

## ONE FROM ACROSS THE POND:

# The G5RV Multiband Antenna

It seems that the easy-to-build antenna designs available to us are almost always one-band antennas. They usually work quite well on the band for which they are designed, and not as well (sometimes poorly) on other bands.

It is exciting, then, to find an antenna design which is simple to construct and yet gives good performance on a number of bands. Just such an antenna is the G5RV antenna, developed by a British amateur radio operator with the call sign of, you guessed it, "G5RV."

For use in transmitting and receiving on the shortwave ham bands (80, 40, 20, 15, and 10 meters), the G5RV has long been a respected antenna. Less well known is the fact that it does quite a decent job as a receive-only antenna on the shortwave broadcast bands too. I say this because I have used one for both purposes in my station and obtained good results with the antenna in both applications.

So, if you want one antenna which will serve you well on the ham bands, and also give a good account of itself when monitoring shortwave broadcasts, read on: the G5RV may be just what you are looking for.

### LET'S BUILD ONE:

To build this antenna, you will need about 104 feet of antenna wire, 30 feet, 4 inches of 300-ohm twinlead TV-type lead-in cable, three antenna insulators, and enough low impedance (50 to 75 ohms) coaxial cable to run between the antenna and your shack. One end of the coax will need to have a plug which fits the antenna socket on your rig. You will also need incidentals like guy ropes, black plastic electrical tape, and coax-type sealer.

Here are the steps in building the G5RV.

1. Cut two pieces of antenna wire each to 51 feet, 6 inches in length. These will be the radiating portion of the antenna.
2. Slip insulators onto each end of one of the wires just prepared. Pull the wire through the insulator only enough to make the overall length of the wire equal to 51 feet once the insulators are fully attached (see Figure 1).

Next, using a knife edge, prepare the wire for soldering by scraping both the ends of the wire and the body of the wire at the places where the wire will wrap around itself as shown in Figure 1. The wire must be scraped bright so you can solder

the wire to itself to hold the wire on the insulator. When the scraping is finished, wrap the ends around the body of the wire as shown in Figure 1, and solder the wrapped portion in place.

3. Next, take the second piece of antenna wire which you prepared in step 1, and scrape both its ends as you did for the wire in step 2.
4. Put the remaining insulator on the other end of this second piece of wire. The length of this second piece of wire, once the insulators are installed, should equal 51 feet, the same as the length of the first piece you worked with.
5. Now cut the 300-ohm twinlead to a length of 30 feet, 4 inches. Trim the insulation from two inches at each end of this cable.
6. Take one end of the twinlead and wrap one of its conductors around the soldered connection on one side of the center insulator which attaches the two 51 foot antenna elements together (see Figure 1). Solder this conductor in place. Then similarly wrap and solder the other twinlead conductor at this same end of the twinlead to the soldered connection on the other side of the center insulator.

7. Now prepare the coax by stripping off the outer insulating jacket off one end for about two inches. Then undo the braid of the coax from around the center insulation, and twist it into one thick strand, as shown in Figure 1. Remove the center insulation of the coax from the center conductor of the coax for about one inch.

8. Attach and solder the center conductor of the coax to one conductor of the unattached end of the twinlead cable. Attach and solder the other twinlead conductor to the thick strand of coax shield (see Figure 1).

9. Now use black plastic tape to tape the connection between the coax and the twinlead so that there will be no

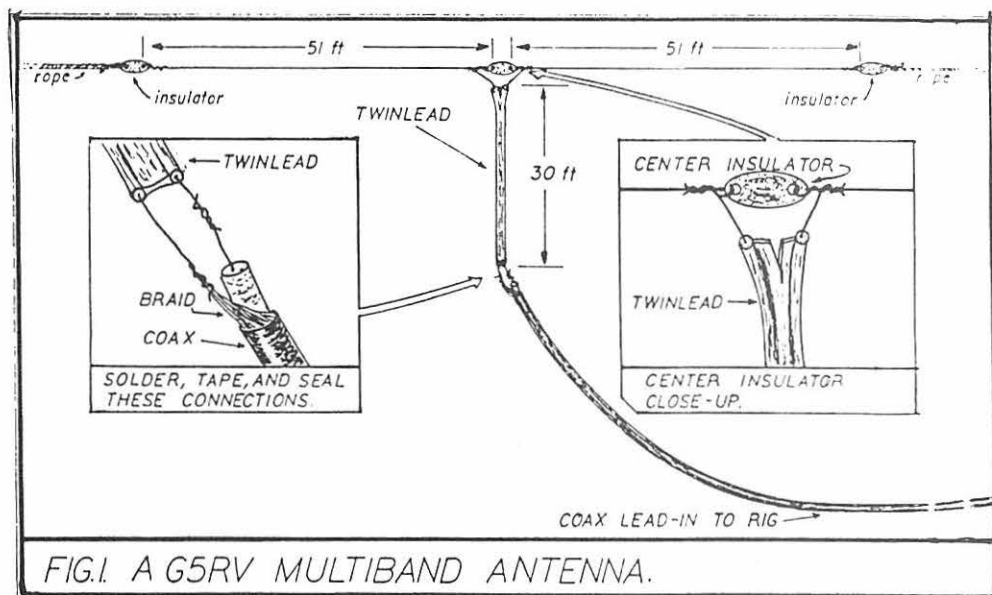


FIG. 1. A G5RV MULTIBAND ANTENNA.

touching of wires that should not touch each other. Also make the taping as watertight as possible.

10. Cover the taped section with coax-type seal to prevent moisture from entering the connections.
11. If you live in lightning country, don't forget lightning protection. The minimum is to never use the antenna during stormy weather, and disconnecting and grounding the antenna when it is not in use.
12. Now you can connect the connector end of the coax to your rig and enjoy some G5RV communications.

## RADIO RIDDLES

**Last Month:** Last month I reminded you that recently this column had reference to "romantic antennas," (the rhombic antenna which is constructed of two "mouth-to-mouth" V antennas). And we've all heard of "active" antennas, haven't we? Then last month we discovered "lazy" antennas. So, noting that antennas possess these human traits, I asked you to guess "just how human an antenna can get?"

Well, as surprising as it may seem, an antenna can be totally human. That is, an antenna can be a human! Better said, a human can be an antenna. Of course, anyone who tinkers with the innards of a radio soon finds that they can disconnect a radio's antenna, touch a finger to the antenna connection inside the set, and hear signals as their body, connected to the set via their finger contact, serves as an antenna. But I'm not talking about just that.

Did you know that serious research has been done on the use of the human body as an antenna? For instance, Rudge et al<sup>1</sup> report work which indicates that: "...In the range of 30-80 MHz, the human body behaves in a manner similar to a lossy dielectric cylinder. Suitably fed, it can act as a moderately efficient radiator..." They then show a graph of "man as antenna, relative gain of base-fed man compared to base-fed whips."

The gain of such a "base-fed man" ranges from around -9 dB at 30 MHz to 0 dB at 80 MHz. How about it folks, anyone want a career in communications as an antenna? Of

course, watch where you put your finger. One wrong move and you could be a dead human antenna.

**This Month:** Well, I was surprised when I read the reference on the study of "man as a base-fed antenna." But then I got to thinking, and realized that radio is a very human endeavor indeed. That is, various other radio functions, other than the antenna function, can be served by various parts of the human body.

Next month I will report to you some amazing, even shocking (pardon the pun) applications of the human body to serve as parts of a radio communication system. And these are applications which have been tried, have worked, and been reported in the radio literature.

So tune in next month for some surprises. Till then, Peace, DX and 73.



<sup>1</sup>The Handbook of Antenna Design: V. 2, A. W. Rudge, K. Milne, A.D. Oliver, P. Knight. 1983, London, Peter Peregrinus Ltd. on behalf of the Institution of Electrical Engineers. Pp 824.

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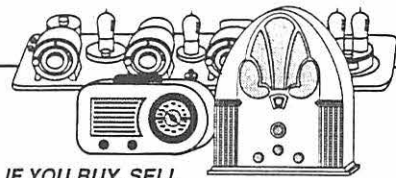
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