

ASSEMBLY AND INSTALLATION INSTRUCTIONS



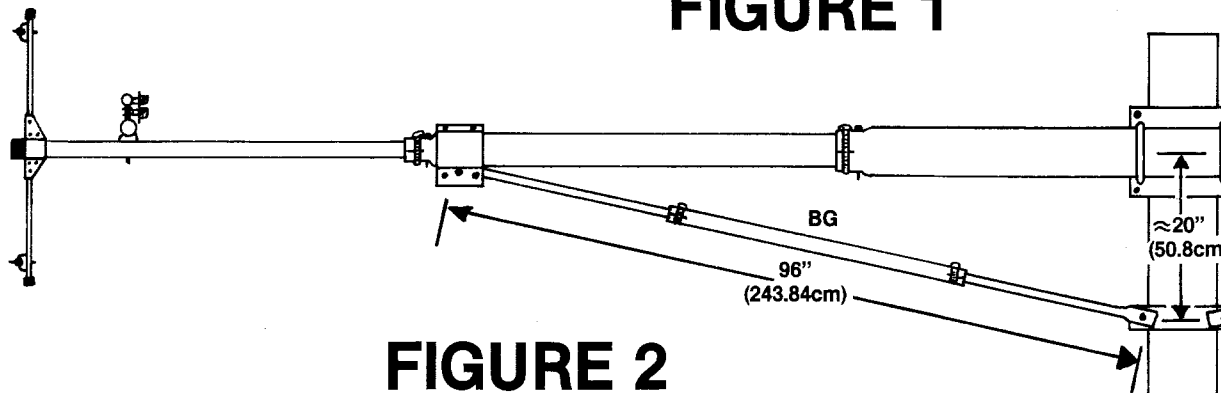
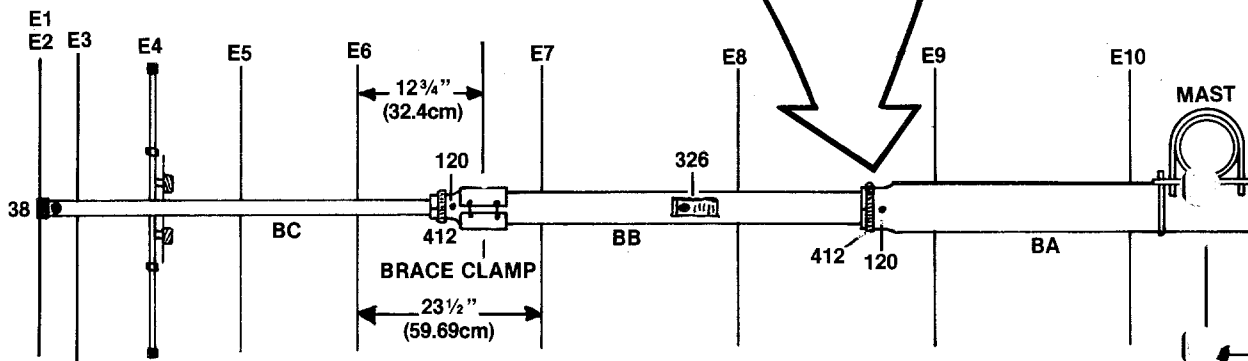
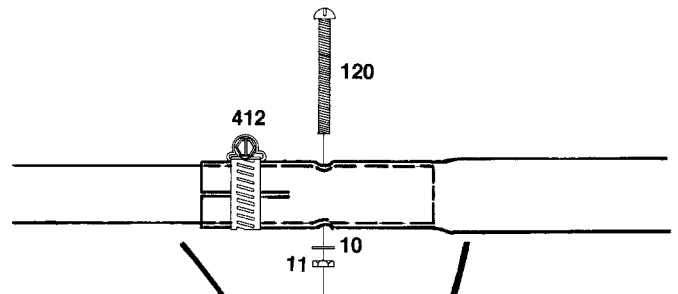
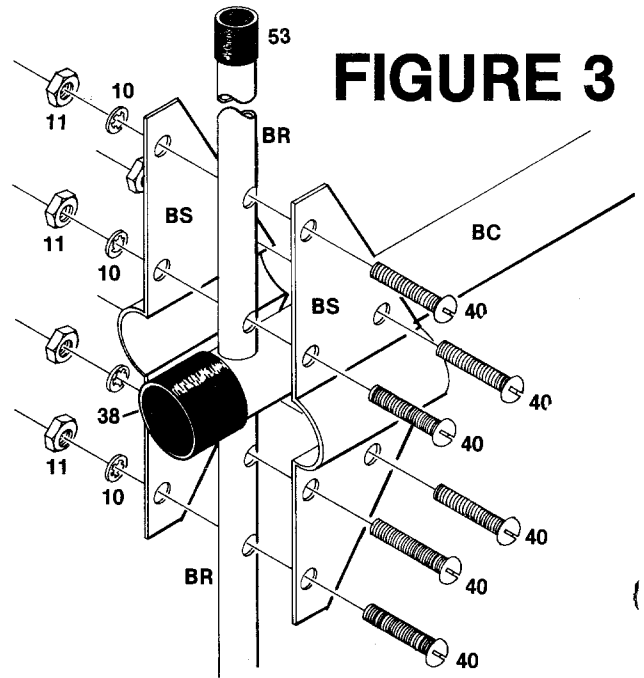
2 METER BOOMER 4218 XL

 **cushcraft**
CORPORATION
THE ANTENNA COMPANY

951332 (6/85)

