

17B2
2 METER BOOMER
144-145 MHz



951415 (7/92)

TA5FA

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 17B2 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 7. 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 in charge 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 17B2 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 E.**

MOUNTING

The mast mount bracket will accommodate up to a 2" (5.1 cm) mast. A 1-1/2" OD (3.8 cm) or larger heavy wall tubing mast should be used. A good heavy duty antenna rotator will provide the best service and longest life. Often it is desirable to mount several antennas on one mast. To keep possible interaction to a minimum, place your antennas as far apart as you can.

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

ASSEMBLY

Assemble your antenna by following the directions and illustrations in steps 1 through 7. After the antenna is completely assembled, verify dimensions and element spacings for accuracy. Then, return to the section below for final tuning.

TUNING PROCEDURE

The 17B2 does not normally require tuning after assembly. However, if you wish to check the VSWR before installation, please observe the following procedures. To prevent detuning the antenna, it should be tuned in place or at least 7 feet (2.13 meters) above ground and clear of surrounding objects. Keep all metal obstructions such as guy wires and other antennas at least 10 feet (3.05 m) away since they will nullify any adjustment and degraded performance will result.

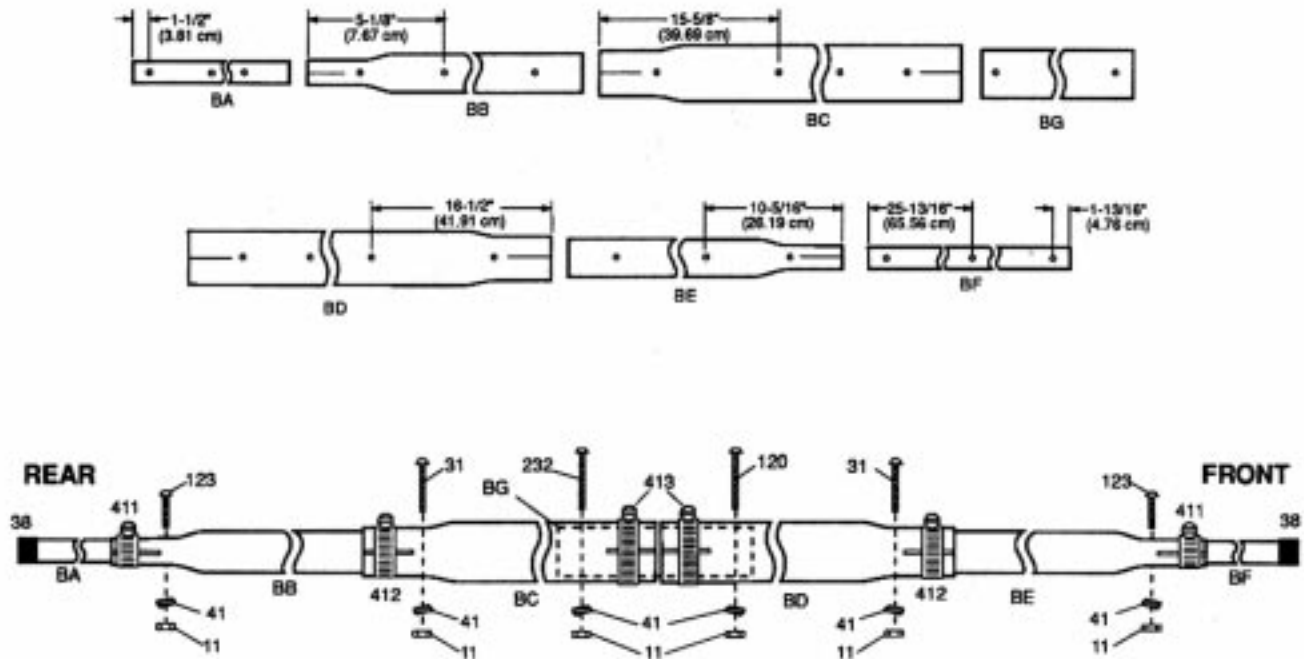
Run the coax cable from your transmitter to the area in which the antenna is going to be tested. The length of this cable or your feedline is not critical. Connect a good quality VHF VSWR bridge to the end of this cable. Connect a short length of cable [20 ft (610 cm) or less] from the VSWR bridge to the antenna. Set the transmitter to your center operating frequency. When you read VSWR, be sure you move far enough away from the antenna so that your body does not effect the reading.

Measure the VSWR. If it is too high, move both T-Match straps (125) by 1/4" (.6 cm) either inward or outward and check the VSWR. *Both T-Match straps should be the same distance from the center of the driven element.* If the VSWR improved, then continue moving the T-Match straps in the same direction. If the VSWR deteriorated then move the T-Match straps in the opposite direction. Repeat this procedure until no further improvement can be made. You have matched your antenna. Then tighten all connections on the T-Match driven element assembly. Tape the feedline to the boom and mast as shown in figure I.

