

By Phil Salas, AD5X

A Simple HF-Portable Antenna

Tired of dragging that bulky old antenna tuner along on your vacation jaunts? Spare your suitcase and your pocketbook because this simple multiband wire antenna will get you on the air in a jiffy—with no extra gear required.

Every summer my wife (N5UPT), my daughter (AC5NF) and I spend about a week on Mustang Island off the coast of Corpus Christi, Texas. I always enjoy operating HF-portable when on vacation, and because Mustang Island is also known as IOTA NA092 (Islands On The Air, North American island number 92), getting on the air is even more fun! In case you're imagining typical DXpedition fare, you should know right from the start that we don't exactly rough it on Mustang Island. In fact, we always stay in a condo, which I request to be "the highest one available."

My first portable rig was a Kenwood TS-50, followed by an MFJ-9420 (see May 1999 *QST*). Last year I went deluxe and upgraded to an ICOM IC-706MKII. That little rig works dc to light—all bands and all modes, with goodies to boot. It is an excellent choice for almost any type of portable operation.

I've experimented with several types of antennas on these outings—including Hamstick mobile whips, resonant dipoles and random-length wire dipoles fed through a tuner. I prefer resonant antennas so I don't have to worry about transporting and storing an antenna tuner. Of course, multiple dipoles or a handful of Hamsticks can take up a lot of room.

Last summer I used the multiband dipole described here with excellent results. If you're interested in a simple multiband wire that's easy to build and pack away, give this antenna a try.

The basic antenna covers all bands from 20-10 meters. You could increase its coverage, but the dimensions of a typical condo balcony seem to limit the lower frequency to 20 meters or so. If your operating site is larger, feel free to scale the antenna appropriately.

Basically, the antenna started as a full-size 20-meter di-

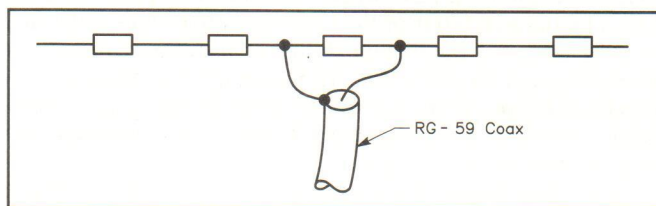


Figure 1—The concept began with a full-size dipole antenna that I "broke up" with small insulators.

pole. I then inserted small in-line insulators to allow for multi-band operation as shown in Figure 1.

The insulators are $\frac{3}{8}$ -inch (diameter) by one-inch nylon spacers that can be found at most hardware stores. Each spacer is used as a "band switch" by drilling a small hole in each end and threading a short length of #14 bare wire (house wire) through each end, and attaching a short piece of wire terminated in an alligator clip. The clip, shown in Figure 2, is available at RadioShack stores (ask for part number 270-380).

I used #24 insulated wire for the dipole elements because it's lightweight and flexible. Obviously, any type of wire is fine. Use whatever you have on hand. The best way to determine the various segment lengths is to calculate the individual dipole lengths using:

$$L \text{ (feet)} = 468/\text{freq (MHz)}$$

Tack solder the wire sections to the insulators, attach a feed line (RG-59 coax will do) and hang the dipole in a convenient place where it's easy to work on and adjust. Although the SWR meter method will work, to adjust the multiband dipole prop-



The entire antenna can be collapsed to a size that fits in the palm of your hand!

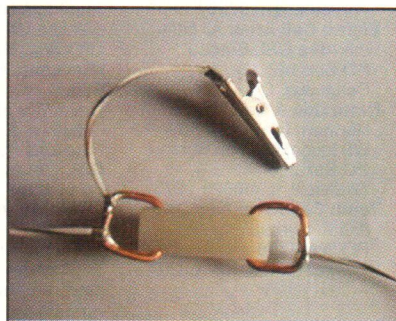


Figure 2— The band switches are constructed from nylon spacers, some wire and an alligator clip.

