

# ASSEMBLY INSTRUCTIONS A144-11, A144-7, A220-11, A430-11

## PARTS LIST

DESCRIPTION	QUANTITY			
	A144-11	A144-7	A220-11	A430-11
<b>BOOMS:</b>				
7/8" x 50" boom sections -----	2			
1" x 48" boom sections -----	1		1	
7/8" x 44" boom sections -----		1		
3/4" x 47" boom sections -----		1		
7/8" x 56" boom sections -----			1	
1" x 54" boom sections -----				1

## ELEMENTS: 3/16" Solid Rod

#1 Reflector -----	*40 1/4"	*40 1/4"	*26 1/4"	*13 3/4"
#2 Dipole w/Reddi Match -----	38 7/16"	38 7/16"	24 15/16"	12 7/8"
#3 Director -----	36 3/4"	36 3/4"	23 3/4"	12 1/4"
#4 Director -----	36 1/4"	36 1/4"	23 1/2"	12 1/8"
#5 Director -----	35 3/4"	35 3/4"	23 1/4"	12"
#6 Director -----	35 1/4"	35 1/4"	23"	11 7/8"
#7 Director -----	34 3/4"	34 3/4"	22 3/4"	11 3/4"
#8 Director -----	34 1/4"		22 1/2"	11 5/8"
#9 Director -----	33 3/4"		22 1/4"	11 1/2"
#10 Director -----	33 1/4"		22"	11 3/8"
#11 Director -----	32 3/4"		21 3/4"	11 1/8"

4" x 6" Formed aluminum mast bracket -- 1  
 \*Cutting tolerance of 1/16" on all elements

PART #	DESCRIPTION	QUANTITY			
		PARTS PACKAGE A144-11	A144-7	A220-11	A430-11
3	1 1/2" U-bolts -----	4	1	1	1
4	1 1/2" U-bolt brackets -----		1	1	1
12	3/4" Plastic caps -----	2	3	2	
14	1 1/2" U-bolt backing plates -----		1	1	1
15	1/4" Flat steel washers -----	4			
16	1/4" Lock washers -----	8	2	2	2
17	1/4 - 20 Hex nuts -----	8	2	2	2
21	10 - 24 x 2" Bolts -----	10	6	10	10
22	10 - 24 Hex nuts -----	10	6	10	10
25	7/8" Formed aluminum brackets ---	10	6	10	10
28	Aluminum half washers -----	10	6	10	10
29	#10 Internal tooth lock washers ----	10	6	10	10
38	1" Plastic caps -----			1	2
39	3/8" Aluminum spacers -----	4			
53	1/2" Plastic caps -----				2
61	7/8" Plastic caps -----	2	1	1	
G-10 1/4	1" Telescope clamps -----	2		1	

Your Cash Craft VHF/UHF Yagi 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 if care is used in assembly and installation.

**MASTING:** The mast mount brackets will take up to a 1 1/2" O.D. mast. A 1 1/4" O.D. television type tubing is satisfactory for any of the single yagis.

**MOUNTING:** When mounting the yagis on the same mast with other dissimilar antennas they may be mounted within 4' of the other antenna. Generally it is best to mount these yagis above lower frequency antennas.

**ROTATOR:** A good quality television antenna rotator will easily handle any of these antennas.

**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 installed approximately 4' from the top.

**BOOM ASSEMBLY:** For the A144-11 slide the 7/8" sections (as far as the black line) into the 1" center section and tighten securely with the 1" telescope clamps, figure 1. To align the boom sections insert a 2" bolt through one hole in each section and sight along the boom.

Assemble the two section A220-11 boom in the same manner as the A144-11 boom. The two A144-7 boom sections are secured by the #4 element and bracket. Select this element from the bundle and assemble it at the splice as shown in figures 2 and 5.

**ELEMENT ASSEMBLY:** The elements (not including the dipole) are taped in one bundle. They are progressively shorter to improve bandwidth. Mount the reflector (longest element) at the 7/8" end of the A144-7, the 1" end of the A220-11 and either end of the A144-11. Mount the dipole next, then each progressively shorter director up to the front director #7 or #11, which is the shortest element, figure 5. Align the elements and tighten securely. The A430-11 elements are preassembled on the boom.



FIGURE 1



FIGURE 2



FIGURE 3



FIGURE 4

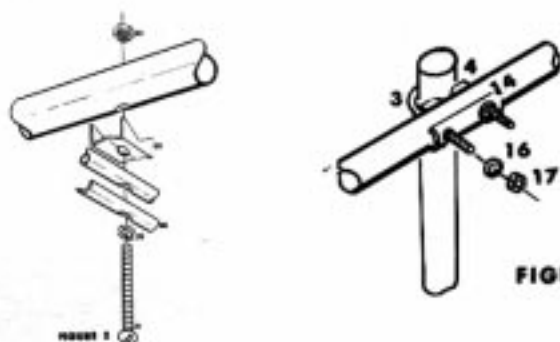


FIGURE 5

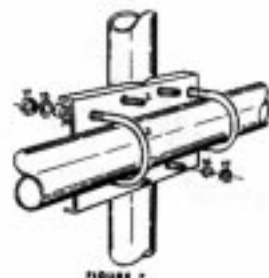


FIGURE 6

**MAST MOUNT:** The A144-7, A220-11 and A430-11 use a single U-bolt and bracket assembled as shown in figure 6. There are two sets of U-bolt holes in the booms, to give either horizontal or vertical polarization. The A144-11 used a 4" x 6" plate mounted between the No. 5 and 6 elements, figures 1 and 7. The boom may be rotated in the bracket to give either horizontal or vertical polarization.

