The army used to call it a "field expedient," using what you have at hand. KB2MF uses a bit of theory and a field expedient to get some r.f. out on 160 from a city lot.

The Unconventional Sloping "L" Antenna For 160 Meters

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Living in a ranch-style home on a 70'× 110' lot in a residential neighborhood presented me with a challenge to build a 160 meter antenna.

As a broadcast engineer familiar with antenna operating between 550 and 1600 kHz, I was very concerned with the match between the transmitter and the antenna. Broadcast transmitters are designed to work into a 50 ohm load with zero reactance (expressed 50 ± jØ ohms). The j is used to identify reactance, + for inductive and − for capacitive. If the reactive component is not Ø, the power output and transmitter efficiency will suffer. In addition, the bandwidth will be affected and consequently the sound will suffer.

The more I thought about the perfect antenna for 160, the more discouraged I became. There was just no way to erect a halfwave or quarterwave antenna on my limited property. Or was there? The question that kept popping up was is it necessary to achieve 50 ± jØ ohms? The answer was not really. What would suffer and what problems could I expect to see? Bandwidth and efficiency were not major issues, and since an amateur transmitter operates either in the c.w. or s.s.b. mode, the key-down duration period wouldn't put any excessive strain on my finals.

With theory now out of the way, I proceeded to string up a quarterwave antenna any way I could. The result was an antenna wire attached to my tower, end-fed at 30 feet, sloping down to the far corner of my backyard, and attaching to a 6 foot high stockade fence. From that point the wire makes a 45-degree turn to the right and travels 1 foot above the fence for 50 feet. The only ground used is the 30 foot tower and an 8 foot ground rod attached to it. The total length of wire used was about 136 feet.

To make the antenna work, I installed a Bird model 43 Thruline wattmeter in the line at the transmitter end and trimmed the antenna length for a 1:1 s.w.r. at the center of the band. Using this technique I got an s.w.r. of 2.5:1 at the band ends and an s.w.r. of 1:1 at the center.

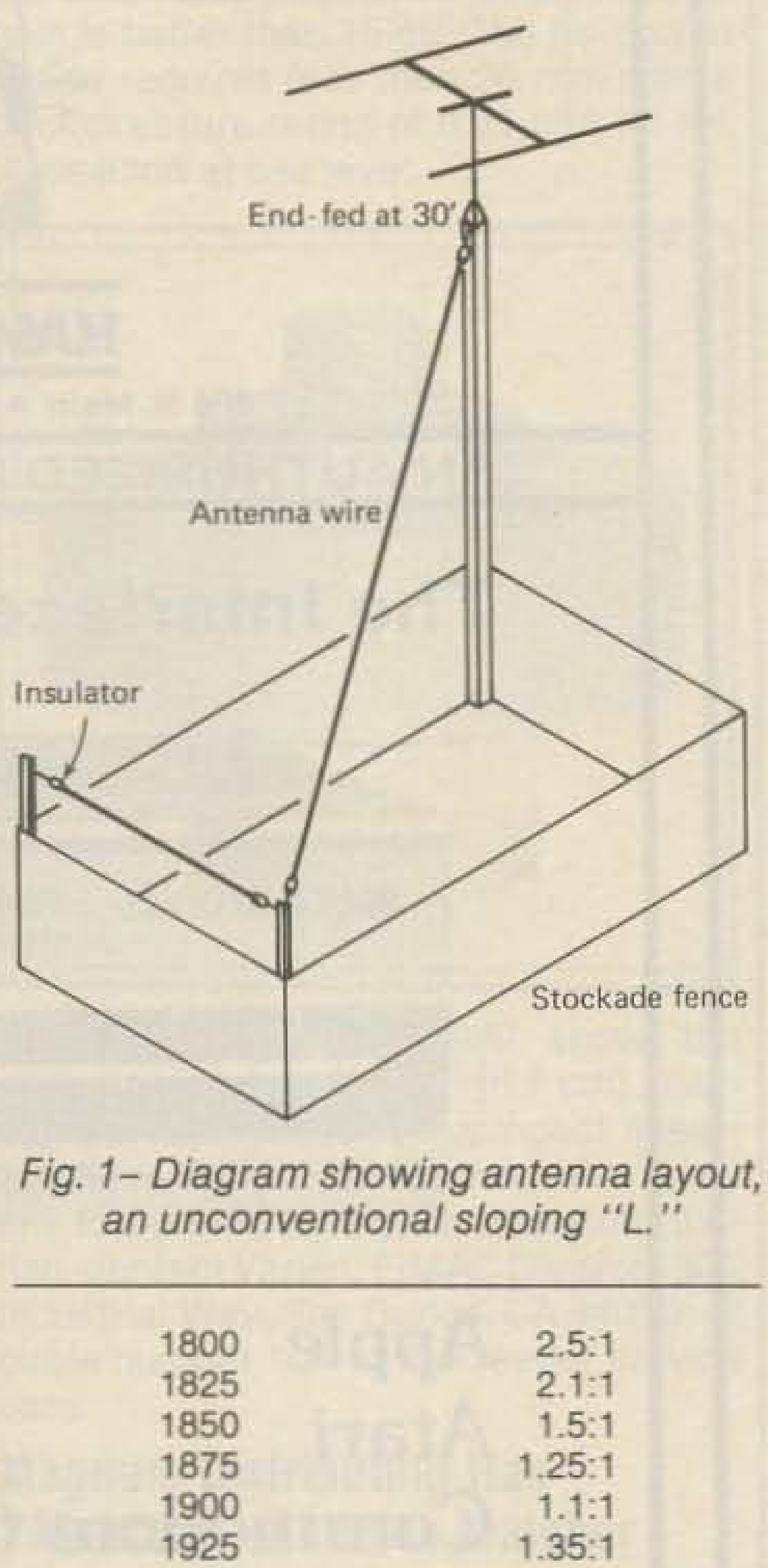

Fig. 1– Diagram showing antenna layout, an unconventional sloping "L."

