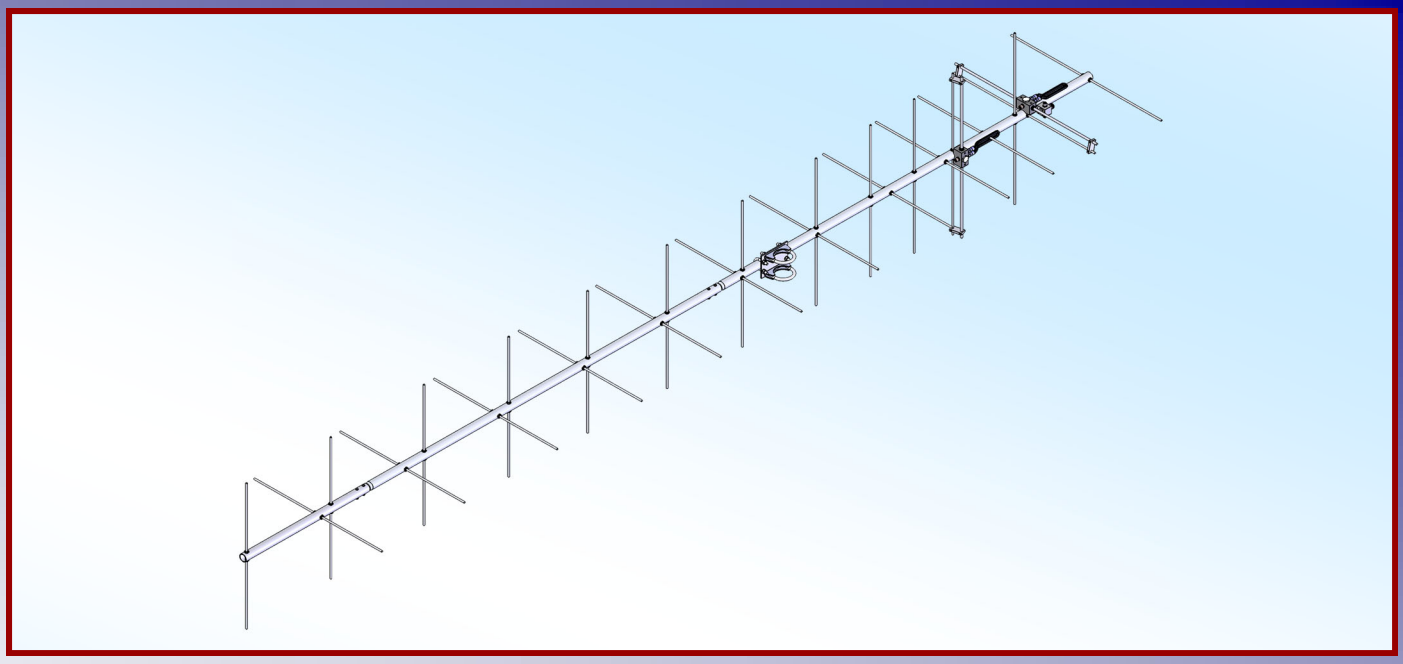
M2 Antenna Systems, Inc.
Model No: 249CP24



SPECIFICATIONS:

Model	249CP24
Frequency Range	244 To 254 MHz
*Gain	14.74 dBic
Front to back	20 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
Mast Size	1-1/2" to 2" Nom.
Wind area / Survival	0.89 Sq. Ft. / 100 MPH
Weight / Ship Wt.	7 Lbs. / 9 Lbs.

***Subtract 2.14 from dBi for dBd**

FEATURES:

The 249CP24 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 connections 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 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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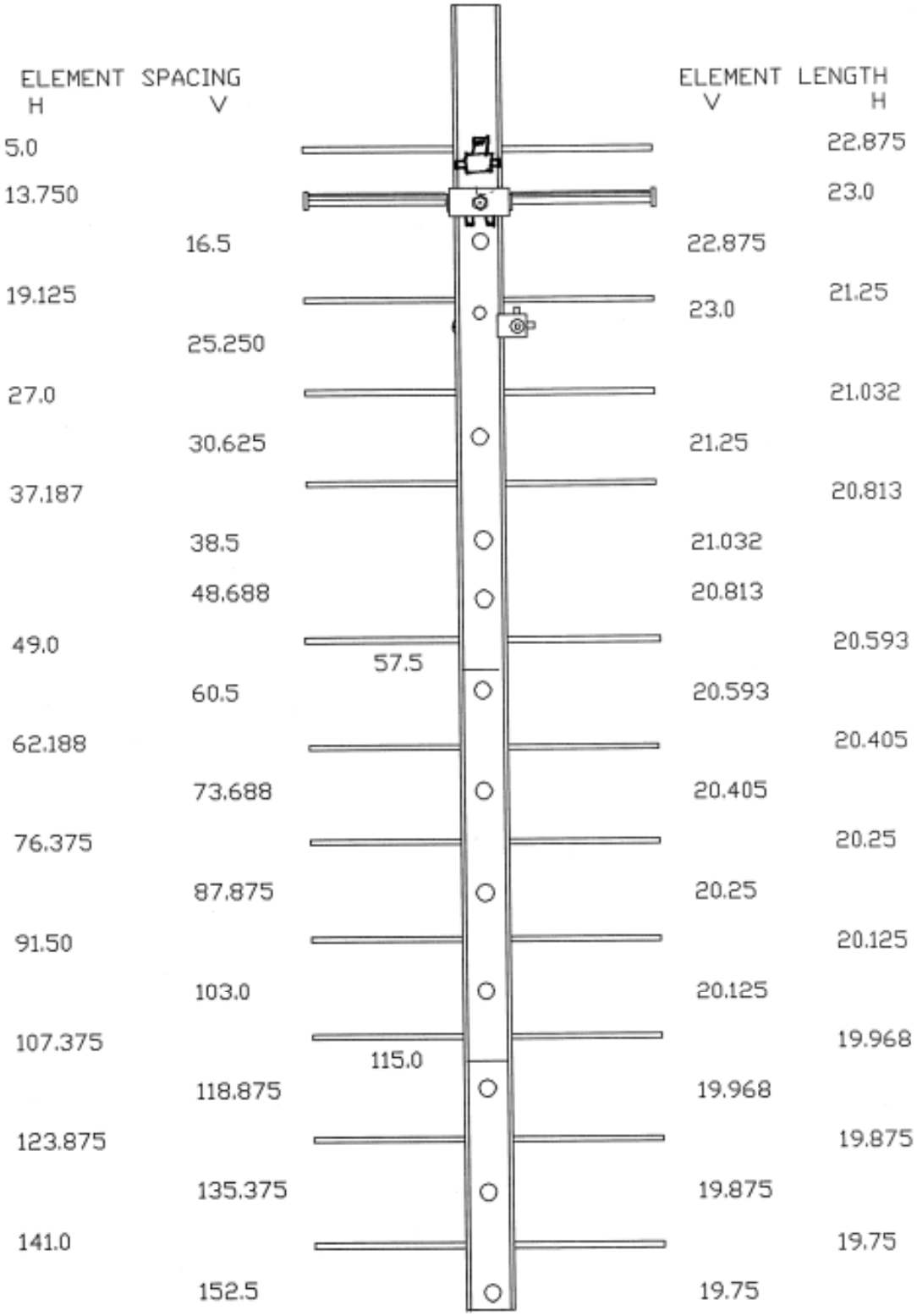
08/22/22
Rev.01

249CP24 DIMENSION SHEET



249-C24 CROSS-POLARIZED YAGI
Cathy Staal 5-10-89

249CP24 ASSEMBLY MANUAL

ASSEMBLY INSTRUCTIONS FOR THE 249CP24

Before beginning assembly, read over the parts list and check for missing or damaged parts. Contact the M2 Antenna Systems, Inc. directly, (559) 432-8873 if any discrepancy is found.

Tools required: A medium size flat blade screwdriver, an 11/32 nut driver or equivalent, a 1/2 inch wrench or nut driver, a 7/16 inch wrench and a tape measure.

1. The driven element is partially assembled at the factory. Starting 13-3/4" (13.75") from the rear of the boom, mount this driven assembly to the boom so the two female "F" connectors point toward the front of the antenna. Secure with an 8-32 x 1-1/4" screw. Next, slide the 3/16 x 23.0 inch long rod through the open holes just below it and add two black button insulators. Center the rod in the boom. Add the shorting blocks, positioning them at the ends of the shorter rod elements. When everything is adjusted, tighten up the set screws.

2. Repeat this operation for the second driven element, mounting it at 25-1/4" (25.25") from the rear and with the two "F" connectors facing the rear driven element just installed and on the left side of the boom per the sketch. Proper positioning per the sketch will guarantee RIGHT HAND CIRCULARITY.

3. Assemble the boom per the antenna dimension sheet, secure the joints with the 8-32 x 1-1/4" screws, lock-washers and nuts. Final tightening and alignment will be done after the elements are all in place.

4. Now mount the phasing block 9-1/2" from the rear of the boom using an 8-32 x 1/4 inch screw. Position the block on the same side of the boom as the rear driven element so the large "N" connector is facing to the rear.

REFER TO THE CABLE ASSEMBLY SKETCH FOR STEPS 6, 7 & 8

5. Connect the two 18.0 inch long balun cables to the two close spaced connectors on each driven element block. Tighten the connectors first by hand and then gently but firmly with a 7/16 inch end wrench. TO PREVENT POSSIBLE CABLE DAMAGE hold the body of the connector with pliers so it doesn't rotate during this final tightening operation.

6. Connect the long, 27-3/8" phasing cable to the single TOP connector on the FRONT driven element and route the cable back to the side connector on the phasing block. Again, tighten both ends first by hand and then finally with the 7/16 inch wrench.

7. Connect the short 9-1/8" phasing cable to the single connector on the rear driven element block and route the cable to the in line connector on the phasing block. Tighten as before.

8. Once the cables are all in place form them neatly against the boom and hold in place with the black nylon ties. In places where director rod elements will come through the boom, do not tighten the nylon ties all the way so the cables may be moved slightly for clearance around the rod elements.

INSTALLING THE ELEMENTS

9. Separate the rod elements into two (2) sets. Using just one set, install the 22-7/8" rod element in 5/16 inch diameter hole 5 inches form the rear of the boom. Use the black button insulators on either side where the element passes through the boom. At this time just position the element near center. Final centering can be done later when all the elements in one plane are in place.

10. The elements taper in length so continue installing the rods down the boom using the button insulators as described in step #10.

249CP24 ASSEMBLY MANUAL

11. When all the elements in one plane are in place, start at one end using a tape measure. Center each element to 1/16 inch or better. We recommend you DO NOT install the keepers at this time, just center each element. When centering is complete, stand at the end of the boom and sight down the tips of the elements noting any irregularities. The tips should form a gentle curve and each side should look like a mirror image of the other. This is just a crude check to catch major errors or any irregularities. Correct if found.

12. The stainless steel element keepers are stiff so grasp the element firmly while sliding the keepers in place. USE THE 3/8" X 3" TUBE TO AID IN THE INSTALLATION. Double check your centering dimensions and then push the keepers up tight against the button insulators.

13. Repeat steps 10 through 13 for the other set of elements.

14. Now that all the elements are in place, sight down the boom looking for the element alignment irregularities around the boom splice joints. Align and tighten.

15. Pick up the boom and find the weight balance point. Remember the feedline will attach at the rear and add a bit more weight on that end. Position the boom to mast plate accordingly, attaching it to the boom with the 1-1/8 inch U-bolts, cradles and nuts.

16. Circular Polarized antennas such as this antenna must be mounted on non-metallic masts or support booms and the feedlines must run off the back of the boom so as not to disturb the standing wave ratio and the circular properties of the antenna. If this antenna is to be mounted as a par of transmit-receive antennas a 6 to 8 foot long by 1-1/2 inch diameter cross boom is recommended. When attaching the main 50 ohm feedline, tape or nylon tie it securely to the rear stub of the boom to remove stress on the male "N' connector.

THIS ANTENNA HAS BEEN CAREFULLY MANUFACTURED BY

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249CP24 PARTS & HARDWARE

249CP24 PARTS LIST

DESCRIPTION	QTY.
Boom section, 1” x 0.058 x 60" SOE	2
Boom section, 1” x 0.058 x 38" PLAIN	1
Elements, 3/16" Alum. Rod x (See Dim Sheet)	24
Driven Element Block Assembly	2
Junction Block Assembly (SADE0065)	1
Balun, RG-6U X 20”	2
Phasing Line, Short (RG-6)	1
Phasing Line, Long (RG-6)	1
Shorting Bars	4
Boom to Mast Plate, 3 x 4 x .125" (M2APT0019)	1
Assembly instructions	1

HARDWARE

U-bolt and Cradle, 2"	2
U-bolt, 1" No Cradle	2
Nut, 5/16-18 ss	4
Lockwasher, 5/16" ss	4
Nuts, 1/4-20 ss	4
Lockwasher, 1/4-20 ss	4
Button insulators, 3/16" black	50
Shaft Retainers, 3/16" ss	50
Screw, 8-32 x 1-1/4" pan head,ss	7
Set screw, 8-32 x 1/4" ss	8
Locknut, 8-32 ss	4
Allen wrench, 5/64"	1
Push tube, 3/8 x 3" (for retainer installation)	1
Nylon cable ties, 8"	5

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