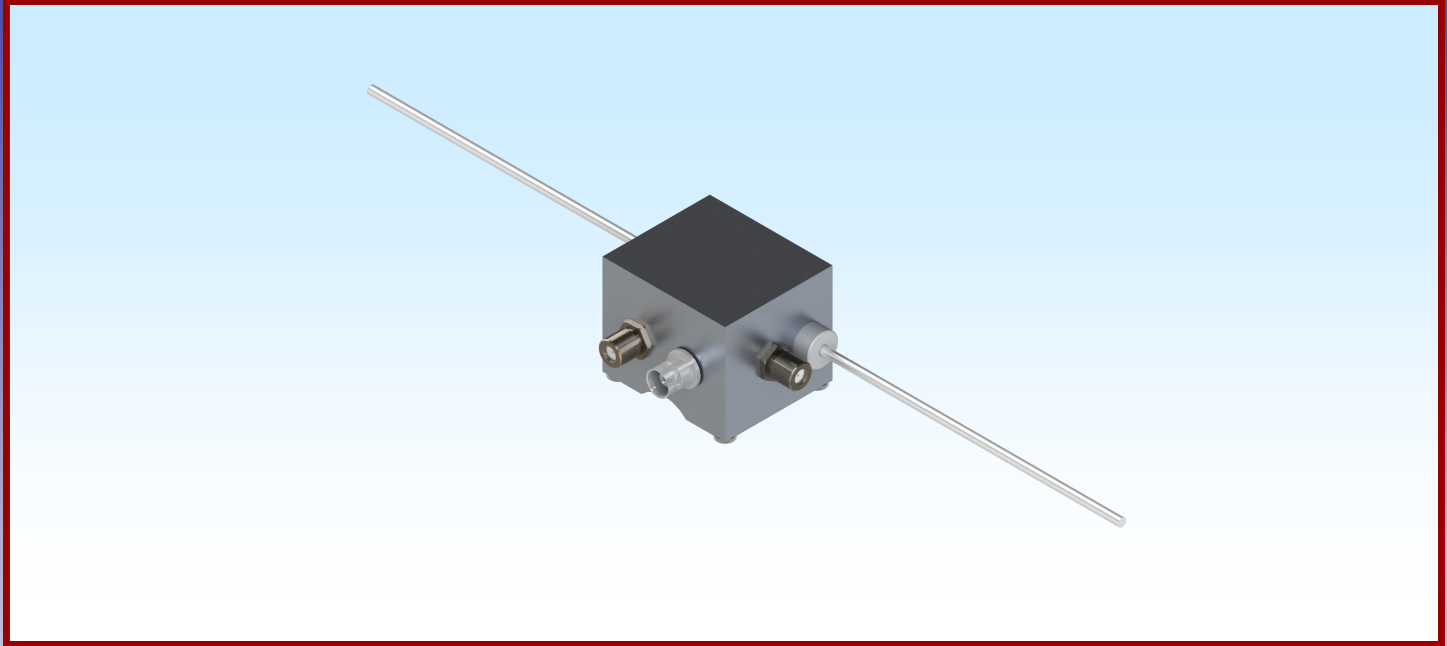




# M2 Antenna Systems, Inc. Model No: PS-70CM



## SPECIFICATIONS:

Model .....	PS-70CM	Power Handling .....	150 W
Isolation .....	40dB	DC power req. ....	12 VDC @ 80mA
Feed Impedance. ....	50 Ohms Unbalanced	Block size / Rod Dia .....	2" X 2" X 1-1/4" / 1/4"
VSWR.....	1.2:1 or better	Maximum Element Length.....	16"
Connectors .....	"F" Female	Operating Temp range .....	-50°c to 150°c
Insertion Loss .....	0.2 dB	Weight / Ship Wt.....	2.0 Lbs. / 4 Lbs.
Switch Time, In / Out.....	20ms / 15ms		

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

## FEATURES:

The PS-70CM polarity switch kit is designed to work with the 436CP16, 436CP30, and 436CP42UG. It allows instantaneous selection of right or left hand circularity. Originally designed for Nasa for many of their 100 to 500 MHz satellite and space craft applications, the PS-70CM is now used by many amateur VHF enthusiasts to performance flexibility to both terrestrial and satellite applications.

