Mount Up!

Try this easy cell phone-to-2m antenna conversion.

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Having read several articles on constructing mobile-mounted two-meter antennas, I set out to build one from ideas I got in *73* on how to convert an 11-meter (CB) antenna to two-meter use.

At a local radio store, I saw several low-cost CB antennas and was leaning toward the cheapest. I went through its disassembly instructions provided in *73*. The article was very well written and clear, but being the cheap, cheap, cheap antenna builder I am, I was still on the lookout for an even *cheaper* and easier antenna to convert.

In reviewing sales pamphlets and bulletins from several electronic surplus companies, I noticed a 900 MHz cellular magnetic mobile-mounted antenna. They were certainly in the right price range: $6 each. Furthermore, the catalog stated that this antenna element was easily unscrewed from its magnetic base.

Fine, I thought to myself: This feature might be just the thing to lend itself to the construction of a two-meter antenna. I counted the money I had left in my monthly allowance. Good news. I had saved enough for four antennas, including the shipping cost.

I immediately phoned in my order to All Electronics Corporation™. I found the salespeople there were very helpful and just plain nice to deal with. I waited with bated breath for delivery.

Finally, the magic knock on the door. Yes, it was the UPS™ man. He was very fast. By the time I reached the door, he had left my antennas and was halfway down the block! I picked up the antenna package and went straight to the basement workshop. Upon opening the packages, I was pleasantly surprised by a better-than-advertised antenna.

Construction

First, I unscrewed the 900 MHz antenna element from its magnetic base and laid it to one side. I checked the antenna mounting stud, a threaded stud whose size looked comfortingly familiar. To be sure, I got out the gauge and to my great relief it was, in fact, a 1/4-inch times 20 thread.

My next step was to check out the inside of the magnetic base itself. This task was very easy. I simply took a sharp knife and carefully cut the plastic cover from the bottom of the magnetic base.