1800	2.5:1
1825	2.1:1
1850	1.5:1
1875	1.25:1
1900	1.1:1
1925	1.35:1
1950	1.8:1
1975	2.3:1
2000	2.5:1

Table I– S.w.r. measured with the Bird 43 Thruline wattmeter.

Just out of curiosity, and since I had the equipment handy, I measured the whole band with a stable URM-25F signal generator and a General Radio 916-AL R.F. Bridge. At 1900 kHz the antenna system read 48 + jØ ohms. However, at 1800 kHz it read 12 + j3.3 ohms, and at 1975 kHz it read 15 − j26 ohms. As you can see, the resistance and reactance varied all over the place.

1800	12 + j3.3 ohm
1825	15 + j10 ohm
1850	22 + j13 ohm
1875	34 + j16.3 ohm
1900	58 + j8 ohm
1925	51 − j37 ohm
1950	28 − j37 ohm
1975	15 − j26 ohm
2000	10 − j19 ohm

Table II– Resistance and reactance.

The end result is that the antenna works great throughout the band. It was cheap and easy to build. The items used were 136 feet of No. 14 copperweld wire, 2 plastic insulators, 1 hose clamp, and a length of RG-8 about 50 feet long with a PL-259 connector on the end.

Will it work DX? Perhaps. Will it work WAZ? Maybe. Can I operate on 160 meters and have fun? You bet! The moral to this story is don't be concerned about a proper antenna. Improvise and trim until you get a good, low s.w.r. and operate.

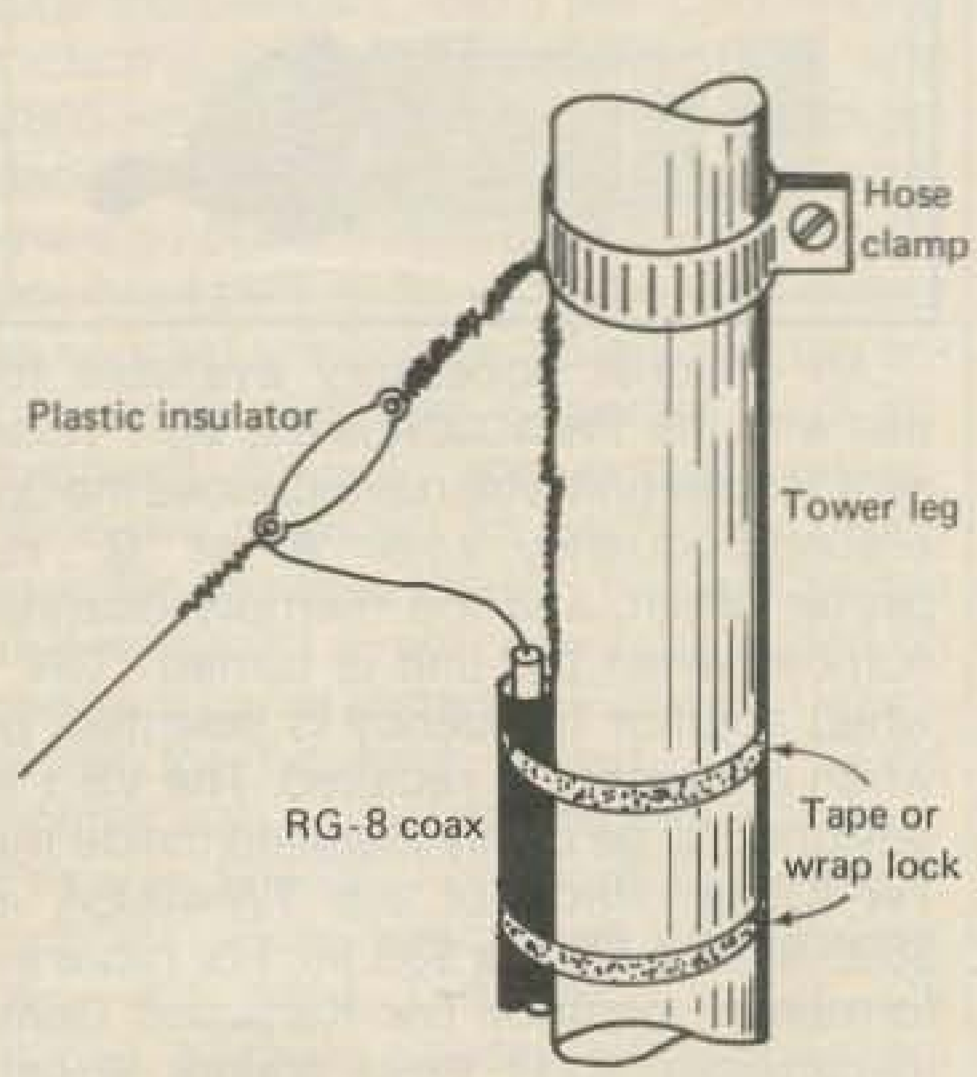

Fig. 2– Typical end-fed installation of the unconventional sloping "L."

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