Part Chart A Boom Assembly

P/N	KEY	DISPLAY	DESC.	SIZE	QTY
	BA		Boom Center	72 x 1 1/2 in (182.88 x 3.8cm)	2
	BE		Center Splice	12 x 1 3/8 in (30.48 x 3.49cm)	1
	BB		Boom Section	60 x 1 1/4 in (152.4 x 3.18cm)	2
	BC		Rear Boom	55 x 1 in (139.7 x 2.54cm)	1
	BD		Front Boom	42 x 1 in (106.7 x 2.54cm)	1
010120	120		Machine Screw	#8-32 x 2 in (5.8cm)	6
010010	10		Lock Washer	#8	12
010011	11		Hex Nut	#8-32	12
	BS		Reflector Bracket	2 x 5 in (5.8 x 12.7cm)	2
	BR		Reflector Support	12 x 1/2 in (30.48 x 1.27cm)	2
010040	40		Machine Screw	#8-32 x 1 1/4 in (3.18cm)	6
030412	412		Worm Clamp	1 1/2 in (3.8cm)	4
030413	413		Worm Clamp	1 3/4 in (4.44cm)	2
050038	38		End Cap	1 in (2.54cm)	2
050053	53		End Cap	1/2 in (1.27cm)	2
290326	326		Danger Label		1
050115	115		Vinyl Boot		1
240116	116		Silicone Package		2



Your Cushcraft antenna is 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 4218XL mast mount bracket will take up to a 2in(5cm) OD mast. Because of the large antenna size, we recommend a heavy gauge 2in(5cm) OD steel mast. Before deciding on the location and height of your antenna you should check with your local building department for zoning and building regulations pertaining to installations.

ROTATOR: Use a good quality rotator designed for use with amateur radio stations.

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 THIS 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.

ASSEMBLY INSTRUCTIONS

Assemble the boom as shown in figures 1 and 2. The boom sections are aligned with 8-32 machine screws. The sections are held securely in position with telescoping clamps. The trigon reflector will be mounted on the boom later.

Assemble the T-match to the driven element as illustrated in figure 4A. The position of the sliding straps 125 is measured from the center of the element. The flattened end of tube ET should be attached to the connector block as shown. The connecting strap 124 must be attached on the connector block as shown. The feedline will be attached to the connector closest to the boom and the balun will be connected between the other two connectors. Connect the balun at this time. Coat the outside of the aluminum connector threads and the PL-259s with silicone grease provided. Do not coat the connector center pins or sockets with silicone. Slide the vinyl boots over the connectors and against the plate for a good weather tight connection, figure 4B. Mount the dipole to the boom as shown in figure 4A.

The parasitic solid rod elements should now be attached to the boom. Use chart B2 to determine the proper length for each element being installed. Begin with element number 3 as numbers 1 and 2 will be part of the trigon reflector. Element lengths should be within $\frac{1}{16}$ " (0.16cm) of the length shown in the chart. Secure the elements to the boom as shown in figure 5. After all elements have been attached to the boom, recheck their lengths to confirm they are all correctly placed.

Assemble the boom to mast bracket to the boom as illustrated in figure 6. Now assemble the boom braces as shown in figure 7. Note that the front and rear braces are not identical. The rear brace is shorter.

The braces may be installed above or below the boom with no effect on antenna performance. This feature allows for simplified stacking arrangements in larger arrays. (See stacking information.)

The trigon reflector mounts on section BC as illustrated in figures 2 and 3. The trigon is easily positioned by placing the plastic end cap on the boom and locating the trigon plates BS against the end cap. Tighten the trigon mounting screws insuring that the vertical trigon support tubes BR are perpendicular to the plane of the elements on the boom. Elements 1 and 2 should now be bolted to the rear of the trigon support. See figures 2 and 5.

Mount the antenna and the diagonal braces to your support mast as illustrated in figures 2 and 7. After tightening the boom/mast U-bolts slide the brace U-bolt up or down the mast if necessary to straighten the boom. Tighten the U-bolt. Attach the feedline to the unused connector using the weather proofing procedure you followed with the balun above.

TUNE UP PROCEDURE: The 4218XL does not normally require tuning after assembly. The antenna is tuned to 144.2 MHz as it comes from the factory. If you wish to check the VSWR before installation, please observe the following procedures. Mount the antenna clear of surrounding objects. Keep all metal obstructions such as guy wires and other antennas at least 25 feet (7.6m) away.

Attach a good quality SWR bridge in the coaxial cable as close to the antenna as possible and note the VSWR at your operating frequency. Move the sliding straps on either side of the driven element out towards the end of the dipole by an equal amount of $\frac{1}{4}$ in (0.6cm). Check the VSWR. If the VSWR deteriorated, move the straps back to their original position and go $\frac{1}{4}$ in (0.6cm) beyond towards the center of the driven element. Check the VSWR 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 driven element assembly.

Do not attempt to tune this Yagi by other methods. Ground effects will nullify any adjustments and degraded performance will result.

STACKING: Two 4218XL Yagis may be stacked for higher gain on the same vertical mast using the 4218SK Stacking Kit. Assemble the two antennas. Connect the balun to each antenna. Space the antennas 12ft 7 $\frac{1}{2}$ in (3.85m) apart center to center on your mast, figure 8.

The stacking harness consists of a power divider and two equal lengths of RG8/U cable sections illustrated in figures 8A and 8B. Connect one end of a cable section to each antenna. See the antenna assembly text for information on weather proofing with the vinyl boots. Place the cables along the booms and mast with tape to hold them in position. Connect your feedline to the power divider T-fitting using the vinyl boot to weather protect it. Tape all cables tightly to the mast.