The heart of the unit is a small, low loss coaxial switch carefully designed into the driven element block. Only one PS-70CM per antenna is required to achieve full right hand and left hand selection. The PS-70CM can handle 150W of continuous RF transmission power. Losses are less than 0.2 dB.

Installation is easy and involves the removal of one of the original Driven Element assemblies and then mounting the PS-70CM-COM in its place. On some antenna models, a couple of elements (included with the PS-70CM) may need to be changed also. M2 Antennas has polarity switches available for our commercial antennas for popular frequencies. Polarity switches can also be designed for any of our custom antennas based on your requirements. Please contact us with your requirements.

# PS-70CM POLARITY SWITCH ASSEMBLY MANUAL

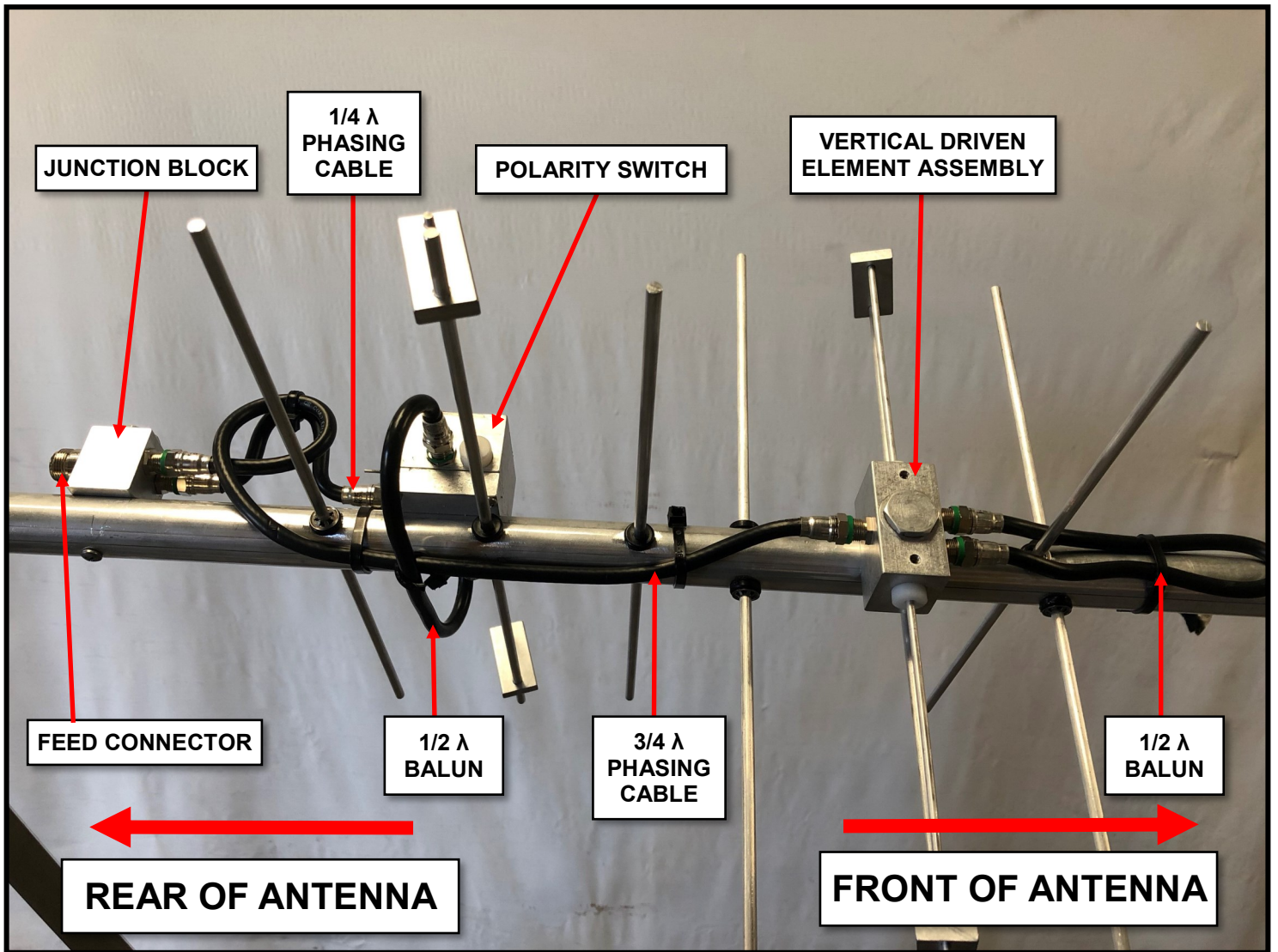
**NOTE: THIS SHEET IS USED ON 436CP16, 436CP30, AND 436CP42UG ANTENNAS**

TOOLS REQUIRED FOR ASSEMBLY: screwdriver, 11/32 nut driver or wrench, a 7/16" and 1/2" end wrench.

REFER TO THE ENCLOSED DIMENSION SHEET AND NOTE ITEMS SURROUNDED BY BOXES. THE BOXES MEAN THERE IS A CHANGE TO THE ORIGINAL PART OR SOMETHING NEW HAS BEEN ADDED.

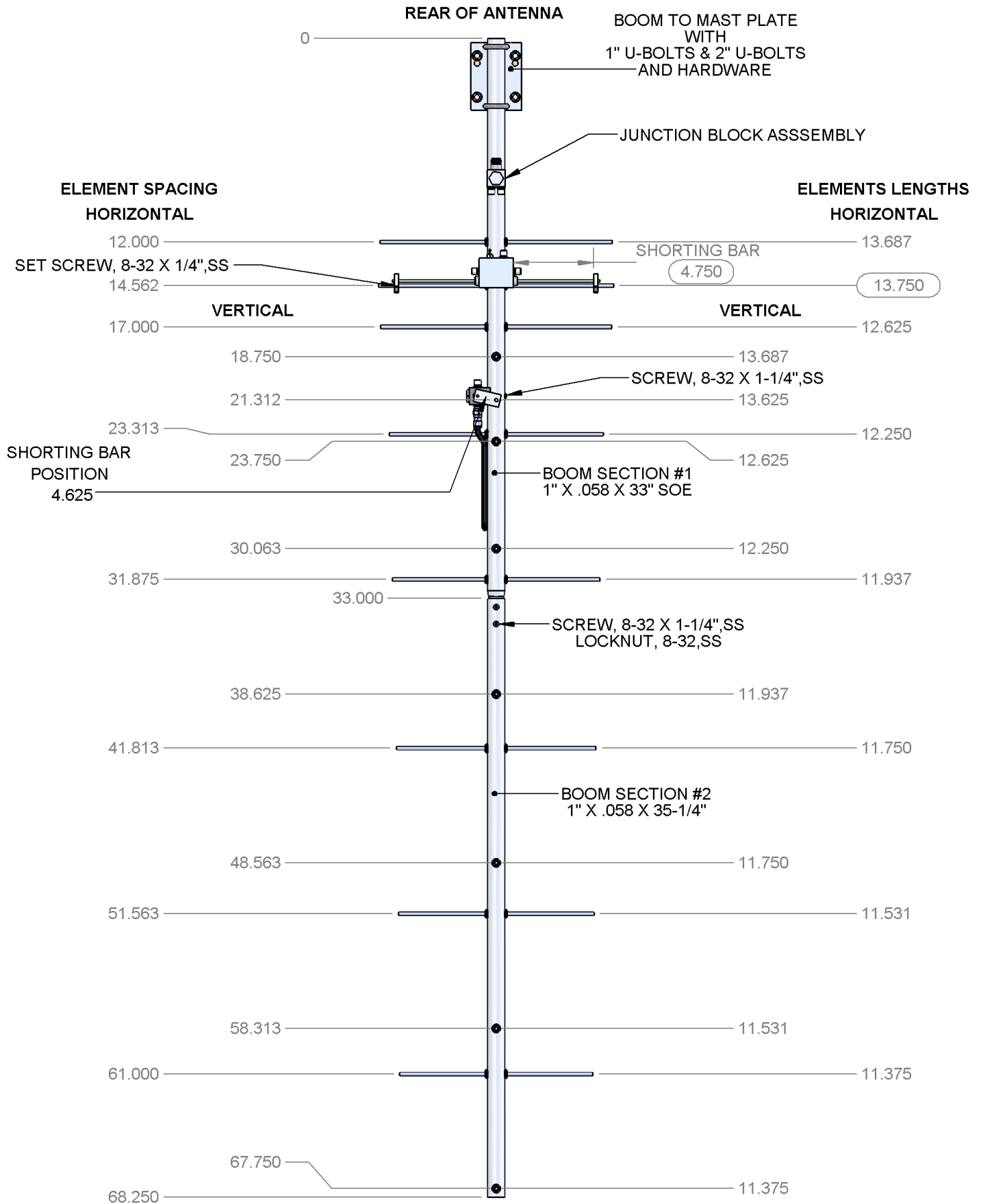
1. Loosen the set screws in the shorting bars in the rear driven element. WD40 lubricant will aid in loosening the set screws in the shorting bars if they have been in a hostile environment for some length of time. Remove the shorting bars from each side so the rear driven element can be completely removed from the antenna.
2. Cut off one element keeper and remove the original driven element rod that passes through the boom and replace it with the new correct length rod. SEE DIMENSION SHEET. Center the rod and install the keepers.
3. Cut off one element keeper from the rear REFLECTOR element and remove the element and the button insulators temporarily, you will re-install this element later.
4. Remove the "T" block temporarily. Both the long and short cables on the "T" block will remain.
5. For 436CP42UG Using a .173" to .188" (3/16") diameter drill bit, drill a hole as shown on the top of the "**DIMENSION SHEET**" at 2.875" inches from the rear of the boom. This hole should be in line with the hole of the rear driven element. For 436CP30, using a .173" to .188" (3/16") diameter drill bit, drill a hole as shown on the top of the "**DIMENSION SHEET**" at 4.5 inches from the rear of the boom. This hole should be in line with the hole of the rear driven element. Newer 436CP30 models have hole pre-drilled.
6. Attach the polarity switch with the 8-32 x 1-1/4" screw in the forward hole. Orient the polarity switch so it matches the DIMENSION SHEET.