**FEED LINE:** Attach a standard PL-259 coax fitting to your 52 ohm feed cable and connect it to the coax fitting on the Reddi Match, figure 8.

**TUNING:** The Reddi Match is set at the factory for 52 ohm coax and center band operation. For best results it should be individually tuned at your site, by using a good quality standing wave ratio bridge. It is not necessary to cut your feed line or prune it to a particular length. Any feed length cable may be used with the beam. Always make the cable as short as possible to reduce feed line loss.

- (1.) Insert the standing wave ratio bridge in the line between the transmitter and the antenna. Set the transmitter to your center operating frequency.
- (2.) Adjust the bridge for maximum forward power. Check the standing wave ratio with the bridge in the reverse position. If the VSWR is high loosen the tuning strap and adjust it slightly in either direction. Move away from the antenna and check the reading. If the VSWR has increased move the strap back to its original position and adjust in the opposite direction. If the SWR dropped repeat the adjustment procedure until there is little or no reflected power indicated on the bridge.
- (3.) When the antenna is completely assembled and tuned tighten the feed line connections, tape them and coat with a clear acrylic spray or equal. Run the coaxial feed line along the boom and down the mast with electrical tape to hold it in position.
- (4.) If necessary, re-align the elements and tighten all fasteners securely. Mount the plastic caps on the dipole and boom ends.

**OPERATION:** The A144-11 and A144-7 are cut at 144.5 mhz. They will cover the entire 2 meter band with a VSWR of less than 1.8-1, and the lower end with a VSWR of less than 1.5-1. The antennas may be cut for FM repeater or other use at high end of the band. For operation at the high end cut 1/4" from each end of each element for 1 mhz of change.

The A220-11 is cut at 221.0 mhz and will cover the entire band with a VSWR of 1.5-1 or less.

The A430-11 is cut at 432 mhz and will cover the most popular portion of the band with a VSWR of less than 1.5-1. For operation at the high end cut 1/32" from each end of each element for 1 mhz of change.

## STACKING PROCEDURE

Any of the Cush Craft VHF/UHF beams may be stacked to give an additional 3 db gain, lower angle of radiation, and greater capture area. The following instructions apply to the Cush Craft coaxial stacking kits. This same procedure may also be used in fabricating your own stacking harness. Cable lengths Chart 1 Dimension B are the same for both RG-59/U and RG-11/U cables.

The stacking kits include two RG-59/U cable - Q sections, with PL-259's and T fitting.

- (1.) Before connecting the harness tune the antennas separately by following the procedure for the single antennas.
- (2.) Mount the two antennas on your mast with both Reddi Match units facing in the same direction, figure 9. Spacing between the antennas dimension A is given in Chart 1.
- (3.) Attach an end of the stacking harness to each Reddi Match. Run the cable along the boom and mast. Connect your 52 ohm feed cable to the center T fitting, figure 9. Any excess cable in the harness can be coiled equally on each side of the center insulator and taped to the mast.
- (4.) If it is necessary to tune the complete array, tune the lower antenna only. When the array is tuned tighten all connections. Cable connectors may be taped and covered with a clear acrylic spray or equal.

**VPK:** To assemble the vertical polarization kit slide the two 1 1/2" boom sections into the 1 5/8" center splice. The bolts of the 4" x 6" mast mounting bracket serve as the splice clamps. Mount the antennas on the ends of the boom with both Reddi Match rods pointing in the same direction. Connect the cable and tune the array as outlined in the previous section.



FIGURE 8

CHART #1

MODEL NO.	DIMENSION	
	A	B
A144-11	79"	95 1/4"
A144-7	79"	67 3/4"
A220-11	50"	61 3/4"
A430-11	26"	32 1/4"

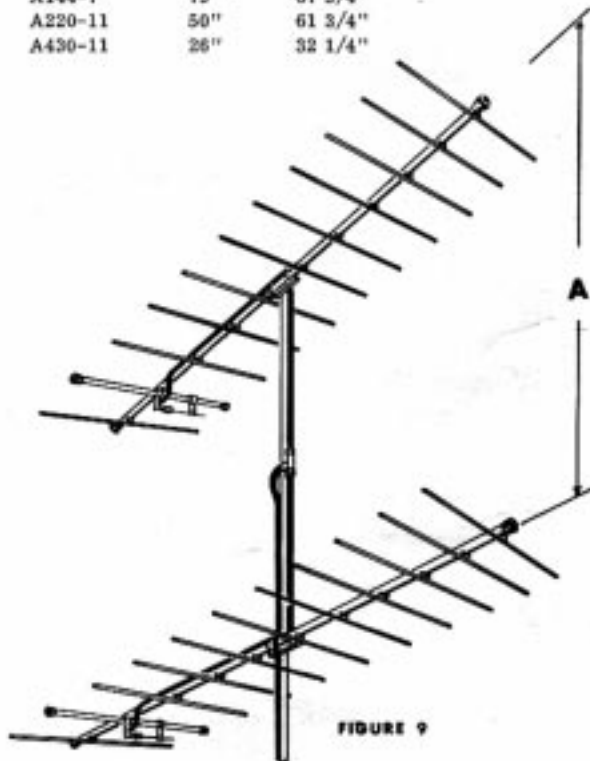


FIGURE 9

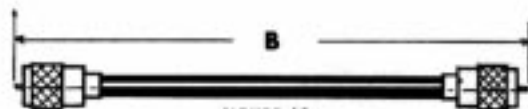


FIGURE 10



FIGURE 11