

R4

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 ACCIDENTLY FALL. FOLLOW THE GUIDELINES FOR ANTENNA INSTALLATIONS RECOMMENDED BY THE U.S. CONSUMER PRODUCT SAFETY COMMISSION AND LISTED IN THE ENCLOSED PAMPHLET.

Your Cushcraft R4 vertical antenna is designed and manufactured to give 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 you antenna package use the parts list on page 8. 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 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

Extreme care must be used for your safety. Although the R4 will operate in almost any location, it will perform best if it is in the clear. Surrounding objects such as trees, power lines, other antennas, etc., will reduce its efficiency. If possible mount the antenna high and in the clear.

Your R4 is a half wavelength vertical which does not require traditional ground radials. Your roof top, balcony, garden, motor home, porch, deck, or tower top etc, are all suitable locations for the R4. **YOU MUST INSURE THAT NEITHER PEOPLE OR 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 are four warning stickers which should be attached to the counterpoise ground rods as shown in figure 2.

INSTALLATION

Following the guidelines in the LOCATION paragraph, place your antenna in its operating location. The base section will conveniently fit over a 1 7/8" (4.8 cm) OD or smaller tube. Now connect your feedline to the R4. Run the feedline to your operating position. Attach the feedline to your transceiver.

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 the LAC-1, LAC-2 or the LAC-4 series.

INITIAL ADJUSTMENT

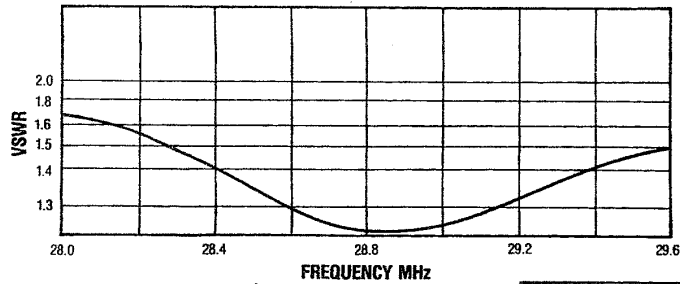
The dimensions shown in figure 3 normally allow proper operation on all bands. The following procedure compensates for variations from one installation to another. Adjustments should be made to the R4 beginning with the section between the base and the first trap. This controls 10 meter operation. Attach a good quality SWR bridge in the coaxial cable as close to the antenna as possible. Measure the SWR across the 10 meter band. If the lowest readings are not near your favorite frequencies the following adjustments may be made. If the frequency of the lowest SWR is too high then lengthen dimension A by 1 inch (2.54 cm). This will lower the operating frequency. If you would like to raise the frequency of 10 meters, dimension A should be shortened. Check the SWR to see if the lowest reading is on the proper frequency. If it is satisfactory you may use this procedure to adjust dimension B for 15 meters and dimension C for 20 meters. The antenna does not need to be adjusted for 12 meter operation. When the antenna is completely assembled and tuned check all fasteners to be sure that they are tight.

SPECIFICATIONS

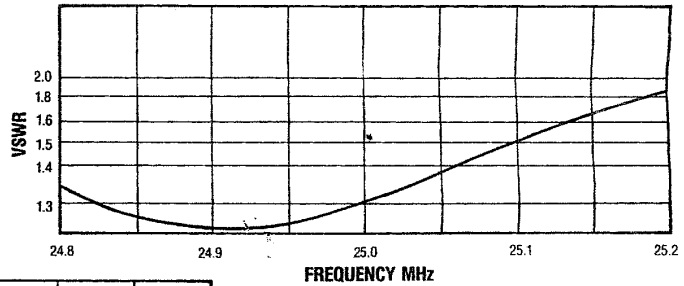
R4

Frequency, Meters	10,12,15,20
Electrical Wavelength	
Each Band	Half-wave
SWR 1.2:1 Typical	
2.1 Bandwidth	10m-2.0-1.7MHz, 12m-100KHz, 15m-450KHz, 20m-350KHz
Power Rating, Watts PEP	1800
Radiation Angle, Typical	At Horizon
Freq Selection	Automatic
Horizontal Rad. Pattern Deg.	360°
Height, ft(m)	18(5.5)
Mast Size Range, In.(cm)	1.5-1.75(3.8-4.4)
Wind Load, ft ² (m ²)	1.4(.13)
Weight, lb(kg)	8(3.7)

