W4FA describes a very simple wire antenna that can be used for all-band HF operation. You can assemble the antenna from individual components, or an inexpensive Radio Shack item will provide the basis for the antenna.

The W4FA "Fast Antenna"

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This article describes a very simple, low-cost wire antenna that can be used for all-band HF operation. It can be erected quickly for use either as a portable antenna or even as a permanent station antenna. Depending upon the materials used for its construction, it can handle power outputs of from 100 to 1500 watts over the 80 to 10 meter range, although it is mainly advanced as a low- to medium-power antenna.

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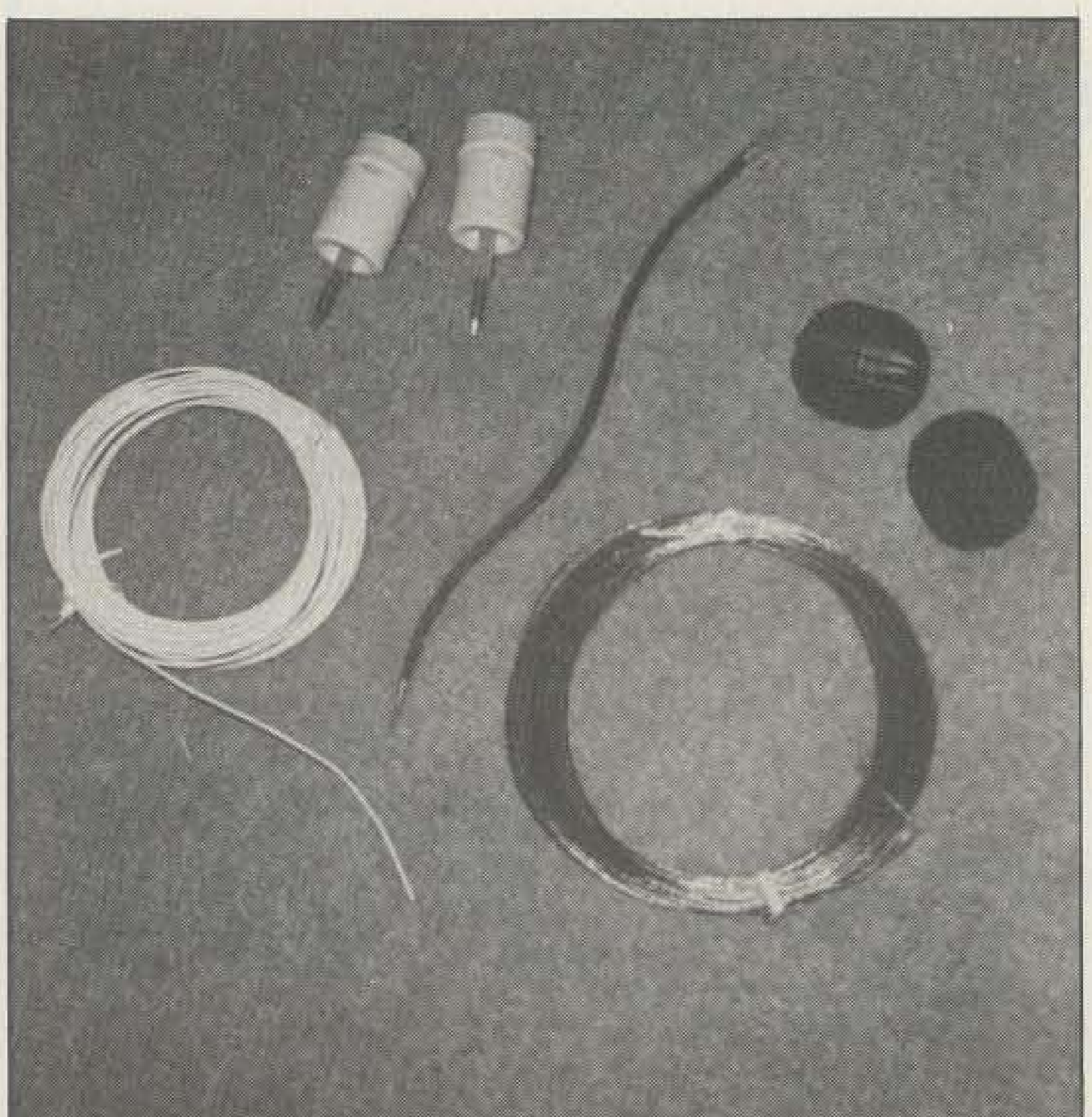
The antenna is not a computer-designed piece of magic. The design evolved out of experiences with many portable HF antennas. The design, in fact, incorporates some features which would have been regarded as undesirable in previous years. Although the antenna may exhibit some low-impedance resonances at certain frequencies such that an antenna coupler is not required, in general it does require the use of an antenna coupler with a transceiver.

The antenna layout is shown in fig. 1. Basically, a 75 foot flat-top section is fed by a single conductor feedline approximately 50 feet long. The antenna is "worked" against ground. Many readers at this point may say that the antenna is just another Windom antenna design. That is not really true. The original Windom had a ½-wavelength flat-top section and a single wire feedline connected slightly off of the center point of the flat-top section (about 14% of total antenna length) such that the antenna would more or less resonate on each even harmonic



These are the parts of the Radio Shack #278-758 SWL antenna kit: 75 feet of antenna wire, 50 feet of lead-in wire, antenna end insulators, stand-off insulators, and a plastic feed-through for getting the lead-in wire through a window. Although this kit was intended for SWL use, it does contain the essentials for the antenna described and has worked well at the 500 watt output level with a transceiver/linear-amplifier/antenna-tuner setup.

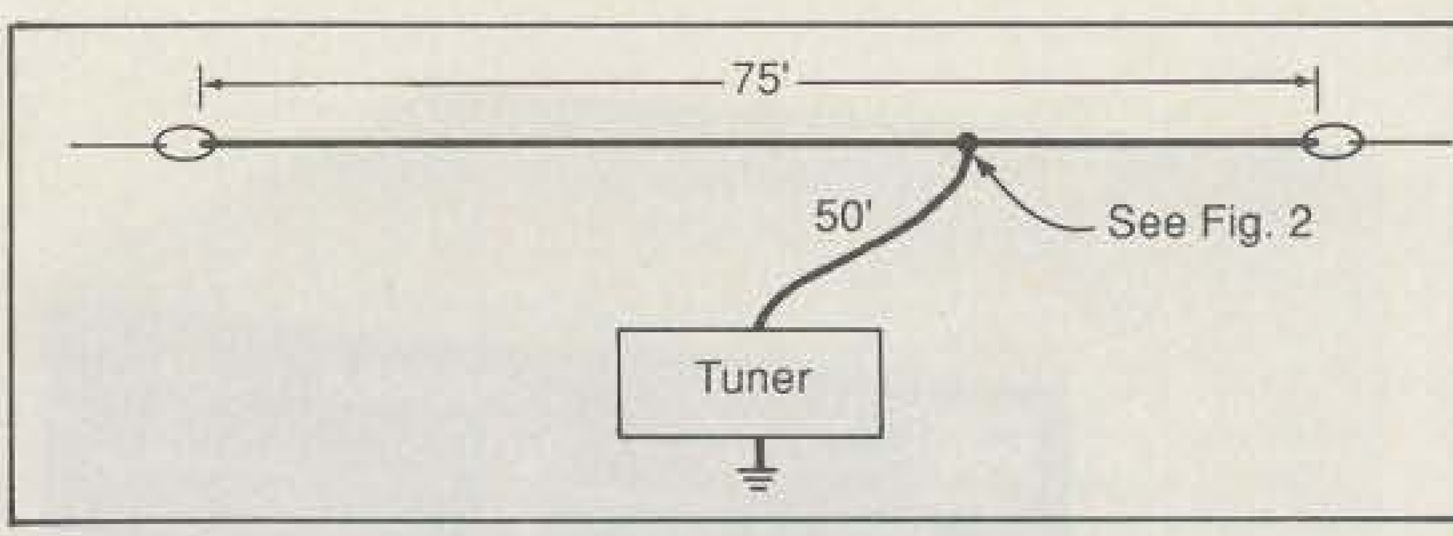


Fig. 1– The overall dimensions of the simple multiband antenna. The dimensions are not critical, but are simple representative values. The antenna should be "worked" against a good ground connection, especially on 80 and 40 meters.

