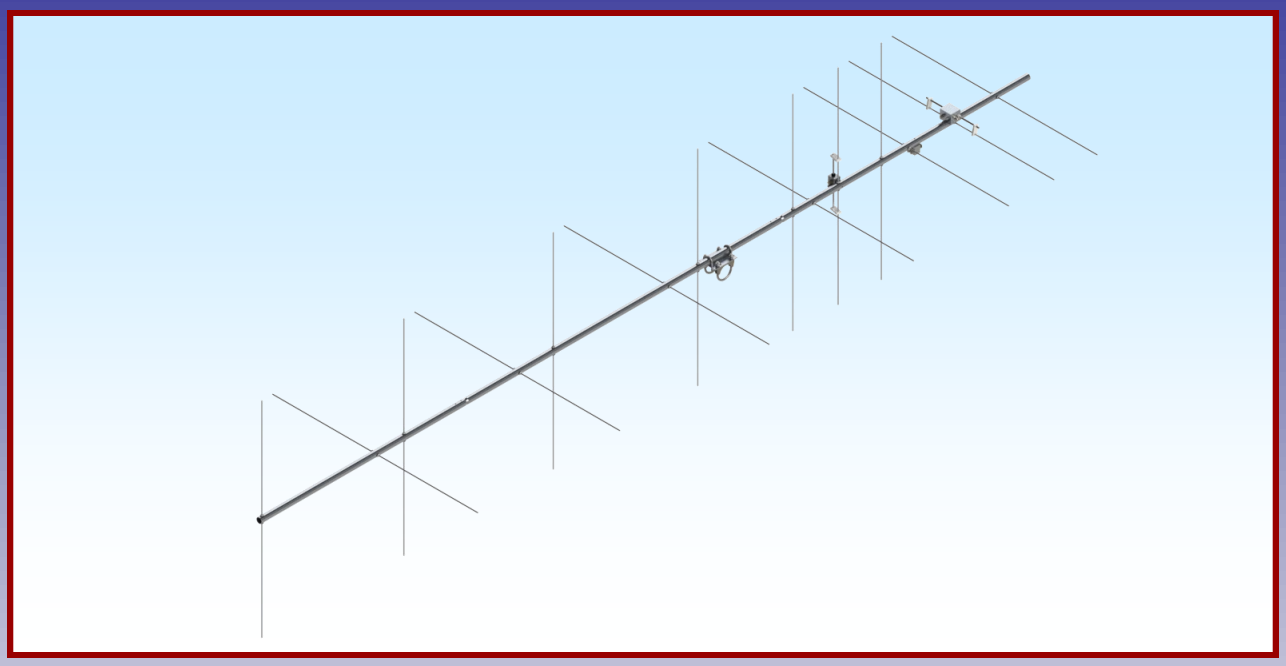
M2 Antenna Systems, Inc.
Model No: 141CP14



SPECIFICATIONS:

Model	141CP14
Frequency Range	140 To 144 MHz
*Gain	14.7 dBi
Front to back	13 dB Typical
Beamwidth	45° Circular
Elipticity	>3dB
Feed type	"T" Match
Feed Impedance.	50 Ohms Unbalanced
Maximum VSWR	1.3:1 Typical
Input Connector	"N" Female
Power Handling	1.5 kW
Boom Length / Dia	139" / 1"
Maximum Element Length	41-1/4"
Turning Radius:	64"
Stacking Distance	63" High & 63" Wide
Mast Size	1-1/2" to 2" Nom.
Wind area / Survival	1 Sq. Ft. / 100MPH
Weight / Ship Wt.	5 Lbs. / 8 Lbs.

***Subtract 2.14 from dBi for dBd**

FEATURES:

The 141CP14 is a light weight, circularly polarized antenna optimized for Low Earth Orbit (LEO) satellite communications or other applications where a small circular polarized antenna is required. Optimum match and gain are between 140 & 144 MHz for the satellite band. A preamp can be mounted close to the antenna for almost no coax loss before the preamp, maximizing your receive performance. Computer design techniques help keep spurious side lobes low down for optimum signal to noise ratios. This antenna features the same CNC machined, O-ring and silicone-gel sealed, driven element assemblies common to all M^2 Yagi antennas. This insures years of trouble free performance regardless of weather.

