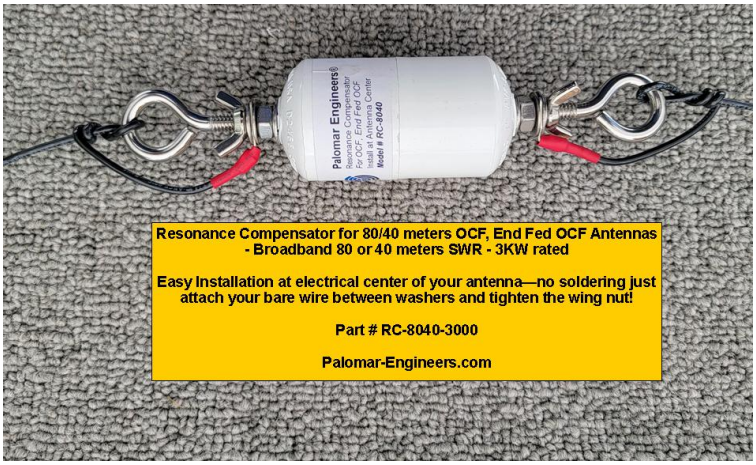
PALOMAR ENGINEERS®

RFI Solutions from KHz to GHz

Product Manual
RC-8040
Resonance Compensator
For
Off Center Fed Antenna
End Fed OCF Antenna

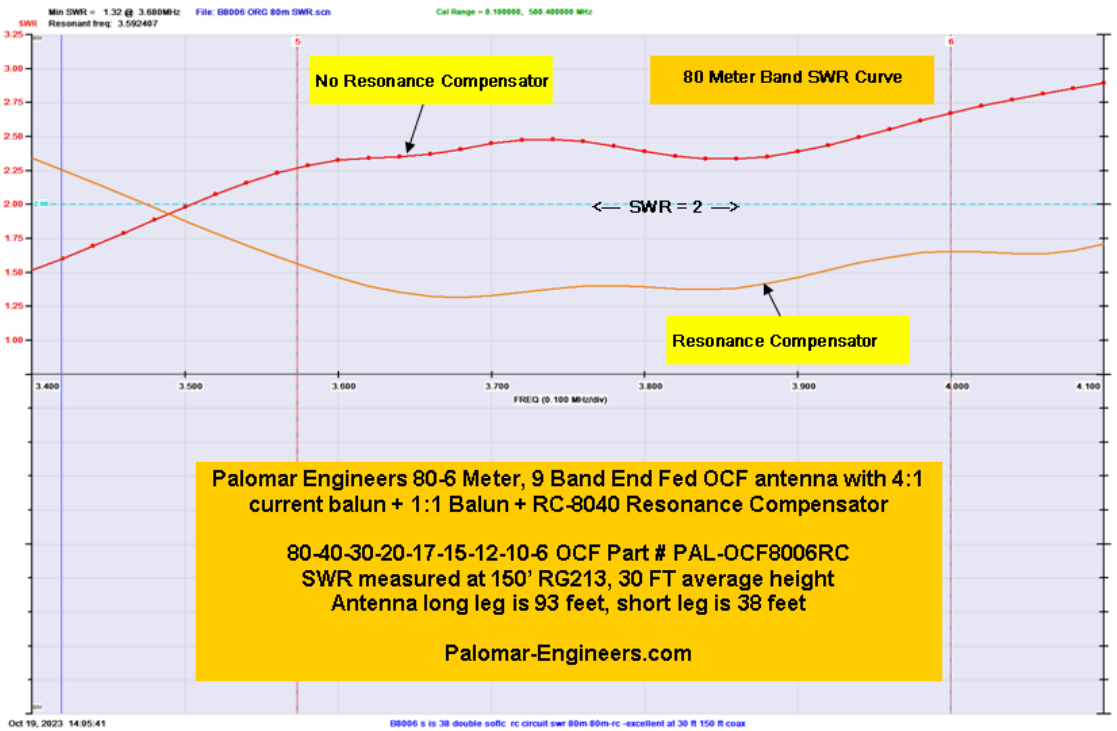
RC-8040 RESONANCE COMPENSATOR



The resonance compensator is used to bring the 80 meter band resonance frequency closer to mid band as the natural length of the antenna must be cut for resonance in the lower portion of the 80 meter band so that 40, 20 and above band harmonics fall within their respective bands. The RC-8040 minimizes the amount of antenna tuner adjustment that may be required in the 80 meter band.

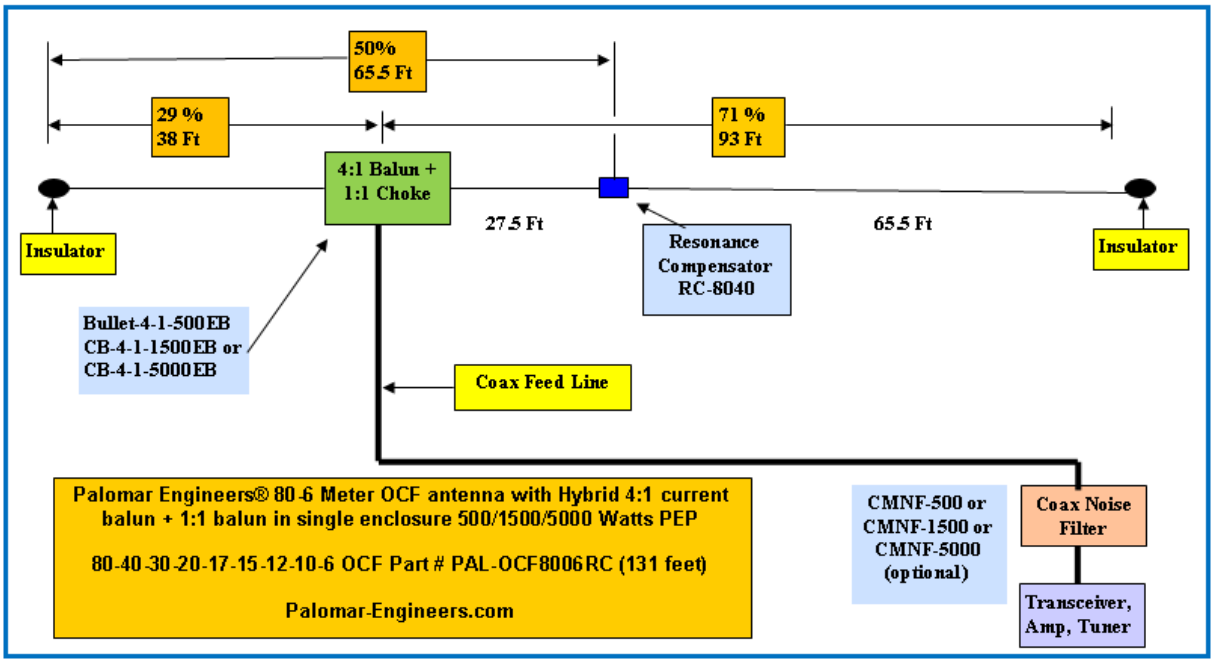
Tech Note: It takes 6-9 inches of wire to wrap the existing antenna wire thru a eyebolt, make 3 turns around the antenna wire and create a small ½ loop (for water drainage during a rain) back to the wing nut/flat washer attachment point.

Here is an 80 meter band SWR curve of the difference with the RC-8040:



Palomar-Engineers.com

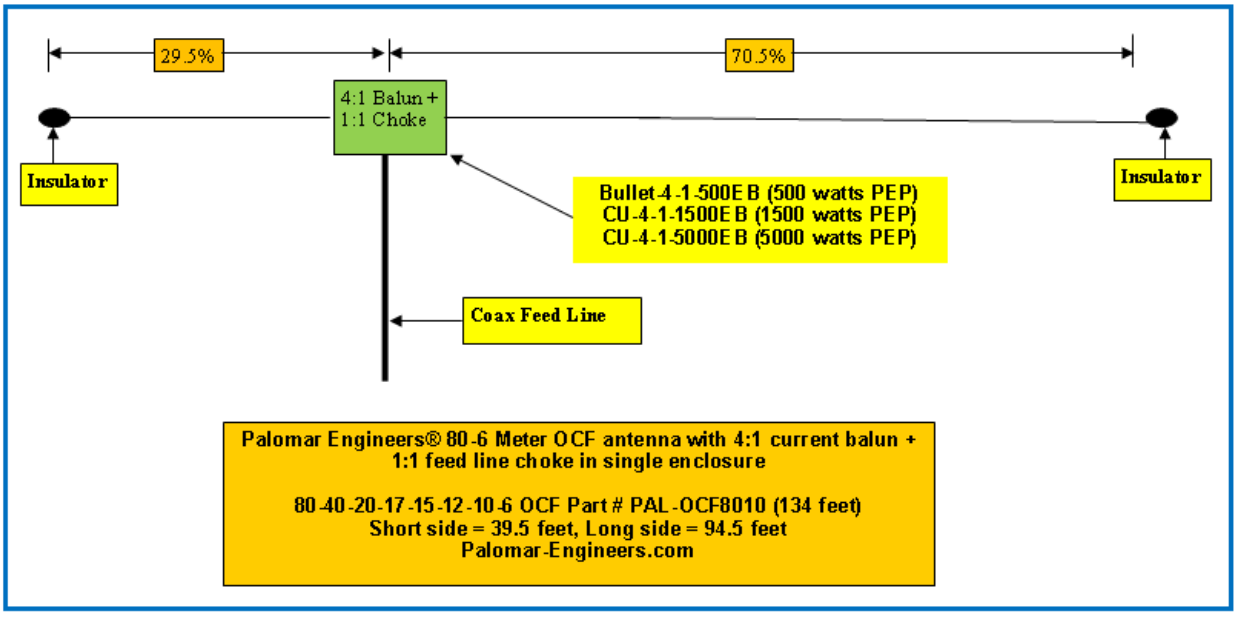
TYPICAL PALOMAR ENGINEERS OCF+RC ANTENNA LAYOUT



OCF antennas are very convenient as they will allow multiple bands of operation with a simple wire antenna which is fed off center.

INSTALLATION/UPGRADE of PAL-OCF8010 ANTENNA

PAL-OCF8010 Upgrade:
Original Layout:



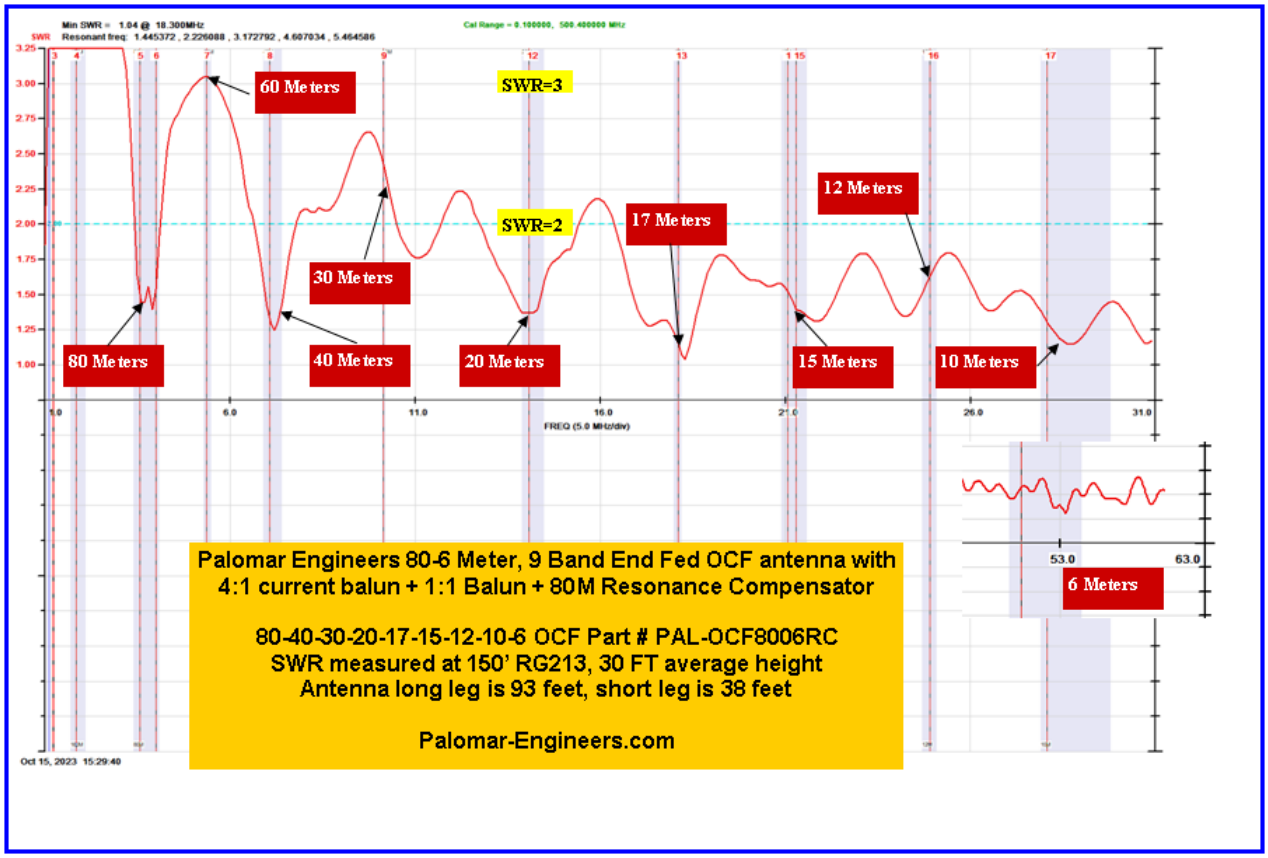
On the original antenna, the short side is 39.5 feet and on the new antenna with the RC-8040, the short side will be 38 feet. So adjust (DO NOT CUT WIRES) the length by pulling the excess 1.5 feet thru the insulator and wrapping it back on itself in case you have to make minor adjustment due to your overall antenna installation shape.

