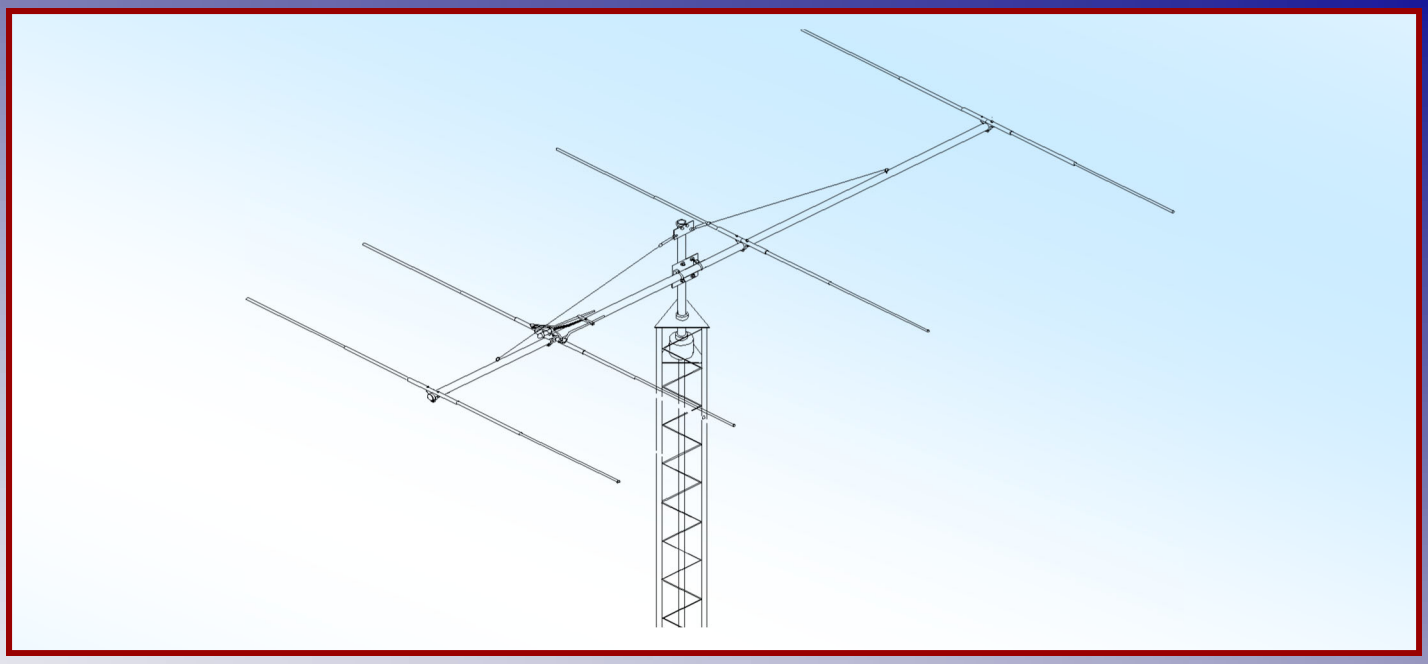
M2 Antenna Systems, Inc.
Model No: 25M4



SPECIFICATIONS:

Model	25M4	Power Handling	3 kW, Higher avl.
Frequency Range	11.9 To 12.10 MHz	Boom Length / Dia	40’ / 2 1/2”
Gain	9.52 dBi	Element Length / Dia.	34’ / 1-1/4”-3/8”
Front to back	21 dB Typical	Turning Radius:	Call
Feed type	Hair Pin Match	Stacking Distance	Call
Feed Impedance	50 Ohms Unbalanced	Mast Size	2” to 3 ” Nom.
Maximum VSWR	1.2:1	Wind area / Survival	3.5 Sq. Ft. / 100 MPH
Input Connector	SO-239/Others available	Weight / Ship Wt.	65 Lbs. / 75 Lbs.