7. Re-attach the "T" block at the new hole position. Reference dimension sheets for distances. The "T" block should be mounted on opposite side of the boom from the rear driven element. The driven element blocks should be mounted as shown or the RHC, default circularity may be reversed.
8. Install the new rear boom extension, align the holes, re-install the reflector element and secure with a new keeper.
9. Attach the new, slightly shorter 1/2 wave balun to the polarity switch. Tighten the connectors gently with a 7/16 end wrench.
10. Re-install the shorting bars on the rear driven element. Set the bars at the dimension shown on the "ANTENNA DIMENSIONS" sheet . NOTE: ON THE 436CP42UG, THE REAR DE SHORTING BARS ARE AT A DIFFERENT DIMENSION THAN THE FRONT DRIVEN ELEMENT SHORTING BARS.
11. Attach the original 1/4 wavelength RG-6U matching line to the polarity switch and tighten connector and nut seal as noted above.
12. **FOR THE 436CP42UG ONLY**  
Remove the REAR D1 (12.25") and replace with the 12.625" element. Center and install keepers. Remove the FRONT D1 (12.25"), and replace with the 12.188" element. Center the element and install keepers.
13. The power input connector is a female BNC connector, M2 suggests to use a inexpensive shielded coax like RG-58 with a male BNC connector on one end. Power should be applied to the center conductor of the coax and the shield should be grounded. Attach the coax to the BNC connector on the new D.E. block and route it to the rear. Attach MAIN FEED LINE AGAIN and secure it and the dc control coax to the rear boom section. Route all cables as shown and keep them close against the boom using the cable ties provided.

