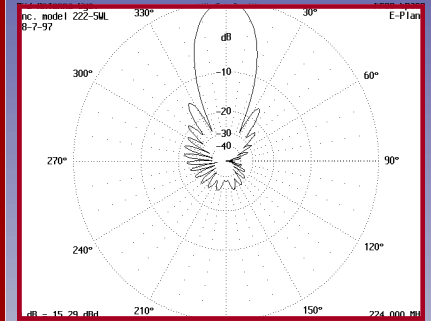
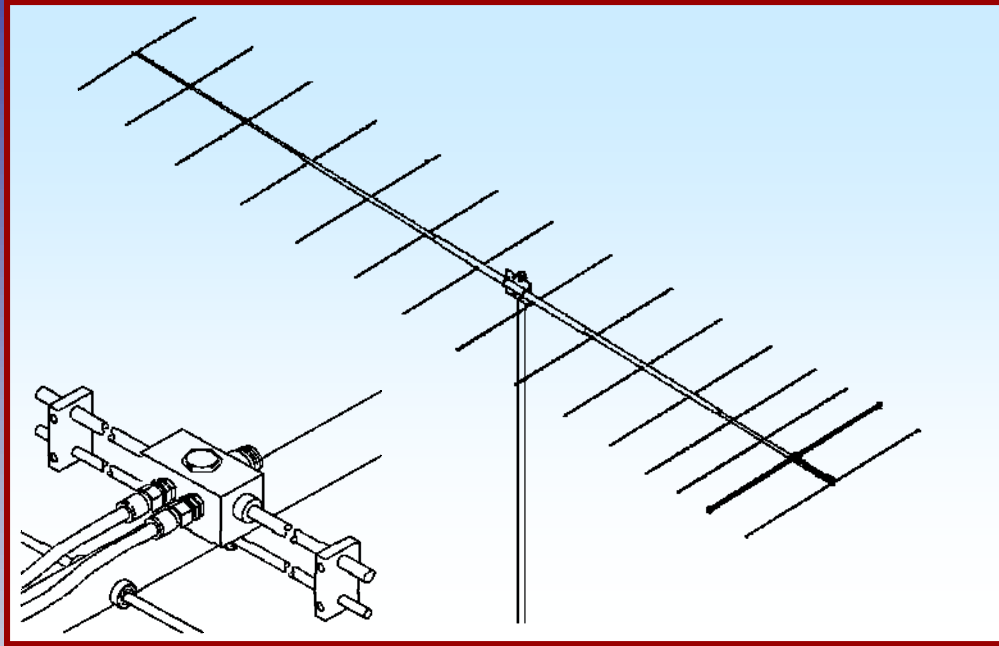




M2 Antenna Systems, Inc.

Model No: 222-5WL



SPECIFICATIONS:

Model	222-5WL	Power Handling	1.5 kW
Frequency Range.....	222 To 226 MHz	Boom Length / Dia.....	23.3' / 1-1/2" To 1"
Gain.....	17.4 dBi	Maximum Element Length.....	26-3/8"
Front to back	21 dB	Turning Radius:	12' 6"
Beamwidth	E=23° H=25°	Stacking Distance.....	10' Wide 10" High
Feed type	"T" Match	Mast Size.....	1-1/2" to 2" Nom.
Feed Impedance.....	50 Ohms Unbalanced	Wind area / Survival	1.5 Sq. Ft. / ?? MPH
Maximum VSWR.....	1.2:1 Typical	Weight / Ship Wt.....	9 Lbs. / 10 Lbs.
Input Connector.....	"N" Female Optional		

FEATURES:

The 222-5WL 15 element Yagi is our latest design using computer techniques to maximize gain and pattern with the fewest number of elements. Clean patterns allow you to hear more, interfere less and are essential when stacking. The 222-5WL is ideal for stacking in either polarization. Two 222-5WL's stacked are a dynamite DX package for FM or SSB and 4 or more are perfect for long haul tropo DXing or moonbounce. The 5WL allows you to experience the radio spectrums best tropo frequency without bustin your mast or your budget!

