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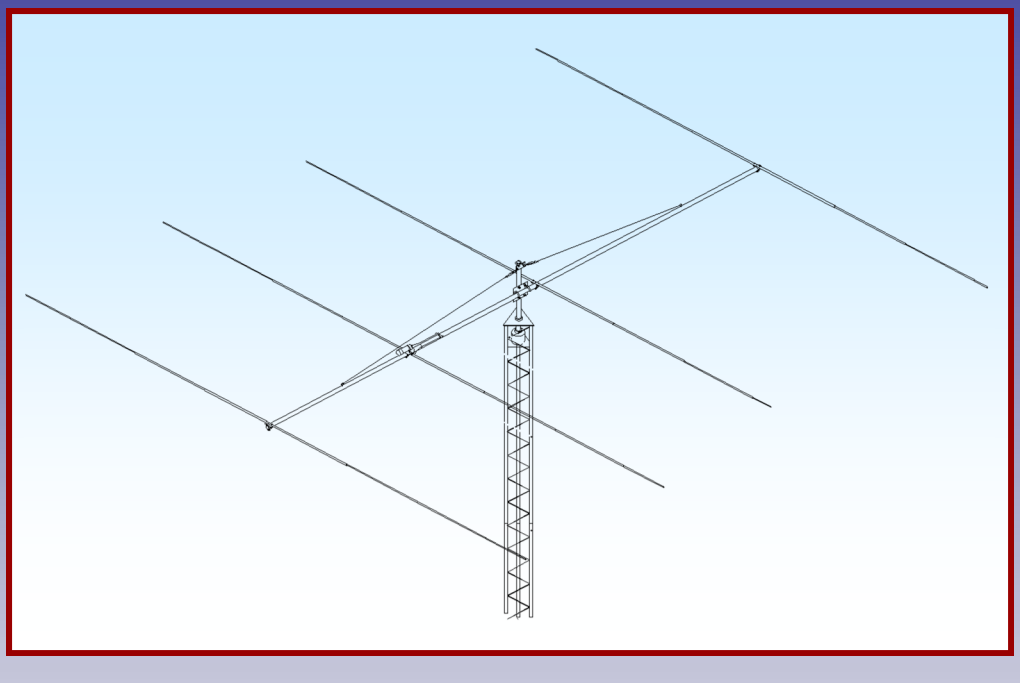
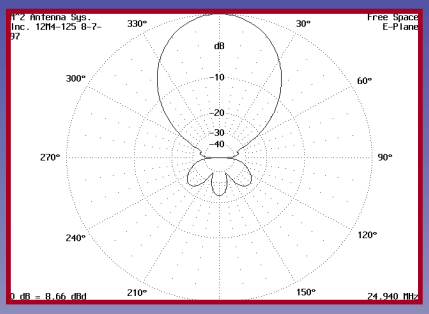
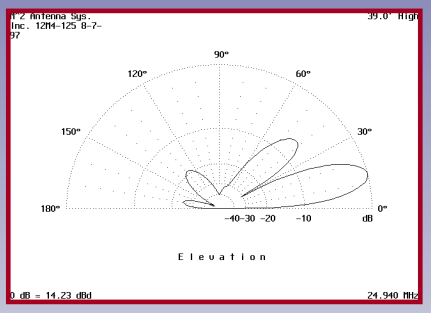
M2 Antenna Systems, Inc.
Model No: 12M4-125







SPECIFICATIONS:

Model	12M4-125
Frequency Range	24.890 To 24.990 MHz
*Gain, (FS) / Over gnd	10.7dBi / 16.4dBi @40'
Front to back	20 dB Typical
Beamwidth	E=48° / H=58°
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	30' / 3" x .125 Wall
Element Length / Dia.	20' / 1" To 1/2"
Turning Radius:	16' 8"
Stacking Distance	35' To 39'
Mast Size	2" to 3 " Nom.
Wind area / Survival	5.2 Sq. Ft. / 125 MPH
Weight / Ship Wt.	50 Lbs. / 65 Lbs.

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

FEATURES:

The 12M4-125 version is a great performer for its size. It was designed for low wind area but rugged and light-weight. The computer optimized design allows full band coverage with good gain and front to back. Performance is excellent on both the CW and phone. Mechanically, CNC machined aluminum (6061-T6) ring clamps ground the elements to the boom and make assembly a snap. A hairpin type match couples the 3 kW 1: balun to the feed line. The antenna is completely DC grounded. The 12M4-125 version is also great for stacking, providing 3 dB increased gain not to mention the lower angle of radiation. Put the 12M4DX to the test in the new cycle!

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02/25/15
Rev.04

12M4-125 ASSEMBLY MANUAL

TOOLS REQUIRED: screw driver, 11/32" spinet or socket, 7/16", 1/2", and 9/16" socket and or end wrenches. A small container of Noalox, Penetrox (or equivalent) conductive, anti-oxidant zinc paste has been supplied. Apply a small amount at all aluminum to aluminum and other electrical joints.

1. Begin by assembling the three 1 x 60" SBE (Swaged Both Ends) and six 3/4" elements as shown on the "ASSEMBLY DETAILS" drawing. Use 8-32 x 1-1/4" screws and locknuts at the joint to hold the 3/4" section. Tighten securely. Using the “DIMENSION SHEET” as a reference, add the 1/2” tip elements now or later depending on your space limitations. Secure the tip elements to the 3/4” sections with the 8-32 x 1” screws and locknuts.

2. See "ASSEMBLY DETAILS" drawing for the driven element assembly. Assemble the two element clamp halves, including the angle bracket for mounting the balun. Use four (4) 1/4 - 20 x 2" bolts and locknuts to secure the clamps. Assemble loosely. Locate the 7/8 x 15' fiberglass rod and the 2 white poly disks. Mark the center of the rod and slide it into the clamp halves. Once centered, rotate the bar so the bolt holes are vertical. Now tighten the 4 bolts on the clamp assembly. Slide the two poly disks on each side of the assembly, positioned up against the metal clamps. Next slide on the 1 x 30" SOE (Swaged One End) tubes, align the holes of the tubes with that of the fiberglass rod, and run the 1/4 - 20 x 2" bolts up from the bottom. Add the 3/8" diameter hairpin tube clamp blocks, and finger tighten the locknuts onto the bolts at this time.

3. Add the 3/4 x 38" SOE sections on both sides of the driven element assembly and secure with 8-32 x 1-1/4 screws and locknuts. Add the 1/2" tips now or later, depending on the available space, and secure with 8-32 x 1" bolts and locknuts.

4. Mount the 3-30 MHz 1:1 balun to the L bracket with the single 2-1/2" u-bolt and cradle, and secure with the supplied 5/16" nuts and lockwashers. Tighten MODESTLY, as over tightening may damage the balun case. Now orient the balun terminals as shown on the "DIMENSION SHEET." Remove the nuts holding the 1" element halves on the driven element assembly. Place the balun leads over the two studs and replace the locknuts. Again, finger tighten the locknuts at this time.

5. Locate and mark the center of each 1” x .058 x 60” (swaged both ends SBE) section. Attach these three to the element clamp plates and secure with four (4) 1/4-20 x 2” bolts and locknuts. Be sure to keep the plates parallel and centered. Just before tightening, rotate the whole element so the nuts on the sections are down or toward the saddle side of the clamp blocks.

6. See “ASSEMBLY DETAILS” drawing for the boom assembly. The boom is symmetrical, so outer sections are identical. Add 1/4-20 x 3-1/2" bolts, and locknuts and tighten.

7. Install the two CABLE / EYEBOLT assemblies into the boom, just in from the outer ends, and tighten the nuts.

8. Place the boom on saw horses or equivalent to get it to a convenient working height (eyebolts UP). 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.

