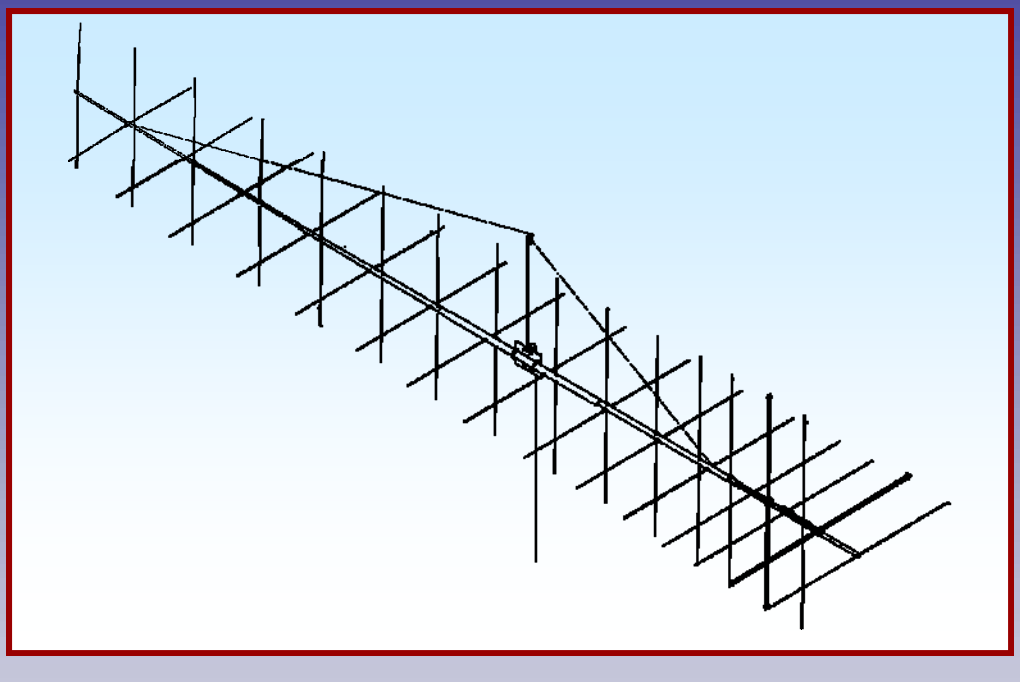
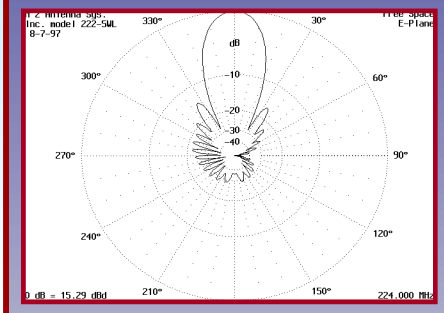
M2 Antenna Systems, Inc.
Model No: 222XP30





SPECIFICATIONS:

Model	222XP30
Frequency Range	222 To 226 MHz
*Gain	17.4 dBi
Front to back	21 dB Typical
Beamwidth	E=23° H=25°
Feed type	"T" Match
Feed Impedance.	50 Ohms Unbalanced
Maximum VSWR	1.2:1 Typical
Input Connector	"N" Female
Power Handling	1.5 kW
Boom Length / Dia	24' 3" / 1-1/2" To 3/4"
Maximum Element Length	25-7/8"
Turning Radius:	13" 10"
Stacking Distance	120" High & 120" Wide
Mast Size	1-1/2" to 2" Nom.
Wind area / Survival	2.4 Sq. Ft. / 100 MPH
Weight / Ship Wt.	12 Lbs. / 13 Lbs.

***Subtract 2.14 from dBi for dBd**

FEATURES:

The 222XP30 is the dual polarized version of the famed 222-5WL 15 element Yagi. It is our latest design using computer techniques to allow maximum gain and patterns in both the horizontal and vertical planes. The vertical elements have been shifted 1/4 wave length in front of the horizontal set to allow circular polarization if needed. This means four possible polarization modes with one antenna! Two antennas stacked are a dynamite DX package for FM and SSB and 4 or more are perfect for long haul tropo DXing or moonbounce. The 222XP30 allows you to experience the radio spectrum's best tropo frequency without bustin' your mast or your budget!

