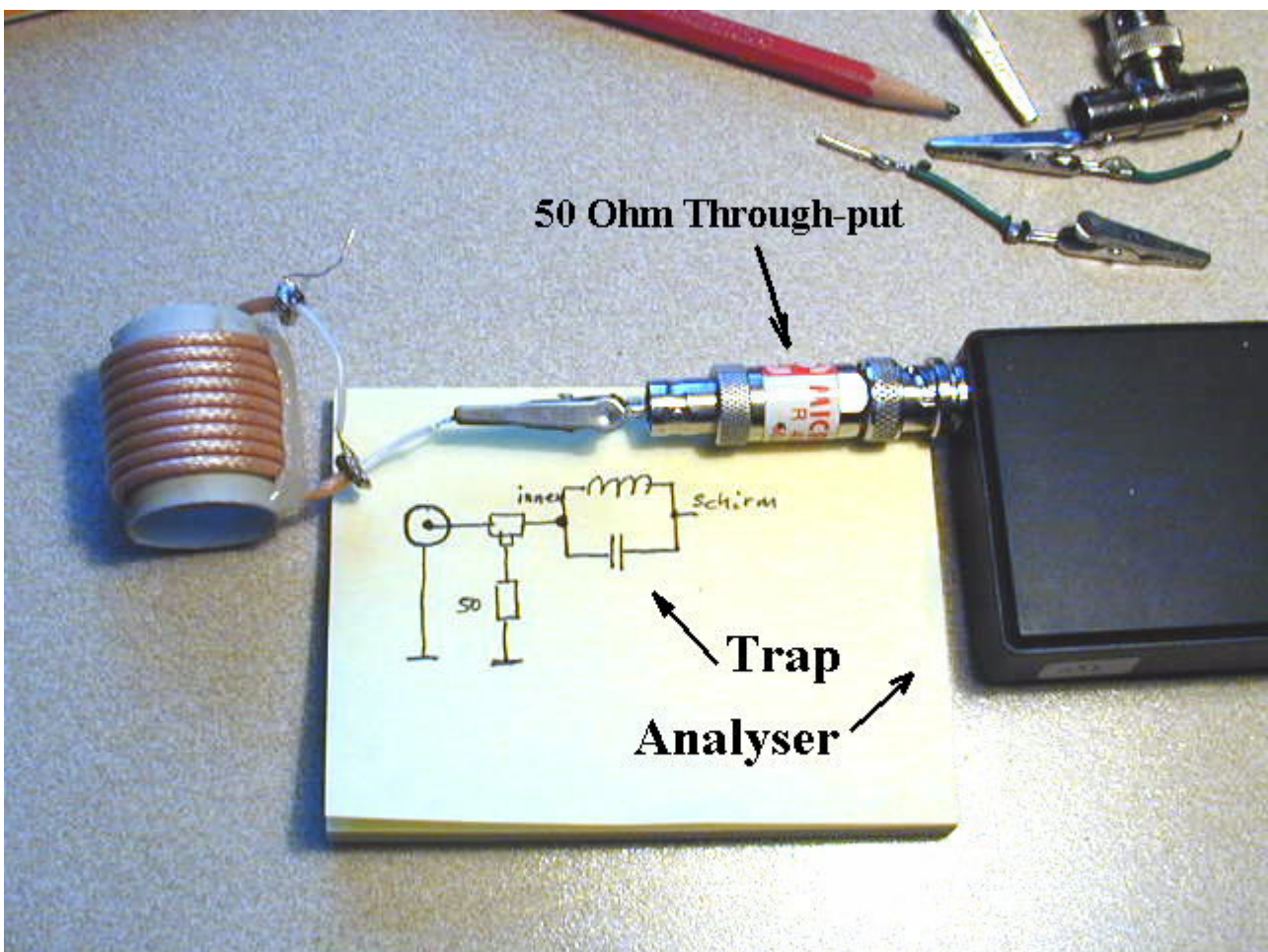How to measure Parallel - Resonances and Q with our Analyser
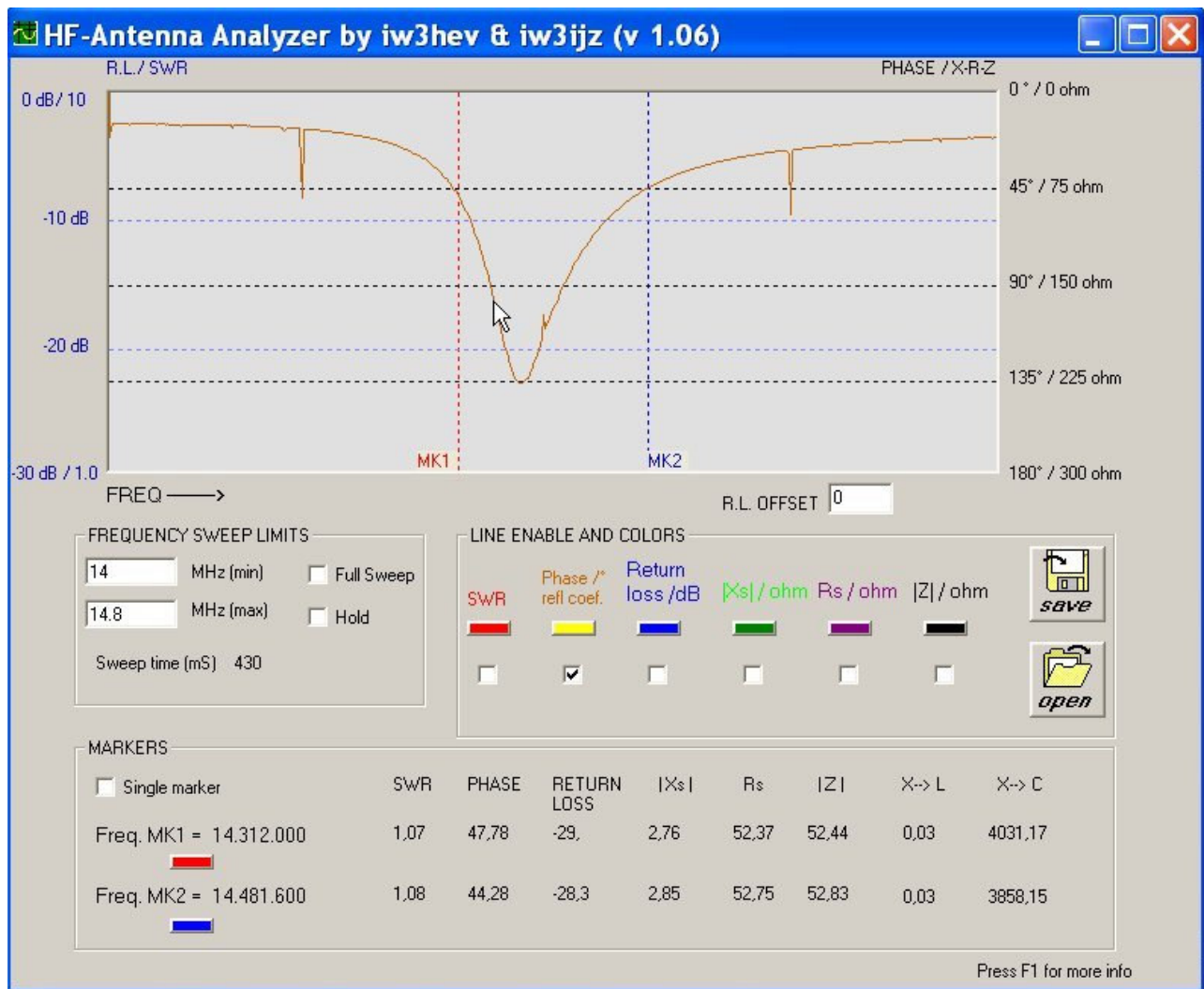
Paralleled L-C or Antenna Trap`s are high ohmic at resonance frequency. Our Analyser is specified