

A Wireless (Remote) Antenna Switch

By VA3DDN

Like most other amateurs, I have one main operating position proudly referred to as “the Shack”, which is located in a corner of my basement. However, I spend a lot of time in the kitchen on the main floor, and found it convenient to set up a secondary operating location there for my VHF and UHF transceivers.

At first I used small antennas set up near the kitchen until it occurred to me that it would be better to “split” the feed lines for my existing outside antennas, for use either in the main “shack” or in my “kitchen shack”.

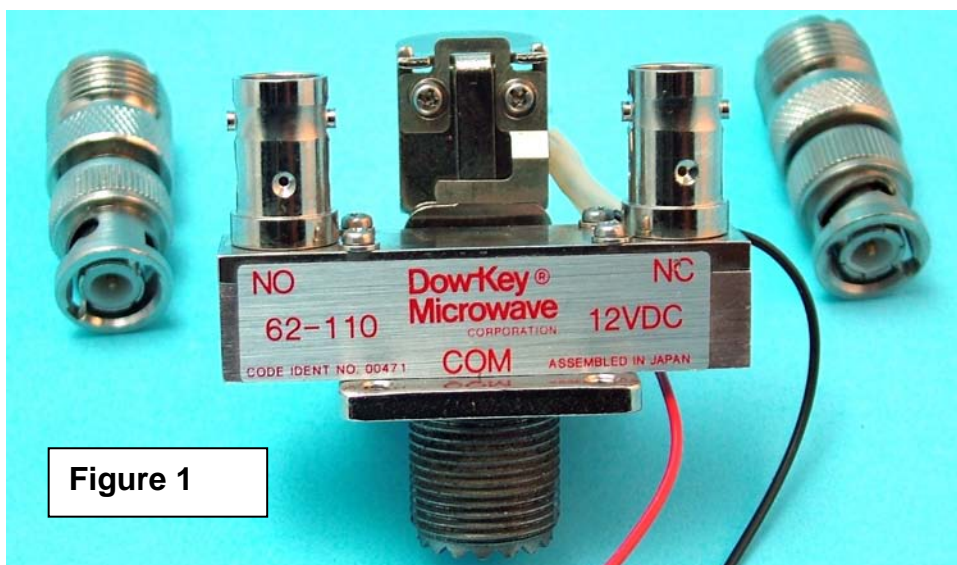
My first attempt used several common Daiwa CS-201, 2-port coaxial switches, mounted in the basement shack location, one to switch the 220 antenna and the other to switch a dual-band 144/440 antenna, both of which are located a good

I wired these manual switches so that one position, connects the outside antennas to the basement rigs, and the other position diverts the antennas to the kitchen. This approach was simple, but in order to use the kitchen position, I had to run downstairs and throw the Daiwa switches, and then remember to switch them back! What I needed was a means of doing this by remote control.

I searched for another solution and came across a surprising variety of single-pole, double-throw (SPDT) coaxial relays, on eBay for a reasonable prices. .

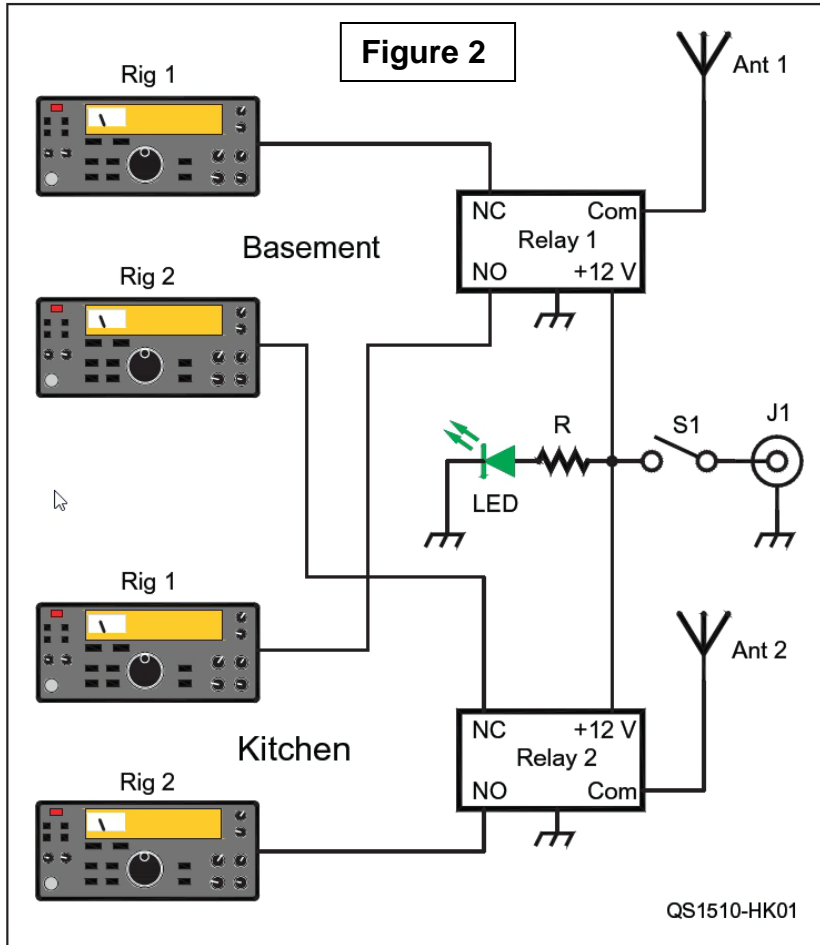
Eventually, I found a coaxial relay that can be switched electrically, can operate at VHF and UHF frequencies, and can handle the 50 watt output of my rigs.