#1 - ASSEMBLE BOOM

Assemble the boom in two sections, the rear and the front (figure A). Slide worm clamps (413) onto the large diameter ends of tubes BC and BD. Slide worm clamps (412) onto the smaller diameter end of the tubes BC and BD and worm clamp (411) on the smaller diameter end of tubes BB and BE. Insert the end of tube BA into the end of tube BB until the first set of holes are aligned. Insert the screw, washer and nut as shown below. Refer to the dimensions in figure A to be sure that the proper tube ends are joined. Do the same with tubes BB, BC, BD, BE and BF. Join the two boom sections together with tube BG. Tighten the screws and worm clamps. Push the plastic caps (38) onto the ends of the boom. NOTE: screw 232 will be used later for attachment to element EK.

FIGURE A



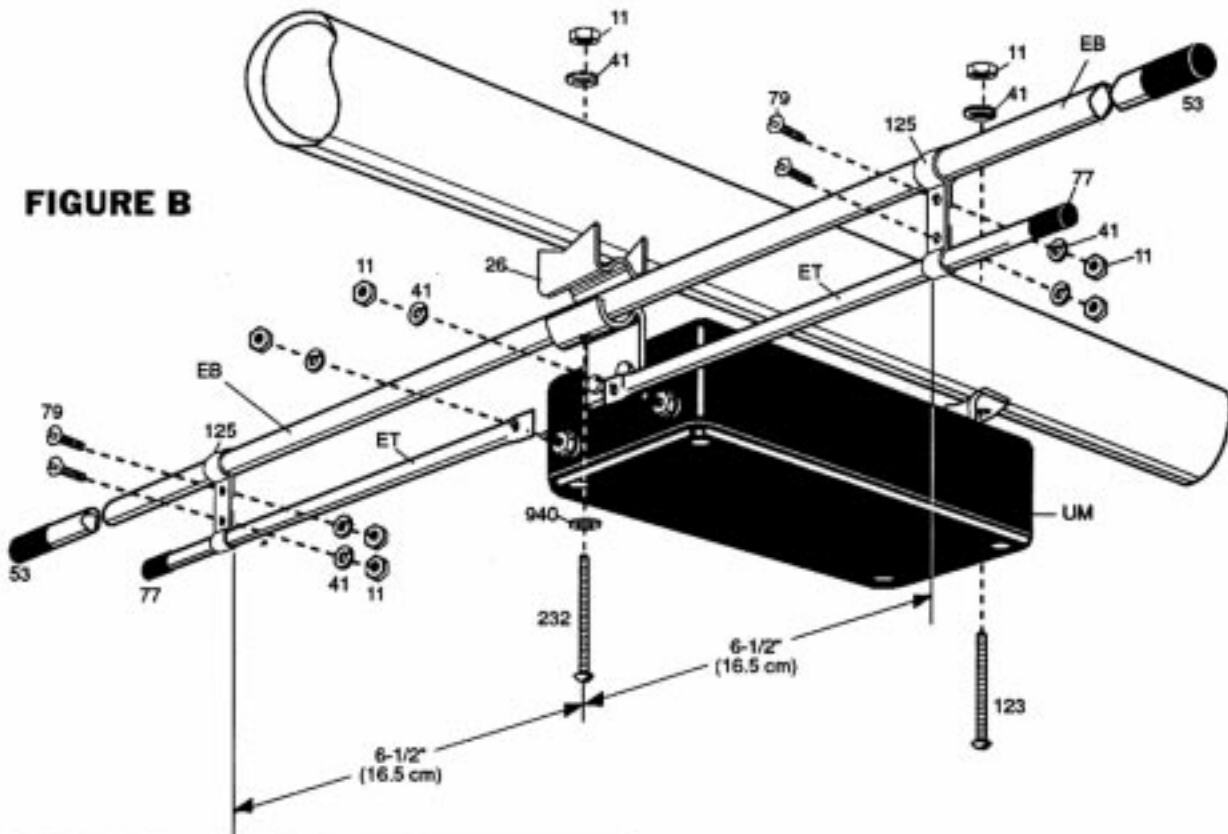
| KEY | PiN | DESC. | SIZE | QTY |
|-----|--------|-------------|----------------------------------|-----|
| BA | | ALUM TUBING | 1" x 64" (2.5 x 162.6 cm) | 1 |
| BB | | ALUM TUBING | 1-1/4" x 60" (3.2 x 152.4 cm) | 1 |
| BC | | ALUM TUBING | 1-1/2" x 72" (3.8 x 182.9 cm) | 1 |
| BD | | ALUM TUBING | 1-1/2" x 72" (3.8 x 182.9 cm) | 1 |
| BE | | ALUM TUBING | 1-1/4" x 60" (3.2 x 152.4 cm) | 1 |
| BF | | ALUM TUBING | 1" x 60" (2.5 x 152.4) | 1 |
| BG | | ALUM TUBING | 1-3/8" x 12" (3.5 x 30.5 cm) | 1 |
| 11 | 010011 | SS HEX NUT | 8-32 | 6 |
| 31 | 010231 | SS SCREW | 8-32 x 1-3/4" (4.4 cm) | 2 |