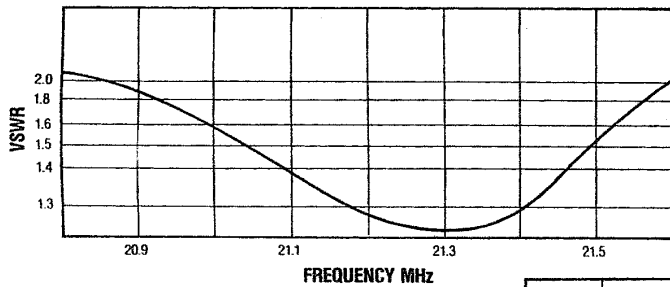
10 METERS



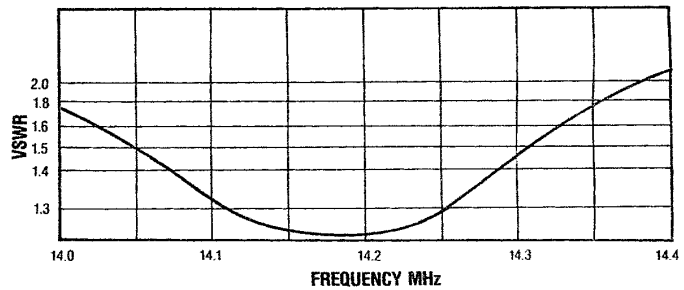
12 METERS







15 METERS



20 METERS



ROD BRACKET ASSEMBLY

KEY	P/N		DESC	SIZE	QTY
10	010010		LOCK WASHER	#8	12
11	010011		HEX NUT	8-32	12
79	010079		MACHINE SCREW	8-32 x 1/2" (1.27 cm)	12
96	202296		ROD BRACKET		4

#1-ASSEMBLE GROUND ROD BRACKETS

Using figure 1 assemble the rod brackets. First assemble two rod brackets leaving the screws and nuts loose. Now assemble a second set of these brackets. Attach the two halves loosely around the base insulator.

