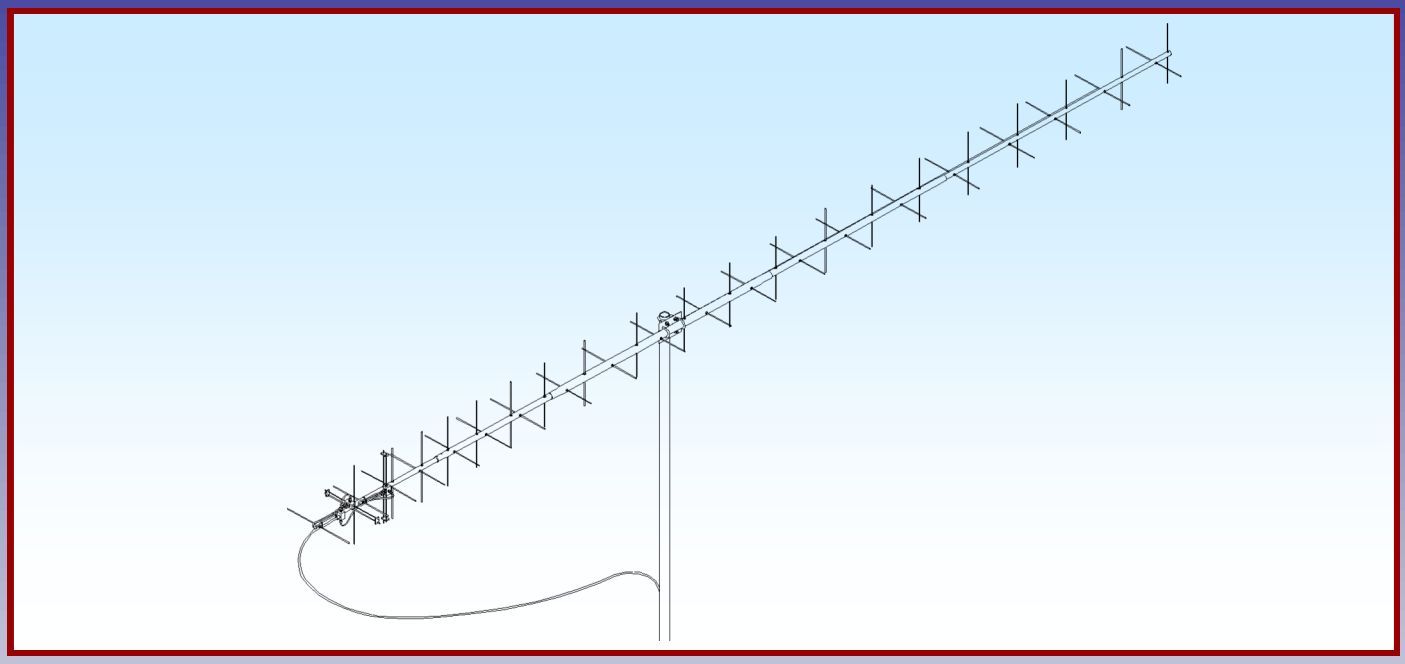
M2 Antenna Systems, Inc.
Model No: 436CP42UG



SPECIFICATIONS:

Model	436CP42UG
Frequency Range	430 To 438 MHz
*Gain	18.9 dBic
Front to back	25 dB Typical
Ellipticity	1.5 db Typical
Beamwidth	21° circular
Feed type	Folded Dipole
Feed Impedance.	50 Ohms Unbalanced
Maximum VSWR	1.5:1

Input Connector	“N” Female others opt.
Power Handling	1Kw (.5kW w/POL SW1)
Boom Length / Dia	18’ 10” / 1-1/2” To 1”
Maximum Element Length	13-1/4”
Turning Radius:	95”
Stacking Distance	68” High & 68” Wide
Mast Size	1-1/2” to 2” Nom.
Wind area / Survival	2 Sq. Ft. / 100 MPH
Weight / Ship Wt.	7.5 Lbs. / 10 Lbs.

***Subtract 2.14 from dBi for dBd**

FEATURES:

The 436CP42UG (Ultra-Gain) sets a new performance standard for UHF circular polarized antennas. Gain and F/B are excellent. The boom length is matched to the 2MCP22, and together they form an unbeatable satellite communications package. The extremely clean pattern maximizes forward gain and F/B. The pattern is important in order to match the antenna’s noise temperature with modern low-noise preamps. The CP42 is also excellent for ATV, repeater operation, and long haul tropo DX and EME around 432 MHz.

