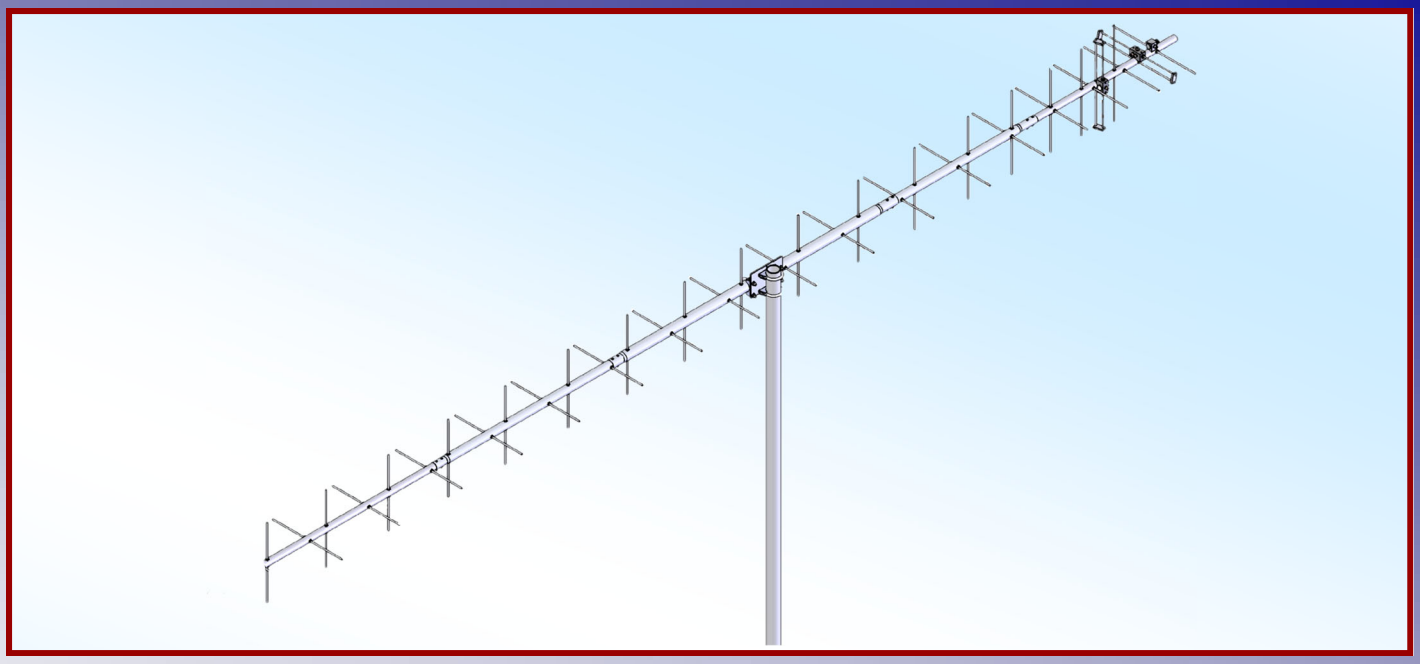
M2 Antenna Systems, Inc.
Model No: 250CP36



SPECIFICATIONS:

Model	250CP36
Frequency Range	240-265 MHz
Gain	14.4 dBic
Front to back	22 dB Typical
Feed type	“T” Match
Feed Impedance.	50 Ohms Unbalanced
Maximum VSWR	1.5:1 Typical
Input Connector	“N” Female
Power Handling	1.5 kW
Boom Length / Dia	153” / 1”
Maximum Element Length	23”
Turning Radius:	Call
Stacking Distance	Call
Mounting	1-/2” to 2”
Wind area / Survival	0.89 Sq. Ft. / 100MPH
Weight / Ship Wt.	7 Lbs. / 9 Lbs.

***Subtract 2.14 from dBi for dBd**

FEATURES:

The 250CP36 is high performance circular 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 satellite work but is also excellent for terrestrial uses.

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 3/16” 6061-T6 rod elements are centered on the boom to minimize interaction and maintain good ellipticity. Insulators are UV stabilized and locked in place with stainless keepers. Rugged construction, uncompromising performance for the boom length.

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250CP36 ASSEMBLY MANUAL

TOOL REQUIRED FOR ASSEMBLY: screwdriver, 11/32 nut driver or wrench, 7/16” and 1/2” socket or end wrenches, measuring tape.