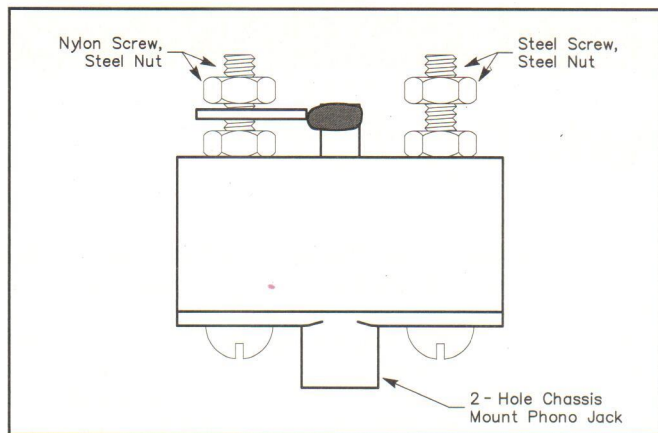
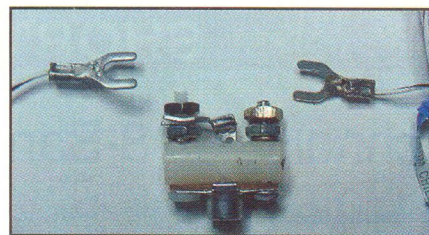
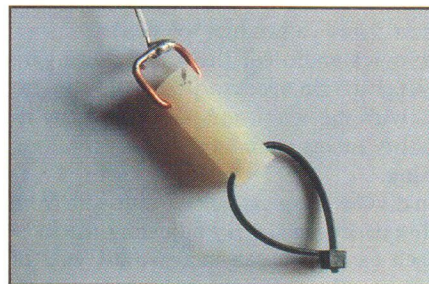


Figure 3 — I used an extra nylon spacer for the center insulator. I drilled the ends and attached a chassis-mount phono jack as shown. The nylon screw is used on one side to make sure that the phono jack's center conductor doesn't short to ground. I soldered #4 spade lugs to the inside ends of the 10-meter dipole elements so the dipole can be easily attached (and detached) to the center insulator. Feel free to use other center insulator designs as desired.



A photograph of my version of the center insulator.



My design for the end insulator.

erly, beg, borrow or buy an antenna analyzer.

First, "unclip" all of the alligator clips and adjust the inner wire segments for the lowest SWR on your favorite part of the 10-meter band. The wires should be a bit long, so unsolder them on one end and trim them as follows:

New length = Original length \times Measured low-SWR Frequency/Desired low-SWR frequency

Next, clip (attach) the inner pair of alligator clips and adjust the next segment for resonance on 12 meters using the formula and steps described previously. Continue this procedure for 15, 17 and 20 meters.

I know—you're adjusting your antenna low to the ground and your particular portable mounting location will undoubtedly vary. For our purposes it really doesn't matter. Most modern rigs can put out full power into a 2:1 SWR, so reasonable location-based SWR variations probably won't affect your rig's operation. If the SWR is really high, something's drastically wrong or you have the alligator clips set up for operation on the wrong band, etc. Incidentally, you can use a balun if you want to. I normally don't worry about feed line transformers when operating portable.

The antenna leg lengths I wound up with are shown below:

- 10 meters: 8 feet 3 inches on each side
- 12-10 meters: 10 inches on each side
- 15-12 meters: 1 foot 4 inches on each side
- 17-15 meters: 1 foot 8 inches on each side

20-17 meters: 3 feet 9 inches on each side

Each side is a total of 15 feet, 10 inches, for a total of 31 feet, 8 inches for the entire antenna.

Finally, if you want to electrically "shorten" your antenna, make the clip lead wires a little longer and wrap the excess wire around the insulators to make loading coils.

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Conclusion

If you need a simple portable antenna, spend an hour or two assembling this one. It's simple, cheap and a good performer. Simply adjust the clip leads for the desired frequency band and you're on the air—no tuner required! Sure, you have to make a quick trip to the balcony (or whatever) to change bands...but this is a vacation-oriented design, after all!