The driven element and 'T' blocks are CNC machined, with connectors O-ring sealed for low maintenance and long-term peak performance. Internal connections are embedded in a space-age silicone gel that seals out moisture and improves power handling. The 3/16” 6061-T6 rod elements are centered in the boom to minimize interaction and maintain low ellipticity. Insulators are UV stabilized and locked in place with stainless retainers. The central boom section is 1-1/2" dia., tapering, front and rear,through 1-1/4" sections to 1" ends.If you are looking for rugged construction and top-notch performance, For EME use, M^2 can supply an optional polarity switch and parts needed to convert these to dual polarity Yagis. Contact us for more details.

M2 Antenna Systems, Inc. 4402 N. Selland Ave. Fresno, CA 93722
Tel: (559) 432-8873 Fax: (559) 432-3059 Web: www.m2inc.com

7/10/18
REV A

436CP42UG ASSEMBLY MANUAL

TOOLS 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 screws and locknuts to join sections. Use screw lengths 1/4" longer than the larger of the two boom sections to be assembled (1-/34" hardware for 1-1/2" boom section, etc.)

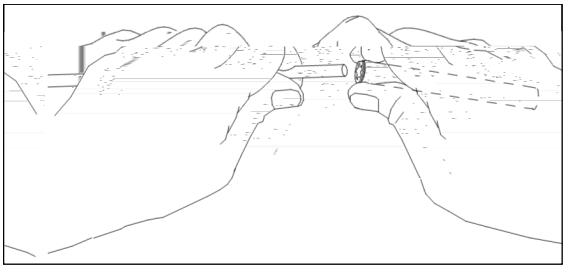
ASSEMBLING THE HORIZONTAL ELEMENTS

2. Lay out the elements by "H" length and position as shown 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 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 boom. DO NOT BOTHER CENTERING the element at this time and DO NOT INSTALL the stainless steel shaft retainers.

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.***

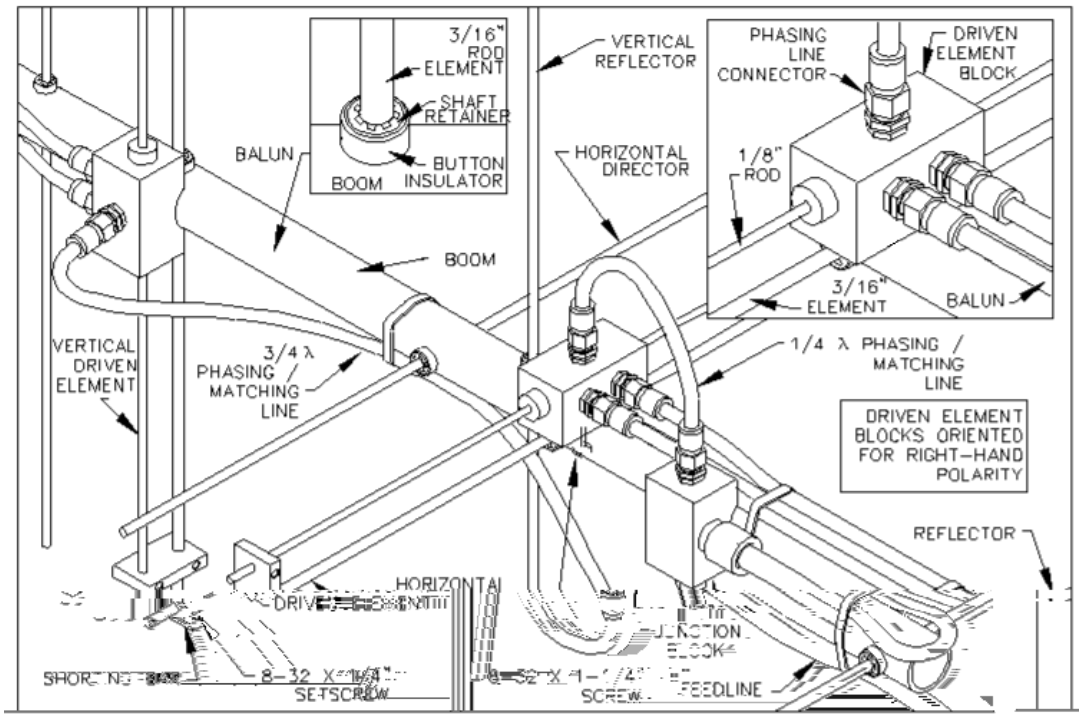
4. Now begin centering the elements. Use a tape measure to EQUALIZE the amount the element sticking out on each side of the boom. Once you have all the elements centered, sight down the element tips from the rear comparing each side. Look for any obvious discrepancies and correct if found.