Structurally the 222XP30 is sturdy and clean. Elements are 3/16" 6061-T6 aluminum rod mounted through the boom on UV stabilized "button" insulators. The boom is a full 1-1/2 inch diameter in the middle tapering through two 1-1/4 inch sections to stiff 1 and 3/4 inch tips. The main 'N' connectors are O-ring sealed to the CNC machined block and 4:1 balun connectors feature triple seals. The internal module connections are sealed in a space-age silicone gel.

M2 Antenna Systems, Inc. 4402 N. Selland Ave. Fresno, CA 93722
Tel: (559) 432-8873 Fax: (559) 432-3059 Web: www.m2inc.com

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222XP30 ASSEMBLY MANUAL

Tools required: slot screwdriver, 11/32", 7/16", and 1/2" end wrenches and / or sockets.

1. Start by laying out the boom sections using the DIMENSION sheet as a guide. Use the appropriate 8-32 screws and locknuts as shown to join the sections. To make the assembly easier, support the completed boom about waist high on bucks, tables, etc. Or even better, drive a 1-1/2" to 2" pipe into the ground and temporarily attach boom using the boom to mast plate and U-bolts at the balance point shown on the DIMENSION SHEET.

2. Lay out the 3/16" elements by length and position as shown the DIMENSION sheet. Start with the REFLECTOR (25.875") element. Balance across finger to find center and push on a black button insulator to about 1/2" from center. Push the element through the holes 1/2" from the rear of the boom and install the second button, snugging it up into boom. DO NOT BOTHER WITH ACCURATELY CENTERING the element at this time and DO NOT INSTALL the stainless steel internal locking "KEEPERS" yet. This is easier to do after all the elements are installed in the boom.

3. Install the 25" DRIVEN ELEMENT as you did the reflector. Then continue with the installation of the DIRECTORS. ***Note that the Director Elements do not consistently diminish in length from rear to front, so pay close attention to length and position.***

4. Now begin centering the elements. Use a tape measure to EQUALIZE the amount the element sticking out on each side of the boom. Once you have all the elements centered, sight down the element tips from the rear comparing each side. Look for any obvious discrepancies and correct if found.

5. Begin installing the stainless "keepers." Use thumb and index finger to hold a keeper over end of the 3/8 x 3" push tube (keeper dished into tube). Hold the element firmly and start the keeper onto the rod by applying pressure with the push tube. Push the keeper until up tight against the button insulator (Locking pliers, ***lightly*** clamped up against opposite button insulator will help maintain center reference and keep you from pushing the first keeper too far). Repeat for the opposite side. Continue installing keepers until all elements are locked in place.

6. Now loosen the 1-1/2" U-Bolts on the boom to mast plate and rotate the boom 90 degrees and repeat steps 2 through 5 for the VERTICAL set of elements.

7. Mount the DRIVEN ELEMENT BLOCK ASSEMBLIES to the boom using 8-32 X 1-1/4" screws. Orient the block with the 'N'-connector facing towards the rear of the antenna and balun 'F'-connectors facing towards the front.

8. For the two DRIVEN ELEMENT BLOCK ASSEMBLIES, install a 3/8" SEAL NUT all the way onto BOTH 'F'-connectors, with the black Neoprene seal facing out. Attach the balun to one of the 'F'-connectors on the block, make two loops, and connect the other side to the other 'F'-connector. The extra loop prevents the either balun from touching the first directors. Now tighten the connectors ***gently*** using a 7/16" end wrench. Once the connectors are tight, back the Seal Nuts out and finger-tighten firmly up against the face of the connectors (or tighten ***very gently*** with 1/2" end wrench). Secure the balun close to the boom with a nylon cable tie in such a way so that it's snug but not crushing or kinking the coax.

9. Install the 8-32 x 1/4" set screws (internal Allen head - tool supplied) into the two SHORTING BARS. Slide the bars onto the 3/16" rod driven element tips and then onto the Driven Element Block Rods. Position the Shorting Bars as specified on the DIMENSION SHEET: the distance given is between the outer edge of the Driven Element Block and the inner edge of the Shorting Bar. Align the bars and rods with each other and tighten the setscrews.

