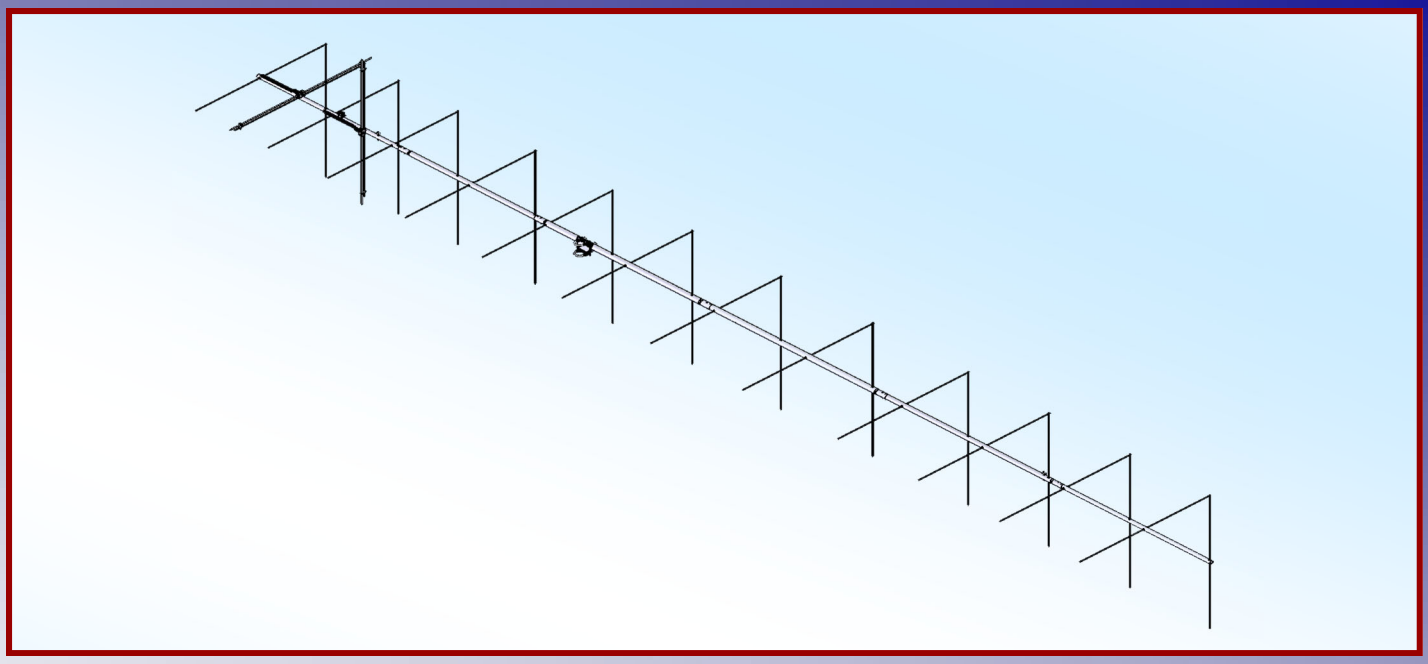
M2 Antenna Systems, Inc.
Model No: 138XP26



SPECIFICATIONS:

Model	138XP26
Frequency Range	137.8 To 138.4 MHz
Gain	16.88 dBic
Front to back	22 dB Typical
Feed type	T-Match
Feed Impedance.	50 Ohms Unbalanced
Maximum VSWR	1.2:1 Max
Input Connector	"N" Female
Power Handling	1.5 kW
Boom Length / Dia	399"/ 2 1/2" to 2"
Turning Radius:	Call
Stacking Distance	H=170" / E=170"
Mast Size	2" Nom.
Wind area / Survival	3.8 Sq. Ft. / 100 MPH
Weight / Ship Wt.	65 Lbs. / 75 Lbs.

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

FEATURES:

The 138XP26 is a heavy duty, high performance cross polarized antenna with a remarkably clean pattern. The pattern is important in order to match the antenna's noise temperature with modern low noise preamps. This antenna is ideal for specialized satellite communications. The CNC machined driven element module is O-ring sealed and weather tight for low maintenance and long-term peak performance. Internal connected are encapsulated in a space-age silicone gel that seals out moisture and improves power handling. The large 3/8" 6061-T6 rod elements are centered to minimize interaction and maintain good ellipticity. Insulators are UV stabilized and locked in place with stainless keepers. Rugged construction, uncompromising performance: that's the M^2 138XP26.

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08/18/22
Rev.00

138XP26 ASSEMBLY MANUAL

TOOLS REQUIRED FOR ASSEMBLY: 1/2” and 7/16” end wrenches or sockets, pliers, measuring tape.

ASSEMBLING THE BOOM

1. Slip two 2-1/2” machined ring clamps onto the end of the tube with an element hole just 6 inches from the end. Slide the two clamps on 102 inches in from that end. They can be secured there temporarily with a 1/4-20 x 1” bolt and locknut. Final positioning will occur later in the assembly.

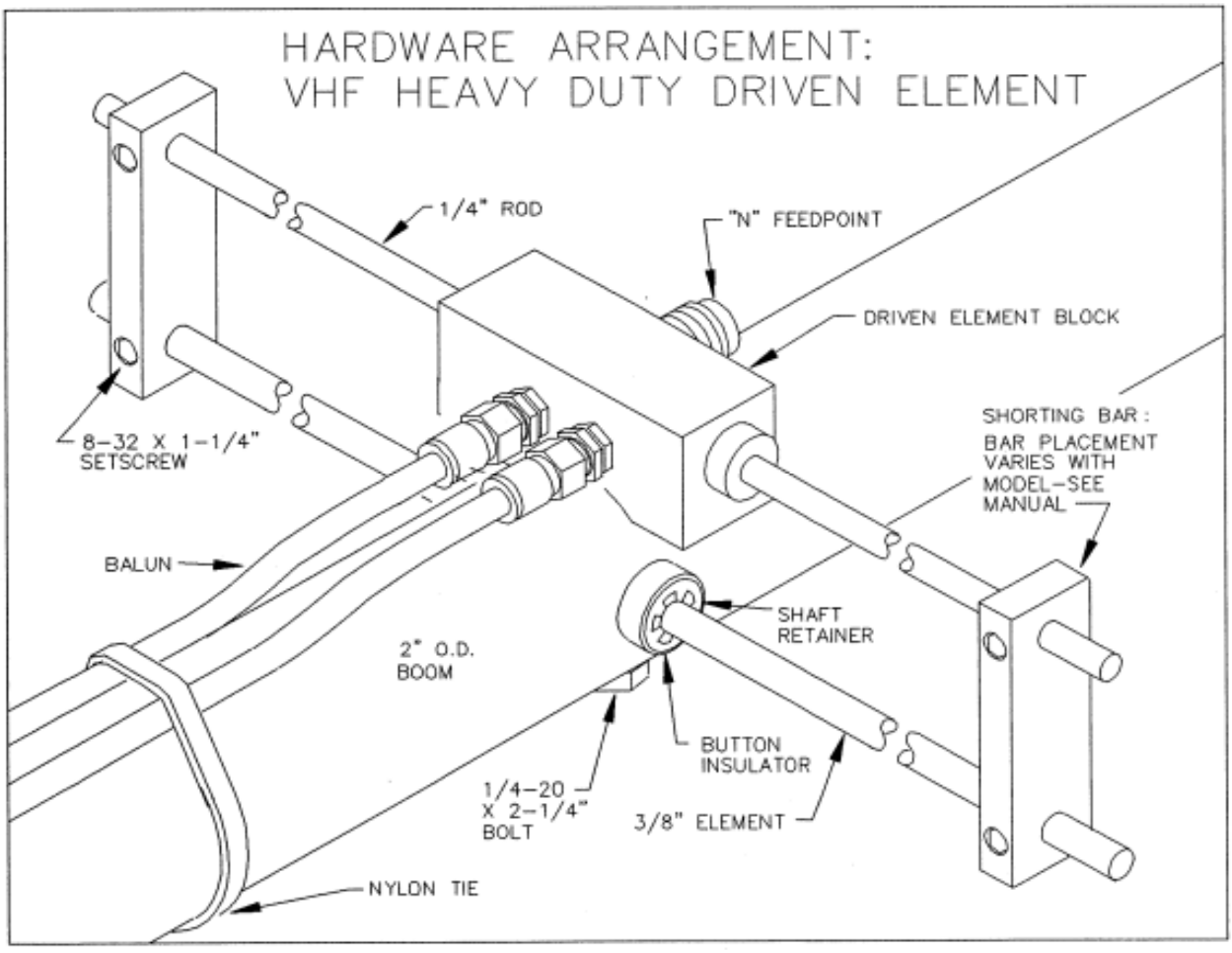
2. Insert the 80” x 2” boom section into the 2-1/2” section at the end with the element hole only 6 inches from the end. Align holes and secure with 1/4-20 x 2-3/4” bolts and locknuts. Repeat for the 87” x 2” boom section, inserting it into the other end of the 2-1/2” diameter center section, align the holes and secure with 2 more 1/4-20 x 2-3/4” bolts and lock nuts. NOTE: FINAL TIGHTENING SHOULD BE DONE AFTER ELEMENTS ARE INSTALLED IN BOTH PLANES. ELEMENTS SHOULD BE ALIGNED AND BOOM SECTION BOLTS TIGHTENED FINALLY AT THAT TIME.

3. Set the boom up on bucks at waist level in preparation of element installation. Install the two 5/16” x 4” eye bolts in the holes about 40” in from each end of the boom.

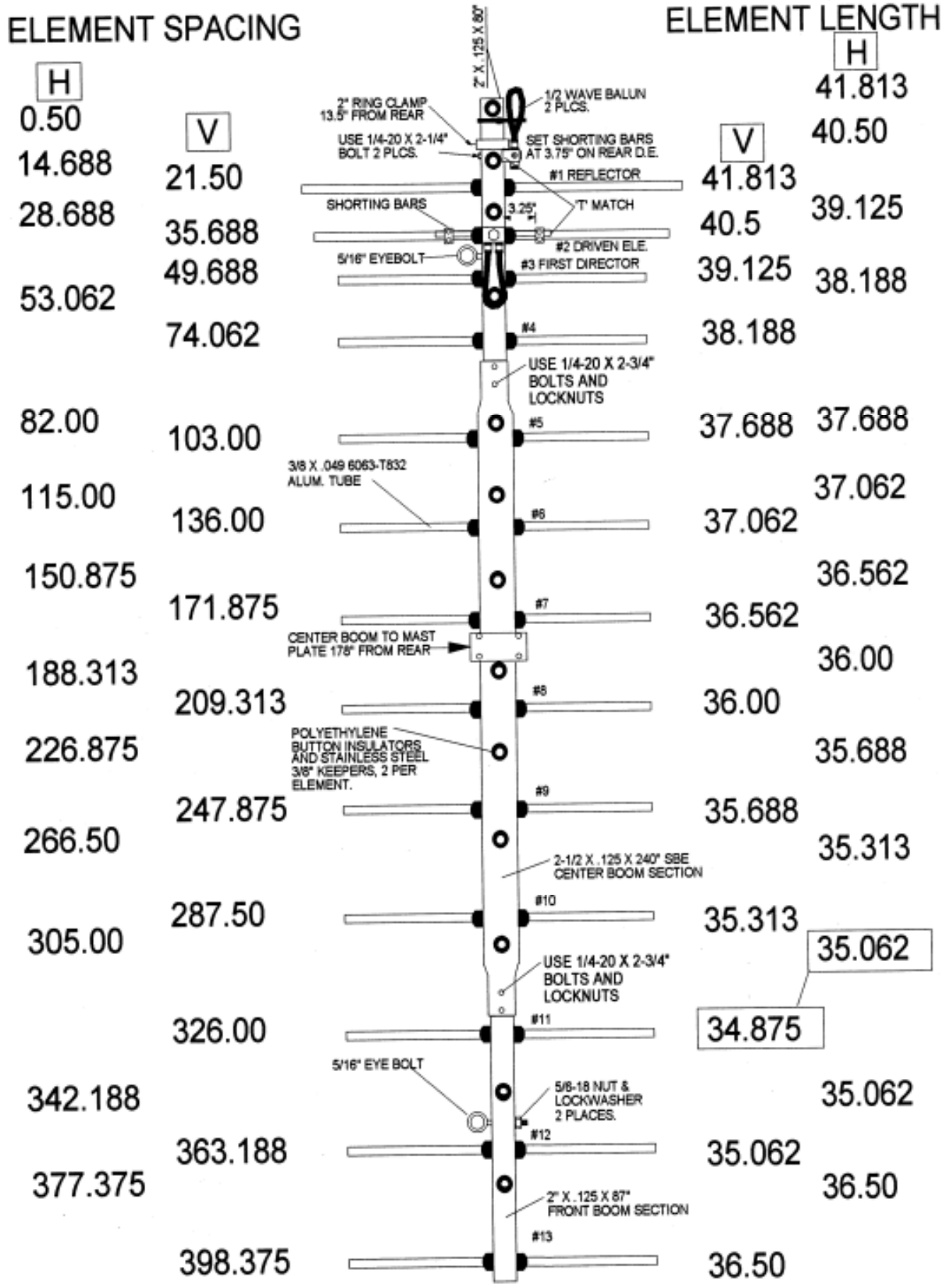
4. At the rear of the boom slip on a 2” ring clamp past the first two element holes. This ring clamp will be listed and found in the hardware for the “H” frame kit.

ASSEMBLING THE HORIZONTAL ELEMENTS

1. Separate the 3/8” tube elements by length into two sets, “H” and “V”. NOTE: THE THIRD DIRECTOR FROM THE FRONT DIFFERS FROM THE HORIZONTAL TO VERTICAL SET. Install the “H” element set along the boom by length and spacing as shown on the DIMENSION SHEET. Start with the REFLECTOR (longest) element. Balance it on your finger to find rough center and push on a black button insulator to about 2” off center. Push the element through the holes 1” from the rear of the boom and install the second button, pushing it up into boom. DO NOT BOTHER CENTERING the element at this time and DO NOT INSTALL the stainless steel SHAFT RETAINERS yet. It is easier to do after all the horizontal elements are installed in the boom.



138XP26 DIMENSION SHEET



NOTE: ELEMENT LENGTHS DO NOT TAPER.
NOTE: LENGTHS OF VERTICAL ELEMENT # 12 IS DIFFERENT FROM HORIZONTAL #12.
NOTE: 'T' MATCH SHORTING BAR POSITIONS DIFFER FROM HORIZONTAL TO VERTICAL.

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138XP26 ASSEMBLY MANUAL

2. Install the 3/8” DRIVEN ELEMENT as you did the reflector and then the DIRECTOR ELEMENTS. When the 2-1/2” boom section is reached, set first button insulator about 1-1/4” off center.

3. Now accurately center the elements using a tape measure. EQUALIZE the amount of tube 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.

4. Begin installing the stainless SHAFT RETAINERS. Use thumb and index finger to hold a retainer over end of the 3/8” x 3” push tube (keeper dished into tube). Hold the element firmly and start the retainer onto the rod by applying pressure with the push tube. Push the retainer until up tight against the button insulator (Locking pliers, clamped up against opposite button insulator will help maintain center reference and keep you from pushing the tube off center. Alternately, grab the opposite side of the element near the boom and pull it hard sideways to the boom to preload and increase the friction of the element on the button insulators while pushing the retainer. Do all the retainers on one side first, DOUBLE CHECK CENTERING and then do the other side. Continue installing retainers until all HORIZONTAL elements are locked in place.

5. Mount the HORIZONTAL DRIVEN ELEMENT BLOCK / 1/4” ROD ASSEMBLY to the TOP of the boom using a 1/4-20 x 2-1/4” bolt WITH A LOCKWASHER UNDER THE HEAD OF THE BOLT. Orient the block with the two balun connectors facing backward, “N” connector to front.

6. Install the 8-32 x 1/4” set screws (internal Allen head - tool supplied) into the SHORTING BARS. Slide the bars onto the 3/8” driven element tubes and on over the 1/4” Driven Element “T” match Block Rods. Position the Shorting Bars per the DIMENSION SHEET. Align the rods parallel and the bars with each other and tighten the set screws moderately at this time to keep the bars in place. Final tightening should be done after each antenna has been checked out electrically with an antenna analyzer or SWR bridge.

ASSEMBLING VERTICAL ELEMENTS

7. Repeat steps #1 through #6 for the Vertical elements, using the Dimension Sheet as your guide to lengths and spacing. Note the vertical driven element block should be mounted on the right side of the boom when the rear driven block is up. The two connectors for the balun face to the front. NOTE WHEN INSTALLING THE SHORTING BARS THAT THE DIMENSIONS ARE DIFFERENT FOR THE FORWARD SET OF ELEMENTS.

COMPLETING ANTENNA

1. Install the SEAL NUTS on each female balun connector with the black neoprene seal out. Then install a balun to each driven element block connector. Form the balun coax away from the block in a single loop. Form closely to the boom and secure near the loop end with a nylon tie. Depending on the model, a balun may loop around an element in the opposite polarity. This is normal. Tighten the connectors gently with a 7/16” end wrench and then run the seal nuts up against the face of each male cable connector. Gently tighten about 3/4 turn beyond finger tight with a 1/2” end wrench.

2. Attach the larger 8” x 8” boom to mast plate to the two previously mounted 2-1/2” ring clamps using four (4) 1/4-20 x 1-1/4” bolts and locknuts. Tighten this hardware. Adjust the 8” x 8” boom mounting plate to its desired orientation and position (SEE THE DIMENSION SHEET AND THE COMPLETE “H” FRAME DRAWING) near the balance point. Tighten the 1” boom ring clamp bolts. Add the second, smaller 4” x 8” plate using 1/4-20 x 4” bolts and lock nuts. This is in preparation of mounting the antenna on the 2” square fiberglass vertical masts of the full “H” Frame.

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MOUNTING THE ANTENNAS ON THE "H" FRAME
Attach feedlines and fasten to the boom and down the cable support tube with cable ties. Or equivalent. If black ties are used cover them with two wraps of black electricians tape after tightening to prevent UV degradation.

The 138XP26 is a cross polarized antenna that creates fields in both H and V planes. Mounting on a metal (conductive) mast or crossboom can severely affect the performance of the elements in the same plane. A 3" mast or crossboom of any NON-CONDUCTIVE material should be used. Fiberglass is the prime choice for its strength and weather resistance. Mount the antenna so that the rear set of elements are parallel with the ground.

This completes the antenna assembly.

Carefully Manufactured by
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138XP26 PARTS & HARDWARE

138XP26 PARTS LIST

DESCRIPTION	QTY
BOOM SECTION #1, 2 X .125 X 80”	1
BOOM SECTION #3, 2 X .125 X 87”	1
BOOM SECTION #2, 2-1/2 X .125 X 240” SBE	1
ELEMENTS, 3/8” ROD X Dimension Sheet	26
DRIVEN ELEMENT “T” MATCH BLOCK	2
BALUN, 1/2 WAVE RG-6U	2
TURNBUCKLE PLATE, 2 X .188 X 5”	1
MAST TO ANTENNA CLAMP PLATE, 1/4 X 4” X 8”	1
MAST TO ANTENNA CLAMP PLATE, 1/4 X 8” X 8”	1
RING CLAMP, 2-1/2”	2
TURNBUCKLE PLATES, 1/4 X 1” X 4.5”	2
GUY CABLE, H.P.T.G. 1200 X 28’	1
WIRE CLIPS, 1/8” OR 3/16” Galvanized	4
TURNBUCKLE, 5/16” SS	2
EYEBOLTS, 5/16” X 4” SS	2
ASSEMBLY MANUAL	1

IN HARDWARE BAG:

SHORTING BAR, 1/4” X .75 X 2.188” Aluminum Bar	4
BUTTON INSULATORS, 3/8”	52
SHAFT RETAINERS, 3/8” SS	52
LOCK NUT, 3/8-16	2
LOCK WASHER, 3/8	2
NUT, 5/16-18 SS	2
LOCK WASHER, 5/16 SS	2
BOLT, 1/4-20 X 4” SS	10
BOLT, 1/4-20 X 2-3/4” SS	4
BOLT, 1/4-20 X 2-1/4” SS	2
BOLT, 1/4-20 X 1-1/4” SS	4
BOLT, 1/4-20 X 1” SS	2
LOCK NUT, 1/4-20 X SS	20
SET SCREW, 8-32 X 1/4” SS	8
CABLE TIE, 14” NYLON	8
ALLEN HEAD WRENCH	1
NUTSEAL	4
PUSH TUBE, 3/8” X 3”	1

STR = STRAIGHT TUBE
SOE = SWAGED ONE END
SBE = SWAGED BOTH ENDS

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