Home mode Artificial Ground

This Artificial Ground has been designed by

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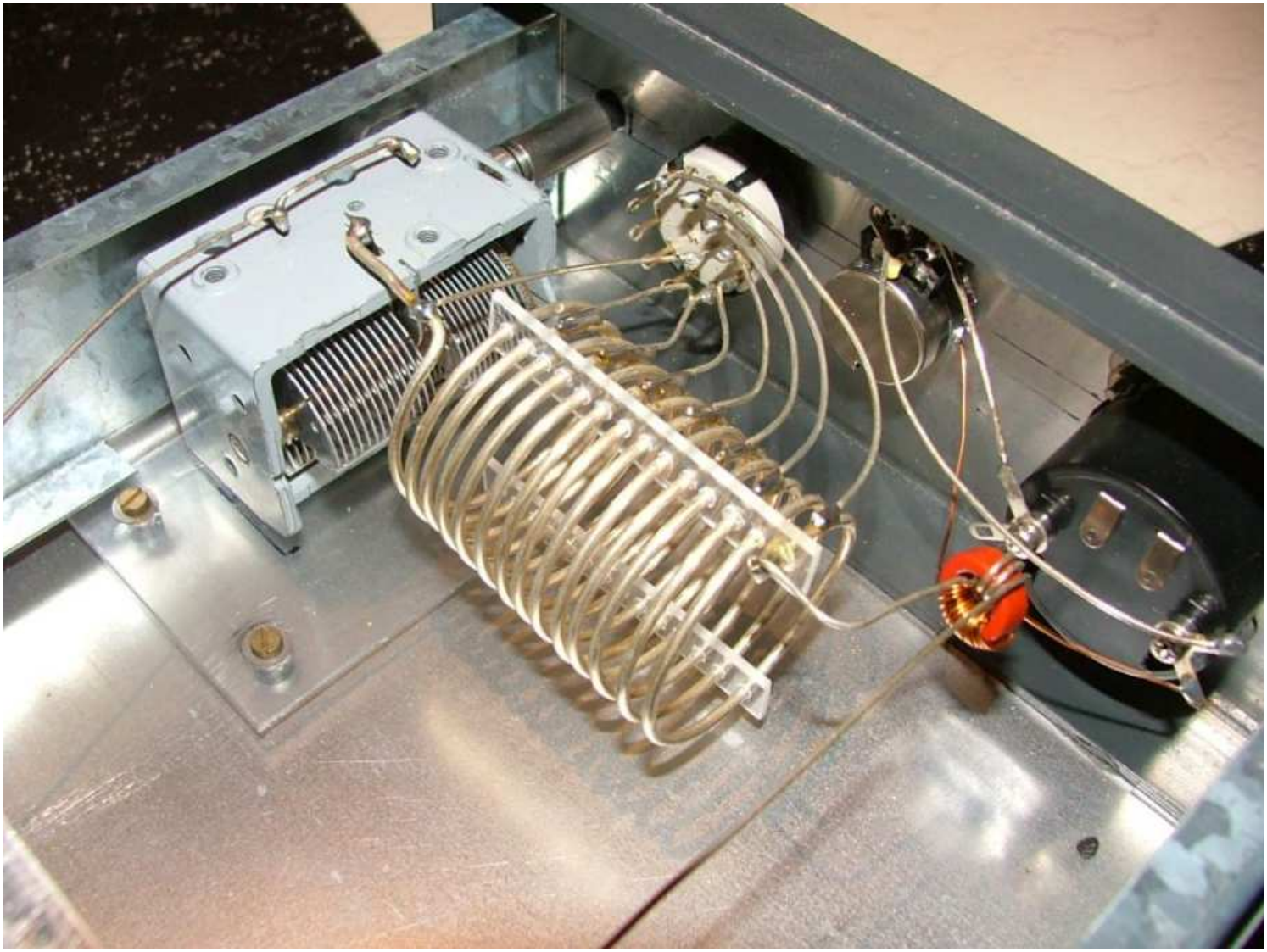
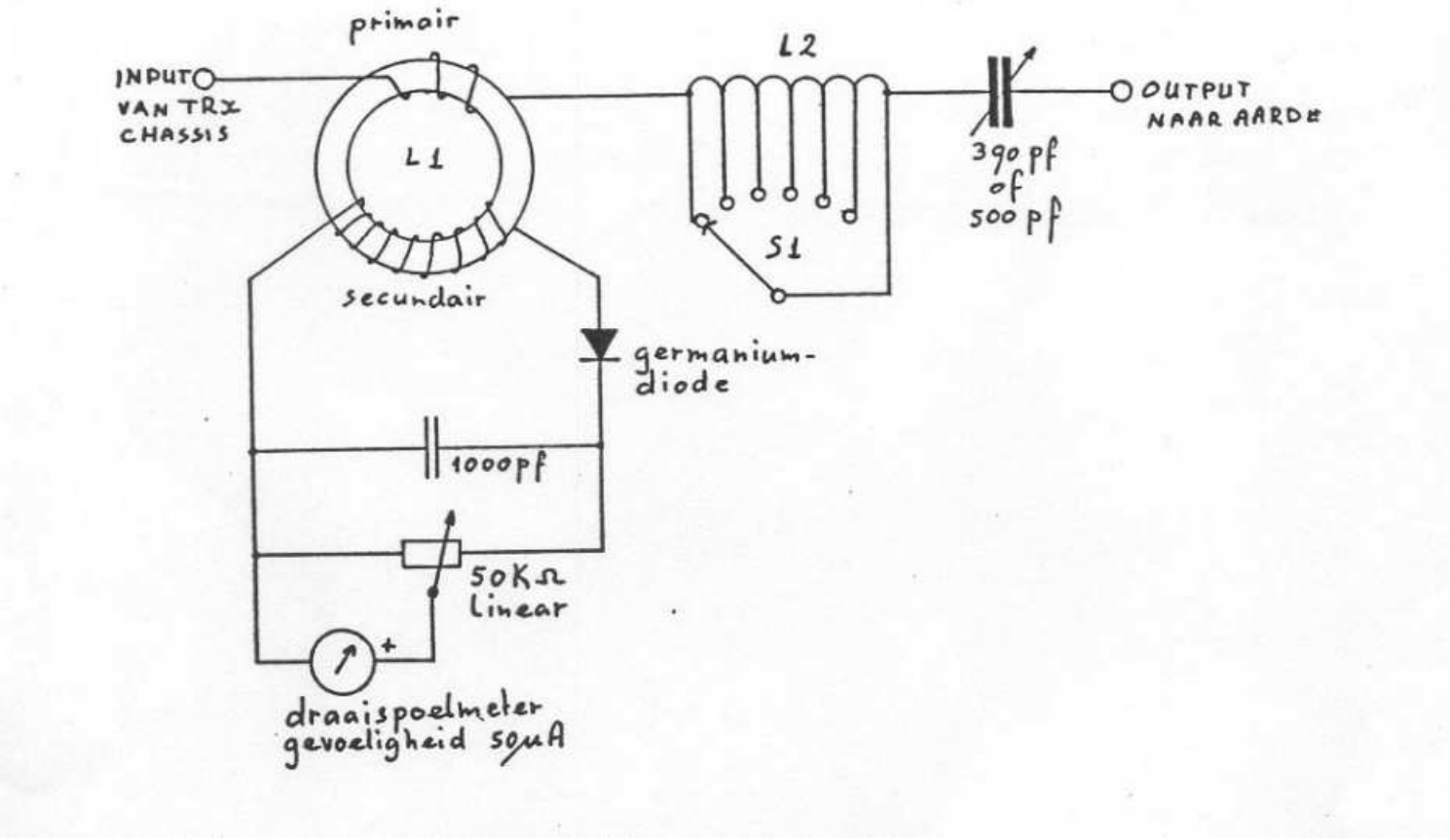
(Practical Wireless, October 1990)