# 436CP16 CABLE ROUTING



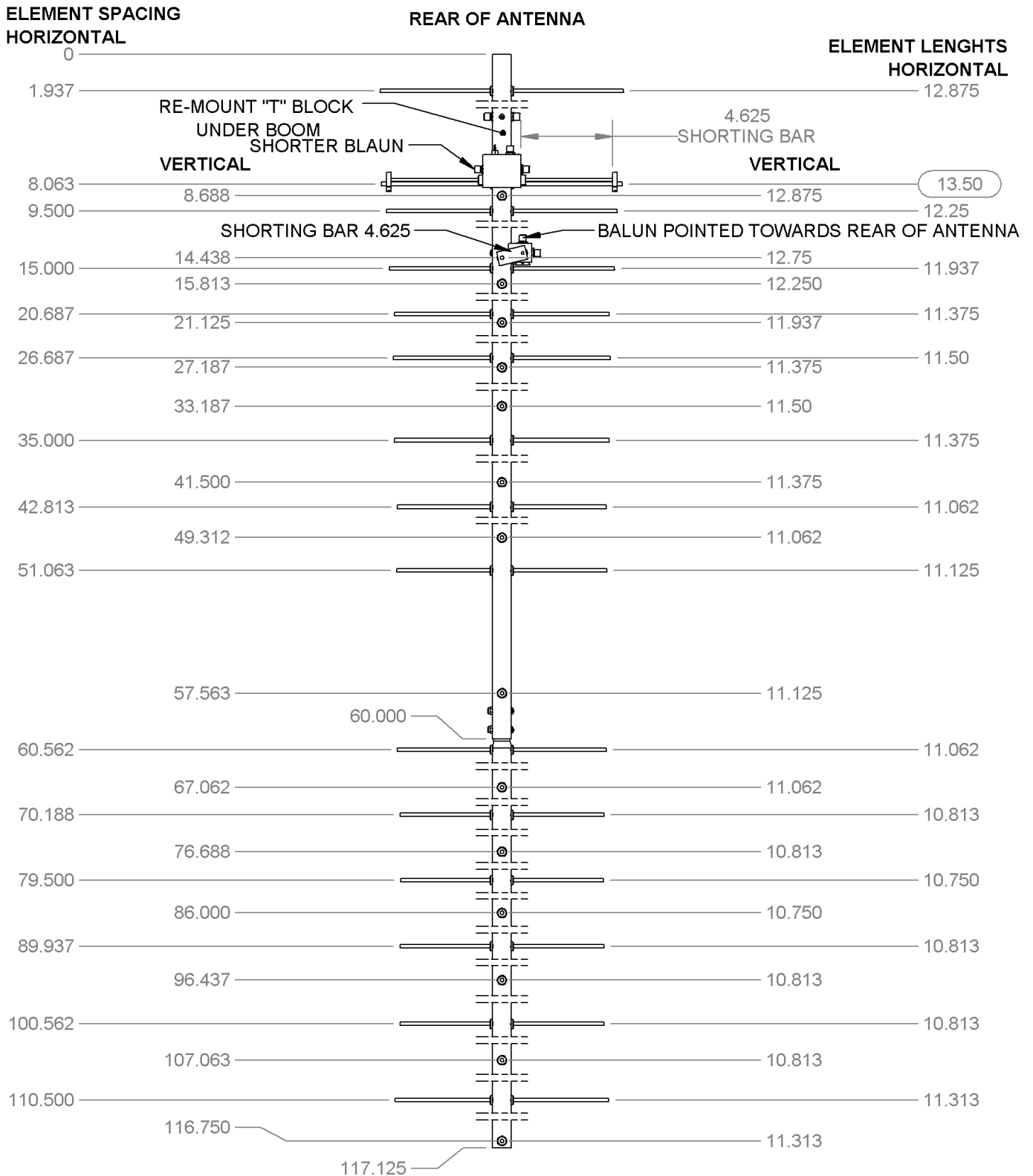
# PS-70CM DIMENSION SHEET (436CP16)