| KEY | PiN | DESC. | SIZE | QTY |
|-----|--------|----------------|---------------------------|-----|
| 41 | 011941 | SS LOCK WASHER | #8 | 6 |
| 38 | 050038 | PLASTIC CAP | 1" (2.54 cm) | 2 |
| 120 | 010120 | SS SCREW | 8-32 x 2" (5.1 cm) | 1 |
| 123 | 010123 | SS SCREW | 8-32 x 1-1/2" (3.8 cm) | 2 |
| 232 | 010232 | SS SCREW | 8-32 x 2-1/2" (6.4 cm) | 1 |
| 411 | 030411 | SS WORM CLAMP | 1-3/8" (3.5 cm) | 2 |
| 412 | 030412 | SS WORM CLAMP | 1-1/2" (3.8 cm) | 2 |
| 413 | 030413 | SS WORM CLAMP | 1-3/4" (4.5 cm) | 2 |

TA5FA

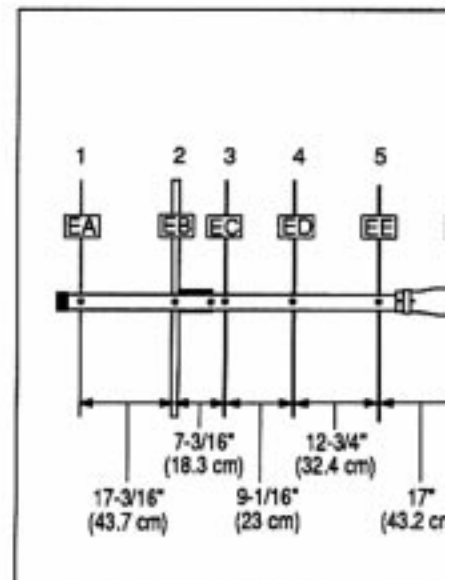
#2 - ASSEMBLE T-MATCH

FIGURE B










| KEY | P/N | DISPLAY | DESC | SIZE | QTY |
|-----|--------|---------|------------------|----------------------------------|-----|
| EB | | | ALUM TUBING | 1/2" x 39-3/4" (1.3 x 101 cm) | 1 |
| ET | | | ALUM TUBING | 3/8" x 8-1/2" (.95 x 21.6 cm) | 2 |
| UM | UM2N | | UltraMatch BALUN | 4-3/4" x 2-1/2" (12 x 6.4 cm) | 1 |
| 11 | 010011 | | SS HEX NUT | 8-32 | 8 |
| 26 | 190026 | | ALUM BRACKET | 7/8" (2.2 cm) | 1 |
| 41 | 011941 | | SS LOCK WASHER | #8 | 8 |
| 53 | 050053 | | PLASTIC CAP | 1/2" (1.27 cm) | 2 |
| 77 | 050077 | | PLASTIC CAP | 3/8" (.95 cm) | 2 |
| 79 | 010079 | | SS MACHINE SCREW | 8-32 x 1/2" (1.3 cm) | 4 |
| 123 | 010123 | | SS MACHINE SCREW | 8-32 x 1-1/2 (3.81) | 1 |
| 125 | 200125 | | T-MATCH STRAP | | 2 |
| 232 | 010232 | | SS MACHINE SCREW | 8-32 x 2 1/2" (6.4 cm) | 1 |
| 940 | 360940 | | ALUM FLAT WASHER | #8 | 1 |

Assemble the T-match to the driven element (EB) as illustrated in figure B. First attach the UltraMatch to the driven element with the hardware shown. Then connect the T-match elements (ET) to the UltraMatch with the split washers (41) and nuts (11). Next, attach the T-match elements to the driven element with the T-match straps (125) and hardware shown while noting the spacing dimensions between the straps. Place plastic caps (53) on the ends of the tube EB and plastic caps (77) on the ends of the tubes ET. Attach this subassembly to position 2 on the boom as shown in figure D noting that the UltraMatch "N" connector must face the center of the antenna. Tighten all screws.