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

FEATURES:

The 25M4 was designed for high performance while keeping weight, wind area and costs low. Using computer optimization techniques, every bit of the design has been squeezed for performance. The 25M4 can be stacked for improved performance. The 1:1 Fairite balun and low loss hairpin match help maintain high efficiency. Element ring clamps and other important components are CNC machined for maximum strength and electrical integrity. All antenna hardware is stainless steel and the U-bolts for mounting are zinc plated.

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08/30/22
Rev.01

25M4 ASSEMBLY MANUAL

NOTE: A cup of zinc paste (PENETROX, NOALOX, or equivalent) has been provided to enhance the quality of all the electrical joints and make assembly and disassembly easier. Apply a thin coat wherever two pieces of aluminum come in contact.

REFER TO THE DIMENSION SHEET FIRST. YOU MAY BE ABLE TO ASSEMBLE THE ANTENNA REFERRING TO THE WRITEEN INSTRUCTIONS ONLY AS A GUIDE.

1. BOOM ASSEMBLY: Note the different boom sections and the approximate position of each element. ALSO NOTE THAT TWO BOOM SECTIONS HAVE LARGE EYEBOLT MOUNTING HOLES. Slide the INNER TWO 2-1/2" RING CLAMPS into their approximate positions on the appropriate boom sections. Note the FIRST DIRECTOR ring clamp mounts between two boom coupling bolts in the third boom section. Spread the ring clamp fingers with a flat blade screwdriver to ease movement on the boom. Loosely add a 1/4-20 x 1" bolt and locknut to fingers of all clamps. Add 1/4-20 x 3" bolts and locknuts to each joint and tighten securely. Add the eyebolts and secure with 5/16-18 nuts and lockwashers.

NOTE: THE FOLLOWING OPERATIONS SHOULD BE DONE WITH THE BOOM AT WAIST HEIGHT.

2. Push two 1/4-20 x 2" bolts through the small holes in the 2" x 5" BALUN MOUNTING PLATE. Now feed these bolts down through the inner two holes of the 7/8 x 30" fiberglass rod. Mount this assembly onto the SECOND ring clamp holes (DRIVEN ELEMENT) and add the locknuts to the underside of the ring clamp. Tighten securely. Then push on a 2" diameter white POLYETHYLENE RING on each side. These rings form a long path to prevent water and residue induced arcing. ALIGN the ring clamp so it's long grooved top is perpendicular to the EYE BOLT HOLE just to the rear in the first section and tighten the ring clamp.

3. Select the two 1-1/4" x 60" SOE (Swaged One End) element sections with 9/32 holes in the butts. There will also be two sleeve sections in the butts. Slide them onto the 7/8" diameter fiberglass rod. Align the holes in all the sleeves and add the 1/4-20 x 2-1/2" bolts so the threaded ends are up. Add a pair of 3/8 clamp blocks to each side and then add a locknut finger tight to each side (The balun leads will attach to these studs later in the assembly).

4. Add a 1" x 60" SOE element section to each side. Align the holes and secure with 8-32 x 1-1/2" screws and locknuts. Tighten the screws alternately until each joint is secure and no movement is detected in either joint.

5. Slide two more 1-1/4" element sections and slide the butts over the 1-1/8" x 30" sleeves. Align the holes and drop in two 1/4-20 x 2" bolts. Set the assembly over the rear ring clamp. Add the two locknuts and tighten securely. It is the center section of the REFLECTOR element. Now add two more 1" x 60" tubes and secure these to the inner sections with 8-32 x 1-1/2" screws and locknuts. Tighten the screws alternately until each joint is secure and no movement is detected in either joint.

6. Pair up the remaining 1-1/4" element sections and slide the butts over the 1-1/8" x 30" sleeves. Align the holes and mount to the ring clamps using more 1/4-20 x 2" bolts and locknuts and secure.

7. Assemble the rest of the element halves using the 8-32 screws and locknuts as described on the ELEMET ASSEMBLY SHEET and the DIMENSION SHEET. Tighten each joint securely by alternating back and forth between the two screws at each joint until no movement is noted. BE SURE TO PAIR UP the 3/8" tip sections and get them in the correct locations.

25M4 ASSEMBLY MANUAL

8. Now adjust ELEMENT SPACING accurately following the Dimension Sheet. Dimensions given are “center to center” or common edge to common edge. After setting spacing, align elements and tighten the 1/4-20 x 1” bolts at the bottom of each ring clamp.

9. Now, if you haven’t already done so, attach the 3/4”, 1/2” and 3/8” element sections to the 1” tubes at the correct location. Secure with 8-32 x 1-1/4” screws and locknuts. Repeat for all elements. MAKE SURE TIPS LENGTHS ARE IN THE RIGHT ELEMENT POSITIONS.

10. Attach the SPECIAL 3-30 MHz, 1:1 balun (Teflon coax inside for greater power handling) to the plate at the center of the DRIVEN ELEMENT. Secure the balun to the plate using two studs protruding from the bottom of the balun housing. Note there are two 1/8” diameter vent / drain holes near the studs. These holes must be DOWN. Add two 1/4-20 locknuts and tighten the balun to the plate. The balun connector should be facing forward. Connect the terminals on the balun leads to the STUDS formed earlier in the construction. Next slide the HAIRPIN TUBES into the 3/8 clamp block pairs, align and tighten the locknuts. Large nylon ties are provided to secure the feed line along the boom to the mast mounting plate. Seal the feedline connector as required with vinyl tape and coax seal or equivalent.

11. Add the 1/4-20 x 2-1/4” bolt from inside the BAND CLAMP attach the clamp loosely to the boom close to the HAIRPIN DIMENSION on the DIMENSION SHEET. Add the 3/8” x 1” spacer to the bolt: set the 1/2 x 1/2 x 5” shorting bar on the bolt and add the 1/4-20 locknut. Align the bar with the band clamp and tighten the locknut. Place the band clamp grounding assembly on the boom about 40 inches in front of the Driven Element. Slide the shorting bar onto the HAIRPIN TUBES and install the two 1/4-20 x 1/4” set screws into the ends of the shorting bar. Se the bar and clamp assembly to the dimension noted on the DIMENSION SHEET. Align and tighten the set screws and the band clamp. NOTE: THIS ASSEMBLY DC GROUNDS THE DRIVEN ELEMENT. THE REST OF THE ELEMENTS ARE ALREADY GROUNDED.

12. Pick up the boom and mark the balance pint. Center the BOOM TO MAST PLATE and secure with two 2-1/2” U-bolts, cradles, stainless lockwashers and nuts. Four, 2” U-bolts are supplied for attaching the antenna to the mast.

13. To prepare the overhead guy system, begin by temporarily installing a 2” U-bolt through the TURNBUCKLE PLATE and INTO the top set of 2” U-bolt holes on the boom to mast plate. Add a couple of 5/16” nuts to hold in place. Unscrew turnbuckle eyes / hooks until only a thread or two shows inside the turnbuckle body and hook them into the turnbuckle plate.

14. Uncoil the 5/16” DACRON CORD. Secure one end to the rear eyebolt, taking two turns through the eyebolt, then adding three TIGHT half-hitches. Pull hard on cord to set the knots. Repeat for the front eyebolt. Seal cord ends with heat (lighter, propane torch, etc) and tape the main length.

15. Equalize cord length at turnbuckle plate and cut. Put two turns through the rear turnbuckle eye, pull slack out of rope, and add three TIGHT half-hitches. Repeat for front cord section. Seal and tape cord ends.

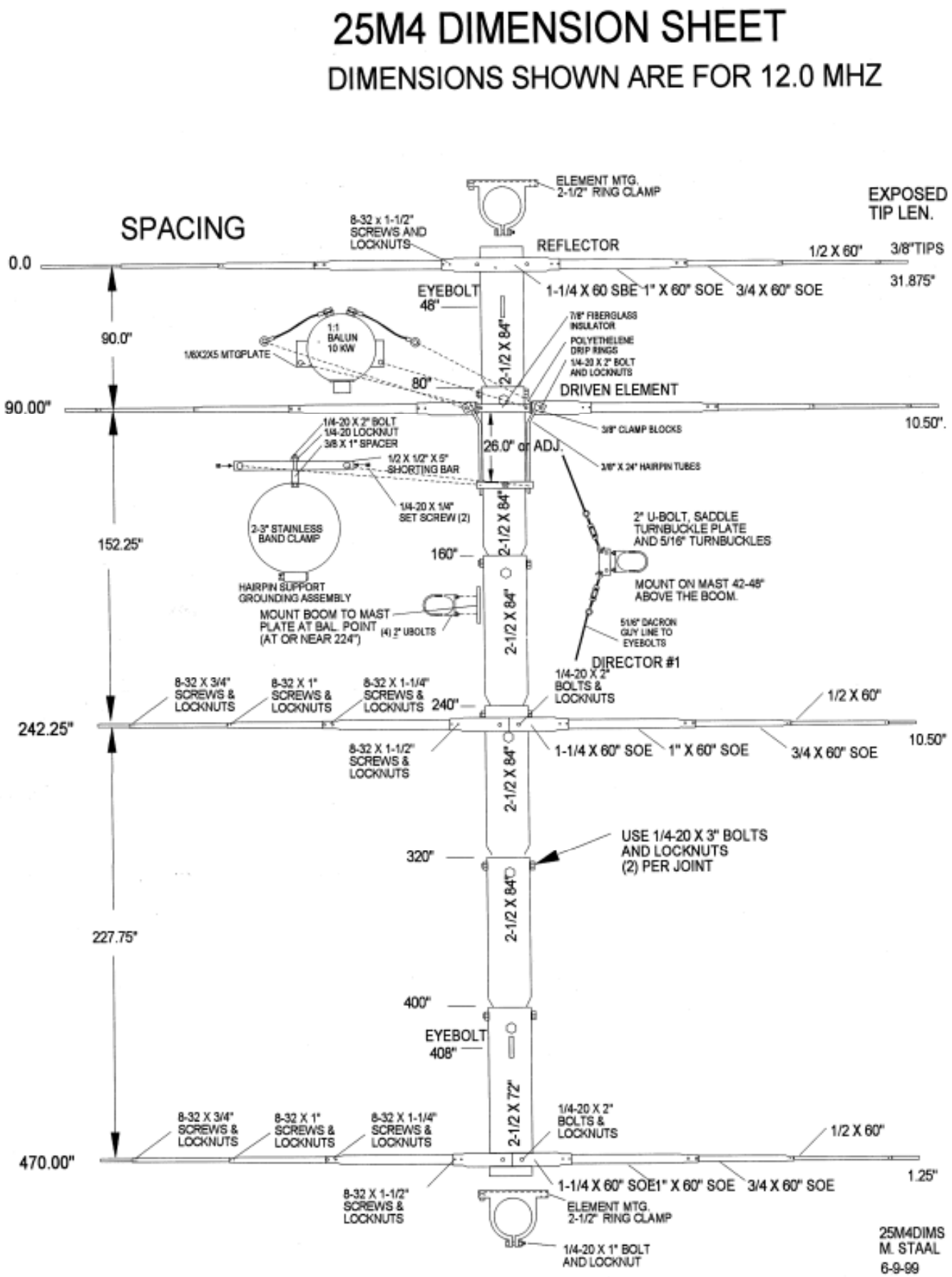
16. Disconnect the 2” U-bolts holding the turnbuckle plate and lift it up until the boom bows up slightly. This is approximately how high the plate will be when the antenna is installed on the mast.

17. During final installation on the tower / mast, secure the turnbuckle plate at the appropriate height with the 2” U-Bolt. Then lean 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”, loosen the 2” U-bolt and adjust turnbuckle plate height until boom is straight and level. Finer adjustments can be made at any time, if necessary, with the turnbuckles.

18. This completes the ASSEMBLY, REMEMBER to support the feedline at the antenna boom and on the mast. Leave an adequate feedline loop for rotation around the tower. Mount any horizontally polarized VHF and UHF antenna AT LEAST 40” above or below this antenna to minimize interaction.

D.E. & PARASITIC ELEMENT DETAIL

25M4 DIMENSION SHEET



25M4 PARTS AND HARDWARE

DESCRIPTION	QTY
BOOM SECTION, 2-1/2" X .058 X 84" SWAGED	5
BOOM SECTION, 2-1/2" X .058 X 72"	1
ELEMENT SECTION, 1-1/4" X .058 X 60" SOE	8
ELEMENT SECTION, 1" X .058 X 60" TYPE 1 (SOE)	8
ELEMENT SECTION, 3/4" X .049 X 60" SOE	8
ELEMENT SECTION, 1/2" X .049 X 60"	8
ELEMENT TIP, 3/8" X .049 X SEE DIMENSION SHEET	8
ELEMENT SLEEVE, 1-1/8" X .058 X 30" (FOR 2-1/2" RING CLAMPS)	3
ELEMENT SLEEVE, 1-1/8" X 15" (DRIVEN ELEMENT)	2
ELEMENT SLEEVE, 1" X 15" (DRIVEN ELEMENT)	2
INSULATOR, 7/8" X 30" SOLID FIBERGLASS ROD	1
BOOM TO MAST PLATE, .188" X 6" X 8"	1
RING CLAMP, 2-1/2"	4
HAIRPIN PARTS	
HAIRPIN TUBES, 3/8" X 40" FORMED	2
BALUN, 1:1 WITH 7/16" DIN CONNECTOR	1
BALUN MOUNTING PLATE, 1/8" SPECIAL	1
HAIRPIN HARDWARE	
CLAMP BLOCK, 3/8"	4
SHORTING BAR, 1/2" X 1/2" X 5.5"	1
SPACER, 3/8" X 1" ALUMINIUM	1
POLY RINGS, 7/8" HOLE	2
BAND CLAMP, 2-3" SS (MODIFIED)	1
U-BOLT, 2-1/2"	1
NUT, 5/16-18 SS	2
LOCKWASHER, 5/16 SPLIT RING SS	2
BOLT, 1/4-20 X 2-1/4" SS	1
NYLOCK NUT, 1/4-20 SS	1
SET SCREW, 1/4-20 X 1/4" SS	2
ALLEN WRENCH, 1/8"	1
DACRON ROPE, 5/16" X 35'	1
EYEBOLTS, 5/16" X 6"	2
TURNBUCKLE, 5/16" (HOOK AND EYE)	2
TURNBUCKLE PLATE, .125" X 2" X 5"	1
U-BOLT AND CRADLE, 2"	3
U-BOLT AND CRADLE, 2-1/2"	2
ASSEMBLY INSTRUCTIONS	1
IN HARDWARE BAG	
NUT, 5/16-18 SS	12
LOCKWASHER, 5/16 SPLIT RING SS	12
BOLT, 1/4-20 X 3" SS	10
BOLT, 1/4-20 X 2-1/2" SS	2
BOLT, 1/4-20 X 2" SS	6
BOLT, 1/4-20 X 1" SS	4
NYLOCK NUT, 1/4-20 SS	22
SCREW, 8-32 X 1-1/2" SS	16
SCREW, 8-32 X 1-1/4" SS	16
SCREW, 8-32 X 1" SS	16
NYLOCK NUT, 8-32 SS	64
NYLON TIE, 11"	5
ZINC PASTE, 1 OZ CUP	1

Carefully Manufactured by
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