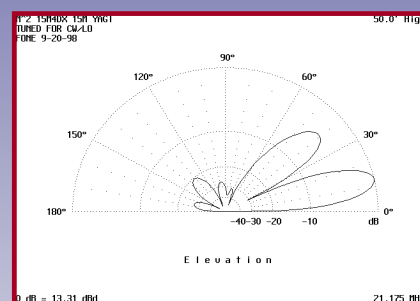
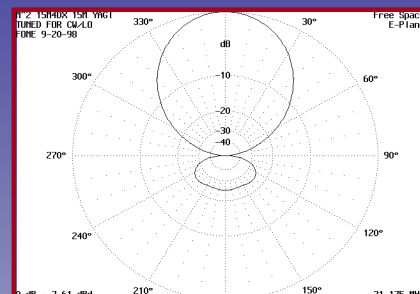
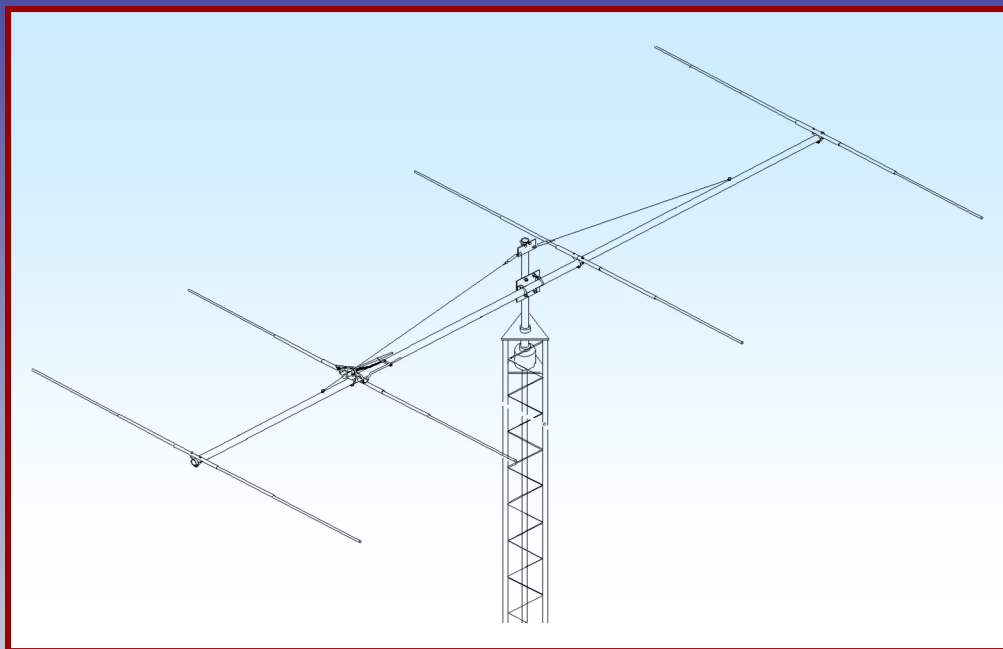




# M2 Antenna Systems, Inc.

## Model No: 15M4DX



### SPECIFICATIONS:

Model ..... 15M4DX  
 Frequency Range ..... 21.0 To 21.450 MHz  
 \*Gain, (FS) / Over gnd ..... 9.7dBi / 15.5dBi @47'  
 Front to back ..... 24 dB Typical  
 Beamwidth ..... E=52° / H=70°  
 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 ..... 27' / 2"  
 Element Length / Dia. .... 144' / 1" To 1/2"  
 Turning Radius: ..... 18'  
 Stacking Distance ..... 30' To 37'  
 Mast Size ..... 2" to 3" Nom.  
 Wind area / Survival ..... 4.9 Sq. Ft. / 100 MPH  
 Weight / Ship Wt. .... 32 Lbs. / 41 Lbs.

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

### FEATURES:

The 15M4DX is a great performer for its size. It was designed for low wind area but rugged and lightweight and it will save you a bundle on shipping. IT'S UPSABLE! like all our "DX" series. 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 15M4DX is also great for stacking, providing 3 dB increased gain not to mention the lower angle of radiation. The 15M4DX is a perfect stacking partner for our other "DX series Yagis like the 20M4DX and 10M4DX. Put the 15M4DX to work in the new cycle!

