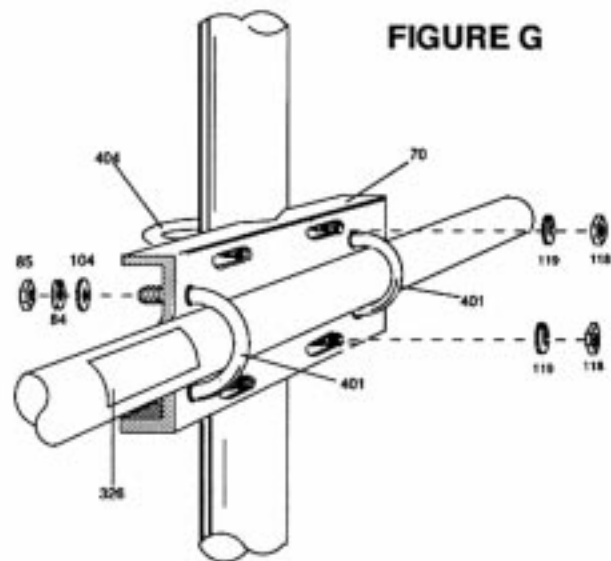
FIGURE F



KEY	P/N	DISPLAY	DESC	SIZE	QTY
84	010084		SS LOCK WASHER	1/4" (.64 cm)	4
85	010085		SS HEX NUT	1/4" (.64 cm)	4
104	010104		SS FLAT WASHER	1/4" (.64 cm)	4
118	010118		SS HEX NUT	5/16" (.79 cm)	4
119	010119		SS LOCK WASHER	5/16" (.79 cm)	4
401	010401		SS U-BOLT	1 1/2" x 3" (3.8 x 7.6 cm)	2
404	010404		SS U-BOLT	2 1/2" x 3" (5.5 x 7.6 cm)	2
70	190070		MOUNTING PLATE	4" x 6" (10.2 x 15.2 cm)	1
326	290326		DANGER LABEL		1

## #5 - ASSEMBLE BOOM TO MAST MOUNT

Assemble and mount the boom to mast bracket assembly at the approximate balance point between elements numbers 8 and 9. Attach the mounting plate (70) to the boom with the 401 U-bolts as shown below. Secure with flat washer (104), lock washer (84) and nut (85) in that order. When you're ready to mount the antenna to the mast use the 404 U-bolts. Secure with lock washer (119) and nut (118). Affix warning label (326) to boom.