Chart D Driven Element

P/N	KEY	DISPLAY	DESC.	SIZE	QTY
	ED		Driven Element	38 3/4 x 1/2 in (98.42 x 1.27cm)	1
200125	125		Tuning Strap	3/8 in (.95cm)	2
	ET		T-Match Tube	7 x 3/8 in (17.78 x .95cm)	2
	DC		Connector Bracket	2 x 2 1/4 in (5.08 x 5.72cm)	1
010079	79		Machine Screw	#8-32 x 1/2 in (1.27cm)	4
010010	10		Lock Washer	#8	9
01011	11		Hex Nut	#8-32	8
190124	124		Connector Strap	1 1/8 in (3.65cm)	1
050053	53		End Cap	1/2 in (1.27cm)	2
050077	77		End Cap	3/8 in (.95cm)	2
	BN		Balun	22 7/8 <i>skarm/skarm</i> RG-11, 24in (60.96cm) = <i>tip to tip</i>	1
190026	26		Element Bracket	7/8 in (2.22cm)	1
010232	232		Machine Screw	#8-32 x 2 1/2 in (6.35cm)	1

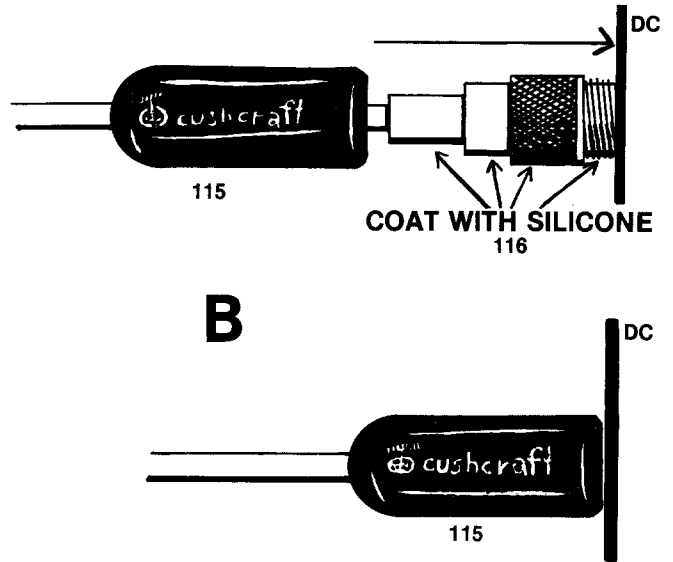


FIGURE 4

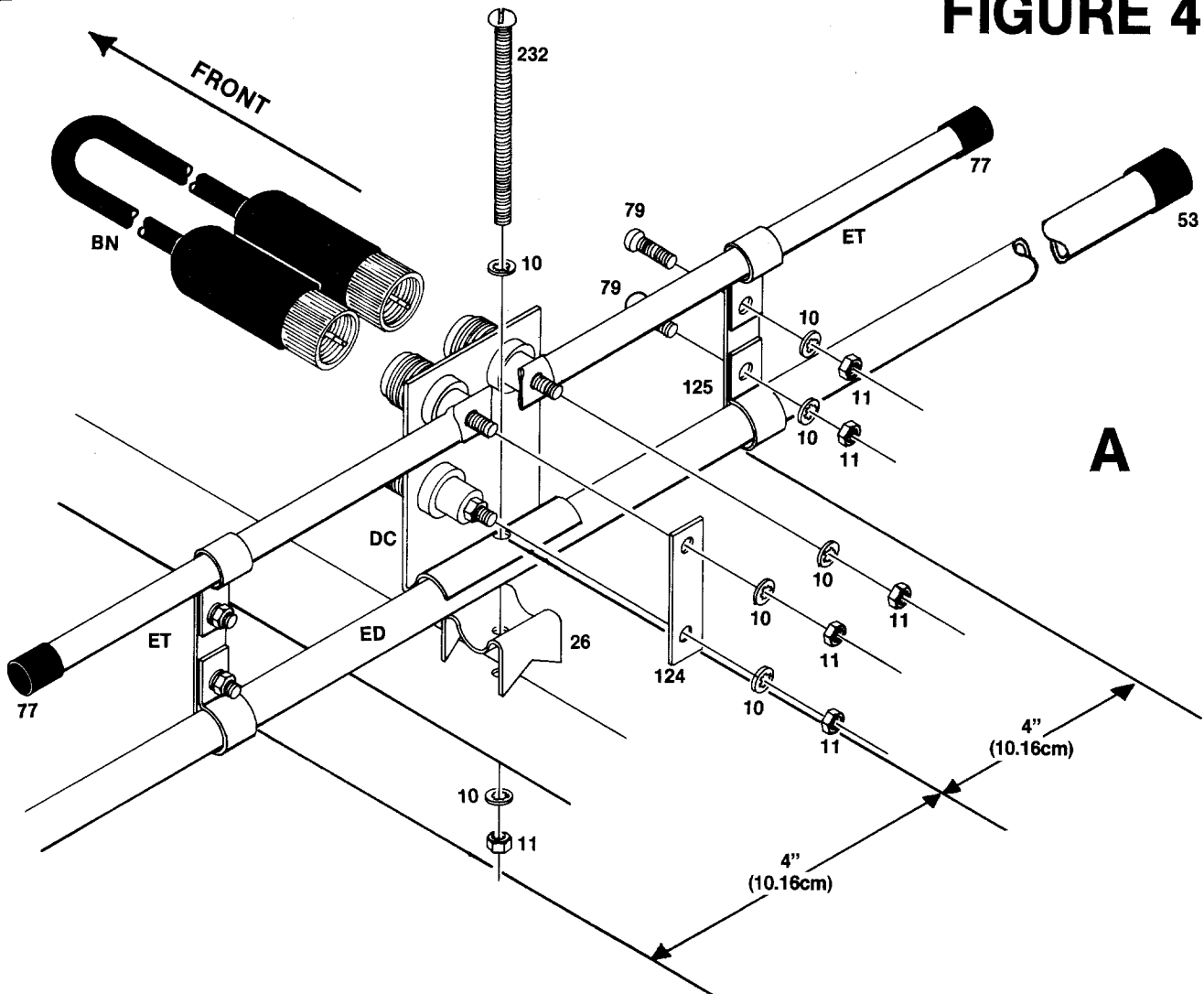


Chart C Brace Assembly

P/N	KEY	DISPLAY	DESC.	SIZE	QTY
	BJ		Brace	36 x 3/4 in (91.44 x 1.90cm)	2
	BG		Rear Brace	36 x 7/8 in (91.44 x 2.22cm)	1
	BH		Front Brace	60 x 7/8 in (152.4 x 2.22cm)	1