# 15M4DX ASSEMBLY MANUAL

Note: A cup of zinc paste (PENETROX, NOALOX, or equivalent) has been provided to enhance the quality of all the electrical joints in this antenna. Apply a thin coat wherever two pieces of aluminum come in contact.

1. Refer to the Dimension Sheet. Note the different boom sections and the approximate position of each element. Slide the 2" RING CLAMPS into their approximate positions on the appropriate boom sections. Now assemble the boom sections using the 1/4-20 x 2-1/2" bolts and locknuts. Install the 5/16" x 4" EYEBOLTS into the holes in the rear and front section using stainless nuts and lock washers. Start with the REFLECTOR and position the ring clamp about 1/2" in from the end of the boom. Loosely add a 1/4-20 x 1" bolt and locknut. Align the ring clamp perpendicular to the eyebolts and tighten in place. Continue positioning the rest of the ring clamps using the DIMENSION SHEET

2. Locate the 1" x 30" element half sections and the three 7/8" x 30" center splice sections. Slide a center splice half way into the butt end of a 1" section and line up the holes. Push 1/4-20 x 2" bolt through this hole and add the second 1" element section. Add another 2" bolt and place this assembly on the REFLECTOR ring clamp. Add the 1/4" locknuts and tighten. Pair up another two 1" element sections, insert the 7/8 sleeves and mount to the front two ring clamps as before.

3. Refer to the 15M4 DIMENSION SHEET for the driven element assembly. Note that the balun mounting plate and 4 hole 7/8 x 30" fiberglass rod mount to the ring clamp using 1/4-20 x 2" bolts and locknuts. Clamp the HF balun to the balun plate with the 2-1/2" U-Bolt, saddle, 5/16" lock washers and nuts. Do not over tighten as doing so might crack the balun cover. Slide the POLYETHYLENE RINGS into place. The poly rings are meant to be a tight fit, so soaking them in HOT water for a few minutes may help aid in their installation. Now slide on the 1 x 30" element section halves onto the driven element fiberglass rod. Align holes and insert two 1/4-20 x 2" bolts as shown on the 15M4 DIMENSION SHEET. Place two Clamp Blocks on both bolts as shown. Place the leads of the Balun on top of the Clamp Blocks and secure the entire assembly with 1/4-20 locknuts. Tighten loosely for now.

4. Assemble the hairpin shorting bar arrangement as shown on the 15M4 DIMENSION SHEET. Insert a 1/4-20 x 2" bolt up through the 2-1/2" 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 temporarily secured to the boom.

5. Slide the straight end of the two 3/8 x 24" hairpin tubes into the shorting bar as shown on the 15M4 DIMENSION SHEET. 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 1/4-20 lock nuts. Move the bar to the location shown on the 15M4 DIMENSION SHEET and tighten the set screws securely.

6. Pair up the 1/2" tip sections by length. Note that the tip sections are cut for the CW / LO-PHONE section of the 15m band. If you desire to operate on the upper portion of the band (PHONE ONLY) simply trim back or push-in the 1/2" tip sections to the correct dimensions as shown on the DIMENSION SHEET. If you go for the push-in method you will need to loosen 5/8 compression clamps, push 1/2" element in and re-tight compression clamp.

Now install each pair into a pair of 3/4" x 60" element sections and secure with 8-32 x 1-1/4" screws and locknuts. Then install these 3/4 / 1/2" assemblies into the 1" element sections. REFER TO THE DIMENSION SHEET TO GET THE TIP SECTIONS IN THE CORRECT LOCATIONS. Secure with 5/8 compression clamps.

7. Pick up the boom and mark the balance point. Center the BOOM TO MAST PLATE here and secure with a single set of 2" U-bolts holding the boom. 2" U-bolts are also supplied to mount the antenna to the mast.