TA5FA

| KEY | P/N | DISPLAY | DESC | SIZE | QTY |
|-----|--------|---|-------------------------|---------------------------|-----|
| 11 | 010011 |  | SS HEX NUT | 8-32 | 16 |
| 26 | 190026 |  | ALUMINUM BRACKET | 7/8" (2.2 cm) | 16 |
| 28 | 190028 |  | ALUMINUM HALF WASHER | 1" (2.54) | 16 |
| 31 | 010231 |  | SS SCREW | 8-32 x 1-3/4" (4.5 cm) | 6 |
| 41 | 011941 |  | SS LOCK WASHER | #8 | 16 |
| 120 | 010120 |  | SS MACHINE SCREW | 8-32 x 2" (3.1 cm) | 5 |
| 232 | 010232 |  | SS SCREW | 8-32 x 2-1/2" (6.4 cm) | 5 |

#3 - MOUNT ELEMENTS

Attach the solid rod reflector and directors to the boom at the locations shown on figure D. First check all element lengths using table A. The elements are progressively shorter as you proceed toward the front end of the boom. Attach each element to the boom using the hardware shown in figure C.

TABLE A (Element Lengths)

| KEY | Element Number | LENGTH | |
|-----|----------------|--------------|-----------|
| | | INCHES | CM |
| EA | 1 | 40-3/4 | 103.5 |
| EB | 1 | 39-3/4 x 1/2 | 101 x 1.2 |
| EC | 1 | 38-1/8 | 96.8 |
| ED | 1 | 37-1/4 | 94.6 |
| EE | 1 | 36-11/16 | 93.2 |
| EF | 1 | 36-3/8 | 92.4 |
| EG | 1 | 36 | 91.4 |
| EH | 1 | 35-13/16 | 91.0 |
| EI | 1 | 35-5/8 | 90.5 |
| EJ | 1 | 35-7/16 | 90.0 |
| EK | 1 | 35-1/4 | 89.5 |
| EL | 1 | 35-1/8 | 89.2 |
| EM | 1 | 34-15/16 | 88.7 |
| EN | 1 | 34-13/16 | 88.4 |
| EO | 1 | 34-5/8 | 88.0 |
| EP | 1 | 34-7/16 | 87.5 |
| EQ | 1 | 34-1/4 | 87.0 |

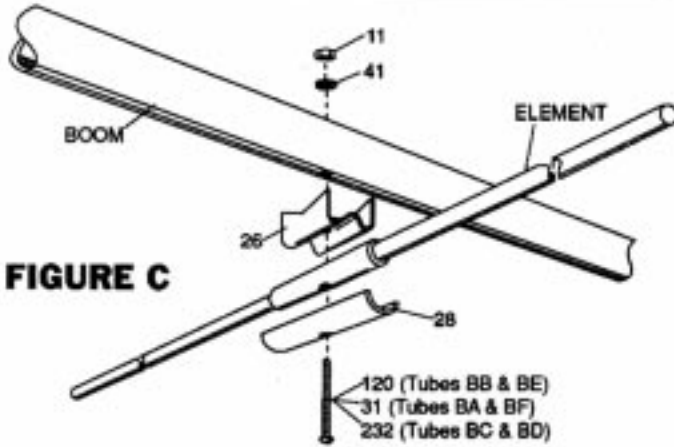
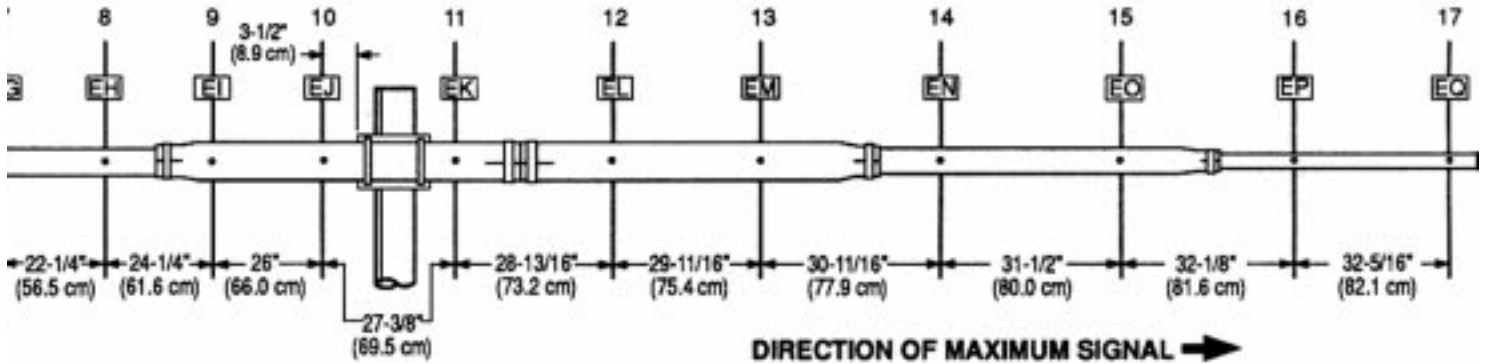


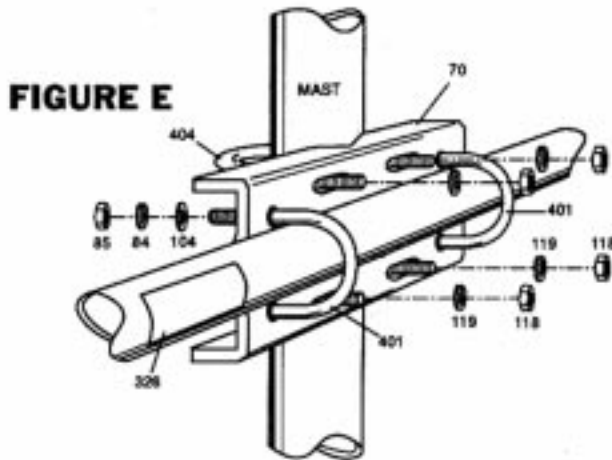
FIGURE C

FIGURE D



#4 - ASSEMBLE BOOM TO MAST MOUNT

Assemble and mount the boom to mast clamp bracket (70) between elements 10 and 11 with the U-bolts 401 as shown in figure E. Secure with flat washer (104), lock washer (84) and nut (85) in that order. Note that the rear of the mast clamp must be 3-1/2 inches (8.9 cm) from element 10 as shown on figure D. You are now ready to mount the antenna to your mast using the U-bolts 404. Secure with lock washer (119) and nut (118) in that order. Affix the warning label (326) to the boom as shown in figure E.



| 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 BRACES

Assemble the mast braces using figure F. If you stack two 17B2's, you may opt to place the braces above rather than below the boom. First place a worm clamp (409) on the slotted end of tubes BH. Then insert the tubes BJ into the slotted ends of tubes BH, set to the dimensions shown and tighten the clamps. Next attach the other end of tubes BH to the boom at the positions shown in figure F using clamps (647), screws (23), washers (41) and nuts (11) as shown in figure G.

| KEY | P/N | DISPLAY | DESC | SIZE | QTY |
|-----|--------|---------|----------------|---------------------------|-----|
| BH | | | ALUM TUBING | 7/8" x 72" (2.2 x 183 cm) | 2 |
| BJ | | | ALUM TUBING | 3/4" x 36" | 2 |
| 11 | 010011 | | SS HEX NUT | 8-32 | 8 |
| 41 | 011941 | | SS LOCK WASHER | #8 | 16 |
| 123 | 010123 | | SS SCREW | 8-32 x 1-1/2" (3.8 cm) | 8 |
| 647 | 191647 | | BRACE CLAMP | | 4 |

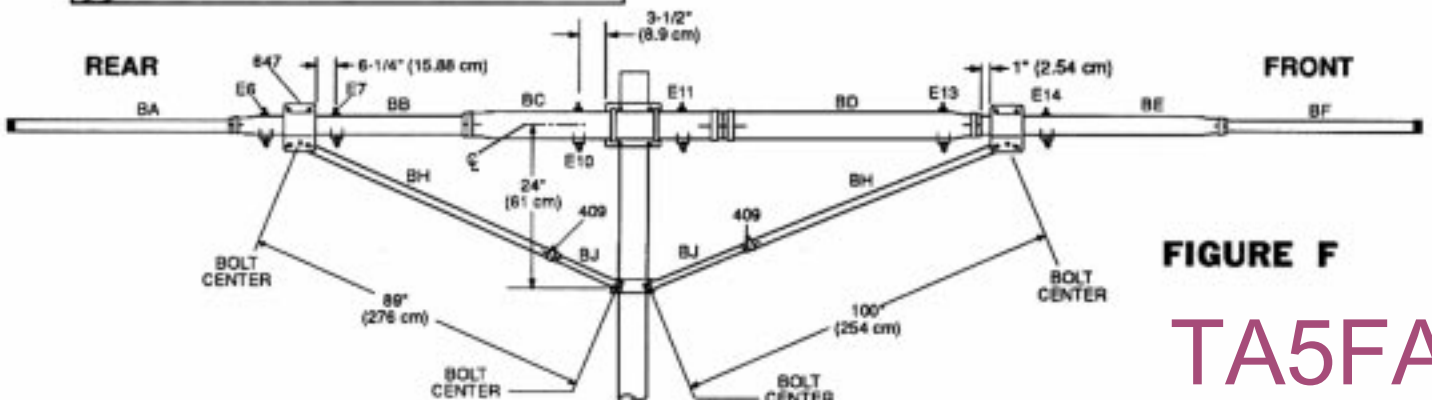
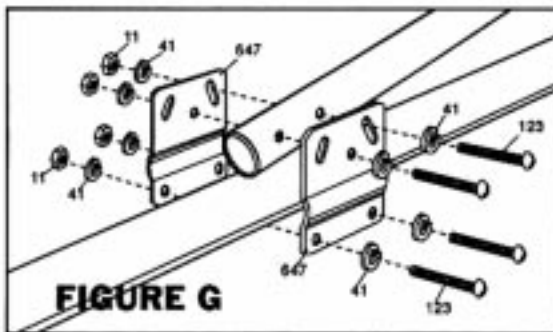







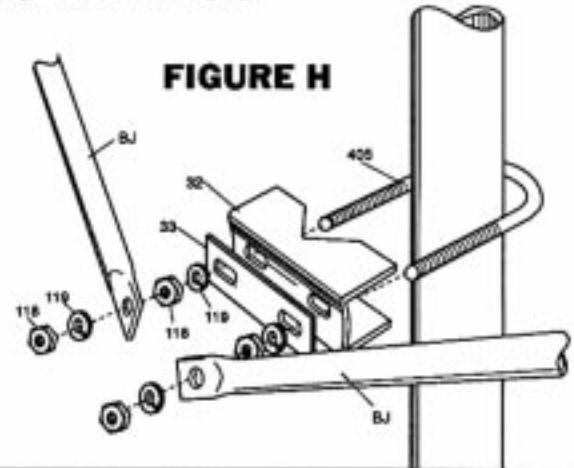
FIGURE F

TA5FA

#6 -BRACE TO MAST ATTACHMENT

| 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 | 193133 |  | BACKING PLATE | 3-1/2" x 1-1/8" (8.4 x 2.8 cm) | 1 |
| 118 | 010118 |  | SS HEX NUT | 5/16" (.79 cm) | 4 |
| 119 | 010119 |  | SS LOCK WASHER | 5/16" (.79 cm) | 4 |
| 405 | 010405 |  | SS U-BOLT | 2-1/2" x 4-1/2" (6.4 x 11.4 cm) | 1 |

Attach the brace clamp to the mast as shown in figure H. First attach the clamp (32) to the mast with U-bolt 404, backing plate (33) and one set of washers (119) and nuts (118) as shown. Next set the 24 inch (61 cm) dimension as shown in figure F and tighten the nuts securely. Then attach the flattened end of tubes BJ to the U-bolt with washers (119) and nuts (118) as shown in figure H and tighten the nuts. If the antenna isn't flat enough, you may loosen the worm clamps and adjust the length of the braces slightly.



#7 - FEEDLINE ATTACHMENT

When the antenna is in its final location, apply some of the silicone on the outer threads of the connector on the UltraMatch. *SILICONE SHOULD NOT BE SPREAD ON THE CENTER PIN!* Attach your feedline connector to the UltraMatch. Tape your feedline down the boom and mast as shown in figure I. It's a good idea to provide a drip loop in the coax as shown to help protect the connector from water damage. Some recommended stacking arrangements are shown on figure J. When you have completed this section, return to the tuning section on page 1.