1. Assemble the boom using 8-32 x 1-1/2” screws and locknuts to join the 1-1/4” to 1” sections. Use 8-32 x 1-1/4” hardware for the 1” tip section. Sections may be swaged to each other or use 7/8” internal splice sections.

ASSEMBLING THE HORIZONTAL ELEMENTS

2. Layout the elements by “H” length and position as shown in the DIMENSION SHEET. Start with the reflector (longest) element. Balance it on your finger to find rough center and push on a black insulator to about 1/2” off center. Push the element through the holes 1/2” from the rear of the boom and install the second button, snugging it up into the 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 it after all the horizontal elements are installed in the boom.

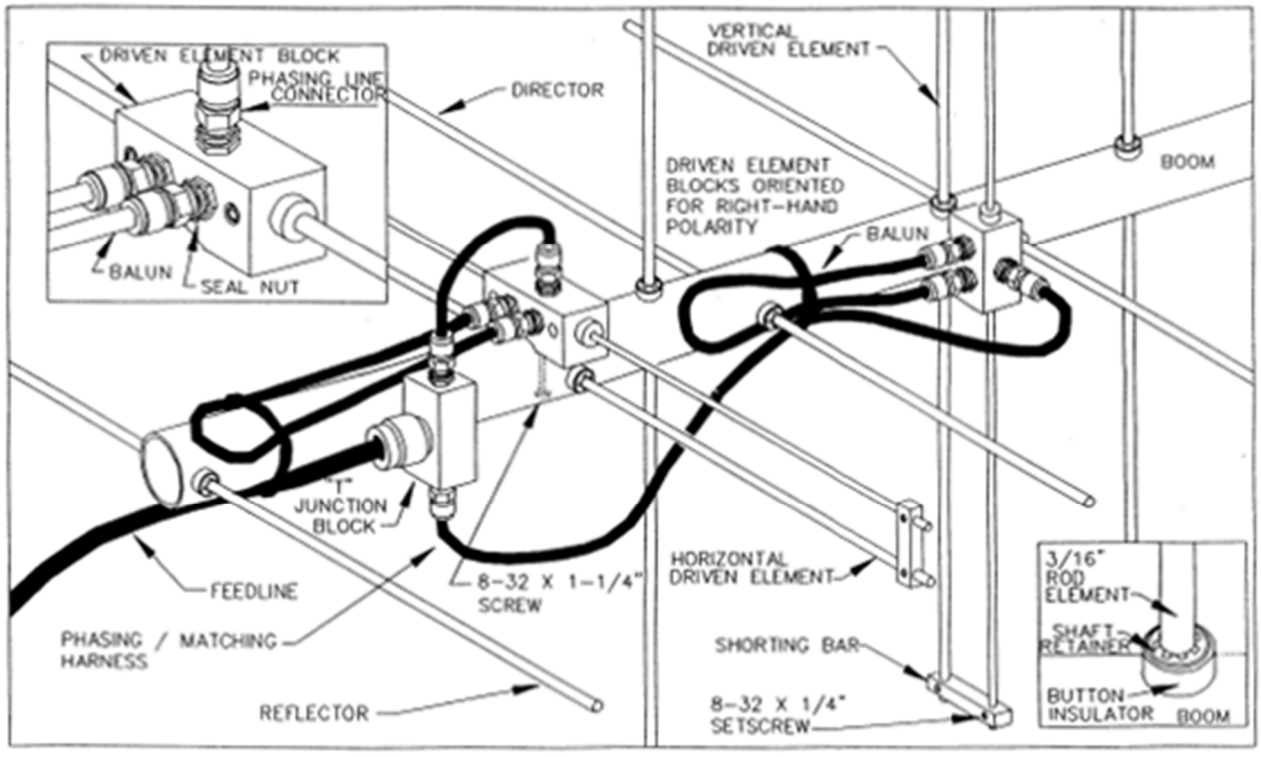
3. Install the 3/16” rod DRIVEN ELEMENT as you did the reflector. Then continue with the installation of the DIRECTORS. Note that the Director Elements do not consistently diminish in length from rear to front, so pay close attention to length and position.

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 steel SHAFT RETAINERS. Use thumb and index finger to hold a retainer over end of the 3/8” x 3” push tube (retainer 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, lightly clamped up against opposite button insulator will help maintain center reference and keep you from pushing the first retainer too far). Repeat for the opposite side. Continue installing retainers until all elements are locked in place.