10. If you have not already done so, attach the boom to mast plate to the boom. It is normally mounted at the balance point, as shown on the DIMENSION SHEET. Since the feed line represents significant weight it is best to have it, or a temporary equivalent, attached and fastened along the boom with cable ties before final mounting the plate. Use two 1-1/2" U-bolts and the stainless nuts and lock washers provided. DO NOT OVER TIGHTEN. 2" U-bolts are provided for mounting the antenna to your **NON-CONDUCTIVE** mast.

11. OVERHEAD GUY SYSTEM
Locate the 3/8 x 14" fiberglass rod, the three fiberglass rod mast clamp blocks, the fiberglass mast clamp flag and the remaining four 8-32 x 1-1/4" screws and locknuts. Attach two fiberglass rod mast clamp blocks to the boom to mast plate with two 8-32 x 1-1/4" screws and locknuts as shown below in the figure. Insert the 3/8 x 14" fiberglass rod into the slot formed by the two blocks and tighten the two locknuts. Now assemble the remaining fiberglass rod mast clamp and mast clamp flag with two 8-32 x 1-1/4" screws and locknuts. Slide the assembly onto the fiberglass rod as shown below in the figure and tighten the two screws.

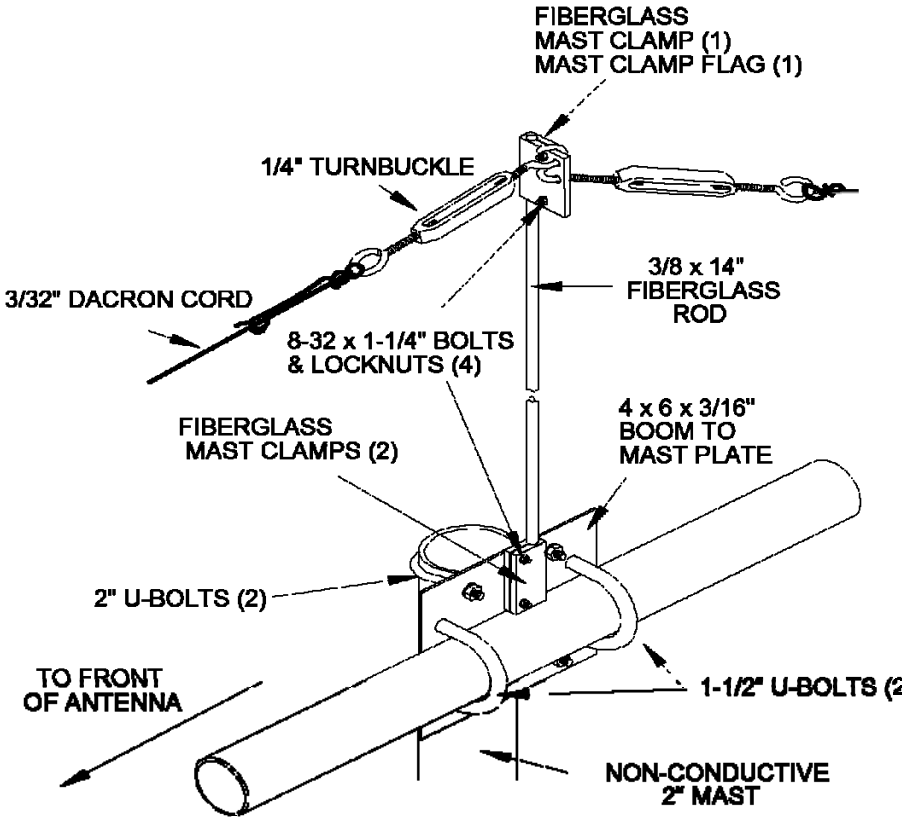


Figure 1. Overhead Support Detail

12. Using the Dimension Sheet as a guide, install the two small "U" clips (3/16" rod) into the **top side** of the 1" rear and rear boom sections. Secure the "U" clips with keepers.