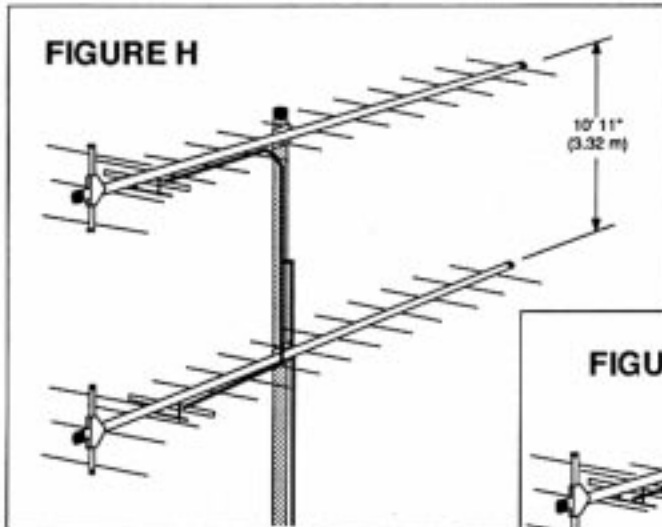
## MASTER PARTS LIST

KEY	P/N	DESCRIPTION	QTY	KEY	P/N	DESCRIPTION	QTY
9	010009	8-32 x 5/8" (1.6 cm) stainless steel machine screw	4	404	010404	2 1/2" x 3" (5.5 x 7.6 cm) stainless steel U-bolt	2
10	010010	No. 8 internal tooth lock washer	45	401	010401	1 1/2" x 3" (3.8 x 7.6 cm) stainless steel U-bolt	2
11	010011	8-32 stainless steel hex nut	30	411	030411	1 3/8" (3.5 cm) stainless steel worm clamp	2
26	190026	7/8" (2.2 cm) formed aluminum bracket	15	676	191676	Formed reflector support bracket	2
27	050027	5/8" (1.59 cm) black plastic cap	2	BA		1 1/4" x 72" (3.2 x 182.9 cm) aluminum tubing	1
28	190028	Aluminum half washer	14	BB		1 1/8" x 72" (2.9 x 182.9 cm) aluminum tubing	1
53	050053	1/2" (1.27 cm) black plastic cap	2	BC		1 1/8" x 48" (2.9 x 121.9 cm) aluminum tubing	1
70	190070	4" x 6" (10.2 x 15.2 cm) formed mounting plate	1	BR		5/8" x 12" (1.6 x 30.5 cm) aluminum tubing	2
77	050077	3/8" (.95 cm) black plastic cap	2	DC		Connector bracket with connectors	1
84	010084	1/4" (.64 cm) stainless steel lock washer	4	ED		1/2" x 39 1/16" (1.3 x 99.2 cm) aluminum tubing	1
85	010085	1/4" (.64 cm) stainless steel hex nut	4	ET		3/8" x 8 1/2" (.95 x 21.6 cm) aluminum tubing	2
104	010104	1/4" (.64 cm) stainless steel flat washer	4	HI		Coaxial balun with vinyl boots	1
115	050115	Vinyl Boot	1	EA		38 3/4" (98.4 cm) aluminum rod	2
116	240116	Silicone Package	1	EB		40 3/16" (102.1 cm) aluminum rod	1
118	010118	5/16" (.79 cm) stainless steel hex nut	4	EC		37 5/8" (95.6 cm) aluminum rod	1
119	010119	5/16" (.79 cm) stainless steel lock washer	4	EE		36 9/16" (92.9 cm) aluminum rod	1
120	010120	8-32 x 2" (3.0 cm) stainless steel machine screw	10	EF		36 1/4" (92.1 cm) aluminum rod	1
123	010123	8-32 x 1/2" (3.8 cm) stainless steel machine screw	8	EG		35 3/4" (90.8 cm) aluminum rod	1
124	190124	Connector strap	1	EH		35 1/4" (89.5 cm) aluminum rod	1
125	200125	T-match strap	2	EI		34 5/8" (87.9 cm) aluminum rod	4
131	050131	1 1/8" (2.86 cm) black plastic cap	2	EJ		35 1/4" (89.5 cm) aluminum rod	1
232	010232	8-32 x 2 1/2" (6.4 cm) stainless steel machine screw	5	EK		35 3/4" (90.8 cm) aluminum rod	1
326	290326	Danger label	1				

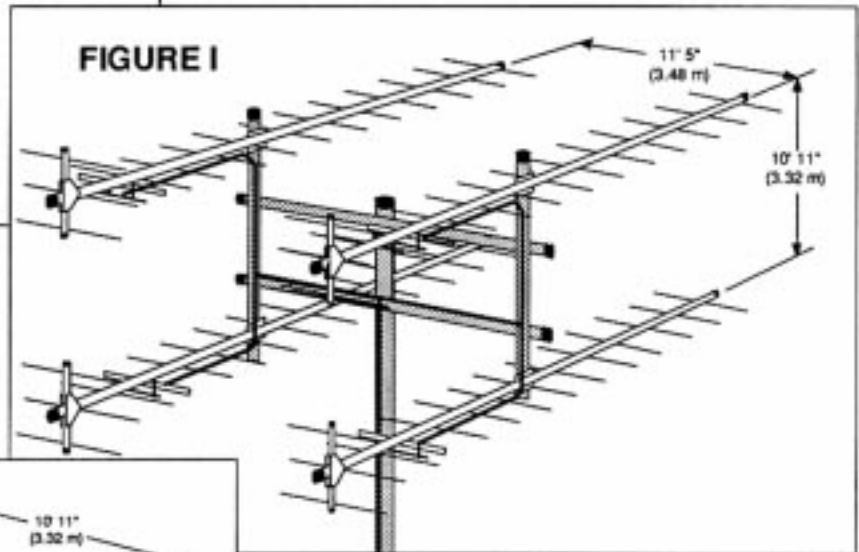
## STACKING THE 215WB

Boomers may be stacked in arrays of two or four 215WB antennas for improved radiation patterns and increased gain. They may be mounted for either horizontal or vertical polarization. When stacking two vertically polarized 215WB's use the 230VPK stacking kit, figure J. When stacking four vertically polarized 215WB's use two 230VPK and one 22-SK, figure K. When stacking two horizontally polarized 215WB's use the 22-SK stacking kit figure H. When stacking four horizontally polarized 215WB's use the 224QK stacking kit, figure I.