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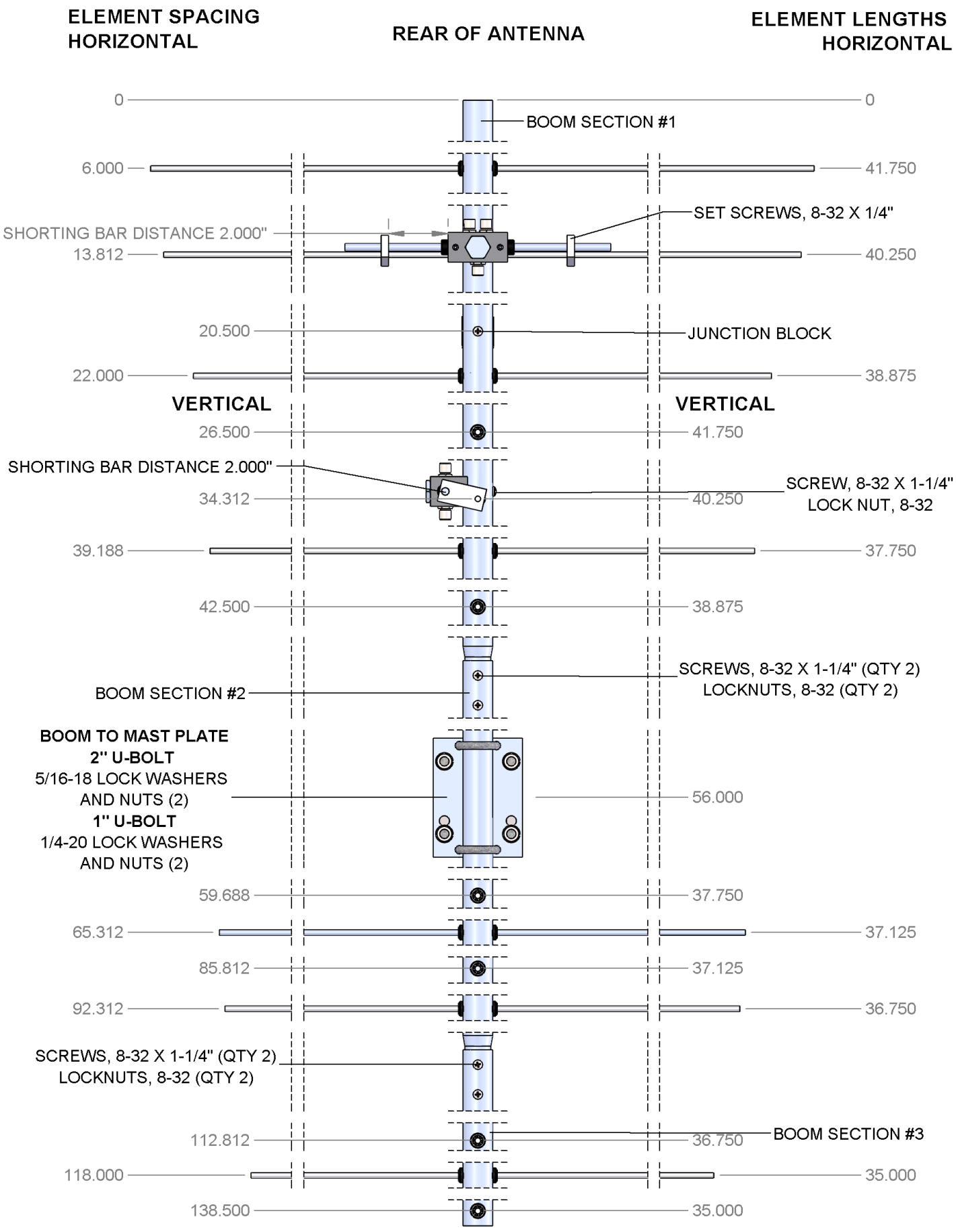
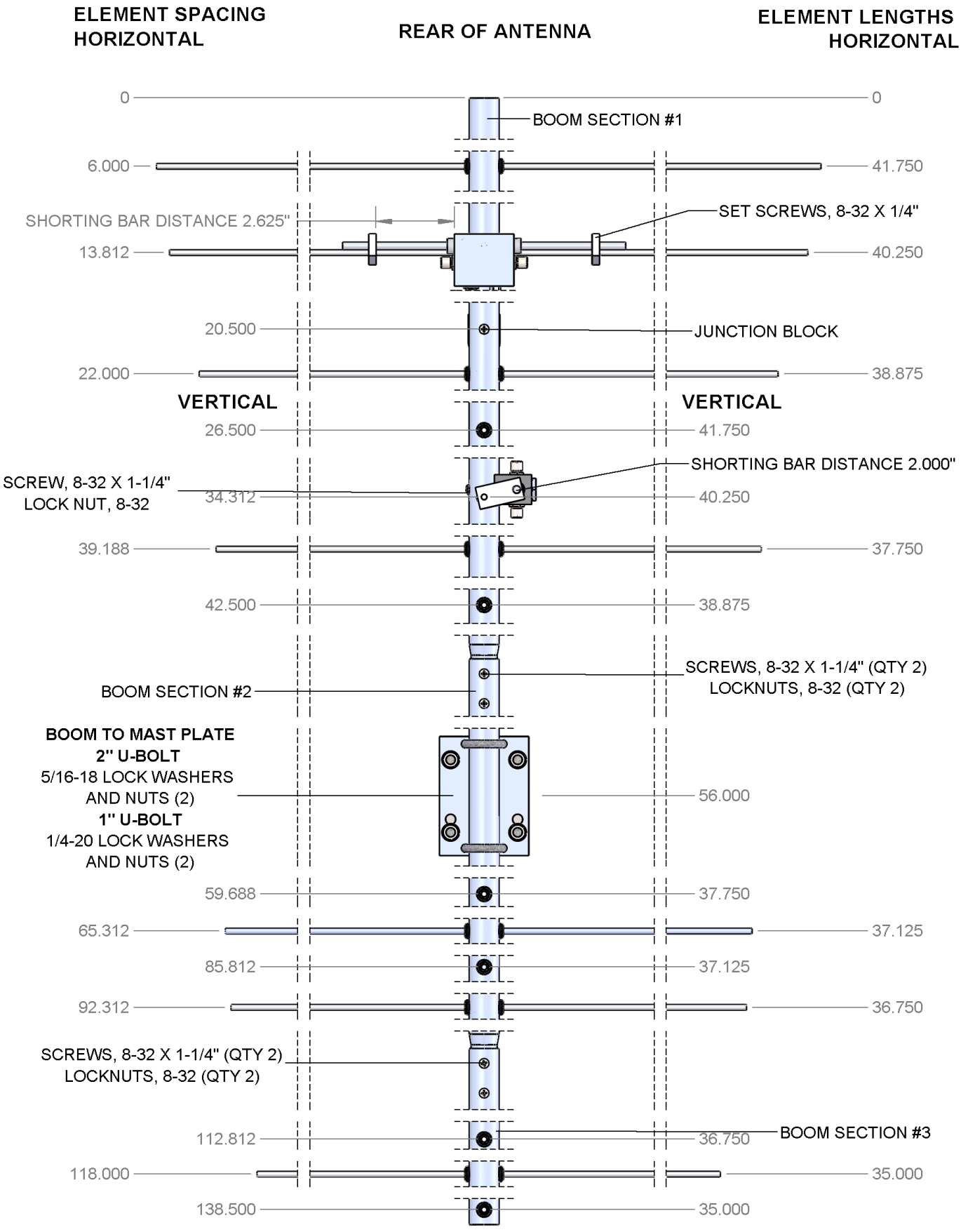
REV A