	BF		Drilled Brace	36 x 3/4 in (91.44 x 1.90cm)	2
010040	40		Machine Screw	#8-32 x 1 1/4 in (3.18cm)	8
010010	10		Lock Washer	#8	16
010011	11		Hex Nut	#8-32	8
030409	409		Worm Clamp	7/8 in (2.22cm)	4
170063	63		V-Block	3 1/2 in (8.89cm)	1
10404	404		U-Bolt	2 7/16 x 3 1/4 in (6.69 x 8.25cm)	1
010119	119		Lock Washer	5/16" (.79cm)	2
010118	118		Hex Nut	5/16" (.79cm)	2
191647	647		Brace Clamp	3 x 5 in (7.62 x 12.7cm)	4

FIGURE 7

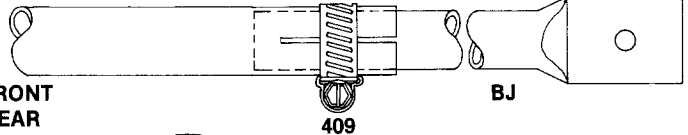
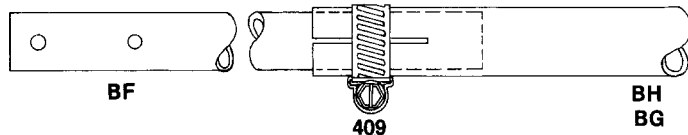
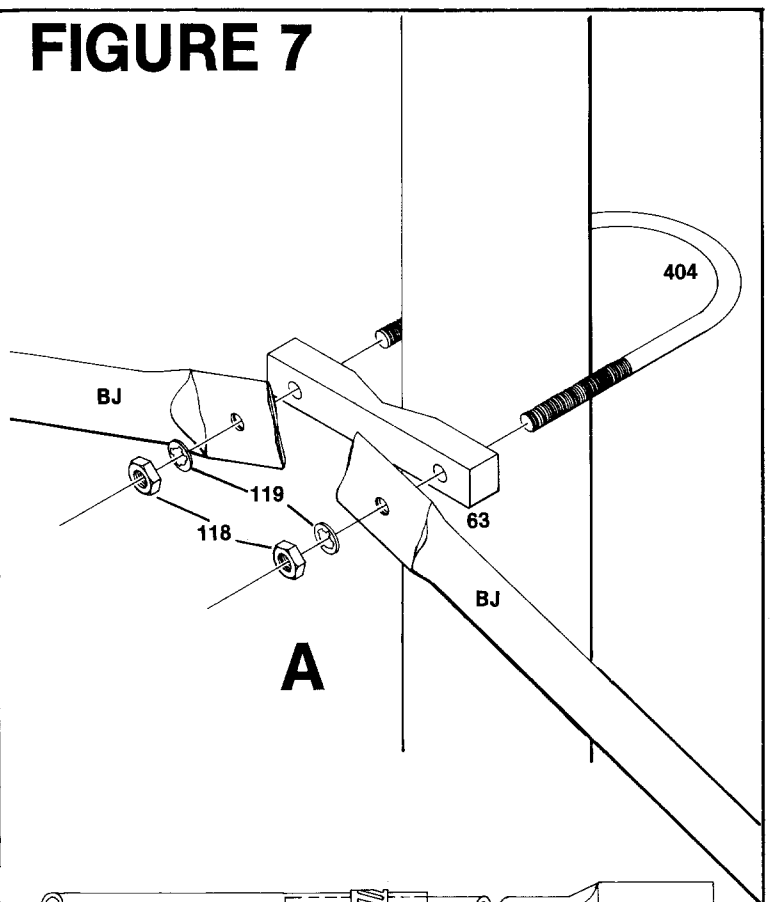


Chart E Boom to Mast Assembly

P/N	KEY	DISPLAY	DESC.	SIZE	QTY
190070	70		Mounting Plate	4 x 6 in (10.16 x 15.24cm)	1
010401	401		U-Bolt	3 x 1 3/4 in (7.62 x 4.45cm)	2
010404	404		U-Bolt	2 7/16 x 3 1/4 in (6.19 x 8.25cm)	2
010104	104		Flat Washer	1/4 in (.63cm)	4
010084	84		Lock Washer	1/4 in (.63cm)	4
010085	85		Hex Nut	1/4-20 (.63cm)	4
010119	119		Lock Washer	5/16 in (.79cm)	4
010118	118		Hex Nut	5/16 in (.79cm)	4