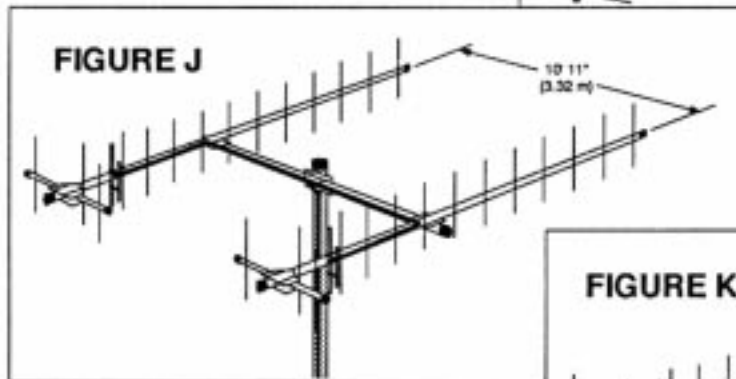
**FIGURE H**



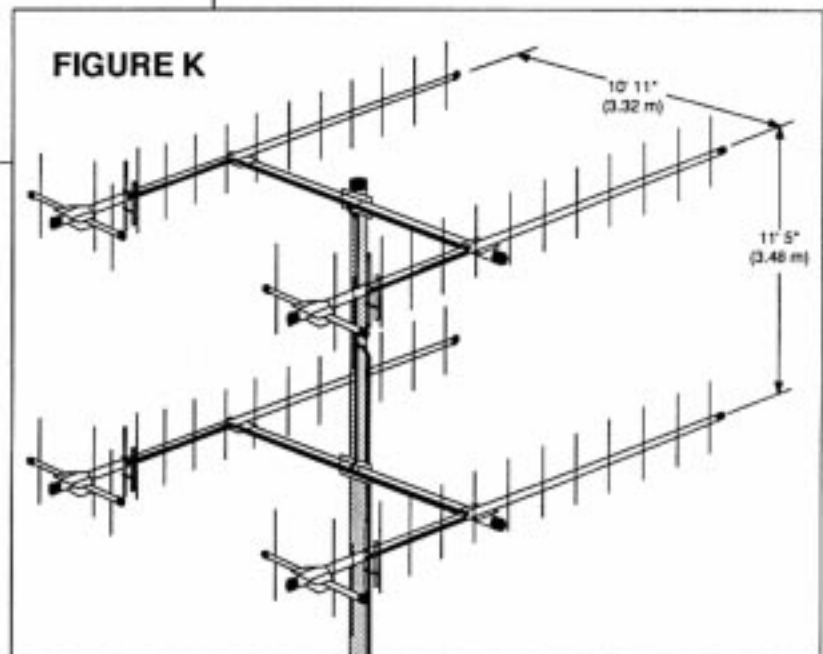
**FIGURE I**



**FIGURE J**



**FIGURE K**



When stacking antennas, all connector brackets must be facing in the same direction for proper phasing. That is to say, vertically polarized antennas must have all connector brackets on one side or the other. Horizontally polarized antennas must have all brackets on either the top or the bottom. One or the other.

**SPECIFICATIONS**

Forward Gain	15.5 dBd
Front to Back Ratio	24 dB
SWR Typical	1.2:1
Boom Length	15 ft. (4.57 m)
Longest Element	39.5 in. (100 cm)
Turning Radius	7.5 ft. (2.29 m)
Wind Surface Area	1.7 ft. <sup>2</sup> (.16 m <sup>2</sup> )
Weight	8 lb. (3.63 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 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.



48 PERIMETER ROAD, MANCHESTER, NH 03108  
603-627-7877 / TELEX 4949472 / FAX 603-627-1764

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE