Kreco CO-41A low-band antenna modification

10/23/2009, by Steve Dold under Special Projects job 9839
Revised 4-8-2013

This procedure will modify a Kreco CO-41A to operate up to 3 MHz above its original factory-tuned frequency. The operating bandwidth remains the same (about 700 KHz), only the center frequency is changed. For example, it can allow an antenna that was originally cut for 43.0 MHz to operate on a center frequency of up to 46.0 MHz.

The modification can be performed in the field, and on the tower if necessary. Access to the bottom of the dipole sleeve is required.

Special equipment and tools needed:

- Spectrum analyzer with tracking generator and directional coupler, or network analyzer (to determine the antenna's resonant frequency)
- Tubing cutter capable of cutting the 2-5/8" diameter 0.040" aluminum sleeve
- Sheet metal shears
- Small hammer
- One or two small pieces of wood (see pictures)
- Special Projects Custom Precision Dimpling Tool
- Tuning ring kit, if desired (if one is not installed already).
- Marking pen or tape to mark the line to cut on the coaxial sleeve
- Half-round medium second cut file to de-burr the coaxial sleeve after cutting

Note: When sweeping the antenna to determine its resonant frequency, have the tower personnel well clear of the antenna (at least ten feet above or below).

<u>Steps to perform the modification:</u>

Step 1: Remove the tuning ring at the bottom of the antenna, if installed.

Step 2: Sweep the antenna to determine its original frequency.

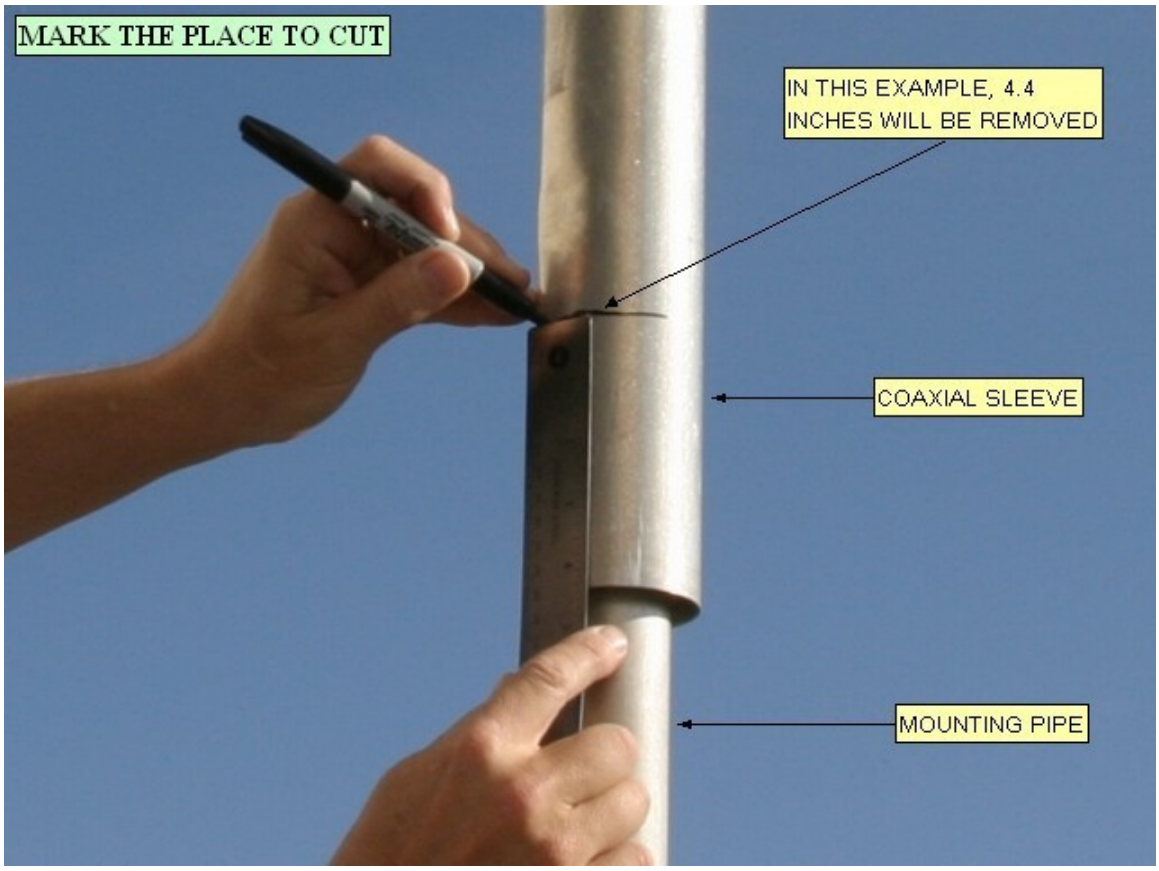
Step 3: Determine the length of sleeve to cut from the bottom sleeve of the antenna using the following formula (42-45 MHz antennas only, see additional notes at the end of this document for other ranges):

$$\text{Length to cut (in inches)} = \frac{\text{new frequency (MHz)} - \text{original frequency (MHz)}}{0.63}$$

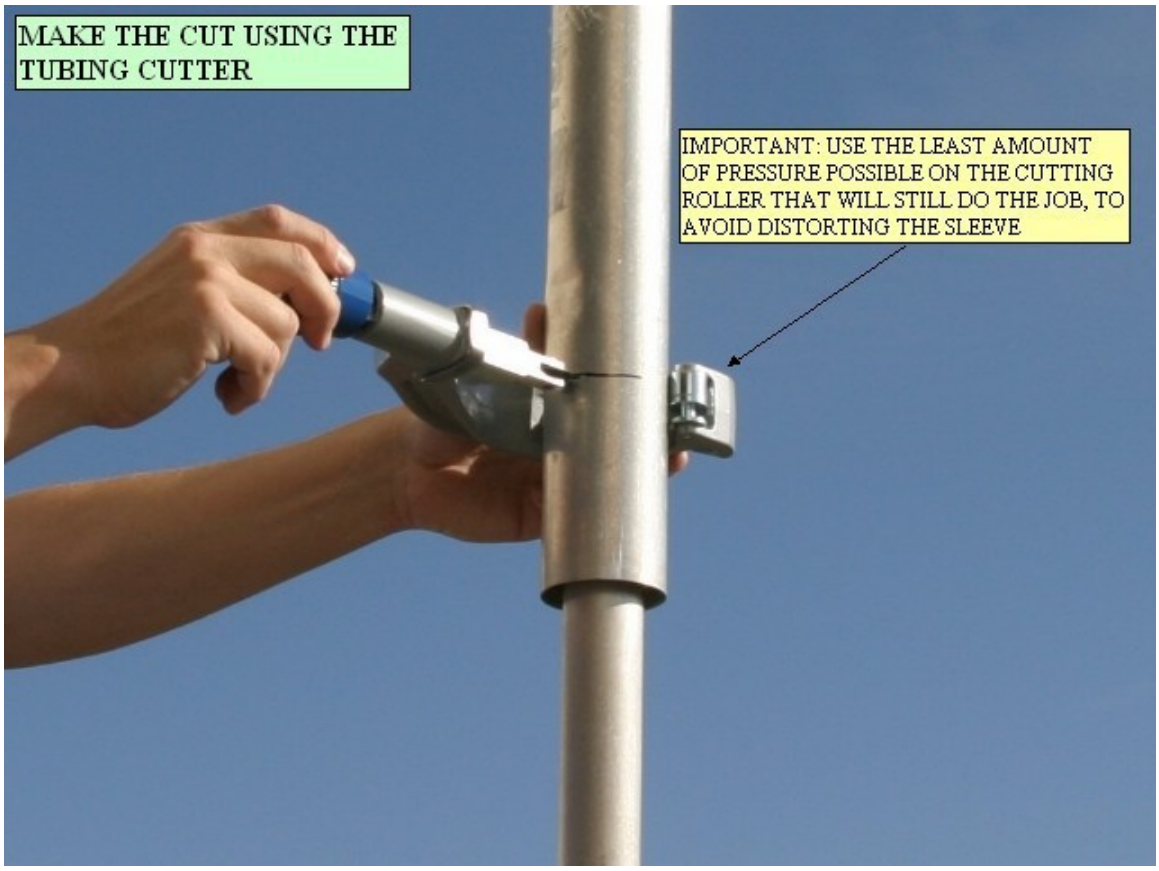
For example, if the sweep shows that the antenna is tuned for 42.70 MHz, and we want to bring it up to 45.50 MHz:

$$\frac{45.50 - 42.70}{0.63} = 4.4 \text{ inches to cut from the bottom of the sleeve}$$

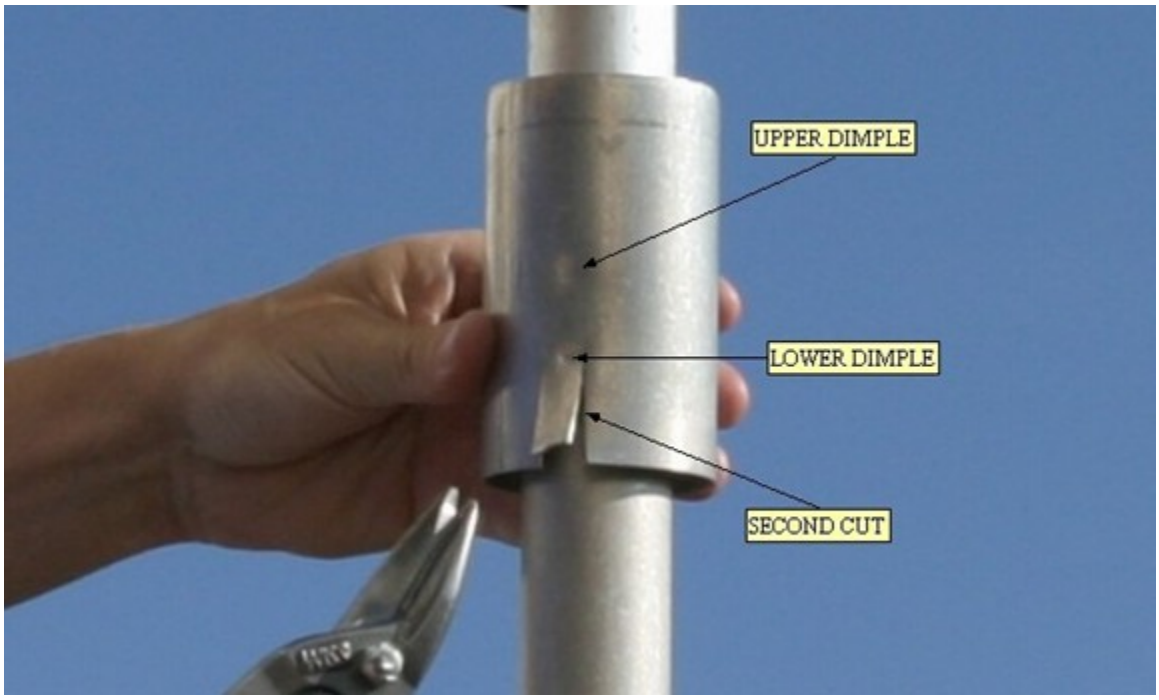
Step 4: Mark this distance from the bottom of the sleeve, as shown:

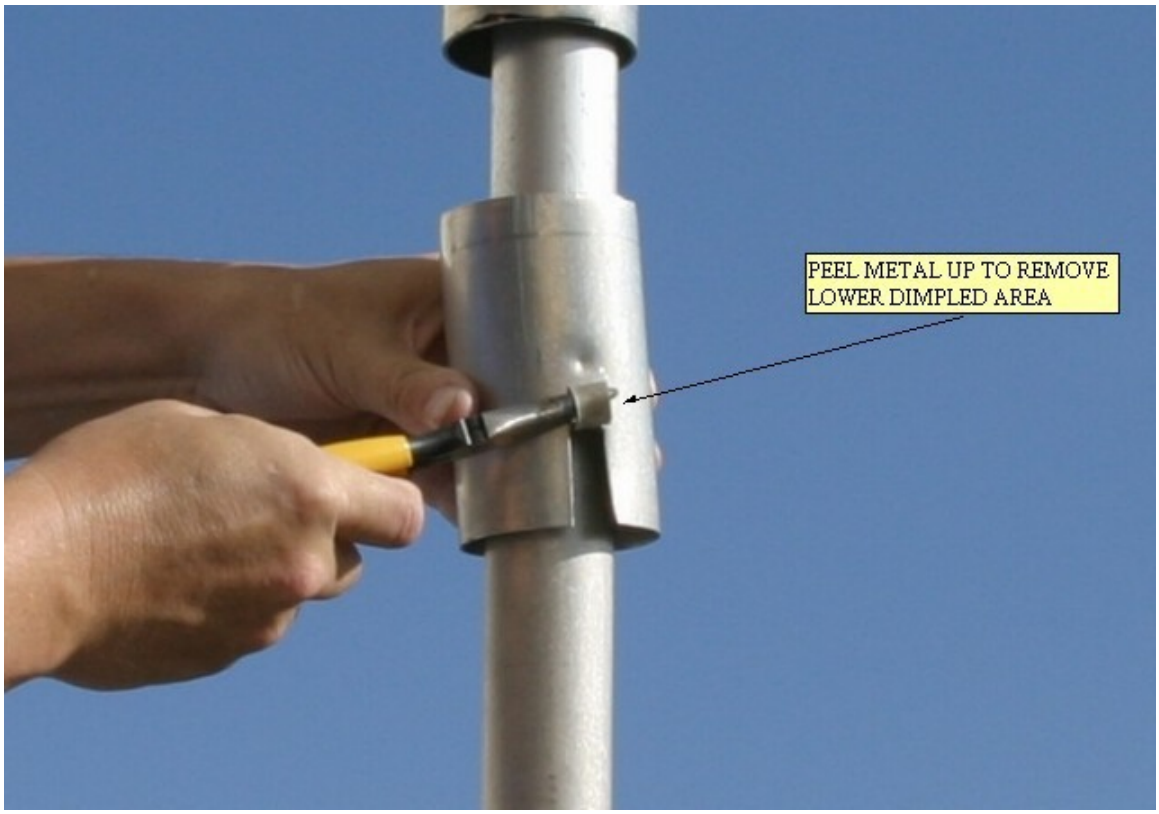


Step 5: Use the tubing cutter to cut the sleeve. Use the least amount of pressure on the wheel that will get the job done. If the cutter tries to cut a "spiral" around the sleeve instead of cutting a single groove all the way around, try going around one turn, coming back one full turn, going forward one turn, back one turn etc. until the sleeve is cut.



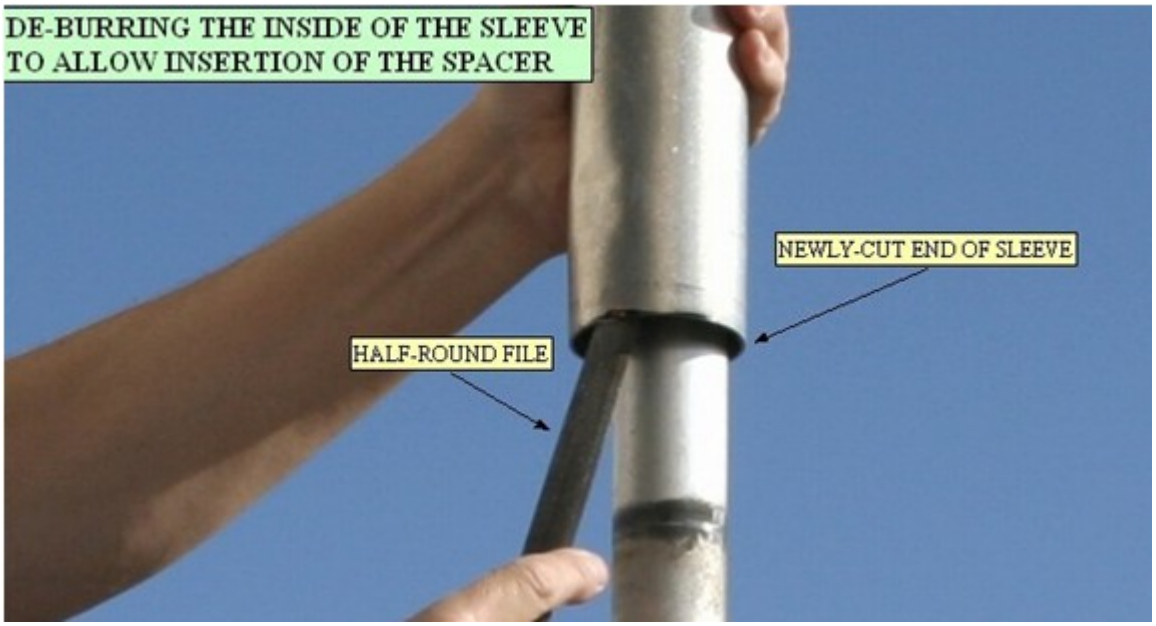
Step 6: After the piece is cut from the sleeve, cut the piece near the lower dimples on both sides of the sleeve and remove the plastic spacer from the inside. If nylon screws hold the spacer in-place instead of dimples, remove them and use the same method (below) to free up the spacer for removal:



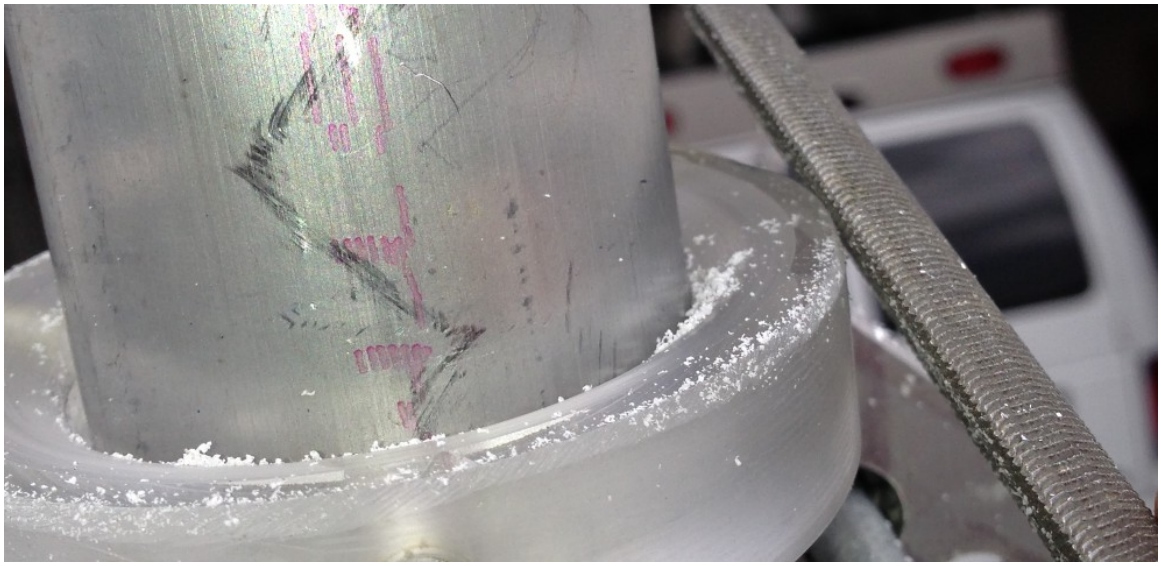


Remove material as necessary to allow removal of the plastic spacer without stressing it and causing cracks. Slide the spacer down the mounting pipe and out of the way. Cut the rest of the way through the excess sleeve piece and remove it from the mounting pipe:

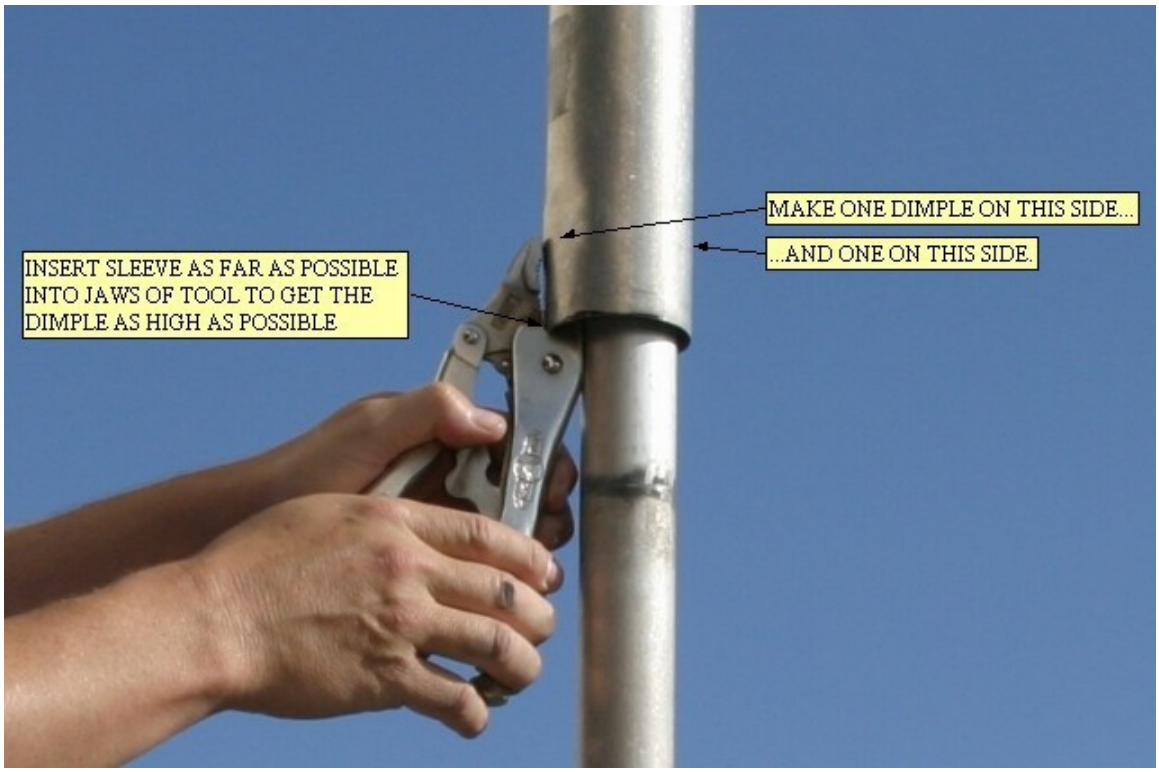
Step 7: Use the half-round file to de-burr the inside of the sleeve. Extra filing will be necessary if the end of the sleeve has been distorted by the pressure of the tubing cutter wheel. File as necessary until you are able to insert the plastic spacer at least part way into the sleeve:



Step 7A: File a small bevel in the upper edge of the plastic spacer to make it easier to insert back into the sleeve in the next step. DO NOT INSERT THE SPACER INTO THE SLEEVE YET!

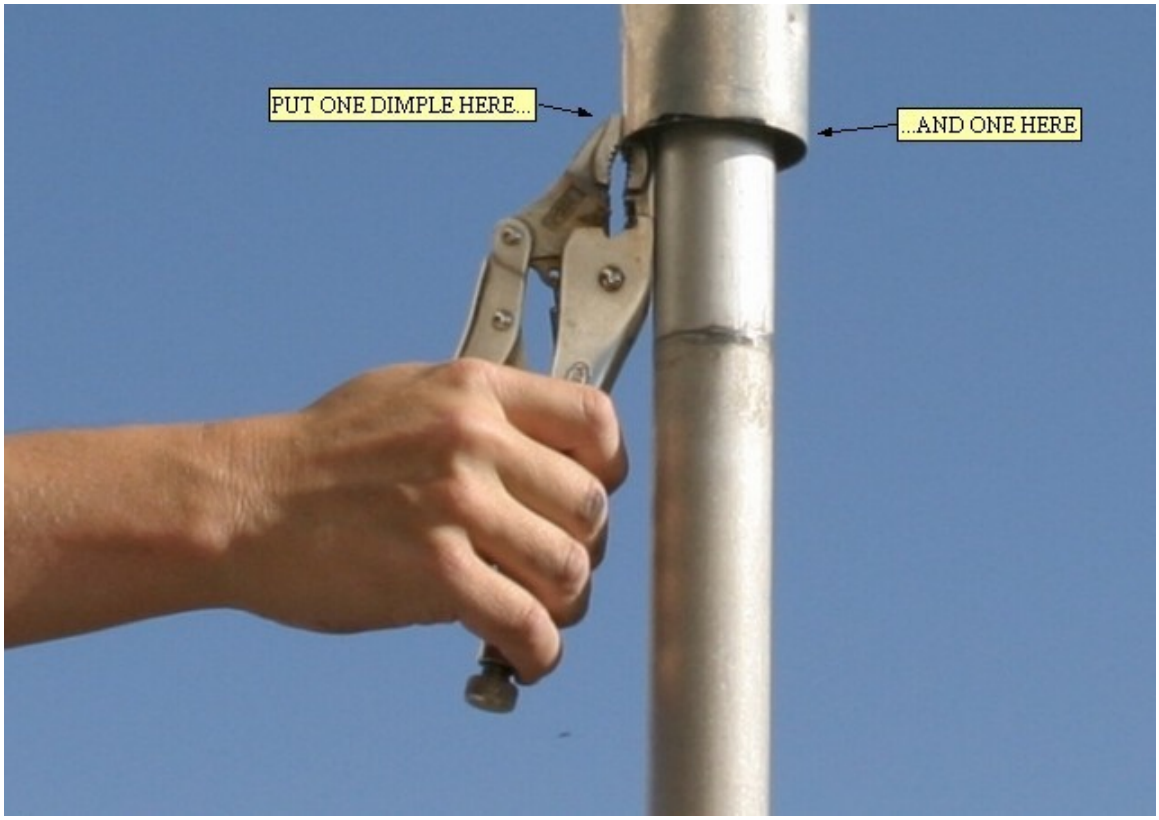


Step 8: Use the custom precision dimpling tool to make two dimples, both as high in the sleeve as possible (about 1.5 inches). Put them on opposite sides of the sleeve. These will prevent the plastic spacer from working its way up too far into the sleeve.



Step 9: Insert the plastic spacer part way into the sleeve by hand, and carefully tap into the sleeve with a small hammer and blocks of wood until it touches the dimples made in the previous step. Tap all the way around the ring slowly and evenly:

Step 10: Make two dimples under the plastic spacer, one on each side of the sleeve, to hold the spacer in place. Insert the tool until it touches the spacer, then back off 1/8 inch or so and make the dimple. This keeps the tool from scratching the spacer.



This completes the modification. The antenna may now be swept to confirm that the desired operating frequency is within the acceptable SWR range. A standard tuning ring may be added to lower the antenna's resonant frequency up to about 800 KHz if needed.

Additional notes from April 8, 2013:

We recently tuned an antenna from 34.05 MHz to 37.5 MHz using this procedure. The frequency changed was 3.45 MHz, and 8.0 inches of sleeve needed to be removed. Six inches was also removed from the top section to bring its length closer to ¼ wavelength.

More notes from 2021:

Yes, this method does work to bring a 42 MHz Kreco up to six meters, but the formula given above probably won't work going that far. Therefore try to cut it a little long and then cut small amounts to bring it up to frequency. I modified one this way and found that I didn't need to change the coupling strap inside the sleeve, but I did shorten the top rod to roughly the same length as the skirt. But it's important to note that the tuning is

done with the skirt length, the rod length has a much smaller effect. So when you make that first (slightly long) rough cut to the sleeve, cut the rod to roughly the same length too, and from there on you'll probably only need to trim the sleeve.

One more thing: We have a lot of these that have the top rods unscrew themselves over the years, so tighten the top rod good. Drill, tap, and insert a setscrew if you really want to be sure.

--Steve Dold W6KCS