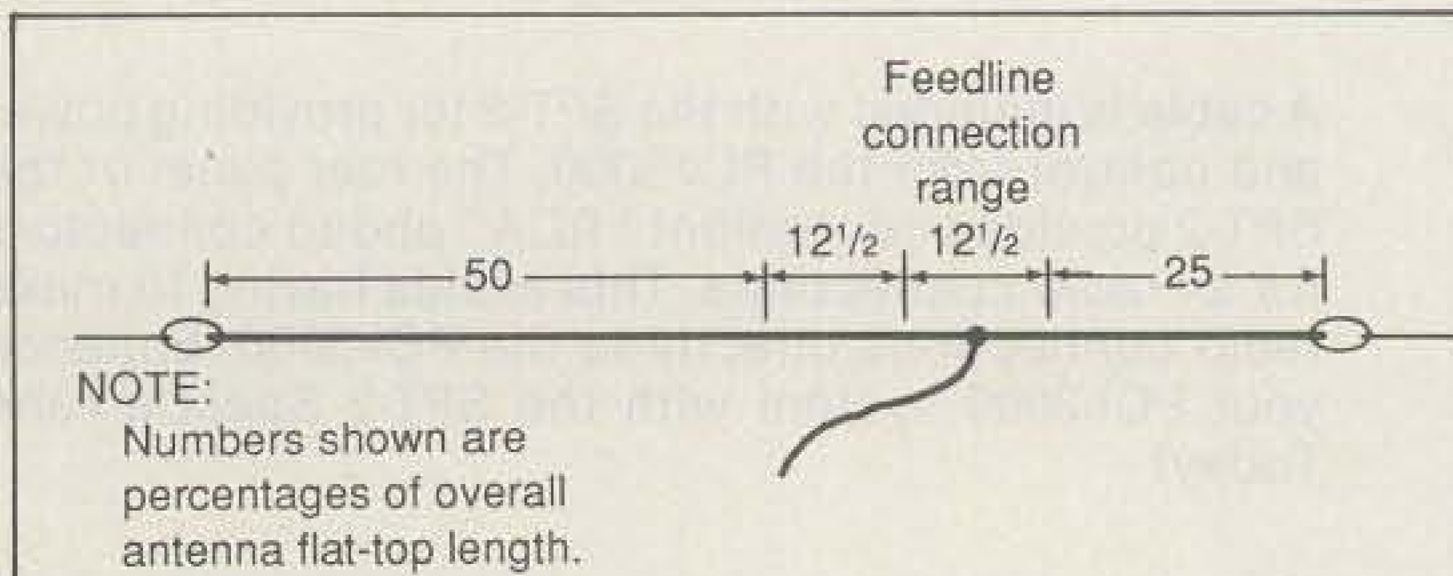


Fig. 2– Connection of the 50 foot download some place in the range indicated seemed to produce the best overall compromise with regards to a reasonable SWR across all of the HF bands. Many compromises are involved in this very simple but quickly erectable antenna, and you can experiment with the feedline connection point to optimize the ease of matching on any given band.

band. That is, if the flat-top were cut for 80 meters, the antenna would resonate again in the 40, 20, and 10 meter bands with a reasonably low SWR at the transceiver end of the feedline.

The antenna design of fig. 1 does not normally resonate on any given band. The idea of the design was to find an extremely easy to erect antenna form which did not require any exact length measurements. The idea of the design was also to achieve a reasonably low feedline SWR (less than about 1:4 on any HF band) such that no extremely high RF voltages would be present at the end of the feedline. The 1:4 SWR ratio limit and the lack of any extremely high RF voltages at the end of the feedline meant that relatively simple antenna couplers (even most automatic tuners) would be able to efficiently couple power into the antenna.

As I said, this antenna did not evolve with the aid of any computer analysis; it evolved from simple cut-and-try experiments. The connection point of the feedline to the flat-top portion of the antenna is not critical, but it has to be within a broadly defined range, as shown in fig. 2. In a field situation, you have only to determine the center point of one half of a flat-top section and then make the feedline connection from the latter point slightly towards the center point of the entire flat-top section. It can all be done just by folding the flat-top piece of antenna wire temporarily together twice over. No measuring tape is necessary. However, don't be tempted to simply connect the feedline at the very center or at one end of the flat-top section just for the sake of convenience. Very high RF voltages which an antenna coupler might not be able to accommodate will be present at the transceiver end of the feedline on some bands. Also, on SSB problems with RF feedback may develop.

If you have the time, the feedpoint connection point can be varied over the range shown in fig. 2 to provide the easiest transceiver loading on one or more favored bands. On the lower frequency bands the antenna seems to have a fairly omnidirectional pattern, while on bands above 20 meters the radiation seems to slightly favor the direction to the left of figs. 1 and 2. Since the antenna consists of little more than some pieces of wire, it can be put together from available materials. However, if you do want to quickly assemble the antenna, the Radio Shack 278-758 antenna kit at $8.49 is a reasonable buy. It provides all of the wire necessary, including some good non-stretch, hard-drawn stranded copper wire for the 75 foot "flat-top" plus lead-in wire, end insulators, etc. It does contain some standoff insulators of dubious value since they are meant to be *nailed* into the side of a building.

One little portable antenna erection kit I assembled, and used quite successfully, consisted of the wire pieces for the antenna plus a slingshot, #4 fishing weights, and 10 and 50 lb. test fishing line. I used the slingshot to get the 10 lb. line and a #4 weight over some trees and used that line to pull up the 50 lb. line, which in turn was used to pull up the antenna wire. It doesn't sound very sophisticated, but it worked quite well, and the total cost for everything, except the antenna wire, was less than $10.00!

The simple antenna I've described has been a lot of fun to use. There is no guarantee that it will put out an outstanding signal, but it certainly seems to perform better than a totally random length antenna if you just need a quick, easy-to-install and relatively inconspicuous multiband wire antenna. Why not give it a try?