6. Mount the HORIZONTAL DRIVEN ELEMENT BLOCK / ROD ASSEMBLY to the TOP of the boom using a single 8-32 x 1-1/4” screw. Orient the block with the two balun connectors facing to rear.

7. Install the 8-32 x 1/4” set screws (internal Allen head - tool supplied) into the SHORTING BARS. Slide the bars onto the Driven Element Block Rods and the driven element rods. Position the Shorting Bards as shown on the Dimension Sheet. Align the bards with each other and tighten the set screws.



250CP36 ASSEMBLY MANUAL

ASSEMBLING THE VERTICAL ELEMENTS

Note: The vertical element set is shifted forward on the boom by 1/4 wavelength. This increases isolation between element planes, improving circularity and ease of phasing / matching the two element sets.

8. Repeat steps #2 through #5 for the Vertical elements, using the Dimension Sheet as your guide to lengths and spacing.

INSTALLATION OF THE VERTICAL DRIVEN ELEMENT BLOCK DETERMINES THE CIRCULARITY OF THIS ANTENNA. THE ORIENTATION OF THE BLOCK FOR RHC - RIGHT HAND CIRCULARITY, IS SHOWN ON THE DIMENSION SHEET AND DRAWING AND DESCRIBED BELOW:

9. Viewed from the rear of the boom (rearmost Reflector HORIZONTAL), the VERTICAL Driven Element Block mounts to the RIGHT hand side of the boom with the two Balun connectors oriented to the REAR. Secure with 8-32 x 1-1/4" screw. Install the Shorting Bars as in step #7.

10. Before installing the Baluns and Matching / Phasing Harness, thread 3/8" seal nuts fully onto all connectors, with the black Neoprene face of the nuts facing out. Attach Baluns and Phasing lines to the Driven Element Blocks and Junction Block as shown on the drawing. 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 gently with 1/2" end wrench). A lot of torque is unnecessary. Depending on model and polarity, the Vertical balun may loop around another element. This is a normal. Form balun coax until it is close to the boom and secure with a nylon cable tie. Also secure the other balun and the matching / phasing harness coax with cable ties. Ties should be snug but not crushing or kinking the coax.

11. Use a good quality coax and "N" connector for your feedline (see Installation Tips). Secure feed coax near connector on Junction Block, to provide stress relief. Allow about 60" of coax to hang in a loop between the rear end of the boom and the reattachment point (at least 12" beyond element tips) on the mast or cross boom. Do not route feedline to boom to mast plate as exiting antenna here will adversely affect circular field.

12. The boom to mast plate is normally mounted to the boom at the balance point. Since the feed line represents significant weight it is best to have it attached and fastened to the boom with cable ties before final mounting the plate. Use two 1-1/4" U-bolts and the stainless nuts and lock washers provided. DO NOT OVER TIGHTEN. 2" U-bolts (and stainless steel nuts / lockwashers) are provided for mounting the antenna to your NON-CONDUCTIVE mast or crossboom.

THIS COMPLETES THE ANTENNA ASSEMBLY

INSTALLATION TIPS

13. The 250CP36 is a circular polarized antenna and creates a field in all planes or polarities. Performance DETERIORATES SIGNIFICANTLY if it is mounted on a metal (conductive) mast or crossboom. A mast or crossboom of any NON-CONDUCTIVE material can be used. Fiberglass is the prime choice for its strength and weather resistance.

14. Recommended feedlines, in order of preference:
    Andrews or Celwave 1/2" hardline
    Times Microwave LMR-400
    Try to keep the cable run to under 100 ft. to prevent excessive signal loss.

15. To maintain proper phasing when stacking two or more antennas, mount each with the same orientation of Driven Element Blocks. DO NOT MOUNT IN MIRROR IMAGE. See the Specification Sheet for stacking distances. For more detailed stacking information contact M2.