5. Stainless steel SHAFT RETAINERS lock the elements in place. They should always be used for permanent and long term antenna installations. For portable or temporary use, the button insulators are adequate for holding the elements and the retainers may be left off.



To install the stainless steel SHAFT RETAINERS, use thumb and forefinger to hold the retainer over the end of the PUSH TUBE (3/8" x 3" tube, supplied in the kit), internal fingers on retainer dished into tube. HOLD THE ELEMENT FIRMLY TO PREVENT IT FROM SLIDING OFF CENTER and press the retainer onto the element end and continue until retainer butts on insulator button. Locking pliers, ***lightly*** clamped up against opposite button insulator will help maintain center reference (if you push the first retainer too far, remove element from boom, push retainer completely off the element, and start over). Install another retainer to the opposite side of the element. Continue installing retainers until all elements are secured.

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 1/8" Driven Element Block Rods and the 3/16" driven element rod. Position the Shorting Bars as specified on the Dimension Sheet: the given distance is between the outer face of the driven element block and the inner face of the shorting bar. Align the bars and rods to each other and tighten the set screws.

ASSEMBLING THE VERTICAL ELEMENTS

Note: The vertical element set is shifted forward on the boom by 1/4 wave length.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 (the Horizontal Driven Element Block), is to be mounted on the top of the boom. The VERTICAL Driven Element Block mounts to the LEFT hand side of the boom with the two Balun connectors oriented to the FRONT. Secure with 8-32 x 1-1/4” screw. Install the Shorting Bars as in step #7. Mount the 'T' Junction Block on the same side of the boom, just to the rear of the horizontal driven element.

10. 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. A lot of torque is unnecessary. Depending on model and polarity, the Vertical balun may loop around another element. This is 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 good quality coax and “N” connector for your feed line (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 feed line to boom to mast plate as exiting antenna here will adversely affect circular field.***

12. A conventional flat plate was not used for this ultra gain CP antenna, because it severely affected the circularity and gain of this antenna. We found that a smaller angle plate bolted to the boom allowed the antenna to work up to its potential. We have drilled two sets of holes in the boom to attach the plate. If neither of these positions work for your particular application, feel free to drill your own two holes. Mount the plate with two 8-32 x 2” screws and tighten securely, 1/2” and 2” u-bolts are provided to match your mast/boom diameter. ***Be sure not to over tighten the U-bolts as this may damage your mast.***

THIS COMPLETES THE ANTENNA ASSEMBLY.

