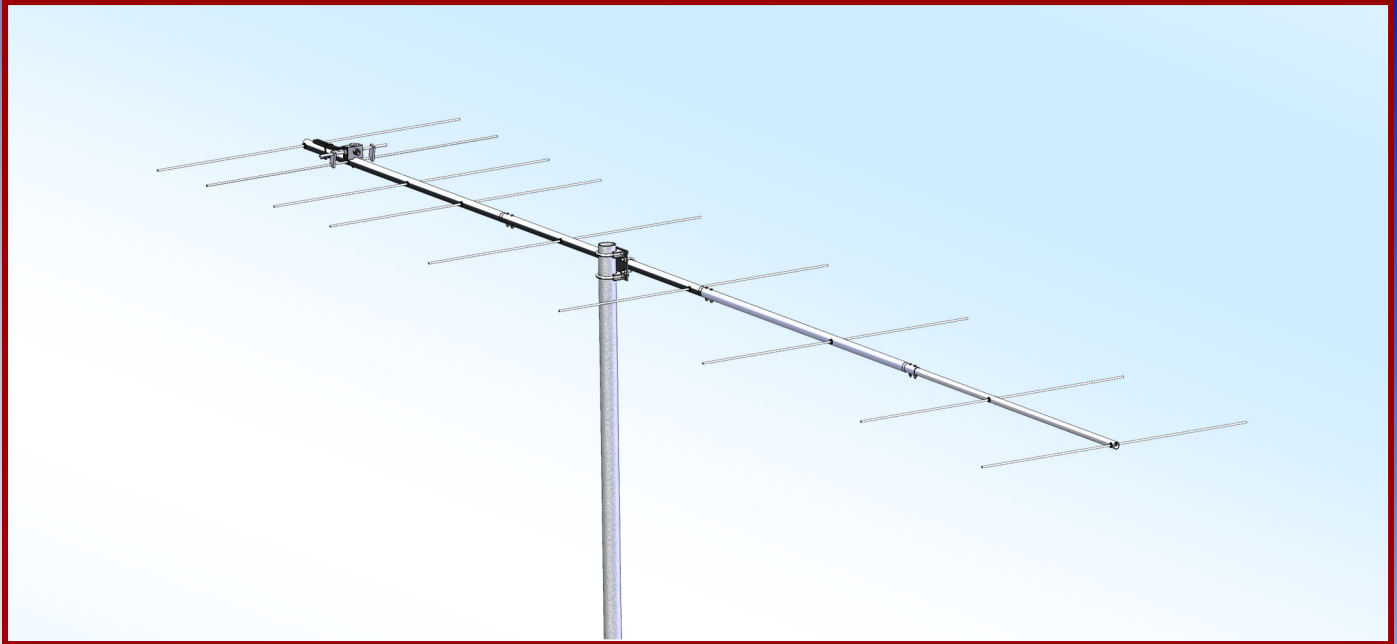




M2 Antenna Systems, Inc. Model No: 145-9



SPECIFICATIONS:

| | | | |
|----------------------|--------------------|-----------------------------|-----------------------|
| Model | 145-9 | Power Handling | 1.5 kW |
| Frequency Range..... | 140 to 150 MHz | Boom Length / Dia..... | 121" / 1" |
| *Gain | 11.62 dBi | Maximum Element Length..... | 42" / 3/16" |
| Front to back | 15 dB Typical | Turning Radius: | Call |
| Feed type | "T" Match | Stacking Distance..... | Call |
| Feed Impedance | 50 Ohms Unbalanced | Mounting..... | 1-1/2" to 2" Nom. |
| Maximum VSWR..... | 1.5:1 Typical | Wind area / Survival | 2.0 Sq. Ft. / 100 MPH |
| Input Connector..... | "N" Female | Weight / Ship Wt..... | 12 Lbs. / 15 Lbs. |

***Subtract 2.14 from dBi for dBd**

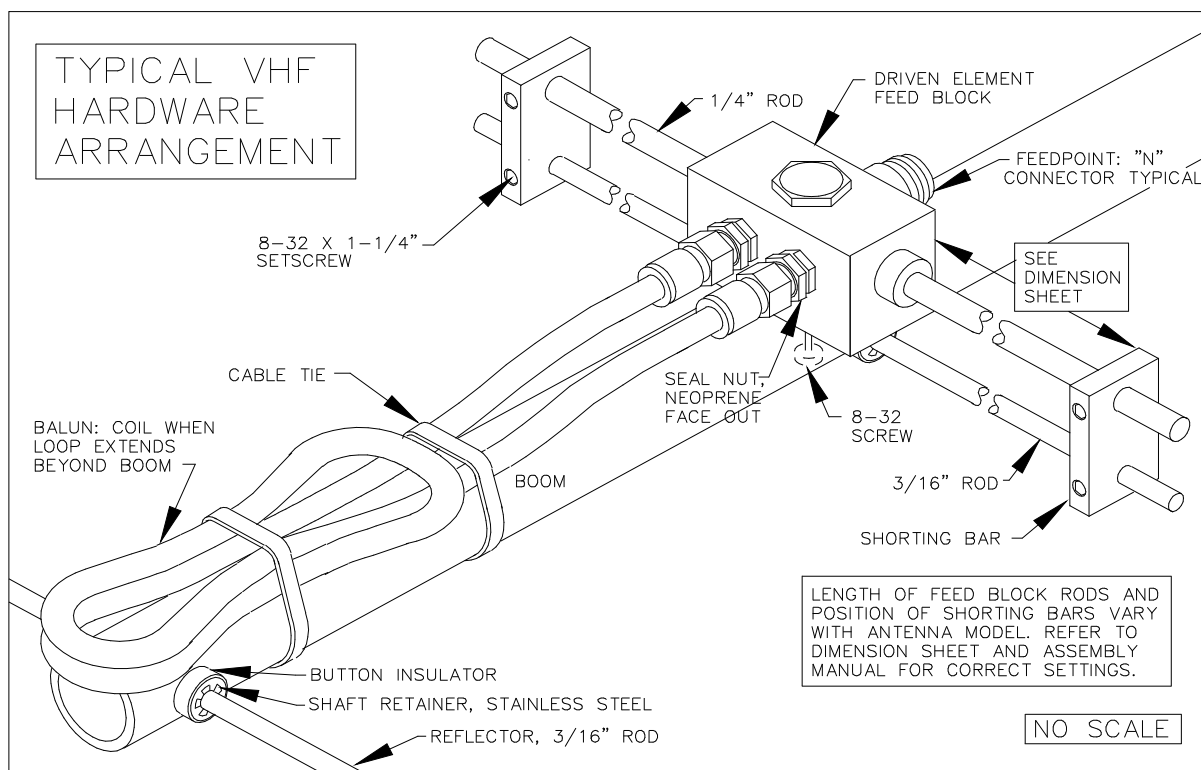
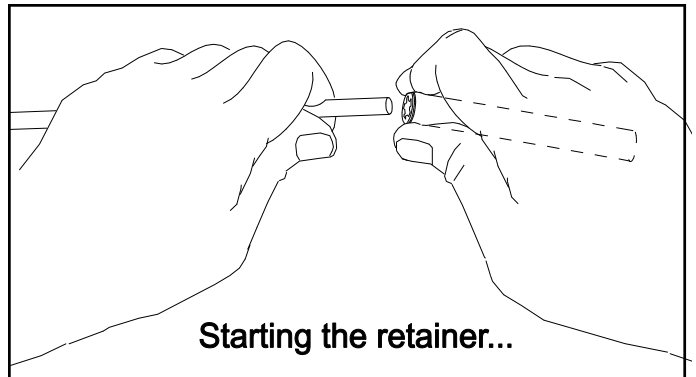
FEATURES:

Performance has been computer optimized to meet your application. Physical construction emphasizes long term electrical and mechanical durability. Elements are 3/16" 6061-T6 aluminum rod, mounted through the boom on UV stabilized polyethylene button insulators, and locked in position with stainless steel shaft retainers. The "T" Match driven element, uses a CNC machined central block with O-ring sealed connectors. Internal connections are encapsulated in a silicone gel with a dielectric strength 3.7 times greater than air for enhanced power handling. Balun connectors are triple O-ring sealed to the coax.

145-9 ASSEMBLY MANUAL

TYPICAL TOOLS REQUIRED: measuring tape, std slot or phillips screwdriver, 11/32, 7/16, and 1/2 spin-tite, end wrenches and / or sockets. Heavy duty models may require larger sizes.

1. Lay out the boom sections and assemble using the DIMENSION sheet as a guide for position and hardware.
2. Lay out the elements by length and position as shown the DIMENSION sheet. Find rough center of the reflector (longest) element by balancing it across finger. Push on a black button insulator to about 1/2" from center. Insert the element through the holes at the rear of the boom and install the second button. Install the 3/16" rod DRIVEN ELEMENT as you did the reflector. Then continue with the installation of the DIRECTORS. **Note that the Director Elements may not consistently diminish in length from rear to front, so pay close attention to length and position.**
3. Now begin centering the elements. Use a tape measure to EQUALIZE the amount the element sticking out on each side of the boom. Once all are centered, sight down the antenna from the rear and compare tip symmetry. Look for any obvious discrepancies and correct if found.
4. Stainless steel SHAFT RETAINERS are used for securing the elements and insulators. Always use for permanent and long term antenna installations. For most portable or temporary use, the button insulators are satisfactory and the retainers may be left off.
5. Use thumb and index finger to hold a Shaft Retainer over end of the 3/8 x 3" push tube (internal fingers dished into tube). Hold the element firmly and start the keeper onto the rod by applying pressure with the push tube. Push the Shaft Retainer down element until 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 Shaft Retainer too far). Repeat for the opposite side. Continue installing Shaft Retainers until all elements are locked in place.
6. Mount the DRIVEN ELEMENT FEED BLOCK to



145-9 ASSEMBLY MANUAL

the boom using a single 8-32 screw 1/4" longer than the boom diameter. Orient with feed and balun connectors oriented as shown on the Dimension Sheet.

7. Thread a 3/8" SEAL-NUT fully onto each balun connector on the feed block, with black Neoprene side facing out. Generally the balun is installed in one long loop. Rear mounted baluns may be coiled once if length extends beyond boom. Attach balun to the block connectors and tighten **gently** using a 7/16" end wrench. Then back the Seal Nuts out and finger-tighten firmly up against the face of the connectors (or tighten **gently** with 1/2" end wrench). Form the balun coax close to the boom and secure with cable ties (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 the 1/4" Feed Block Rods. Position the Shorting Bars as specified on the DIMENSION SHEET: the distance given is between the outer face of the Feed Block and the inner face of the Shorting Bar. Align the bars and rods with each other and tighten the setscrews.
9. For center mounted antennas, the boom to mast plate is normally mounted as close as possible to the balance point (with feedline or a temporary equivalent attached). For rear mounted antennas, use the boom length provided behind the reflector element. Keep mounting plate at least 1" from any element. Secure plate with two U-bolts and the stainless nuts and lock washers provided. **DO NOT OVER TIGHTEN.** Additional U-bolts and stainless nuts / lockwashers are provided for mounting the antenna to your mast. **THIS COMPLETES THE ANTENNA ASSEMBLY.**
10. For optimum performance, mount antenna high and in the clear. **Always** use high quality coax and connectors. Old, corroded, or poor quality materials can **SERIOUSLY** affect VSWR, gain, and pattern. If possible, test the antenna, connectors and feedline **BEFORE** installation. At 6' in height, the antenna will exhibit performance **approaching** the specifications. If it doesn't, check feedline and connectors for continuity and shorts. Check antenna shorting bars, element placement and length, against Dimension Sheet.

11. MOUNTING AND STACKING INFORMATION

Rear mounted antennas can generally be mounted in any polarization to any type of mast, conductive or non-conductive.

Center mounted antennas can also be mounted in any polarity. **However, a mast or crossboom in-line (parallel) with the element plane must be non-conductive.** Anything conductive in the element plane will disrupt the pattern and reduce performance (even the feedline). When a non-conductive mast or crossboom is in-line with elements, route feedline away at right angles to the elements and reattach at least 6" beyond element tips. Fiberglass is the recommended material for a non-conductive mast or crossboom because of its strength and weather resistance.

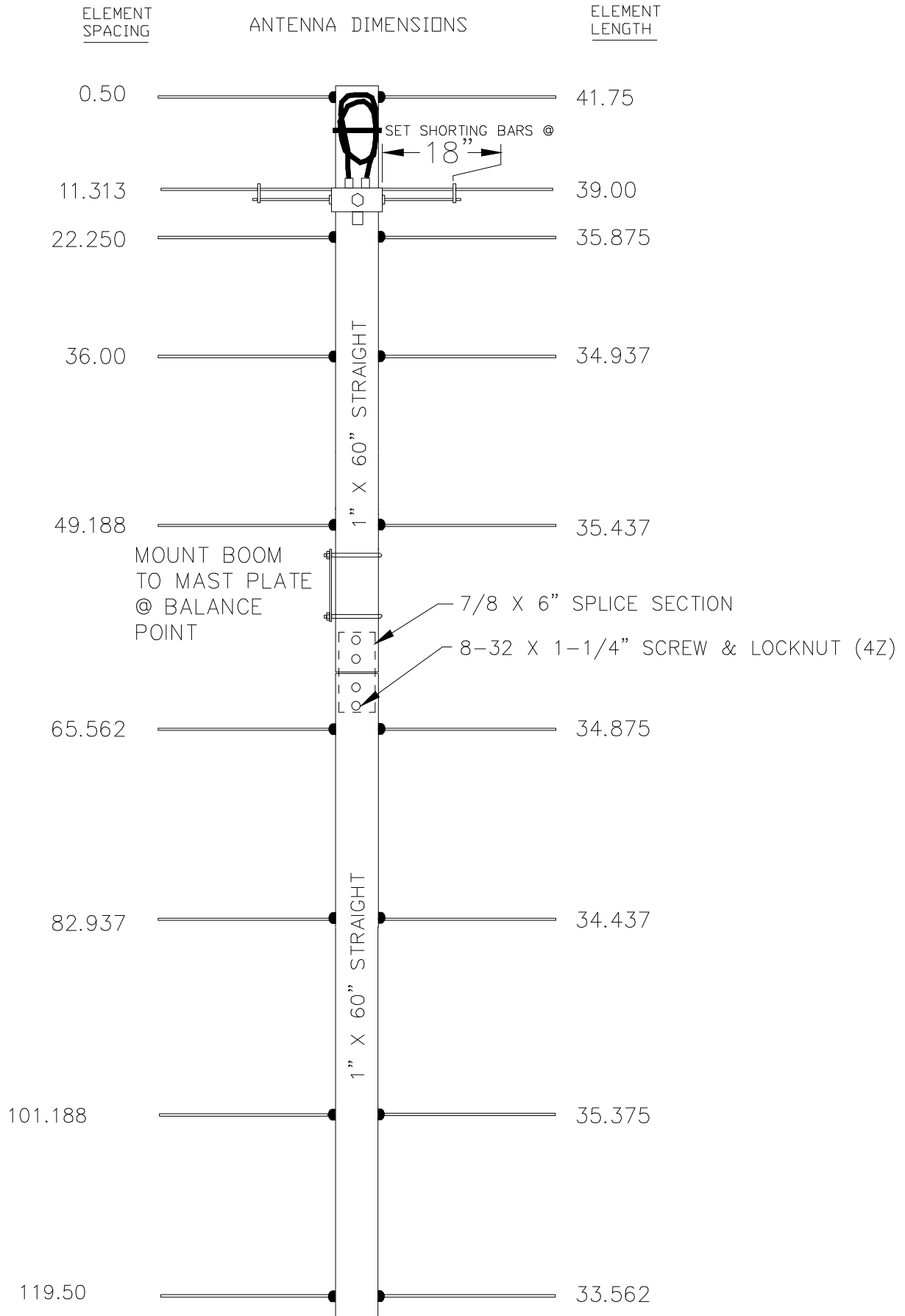
Stacking: See the Dimension Sheet for stacking separation dimensions.

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, ideally, multiples of 1 wavelength in order to maintain equal phasing in the array.

Carefully manufactured by:

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145-9 ASSEMBLY MANUAL



145-9 PARTS & HARDWARE

| DESCRIPTION | QTY |
|---|-----|
| BOOM SECTION, 1 X .058 X 60" STR | 2 |
| BOOM SPLICE, 7/8 X .058 X 6" | 1 |
| ELEMENTS, 3/16 ROD x Dimension Sheet..... | 9 |
| FEED BLOCK, | 1 |
| BALUN, RG-6 1/2 WAVE | 1 |
| BOOM-TO-MAST PLATE, 3 X 4 X .188"..... | 1 |
| U-BOLT AND CRADLE, 2" | 2 |
| U-BOLT, 1" | 2 |
| ASSEMBLY MANUAL | 1 |

IN HARDWARE BAG

| | |
|--------------------------------|----|
| BUTTON INSULATORS..... | 18 |
| SHAFT RETAINER, SS | 18 |
| NUT, 5/16-18 SS | 4 |
| LOCKWASHER, 5/16 SS | 4 |
| NUT, 1/4-20 SS | 4 |
| LOCKWASHERS, 1/4 SS | 4 |
| SCREW, 8-32 X 1-1/4 SS..... | 5 |
| LOCKNUT, 8-32 SS..... | 4 |
| SHORTING BAR | 2 |
| SETSCREW, 8-32 X 1/4, SS..... | 4 |
| 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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