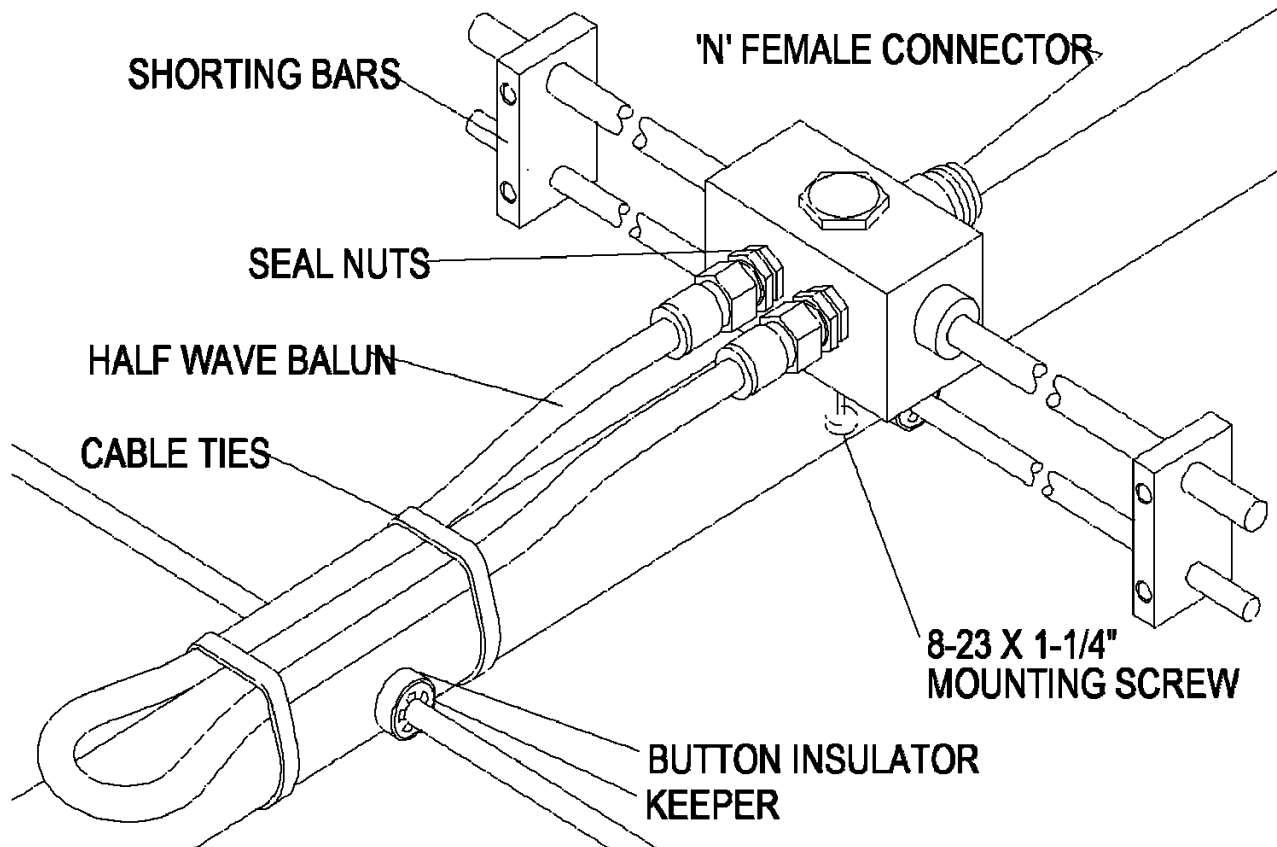
Structurally the 222-5WL is sturdy and clean, requiring no boom support. Elements are 3/16" 6061-T6 aluminum rod mounted through the boom on UV stabilized "button" insulators. The boom is a full 1-1/2 inch diameter in the middle tapering through two 1-1/4 inch sections to stiff 1 inch tips. The heart beats with the famous unique Driven Element Module: The main 'N' connector is O-ring sealed to the CNC machined block and 4:1 balun connectors feature triple seals. All Internal module connections are sealed in a space-age silicone gel.