I ordered two of the Dow-Key Microwave 62-110 relays, which will operate from low HF frequencies to 1 Ghz at up to 150 W. The particular switches I ordered, had an SO-239 as the common connector and BNC females as the normally open (NO) and normally closed (NC) contacts. (.see Figure 1)



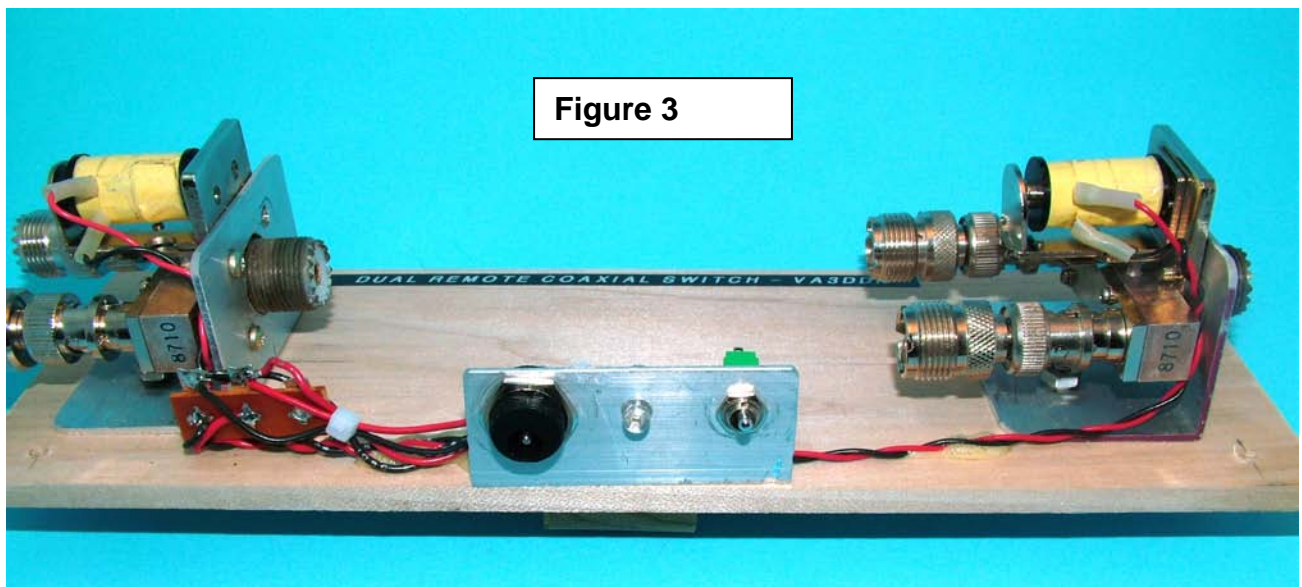
This was not a problem as I simply added 2 RF adapters, to convert the BNC females to SO-239. These coaxial relays operate on 12 Vdc and consume only 170 mA each (a total of 340 mA) when activated.

