

Pacific Antenna 20 and 40M Lightweight Dipole Kit

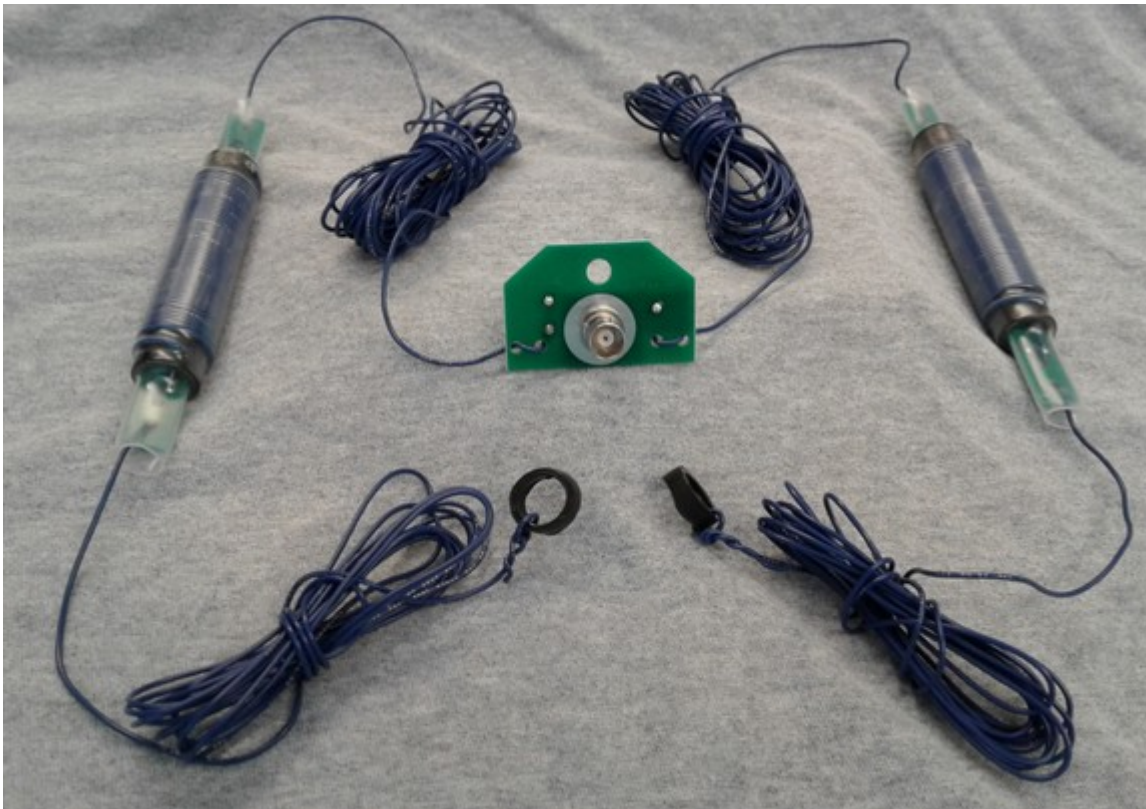
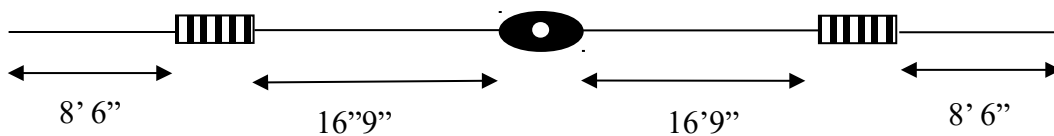


Diagram showing configuration and approximate lengths



Description

The Pacific Antenna lightweight dual band, trap dipole kit provides operation on both 20 and 40M bands.

Two capacitors in series serve to resonate the trap coil and isolate the inner part of the antenna for 20M operation.

On 40M, the traps act as loading coils and shorten the overall length of the dipole
Total length is approximately 50 ft rather than the 66ft of a full size 40M dipole.

The dipole weighs less than 5 ounces and can be used at RF power levels up to 100W.

Recommended Tools

- Wire cutter
- Wire stripper
- Soldering Iron and solder
- Tape measure
- Heat gun or other heat source for shrink tubing

Before you start

We suggest that you inventory the parts according to the contents list to be sure the kit is complete. If not please contact us for replacements.