up to "only" 300 Ohm, what makes it impossible to see SWR, RL or Z. But what we can do, is to look at the phase. To set up a measurement, plug a BNC-T to the analyser and put a 50 Ohm load to one of the two free connectors. Alternatively you can use a 50 Ohm through-put. The source of the analyser is now 25 Ohm with no phase alteration when not connected. This is common to paralleled circuits measurements.
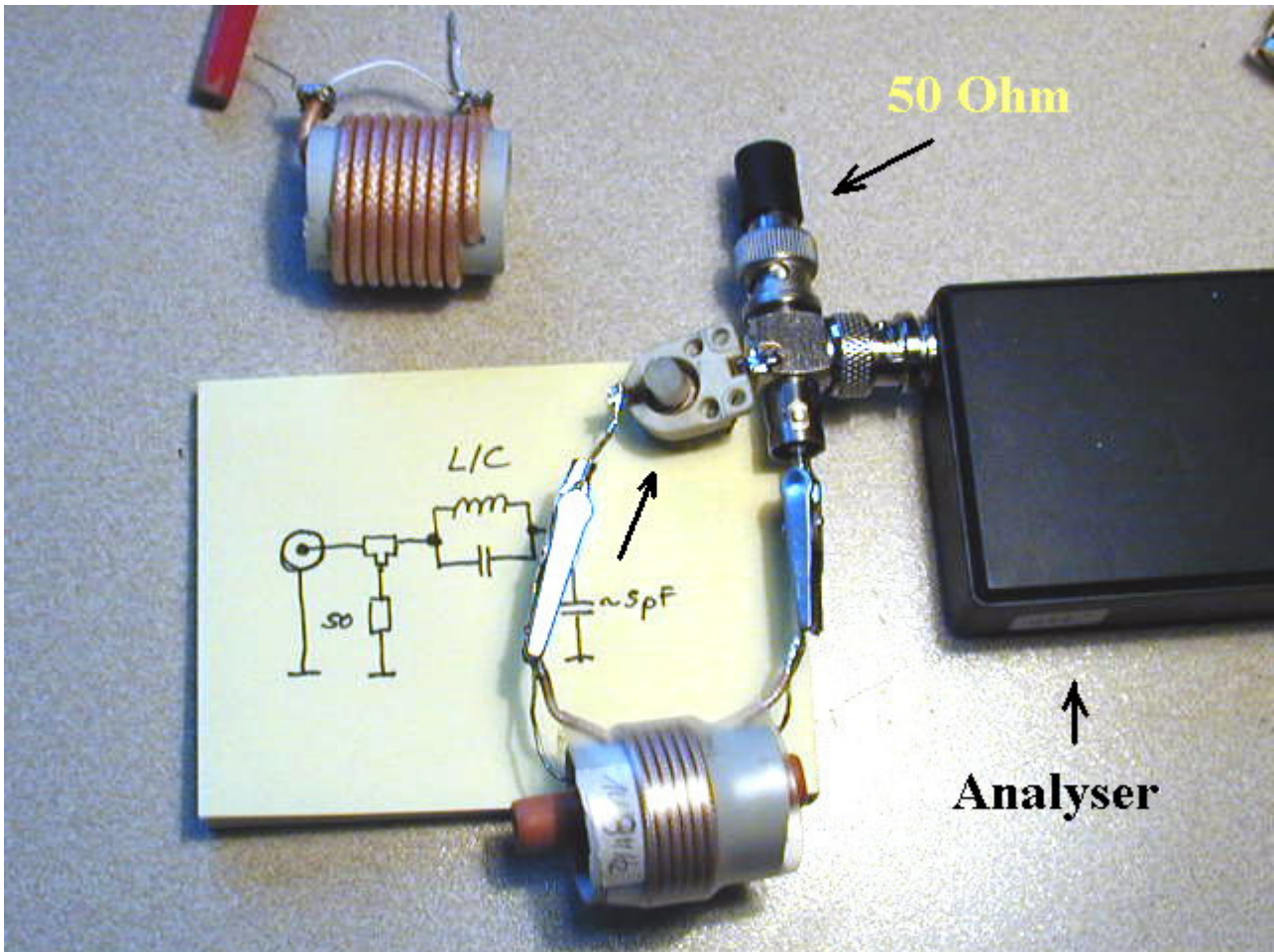
Trap measurement Set-Up:

Trap Q-Calculation:

Either use the 50 Ohm through-put or connect the inner wire to the third leg of the BNC-T and leave the shield open. Start the analyser, tick SWR and RL off, only activate the Phase. Allow both markers. Search for the resonance and zoom the frequency range. Then mark both the lower and upper frequency at 45 dgr Phase. Now you can calculate the Q as Q = Fres / (Fh – Fl), where Fh is the upper frequency at 45 dgr and Fl the lower one. Example: Fres = 14400 MHz

Calculated Q = 14400 / (14481.6 – 14312.0) = 84.9
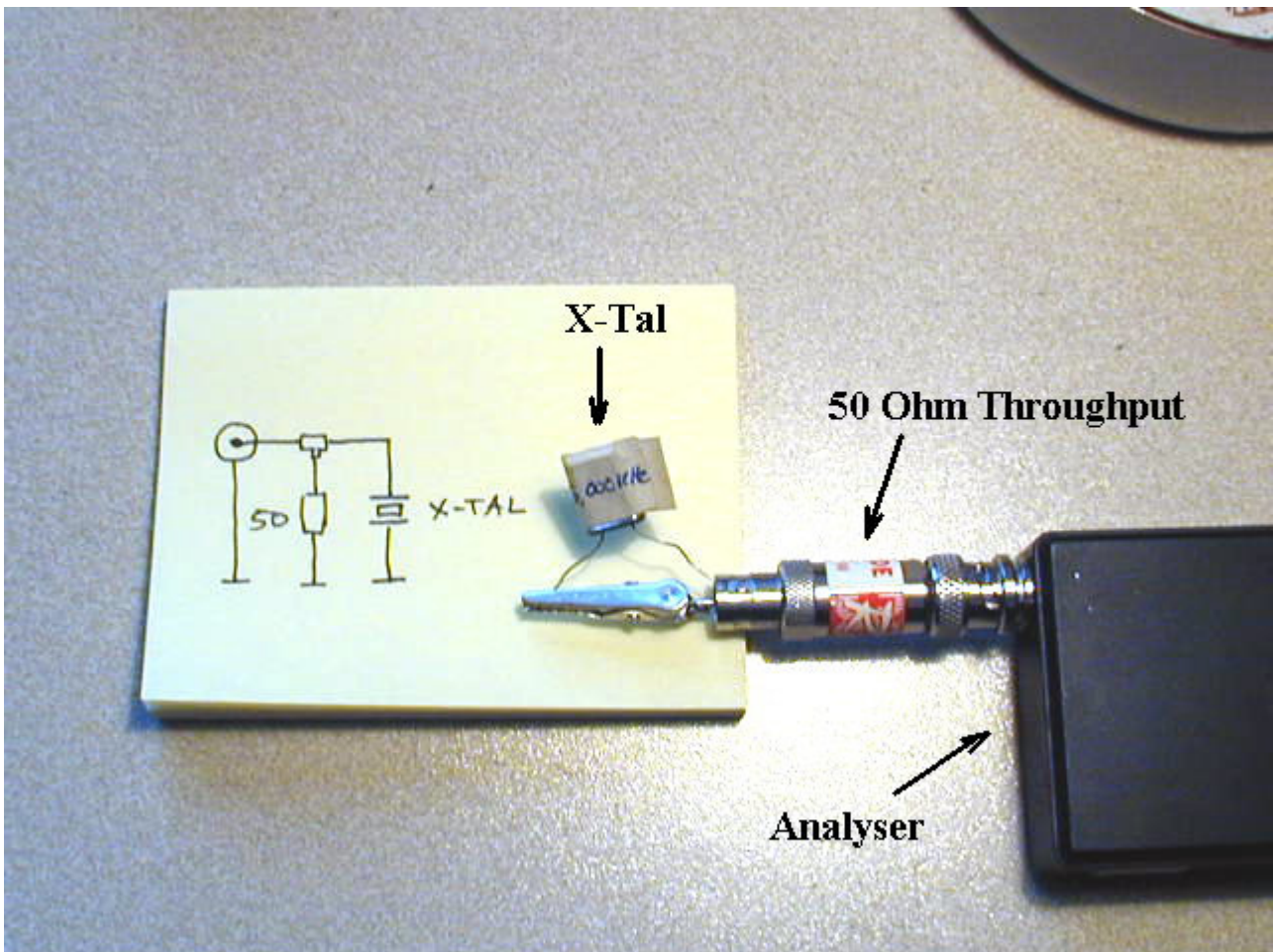
L-C parallel resonance measurement

Set up like below. Couple one end of the circuit with 2…5 pF to ground.

Important Note: Both described methods are sensitive to any stray capacitance.
A connector has already some 3 pF. A connecting wire adds some L. Also how you
position your set up will influence the resonance frequency and Q. Use shortest
possible wiring and keep away from metal.

Series resonance measurement (X-Tal)

Set-up as below with one leg of the X-Tal to Gnd. Start with the expected Fx and set the markers of the analyser +/- 100 KHz . Then zoom towards the resonance frequency. Calculation of Q like described above. Don`t wonder about the very high Q of X-Tals.

GERD (DO1MGK) 26/03/05

Pls mail your comment, suggestion or critic to gerkoetter@aol.com