# 15M4DX ASSEMBLY MANUAL

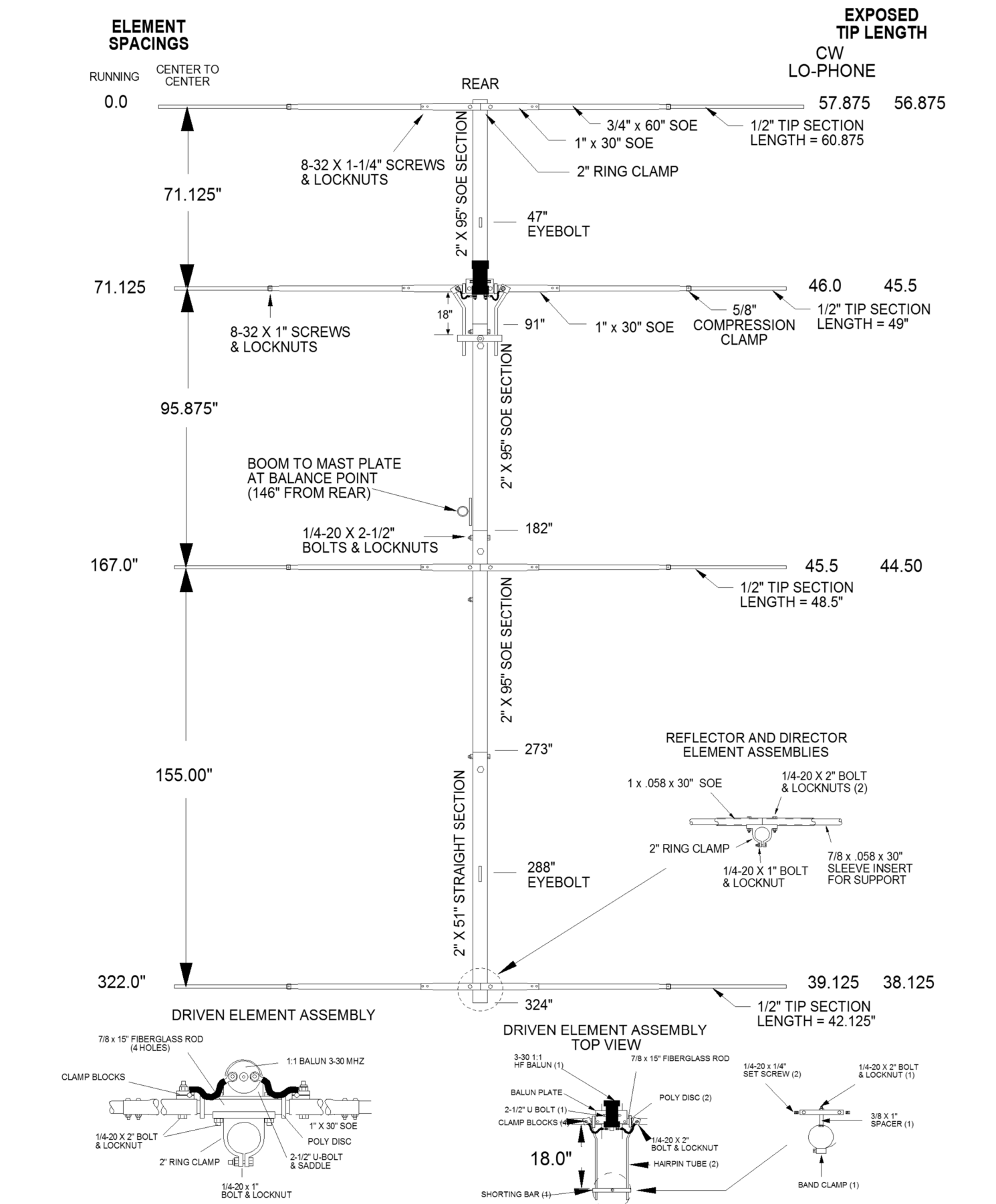
8. To prepare the overhead guy system, begin by **temporarily** installing a 2" U-bolt through the TURNBUCKLE PLATE and into the top set of 2" U-bolt holes on the boom to mast plate. Add a couple of 5/16" nuts to hold in place. Unscrew turnbuckle eyes / hooks until only a thread or two shows inside the turnbuckle body and hook to turnbuckle plate.
9. Uncoil DACRON CORD. Secure one end to 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 to main length.
10. Equalize cord length at turnbuckle plate and cut. Put two turns through rear turnbuckle eye, pull slack out of rope, and add three TIGHT half-hitches. Repeat for front cord section. Seal and tape cord ends.
11. Both cords should now be fairly taut and parallel with boom. Disconnect the 2" U-bolt holding the turnbuckle plate and lift it up until the boom bows up slightly. This is approximately how high the plate will need to be mounted on the mast when the antenna is installed.
12. 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.
13. This completes the ASSEMBLY. REMEMBER to support the feed line at the antenna boom and on the mast. Leave an adequate feed line loop for rotation around the tower. Mount horizontally polarized VHF and UHF antennas at least 40" above or below this antenna to minimize interaction.