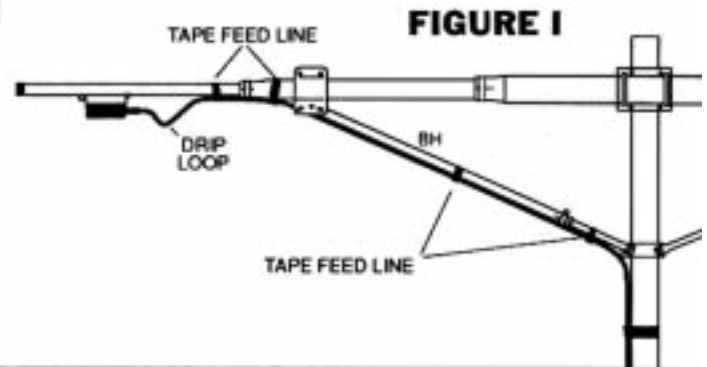
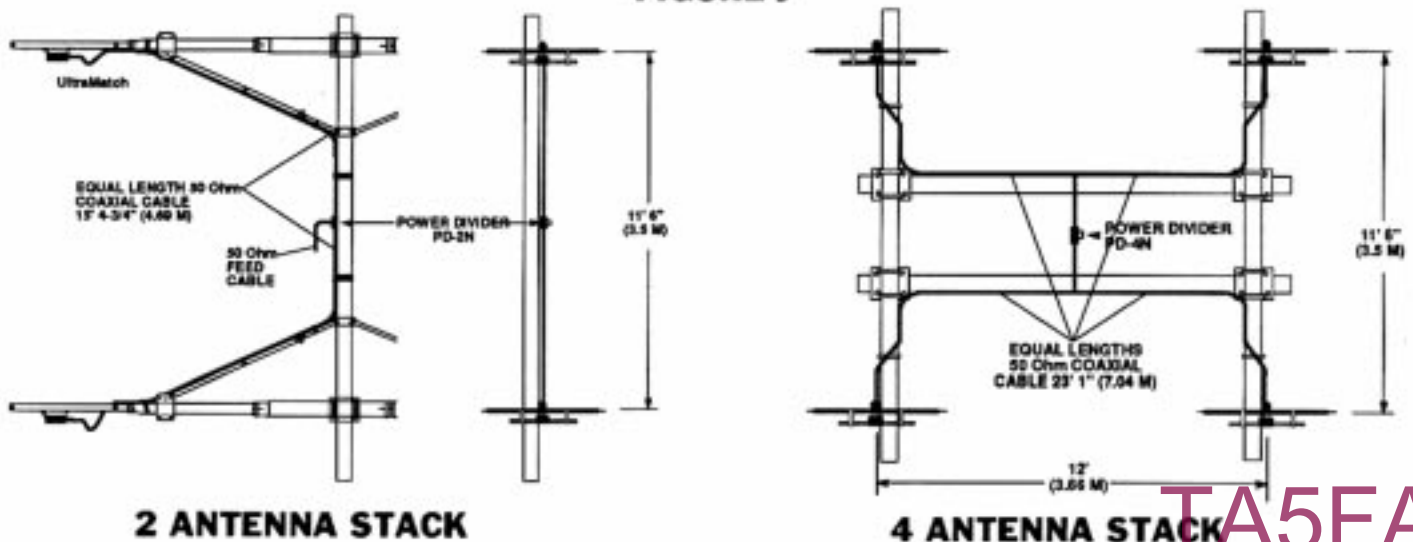


