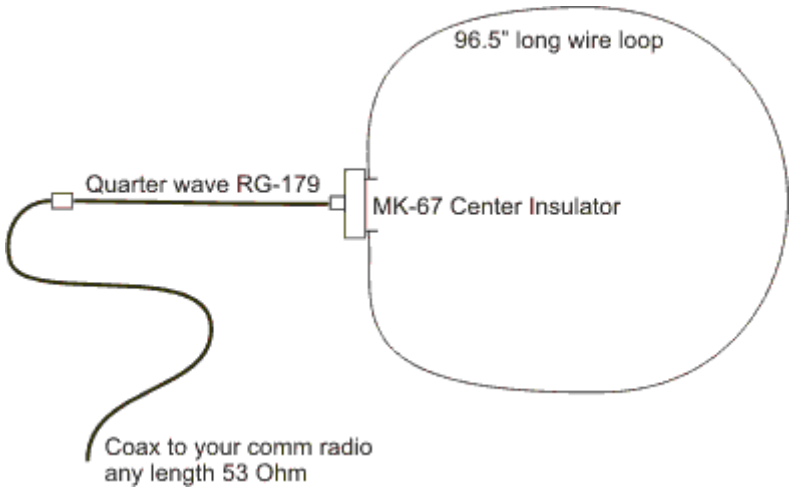
Morris Com Loop

Antenna Kit

Produced by Dave Morris, N5UP, 1828 Glenbrook Ct, Bedford, TX 76021 – Dave@DaveMorris.com



Parts enclosed:

- 1 ea Tefzel insulated wire, 97 inches long, with crimped ring terminal on one end, that forms the "loop" of the antenna;
- 1 ea MK-67 Center Insulator with BNC connector and two wing nut terminals;
- 1 each Quarter wave matching section of RG-179 (73Ohm) coax with one male and one female BNC connector;

Synopsis:

The Morris Com Loop is an antenna designed for homebuilt composite aircraft with a tailcone with a diameter of about 30 ¾ inches at some point. This includes Dragonfly, Q-2, and some other models. Do not use this antenna on a metal fuselage or with significant metal in the vicinity.

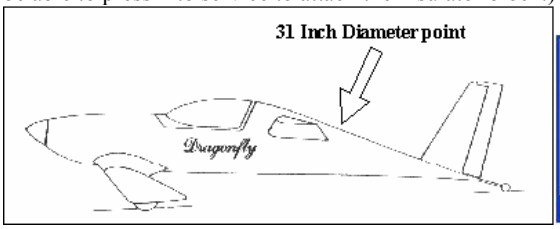
The antenna has advantages over the traditional quarter wave whip antenna in that

a. It does not require a ground plane
b. It has some gain over a quarter wave whip
c. It offers some ignition noise immunity

You can read more about this antenna at www.DaveMorris.com/MorrisComLoop

Installation:

1. Locate the position in your tail cone where the inside diameter is about 30 ¾ inches. Affix the Center Insulator on the fuselage wall about ½ way up the wall, so when you attach the wire loop later, about ½ of the wire loop will be above it and ½ will be below it. (If the center is positioned in any other position, a slight degradation of transmitted and received signals will occur. It won't be significant in normal use, but might be noticeable under weak signal conditions.) Point the BNC connector forward, (or in whatever direction you want to route the coax to your radio). Loosen the wing nuts so you can remove them easily in a few minutes. Now use either RTV or other non-metallic means to fasten the insulator to the wall. If you can make this a temporary attachment, so much the better, as it will allow you to move it around if the wire loop turns out to be too long or too short for the location you've chosen. (There is an unused nylon wire clamp on the insulator block that you might be able to press into service to attach the insulator block.)



2. Attach the ring terminal at one end of the loop wire onto either terminal post of the Center Insulator. Tighten the wing nut or add your own lock nut if you prefer.

3. Strip ½ inch of insulation off the other end of the loop wire and loop it once around the other terminal post of the Center Insulator, and tighten the wing nut just slightly. (The reason we have excess stripped wire on this end is in case we need to adjust the SWR by lengthening the wire loop. ½ inch will make a huge difference in the SWR, and since the desired wire length is 96 ½ inches and the kit provides a 97 inch wire, we start with ½ inch excess and adjust the length as necessary later on.)

4. Now attach the Tefzel insulated wire loop to the inside of the fuselage using any non-metallic means. Options include small dabs of RTV, nylon wire clamps, etc. The plane of the loop should be vertical in flight. You can route the wire around obstacles gently if necessary, but try not to make sharp bends to avoid messing up the impedance or the radiation pattern. If you placed the Center Insulator incorrectly, feel free to let the wire ride slightly off the fuselage wall, cut corners, or orient the wire in a slight "S" pattern if you need to, in order to shorten or lengthen the total path length.

5. Plug one end of the Quarter Wave Matching Section coax into the Center Insulator and lead it away at a 90 degree angle to the plane of the wire loop for as far as possible. Then plug your 50 Ohm coax from the Com radio into the matching section coax. If your plug has the wrong polarity, you can buy a BNC adapter to match it up.

6. Listen on your radio to make sure you have a good signal. (It should sound at least as good as with a rubber duck or a quarter wave whip!) Now use an SWR bridge to make sure the ratio is under 2:1 at the center of the aircraft band. If it is over 2:1 then do the following: Tune your transmitter to a frequency about 2 MHz lower than the center frequency and see if the SWR gets better or worse. If it gets better, the antenna is too long. If it gets worse, the antenna is too short. To verify this, tune the opposite direction, that is, 2 MHz above the design frequency and check the SWR again. It should show the opposite results. Since we've given you ½ inch of extra wire in the kit, you can lengthen or shorten the stripped wire at the terminal post of the insulator block. (Note: Don't spend a whole lot of time trying to get a perfect 1:1 SWR. If you are below 2:1 across the entire aircraft band, you will be fine. The difference in line loss going from 1.5:1 to 2:1 is only about 0.2 dB and will not be noticeable. The author has spent years talking to people on opposite sides of the earth with a 2:1 SWR on some of his experimental antennas!)

7. The short piece of Quarter Wave Matching Section coax is extremely important to the operation of the antenna. You might label it, so that years later you (or the next owner of your airplane) won't forget what it's there for and try to operate the antenna without it.

References:

A full description of the Morris Com Loop antenna, including all formulas, is at www.DaveMorris.com/MorrisComLoop