Palomar-Engineers.com

Next you will insert the RC-8040 in the long side of the antenna. Keep the existing wire attached to the impedance matching transformer and measure out 28 feet 3 inches and cut the existing long wire at this point. Now take the RC-8040 and put the shorter part of the long wire you just cut thru the eyebolt approximately 9 inches and fold it back on itself and make 3 turns around the wire to secure it to the eyebolt. Now attach the remainder of this wire to the RC-8040 between the two flat washers. (Use the fork spade lug soldered to the wire if available).

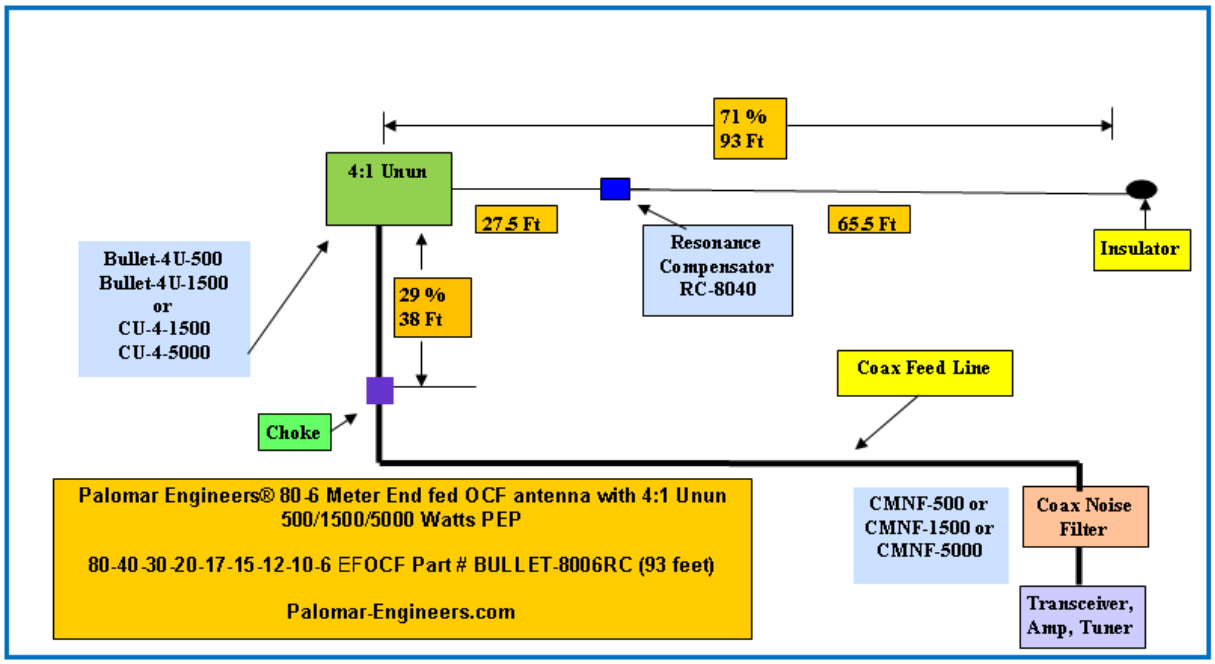
Next take the remaining long part of the cut wire and put it thru 9 inches on the remaining eyebolt and fold back 3 turns, make a small rain loop and attach to the other side of the RC-8040 much like the first picture in this manual. You should have 65 feet of wire to the insulator at this point and you installation is complete.