222XP30 ASSEMBLY MANUAL

13. Install the two turnbuckles into the fiberglass rod mast clamp assembly as shown above in the figure. Adjust threads until just one or two show inside turnbuckle body. With two friends, lift up the two ends of the boom until the middle is 4" to 6" LOWER than the ends. Attach one end of the Dacron cord to the rear U clip by taking two wraps through the "U" and finishing with two half-hitches or a square knot. Adjust to leave 2" to 4" of cord after knots. Attach the other end of the cord to the front clip in the same way. Equalize excess cord at the riser tube and cut. Take rear cord end and make two wraps through rear turnbuckle eye, then pull line taut and knot as above. Repeat for front cord and turnbuckle.

14. MOUNTING INFORMATION
MOUNTING THIS ANTENNA ON A METALLIC MAST WILL GREATLY HAMPER ITS PERFORMANCE, THEREFORE THE ANTENNA MUST BE MOUNTED ON A NON-CONDUCTIVE SUPPORT. If you have not already done so, install your antenna on your non-conductive mast. Supporting the antenna at the boom-to-mast plate will tension the cord and will help the knots to take a set. If possible, let this process extend overnight. Then adjust turnbuckles so boom ends bow up slightly (and equally). A few days on the mast should leave the boom straight. Cut any excess length of cord, leaving 2" to 4". To prevent fraying melt ends with heat or flame and tape back to main line. NOTE: You may notice that the boom may drop slightly from end to end. This is normal and in no way will affect the performance of the antenna.

15. **STACKING INFORMATION**
Stacking two of these antennas either horizontally (E-Plane) or vertically (H-Plane) by 118" (center of one boom to another) should yield the maximum theoretical gain for stacking, with clean patterns. When stacking 4 or more antennas use the same figure, 118". Be sure all antennas are oriented so the HORIZONTAL and VERTICAL driven element blocks are on the SAME SIDE of the boom and NOT MIRROR IMAGE to each other. M^2 can also provide low loss LMR400 or LMR600 phase lines and 4 port power dividers, depending upon your system requirements.

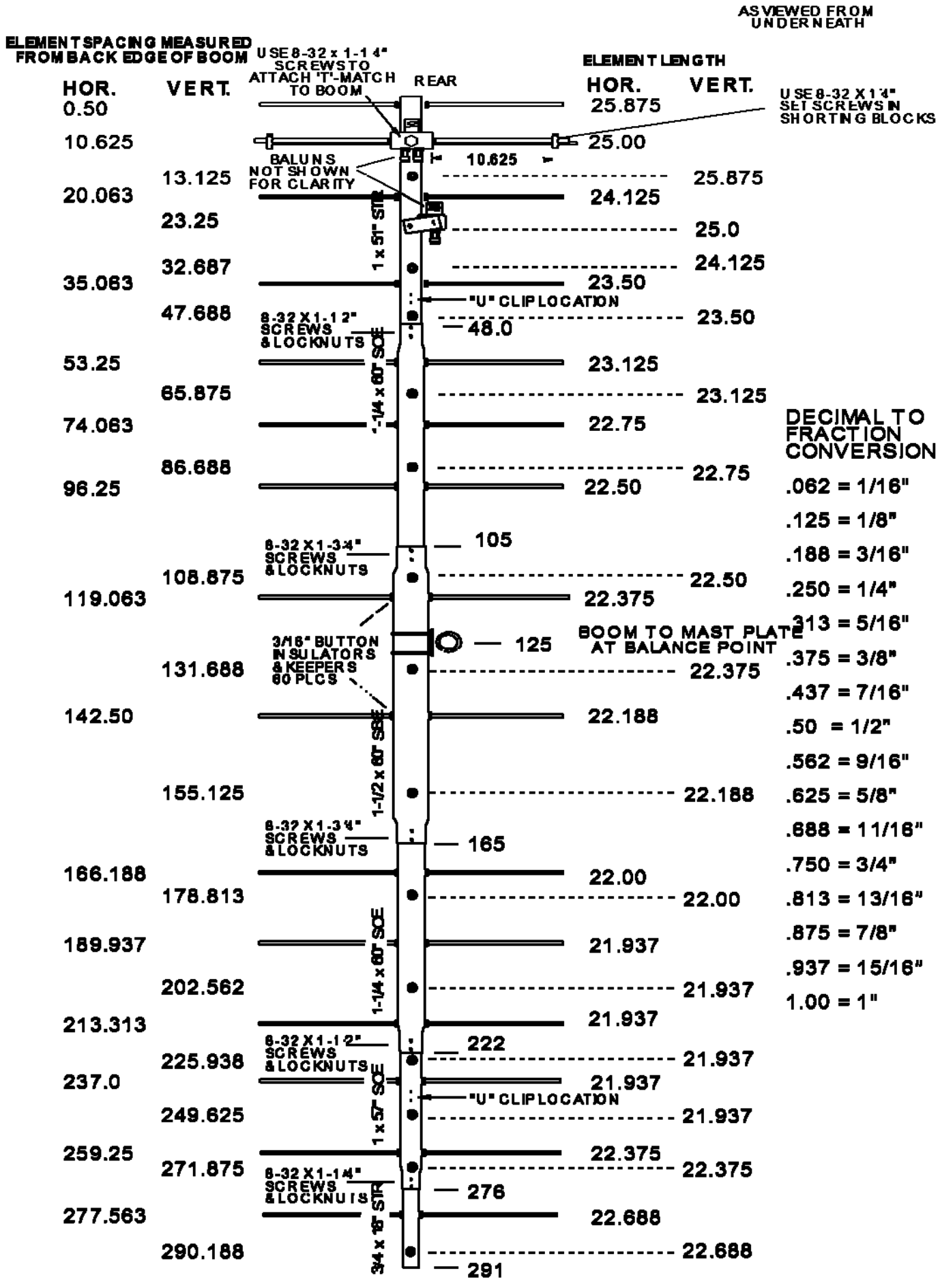
If you need any additional information or HELP with your system, **PLEASE CALL US!**

