UK Radio Astronomy Association

E-Field Antenna Enclosure

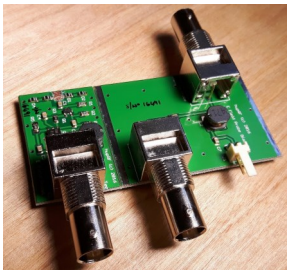
Introduction

This is a short note describing the author's approach to building a weather proof enclosure for the mast head amplifier It is not a definitive design for an antenna enclosure and I encourage everybody to try and improve on this idea. Please share your efforts with us so that we improve on this first effort.

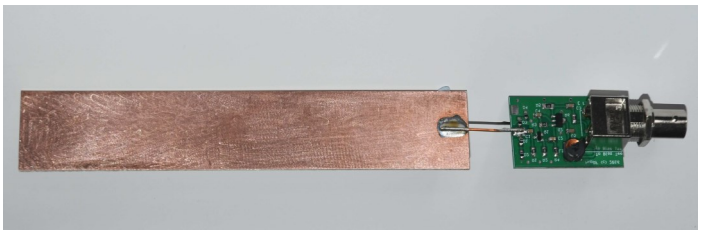
My starting point was the design described by Dave Powis (see E-Field Probe Testing Update downloadable from the UKRAA website) using wastewater pipe, however I wanted to use off the shelf components. I was able to make a simple enclosure which is weatherproof and compact. I now need to assess its performance against winter weather and condensation.

Antenna

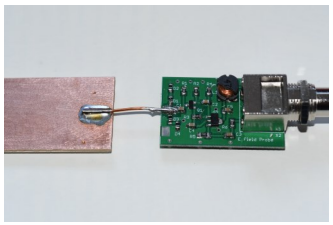
When completed with its connectors the E-field probe kit looks like this was taken before the masthead amplifier and the Bias-T are separated. The masthead amplifier now needs an antenna to be added. I tried a 500mm length of stiff copper wire but settled on a strip of PCB 150mm x 25mm. Both worked well but the PCB results in a more compact device. A short length of stiff copper wire was soldered to the PCB and then soldered onto the amplifier to join the two parts together.



PCB before separation



PCB plate attached to antenna



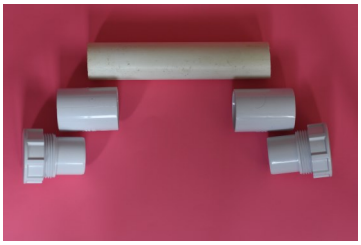
Wire link joint

Enclosure

The enclosure is made from 32mm solvent weld plastic wastepipe, this is available from any plumber's merchant or DIY store. In November 2019 all the parts and a pot of solvent would cost less than £15 at a well known UK DIY store.

The parts are a loose fit and are welded into place with the solvent. Make sure everything fits together correctly before fixing the straight couplers to the pipe and the access plugs. Follow the manufacturer's instructions on the solvent jar to make the joints.

Drill a 12mm hole in one endcap for the BNC connector. This hole needs to be 6mm from the centre point of the cap, this allows the PCB to sit in the centre of the tube.



There are five components:
180mm long pipe
2 straight couplers
2 access plugs

The completed antenna

Drilled endcap

PCB mounted in endcap

Concerns

So far this enclosure has not been tested in wet weather. This will be looked in a future installation note.

Condensation is another potential problem. It is recommended that the PCB is sprayed with a conformal coating to protect it from moisture .Dave Powis recommended drilling a small hole (1.5 to 2mm dia), in the bottom cap to let the water out. This has not been tried and I can make no comment on its effectiveness.