B

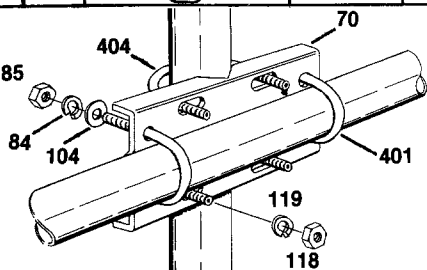
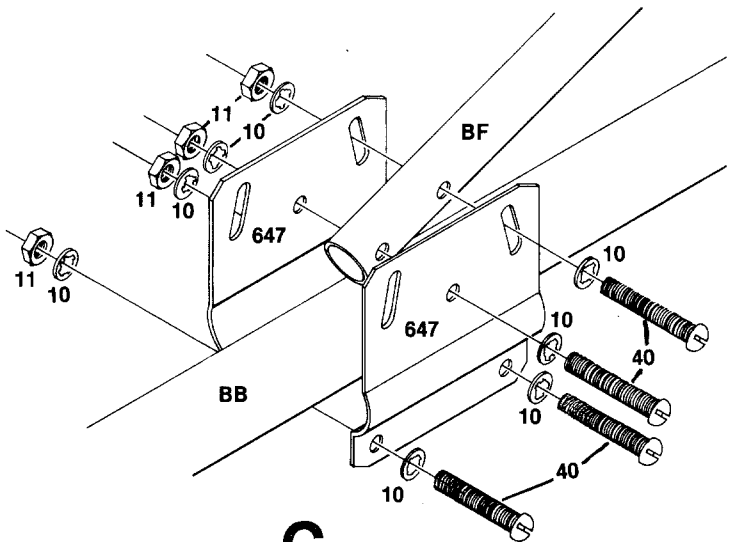


FIGURE 6

C

FIGURE 8

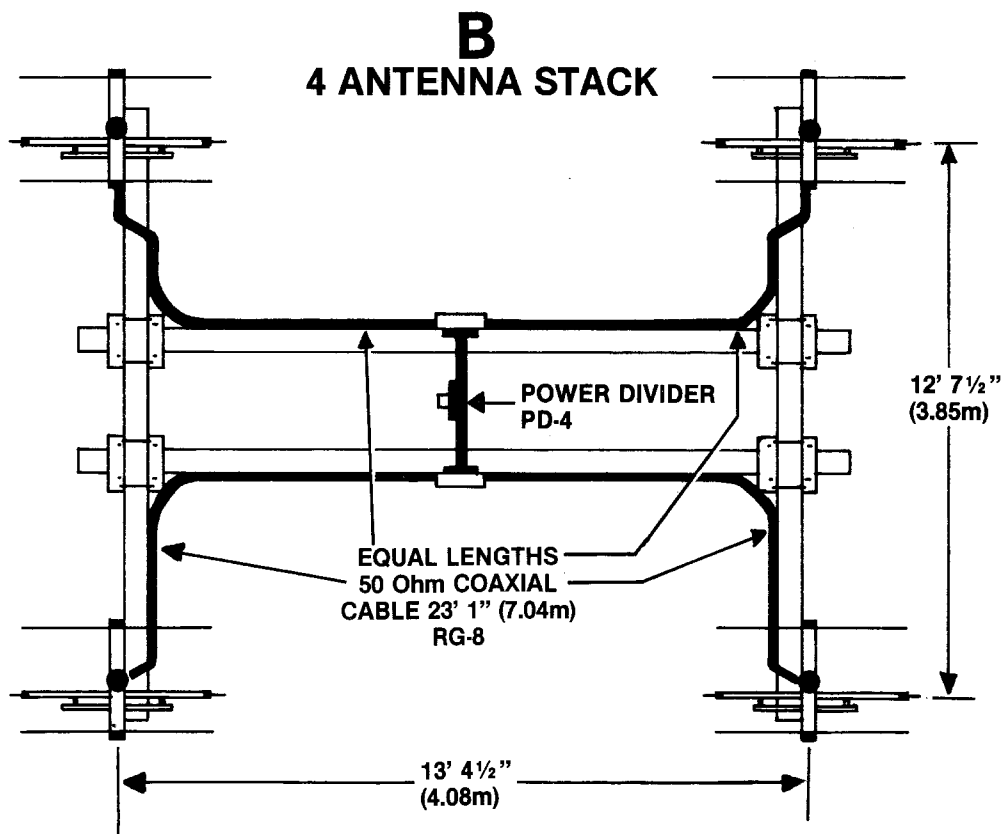
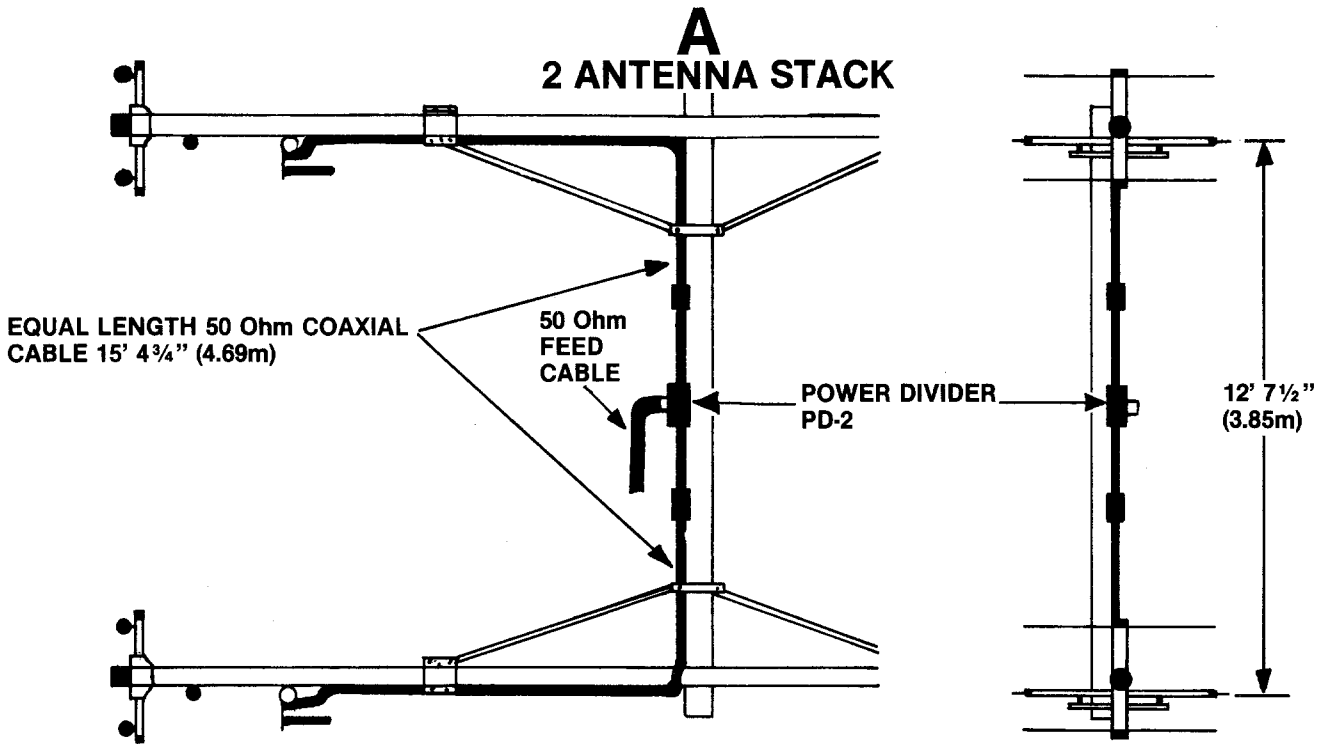


