A Quarter Wave 80 Meter Marconi

BY E. H. MARRINER*, W6BLZ

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ANOTHER new antenna? No, just another application of the old quarter wave Marconi antenna which has been much neglected for many years. This article will show how to erect a short 80 meter antenna in your back yard.

My 80 meter dipole type antenna was suspended between two 25 foot four by fours. The antenna was 125 feet long and weighted down in the center by the coax feeder. When the wind was blowing the continual scratching of the drooping wire hitting the roof of the house kept me awake all night! The dipole antenna also paralleled the telephone line coming into the house and coupled my s.s.b. signals into the telephone conversation. Another bad feature was that it disrupted my neighbors f.m. reception. The solution was obvious; move the antenna to the front yard away from surrounding objects and houses.

A vertical antenna was tried for awhile, but living near the sea-coast, the corrosion soon toppled the aluminum irrigation tubing used for the antenna. Looking around for a better solution and a maintenance free antenna of short length, a quarter wave Marconi seemed like the best solution. Radiation into the shack could be minimized by removing the end to the front yard and feeding it via coax and a tuner box mounted at the base of the 4" × 4" mast.

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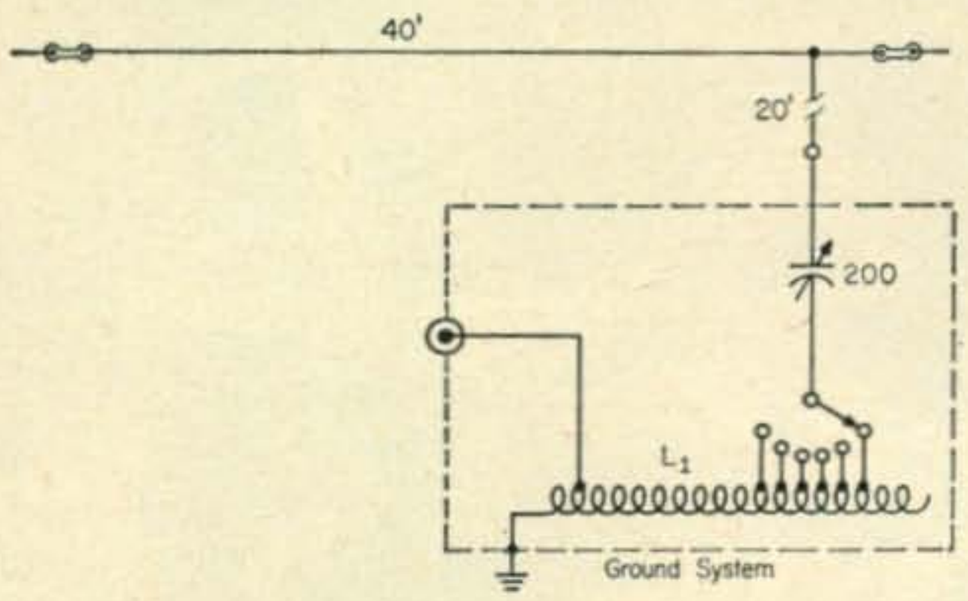


Fig. 1—Dimensions for the 80 meter quarter wave Marconi and the details for the tuning unit. The ground system is discussed in the text. The coil is 24 turns of Air Dux #2408 and the capacitor is a 200 mmf unit salvaged from a BC-375E tuning unit.