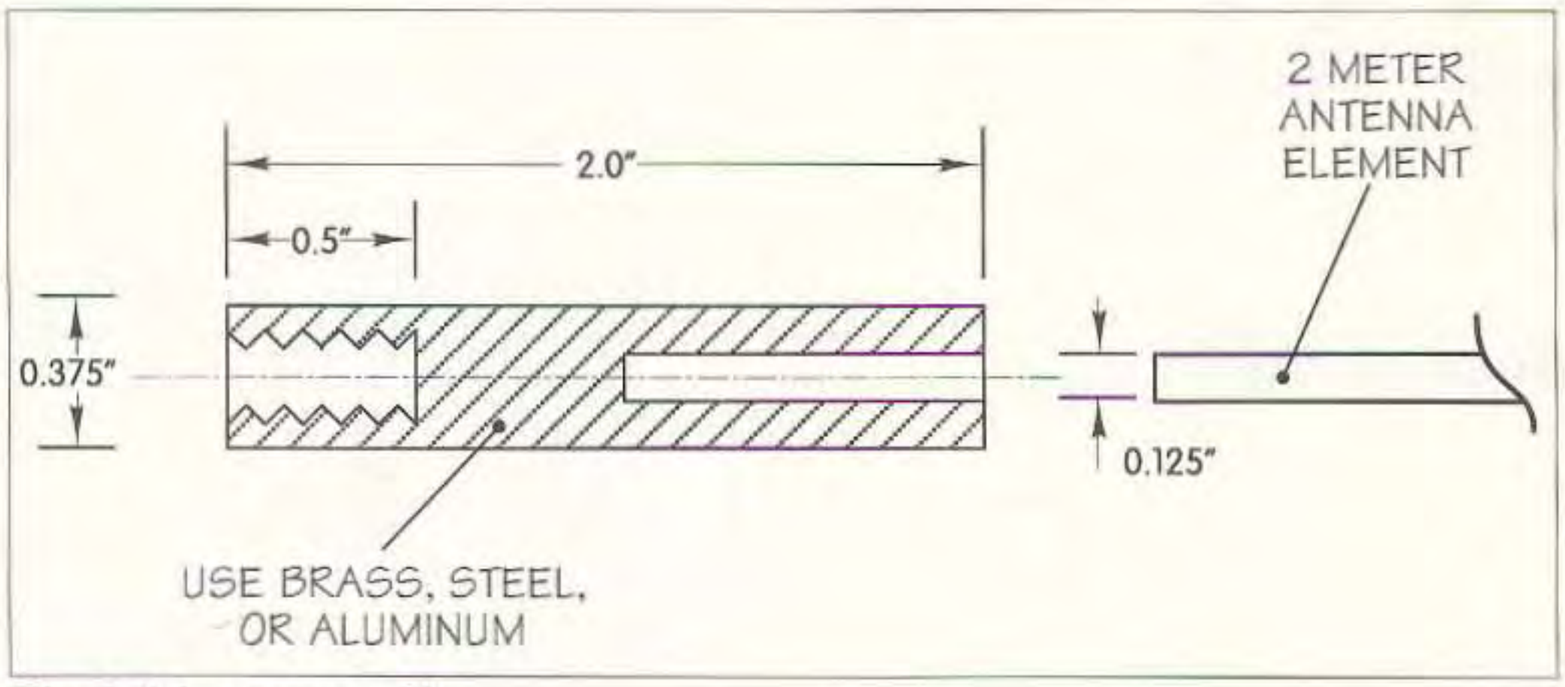

***Fig. 1.** Adapter assembly.*

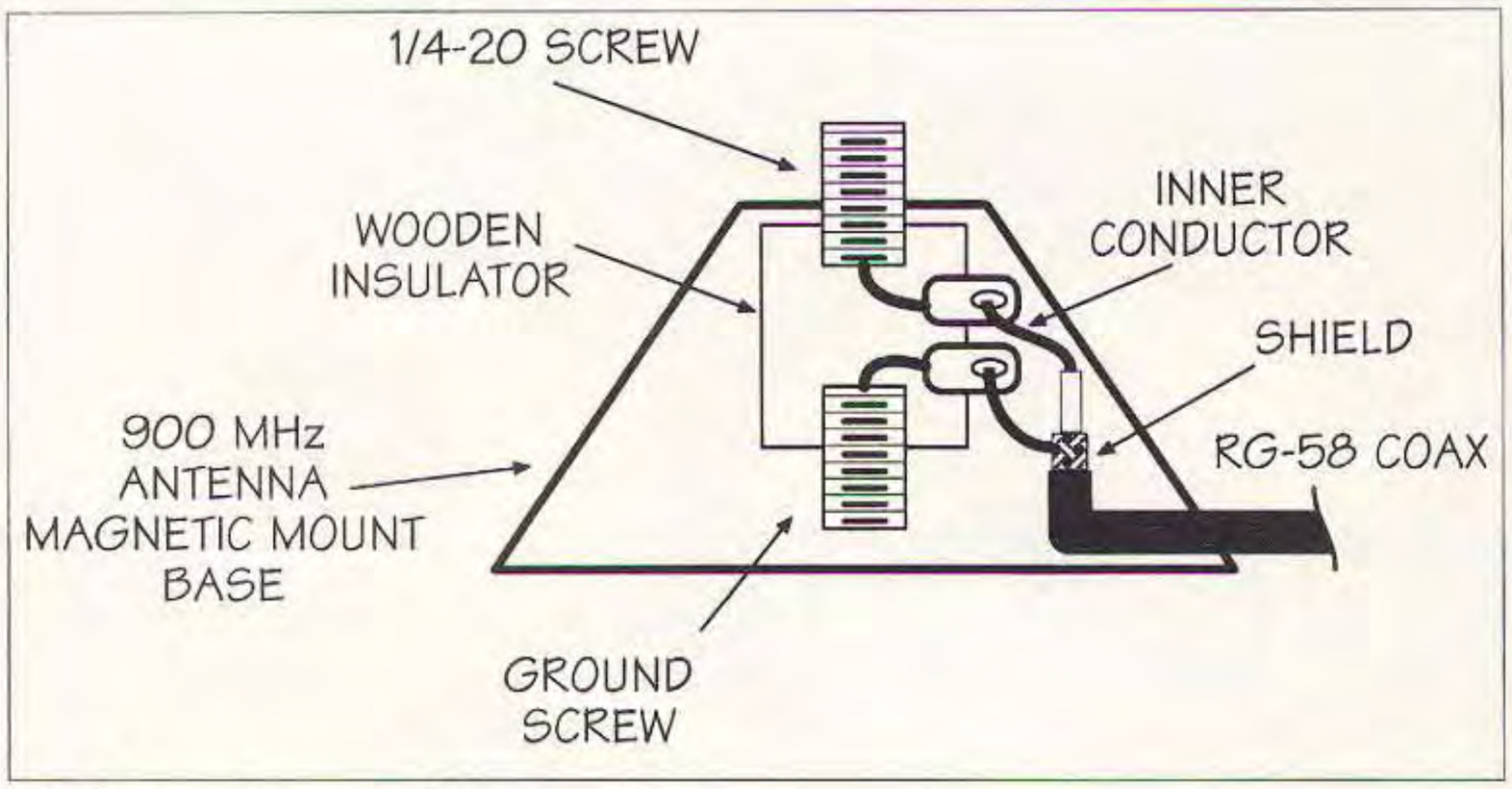

Fig. 2. *Internal magnetic base connections.*

(Please use care in performing this operation.) Once the cover is removed, use pliers or a wrench to remove the nut. Set the nut and magnet to one side. This completes the disassembly operation.

Start construction with the antenna adapter assembly (**Fig. 1**). Cut a two-inch piece of a 3/8-inch-diameter metal rod (this rod can be brass, aluminum, or steel). This piece will be the adapter assembly and screw onto the magnetic mounting base to hold the two-meter antenna element.

Using a #7 drill bit (0.2030), drill a half-inch-deep hole in one end of the adapter assembly. Thread this hole using a bottoming tap (size 1/4 inch x 20). Check out this drilling and tapping operation by screwing the two-meter adapter assembly onto the base of the 900 MHz antenna stud. Use a wrench to tighten the two-meter adapter assembly to a snug fit. Do not tighten the adapter assembly too much. This checks out the drill and tap operation for a good fit.

Unscrew the two-meter adapter assembly and lay it aside. Cut a 1/8-inch-diameter welding rod to a 20-inch length. Clean two inches of one end of the welding rod, using sandpaper. Keep cleaning until the two-inch length of the rod is bright and shiny.

Now, using a medium-wattage soldering iron and 60/40 solder, tin the clean end of the welding rod. Then solder a small ring of solder around the tinned area for a length of one and a half to two inches from the end of the rod. This tin-and-solder operation becomes a shim to ensure a tight fit in the opposite end of the two-meter adapter assembly.

To mount the two-meter antenna element to the adapter assembly, secure the two-meter adapter assembly in a vise. Tighten the vise around the adapter assembly firmly, but do not warp it. Insert the tinned-and-soldered end of the two-meter antenna element into the 1/8-inch hole of the opposite end of the adapter assembly (using the soldering iron). This completes the assembly of the two-meter antenna element and its