Chart B1 Element Assembly







P/N	KEY	DISPLAY	DESC.	SIZE	QTY
010120	120		Machine Screw	#8-32 x 2in (5.8cm)	7
010010	10		Lock Washer	#8	34
010011	11		Hex Nut	#8-32	17
010232	232		Machine Screw	#8-32 x 2 1/2 in (6.35cm)	10
190026	26		Element Bracket	7/8 in (2.22cm)	17
190028	28		Half Washer	1in (2.54cm)	17

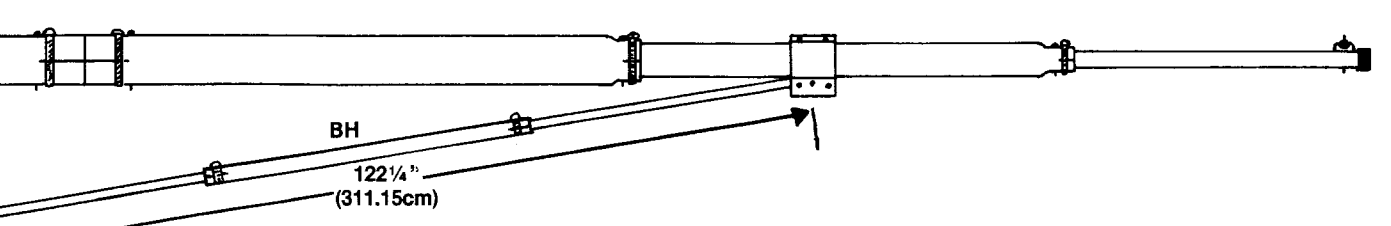
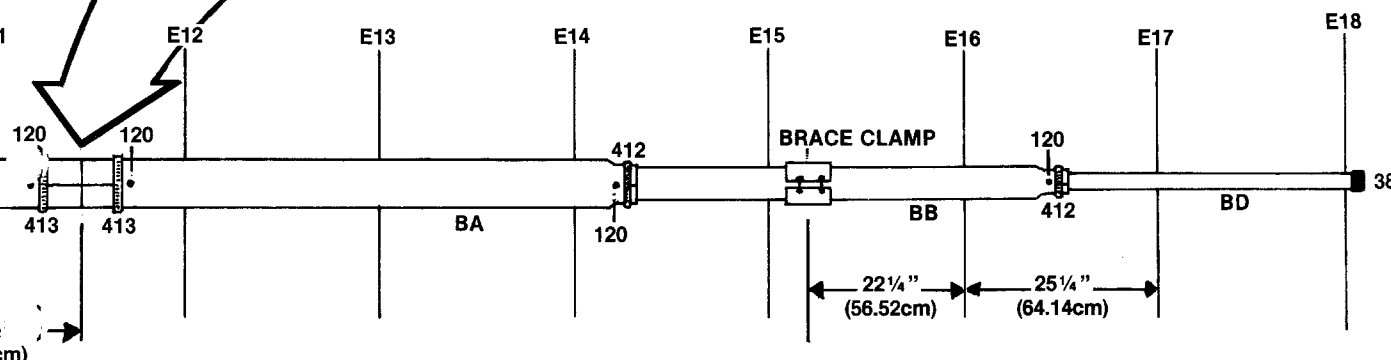
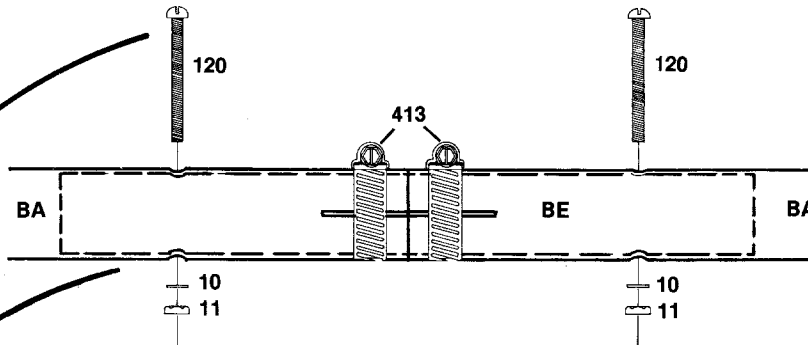
CHART B2 ELEMENTS

ELEMENT	LENGTH
E1-E2	39 7/16" (100.2cm)
E3	40 7/16" (101.8cm)
E4	38 3/4" (98.4cm)
E5	37 7/8" (96.2cm)
E6-E7	37" (94.0cm)
E8	36 1/16" (93.5cm)
E9	36 7/8" (91.8cm)
E10	35 7/8" (91.1cm)
E11	35 3/8" (90.5cm)
E12	35 3/8" (89.8cm)
E13-E18	35 1/8" (89.2cm)

120(E1, E2, E3, E5, E6, E17, E18)
232(E4, E7-E16)

ELEMENT

FIGURE 5



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, NEGLIGENCE, ACCIDENT OR IMPROPER INSTALLATION. ANY REPAIRS OR ALTERATIONS OUTSIDE OF THE CUSHCRAFT FACTORY WILL NULIFY THIS WARRANTY.