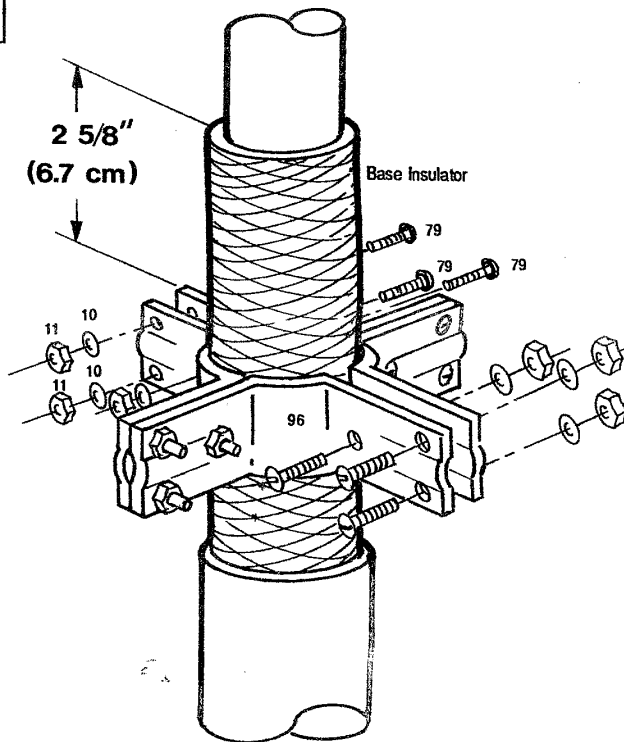


FIGURE 1
ROD BRACKET ASSEMBLY

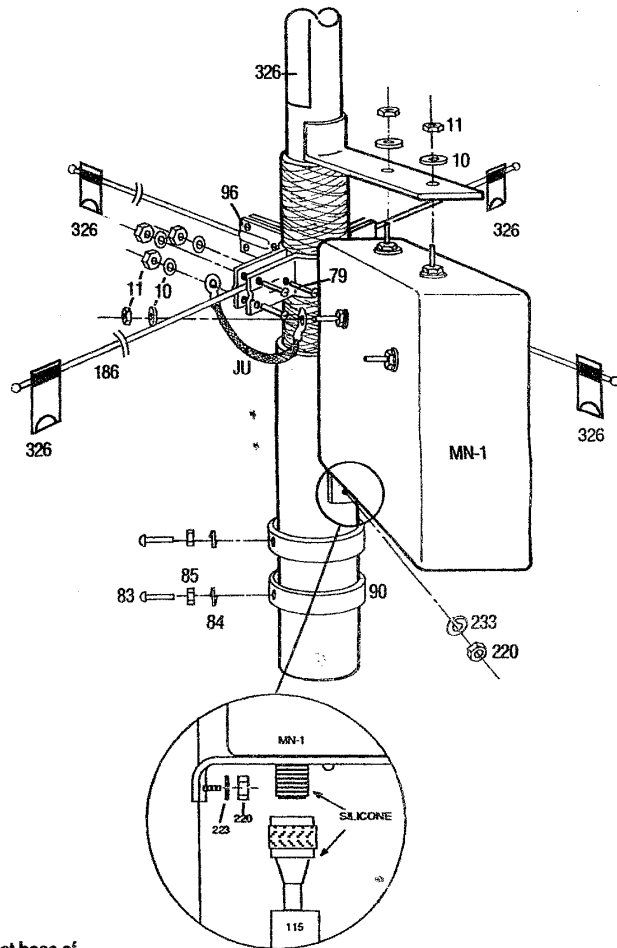
BASE ASSEMBLY PARTS

KEY	P/N	DESC	SIZE	QTY
83	010083	MACHINE SCREW	1/4-20 x 1 1/4" (3.2 cm)	2
84	010084	LOCK WASHER	1/4"	2
85	010085	HEX NUT	1/4-20	2
90	200090	MAST MT. RING		2
96	20296	ROD BRACKET		4
JU		JUMPER STRAP		1
79	010079	MACHINE SCREW	8-32 x 1/2" (1.27 cm)	12
10	010010	LOCK WASHER	#8	15
11	010011	HEX NUT	8-32	15
233	010233	LOCK WASHER	#10	1
220	010220	HEX NUT	10-24	1
186	221186	IG ROD	.1" x 48" (.25 x 122 cm)	4
326	290326	WARNING LABEL		5
116	240116	SILICONE PACKET		1
115	050115	CONNECTOR BOOT		1
MN-1		IMPEDANCE MATCHING ASSEMBLY		1

#2 - ASSEMBLE BASE

Referring to figure 2 attach the Impedance Matching Assembly Box to the radiator bracket as shown. To do this you may have to rotate the rod bracket slightly. The bottom of the box should be attached to the lower bracket as shown. Attach braid JU between the box and the rod brackets as shown. Next assemble and position the mast mount rings (90).