141CP14 DIMENSION SHEET



141CP14 WITH POLARITY SWITCH DIMENSION SHEET



141CP14 ASSEMBLY MANUAL

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

Start by laying out the boom sections using the DIMENSION SHEET as a guide. Use 8-32 X 1-1/4 screws and locknuts to join sections.

Note: If mounting antenna to a standard H-frame with a T-brace kit, it is important to install the T-brace coupling bars to antenna before elements. Refer to H-Frame and T-brace drawings for placement and more information.

ASSEMBLING THE HORIZONTAL ELEMENTS

1. Separate elements by length into two identical sets, "H" and "V". Lay out the "H" elements by 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 hole on the boom and install the second button, snugging it up into boom. DO NOT BOTHER ACCURATELY 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.

2. 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.***

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 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.

4. NOTE: The SHAFT RETAINERS, for securing the elements, should always be used for permanent and long term antenna installations. For portable or temporary use the retainers may be left off. The button insulators, normally a tight fit, hold the elements quite securely.
   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 locked in place.

5. 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. 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 as shown on the Dimension Sheet and tighten the set screws.

6. Mount the JUNCTION BLOCK as shown on the Dimension Sheet. Secure with 8-32 x 1-1/4" screw. See FIG. 3 AND 4 for more information.

ASSEMBLING THE VERTICAL ELEMENTS

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

141CP14 ASSEMBLY MANUAL

8. **NOTE: DEPENDING ON WHETHER YOU ARE USING THE ANTENNA WITH OR WITHOUT THE POLARITY SWITCH THE INSTALLATION OF THE *VERTICAL* DRIVEN ELEMENT BLOCK DETERMINES THE CIRCULARITY OF THIS ANTENNA. FIGURE #3 SHOWS THE ANTENNA WITHOUT THE POLARITY SWITCH. FIGURE #4 SHOWS THE ANTENNA WITH THE POLARITY SWITCH.**

9. Attach Baluns and Phasing lines to the Driven Element Blocks and Junction Block as shown in the picture. Depending on model and polarity, the Vertical balun may loop around another element. This is normal. Coil rear balun if single loop overhangs rear of boom. Form balun and phasing line coax close to the boom and secure with nylon cable ties. Ties should be snug but not crushing or kinking the coax. Tighten the connectors *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). A lot of torque is unnecessary.

10. Use good quality coax and "N" connector for your feed line. Secure feed coax near connector on Junction Block, to provide stress relief, route to rear of boom, and secure again. 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.***

11. The boom to mast plate is normally mounted to the boom at the balance point (with feed line attached). Use two 1" U-bolts and the stainless nuts and lock washers provided. DO NOT OVER TIGHTEN. 2" U-bolts are provided for mounting the antenna to your NON-CONDUCTIVE 2" mast or cross boom.

INSTALLATION TIPS

The 141CP14 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 cross boom. A 2" mast or cross boom of any NON-CONDUCTIVE material can be used. Fiberglass is the prime choice for its strength and weather resistance. Mount the 141CP so that element tips are at least 12" from any conductive material (mast, tower, feed line, etc.).

THIS COMPLETES THE ANTENNA ASSEMBLY.

Carefully manufactured by:

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141CP14 CABLE ROUTING DIAGRAMS

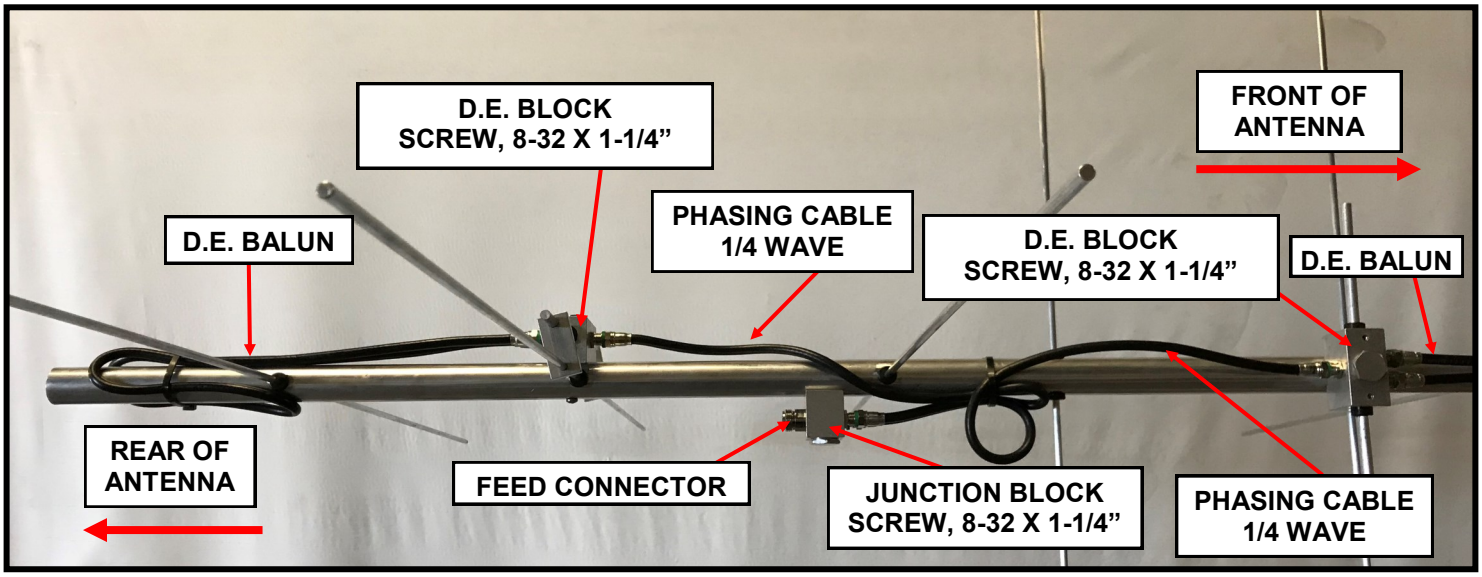

FIG. 3
CABLE ROUTING DIAGRAM WITHOUT POLARITY SWITCH

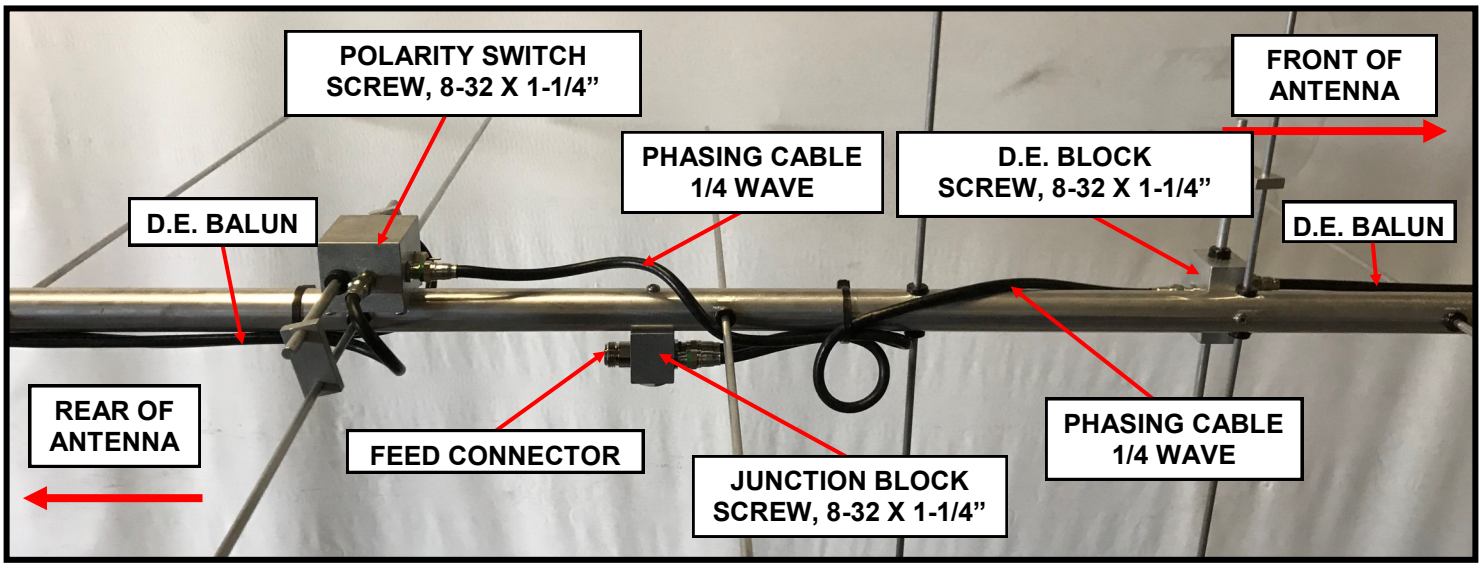

FIG. 4
CABLE ROUTING DIAGRAM WITH POLARITY SWITCH

141CP14 PARTS & HARDWARE

DESCRIPTION	QTY
BOOM SECTION #1, 1” X .058” X 48”, SOE (M2ABS141CP14-1)	1
BOOM SECTION #2, 1” X .058” X 60”, SOE (M2ABS141CP14-2)	1
BOOM SECTION #3, 1” X .058” X 37” (M2ABS141CP14-3)	1
ELEMENTS, 3/16” ROD X SEE DIMENSION SHEET	14
DRIVEN ELEMENT BLOCK ASSEMBLY (SADEA2MCP8A)	2
JUNCTION BLOCK (SADE0065)	1
BALUN, RG-6 1/2λ, 35”	2
MATCHING / PHASING CABLE, 1/4λ, 18”	2
BOOM-TO-MAST PLATE, 3” X 4” X .125” (M2APT0019)	1
U-BOLT AND CRADLE, 1-1/2"	2
U-BOLT AND CRADLE, 2”	2
U-BOLT, 1”	2
ASSEMBLY MANUAL	1

IN HARDWARE BAG:

SHORTING BAR (M2ASB0090)	4
BUTTON INSULATOR	28
KEEPER, SS	28
NUT, 5/16-18, SS	8
LOCK WASHER, 5/16, SS	8
NUT, 1/4-20, SS	4
LOCK WASHER, 1/4”, SS	4
SCREW, 8-32 X 1-1/4”, SS	7
LOCKNUT, 8-32, SS	4
SET SCREW, 8-32 X 1/4”, SS	8
CABLE TIE, NYLON	6
ALLEN HEAD WRENCH, 5/64”	1
PUSH TUBE, 3/8” X 3”	1

141CP14 WITH POLARITY SWITCH PARTS & HARDWARE

DESCRIPTION	QTY
BOOM SECTION #1, 1” X .058” X 48”, SOE (M2ABS141CP14-1)	1
BOOM SECTION #2, 1” X .058” X 60”, SOE (M2ABS141CP14-2)	1
BOOM SECTION #3, 1” X .058” X 37” (M2ABS141CP14-3)	1
ELEMENTS, 3/16” ROD X SEE DIMENSION SHEET	14
DRIVEN ELEMENT BLOCK ASSEMBLY (SADEA2MCP8A)	1
POLARITY SWITCH ASSEMBLY (SAPS2MCP8A)	1
JUNCTION BLOCK (SADE0065)	1
BALUN, RG-6 1/2λ, 35”	2
MATCHING / PHASING CABLE, 1/4λ @ 18”	2
BOOM-TO-MAST PLATE, 3” X 4” X .125” (M2APT0019)	1
U-BOLT AND CRADLE, 1-1/2"	2
U-BOLT AND CRADLE, 2”	2
U-BOLT, 1”	2
ASSEMBLY MANUAL	1

IN HARDWARE BAG:

SHORTING BAR (M2ASB0090)	4
BUTTON INSULATORS	28
KEEPER, SS	28
NUT, 5/16-18, SS	8
LOCK WASHER, 5/16, SS	8
NUT, 1/4-20, SS	4
LOCK WASHER, 1/4, SS	4
SCREW, 8-32 X 1-1/4, SS	7
LOCKNUT, 8-32, SS	4
SET SCREW, 8-32 X 1/4, SS	8
CABLE TIE, NYLON	6
ALLEN HEAD WRENCH, 5/64”	1
PUSH TUBE, 3/8” X 3”	1