222-5WL 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 8-32 X 1-1/2" screws and locknuts for 1" to 1-1/4" sections; 1-3/4" screws for 1-1/4" to 1-1/2" sections. The 1-1/2" section with both ends swaged has a 5/16" element hole 14" from the "rear" end. Mate with the 1-1/4" section with a 5/16" hole 5-1/4" from the swaged end. Also assembled to the rear, is the 1" x 51" straight section (rear of boom). The other 1-1/4" section assembles to the "front" of the 1-1/2" sections, followed by the swaged 1" x 59" section (front of boom).
To make assembly easier, support the completed boom about waist high on bucks, tables, etc. Or, drive a 1-1/2" to 2" pipe into the ground and temporarily attach boom using boom to mast plate and U-bolts at balance point.
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. Mount the DRIVEN ELEMENT BLOCK ASSEMBLY to the top of the boom using a single 8-32 X 1-1/4" screw. Orient the block with feed connector facing to center and balun connectors facing to rear.
7. Before installing the COAX BALUN, thread a 3/8" SEAL NUT all the way onto BOTH connectors, with the black Neoprene face of the nuts facing out. Attach balun and 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). Form the balun close to the boom and secure to boom with a nylon cable tie. Tie should be snug but not crushing or kinking the coax.
8. Install the 8-32 x 1/4" set screws (internal Allen head - tool supplied) into the 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 to the dimension specified on the Dimension Sheet. Align the bars and rods with each other and tighten the setscrews.

222-5WL ASSEMBLY MANUAL



9. The boom to mast plate is normally mounted at the balance point, about 123" from rear of boom. 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 mast.

NOTE: The boom may drop slightly from end to end. This is normal and in no way will affect the performance of the antenna. Overhead support lines of Dacron rope or equivalent can be added, if desired with no effect on the antenna.

THIS COMPLETES THE ANTENNA ASSEMBLY.

222-5WL ASSEMBLY MANUAL

INSTALLATION AND STACKING INFORMATION

- A. **Never mount the antenna with a metallic mast, crossboom or feedline IN THE ELEMENT PLANE: pattern and performance will deteriorate.** Use a fiberglass or equivalent mast or crossboom instead.

HORIZONTALLY POLARIZED, the antenna may be mounted to a metallic vertical mast or a horizontal NON-METALLIC crossboom. If mounted to a horizontal crossboom, route the feedline forward to the boom-to-mast plate, loop down at right angles to the elements, and bring back to crossboom at least 6" beyond element tips.

VERTICALLY POLARIZED, the antenna may be mounted to a NON METALLIC VERTICAL MAST or a horizontal metallic crossboom. If mounted to a vertical mast, route the feed line forward to the boom-to-mast plate, loop out at a right angle to the boom, and bring down to the mast at least 6 inches below the element tips.

- B. To optimize the performance of this high quality antenna, always use high quality coax cable, connectors, adapters, or old, corroded, or poor quality materials are common sources of serious performance losses.
- C. If possible, test the antenna, connectors and feedline BEFORE installing to your mast or tower. At 6 feet or more the antenna will exhibit performance **similar TO** higher mounting heights. Set antenna on a ladder or temporary mast. Check for continuity and that match is close to "specs" across the the rated bandwidth.
- D. STACKING REMINDERS:
1. All driven element blocks MUST be oriented to the same side of boom.
 2. All boom-to-mast plates MUST be mounted at the same point on the boom.
 3. Feed / phasing lines MUST be of equal electrical length or multiples of 1 wavelength in order to maintain equal phasing in the array. Improper phasing can severely deteriorate performance.
 4. See Specifications page for E and H plane stacking distances.

If you are unsure about stacking multiple antennas, please call **M²** and let us help you DO IT RIGHT!

CAREFULLY MANUFACTURED BY:

M² ANTENNA SYSTEMS, INC.