NOTE: THE TIP DIMENSIONS GIVEN WILL PRODUCE THE BEST PERFORMANCE ACROSS THE BAND. IF ONLY THE PHONE PART OF THE BAND IS PREFERRED AND A BETTER MATCH DESIRED, THEN TRIM 1" OFF EACH TIP OF EACH PARASITIC ELEMENT AND 1/2" OFF THE DRIVEN ELEMENT TIP. SEE GAIN AND VSWR PLOTS BELOW.

Carefully designed and manufactured by:

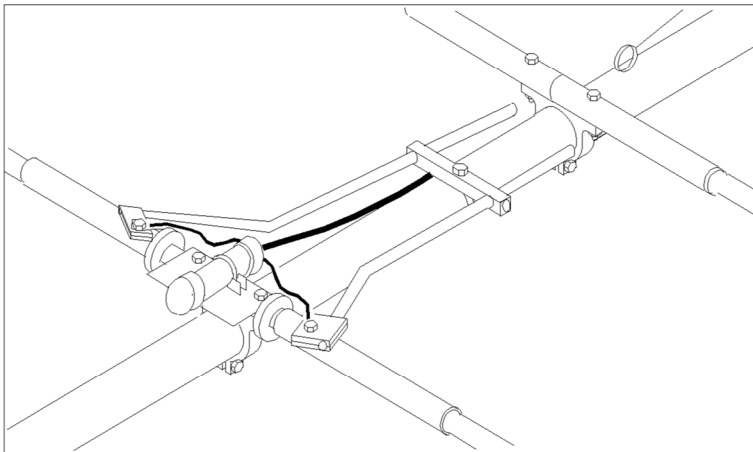
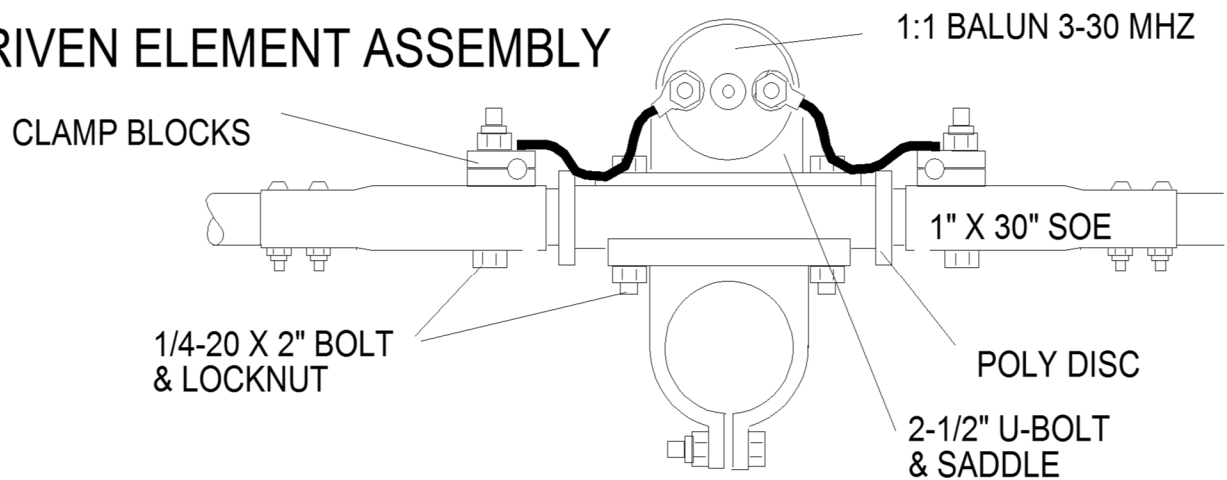
**M<sup>2</sup> ANTENNA SYSTEMS, INC.**  
4402 N. SELLAND AVE  
FRESNO, CA 93722  
(559) 432-8873 FAX: 432-3059  
[www.m2inc.com](http://www.m2inc.com) Email: [sales@m2inc.com](mailto:sales@m2inc.com)