Typical SWR curves through 150 feet of RG-213 and 30 foot average height (Your curves may be different depending on height, ground conditions and surrounding object/antennas):



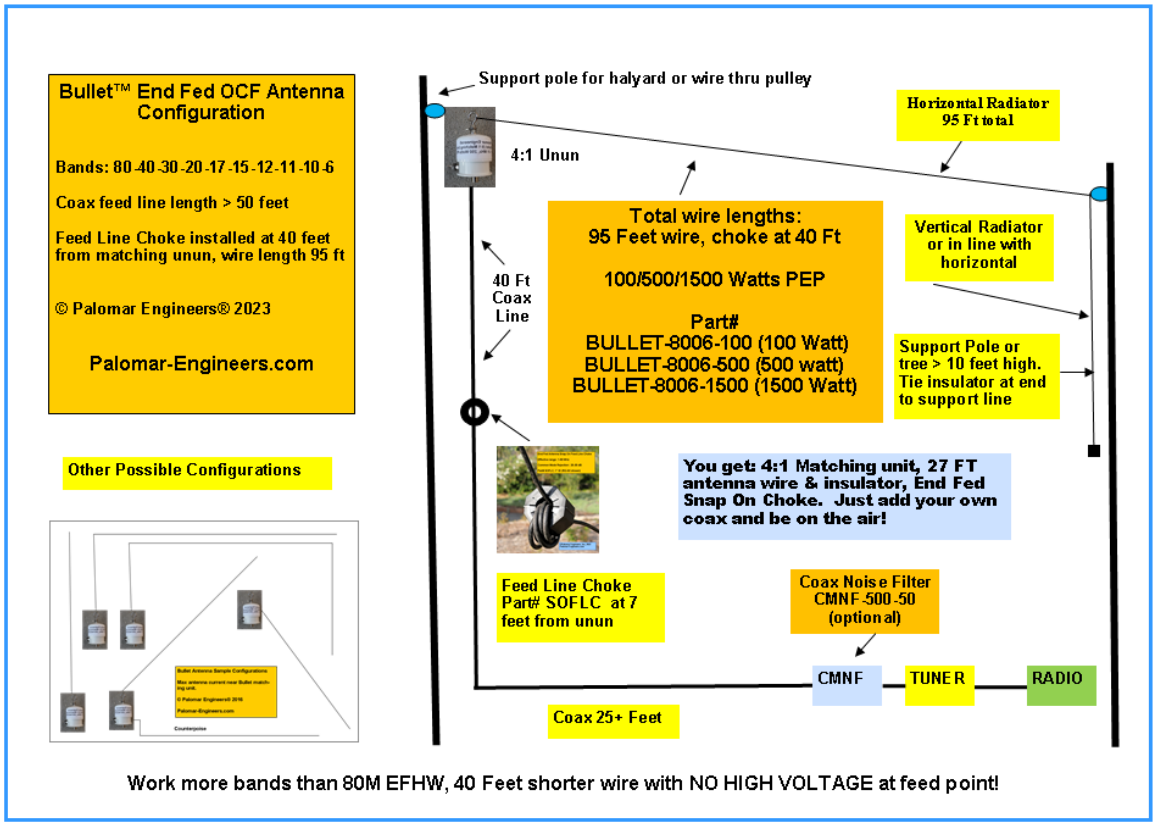
INSTALLATION/UPGRADE of BULLET-8006 ANTENNA

TYPICAL PALOMAR ENGINEERS END FED OCF ANTENNA LAYOUT



INSTALLATION/UPGRADE of BULLET-8006 ANTENNA

BULLET-8006 Upgrade:
Original Layout:

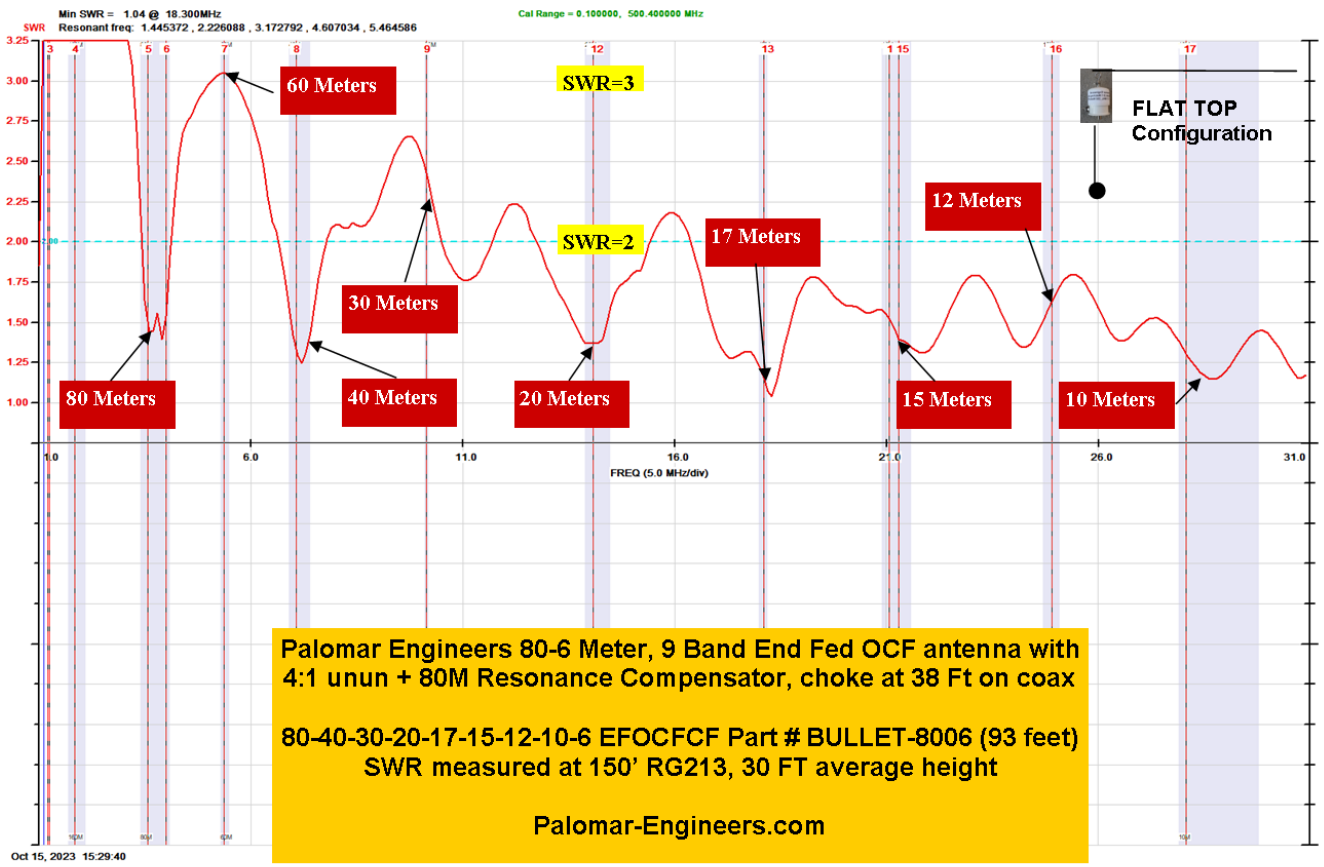


On the Bullet-8006 single wire original antenna, the choke on the coax is 40 feet from the 4:1 unun feed point and on the new antenna with the RC-8040, the short side will be 38 feet. So adjust the position of the choke by moving it two feet closer to the unun and rewind as it was before using cable on the radio end of the coax for the turns.

Next you will insert the RC-8040 in the long side of the antenna. Keep the existing wire attached to the impedance matching transformer and measure out 28 feet 3 inches and cut the existing long wire at this point. Now take the RC-8040 and put the shorter part of the long wire you just cut thru the eyebolt approximately 9 inches and fold it back on itself and make 3 turns around the wire to secure it to the eyebolt. Now attach the remainder of this wire to the RC-8040 between the two flat washers. (Use the fork spade lug if available).