**FIGURE 2
BASE ASSEMBLY**

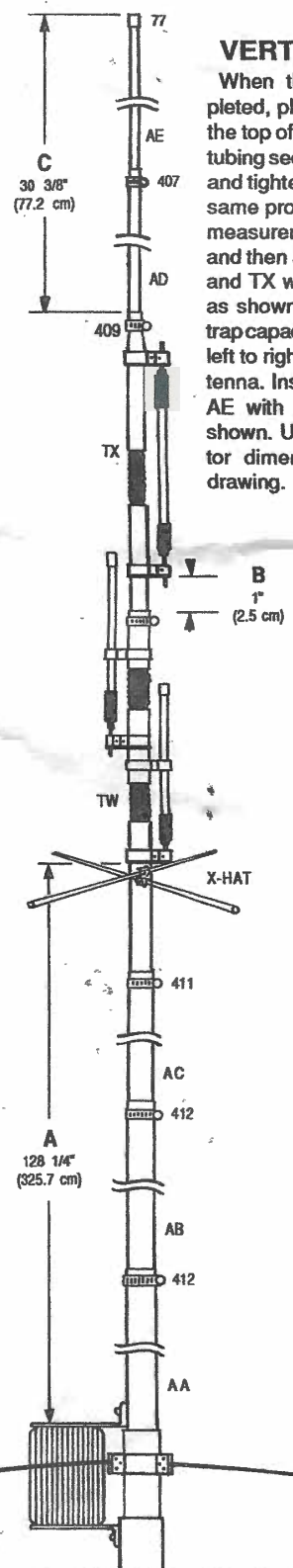


**FIGURE 5
FEEDLINE CONNECTION**

Oversized connector hole at base of black box is for moisture drainage.

VERTICAL ASSEMBLY PARTS

KEY	P/N		DESC	SIZE	QTY
407	030407		WORM CLAMP	3/8" (9 cm)	1
409	030409		WORM CLAMP	3/4" (1.9 cm)	1
410	030410		WORM CLAMP	7/8" (2.2 cm)	1
411	030411		WORM CLAMP	1 1/4" (3.2 cm)	1
412	030412		WORM CLAMP	1 1/2" (3.8 cm)	2
77	050077		PLASTIC CAP	3/8" (9 cm)	1
AE			ALUM TUBING	3/8 x 24" (9 x 61 cm)	1
AD			ALUM TUBING	1/2 x 24" (1.3 X 61 CM)	1
AC			ALUM TUBING	1 1/8 x 48" (2.9 x 121.9 cm)	1
AB			ALUM TUBING	1 1/4 x 48" (3.2 x 121.9 cm)	1
AA			BASE SECTION	48" (121.9 cm)	1
TW			10 & 12 M TRAP		1
TX			15 M TRAP		1



#3
VERTICAL ASSEMBLY

When the base section is completed, place worm clamp 412 over the top of the base tube (AA). Insert tubing section AB in 4 inches (10 cm) and tighten the clamp. Continue the same procedure with AC. Note the measurement point shown in figure 3 and then attach trap assemblies TW and TX with the arrows pointing up as shown in figure 3. The external trap capacitors should alternate from left to right as you assemble the antenna. Install tubing sections AD and AE with clamps 409 and 407 as shown. Use care in setting the radiator dimensions as shown on the drawing.

FIGURE 3
VERTICAL ASSEMBLY

#4 - ASSEMBLE X-HAT

Assemble and attach the X-hat assembly to trap TW as shown in figure 4.







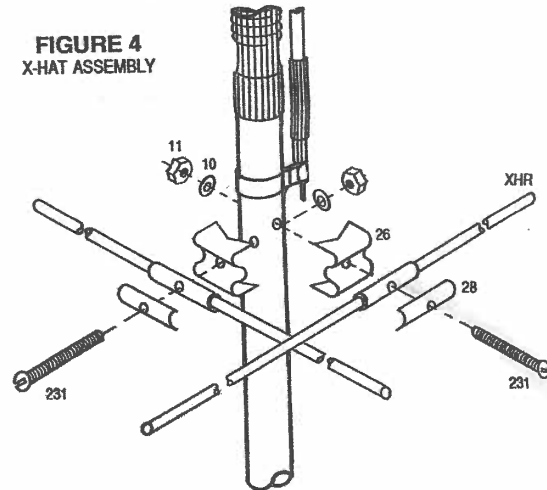
KEY	P/N		DESC	SIZE	QTY
26	190026		FORMED BRACKET	7/8" (2.2 cm)	2
XHR			ELEMENT ROD	3/16 x 36" (.5 x 91.4 cm)	2
231	010231		MACHINE SCREW	8-32 x 1 3/4" (4.4 cm)	2
10	010010		LOCK WASHER	#8	2
11	010011		HEX NUT	8-32	2
28	190028		ALUM HALF WASHER		2