12M4-125 ASSEMBLY MANUAL

9. At one end of the boom, mount the REFLECTOR element assembly (rear plate about 1" from boom end). Add a SADDLE CLAMP under each ELEMENT CLAMP PLATE and secure with four 1/4-20 x 3" bolts. Align the element at right angle to the EYEBOLTS and finger tighten bolts. Rotate boom back and forth a little to make sure saddles and plates are square with boom and not cocked. Tighten evenly. Now do the same for the other three elements as per the "DIMENSION SHEET."

10. Assemble the hairpin shorting bar arrangement as shown on the “DIMENSION SHEET.” Insert the 1/4 - 20 x 2” bolt up through the 2-1/2” - 3” band clamp, and place the 3/8 x 1” spacer over the bolt. Next place the 1/2 x 1/2 x 5” shorting bar on top of the spacer and secure the assembly with a 1/4-20 locknut. Open the band clamp of the assembly all the way and place it onto the boom towards the first director. Close the clamp, so that the assembly is temporairily secured to the boom.

11. Slide the straight end of the two 3/8 x .049 x 30” hairpin tubes into the shorting bar as shown on the “ASSEMBLY DETAILS” drawing. With the supplied 1/8” Allen wrench, insert the two 1/4-20 x 1/4” hex head set screws into the sides of the shorting bar. Now slide the tubes up towards the driven element and into the clamp blocks, align and tighten the two lock nuts. Move the bar to the location shown on the “DIMENSION SHEET,” and tighten the set screws securely. Now tighten the ring clamp to the boom.

12. Unroll the steel cable assemblies at the eyebolts and route the cable ends to the center of the boom. as noted on the DIMENSIONS SHEET. Mount the 8” x 8” BOOM TO MAST PLATE at the balance point about 168” from the rear using two 3 inch U-bolts, stainless steel lock washers and nuts. Add two of the four HEAVY DUTY 2 inch mast U-bolts and install a short (6’ or so) temporary mast in order to pre-rig the outer steel boom support cables. Open the 3/8” forged turnbuckles so just one thread shows inside the body and attach them to the 2 x 5” turnbuckle plate. Mount the plate about 48 inches up on the temporary mast with a standard 2” U-bolt and Attach the steel cable assemblies to the turnbuckle using two WIRE CLIPS OR CABLE U’s and ONE CABLE EYE on each cable. Equalize the tension on the cables.

NOTE: IT IS A GOOD IDEA TO LET THE ANTENNA SET OUTSIDE ONE NIGHT FOR A TEMPERATURE CYCLE LETTING MOTHER NATURE LOOSEN ALL YOUR BOLTS. RECHECK ALL HARDWARE JUST PRIOR TO INSTALLATION ON TOWER.

IT IS ALSO A GOOD IDEA TO ELECTRICALLY TEST THE ANTENNA AT 10 TO 20 FEET OR MORE PRIOR TO INSTALLATION AT ITS FINAL HEIGHT. VSWR REASONABLY CLOSE TO THE DESIRED VALUES SHOULD BE OBTAINED. IF THING DON’T LOOK RIGHT, CALL M2 BEFORE INSTALLATION AND BE PREPARED TO DISCUSS YOUR VSWR MEASUREMENTS AND HOW THE ANTENNA IS WORKING ON RECEIVE EVEN AT THIS LOW HEIGHT. THIS SHORT DELAY MAY SAVE DOLLARS AND TIME IN THE LONG RUN. ENJOY!!

THIS COMPLETES THE ANTENNA ASSEMBLY

Carefully designed and manufactured by:

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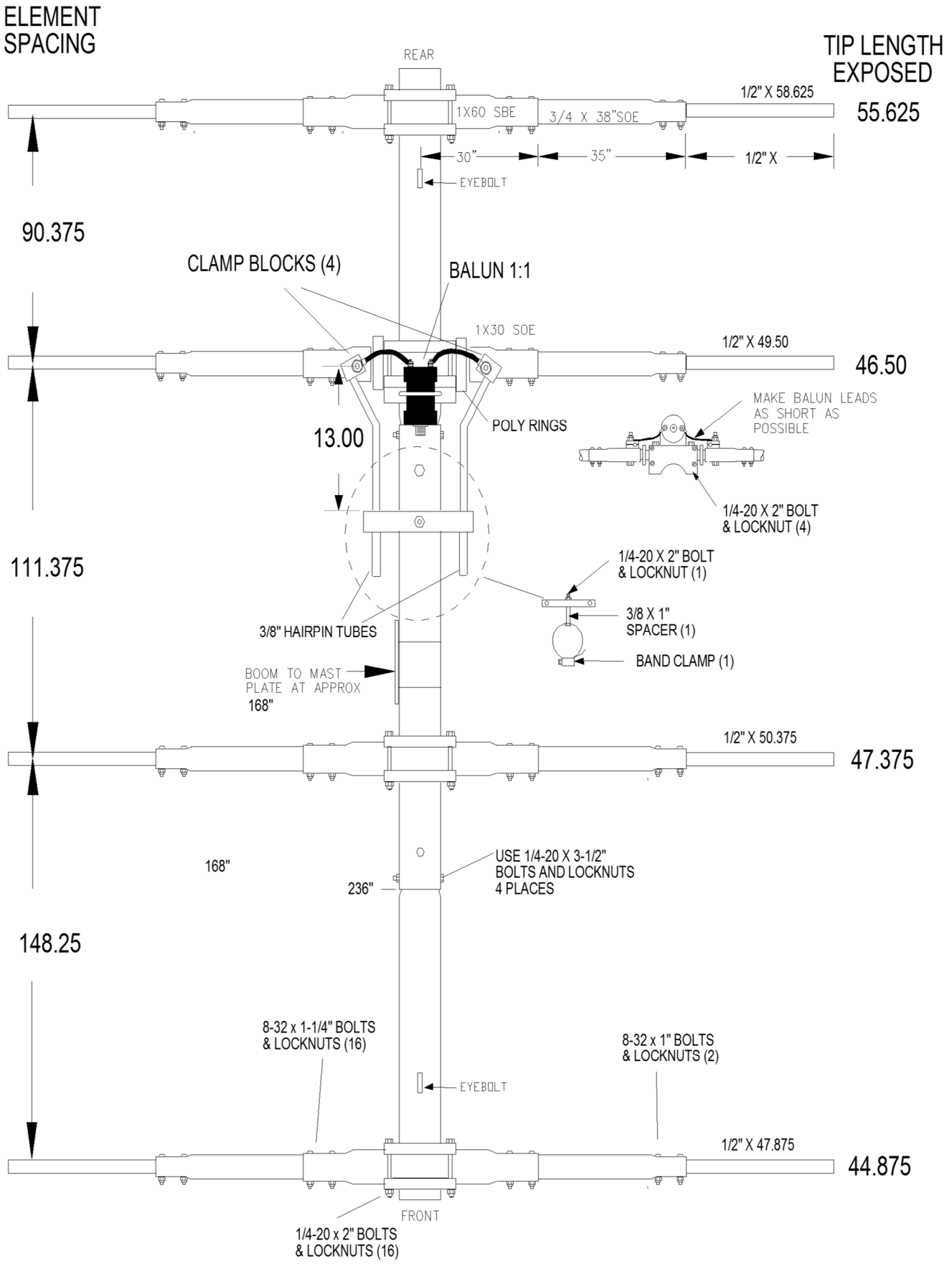
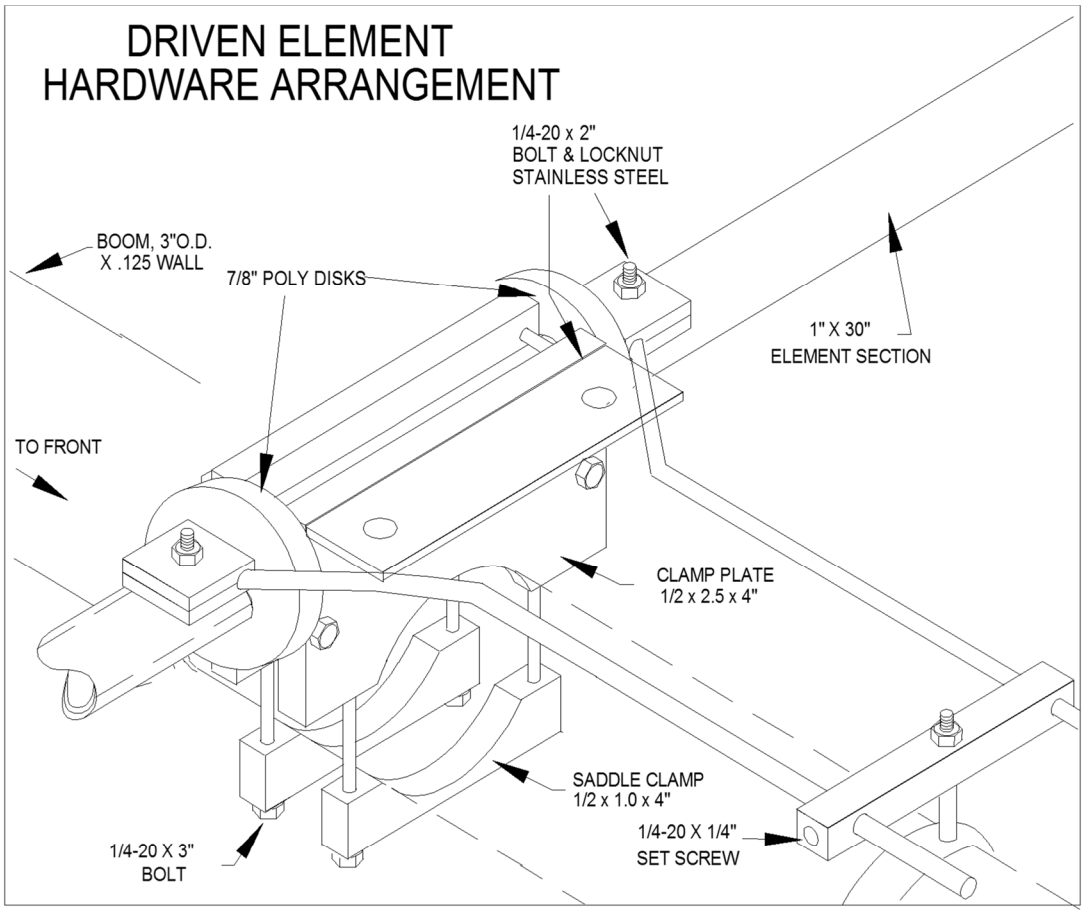
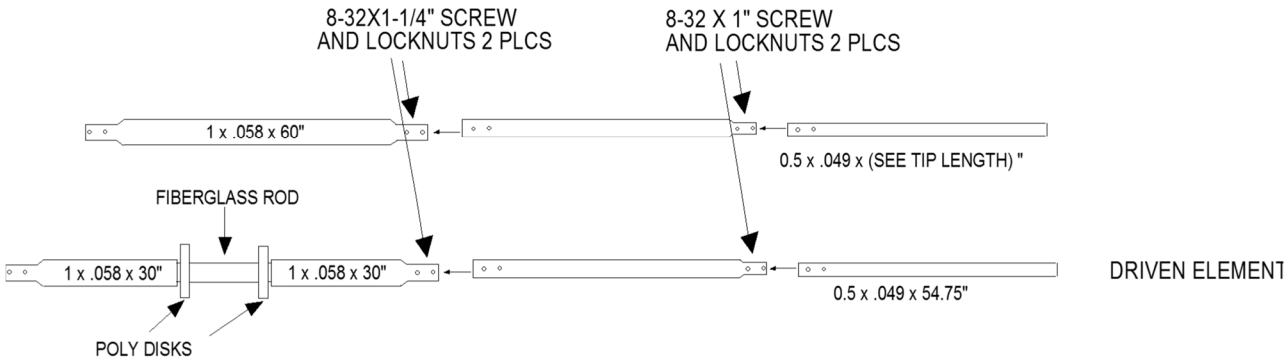
12M4-125 DIMENSION SHEET