Next take the remaining long part of the cut wire and put it thru 9 inches and fold back 3 turns, make a small rain loop and attach to the other side of the RC-8040 much like the first picture in this manual. You should have 65.5 feet of wire to the insulator at this point and you installation is complete.

Typical SWR curves through 150 feet of RG-213 and 30 foot average height (Your curves may be different depending on height, ground conditions and surrounding object/antennas):



A Quick Note on Power Ratings when SWR > 1:1 without the aid of an antenna tuner

Choke & Impedance Transformer Power Rating Table

The table below attempts to generalize the power rating of various chokes and impedance transformers manufactured by Palomar Engineers. These rating do not apply to other manufacturers. (We have replaced many failures of other manufacturers who rate impedance transformers for 1500 watts PEP but fail at 250 watts CW in a high duty cycle (contest operation or digital mode) use. This failure is quite common for competitor 4:1 baluns used for OCF antennas in contesting or high duty digital modes at high power as the transformer is under engineered for the wide range of impedances encountered over the antenna range. Most of these OCF transformers do not have built in 1:1 chokes so common mode current and subsequent coax braid radiation/RFI can be a real issue. All Palomar OCF baluns are Hybrid 4:1 + 1:1 in the same enclosure thus eliminating these types of coax braid radiation issues.

The ratings in the table assume a resistive load (SWR = 1:1) within the frequency range specified for the choke or transformer. Check the product specifications for each model as certain models have specific frequency ranges, impedance min/max, and power ratings. Measure the SWR **without an antenna tuner** (that's what the balun/unun sees as it load) and for SWR other than 1:1, divide the rating shown in the table below by the square root of SWR.(e.g. if SWR is 5:1, the square root of 5 = 2.24 so a 1.5KW PEP SSB 50% rated transformer should be limited to 1500/2.24 = 670 watts max PEP SSB 50% input. For SWR = 3:1, square root is 1.73, so 1500/1.73 = 867 watts max SSB 50%, 2:1 square root is 1.414 so 1500/1.414 = 1061 watts SSB 50% or 469/1.414 = 332 watts AM/FM/Digital continuous.

Note: FT8 = Continuous Carrier – 50% on/off. 1500 Watts balun has FT8 rating of 656 watts at 1:1. At 2:1 max would be 656/1.414 = 468 watts input. At 3:1 max would be 656/1.73 = 379 watts input. For 5000 watts balun, FT8 is 2,188 watts at 1:1 and at 2:1 SWR (no tuner), FT8 max input is 2188/1.414 = 1,547 watts.

		PEP Watts Rated									
Mode	Derating Factor	10,000	7,500	5,000	3,000	1,500	2,000	1,000	600	250	100
Continuous Carrier (AM,FM,Digital)	31.25%	3,125	2,344	1,563	938	469	625	313	188	78	31
Continuous Carrier - 50% on/off	43.75%	4,375	3,281	2,188	1,313	656	875	438	263	109	44
CW - 50% on/off	75.00%	7,500	5,625	3,750	2,250	1,125	1,500	750	450	188	75
SSB + Processor	75.00%	7,500	5,625	3,750	2,250	1,125	1,500	750	450	188	75
SSB - 50% on/off	100.00%	10,000	7,500	5,000	3,000	1,500	2,000	1,000	600	250	100

CAUTION - BEFORE YOUR START

WARNING: INSTALLATION OF THIS PRODUCT NEAR POWER LINES IS DANGEROUS. FOR YOUR SAFETY FOLLOW THE INSTALLATION IINSTRUCTIONS.

WARNING: AT NO TIME DURING ASSEMBLY, INSTALLATION, ADJUSTMENT OR OPERATION SHOULD ANY PART OF THIS PRODUCT BE ALLOWED TO COME INTO CONTACT WITH ELECTRIC POWER LINES, NOR SHOULD THIS PRODUCT BE INSTALLED IN SUCH A WAY THAT ANY PART OF IT MAY CONTACT POWER LINES DURING NORMAL OPERATION OR IN THE EVENT OF STRUCTURAL FAILURE. FAILURE TO EXERCISE EXTREME CARE IN THIS MATTER CAN RESULT IN DAMAGE TO PROPERTY, PERSONAL INJURY, OR DEATH.

Check website for latest product announcements.

Palomar-Engineers.com