4218XL SPECIFICATIONS

FREQUENCY RANGE MHz	144-145
FORWARD GAIN dBd	17.2
Front/Back RATIO dB	24
BOOM LENGTH ft. (m)	28.8(8.78)
WAVELENGTH	4.2
WEIGHT lb(kg)	14.3(6.5)
TURNING RADIUS FT(m)	16.66(5.08)
WIND LOAD ft ² (m ²)	3.5(0.33)
LONGEST ELEMENT in(cm)	40¹/₁₆(101.76)
NUMBER OF ELEMENTS	18
BEAM WIDTH, DEG. E-PLANE H-PLANE	2 x 13 2 x 14.5
SIDE LOBE ATTENUATION dB	60 at 90° OFF AXIS
SWR TYPICAL	1.2:1
IMPEDANCE OHMS	50
CONNECTOR	SO-239
RECOMMENDED STACKING DISTANCES E-PLANE H-PLANE	13'4 1/2" (4.08m) 12'7 1/2" (3.85m)



P.O. BOX 4680, MANCHESTER, N.H. 03108

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Part Chart A Boom Assembly

PIN	KEY	DISPLAY	DESC.	SIZE	QTY
BA			Boom	72 x 1 1/2 in (182.88 x 3.8cm)	2
BE			Center	12 x 1 3/4 in (30.48 x 3.49cm)	1
BB			Splice	60 x 1 1/4 in (152.4 x 3.18cm)	2
BC			Section	55 x 1 in (139.7 x 2.54cm)	1
BD			Rear Boom	42 x 1 in (106.7 x 2.54cm)	1
010120	120		Machine Screw	#8-32 x 2 in (5.8cm)	6
010010	10		Lock Washer	#8	12
010011	11		Hex Nut	#8-32	12
	BS		Reflector Bracket	2 x 5 in (5.8 x 12.7cm)	2
	BR		Reflector Support	12 x 1/2 in (30.48 x 1.27cm)	2
010040	40		Machine Screw	#8-32 x 1 1/4 in (3.18cm)	6
030412	412		Worm Clamp	1 1/2 in (3.8cm)	4
030413	413		Worm Clamp	1 3/4 in (4.44cm)	2
050038	38		End Cap	1 in (2.54cm)	2
050053	53		End Cap	1/2 in (1.27cm)	2
290326	326		Danger Label		1
050115	115		Vinyl Boot		1
240116	116		Silicone Package		2

FIGURE 3

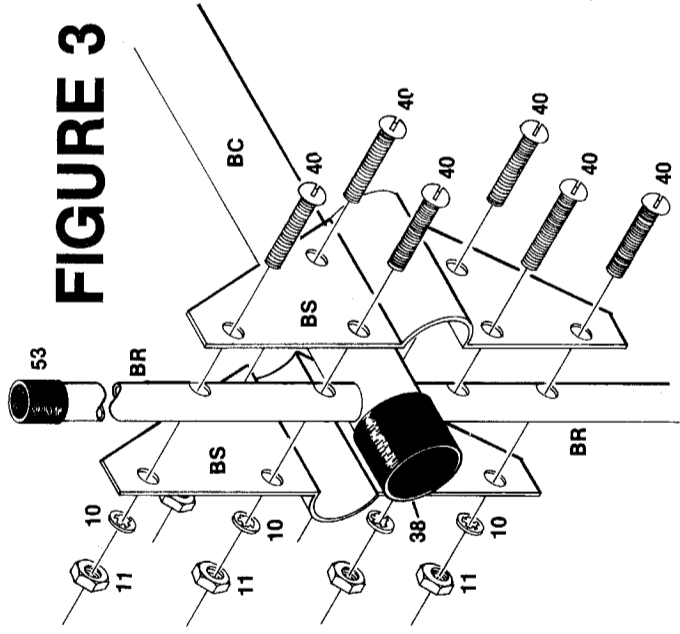


Chart B1 Element Assembly

PIN	KEY	DISPLAY	DESC.	SIZE	QTY
010120	120		Machine Screw	#8-32 x 2 in (5.8cm)	7
010010	10		Lock Washer	#8	34
010011	11		Hex Nut	#8-32	17
010232	232		Machine Screw	#8-32 x 2 1/2 in (6.35cm)	10
190026	26		Element Bracket Half	7/8 in (2.22cm)	17
190028	28		Washer	1 in (2.54cm)	17

Chart B2 ELEMENTS

ELEMENT	LENGTH
E1-E2	39 3/4" (100.2cm)
E3	40 1/4" (101.8cm)
E4	38 3/4" (98.4cm)
E5	37 1/8" (96.2cm)
E6-E7	37" (94.0cm)
E8	36 1/8" (93.5cm)
E9	36 1/2" (91.8cm)
E10	35 7/8" (91.1cm)
E11	35 3/4" (90.5cm)
E12	35 3/8" (89.8cm)
E13-E18	35 3/8" (89.2cm)

