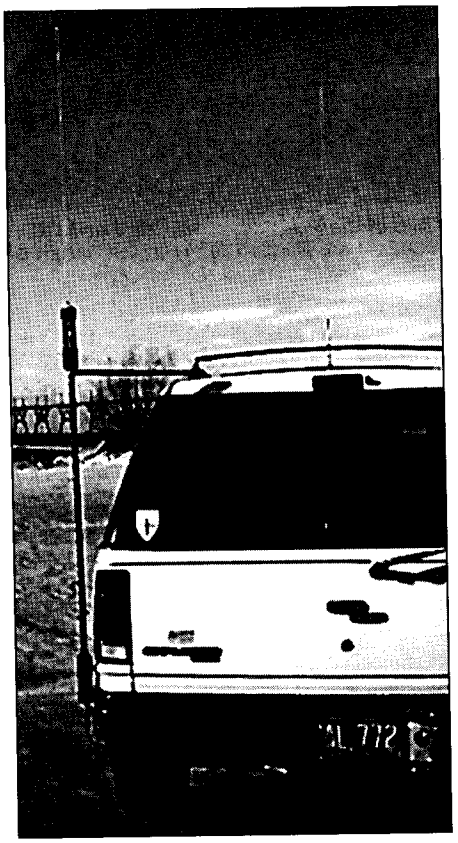
By Frank W. King, KM4IE

# A $20 HF Mobile Antenna

## A few hours of fun with PVC and wire and you've got yourself a respectable road radiator!



**Ready for the road! A length of 1/2-inch-diameter PVC pipe fastened to the vehicle's roof rack and antenna acts as a stabilizer.**

While returning home from a brief business trip one evening, I was listening to the chatter on a 2-meter repeater. As one ham extolled the virtues of a new generation of diminutive HF transceivers, several others lamented the expense of good antennas for the HF bands and 2 meters. I operate HF and VHF mobile every day. On VHF, I use a roof-rack-mounted 5/8-λ commercial mobile antenna that retails for $14.95. On the HF bands, a bumper-mounted "homebrew" antenna—that costs about the same as the VHF antenna—added the bonus of a fun day at the workbench!

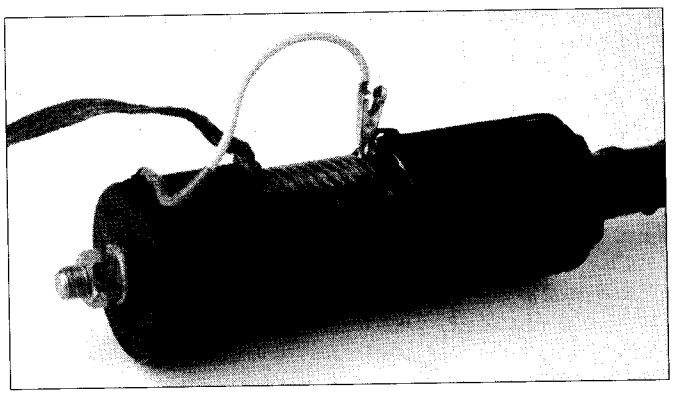
My HF antenna is a "bug-catcher" style vertical that has netted me CW and phone contacts worldwide using my ICOM IC-706MkII. The antenna consists of little more than some PVC pipe topped by a RadioShack replacement whip antenna and a couple of coils made from a small roll of #14 house wire. The beauty of this antenna lies not only in its under-$20 price tag, but also in its simplicity and ease of tuning. The antenna can be built for a wide range of frequencies; finding a good match and low SWR is no more complicated than moving two taps, one on the loading coil and one on the matching coil.

My current version of this antenna operates on 20 through 6 meters with an SWR of 1.5:1 or less in any segment of each band. The antenna is quite broadband even in a one-tap setup. One real joy of building this antenna is that because it's fully adjustable, construction dimensions are completely noncritical! How much easier could an antenna be?

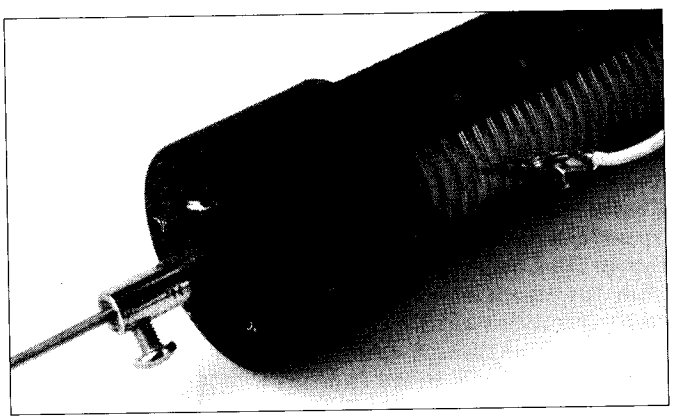
### Construction

A trip to your local hardware store or do-it-yourself outlet and RadioShack should equip you with the majority, if not all, of the parts required; see the **Materials List.** You'll need three pieces of schedule 40 PVC pipe. One piece is a three-foot-long section of 1/2-inch pipe that forms the antenna shaft (center). For the loading and matching-section coil forms, I use 1 1/4-inch-diameter pipe so the antenna can be mounted reasonably close to the vehicle. The loading coil at the top of the antenna is a piece of 1 1/4-inch pipe roughly 6 inches long. The third piece of PVC is a 4-inch length of 1 1/4-inch pipe used for the matching-coil form at the bottom of the antenna.

Refer to the accompanying photographs during the following discussion. Use a belt sander or a file to make a flat about 5/8 inch wide along the length of each of the two 1 1/4-inch coil forms. The flats provide room beneath the coil windings for attaching clip-lead taps. Each coil form has a PVC end



**Close-up view of the matching coil. To the left is the 3/8-24 mounting bolt. Attached to the bottom turn of the coil is a length of shield braid used as a ground strap. A small area of the PVC pipe OD is ground flat to provide room between the coil turns and the pipe form for an alligator-clip tap to firmly grasp a wire turn without interference.**



**The loading coil resembles the matching coil except it has a greater number of turns. A RadioShack whip is attached to the top PVC cap. The wire lead connecting the bottom of the whip to the top of the loading coil passes through a hole in the top of the pipe cap.**