Clip on QRM Probe

By G8MNY (Updated May 13)

Wanting to find which lead on a devices like TV & STB set up, has the most RFI current it, I made a simple current probe from a clip in ferrite choke. It can be used with a Rx or spectrum analyser. And for Tx RF work too, finding if balanced line is balanced, coax line is really RF free etc.

**THE CURRENT PICK UP**

```
QRM cable
--------------------
:::|screen
10 ()))________ 500 Coax

Hinge /~~~\ Locking Catch
\ \ / / / / ~>~ Screen
Rx Coax ~~~~~~\ | ^ Heat Glue^ Coil
```

The clip on ferrite is about 2cm dia with a single locking catch, the catch guard I cut off making it easy to unclip. I removed 1 of the ferrite halves from the hinged plastic casing by levering a plastic protrusion out of the way. Then using some very fine enamelled wire I wound 10 turns on it, made a hole in the case, passed the wire ends through it, & then put back the ferrite against the hidden spring inside the case until locked in place. (depends on make)

I glued a thin coax to the case & connected the coil, after DC & RF testing, I soldered some aluminium foil (or copper foil if you have no aluminium solder) to the coax outer & heat glue a narrow strip of it through hole shielding the coil 1/2 a turn from the QRM cable. Then I put a layer of thin tape (parcel tape) over this to protect the coil.

I have seen other design use a cloths peg to house the 2 ferrite cores.

10 turns was used to give some calibration, & not put on too much wire that the frequency response will be affected. With 500 load a 0.50 is effectively inserted in QRM line.

```

0.50 1T
1A==========
:::|10T
(()))100mA
|________500  = 0.5W = 5V = 74dBmV = 134dBuV

WHERE TO TEST

The clip probe will show the highest current point along a cable & the worst cable in a set up (where a ferrite choke will be most effective).

Here is a typical TV set up...
The clip probe will show which of these 13 places may the best place for a choke. And you can even check an added choke is having some effect.

QRM Test
SOURCE choke [Rx]

As single clip on choke is not very effective (5dB!). More of them or a few turns on one is much better. You will also soon know if you have a "steel tape core" & not a ferrite core as it will have little effect at RF!

SPECTRUM
This is typical.

Now as most things have SMPSU & PC architecture in them, so combinations occur.

Even a USB keyboards show up like this...

TIPS
Some devices may put out a lot of RF current on some leads not on others!

Not all these currents lead to radiation that affects ham bands!

It often depends on the wiring & wire aerials at that location. E.g. a few uA of current into a 1/4 wave long TV aerial lead, may cause havoc, but into a small loop of wires around the TV none at all.

See also Tech Bul "Reducing Electronic RF QRM", & "Stopping HF Tx/Rx SMPSU QRM"

Why don't U send an interesting bul?

73 de John G8MNY @ GB7CIP

G4APL GB7CIP 16.1.2014