Contents

72ft of #24 stranded wire
BNC connector (1)
Dipole center insulator PCB (1)
Trap capacitors PCB (2)
Coil forms (2)
27pF 3KV capacitors (4)
Clear heat shrink tubing (2)
End insulators (2)

1. Wire Preparation

Measure and cut the supplied wire to the following lengths*:

- 2 Sections each measuring 8 feet, 7 inches (outer antenna sections)
- 2 Sections each measuring 9 feet, 4 inches (coil windings)
- 2 Sections each measuring 17 feet (inner antenna sections)

These measurements include extra wire for making connections at the traps and center insulator and trimming to final length

***Note:** Measure carefully and double check the lengths of wire before cutting to reduce any errors. The old saying that applies here is “measure twice, cut once”

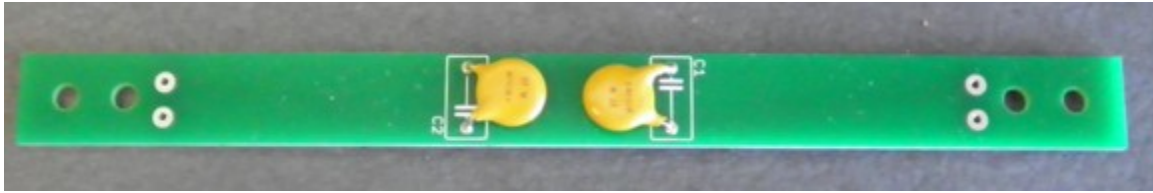
Traps

The traps are constructed from capacitors and an inductor (coil) to form a resonant circuit. Two 27pF capacitors are placed in series by soldering to the long circuit boards and connected in parallel with the loading coils to form the traps.

Trap Capacitors

Insert the capacitors into the long circuit boards in the marked positions.

Before soldering, bend the leads over as shown below so that the capacitors lie flat on the board. This is to allow them to fit inside the coil forms.



Solder the capacitors and trim the excess leads so that the board appears as shown in the photo above.

Trap Coils

The coils use the 9' 4" sections of wire that were prepared previously to wind coils with 46 turns.

Start by inserting the wire through one of the holes of the coil form leaving about 2".



Wind the coils counting one turn each time the wire passes the starting point. Keep the wire as tight as possible and the turns together during winding.

You can tighten the coil by holding one end and with the other hand, twisting the wire on the form in the direction of winding to remove slack.

Double check by counting the turns to verify the total number of turns is 46 before cutting off the excess wire in the next step. A turn is counted as each time the wire passes the starting point as it wraps around the coil support tube.

Note: Tape may be helpful to temporarily hold the turns in place while winding.

Trap Assembly

Trim the leads of the coils to approximately 1 inch and strip the insulation leaving approximately 3/8 to 1/2 inch of the insulation past the coil ends as shown below.

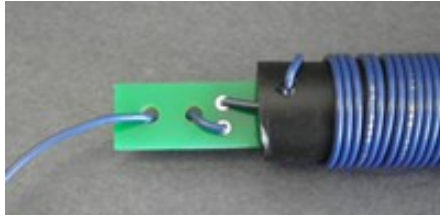


Insert the capacitor board into the coil form so that it is centered in the form, insert the stripped coil wire ends into the board and solder the wires to the boards.

Repeat this process with the other coil to complete the trap set for the dipole.

Antenna sections

Each trap will be connected to the end of one 17 feet and one measuring 8 feet 6 inch wire by feeding the wire through the outer hole, back through the next hole.



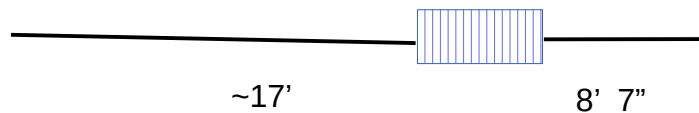
Strip approximately 1/4" of the insulation from the antenna wire, feed it through the solder pad hole and solder the wire to the board.

Pull the end of the wire to remove any slack and to hold the wire in place in the board.

Repeat this process on the other end of the trap with the complementary wire and then do the same with the other trap.

Each trap should now have the 17 ft wire attached to one end and an 8 ft 7 inch wire to the other to form each half of the dipole.

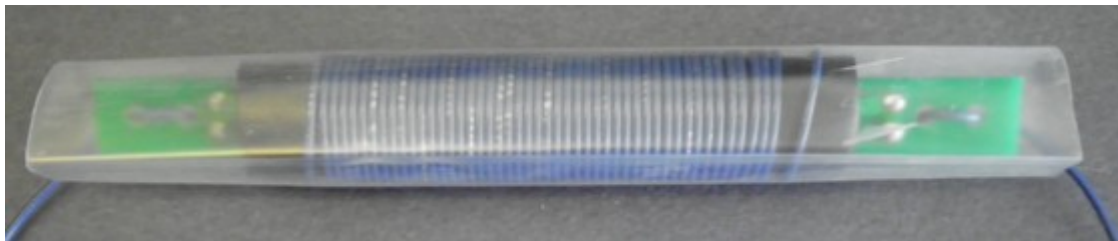
Note: The length includes everything up to the end of the coil so the actual wire may measure a bit shorter if measured from the end of the trap board.



The 17' sections will be the inner part of the antenna and the 8' 7" ones will be the outer ends of the antenna.



Carefully slip a section of heat shrink tubing over each of the coil form.



If some turns of the coil become displaced or separated, use a small flat stick or tool to push them back in place before shrinking the tubing.

Shrink the tubing using a heat gun, or other heat source. Use caution to avoid overheating the coil form or causing injury.



A few tips on shrinking the tubing can be found here:

<http://www.doityourself.com/stry/8-ways-to-heat-your-heat-shrink-tubing>

Center Insulator

The center insulator circuit board has a large hole for mounting the BNC connector as shown in the photos below.

Place the star washer on the BNC and insert the connector in this opening in the circuit board.

Place the nut over the threads and tighten to secure the BNC from rotation. You may find it helpful to use another BNC connector such as one on a feedline to help prevent rotation.

The connection to the BNC shell is made by contact to the circuit board and a short wire provides connection between the center pin of the BNC to the adjacent pad on the board.

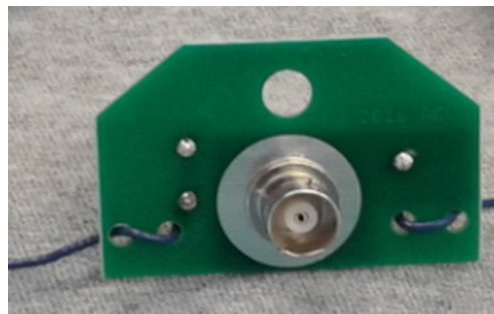
This can be done with a small section of antenna wire as shown below.



Next, trim the 17 ft sections of the antenna to 16 ft 9 and 1/4 inches measuring from where it will be soldered to the trap.

Feed the wire through the outer hole from the back side of the insulator (solder pin side) of the BNC connector and loop back through the inner hole leaving sufficient length to make the solder connections.

Strip the ends of the wires approximately 1/4 inch, push them through the board holes and solder to the board pads as shown below.



After the wire is soldered, the excess pull the excess back through the holes to secure the wire in place and prevent movement of the solder connections.

End Insulators

The kit includes a pair of insulators for connecting supporting string to the antenna ends that are formed from small sections of coil material.



Attach these by simply twisting or tying a knot the ends of the wire around the rings.

After final tuning of the antenna is completed, the wire can be secured to the insulators with tape or heat shrink to prevent slippage during use.

Tuning the Dipole

Depending on how the antenna will be used (height, configuration, etc) the length of the outer section of the antenna will likely need to be adjusted for best match on 40M.

The inner, 20M section will probably not need trimming in most cases.

It is recommended to try the antenna at a few heights and different configurations before cutting the wire.

Note: Before trimming, we recommend that you first try tightly coiling or wrapping up some of the antenna end. This electrically shortens the antenna and may provide sufficient effective shortening to provide a low SWR without any trimming.

First, set up the antenna in the chosen configuration (dipole, Inverted V, V, etc) and test.

Note: Configuration and height above ground will affect the match, especially on 40M.

An antenna analyzer makes tuning the antenna easier but it can also be adjusted by checking the SWR at the lower and upper end of each band.

If the SWR is higher at the highest frequency, then the outer section is too long.

If not, and tightly wrapping up a bit of the end does not improve the match, trim a small amount (1" or less at a time) from each side of the antenna and retest.

Note: It is important to test carefully and verify the need for trimming and be very careful not to remove too much and in most situations, it should not be necessary to cut the outer section shorter than approximately 8 ft 3 inches.

Congratulations, your Pacific Antenna 20 and 40M dipole kit. is now complete!

If you have any questions, please contact us: qrpkits.com@gmail.com

Thanks from the Pacific Antenna Team!