

Re: What's riding on my 60Hz AC? I want to find out

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Norm Dresner wrote:

- > *I want to be able to look at the HF content on my 60 Hz AC main*
- > *supply -- the first use is because I want to see exactly what*
- > *frequency a "wireless" intercom is using but I'd also like a general*
- > *capability for later.*
- >
- > *I first thought of using a small transformer to lower the voltage*
- > *down below the level of lethality (say 12.6v RMS) but I'm fairly sure*
- > *that the inductance in the primary of a transformer would suppress*
- > *any HF content; isn't this so?*
- >

It would be safe, but certainly the frequency response might not be even. There is only the primary stray inductance effective which would have less impact than the capacitance between layers of wire.

- > *Then I thought of using a capacitor and an inductor as a*
- > *frequency-variable AC voltage divider. Literally back of the napkin*
- > *calculations produced a design of a (roughly) 470 nF capacitor*
- > *feeding a 1 mH coil with the output taken from the junction of the*
- > *two.*
- > *Is this (a) feasible?*
- > *(b) reasonable?*
- > *(c) safe enough if I follow the Primary Rule of HV*
- > *Circuitry [*]*
- >

Bad idea, dangerous, should instantly blow your fault-current switch. look, the gnd-clip would hopefully only be on the zero volt line, but it could be also the life one. Then all your measuring gear will be life on the case, or rather the fuse will blow and your scope might be damaged.

So you need a differential measurement with 2 10:1-probes and the scope in differential A-B mode. Make sure the probes can carry the peak voltage and remove both gnd-clips.

You can take out your napkin again and calculate a simple high-pass

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consisting of a small capacitor (rated with sufficient V_{ac} -carrying capability) and a resistor, loaded with the probe impedance. This will attenuate the fundamental and the lower harmonics, so you can increase the gain to capture the RF more easily. If you switch to 1:1, you have to calculate again with the new impedance ($R_{in} || C_{in}$).

Be careful not to touch the life mains accidentally.

--

ciao Ban
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