NOTE: NEW DIMENSIONS SHOWN BOXED.  
ANTENNA SHOWN IN RIGHT HAND CIRCULARITY



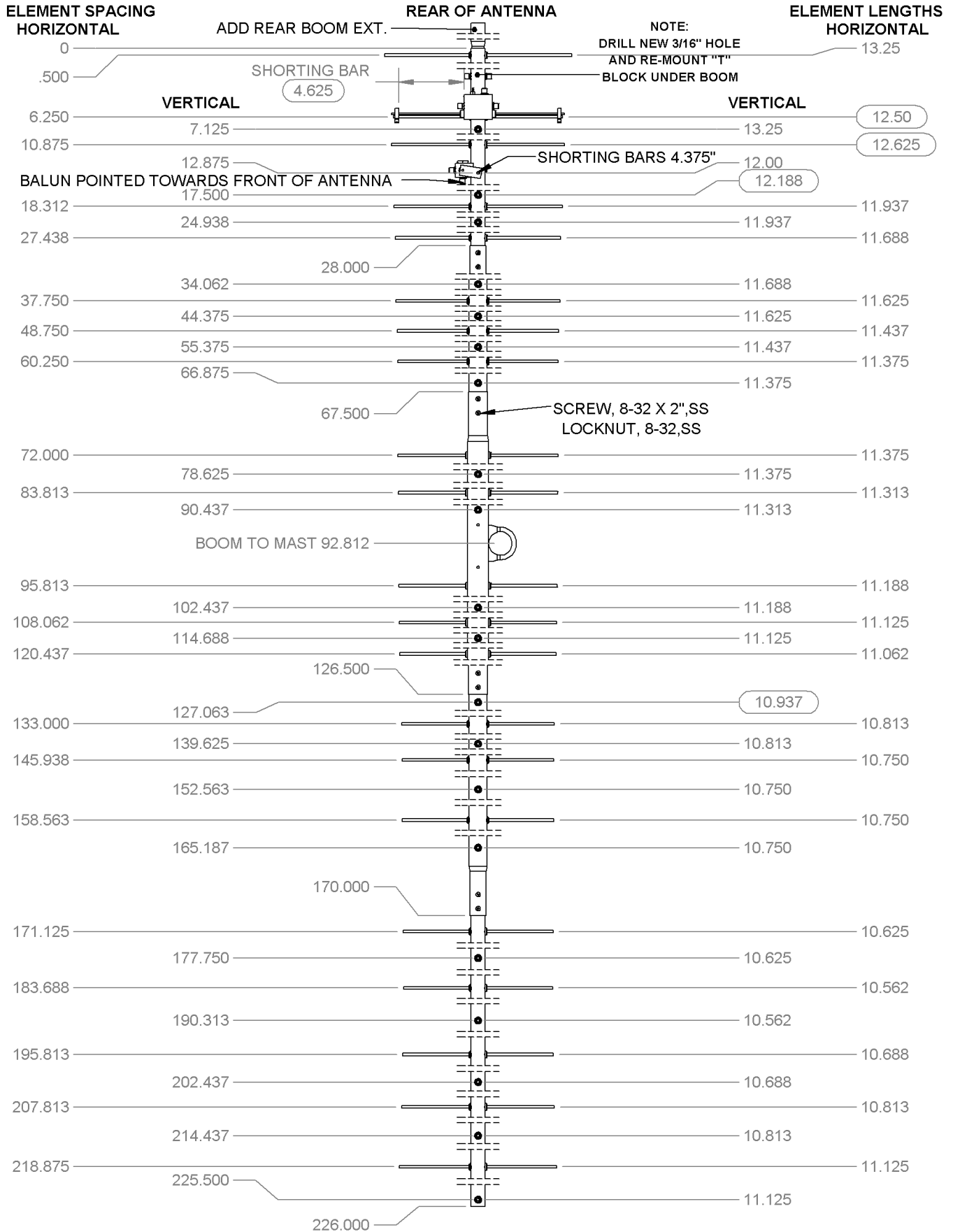
# PS-70CM DIMENSION SHEET (436CP30)

