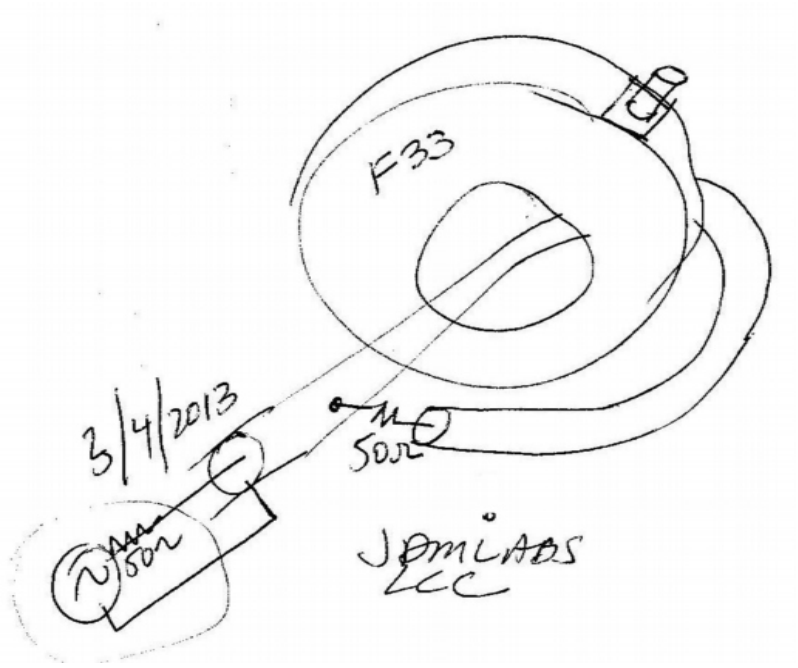
CURRENT PROBE COMPARISON : DIY vs. FCC 33-1 Below 100 MHz

Magnetic field source loop
(w/ 50 Ohm generator)

50 Ohm termination with
partial Electric Field shield.

Shown exciting Fischer
F-33-1 type probe.



Swept Response "0"
to 100 MHz
HP Tracking Generator
8444A.
HP Spectrum Analyzer
8553B-RF ,8552B-IF ,
141T display.

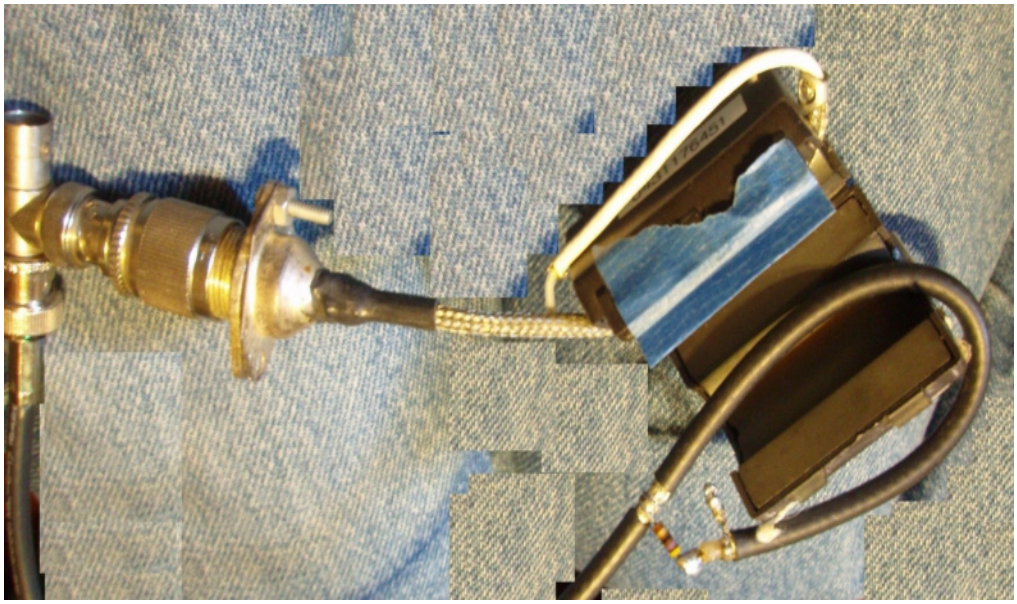
50 Ohm to 50 Ohm
ports coax transfer
function = O dB top
line of display