4402 N. Selland Ave.

Fresno, CA 93722

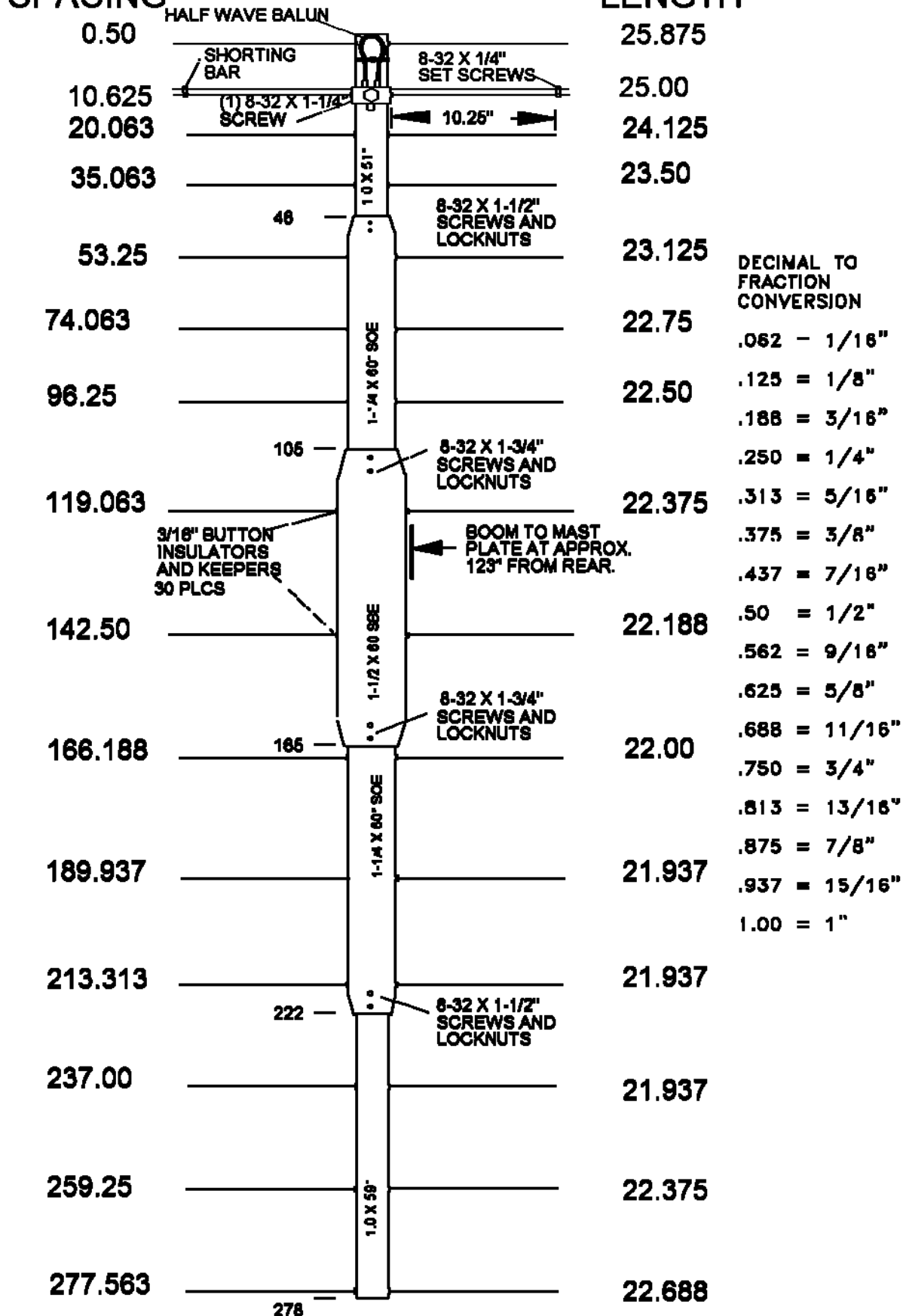
(559) 432-8873 Fax: 432-3059

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222-5WL DIMENSION SHEET

ELEMENT SPACING

ELEMENT LENGTH



222-5WL PARTS & HARDWARE

DESCRIPTION	QTY
BOOM SECTION, 1-1/2 X .058 X 60" SBE.....	1
BOOM SECTION, 1-1/4 X .058 X 60" SOE	2
BOOM SECTION, 1 X .058 X 51" STR.....	1
BOOM SECTION, 1 X .058 X 59" STR.....	1
ELEMENTS, 3/16 ROD x Dimension Sheet	15
DRIVEN ELEMENT BLOCK ASSEMBLY	1
BALUN, RG-6 1/2 WAVE	1
BOOM-TO-MAST PLATE, .188 X 6 X 4"	1
U-BOLT AND CRADLE, 2'	2
U-BOLT AND CRADLE, 1-1/2"	2
ASSEMBLY MANUAL.....	1

IN HARDWARE BAG:

SHORTING BAR.....	2
BUTTON INSULATORS	30
KEEPER, SS.....	30
NUT, 5/16-18 SS.....	8
LOCKWASHER, 5/16 SS.....	8
SETSCREW, 8-32 X 1/4, SS	4
SCREW, 8-32 X 1-1/4 SS	1
SCREW, 8-32 X 1-1/2 SS	4
SCREW, 8-32 X 1-3/4 SS	4
LOCKNUT, 8-32 SS	8
CABLE TIE, NYLON	3
SEAL NUTS, 3/8-32	2
ALLEN HEAD WRENCH, 5/64"	1
PUSH TUBE, 3/8 X 3"	1

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