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**QST Issue:** Sep 1992
**Title:** Trap Construction Information for Al (W8NX) Buxton's July 1992 Dipole
**Author:** Rus Healy, NJ2L

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# Technical Correspondence

Conducted By Paul Pagel, N1FB
Associate Technical Editor

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## TRAP CONSTRUCTION INFORMATION FOR AL (W8NX) BUXTON'S JULY 1992 DIPOLE

☐ Several readers have written asking for clearer instructions on how to build the antenna traps described by A. C. Buxton, W8NX, in his July 1992 *QST* article, "Build a Space-Efficient Dipole Antenna for 40, 80 and 160 Meters." For those of you who didn't write, but aren't sure how to build the traps, here's what you need to know.

*The trap-winding technique is deceptively simple.* Each trap is simply comprised of one winding atop another, wound in the same direction. First, drill four holes in the form for wire entry and exit, as described in July *QST*. *Starting from inside the form,* pass the wire through the hole labeled "1" in Figs 1 and 2. Wind a layer of the inner conductor on the form. Then, run the wire end down through a second hole into the form (just below the one labeled "EXIT" in Fig 2) and, inside the form, bring the *wire back to a point adjacent to where the* first winding started. Bring the wire up through the hole marked "2" and wind another layer on top of the first, in the *same direction as the first winding. Pass the* wire down through the hole labeled "EXIT" and you're done. The tape you see in the photos, described in the article, helps hold the bottom winding's turns together and the top winding in place as you're assembling the trap.

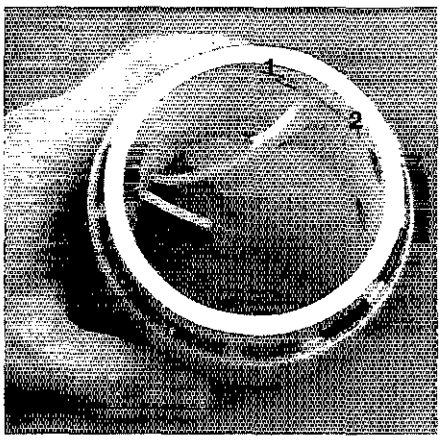


Fig 1—An inside view of a W8NX two-layer trap shows how the windings enter and exit the form. Two holes at each end of the form pass the windings into and out of the form.

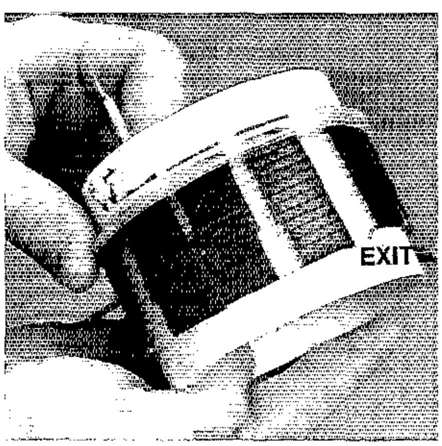


Fig 2—An outside view of a partially assembled W8NX trap. The bottom winding starts at hole "1" and reenters the form just below the "EXIT" hole. The wire then comes back through the inside of the form to hole "2," and is used to make a second winding atop the first. It reenters the form at the "EXIT" hole.

The wires passing through holes in the form are strain-relieved, but use the two mounting holes you drilled in the form to support the trap, just to be on the safe side.—*Rus Healy, NJ2L, Senior Assistant Technical Editor*

## A MODIFICATION FOR THE FET CHARGE CONTROLLER

☐ As I write this, I'm sitting here on my sailboat in the Bahamas and have just finished reading the fine article by Michael Bryce.[1] Since I spend about six months a year living on my boat, articles having to do with alternative energy and its control are of great interest to me.

I found especially interesting Mike's method of generating a negative voltage from a positive one using a 555 timer. Although people on land can use transformers to get any reasonable voltage, converting the 12-volt dc supply available on board a boat is not as easy. I'll file Mike's idea for future reference.

I'd also like to offer an alternative approach to Mike's solution of driving his ammeter. The LM358 IC can be driven directly from a single-sided supply and will operate over a range from 0 to 1.5 volts below supply voltage. If this chip is substituted for the 741 op amp in Mike's circuit, it's not necessary to add any of the circuitry to generate negative voltage. In addition, since this is a dual op amp in an 8-pin package, it's possible to use both of the op amps to measure a non-ground-referenced voltage. This might offer some advantages as the meter shunt would not need to be located with one side at system ground.

I hope you'll continue to print more articles of this nature as there are many boating hams. And we're all in the same boat when it comes to power usage.—*Sam Ulbing, N4UAU, 5305 NW 57th Ln, Gainesville, FL 32606*

[1] M. Bryce, "The FET Charge Controller," *QST*, Jan 1992, pp 45-50; see also Feedback, *QST*, Mar 1992, p 86 and Technical Correspondence, *QST*, May 1992, pp 95-96.

## SWR AND THE FEED LINE

☐ As I've been planning a quad installation, William (KC6T) Stein's article was quite timely.[2] It has answered a number of questions I had about how to feed a five-band quad. Mr Stein is to be congratulated for the effort he put into his article.

On page 55, however, Stein states that adding three feet of coax to a ¼-λ feed line on 40 meters "cured" a 4:1 SWR. I don't dispute Stein's results, but I'm sure he didn't realize that the description of his solution tends to reinforce the following erroneous conclusions: (1) SWR varies along the length of the feed line; (2) quarter-wave feed lines are to be avoided, particularly if the load is reactive; (3) our SWR meter in the shack always provides an accurate reading; (4) feed-line length is critical.

Ignoring #3 for the moment, we know that SWR *does not vary* along the feed line other than by attenuation. On a mismatched line, however, *impedance* repeats every half wavelength. The three feet of additional coax Stein refers to is about 12 electrical degrees on 40 meters, and would have a negligible effect on impedance, and no effect on SWR. The fact that the line was ¼-λ long is irrelevant. Using a Smith Chart, and knowing the load impedance (or the impedance at the shack end), we can easily see the effects of any change in feed-line length. There are plenty of references on this topic, probably the best being Walt (W2DU) Maxwell's *Reflections—Transmission Lines and Antennas* (see pages 11-1 and 21-2 through 21-6).

I strongly suspect that Stein's real culprit was not the ¼-λ feed line or the reactive load, but current flowing on the outside of the coax shield. This could lead to a 4:1 SWR *indication* on the shack SWR meter. Maxwell states "Since there is no practical way to determine the impedance of arm 3," (outside of the coax shield), "the true antenna impedance and SWR cannot be calculated from the measured data." Adding three feet of coax could have altered the impedance on the outside of the shield so that a lower SWR reading was indicated.

[2] W. Stein, "A Five-Band, Two-Element Quad for 20 Through 10 Meters," *QST*, Apr 1992, pp 52-56.