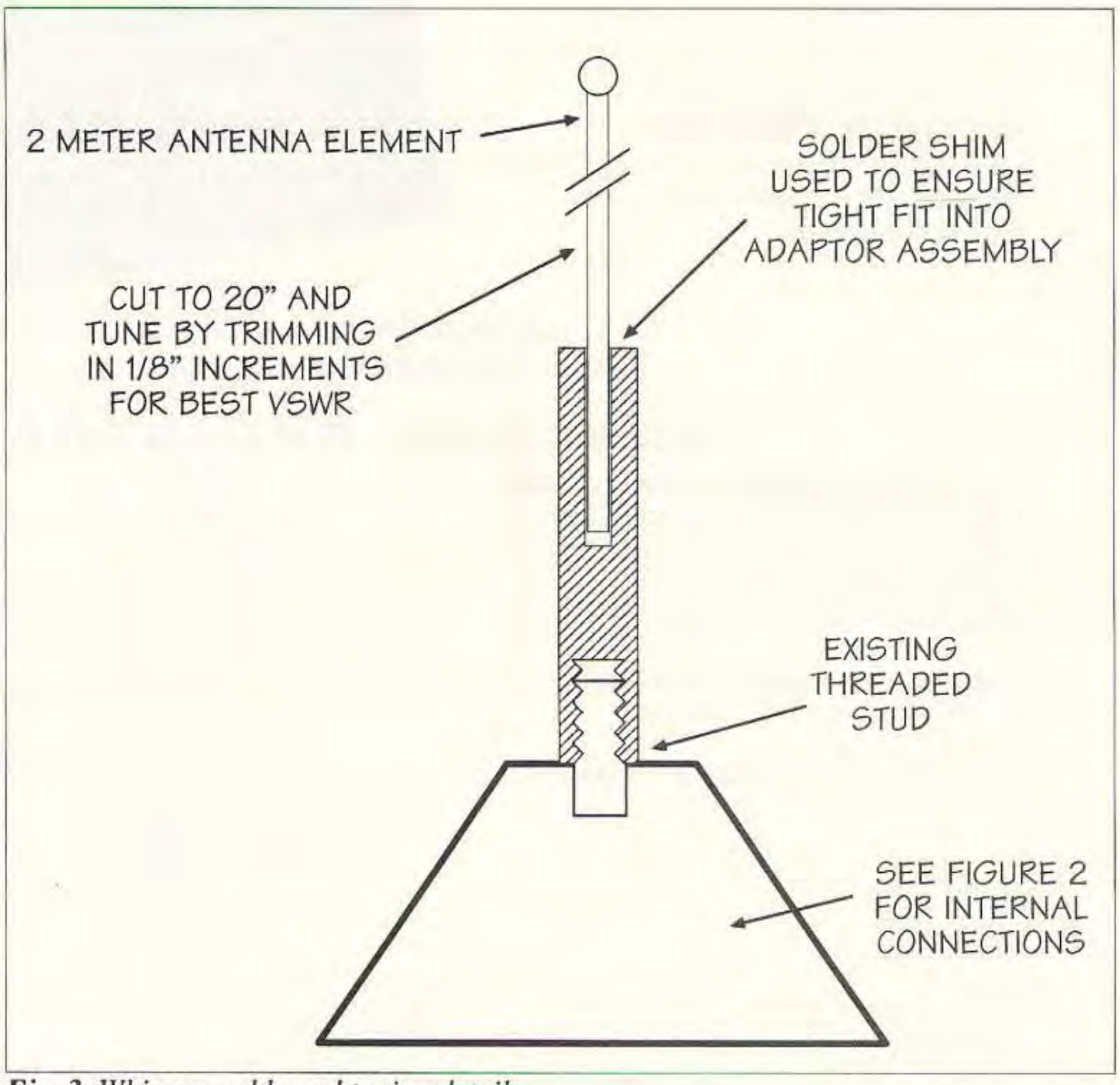

Fig. 3. *Whip assembly and tuning details.*

adapter assembly. Note: Out of the box, the 900 MHz antenna has a TNC connector. I cut off this connector and installed a BNC-style connector. See **Fig. 2** for cable connections within the base.

Tuning

I cut the two-meter antenna element extra long to ensure that I could cut and tune it to the frequency of choice, and allow the antenna element to be inserted deep enough into the adapter assembly to provide mechanical stability (**Fig. 3**). I used the MFJ analyzer (the one with a digital frequency readout and SWR meter) to tune to the 146 MHz frequency and a low SWR reading. Mount the two-meter antenna and its adapter assembly to the mobile antenna base by simply screwing it in for the final time.

To check out the antenna in operation, I mounted the newly converted two-meter antenna and its magnetic base near the center of the top of my vehicle. I connected the coax to the transceiver and listened on the local repeater (146.85 MHz). My QTH is about 15 miles from this machine. I was able to get good signal reports from several mobile and fixed stations. I drove my vehicle up to a speed of 55 mph, then stopped and checked the antenna and its magnetic base. The entire antenna held up very well.

Bonus 70 cm antenna

To make a 70 cm antenna from the original 900 MHz one, measure 7-3/8 inches from the top of the 900 MHz antenna. Mark this spot with suitable masking tape and marking pen. Make the actual cut with a hacksaw or heavy-duty pliers. Screw this new 70 cm antenna into the existing mobile magnetic mount and tighten firmly.

I checked the SWR using a UHF SWR meter. The initial SWR reading at 449.775 MHz was a 1.5-to-1 ratio.

I was able to key our local repeater using low power on the transmit. This produced full quieting.

I figure I sure got my six bucks' worth!