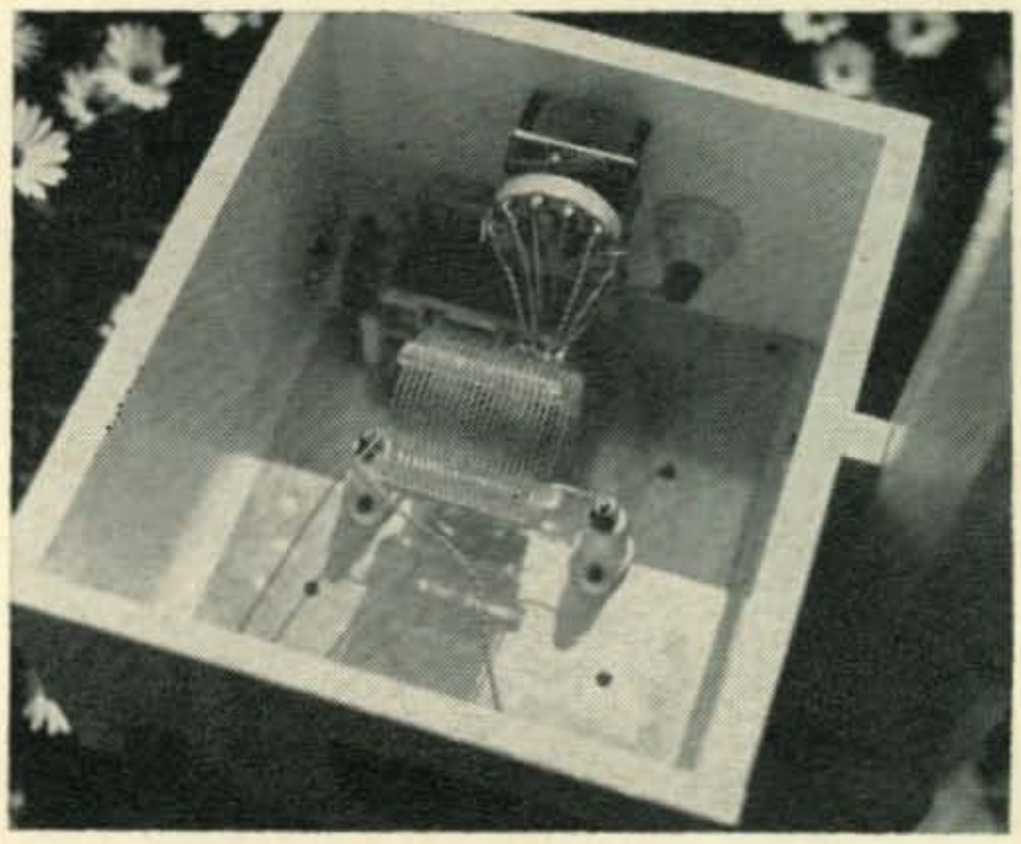
Reviewing the literature I found many construction hints on making a half wave antenna but none showing the quarter wave type. We decided to give it a try anyway and proceeded to hook 40 feet of wire from my chimney over to the mast and drop it down 20 feet to a tuner box. The tuner box had a 200 mmf variable capacitor in series with this wire and a tapped coil. A 150 feet of length of RG-8/U coax feed was buried in the ground at a depth of three inches running from the shack out of the mast. For a match to the antenna, the coax was tapped up from the ground end of the coil to the proper impedance point.

As it turned out I set the tap at 3850 kc and could easily cover the whole eighty meter band by tapping the coil length to gain antenna resonance without bothering this matching tap. You may find it a bit awkward to run out on the wet grass in your bare feet during the middle of the night. If you have tender feet a fixed coil could be used and the capacitor tuned to resonance by using a reversing d.c. hobby type motor to remote control the operation.

Tuner Construction

A plywood box 12 × 12 × 10 inches high is mounted at the base of the mast and painted

[*Continued on page 88*]



Interior view of the tuner housing. The aluminum plate on the bottom may be seen but the right plate is not visible. The clips for tapping the coil are type WC-1 made by E. F. Johnson Co.

Morse [*from page 46*]

was their life and living. In their day the men of the clicking relays and sounders were the true nerve centers of the nation—yes of the world. No news, no secret was hidden from them.

The outgrowth of Morse's discovery, that electricity could be made to carry intelligence instantly over many miles of wire, played a dramatic part in National and World developments since. Here in the U.S. the Pony Express was replaced by the swifter wires. Our railroads for many years depended upon the telegraph for their proper and safe operation. Transcontinental telegraph service and transatlantic cables were also an outcome of Morse's invention.

Morse at one time commented, "if the presence of electricity can be made visible in any part of the circuit, I see no reason why intelligence may not be transmitted instantaneously by electricity." In that prophesy we have today's television.

Truly, we radio Amateurs owe a massive debt of gratitude to this great scientific pioneer. It is indeed fitting and proper that we honor his birthday tonight. ■

SOURCES

1. Private correspondence Lew Tucker, Sec'y-Treasurer, Toledo Chapter, Morse Telegraph Club, Inc. and D. C. McCoy.
2. *Ezra Cornell—A Commemoration,* Cornell University, May, 1957.
3. *The Life of Samuel Finley Breese Morse—Inventor of the Telegraph,* American Heritage, April, 1961.
4. *A Pictorial History of Radio,* Irving Settel, The Citadel Press, New York City, 1960.

Ranger [*from page 43*]

you can dream up to get it grounded, to be used.

A thought worth mentioning is that the d.p.d.t. switch positions may be reversed due to the internal connections of the particular switch being used. Try this before giving up on the whole thing. Another word of caution; whenever the rig is operated with the remote switching, care must be taken when using the spotting switch. The operate switch must be returned to the standby position before spotting. Otherwise the rig will be keyed with no load. Don't blame me for that one, that's the way it works with the factory designed p.t.t. on phone. ■

Marconi [*from page 44*]

with Z-Spar boat paint. An aluminum plate of 16 gauge sheet is placed at the bottom of the box and on one side. Then a 24 turn length of Air-Dux #2408 is mounted on a couple of insulators. One end of the coil goes out through a bolt fastened to the aluminum plate for a ground connection. A 5 foot rod driven into the ground, and a few odd pieces of #12 wire buried a few inches in the lawn constitute the ground system. The other end of the coil goes to a variable 200 mmf capacitor taken from a defunct BC-375E surplus tuner unit. This capacitor is mounted on insulators and an insulated shaft runs out to a tuning knob. The five position switch in the BC-375E tuner serves as a switch to tap turns on my coil for the various parts of the band. The circuit is shown in fig. 1.

Tuning Adjustments

There are various ways to tune this type of antenna, but here is how I tuned mine. I unscrewed the coax from the tuner box and clipped a lead from the aluminum to the center conductor on the coax fitting. Setting the series capacitor at just about full mesh, I took the grid-dripper and tried to find out where the antenna resonated with the 24 turn coil. I found that by tapping down until I had 19 active turns my system would resonate at 3.5 mc. The following chart indicates the active turns per frequency:

3.5 mc	19	active turns.
3.6 mc	18	" "
3.7 mc	17	" "
3.8 mc	16	" "
3.9 mc	15	" "
4.0 mc	14	" "

Note that it required tapping one turn per 100 kc. As my most frequent operating position was at 3850 kc I grid-dipped my antenna system on the 3.8 mc tap and varied the capacitor just slightly for a nice deep null position. I was now ready to apply power and so connected on the coax feeder and placed the lead from the fitting on to the coil one and a quarter turns up from the ground end. This later proved to be the right spot. A rough field check can be made by applying a little power from the transmitter at 3850 kc and while watching the field strength meter, move the tap back and forth a half turn at a time. It will be possible to observe variation in output going away from this tap. Fasten it down at the point where you get the most radiation.

For a more precise adjustment of the tap you will have to use an s.w.r. indicator in the shack. First tune the transmitter up to a 50 ohm non-inductive resistor and then switch it to the antenna and measure the s.w.r. at 3850 kc. If it is not 1:1 and you want it the best, you can run back out to the tap and move it one way or the other slightly until the best or lowest s.w.r. is obtained. If you move the tap too far up the coil, the transmitter will not load into it. I found the vicinity of one turn about right. With the s.w.r. of 1:1 on 3850 kc I found I could move 50 kc either side with a maximum s.w.r. of 1.2:1 without going out to the tuner. In fact I tune most of the phone band without changing the tap. I could go down into the c.f. band to 3.6 mc with only 1.5:1 s.w.r. which isn't too bad. A purist could have a double pole switch and change both taps moving around the band but it has not been necessary here. This indicates that the coax matching tap can be left at one turn up from the bottom of the coil and the tuning capacitor rotated with a motor if the operator would like to keep the antenna at complete resonance at all times.

Performance

On c.w. there has been no difficulty working the east coast and on day-time s.s.b. anything works on 80 meters anyway. I think you will find this antenna works real fine; if you don't think so, give it a try as it isn't much work to haywire one together. ■

Calendar [*from page 52*]

1. Two classifications, single and multi-operator. Club stations will be considered as multi-operator even though only operated by one man.

2. Use all bands 3.5 thru 28 mc.

3. The usual five and six digit serial number, signal report plus a three figure progressive contact number starting with 001.

4. Each contact is worth one point.

5. A multiplier of one for each country prefix worked on each band, a maximum of eight per band. (LA/p will count as only one country even though there are three countries under that prefix.)

6. The final score will be the total QSO points multiplied by the sum of the multiplier from all bands. (There is no single band classification.)

7. Certificates will be awarded to the two highest scoring stations in both classes, c.w. and phone, in each country and each W/K call area. The committee may issue additional awards, depending on the returns.

Logs should show in this order—Date/Time in GMT, station worked, numbers sent and received, band used and note each new multiplier worked. A separate sheet for each band is not necessary, however a summary sheet showing the score for each band is requested.

The summary sheet should also include other essential information regarding equipment and other comments. Don't forget the usual signed declaration that all rules have been observed. And most important, your name and full address in BLOCK LETTERS.

Mailing deadline is October 15th. This year your logs go to the SRAL Contest Committee, P.O. Box 306, Helsinki, Finland.

Ed. Note

As usual no word from down South America way so I have nothing to report on the two tentative listed activities. It is assumed that the dates will hold as in previous years and that there are no rule changes, if you are interested.

Rules for our World Wide DX contest next month. No rule changes anticipated. Most of the letters received favored continuing the changes made last year for at least another year. The only one that stirred up any criticism was the 2 points for contacts between North American stations. Most of the favorable comments came from phone stations. However if this change is continued for another year it will have to be for both sections of the contest. We shall see.

73 for now, Frank, W1WY