FIGURE 4
X-HAT ASSEMBLY

**#5 - ATTACH IG RODS**

Attach the 48 inch (122 cm) IG rods to the rod bracket on the antenna base. Slip them into the slots on the end of the bracket and firmly tighten the machine screws and nuts. Figures 1 and 2. Attach warning labels 326 to the ends of the IG rods as shown in figure 2.

#6 - FEEDLINE

We have provided a weatherproof boot for the PL-259 connector on your feedline. Follow figure 5 on page 3 to install it. Insert the antenna end of you coax through the small end of your connector boot. Many cables are very tight which results in an excellent weather seal. Attach the PL-259 to the end of your coax. Spread the silicone on the treads of the antenna connector. Silicone should not be spread on the center pin. Apply the remaining silicone to the outside of the connector. Slip the boot over the connector.

MASTER PARTS LIST

KEY	P/N	DESCRIPTION	QTY	KEY	P/N	DESCRIPTION	QTY
AB		1 1/4" x 48" (3.2 x 121.9 cm) aluminum tube slotted one end	1	84	010084	1/4" (.63 cm) stainless steel split lock washer	2
AC		1 1/8" x 48" (2.8 x 121.9 cm) aluminum tube slotted one end	1	85	010085	1/4-20 stainless steel hex nut	2
XHR		3/16" x 36" (.4 x 91.4 cm) aluminum rod with #18 hole drilled mid point	2	220	010220	10-24 stainless steel hex nut	1
AA		Base Section Assembly, 1 1/8" x 48" (2.8 x 121.9 cm)	1	231	010231	8-32 x 1 3/4" (4.44 cm) stainless steel machine screw	2
EQ379	379	0.100" x 48" (.25 x 121.9 cm) stainless steel rod with ball tip one end	4	233	010233	#10 stainless steel split lock washer	1
TW		10-12 meter Trap Assembly 26" (66 cm)	1	407	030407	1/2" (1.27 cm) stainless steel worm clamp	1
TX		15 meter Trap Assembly 25 1/2" (64.8 cm)	1	409	030409	3/4" (1.9 cm) stainless steel worm clamp	1
AD		1/2" x 24" (1.27 x 61 cm) aluminum tube slotted one end	1	410	030410	1" (2.54 cm) stainless steel worm clamp	1
AE		3/8" x 24" (.95 x 61 cm) aluminum tube	1	411	030411	1 1/4" (3.17 cm) stainless steel worm clamp	1
MN-1		Impedance Matching Box Assembly	1	412	030412	1 1/2" (3.81 cm) stainless steel worm clamp	2
79	010079	8-32 x 1/2" (1.27 cm) stainless steel machine screw	12	115	050115	Vinyl connector boot	1
10	010010	#8 internal tooth lock washer	17	77	050077	3/8" (.95 cm) black plastic cap	1
11	010011	8-32 stainless steel hex nut	17	26	190026	7/8" (2.22 cm) formed aluminum bracket with #8 hole	2
83	010083	1/4-20 x 1 1/4" (3.2 cm) stainless steel machine screw	2	28	190028	Aluminum half washer	2
				296	202296	7/8" x 3 3/4" (2.22 x 9.52 cm) radial clamp	4
				90	200090	Mast mounting ring	2
				116	240116	Silicone grease packet	1
				326	290326	Warning label	5
				JU		Jumper Strap	1

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.



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SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE