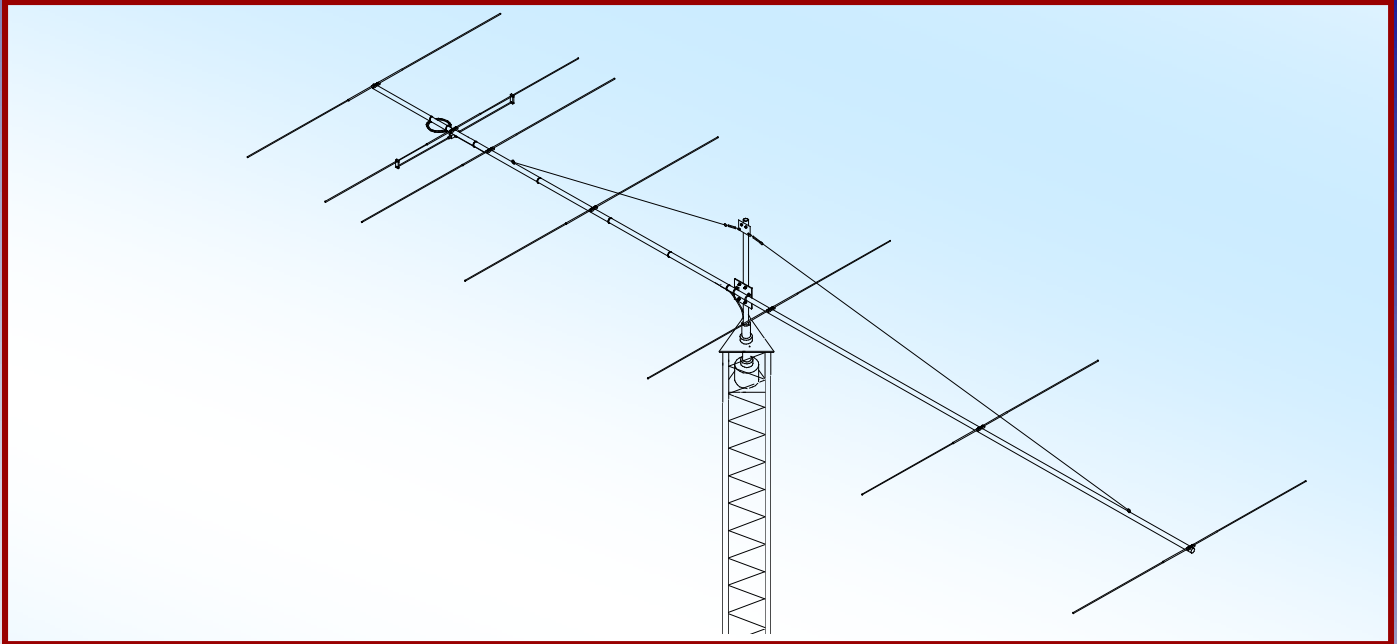




# M2 Antenna Systems, Inc. Model No: 49.9-7



## SPECIFICATIONS:

Model .....	49.9-7	Boom Length / Dia.....	28' 6" / 2-1/2"-2"
Frequency Range.....	49.6 To 50.2 MHz	Maximum Element Length.....	12'
*Gain .....	20.75 dBi	Turning Radius: .....	Call
Front to back .....	29 dB Typical	Stacking Distance.....	Call
Feed type .....	"T" Match	Mounting.....	1-1/2" to 2" Nom.
Feed Impedance .....	50 Ohms Unbalanced	Wind area / Survival .....	3 Sq. Ft. / 100 MPH
Maximum VSWR.....	1.5:1 Typical	Weight / Ship Wt.....	30 Lbs. / 38 Lbs.
Input Connector.....	"N" Female		
Power Handling.....	1.5 kW		

**\*Subtract 2.14 from dBi for dBd**

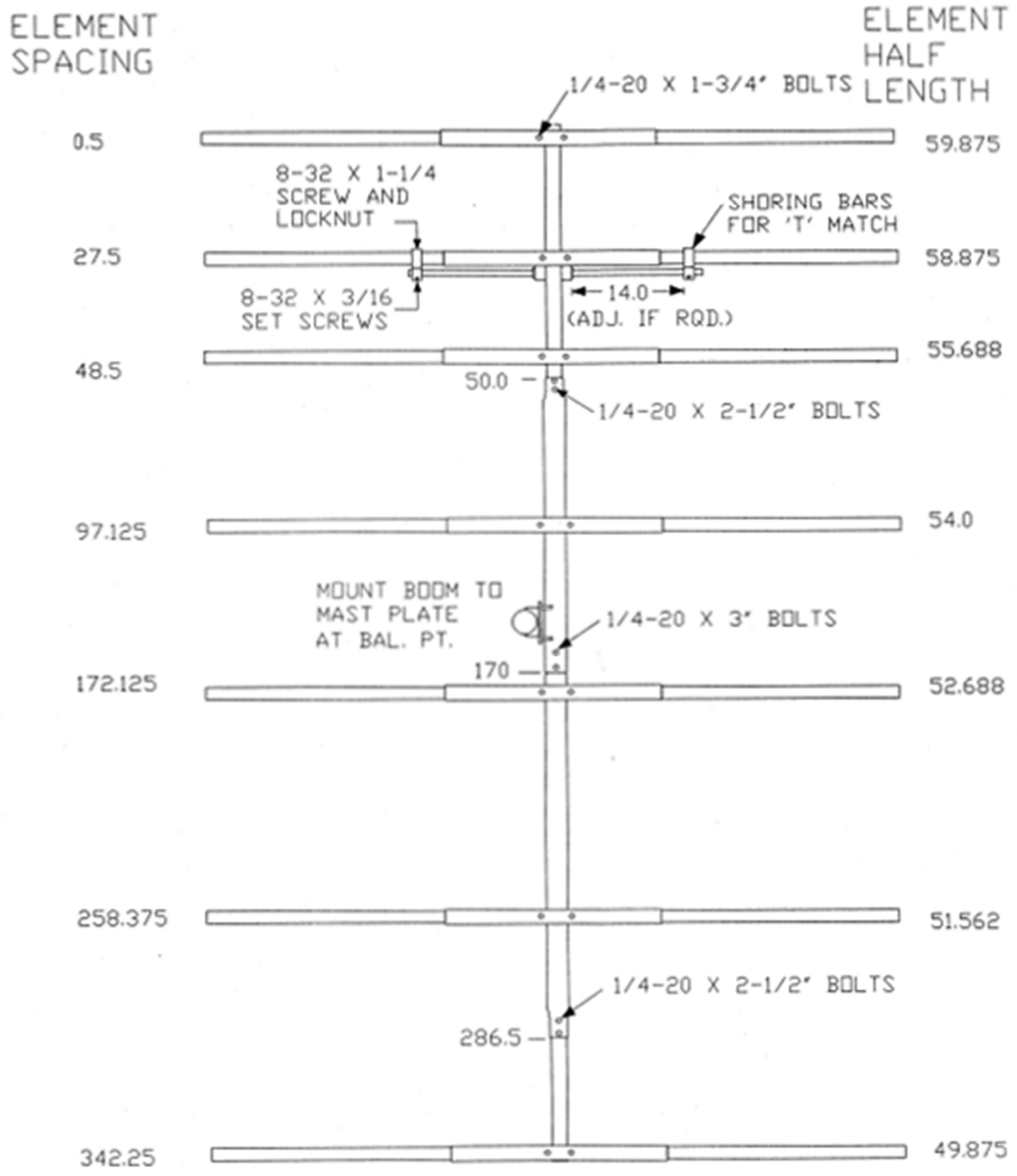
## FEATURES:

The 49.9-7 has been computer optimized from the ground up for gain and pattern covering 49.6-50.2 MHz. The original design was for Meteor Scatter, but can be used for monitoring systems. The custom 1:1 Fairite balun and low loss hairpin match help maintain high efficiency. Element ring clamps and other important components are CNC machined for maximum strength and electrical integrity. All antenna hardware is stainless steel and the U-bolts for mounting are Zinc plated.

# 49.9-7 ASSEMBLY MANUAL

1. Begin by laying out the boom sections in order, according to the DIMENSION SHEET. Note the dimensions next to each joint in the boom. These are reference dimensions used to position the ELEMENT RING CLAMPS, prior to assembling the boom.
2. Locate the rear boom section and install the three, 2 inch ring clamps on that section according to the dimension sheet. USE A FLAT BLADE SCREWDRIVER slipped in the slot of the ring clamp to spread it slightly allowing it to slide along the boom. Remove the screwdriver when the clamp is at the proper dimension.
3. Continue installing ring clamps on the individual boom sections, positioning them according to the dimension sheet.
4. Now assemble the boom using the hardware called out on the dimensions sheet. Use 1/4-20 locknuts and tighten securely.
5. Next mount the "t" match section using the SINGLE 1/4-20 X 2-1/4" bolt. The two small connectors for the balun should face the middle of the boom. The ring clamp for the DRIVEN ELEMENT should now be right against the access cap on the "T" match block. Rotate the ring clamp so the grooved side is on the opposite side of the boom from the "T" block.
6. Align the rest of the ring clamps with the driven element ring and "T" match section.
7. Layout the element pairs according to length, longest (REFLECTOR) to the shortest (FRONT DIRECTOR). Separate the center 7/8" x 30" sleeve sections. The four with the close spaced holes mount on the 2" ring clamps.
8. Starting with the longest element (REFLECTOR) insert one element half into a two inch sleeve, align the holes and drop a 1/4-20 x 1-3/4" bolt through to hold it in position. Insert the second element half and install the second bolt.
9. Now place this assembly over the rear (REFLECTOR) ring clamp on the boom, add two 1/4-20 locknuts and tighten securely.
10. Now install the DRIVEN ELEMENT in the same manner. Then slide on the "T" match shorting bars and position them on the 3/8" diameter "T" sections on each side according to the dimension sheet. Install the 8-32 x 1-1/4" screw and lock nut on each side. Align the shorting bars with each other and tighten in position. Add two 8-32 x 3/16" set screws to each side and tighten with the 5/64 Allen wrench provided.
11. Continue this element assembly until all are mounted on the boom. Re-check the element spacing according to the dimension sheet and re-adjust the positions if necessary. Now carefully align the elements with the DRIVEN ELEMENT, add a 1/4-20 x 1" bolt and locknut to each clamp and tighten each clamp in place.
12. Install the EYEBOLTS in holes provided near each end of the boom. The eyes should be on the ELEMENT SIDE of the boom. Pick up the antenna and find the balance point. Mount the BOOM TO MAST PLATE at or near this point keeping the antenna just slightly FRONT HEAVY to offset the feedline weight (added later).
13. If possible, install a short temporary mast to accommodate turnbuckle plate positioning using two 2" U-bolts. Using the 5/16" black Dacron support line, take two loops through an eyebolt, add two half hitches or equivalent knot leaving about 6 to 8 inches of line after the knot. Pull hard on the knot to "SET" it. Repeat this procedure at the other eyebolt. DON'T CUT THE LINE YET.
14. Open each turnbuckle so just one thread appears inside the body. Install the turnbuckle plate on the short temporary mast with another 2 inch U-bolt just an inch or so above the boom to mast plate. Hook in the turnbuckles, center the line for an equal amount for each turnbuckle and cut the line. NOTE: The line may be sealed with a lighter or equivalent to prevent fraying. Take two turns through the turnbuckle eye, pull taught and lock in place with two half hitches or equivalent. Repeat for the other turnbuckle.
15. Using black electricians plate, tape each line end tightly back on the taught line. Cut off any ends in excess of 18 inches.

# 49.9-7 DIMENSION SHEET



DIMS  
M. STAAL  
7-30-90

# 49.9-7 ASSEMBLY MANUAL

16. Now slide or lift the turnbuckle plate up. At about 2 to 3 feet up, the boom will become straight. Final turnbuckle plate positioning and turnbuckle adjustment will be done during installation.

17. Install the balun on the "T" match block. When tightening the connectors, hold the body of each connector with pliers or 7/16" end wrench while tightening the connectors GENTLY with a 7/16" end wrench. The connectors have face and rear seals. Use of weatherizing with COAX-SEAL™ or equivalent is OPTIONAL. Add the main feed line providing a 6 to 8 inch drip loop before fastening the feedline to the boom with the large cable ties provided.

**Carefully Manufactured By**

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# 49.9-7 PARTS & HARDWARE

DESCRIPTION	QTY
BOOM SECTION, #1, 2" X .058 X 120" .....	1
BOOM SECTION, #2, 2-1/2" X .065 X 120" SBE .....	1
BOOM SECTION, #3, 2-1/2" X .065 X 120" SBE .....	1
BOOM SECTION, #4, 2" X .058 X 107" .....	1
BOOM TO MAST PLATE, 3/16" X 6" X 8" .....	1
BOOM SUPPORT LINE, 5/16" X 30' DACRON.....	1
ELEMENT HALVES, 3/4" X (SEE DIMENSION SHEET) ....	14
ELEMENT SLEEVES, 7/8" X 30" (2" RING CLAMP).....	4
ELEMENT SLEEVES, 7/8" X 30" (2-1/2" RING CLAMP)....	3
DRIVEN ELEMENT ASSEMBLY .....	1
BALUN, RG-6 .....	1
ASSEMBLY MANUAL.....	1

## IN HARDWARE BAG

RING CLAMP, 2" .....	4
RING CLAMP, 2-1/2" .....	3
SHORTING BARS, 1/2" X 1" X 4-3/8" .....	2
TURNBUCKLE PLATE, 3/16" X 2" X 4" .....	1
U-BOLT AND CRADLE, 2-1/2" .....	2
U-BOLT AND CRADLE, 2" .....	3
TURNBUCKLES, 5/16" SS .....	2
EYEBOLTS, 5/16" SS .....	2
NUT, 5/16-18 SS.....	12
LOCKWASHER, 5/16-18 SPLIT RING SS .....	12
BOLT, 1/4-20 X 3" SS .....	2
BOLT, 1/4-20 X 2-1/2" SS.....	4
BOLT, 1/4-20 X 2-1/4" SS.....	1
BOLT, 1/4-20 X 1-3/4" SS.....	14
BOLT, 1/4-20 X 1" SS .....	7
NYLOCK NUT, 1/4-20 SS .....	27
SCREW, 8-32 X 1-1/4" SS .....	2
SET SCREW, 8-32 X 1/4" SS .....	4
ALLEN WRENCH, 5/64 .....	1
CABLE TIES, 11" .....	5
NUT SEAL .....	2

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