
Annex C - Comm radio antenna

As suggested in the chapter describing attachment of the rudder, the port side rear flange of the fin is the ideal place to install the VHF antenna.

The recommended antenna for installation is a dipole type, the total length of which is to be a half wave length at the middle of the frequency range (127.35 MHz if you are using a 760 channel radio). The calculated length of the antenna would make each half of the dipole 588 mm (23.15") long; however there are certain effects to be taken into consideration before the final length is determined. "End effect" makes the antenna apparently longer than it is, and so does the "dielectric effect" of the glass fibre upon which it is mounted. Both of these effects require the dipole to be shortened to bring the effective length to match the mid-frequency half wave length. The only way to take these effects into account is by use of a Voltage Standing Wave Ratio (VSWR) meter.

Installation

Make up the antenna on the bench, soldering the cable to the copper strips and adding the ferric toroids as detailed in the figure overleaf, but don't attach the BNC connector at this point. Attach the toroids to the cable with rapid epoxy to hold them in position first, then apply the heat shrink tubing.

Drill a hole in the rear close out of the fin, close to the port flange, to pass the ferric toroids through. Thread the cable through into the cockpit area, preferably on the starboard side to keep it away from other wiring which should be run down the port side. Attach the BNC connector. Bond the copper tapes to the fin's rear flange and coat the area over the soldered joints with silicone to protect against moisture.

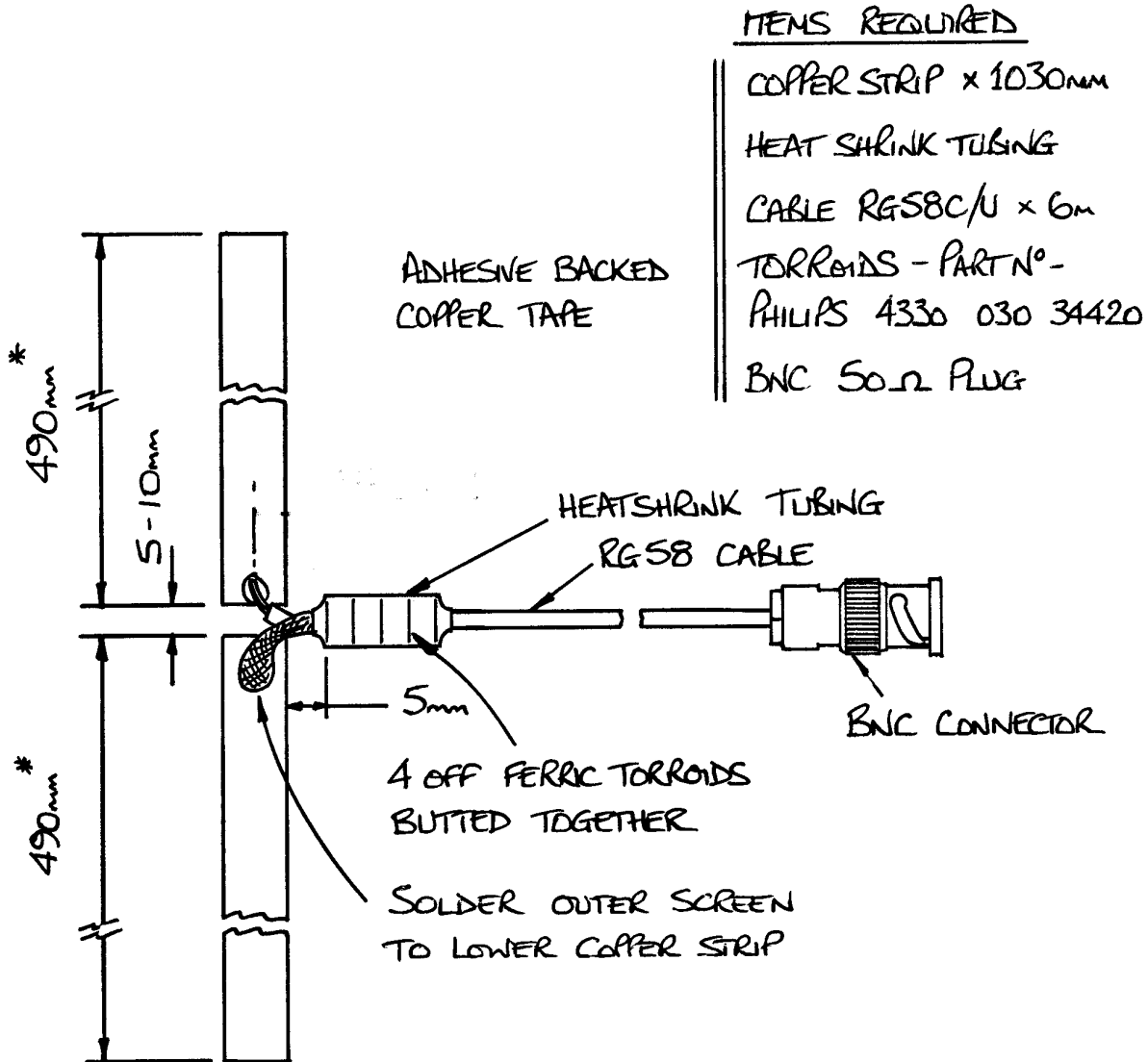
Tuning

Connect a VSWR meter and check the antenna over the entire VHF comm range.

The value will probably be low at 118 MHz and increase as the frequency increases. If this is the case, then shorten the dipoles equally in about 3 mm (1/8") increments and recheck the VSWR readings. The aim is to get the minimum reading at the mid-frequency point and have no more than about 2.1 at the extremes.

Having established the dipole lengths, make sure they are properly bonded to the fuselage, but don't cover them with glass fibre as this will alter the characteristics.

The final check of the antenna's efficiency will be a radio check with a facility as far away as possible, and ideally at frequencies in the middle and at each end of the full VHF comm range. This is not usually practicable to begin with but will eventually be covered as you fly to various destinations and communicate at different frequencies.



* NOTE: INITIALLY MAKE COPPER TAPES 515mm LONG EACH AND, CHECKING SIGNAL WITH VSWR METER, SHORTEN TAPES EQUALLY IN 3mm INCREMENTS UNTIL MINIMUM READING COINCIDES WITH 127.5 MHz

Fig 1. Comm radio antenna.