Carefully Manufactured By
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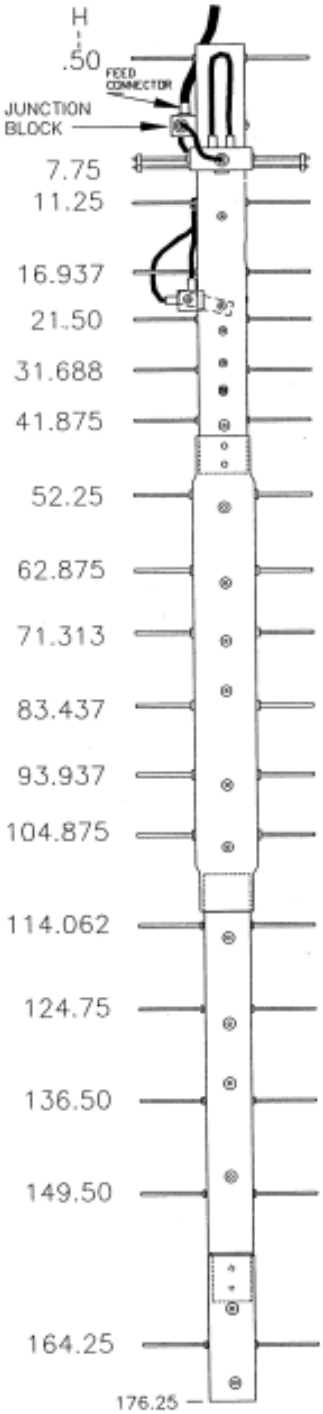
250CP36 DIMENSION SHEET

250CP36
ANTENNA DIMENSIONS

DRIVEN ELEMENT BLOCKS SHOWN IN POSITION FOR RIGHT-HAND CIRCULARITY



ELEMENT SPACING V	ELEMENT SPACING H	ELEMENT LENGTH H	ELEMENT LENGTH V
	.50	24.313	
		FACT. TUNED ⊗	
	7.75		
12.0	11.25	21.25	24.313
			FACT. TUNED ⊗
	16.937	20.50	
19.25	21.50	20.313	21.25
22.75			20.50
28.437	31.688	20.125	20.313
33.0			
43.188	41.875	20.0	20.125
53.375	52.25	19.813	20.125
63.75	62.875	19.50	19.813
74.375	71.313	19.188	19.50
82.813	83.437	19.062	19.188
94.937	93.937	18.625	19.062
105.437	104.875	18.437	18.625
116.375	114.062	18.50	18.313
125.562	124.75	18.313	18.50
136.25	136.50	18.375	18.313
148.0	149.50	18.437	18.375
161.0	164.25	17.50	18.437
175.75	176.25		17.50

CAREFULLY NOTE & FOLLOW ELEMENT LENGTHS FOR 1-1/4" BOOM SECTION: LENGTHS HAVE BEEN ADJUSTED TO COMPENSATE FOR LARGER BOOM SIZE.

DECIMAL TO FRACTION CONVERSION

.062 = 1/16"
.125 = 1/8"
.188 = 3/16"
.250 = 1/4"
.313 = 5/16"
.375 = 3/8"
.437 = 7/16"
.50 = 1/2"
.562 = 9/16"
.625 = 5/8"
.688 = 11/16"
.750 = 3/4"
.813 = 13/16"
.875 = 7/8"
.937 = 15/16"
1.00 = 1"

250CPDIM
FSTAAL
1-10-95

250CP36 PARTS & HARDWARE

DESCRIPTION	QTY
BOOM SECTION, 1” X .058 X 52” STR	1
BOOM SECTION, 1” X .058 X 60” SOE	1
BOOM SECTION, 1” X .058 X 20.25” STR	1
BOOM SECTION, 1-1/4” X .058 X 60” SBE	1
ELEMENTS, 3/16” ALUM ROD (SEE DIMENSION SHEET)	36
DRIVEN ELEMENT BLOCK ASSY	2
“T” BLOCK ASSEMBLY	1
BALUN, RG-6U HALFWAVE LENGTH	2
PHASING LINE, RG6-U QUARTERWAVE LENGTH	1
PHASING LINE, RG6-U THREE QUARTERWAVE LENGTH	1
BOOM TO MAST PLATE, .188 X 4” X 6”	1
U-BOLT AND CRADLE, 2”	2
U-BOLT, 1-1/4”	2
ASSEMBLY INSTRUCTIONS	1

IN HARDWARE BAG

SHORTING BARS, .75 X 1.532 X .250”	4
BUTTON INSULATORS, 3/16”	72
SHAFT RETAINERS, 3/16” SS	72
NUT, 5/16-18 SS	8
LOCKWASHER, 5/16 SS	8
SCREW, 8-32 X 1-1/2 PANHEAD SS	4
SCREW, 8-32 X 1-1/4 PANHEAD SS	5
SET SCREW, 8-32 X 1/4” SS	8
LOCKNUT, 8-32 SS	7
SEAL NUTS, 3/8-32	8
ALLEN WRENCH, 5/64”	1
PUSH TUBE, 3/8” X 3”	1
CABLE TIES, 8” NYLON	4

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