Figure 2 below is a simplified block diagram of my coaxial antenna switch assembly, with 2 of the Dow-Key coaxial relays, one for each antenna. The common (COM) connector of one relay is connected to the 220 MHz antenna and the common of the other to the dual-band antenna. The NC output of each relay is connected to the basement rigs, and the NO outputs are connected to the kitchen rigs. The LED in fig 2 can be any you have available: Size resistor R to match the particular LED you use.



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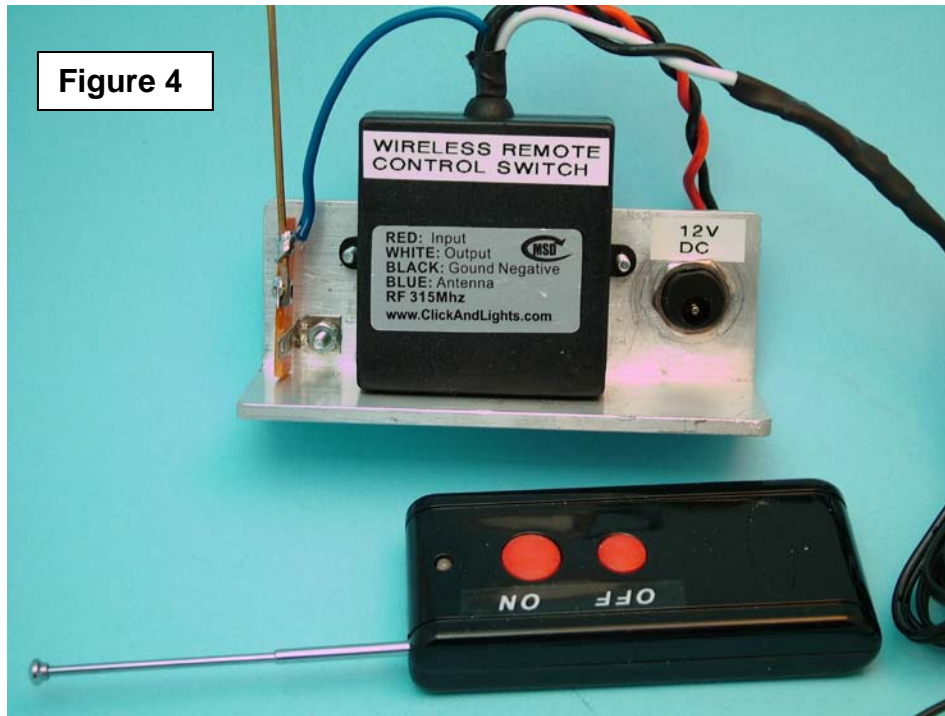
Figure 3 shows the 2 relays mounted on a 3 1/2 x 10 inch piece of wood. I connected the coils in parallel and fed them with 12 V dc from an ac to dc adapter (wall wart) that had a 0.5 amp capacity. The panel in the center has the dc power jack (J1), a relay "on" LED and an ON-OFF switch for manual control.



The remote control aspect of the design uses a wireless remote switch to control the relays. These wireless switches come in ac and dc versions. AC switch examples are the Woods 32555, Globe 78901, or SVAT WRC101. The wireless dc switch I used was the clickandlights.com RS101. There are many other versions of both available.

The ac version is the simplest to install. You just have to plug the wireless switch into any ac outlet and then the wall wart or other dc power supply into the switch. Using the wireless remote control you can turn the relays on or off as necessary.

The dc option is a little more involved, requiring you to solder the wireless switch module's input connections to the 12 V power supply's output and the switch module's output to a dc power plug (P1) to match relay connector (J1). The RS101 wireless dc switch has five wire pigtails (see **Figure 4**), Two of which are the 12 V input, (red and black), two are the switched dc output (white and black), and one for connection to a short antenna (blue).



Another point to consider is that some wireless switches are toggle types with only one button on the wireless remote control, that is, when the switch is off, pressing the button will turn it on; if the switch is on, pressing the button will turn it off. Others have separate ON and OFF buttons. I prefer this type because you can press the OFF button anytime you forget the state of the switches.

Note that if you want to forgo the wireless control option, you can add an optional second switch (S2) to provide hardwired remote operation. When using this option, S1 and S2 need to be SPDT switches wired in a three-way* configuration.

I have found the remote operation to be quite reliable over more than 3 months of use. I have also found the control range distance to be more than adequate at my location with about 30 ft of horizontal separation, and main floor to basement with mainly wood construction.

Additional Information:

