With great weather in the offing, it's time to think of HF mobile. WA2VQW shows us how to build a 15 meter mobile antenna out of readily available components.

The DX Dowel

How To Build A 15 Meter Mobile Antenna

BY MICHAEL MARDIT*, WA2VQW

April is a particularly good time for low-power DX communication on 15 meters. I've developed more than a casual interest in mobile operations, due mostly to my activity on the 14.336 mobile net. I have endeavored to test my skills at the prospect of working 100 countries on 15 meters while operating mobile during the spring and summer with only 20 watts average output power SSB (as determined by RF ammeter and calculation, under key down conditions, into 50 ohms).

While there are many good commercial mobile antennas on the market, purchasing an antenna is not my style, and besides, mobile antennas are easy to make at a fraction of the cost. The antenna now in use cost me about $6.00 to make, was constructed mostly of materials readily available in my local lumberyard and hardware store, and went together quickly and effortlessly during a Saturday afternoon. The antenna is of the continuously loaded helix variety and is constructed of five basic parts as listed in the parts list and shown pictorially in figs. 1 and 2 (refer to fig. 1 and 2 before beginning construction).

Fabrication

The first step is to turn down the head of the cap screw so that it can be jam-fitted to one end of the pipe nipple. This is accomplished by placing three layers of masking tape around the shaft of the screw (to protect the threads), placing the screw in a ⅜ inch drill or drill press, and while spinning the screw, carefully filing down the outside edge of the cap to reduce its diameter. When finished, the cap of the screw should be able to be jammed into one end of the pipe nipple in such a manner as to allow the bottom of the cap to be flush with the bottom of the pipe. Now with a propane torch, heat up the area of the pipe assembly which contains the cap screw and melt enough solder into the pipe to fill the pipe ½ inch over the top of the head of the screw. The solder when properly applied will fill the hex indent at the top of the cap screw and bond the screw to the pipe. Be careful not to melt solder on the inside pipe walls. I drilled a ⅜ hole in a scrap of 2 × 4 lumber to support the screw and pipe assembly during the soldering process and to hold them vertical. After cleaning out the flux residue with solvent, the antenna support mount is now ready to accept the dowel.

Insert the dowel into the open end of the antenna mount so that the bottom of the dowel is resting on top of the solidified solder. Using a sharp number 51 drill bit, drill two holes 90 degrees apart through the dowel-pipe assembly as shown in fig. 1. Insert the two #14 wires through the assembly; this may be accomplished by placing the end of the wire on the hole and tapping lightly with a tack hammer. File the ends smooth. They may be soldered to the surface of the pipe if you wish.

The top 2 inches of the dowel is now dressed with a layer of PVC tape so that the PVC tubing will force fit onto the dowel. Now wrap a single layer of PVC tape along the entire length of dowel and PVC tube-assembly. This covering of tape will serve two purposes: It will keep the magnet wire from sliding as it is applied to the dowel, and it will keep moisture from entering the wood.

The magnet wire or other form of #18 solid wire is now ready to be applied. Begin by soldering one end of the wire to the top side of the nipple and start to wind the wire. Make a tight winding and space according to fig. 2. When complete, insert the end of the wire through the small hole at the top of the PVC tubing and secure it in place. Finally, wrap the whole winding with PVC tape, and plug or caulk the top section of PVC tubing.

I'd like to thank Bob, N2DVQ, for generating the artwork.

Operation

The antenna was mounted on a standard spring/swivel ball mount, which is avail-

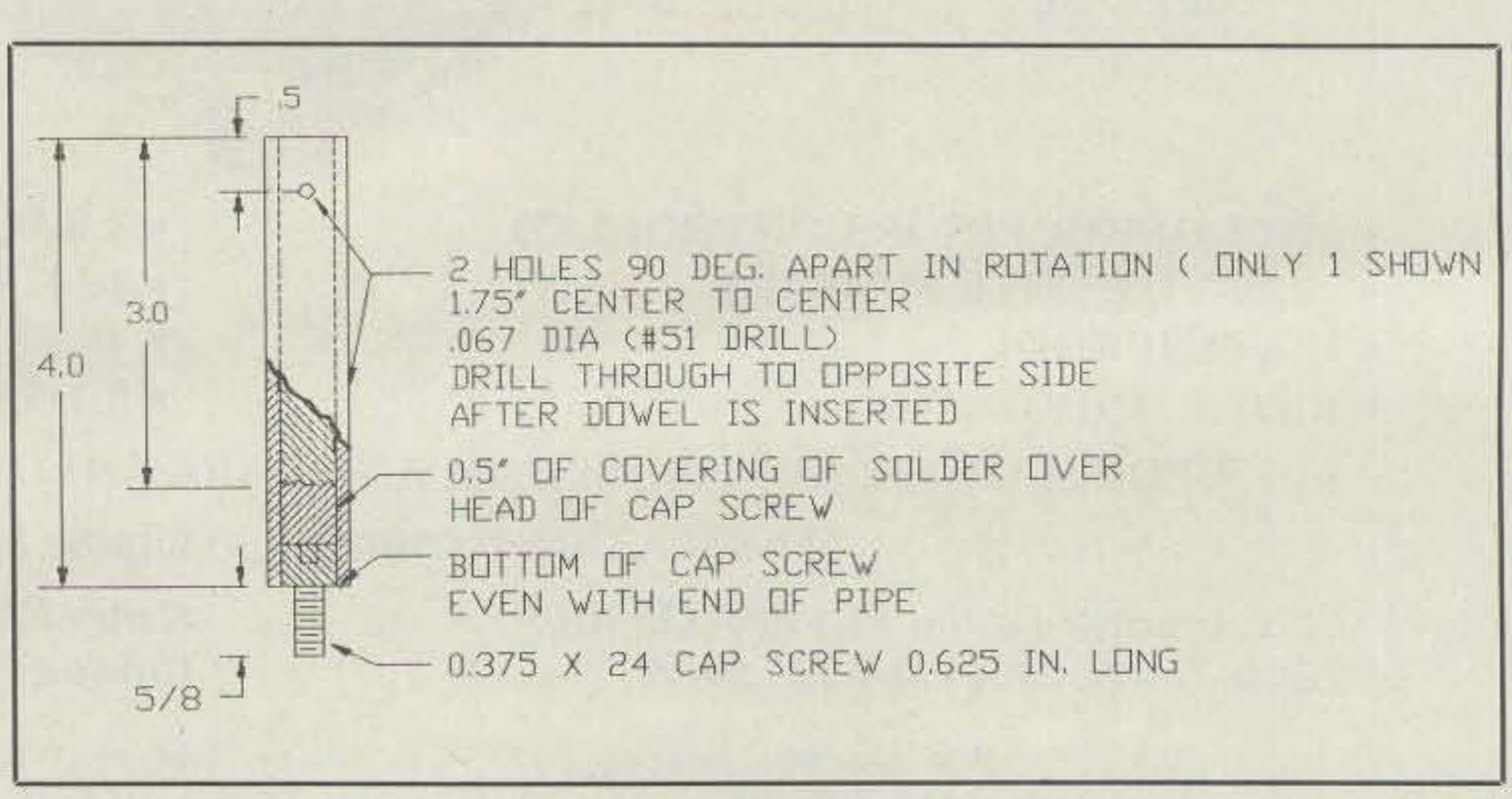

Fig. 1– Mechanical details of the 15 meter mobile antenna base section.

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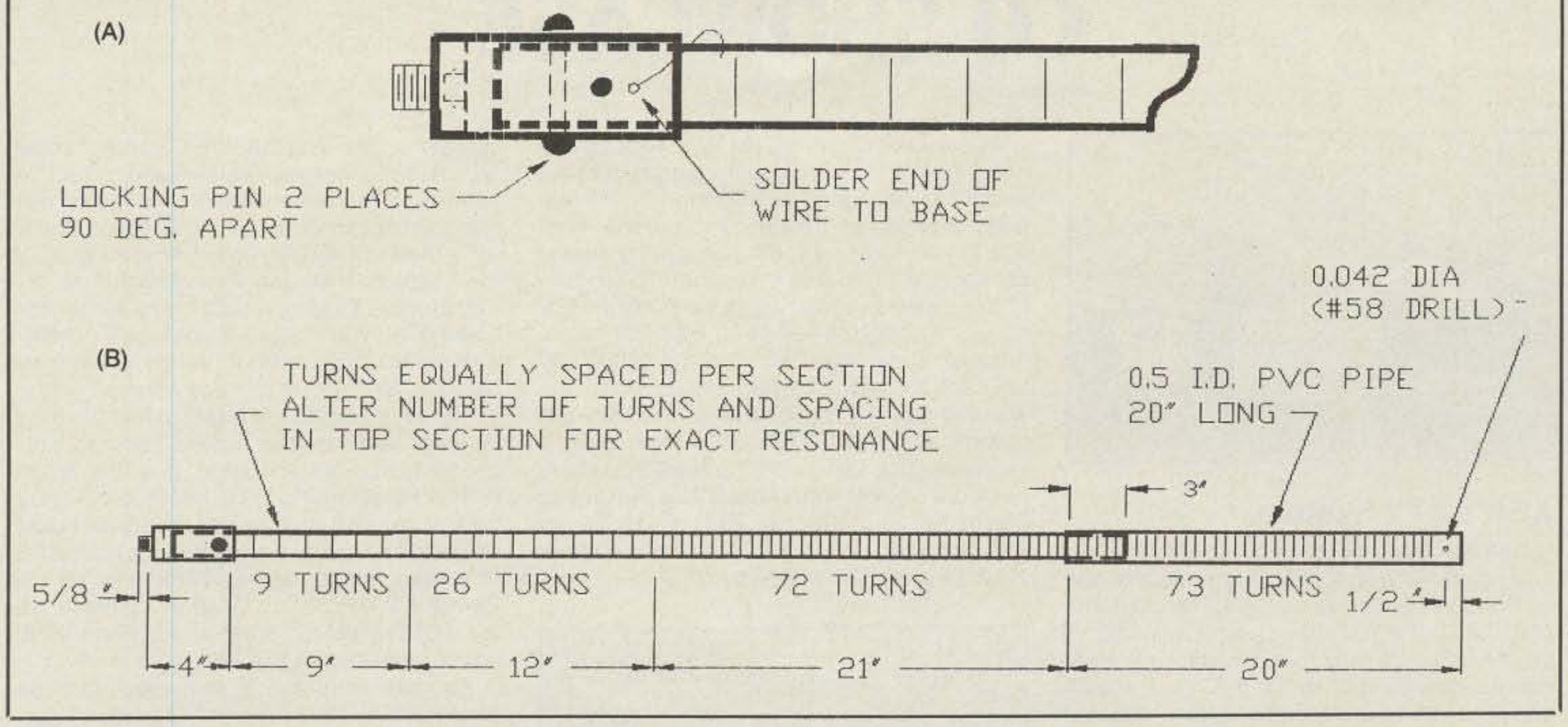

Fig. 2–(A) Base section antenna connection. (B) How to wind the wire helix.

able from Radio Shack. I mention this because the ball and spring are part of the antenna's overall electrical length.

Using the SWR bridge in my Argonaut 509 and running 2 watts output, as measured with an RF ammeter, the SWR was checked at 50 kHz points across the band. Absolutely no reflected power could be observed anywhere on the band and a 1:1 match was recorded.

In my mobile installation the Argonaut drives a 6146 linear amplifier to 20 watts average power output for the needed boost.

In New York, the New York State Police take a dim view of mobile antennas "swinging around in the breeze." With nylon mason cord I tether my mobile antennas to the plastic coat hangers at the inside rear of the vehicle and place some vinyl sleeving at the points on the cord where the rear doors close. This method has proven to be very effective. While allowing for some movement, it holds the antenna basically vertical and appears to reduce the QSB associated with gross antenna displacements, while keeping the state police happy.

Results

The ability of this mobile antenna to work DX with low power is impressive. Most of the stations I work reward my efforts with S6 to S9 signal reports and say "excellent signal for a mobile." In the last 6 months I've worked 96 countries on 15 meters, including great DX such as BY4RB, A92BE, S92LB, and HL5FEE. My greatest DX versus output power, however, was VK3ZJ. While parked with the engine off, running ½ watt output power, he gave me a 5 × 5! (QSL in hand.) The only problem I've encountered, in fact, is that it's hard to convince some people that I'm really mobile!

I'm quite satisfied with my weekend project; although it's not quite the "coil of wire on a broom-stick handle," it's pretty darn close, and most important it works!

Parts List

One ⅜ × 24 × ⅝" socket head cap screw threaded to the bottom of the head. (Screw with round head that is hex indented.)

One 4 inch piece of ½ inch brass water pipe, ½ inch inside diameter, commonly referred to as a pipe "nipple" (does not have to be threaded).

One 4 ′ × ½" hardwood dowel of sound condition.

One 20 inch piece of ½ inch ID PVC water pipe.

About 25 feet of #18 solid-bare or enameled wire.

Misc: PVC tape, 2 inches #14 solid wire, etc.

References

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