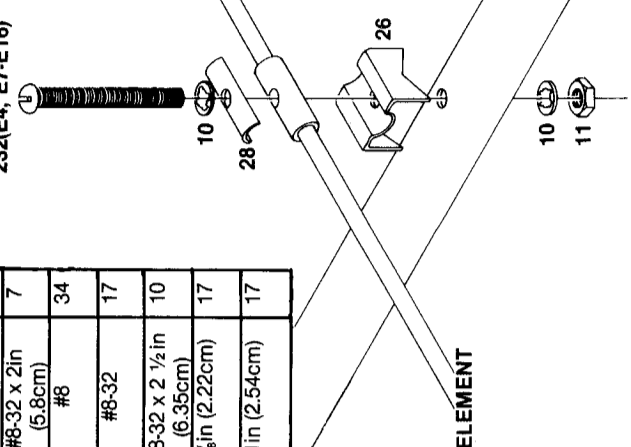


FIGURE 5

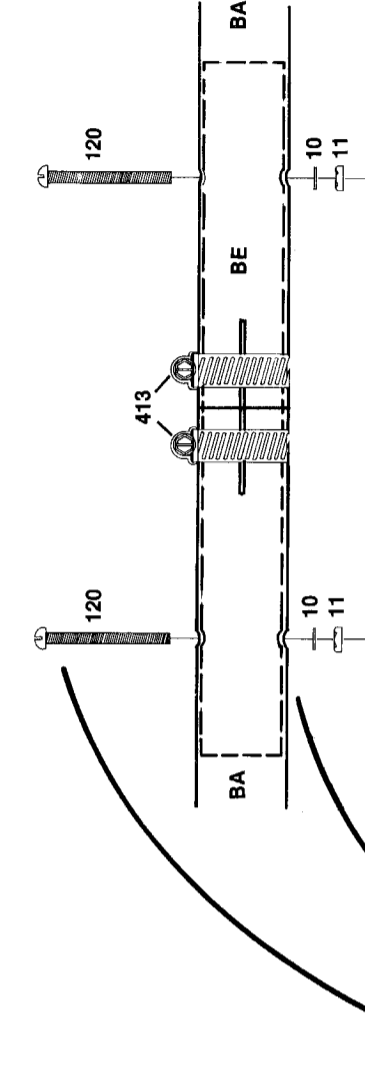
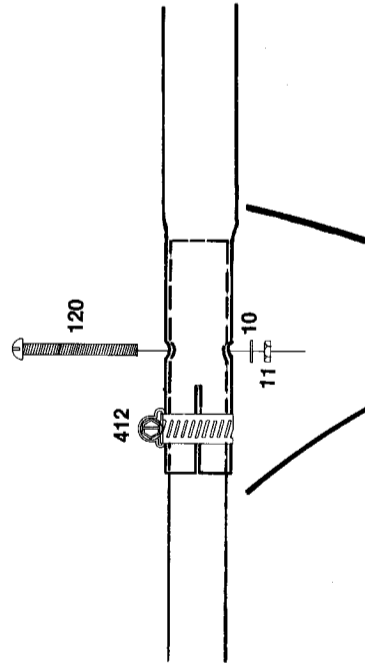


FIGURE 1

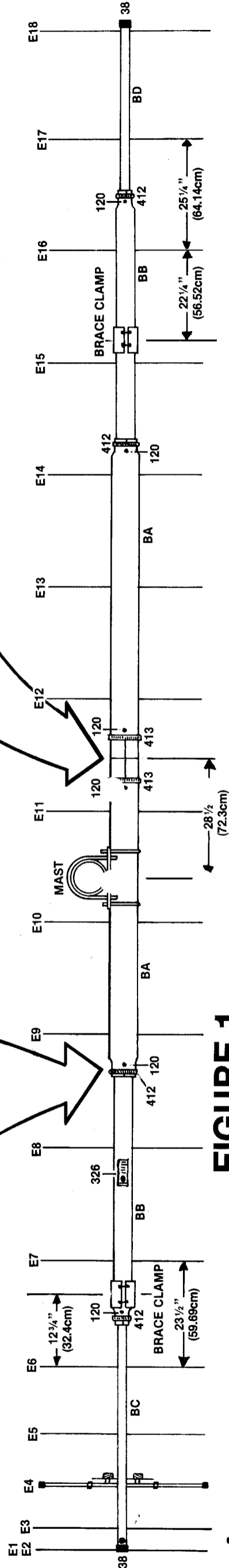


FIGURE 2

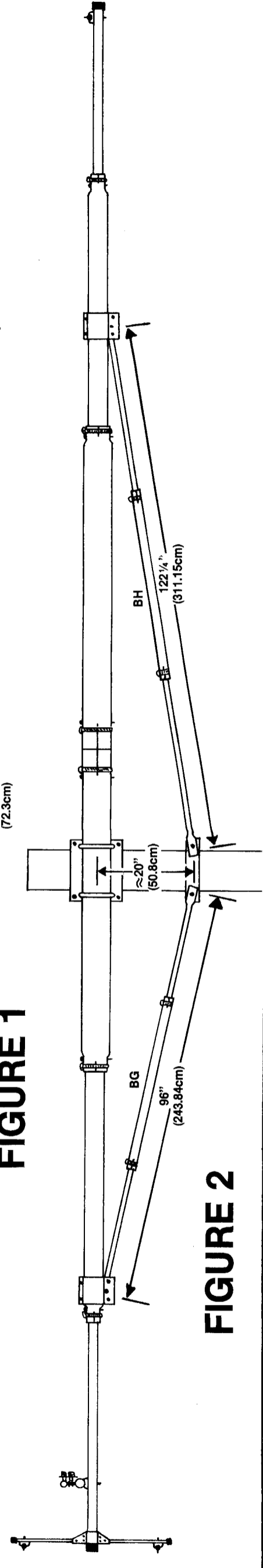


FIGURE 2