THIS COMPLETES THE ANTENNA ASSEMBLY.

CAREFULLY MANUFACTURED BY:

M^2 ANTENNA SYSTEMS, INC.
4402 N. Selland Ave.
Fresno, CA 93722
(559) 432-8873 Fax: 432-3059
www.m2inc.com Email: sales@m2inc.com

222XP30 DIMENSION SHEET



222XP30 PARTS & HARDWARE

DESCRIPTION	QTY
BOOM, 3/4 X .049 X 18” ALUM. TUBE	1
BOOM, 1.0 X .058 X 51” ALUM. TUBE	1
BOOM, 1.0 X .058 X 57” ALUM. TUBE	1
BOOM, 1-1/4 X .058 X 60 SOE, ALUM.	2
BOOM, 1-1/2 X .058 X 60 SBE ALUM.	1
ELEMENT, 3/16 X SEE DIMENSION SHEET	30
λ/2 BALUN, RG6U	2
‘T’ MATCH BLOCK ASSEMBLY	2
BOOM TO MAST PLATE, 3/16 X 4 X 6”	1
DACRON, 3/32” X 30 FT.	1
VERT. SUPPORT ROD, 3/8 x 14” FGLASS ROD	1
TURNBUCKLE, 1/4”	2

HARDWARE BAG #1

U-BOLT AND CRADLE, 2”	2
U-BOLT AND CRADLE, 1-1/2”	5
NUT, 5/16-18 SS	10
LOCKWASHER, 5/16” SPLIT RING SS	10

HARDWARE BAG #2

NUT SEAL	4
BUTTON INSULATOR, 3/16” POLY	60
KEEPER, 3/16” SS	64
TURNBUCKLE, 1/4”	2
SCREW, 8-32 X 1-3/4” SS, PHILLIPS	6
SCREW, 8-32 X 1-1/2” SS, PHILLIPS	4
SCREW, 8-32 X 1-1/4” SS, PHILLIPS	8
SET SCREW, 8-32 X 1/4” SS	8
LOCKNUT, 8-32 SS	18
SHORTING BLOCK	4
CLAMP BLOCK, 1/4 x 1” ALUM	3
CLAMP BLOCK FLAG, 1/4 x 1-1/2” ALUM.	1
U-CLIP, 3/16” ROD	2
NYLON TIE, 5” BLACK	8
ALLEN WRENCH, 5/64”	1
PUSH TUBE, 3/8” X 3” ALUM	1

Carefully manufactured by:

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