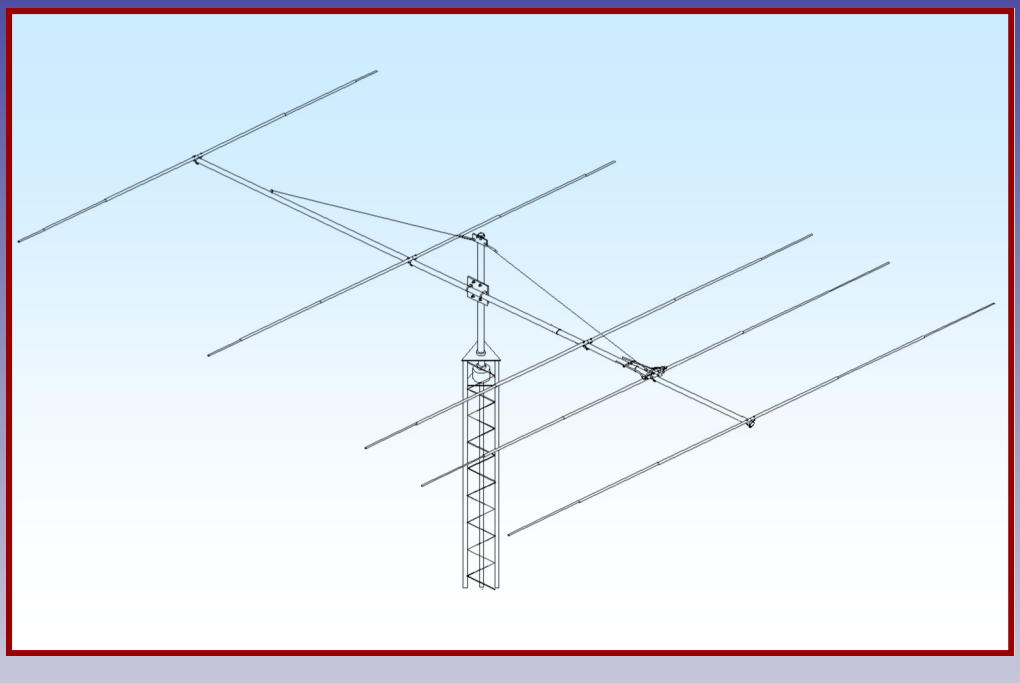
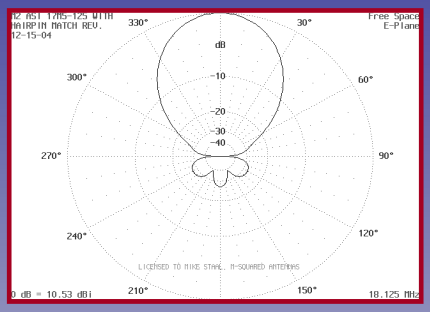
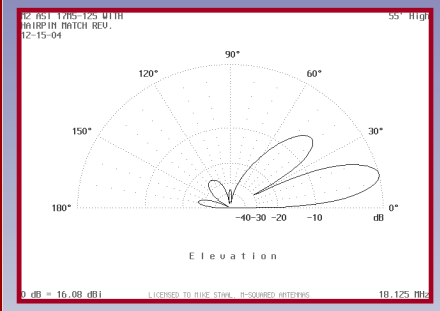
M2 Antenna Systems, Inc.
Model No: 17M5-125







SPECIFICATIONS:

Model	17M5-125
Frequency Range	18.080 To 18.18 MHz
*Gain, (FS) / Over gnd	10.5dBi / 16.0dBi @55'
Front to back	24 dB Typical
Beamwidth	E=50° / H=60°
Feed type	Hair pin match
Feed Impedance	50 Ohms Unbalanced
Maximum VSWR	1:2.1
Input Connector	SO-239, Others avl.
Power Handling	3 kW, Higher avl.
Boom Length / Dia	36' / 3" x .125 Wall
Element Length / Dia.	28' / 1-1/4" To 1/2"
Turning Radius:	24' 5"
Stacking Distance	43' To 54'
Mast Size	2" to 3 " Nom.
Wind area / Survival	9 Sq. Ft. / 125 MPH
Weight / Ship Wt.	110 Lbs. / 135 Lbs.

***Subtract 2.14 from dBi for dBd / FS = Free Space**

FEATURES:

The 17M5-125 is a great band opener! It was designed to with stand the worst mother nature can bring and stay on top of the pile no matter what. The computer optimized design allows full band coverage with good gain and excellent front to back. Mechanically, CNC machined aluminum (6061-T6) clamps ground the elements to the boom and stay exactly aligned. The boom sections are 3" O.D. x .125" wall 6061-T6 aluminum tubing. An overhead guy system is supplied. A hairpin type match couples the 3 kW 1:1 balun to the feed line. The antenna is completely DC grounded. The 17M5-125 is also great for stacking, providing 3 dB increased gain not to mention the lower angle of radiation. The 17M5 -125 is a perfect stacking partner for our other "SURVIVOR series (125 MPH RATED) Yagis.

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02/24/14
Rev.04

17M5-125 ASSEMBLY MANUAL

BACKGROUND ON YOUR 17M5HD-125 YAGI

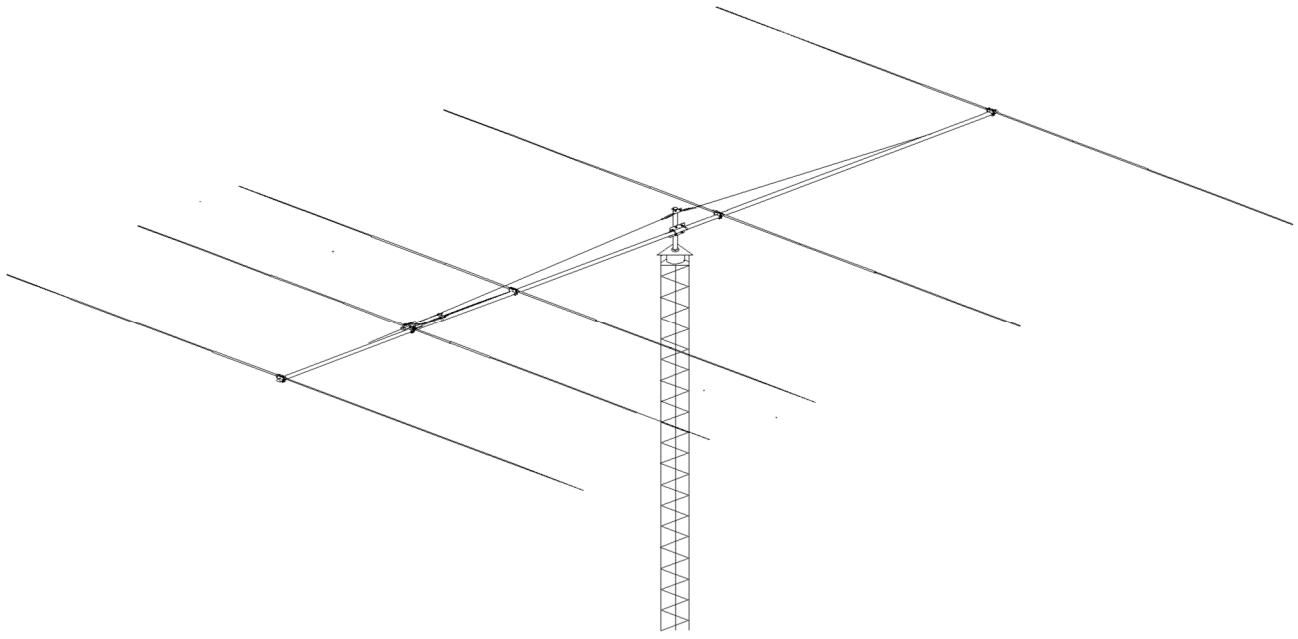
The computer program used to generate the plots and optimize the Yagi is YO (Yagi Optimizer) created by Brian Beezley, K6STI. The figures generated by the program have been checked against MiniNEC and generally are within a few hundredths of a dB.

You may be accustomed to seeing inflated numbers on spec sheets and in advertising. Don't worry, the inflated numbers may be referenced to Isotrophic (dBi), which is 2.14 dB higher than a dipole reference (dBd), or including as much as 6 dB of 'GROUND GAIN'. Other possibilities include faulty measurements or "marketing" guys that simply decided that a higher number would sell more antennas.

Actual realized gain, in the case of plots over perfect ground, may be somewhat less than the figures indicates. Most of us don't have perfect ground. Not only does the quality of the ground itself affect the actual number but, in most cases, the things above the ground have a much greater detrimental effect on realized gain. Houses, buildings and heavy trees all eat up the part of your pattern needed to generate ground gain.

To put this in perspective take the case of a station using a 5 dBd tribander up 70 feet located in open farmland of normal ground. The net gain at 14 degrees radiation angle is probably 10 dB. Compare that station to the 8.6 dBd monobander at 70 feet in the middle of a housing tract with perhaps only 2 dB of additional ground gain for a net of 10.6 dB. In a pile-up it would be a flip of a coin who would get through first. However, reverse the situation and the monobander would be ahead by miles.

Understanding these facts may help you understand why some small stations do quite well and why some big stations are almost unbeatable. The flexibility of the 17M5-125 design at least allows you the get the most you can out of your QTH.



17M5-125 ASSEMBLY MANUAL

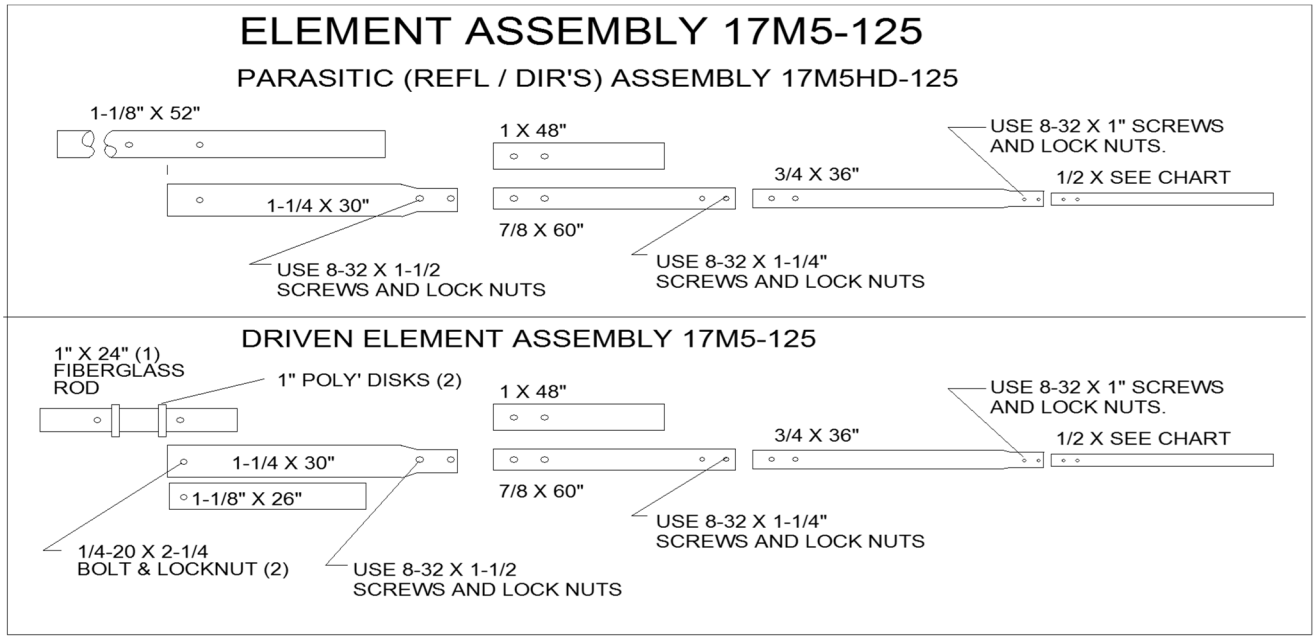
TOOLS REQUIRED: electric drill, screw driver, 11/32" spintite or socket, 7/16" end wrench, 7/16", 1/2", and 9/16" socket set, measuring tape.

1. PARASITIC ELEMENT ASSEMBLY: Refer to the element assembly sketch below. Note that many of the sections are double wall. A coupling sleeve 1-1/8” in diameter has two 1-1/4” dia. tubes slipped over it. Align the holes and insert a 1/4-20 x 1-3/4” bolt through each side. Add a 1/4-20 lock nut to each bolt and tighten. Do all 4 element centers now.

2. Assemble a pair of ELEMENT CLAMP PLATES to midpoint of each center element section using 1/4-20 x 2-1/2 bolts and locknuts. Rotate element sections so assembly holes are vertical. Center each section accurately and tighten the clamp plate bolts evenly so the sides of the two plates stay parallel. Repeat for all five center sections. Add the BALUN MOUNTING ‘L’ BRACKET to the clamp set used for the DRIVEN ELEMENT.

3. Now assemble the rest of the element halves from the 1-1/4” diameter sections on out (SEE ELEMENT LAYOUT ASSEMBLY DRAWING). Pair up 1/2” element tip sections by length. Insert 1/2” sections into the swaged end of the 3/4” x 36” sections (SEE DIMENSION SHEET). Secure 1/2” sections with 8-32 x 1" screws and locknuts. ASSEMBLY TIP: Use a felt pen and masking tape to identify each element set by tip length as it is completed.

4. Now assemble the DRIVEN ELEMENT sections as shown below. Slide the POLY’ RINGS on the 1” fiberglass CENTER INSULATOR. We make the rings tight so they don’t allow any conductive material (like bird stuff) and moisture to pass underneath. These rings increase the arc path length. They can be softened by placing them in hot water for a few moments prior to pushing them on. Space them 6-1/8” apart so the 6’ long element mounting clamps can fit in between.



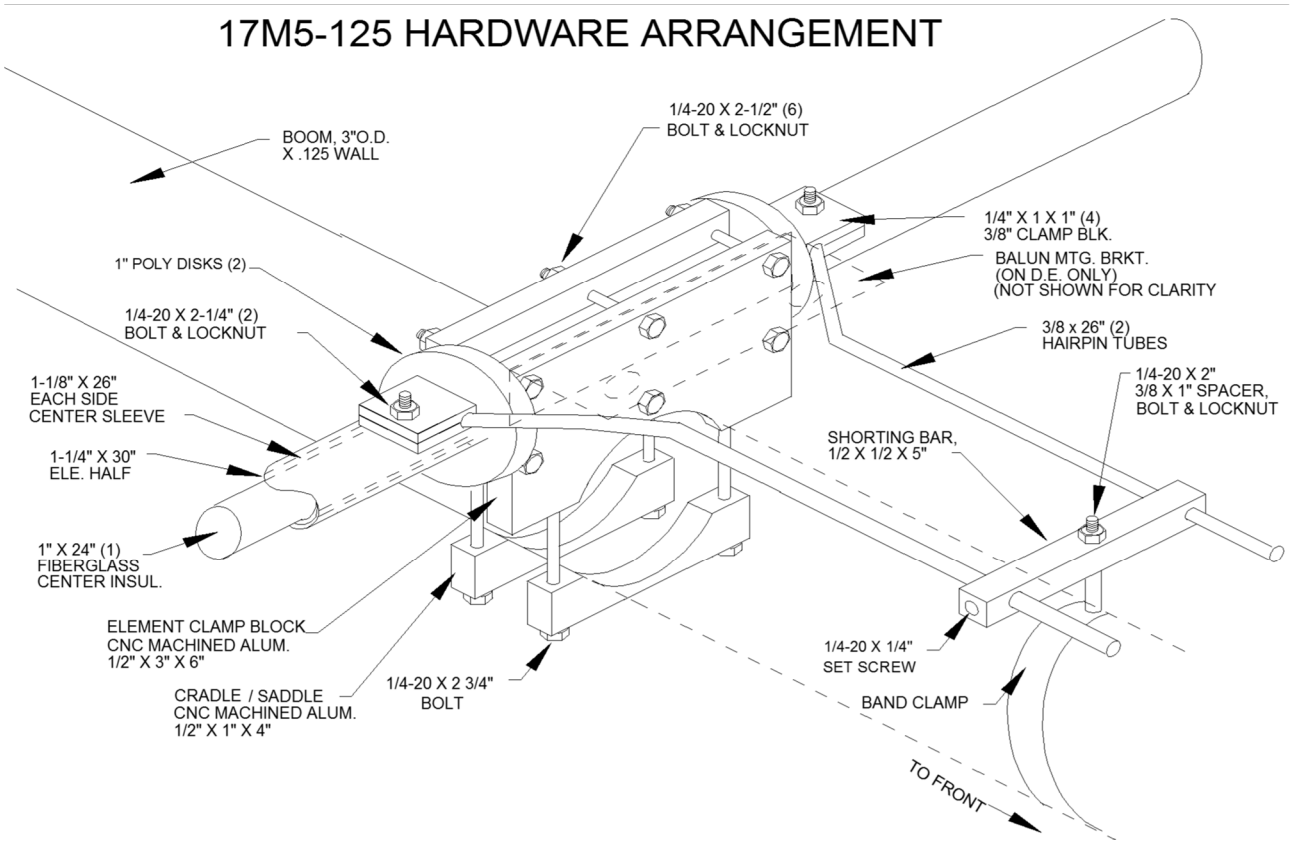
17M5-125 ASSEMBLY MANUAL

5. BOOM ASSEMBLY: (SEE DIMENSION SHEET) One 15 ft. boom section has holes only in the swaged section. This is the rear section. Insert its swaged section into the other 15 ft. section and secure with 1/4-20 x 3-1/2" bolts and locknuts. Now add the tip section and secure with two more 1/4-20 x 3-1/2" bolts and locknuts.

6. Install the two eyebolts in the boom end sections and tighten the nuts.

7. Orient the eyebolt eyes to the top of the boom. Place the boom on bucks or equivalent to get it to a convenient working height. Refer to the DIMENSION SHEET and using a tape measure and a marking pen or piece of tape, mark the ELEMENT LOCATIONS on the boom. Spacing dimensions are from the rear of the boom.

8. At the REFLECTOR element location, mount a center element assembly on the boom Using a SADDLE CLAMP under each ELEMENT CLAMP PLATE (SEE HARDWARE ARRANGMENT DRAWING). Install 1/4-20 x 2 3/4" bolts, align the element with the EYEBOLTS and tighten bolts.



9. Now mount the DRIVEN ELEMENT and orient the element to boom clamp so the balun bracket is facing the front of the antenna. Align the element with the REFLECTOR and tighten saddle bolts. Mount the 1:1 BALUN using the 2-1/2" u-bolt but do not over tighten. BE SURE THE BALUN VENT HOLE IS DOWN. Remove the NUTS from the two 1/4-20 x 2-1/4" bolts and add the hairpin CLAMP BLOCKS and the balun leads as shown on the DIMENSION SHEET. Do not tighten yet. Fabricate the band clamp / shorting bar assembly and place loosely on the boom. Insert the short bent end of the 3/8 x 26" hairpin tubes into the clamp blocks and orient as shown below. Slide the shorting bar assembly onto the tube and set the distance at 19" as noted on the DIMENSION SHEET. Install the 1/4-20 x 1/4", set screws, align the assembly and tighten the band clamp. Rotate the 3/8" tubes so they are parallel and tighten the clamp blocks. Now tighten the set screws.

NOTE: the SWR should be 1.2:1 or better but if adjustment is required, the shorting bar position and the driven element tip length may both have to be adjusted (some drilling required). The tip length affects the frequency and the shorting bar affects the match but they interact slightly.

10. Next, attach the OUTER ELEMENT ASSEMBLY PAIRS to the 1-1/4" central element sections using 8-32 x 1-1/2" screws and locknuts. Double check for correct lengths and positions. Tighten securely

11. To determine the balance point of the antenna, attach a good quality 50 Ohm cable to the balun and route the cable forward toward the middle of the boom. If desired this cable can be a section of main feedline. Use the large cable ties to secure the feed line to the boom. Now tighten the connectors and tape them up carefully.

12. Determine the BALANCE POINT (typically near 184" from the rear) of the assembled antenna and mount the BOOM TO MAST PLATE using two 3" U-bolt stainless steel lockwashers and nuts.

13. OVERHEAD BOOM SUPPORT SYSTEM.

A. Attach one end of the Dacron cord to the rear eyebolt using two turns around the eyebolt and a series of three half hitches or equivalent knots. Without cutting the cord, secure other end at the front eyebolt. Pull on the knots *HARD* to *SET* them. Cut ff the excess cord and seal the ends with heat or flame to prevent fraying. Tape the sealed ends of the cord back to main cord tightly with black vinyl electricians tape.

B. TEMPORARILY insert a standard 2" U-bolt through the turnbuckle plate and add two nuts so about 1/2 inch of the threads stick out. Insert U-bolt studs through the top set of 2" U-bolt holes in the boom to mast plate from the boom side and add two more nuts. Open the two turnbuckles up until just a thread or two from each end shows inside the body of the turnbuckle. Hook the turnbuckles into the holes at the edge of the turnbuckle plate. Equalize the Dacron cord over the plate and cut it. Take two wraps of the cord through the eye of the rear turnbuckle, PULL the cord as tight as possible and make the knots as before. Repeat for the front cord section and turnbuckle. Cut off any excess over one foot long and again seal and tape the excess cord back to the main cord.

C. Now DISASSEMBLE the U-bolt from the boom to mast plate. The guy assembly is now centered and the turnbuckle plate ready to be installed to the mast and raised until the boom is straight.

D. If practical, after the final assembly and ***before*** installation, let the overhead guy system support the boom and take a set overnight: Install a 2' to 3' temporary 2" mast section to the boom to mast plate and attach and raise the turnbuckle plate. Support the antenna at the boom to mast plate. The Dacron cord DOES NOT STRETCH UNDER LOAD but cord and knots will take a SET and the boom may droop just a bit. Reset turnbuckle plate. If your boom droops again following this adjustment, check your knots - they may be may be slipping. If an overnight set is not possible, then after installing antenna on mast, lean on or pull on the cords to increase the tension and help the knots take their final "set." Make sure the knots are not slipping. When the guy system has taken a "set", raise the plate and adjust turnbuckles as required until boom is straight and level.

E. After final installation, do any minor boom straightening with the turnbuckles. Then safety wire to prevent changes to settings.

13. This completes the ASSEMBLY. When the antenna is installed in position on the mast, the main feedline can be attached and sealed at that time. REMEMBER to support the feedline at the antenna boom and on the mast. Leave an adequate feedline loop for rotation around the tower. Mount horizontally polarized VHF and UHF antennas at least 40" above or below this antenna to minimize interaction.

This completes the assembly.

CAREFULLY DESIGNED AND MANUFACTURED BY:

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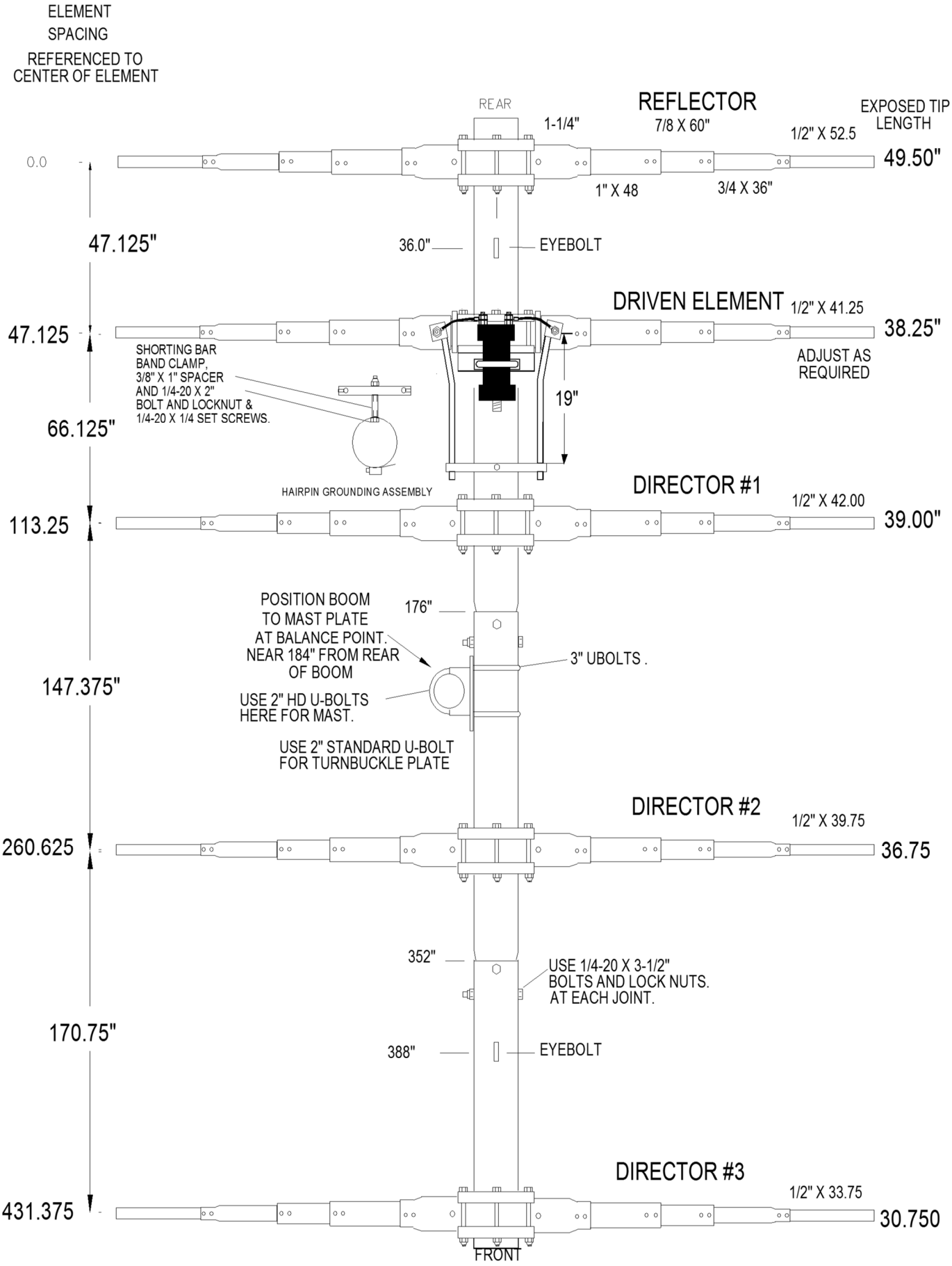
17M5-125 DIMENSION SHEET



17M5-125 PARTS & HARDWARE

DESCRIPTION	QTY
Boom sections, 3" x .125 x 15' swaged	2
Boom section, 3" x .125 x 7' straight	1
Boom to mast plate, 8 x 8 x .250" (M2APT0070)	1
Center element sleeve, 1-1/8 x .058 x 52" alum. tube	4
Center element sleeve, 1-1/8 x .058 x 26" alum. Tube	2
Center insulator, 1" x 24" fiberglass rod (M2AFG0037)	1
Element, 1-1/4 x .058 x 30" alum tube SOE (9/32 x 1.5)	10
Element, 1 x .058 x 48" alum. tube STR	10
Element, 7/8 x .058 x 60" alum tube STR	10
Element, 3/4 x .049 x 36" alum tube SOE	10
Element tip, 1/2 x .049 alum. tube STR:	
x 52.50"	2
x 41.25"	2
x 42.00"	2
x 39.75"	2
x 33.750	2
Element Clamp Plate, 3 X 6 X 1/2" #6 (M2AEC0040)	10
Saddle clamp 1 x 4 x 1/2" (M2AMC0136)	10
Disc Insulator, 1" dia (M2ADI0030)	2
3/8 x 26" hairpin tubes.	2
Balun, 1:1 current type, (FGBL0100)	1
Mounting bracket, Balun (M2APT0016)	1
Clamp block, 1/4" x 1" x 1-1/4" (M2AMC0261)	4
Shorting bar, 1/2 x 1/2 x 5" (M2ASB0262)	1
Band clamp, 3-1/2" modified with 1/4" hole	1
Spacer, 3/8" x 1"	1
Dacron rope, black 5/16 x 30 ft.	1
Turnbuckle, 3/8"	2
Eyebolt, 3/8 x 6"	2
Turnbuckle plate, 2 x 5 x 1/4 (M2APT0110)	1
Cable ties, large	5
U-bolt, 3"	2
U-bolt 2-1/2" (for balun)	1
U-bolt, 2" heavy duty	4
U-bolt, 2" standard (for turnbuckle)	1
Assembly Manual	1

IN HARDWARE BAG

Bolt, 1/4-20 x 3-1/2" ss	4
Bolt, 1/4-20 x 2-3/4" ss	20
Bolt, 1/4-20 x 2-1/2" ss	30
Bolt, 1/4-20 x 2-1/4",ss	2
Bolt, 1/4-20 x 2", ss	1
Bolt, 1/4-20 x 1-3/4 ss	8
Set screw, 1/4-20 x 1/4" ss	2
Nut, 1/4-20 locking, ss	45
Nut, 5/16-18 ss	4
Lockwasher, 5/16 ss	4
Nut, 3/8-16 ss	14
Lockwasher, 3/8 split ring ss	14
Screw, 8-32 x 1-1/2" ss	20
Screw, 8-32 x 1-1/4" ss	20
Screw, 8-32 x 1" ss	20
Nut, 8-32 locking, ss	60
Allen wrench, 1/8"	1