Inside view of the homemade Artificial Ground

Frontside of the Artificial Ground device



Schematics of the Artificial Ground

L1 primary = 2 turns on Amidon T50-2, you may use the same wire as for L2

L1 secondary = 12 turns, 0,5 mm wire

L2 = 12 turns, 2 mm wire, with a coil diameter of 37 mm

Isolated (!) variable capacitor = between 390 and 500 pF

In QST March 2004 I did read an interesting article about grounding and the "artificial ground" device.

David asks:

I recently moved my ham shack from the basement of my house to the second floor. My question has to do with the grounding of my station equipment. I've been told that I should ground my equipment. Other than a good ground at the electrical plug (I checked it and it is good). I can run a ground line to a stake (copper clad) driven into the ground. I was also told that the line running to the ground rod should not be resonant at any frequency that I plan to use. With my current rig, I operate from 70 cm to 80 meters and may add 160 meters, too. What would be the easiest way to calculate a safe length for my ground line or what would you suggest?

Answer from QST Workbench:

I assume that when you say that you checked the ground at the electrical plug and that it was good, you're refering to the dc ground. Unfortunately, this has nothing to do with a good RF ground, except at very low frequencies. That plug ground will probably be useless as an RF ground on the HF bands. At the very least, however, it could be effective as an ac ground for the station and can be used for that purpose. It will not be a good lightning ground, however, and it shouldn't be relied upon for that purpose. For lightning (if that's a problem at your location), the shortest direct path to ground, outside the house, using an 8 to 10 foot ground rod with at least 10 gauge wire from either the coax shield or an arc arrester is to be preferred. This can also serve as an effective dc ground for the station. Keep the wire gauge large and the run short.

A good RF ground would require the lead to be short relative to a wavelength - generally less that 1/4 wavelength at the highest frequency of interest. As a rule, it is best to keep ground leads as short as possible with a minimum of bends in the wire. It's also advisable to use a wide, flat braid for a ground wire, as the RF tends to travel on the outside of the conductor (the "skin effect").

As a practical matter, accomplishing a good RF ground is difficult at best, especially on the second floor. The good news, however, is that most installations do not necessarily require one. If you have a well balanced antenna/feed line system, you're probably okay.

If you use a wire antenna and you do have a relatively poor RF counterpoise or ground system, you might look into at "artificial ground". This can successfully resonate a random length ground wire and make the station "see" an effective counterpoise. These can work well, although every situation is unique, and it would have to be evaluated for your particular RF environment.

The bottom line: I suggest running the shortest ground lead that is pratical for your station and keeping bends to a minimum. Make sure the station is at least at dc ground potential (ground all the equipment chassis to a common point and then to a good dc ground) and keep the lightning ground outside the house. If you're using a wire antenna and you're plagued with a poor RF counterpoise, try using the "artificial ground" device.

(Thanks QST/ARRL "The Doctor", www.arrl.org/tis/, doctor@arrl.org)

With thanks to the designer

Colyn Baillie-Searle GD4EIP!

Main menu (mainly Dutch language)

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