NOTE: NEW DIMENSIONS SHOWN BOXED.  
ANTENNA SHOWN IN RIGHT HAND CIRCULARITY



# PS-70CM DIMENSION SHEET (436CP42UG)

NOTE: NEW DIMENSIONS SHOWN BOXED.  
ANTENNA SHOWN IN RIGHT HAND CIRCULARITY



# PS-70CM ASSEMBLY / PARTS & HARDWARE

## TUNE UP AND OPERATION NOTES

The power input connector is a female BNC connector, M2 suggests to use a inexpensive shielded coax like RG-58 with a male BNC connector on one end. Power should be applied to the center conductor of the coax and the shield should be grounded. Attach the coax to the BNC connector on the new D.E. block and route it to the rear. Attach MAIN FEED LINE AGAIN and secure it and the dc control coax to the rear boom section. Route all cables as shown and keep them close against the boom using the cable ties provided.

When +12 vdc is applied to the control wire the internal coax relay switches the center conductor of the feed line from one side side of the REAR driven element to the other. This inverts the phase of the rear driven element by 180 degrees and subsequently reverses the circularity from RHC TO LHC. Because there are small lead length differences from one phase to the other, you may see a slight change in VSWR when the circularity is reversed. M<sup>2</sup> has tried to minimize this change by adjusting the rear driven element length and shorting bar position. Your system may differ slightly and you may have to adjust the shorting bars slightly. You may also note a slight overall VSWR change after you do this upgrade. This is normal but again the match change in the satellite band should be minimal and typically under 1.5:1. The change might be greater on either side of the satellite band. Again some adjustment can be done depending on what modes and frequencies you intend to use your antenna.

## INSTALLATION TIPS

The 436CP16, 436CP30, and 436CP42UG, are circular polarized antennas and create a field in all planes or polarities. Performance and VSWR can DETERIORATE SIGNIFICANTLY if they are 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 best choice for its strength and weather resistance. Please note if the antenna is rear mounted this restriction does not apply. However, if the antenna is centered mounted, non-conductive material must be used. Try to keep the cable run to under 100 ft. to prevent excessive transmit power loss. Using a good low noise switching preamp at or near the antenna is highly recommended. The preamp will prevent the feedline loss from reducing your overall receive sensitivity. ARR and SSB Electronics both make good 160 watt + power handling relays. To maintain proper phasing when stacking two or more antennas, mount each with the same orientation of Driven Element Blocks. DO NOT MOUNT MIRROR IMAGE.

DESCRIPTION	QTY
UHF DE BLOCK ASSEMBLY W / RELAY & B&C con .....	1
BOOM EXTENSION, 1" X 8" SOE .....	1
BALUN, RG-6U HALF WAVE .....	1
ELEMENT, 3/16" X 13-3/4" (436CP16) .....	1
ELEMENT, 3/16" X 13-1/2" (436CP30) .....	1
ELEMENT, 3/16" X 12-5/8" (436CP42UG) .....	1
ELEMENT, 3/16" X 12-1/2" (436CP42UG) .....	1
ELEMENT, 3/16" X 12-3/16" (436CP42UG) .....	1
KEEPERS, 3/16" SS, SS .....	6
SCREW, 8-32 X 1-1/4", SS .....	1
SET SCREW, 8-32 X 1/4", SS .....	4
CABLE TIES, MEDIUM .....	4
PUSH TOOL, 3/8 X 3" .....	1
ALLEN WRENCH, 5/64" .....	1
ASSEMBLY / UPGRADE SHEET .....	1

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