# 15M4DX DIMENSION SHEET

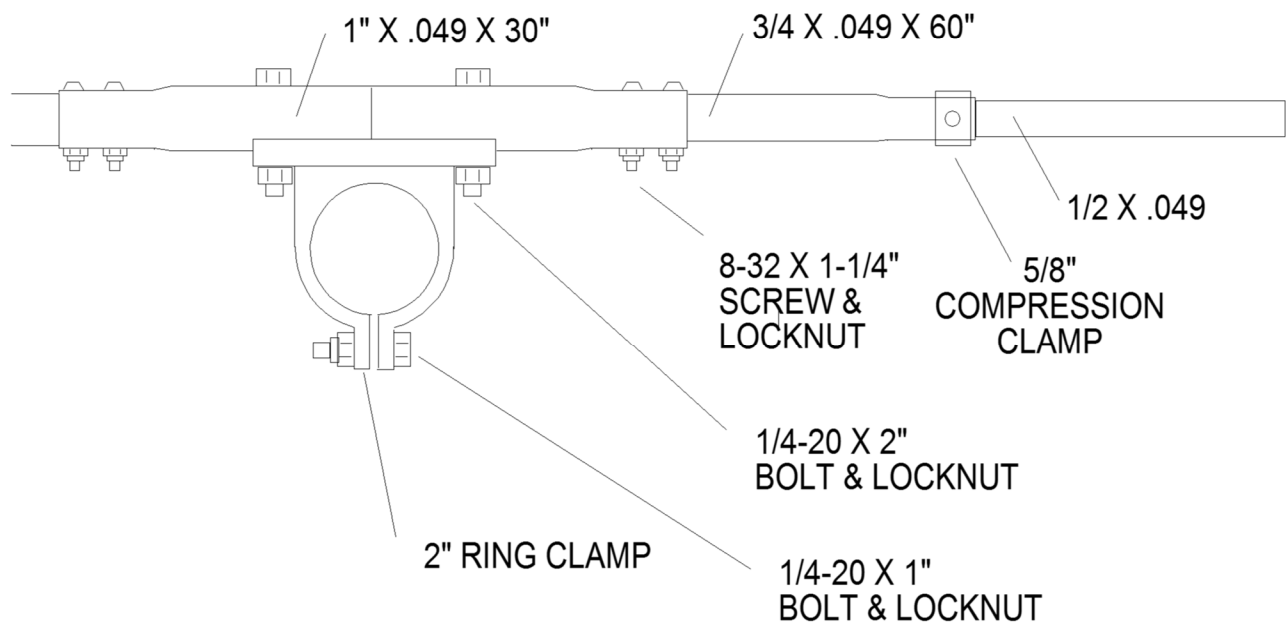


# D.E. & PARASITIC ELEMENT DETAIL

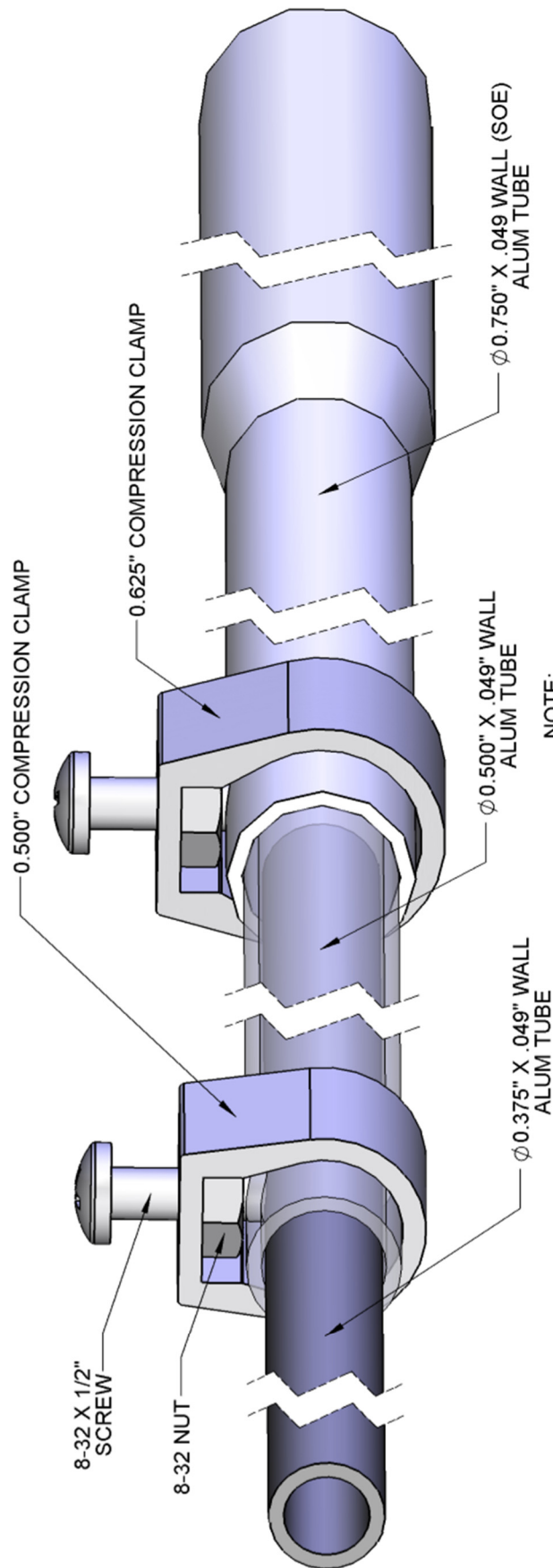
## DRIVEN ELEMENT ASSEMBLY



## PARASITIC ELEMENT ASSEMBLY



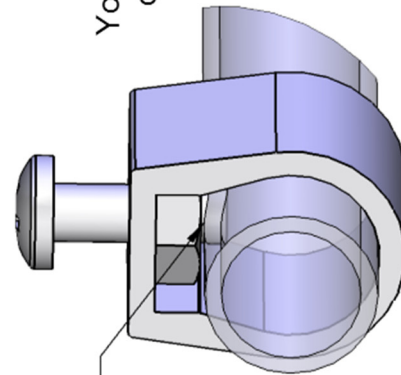
# GENERIC COMPRESSION CLAMP DETAIL



NOTE:  
TUBES SHOWN TRANSPARENT  
TO SHOW MORE DETAIL

## NOTE:

Generic layout to show  
how compression clamps work.  
Your antenna may have one or the other  
or may even have both compression  
clamp sizes.



NOTE:  
8-32 X 1/2" SCREW  
PRESSES ON INNER TUBE

NOTE: INSIDE TUBE NOT SHOWN FOR CLARITY

# 15M4DX PARTS & HARDWARE

DESCRIPTION .....	Qty
Boom section, 2" x .063 x 51" STR with eyebolt hole .....	1
Boom section, 2" x .063 x 95" SOE .....	2
Boom section, 2" x .063 x 95" SOE with eyebolt hole .....	1
Element section, 1" x .049 x 30" swaged one end.....	8
Element section, 3/4" x .049 x 60" SOE .....	8
Element tip, 1/2 x .049 x see dim sheet .....	8
Sleeve, element, 7/8" x .058 x 30" (for 2" ring clamp) .....	3
Insulator, fiberglass, 7/8" x 15" (for 2" ring clamp).....	1
Boom to mast plate, 4" X 6" x .188" .....	1