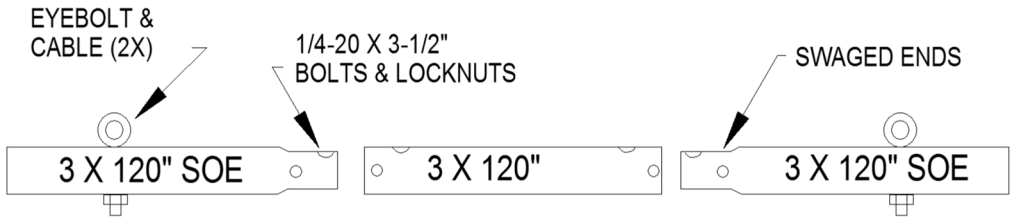
12M4-125 ASSEMBLY DETAILS



12M4-125HD ELEMENT ASS'Y



BOOM ASSEMBLY



12M4-125 PARTS & HARDWARE

DESCRIPTION	QTY
Boom sections, 3" x .125 x 10' SOE alum. tube	2
Boom section, 3" x .125 x 124" str. alum. tube	1
Boom to mast plate, 8 x 8 x .250" HD 2" **(M2APT0070)**	1
1 x .058 x 60" alum. tube SBE	3
1 x .058 x 30" alum. tube SOE	2
3/4 x .049 x 38" alum. tube SOE	8
1/2 x .049 X SEE DIM. SHEET, alum. tube	8
Insulator, fiberglass, 7/8 x 15" **(M2AFG0030)**	1
Hairpin Tube, 3/8 x .049 x 30"	2
Clamp plate **(M2AEC0038)**	8
Saddle clamp **(M2AMC0136)**	8
Turnbuckle plate, 2 x 5 x 3/16" **(M2APT0113)**	1
Wire Rope, 1/8" x 165" with 3/8 X 6"eyebolt	2
Turnbuckle, forged, eye and jaw 3/8"	2
Cable ties, large, Nylon	3
U-bolt, 3"	2
U-bolt, 2" heavy duty	4
U-bolt, 2" standard (for turnbuckle)	1
U-bolt, 2-1/2" standard (for balun mounting)	1
Balun, 3-30 MHz 1:1 w/ SO239 connector **(FGBL0100)**	1
Assembly Manual	1
IN HARDWARE BAGS	
Bolt, 1/4-20 x 3-1/2"ss	4
Bolt, 1/4-20 x 3"ss	16
Bolt, 1/4-20 x 2"ss	16
Nut, 1/4-20 locking ss	22
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 1-1/4" ss	16
Screw, 8-32 x 1" ss	16
Nut, 8-32 locking, ss	32
Cable clips 1/8"	4
Cable eyes, 1/8"	2
Penetrox, conductive paste, cup	1
STANDARD HAIRPIN PARTS BAG	
Shorting bar, 1/2 X 1/2" x 5" **(M2ASB0262)**	1
Clamp block, 3/8" **(M2AMC0261)**	4
Poly rings, 7/8" hole **(M2ADI0040)**	2
Balun L bracket, 4 x 1 x 1" **(M2APT0015)**	1
Spacer, 3/8 x 1" alum	1
Band clamp, 2-1/2" - 3"	1
Bolt, 1/4-20 x 2, ss"	3
Nut, 1/4-20 locking, ss"	3
Set screw, 1/4-20 x 1/4" Ss	2
Allen wrench, 1/8"	1

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