AN 80 METER DIPOLE

BY JOHN A. HOUSER,* WB2GQY

This 80 meter dipole can fit in sixty-five feet of space and will load out on 40, 20, 15 and 10 meters as well.

THE writer is a member of that group that seems to predominate the amateur fraternity. He has very little real estate for antennas and likes to work the 80 meter band, a bad combination.

It has been pretty well established that a resonant 80 meter dipole *has* to be around 117 feet (for 3.5 mc operation) to 134 feet (for 4.0 mc operation) or, as is the general practice, one cut to 125 feet for mid-band, which will be about 8 feet too short for the high end, and 8 feet too long for the low end of the band.

It has also been variously mentioned that if you can get this 125 feet of wire up somewhere, even in the shape of a Z, an L, or a V, as long as you have the full 125 feet, the antenna will resonate in the 80 meter band.

If one has but confined space, perhaps just wide enough to get up two poles 65 feet apart, what does one do? Folding the antenna wire back on itself is *out*, as partial cancellation of the wave will occur. The trick is to get 125 feet of wire in a 65 foot run of narrow space.

Much has been said and written about land conservation, water conservation, and now even air conservation—but who has seriously considered space conservation?

The writer tried rather unsuccessfully to resonate a shortened 80 meter antenna by means of some of the methods listed: putting loading coils at each end of the 65 foot run; using vertical drop sections off the ends of the antenna; and many combinations including loading coils at the ends of the vertical dropped sections. All worked to some degree, if one can suffer a 10 to 1 v.s.w.r. and call it a bargain. To a perfectionist, radiating about 35% of the transmitter power is far, far from a near perfect setup.

Finally, the writer came to the conclusion he just *had* to get 125 feet of antenna wire in the 65 foot space available. Space compression, that's the only answer. So he set to work to compress 125 feet into 65 feet. There is only one way to do it and that is by making a spiral coil out of the wire.

Coiling

Take 2 feet of #14 wire, wind it around a 3/8" wood dowel, and space the turns about 3/4" from each other. In this way the two feet of wire can be wound onto 1 foot length of the dowel.

Now one is not likely to be able to find 65 feet of 3/8" wooden dowel around anywhere,

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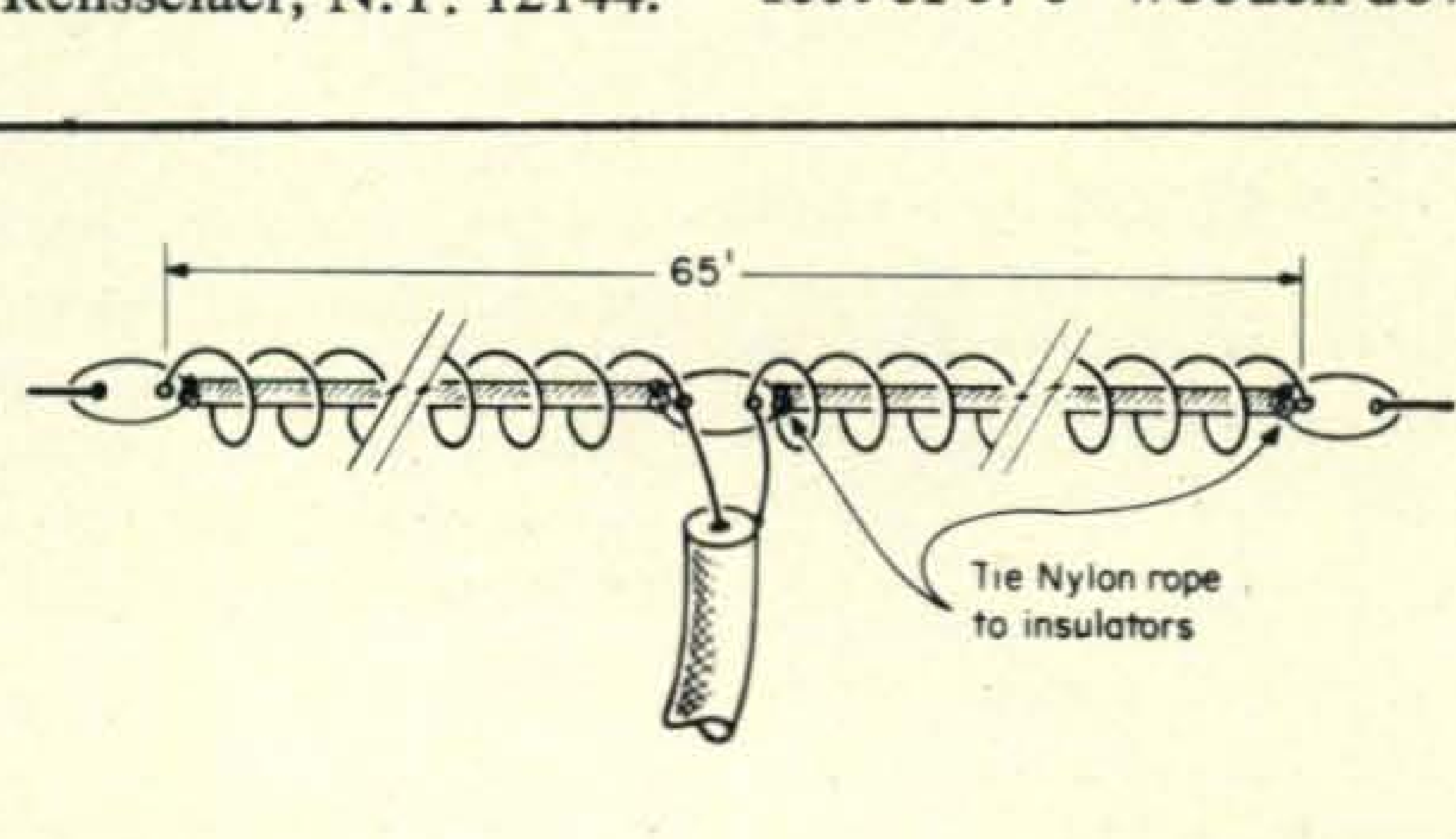

Fig. 1—Two 48' hanks of 3/16" nylon sash rope cut to the proper length supports 125' of coiled # 14 wire. The dipole is fed by a length of RG8/U coax. This antenna will load on 80, 40, 20, 15 and 10 meters.

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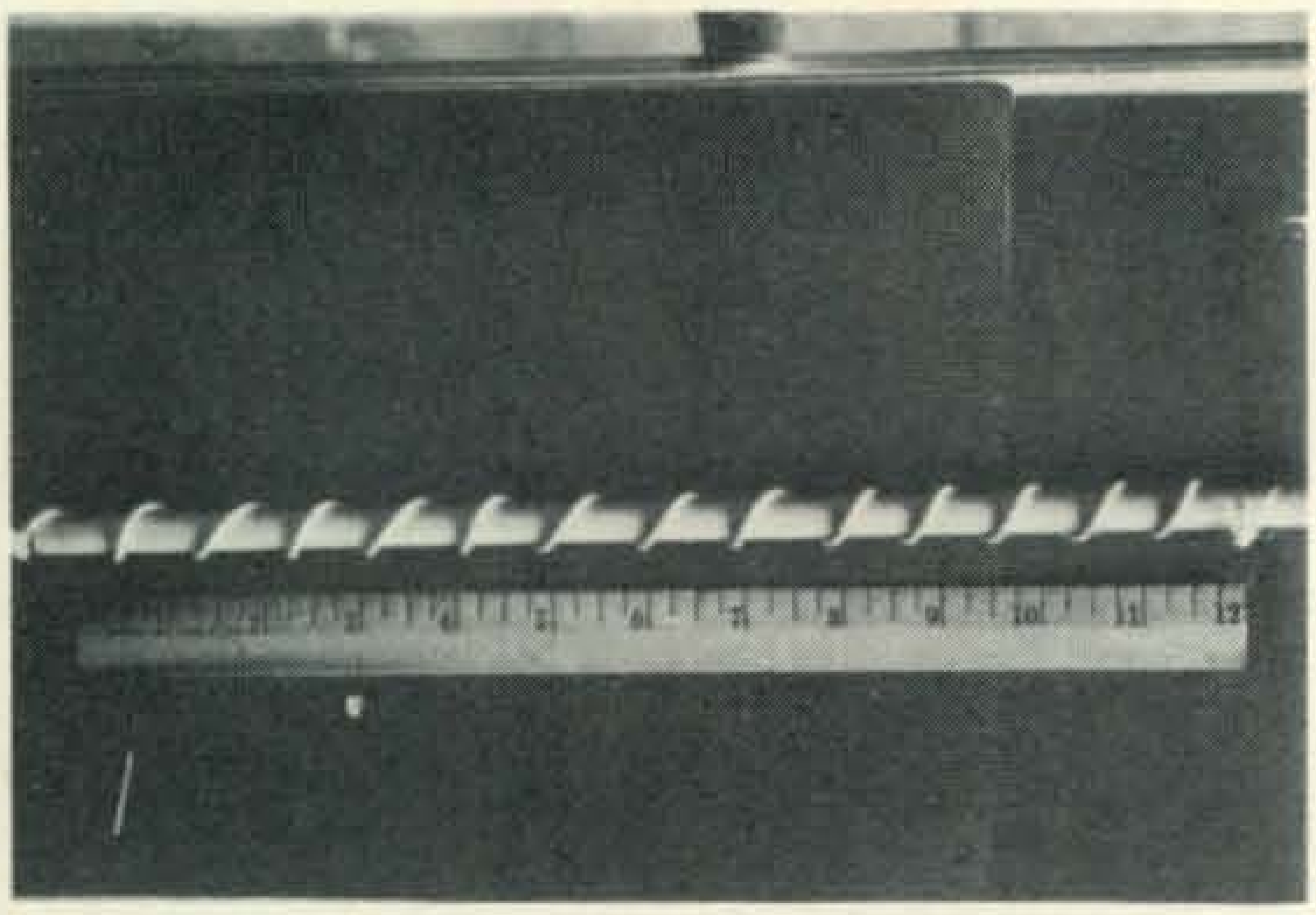

View of a 12" length of 3/8" dowel with two feet of #14 wire wrapped around it.

so something which would substitute for the dowel, be a near-perfect insulator at high frequencies, and still allow for the coiling of the wire had to be found.

Immediately the thought occurred, "Why couldn't the new type nylon rope be used?" Nylon is a good insulator, the rope could be secured with the section-strands coiled around each other, and the only remaining question was if the spaces between the twisted strands would approximate 3/4″ between turns.

A trip down to the local hardware store was in order. The largest diameter nylon twisted rope they had was called 1/2″. Nothing to do but buy a 2 foot section, bring it back to the lab and start coiling 2 feet of wire on 1 foot of rope, following the groove of 1 of the 3 strands which compromise the twist. We end up with 17 inches of rope instead of the desired 12 inches. Won't work. Didn't feel too badly about it,(because this rope is 24¢ per foot, which is too expensive for a ham, anyway.

Now, what's the cheapest nylon rope? It's called sash cord, comes in 48 foot hanks, for $0.98 per hank. This is more like it, even though one has to buy two hanks for the antenna. The diameter is about 3/16″, but my, is this stuff strong!

Back to the original idea. Wind a section of wire on the 3/8″ wood dowel, spacing 3/4″ between turns. Then fish the rope through 2 feet of the spiral by means of a 2 foot piece of wire wound around the end of the rope for a snake. Wind 2 feet more, fish again, and soon to the end.

Cheap, but efficient. When finished, loop the ends of wire and rope through the center and end insulators, hook up the RG-8/U feedline, raise the antenna, and we're in business on 80 with a 65 footer.

Performance

Into the rig to test it out. Heard a CQ from Buffalo, N.Y., which is about 300 air miles from this location. Answered and he came right back with a 349. Not bad considering this was off the West end of the antenna which points E and W. The second QSO was with Arlington, Va. which is about 450 miles south, broadside to the antenna direction.

Loading on both 80 and 40 with just the transmitter (a TR-3) barefoot, with line hooked directly to it, was no problem. The s.w.r. on 80 is higher than on 40, but due to surrounding buildings and trees more so than antenna itself. The antenna is barely 20 feet from ground, which is another detracting factor in regard to both DX and s.w.r. On 20 the first QSO was with N. Carolina, about 600 miles on short skip. The loading was also OK, and the s.w.r. about 2.8, actually a little lower than that on 80 and 40. As the s.w.r. did not vary appreciably all across the 3 bands, the writer feels that this type of antenna, while it may not be particularly the meat for the DX hound, will actually give satisfactory performance over the 3 bands, which up to now has been considered quite difficult in a single dipole. While it was not thought originally that it would turn out to be a 3-band antenna it has turned out to be so and it would seem to be a little more economical to use 1 antenna for multi-band operation if feasible.

Undoubtedly, if enough hams construct this type of antenna, some are bound to find some improvements which may increase the efficiency—but if one intends to use it, as the writer does, on 80, 40, and 20, these should be checked on all 3 bands to determine that an improvement on one band does not detract from the operation on the other two. However, this experiment seems to indicate that a little ingenuity in the application of some slightly-known theory and a little work can sometimes lead to rather unexpected results. ■

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