Hairpin tube, 3/8" x .049 x 24" .....	2
Balun, 3-30 MHz 1:1 with PL-259 connector .....	1
Ring clamp, 2" .....	4
Dacron rope, 5/16" x 24' .....	1
Eyebolts, 5/16" x 4" .....	2
Turnbuckles, 5/16", hook & eye.....	2
Turnbuckle Plate, 2" x 4" x .188" .....	1
U-bolt and cradle, 2 inch .....	5
Compression Clamp, 5/8" .....	8
Assembly Instructions .....	1
<b>IN HARDWARE BAG</b>	
Nut, 5/16-18 ss .....	10
Lock washer, split ring 5/16".....	10
Bolt, 1/4-20 x 2-1/2" ss .....	6
Bolt, 1/4-20 x 2 ss .....	8
Bolt, 1/4-20 x 1" ss .....	4
Nut, 1/4-20 locking, ss.....	18
Screw, 8-32 x 1-1/4" ss .....	16
Screw, 8-32 x 1/2" ss.....	8
Nut, 8-32 locking, ss.....	16
Nut, 8-32, ss .....	8
Nylon tie, large black, 11" .....	2
Zinc paste, 1 oz. cup .....	1
<b>STANDARD HAIRPIN KIT PARTS BAG</b>	
Shorting bars, 1/2 X 1/2 " x 5" .....	1
Clamp block, 3/8" .....	4
Poly rings, 7/8" hole .....	2
Plate, balun mounting, 2 x 4 x 1/8" .....	1
U-bolt, 2-1/2", balun mtg. ....	1
Nut, 5/16-18, ss.....	2
Lock washer, 5/16" split ring, ss .....	2
Spacer, 3/8" x 1" alum. ....	1
Band clamp, modified, 2-2-1/2" ss .....	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

**M<sup>2</sup> ANTENNA SYSTEMS, INC.**

4402 N. SELLAND AVE

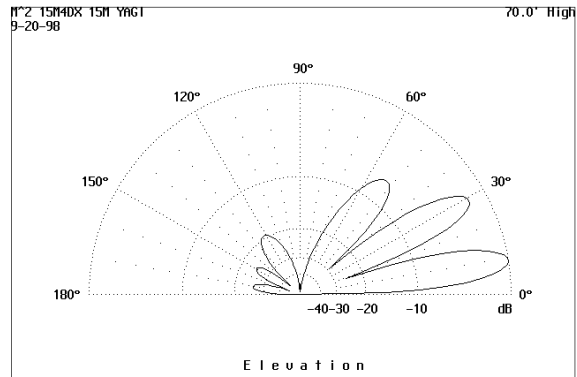
FRESNO, CA 93722

(559) 432-8873 FAX: 432-3059

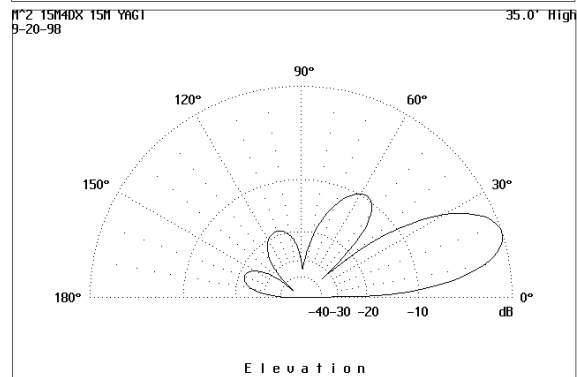
www.m2inc.com Email: sales@m2inc.com



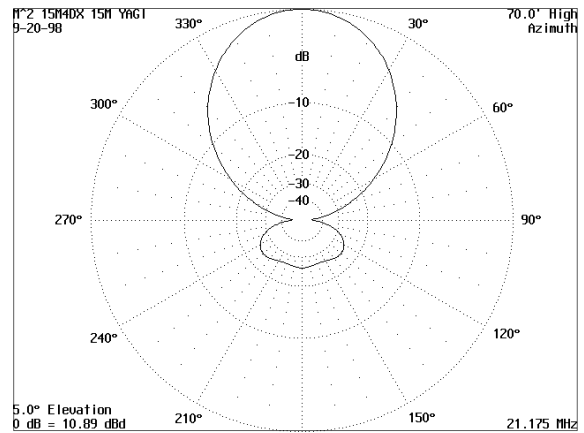
# 15M4DX ANTENNA PATTERNS



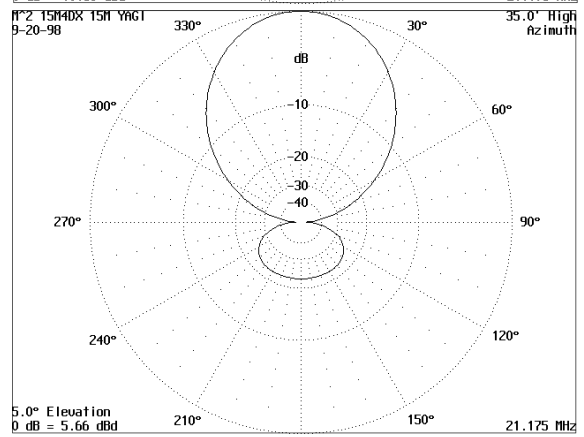
0 dB = 13.43 dBd 21.175 MHz



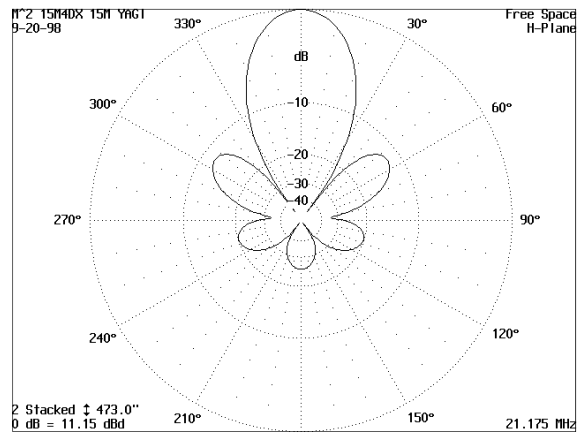
0 dB = 13.01 dBd 21.175 MHz



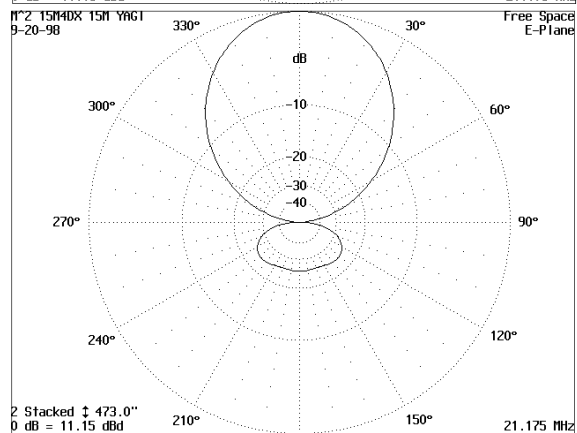
5.0° Elevation  
0 dB = 10.89 dBd 21.175 MHz



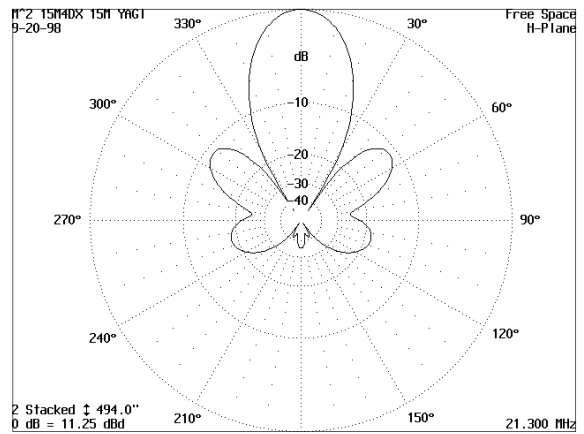
5.0° Elevation  
0 dB = 5.66 dBd 21.175 MHz



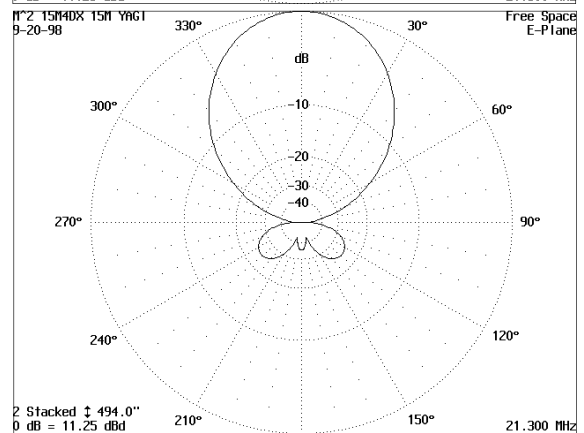
2 Stacked  $\uparrow$  473.0"  
0 dB = 11.15 dBd 21.175 MHz



2 Stacked  $\uparrow$  473.0"  
0 dB = 11.15 dBd 21.175 MHz



2 Stacked  $\uparrow$  494.0"  
0 dB = 11.25 dBd 21.300 MHz



2 Stacked  $\uparrow$  494.0"  
0 dB = 11.25 dBd 21.300 MHz