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RF SIGNAL STRENGTH METER



This simple Transmitter Signal Meter is a wide band circuit which can be used to monitor RF from 27MHz, 35MHz, or 40 MHz AM or FM Transmitters. In tests, all AM transmitters showed no RF signal when the crystal was removed, but a 40MHz FM HiTec Ranger transmitter showed RF transmission even when the crystal was removed. Clearly transmitters will vary in this test.

TOOLS

For construction you will require a soldering iron (anything between 15 to 30 Watts will a thin pointed bit) and flux cored solder (22 SWG); a drill and a selection of bits; a round and a flat file plus a small screwdriver and a pair of wire cutters is also needed. As always, a good level of lighting should be available.

PREPARING THE CASE

Drill a hole in the angled half of the case in accordance with the drawing FIG 2. With a round file, open up the hole to 18mm. Then take the flat file and square up the lower part of the hole in order that the projection on the bottom of the meter movement will pass through it. When you are happy that the meter can be fitted easily into the hole, remove it. It will be stuck down to the case surface as the last job in construction.

Next step is to drop the PCB into the other (bottom) half of the case with the insulated side upwards. You will find a 9mm hole in the PCB which allows the case screw post to protrude through it. Ensure that the edges of the PCB are parallel with the sides of the case then, with a sharp point, mark out the position of the two central holes for the 8BA screws using the PCB as a drilling template. These holes should next be drilled with a 3mm bit. The two 8BA screws will now need to be inserted into the nylon-coated Terry clips and fitted as per drawing FIG 3. As you will see the first nut and washer holds the clip in place and spaces the PCB away from the case bottom, while the second nut and washer hold the PCB in place. At this stage the PCB is not populated so the two nuts and washers will have to be saved until the soldering is done. A hole will be required for adjustment of VR1. This will fall between the two case half sections at the deepest part of the case. It may be best to wait until VR1 is fitted to the PCB to mark the exact position and file the two half sections.

ELECTRONICS PARTS

The PCB has an insulated (Component Side) and a tinned track side. Components are mounted on the insulated side and soldered on the track side. The drawing for the Component Layout on the PCB is FIG1.

The RFC (Radio Frequency Choke) looks similar to a resistor with a wire at each end of a rod with colour bands. As there is only one RFC the colours can be ignored. It can be fitted either way round.

The tiny glass diodes D1 and D2 have a dark bar at one end shown on drawing FIG 1 as a black band. This shows the orientation of these components on the PCB.

The monolithic ceramic capacitor C1 is marked 473 which is a coded form of 0.047uF. It can be fitted either way round.

The three legged adjustment trimmer (Variable Resistor VR1) is, as its name suggests, to enable adjustment of the meter reading.

PCB CONSTRUCTION

PCB construction is very straight forward and can be completed with just the layout drawing FIG 1 and the Parts List. The only thing to note is the direction that D1 and D2 are fitted. When the components are fitted and the spare wires neatly clipped off the components, solder the short red and black wires as shown.

Fasten the PCB in position with the remaining nuts and washers and, feeding the wires through the meter hole in the case top, screw on the case top with the self tapping screw provided. Now solder the Red wire to the +ve of the meter and the Black wire to the -ve. It is advisable to check that the unit is working before you stick down the meter, in case you need to re-solder any joints.

RECOVERY SERVICE

A recovery or repairs service ensures that in the event of a mishap you will not be left with a dead project.

The Service Charge for this kit is £11.00 including parts cost (POST FREE IN UK).

All returns should include full Credit Card details (Name & Address of cardholder, Card Number, Expiry Date and Card Security Number)

ACTION R/C ELECTRONICS, 1 Llwyn Bleddyn, Llanllechid, Bangor LL57 3EF

The small print.....

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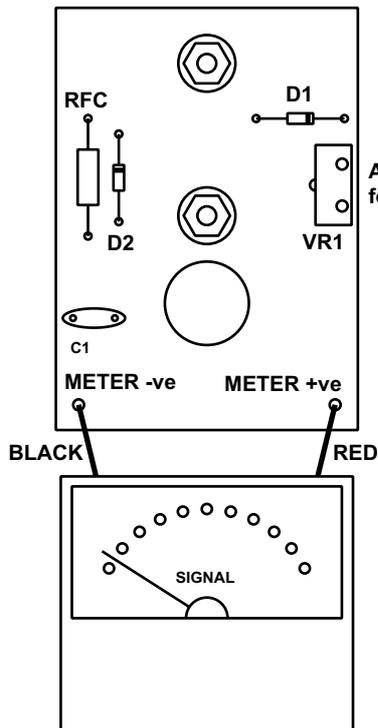
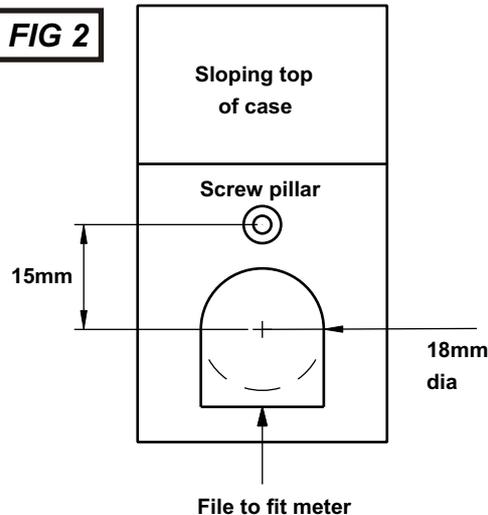


FIG 1

Adjust VR1 for full scale

Use double-sided tape or contact adhesive to fix meter to case. This will allow for its removal if required

FIG 2



DRAWINGS NOT TO SCALE

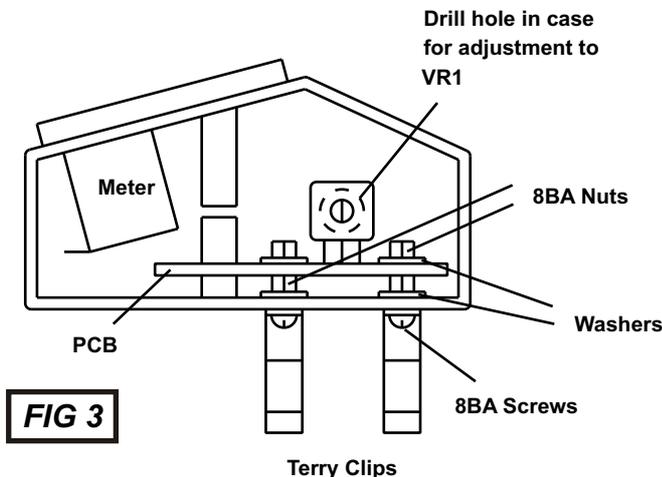


FIG 3

PARTS LIST

- RFC 1uH AXIAL RADIO FREQUENCY CHOKE
- D1,2 1N4148 GLASS SIGNAL DIODE (NOTE DARK BAR)
- VR1 4K7 MINIATURE VERTICAL PRESET (marked 4K7)
- C1 0.047 uF MONOLITHIC CERAMIC CAPACITOR (marked 473)
- PCB TYPE P38
- CASE TWO PART SCREWED CASE. TYPE 5.
- CLIP1,2 NYLON COATED TERRY CLIPS WITH 2 x 8BA SCREWS, 4 x 8BA NUTS and 4 x PLAIN WASHER
- WIRE SHORT LENGTH OF RED AND BLACK FINE FLEXIBLE
- METER 200uA METER (SCALE 'SIGNAL' 0-5)

A FEW WORDS OF WARNING

A transmitter may still radiate RF power without a crystal fitted. This unit is untuned and cannot be used to tune any R/C transmitter. The unit will reduce the radiated RF to the model. It absorbs the power needed to drive the meter from the aerial to which it is attached. It should be removed when operating a model. If you decide to leave it on whilst operating your model, despite the above warning, ACTION cannot be held responsible for any loss of control. The unit has a moving-coil meter movement and should be handled as a delicate instrument.

SETUP

- You will require a non-metallic screwdriver to adjust this item. One can easily be made with plastic rod or a strip of wood.
1. Ensure that your transmitter has either new dry batteries or fully-charged NiCad/NiMH cells.
 2. Clip the Signal Meter to the transmitter aerial.
 3. Switch on the transmitter and extend the aerial fully.
 4. Adjust the trimmer (see drawing) to set the meter to full-scale reading.
 5. As the battery discharges, the signal meter will give an early warning of reduced power being transmitted.

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PHOTOGRAPHIC BUILD SEQUENCE FOR KIT VERSION ONLY



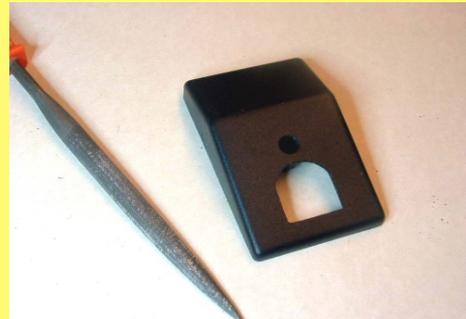
1. Mark out case lid



2. Drill round inside marks



3. Remove waste plastic



4. File back to marks



5. Mark & drill holes for screws



6. Fit nylon-covered brackets



7. Populate PCB and fit to case



8. Assemble case and fit meter



9. Finished unit clipped to Tx aerial