FIGURE J



MASTER PARTS LIST

| KEY | P-N | DESCRIPTION | QTY | KEY | P-N | DESCRIPTION | QTY |
|-----|--------|--|-----|-----|------|---|-----|
| 11 | 010011 | 8-32 stainless steel hex nut | 37 | BA | | 1" x 64" (2.5 x 162.6 cm) aluminum tubing drilled | 1 |
| 26 | 190026 | 7/8" (2.2 cm) formed aluminum bracket | 17 | BB | | 1-1/4" x 60" (3.2 x 152.4 cm) aluminum tubing slotted, drilled, swaged | 1 |
| 28 | 190028 | Aluminum half washer | 16 | BC | | 1-1/2" x 72" (3.8 x 182.9 cm) aluminum tubing slotted both ends, drilled, swaged | 1 |
| 31 | 010231 | 8-32 x 1-3/4" (4.4 cm) stainless steel machine screw | 8 | BD | | 1-1/2" x 72" (3.8 x 182.9 cm) aluminum tubing slotted both ends, drilled, swaged | 1 |
| 32 | 190032 | 3-5/8" x 2-1/2" (9.2 x 6.4 cm) U-bolt bracket | 1 | BE | | 1-1/4" x 60" (3.2 x 152.4 cm) aluminum tubing slotted, drilled, swaged | 1 |
| 33 | 193133 | 3-1/2" (6.4 cm) backing plate | 1 | BF | | 1" x 60" (2.5 x 152.4 cm) aluminum tubing drilled | 1 |
| 38 | 060038 | 1" (2.54 cm) black plastic cap | 2 | BG | | 1-3/8" x 12" (3.5 x 30.5 cm) aluminum tubing drilled | 1 |
| 41 | 011941 | # 8 stainless steel split lock washer | 46 | BH | | 7/8" x 72" (2.2 x 182.9 cm) aluminum tubing | 2 |
| 53 | 060053 | 1/2" (1.3 cm) black plastic cap | 2 | BJ | | 3/4" x 36" (1.9 x 91.4 cm) aluminum tubing flattened one end | 2 |
| 70 | 190070 | 4" x 6" (10.2 x 15.2 cm) formed mounting plate | 1 | EA | | 40-3/4" (103.5 cm) aluminum rod | 1 |
| 77 | 060077 | 3/8" (.95 cm) black plastic cap | 2 | EB | | 39-3/4" x 1/2" (101 x 1.2 cm) aluminum tube | 1 |
| 79 | 010079 | 8-32 x 1/2" (1.3 cm) stainless steel machine screw | 4 | EC | | 38-1.8" (96.8 cm) aluminum rod | 1 |
| 84 | 010084 | 1/4" (.64 cm) stainless steel lock washer | 4 | ED | | 37-1/4" (94.6 cm) aluminum rod | 1 |
| 85 | 010085 | 1/4" (.64 cm) stainless steel hex nut | 4 | EE | | 36-11/16" (93.2 cm) aluminum rod | 1 |
| 104 | 010104 | 1/4" (.64 cm) stainless steel flat washer | 4 | EF | | 36-3/8" (92.4 cm) aluminum rod | 1 |
| 116 | 240116 | Silicone Package | 1 | EG | | 36" (91.4 cm) aluminum rod | 1 |
| 118 | 010118 | 5/16" (.79 cm) stainless steel hex nut | 8 | EH | | 35-13/16" (91 cm) aluminum rod | 1 |
| 119 | 010119 | 5/16" (.79 cm) stainless steel lock washer | 8 | EI | | 35-5/8" (90.5 cm) aluminum rod | 1 |
| 120 | 010120 | 8-32 x 2" (5.1 cm) stainless steel machine screw | 6 | EJ | | 35-7/16" (90.0 cm) aluminum rod | 1 |
| 123 | 010123 | 8-32 x 1-1/2" (3.8 cm) stainless steel machine screw | 11 | EK | | 35-1/4" (89.5 cm) aluminum rod | 1 |
| 125 | 200125 | T-match strap | 2 | EL | | 35-1/8" (89.2 cm) aluminum rod | 1 |
| 232 | 010232 | 8-32 x 2-1/2" (6.4 cm) stainless steel machine screw | 6 | EM | | 34-15/16" (88.7 cm) aluminum rod | 1 |
| 326 | 290326 | Danger label | 1 | EN | | 34-13/16" (88.4 cm) aluminum rod | 1 |
| 401 | 010401 | 1-1/2" x 3" (3.8 x 7.6 cm) stainless steel U-bolt | 2 | EO | | 34-5/8" (88.0 cm) aluminum rod | 1 |
| 404 | 010404 | 2-1/2" x 3" (5.5 x 7.6 cm) stainless steel U-bolt | 2 | EP | | 34-7/16" (87.5 cm) aluminum rod | 1 |
| 405 | 010405 | 2-1/2" x 4-1/2" (6.4 x 11.4 cm) stainless steel U-bolt | 1 | EQ | | 34-1/4" (87.0 cm) aluminum rod | 1 |
| 409 | 030409 | 7/8" (2.2 cm) stainless steel worm clamp | 2 | ET | | 8-1/2" x 3/8" (21.6 x .95 cm) aluminum tube | 2 |
| 411 | 030411 | 1-1/4" (3.2 cm) stainless steel worm clamp | 2 | UM | UM2N | UltraMatch Balun | 1 |
| 412 | 030412 | 1-1/2" (3.8 cm) stainless steel worm clamp | 2 | | | | |
| 413 | 030413 | 1-3/4" (4.5 cm) stainless steel worm clamp | 2 | | | | |
| 647 | 191647 | Boomer bracket brace clamp | 4 | | | | |
| 940 | 360940 | #8 aluminum flat washer | 1 | | | | |

SPECIFICATIONS

| | | | |
|-------------------------|----------|--|-----------------|
| Frequency, MHz | 144-145 | Side Lobe Attenuation, dB, E Plane | >60 |
| No. Elements | 17 | Electrical Wavelength | 4.5 |
| Forward Gain, dBd | 18.0 | Boom Length, ft (m) | 31 (9.45) |
| Front to Back Ratio, dB | 26 | Longest Element, in (cm) | 40.75 (103.5) |
| SWR 1.2:1 Typical | | Turning Radius, ft (m) | 17.25 (5.26) |
| 2:1 Bandwidth, MHz | >2 | Mast Size Range, in (cm) | 1.5-2 (3.8-5.1) |
| Power Rating, Watts PEP | 2000 | Wind Load, ft ² (m ²) | 3.9 (.36) |
| 3 dB Beamwidth, Degrees | | Weight, lb (kg) | 15.75 (7.14) |
| E Plane | 2 x 14.5 | | |
| H Plane | 2 x 15.0 | | |

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, neglect, accident or improper installation. Any repairs or alterations outside of the Cushcraft factory will nullify this warranty.



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

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

TA5FA