Fischer type F-31-1
-15 to -18 dB
32 mm ID
19mm long

CURRENT PROBE COMPARISON : DIY vs. FCC 33-1 Below 100 MHz

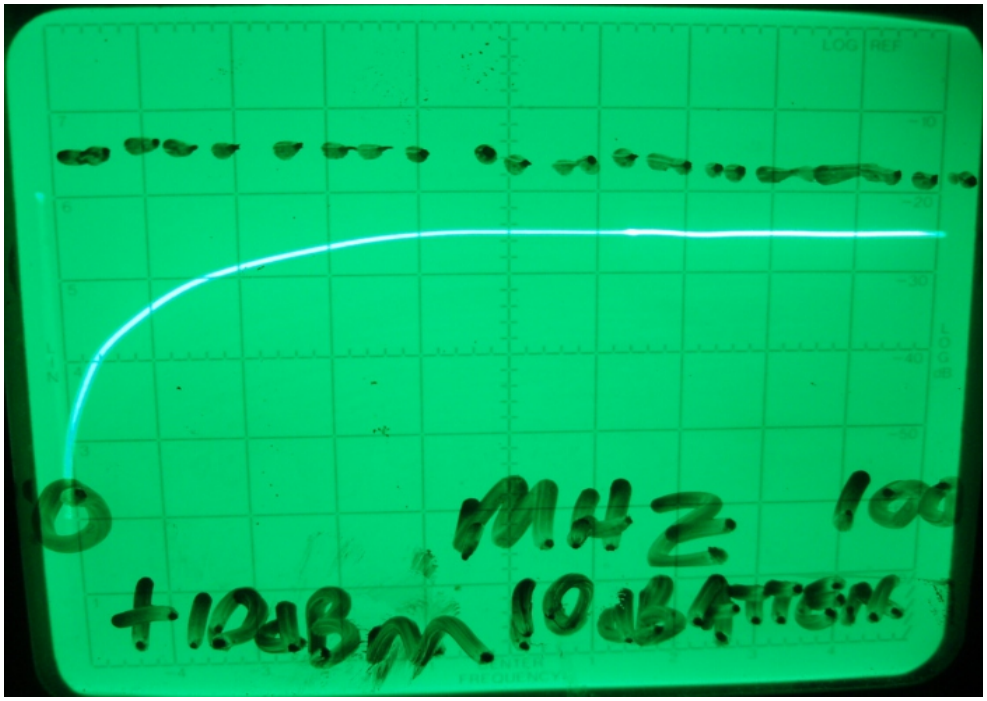
JDM LABS LLC DIY 1 turn coax shielded receiving loop (white Teflon & partial bare second braided over-shield).

Black Coax shielded 1 turn Source magnetic field loop.
DIY Clamp-on Ferrite coupler open .



Here open DIY ferrite clamp. NOT the condition when making a real measurement . Shows "stray" field coupling between the 2 large coax loops plus any enhancement from the ferrite structures.

Dash line = F-31-1 response , prior .



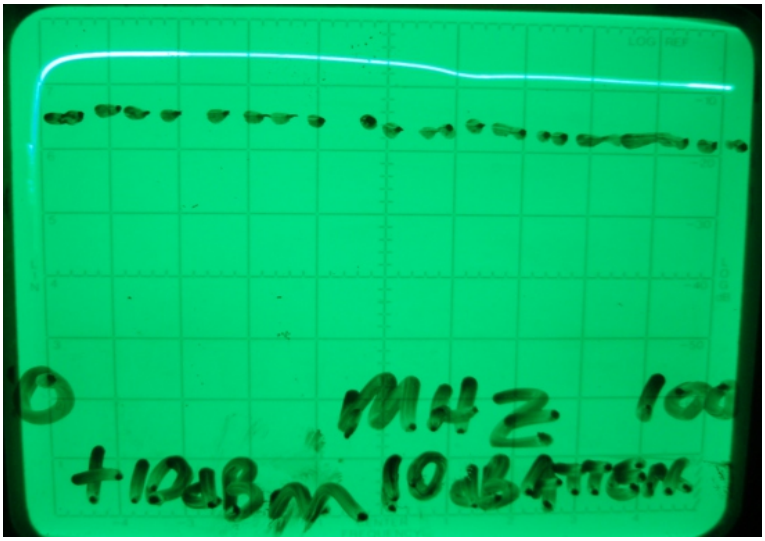
CURRENT PROBE COMPARISON : DIY vs. FCC 33-1 Below 100 MHz

DIY Ferrite clamp in closed configuration, for measurements.

Fair-Rite model 0431176451
Type 31 ferrite material
(digits 3 & 4 of number)
38 mm OD
18mm ID
45 mm long

DIY Current probe response in closed configuration
-5 to -9 dB
~2 to 100 MHz.

Dash line FCC 33-1 probe.



Thus DIY is roughly 10 dB more "sensitive" than the known calibrated FCC whose Zt is 16 dB-Ohms. Since V(out)dB = I(in)dB + Zt-dB-Ohms.
The DIY's Zt-dB-Ohms = 26 approximately.

Its a bit amazing that the DIY is significantly more sensitive, over a limited frequency range, with a single turn coil pickup inductor, compared to the $$ precision calibrated probe...
** But we'll take it ! All's fair in EMC. Particularly as the current probe is used to give an approximate worst case radiated emissions prediction, from just clamping on wires coming out of a sample … QED JDM