

A remote sensing radiated signal indicator

Knowing how much signal you are radiating can be crucial to getting the best out of your amateur station. This article describes a simple accessory that could be useful if you find that you need to make constant adjustments to antenna tuning during normal operation.

As a user of a small loop antenna for the HF bands I've had to respond to the need for constant retuning whenever even a small change of frequency is required. That said, I find that the advantages of the loop far outweigh the principal disadvantage (i.e. the extremely narrow bandwidth). The loop (which is mounted in the loft and in the horizontal plane) has an exceptionally low angle of radiation, is extremely compact (around 3 feet in diameter), generates no discernible RFI/TVI, and is virtually impervious to noise.

However, rather than rely on SWR and RF power indicators in the shack (which often seem to be affected by local RF fields and particularly those around antenna cables) I decided to improve the situation by sensing the RF field strength at a remote point some distance away from the radiating loop, displaying the relative strength of the radiated signal on a meter at my operating position. The complete circuit of the remote sensing radiated signal indicator (RSRI) is shown in Figure 1.

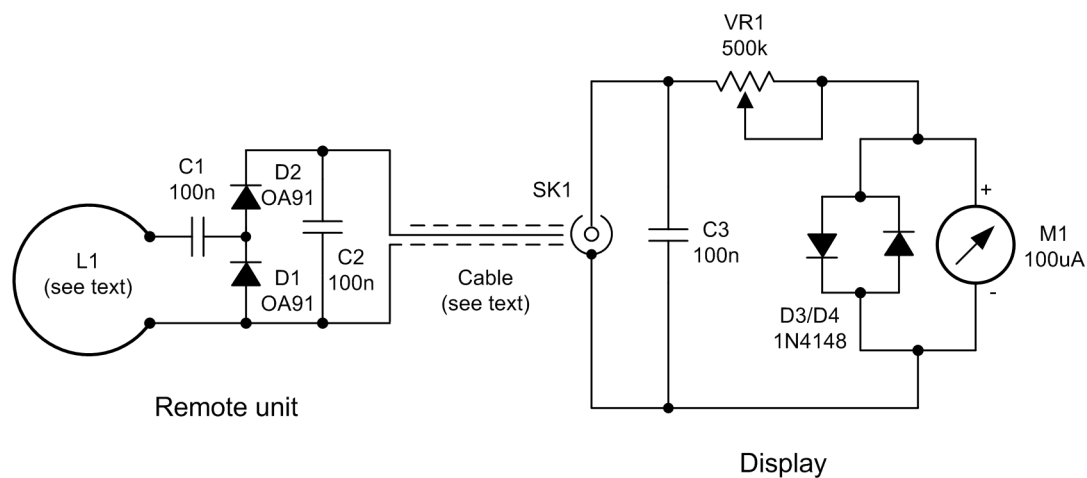


Figure 1 Complete circuit of the remote sensing radiated signal indicator (RSRSI)

The pick-up device consists of a loop of heavy-gauge wire which, in my case, is mounted about 12 feet from the radiating loop and in the same plane. The dimensions of the loop are uncritical (the loop itself is not resonant) and satisfactory results can be obtained over a wide frequency range (from 3.5 MHz to 146 MHz) with a loop of only around 1 ft. in diameter. Note that the unit works well with other types of antenna and is capable of providing useful indications on all HF and VHF bands.

The remote sensing unit (see Figure 1) is mounted on the loop and will need a waterproof enclosure if the loop is to be mounted outdoors. The connecting cable can be almost any type of cable (including bell wire and twisted pair) but I found this to be an ideal application for a length of 75 ohm TV coax purchased for a bargain price at the last HARC Junk Sale! Note that the appreciable shunt capacitance of the cable (about 120 p per foot) helps to eliminate stray RF that may otherwise be picked up along the cable run.

Construction is non-critical and near component values can be substituted if you don't have the right values in your junk box. To minimise construction costs I made use of a surplus parallel printer switch box which turned out to be perfect to accommodate the meter and sensitivity control (see Figure 2).

In use, simply adjust the sensitivity control (VR1) to provide a reasonable indication for the band, mode and power that you are using. Then adjust your antenna tuning controls for maximum radiated signal. It's as simple as that!



Figure 2 The finished RSRI built into a surplus parallel printer switch box

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