INSTALLATION TIPS

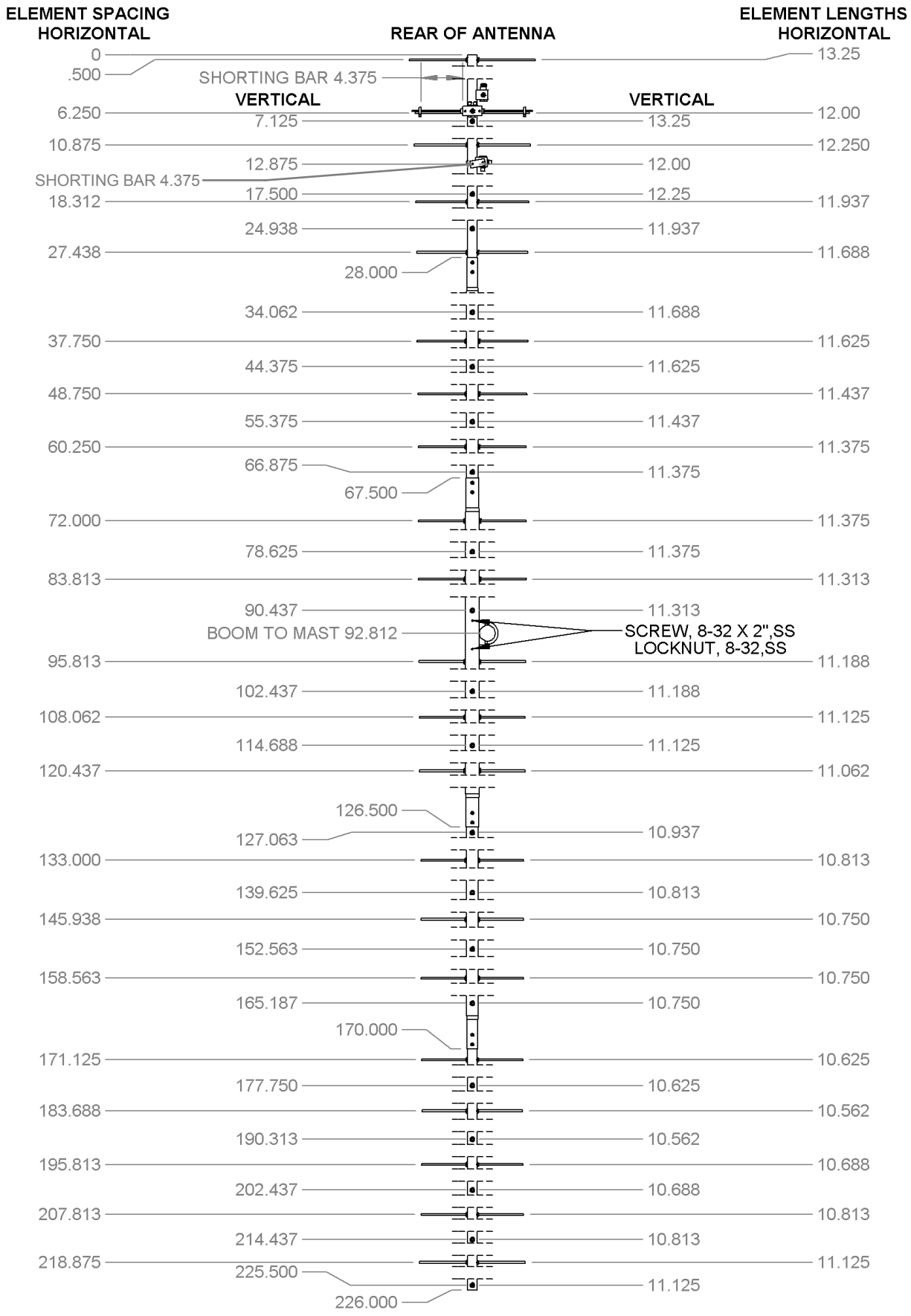
13. A circular polarized antenna creates a field in all planes or polarities. Performance DETERIORATES SIGNIFICANTLY if it is mounted on a metal (conductive) mast or cross boom. A mast or cross boom of any NON-CONDUCTIVE material must be used. Fiberglass is the prime choice for its strength and weather resistance. Mount so that element tips are at least 12” from any conductive material (mast, tower, feed line, etc.).

14. Recommended feed lines, in order of preference:
    Andrews or Celwave 1/2” hardline
    Times FM-8, LMR400, or Belden 9913 (We can highly recommend LMR400 because of its improved resistance to moisture and reduced weight.)
    Try to keep the cable run to under 100 ft. to prevent excessive signal loss.

15. If stacking two or more antennas, contact M^2 specific stacking information

436CP42UG DIMENSION SHEET

NOTE: ANTENNA SHOWN IN RIGHT HAND CIRCULARITY.



436CP42UG PARTS & HARDWARE

DESCRIPTION	QTY.
Boom section, 1-1/2 x .058 x 59" SBE	1
Boom section, 1-1/4 x .058 x 42-1/2" SOE	1
Boom section, 1-1/4 x .058 x 46-1/2" SOE	1
Boom section, 1 x .058 x 31" STR	1
Boom section, 1 x .058 x 59" STR	1
Boom to mast plate, 4 x .125" angle (M2APT0063)	1
Elements, 3/16" alum. rod x (see dim. sheet)	42
Driven element block assembly	2
`T' Block assembly (SADE0060)	1
Balun, RG-6U halfwave length	2
Phasing line, RG6-U, 1/4	1
Phasing line, RG6-U 3/4	1
U-bolt and cradle, 2”	2
U-bolt and cradle, 1-1/2"	2
Assembly instructions	1

IN HARDWARE BAG

Shorting bars, .75 x 1.532 x .250" mach. alum.	4
Button insulators, 3/16" black	84
Shaft Retainers, 3/16" ss	84
Nut, 5/16-18 ss	8
Lockwasher, 5/16" ss	8
Screw, 8-32 x 2”	2
Screw, 8-32 x 1-1/4" panhead	3
Screw, 8-32 x 1-3/4" panhead	4
Screw, 8-32 x 1-1/2" panhead	4
Set screw, 8-32 x 1/4" ss	8
Locknut, 8-32 ss	10
Allen wrench, 5/64"	1
Push tube, 3/8 x 3" (for keeper installation)	1
Cable ties, 8"	5

M² ANTENNA SYSTEMS, INC.
4402 N. Selland Ave.
Fresno, CA 93722
(559) 432-8873 Fax: 432-3059
www.m2inc.com Email: sales@m2inc.com