

## **No Free Lunch** <http://www.arrl.org/no-free-lunch>

When you are shopping for antennas, be careful. You'll see all sorts of claims that seem incredible, yet highly attractive.

### **The No-Radial Vertical**

Yes, it is possible to design a vertical antenna that doesn't use radials. But unless the antenna in question is a vertical dipole, you still need a pathway for the RF currents to return to the antenna. This means radials. Without radials, a vertical antenna can still radiate, but not very well. Steer clear of any vertical antenna that claims great performance without radials.

### **Miniature HF Antennas**

The lower the frequency, the bigger the antenna. So how do some manufacturers get away with claiming that their low-band HF antennas will fit in a suitcase? What they have done is use a creative combination of coils and other components to achieve a feed line match at the desired frequency. But a 1:1 SWR does not mean that an antenna is efficient, and efficiency is what really counts. In these tiny HF antennas, most of your precious RF energy is lost as heat. Unless you can't get on the air any other way, choose a full size antenna instead.

### **100% Efficient!**

An antenna that is 100% efficient radiates all of its RF energy without a single microwatt of loss. However, unless the antenna is made out of exotic as-yet-undiscovered materials, 100% efficiency is impossible. If you see an advertisement that makes this claim, turn the page quickly.

### **Wild Gain Claims**

If you glance through the pages of *QST magazine*, you'll notice that very few antenna advertisements include gain figures. Antenna gain is measured in decibels (dB) and describes how powerfully the antenna directs your RF energy. The reason for the lack of gain figures is that *QST* magazine has a strict policy: If you claim a gain figure for your antenna, you must be able to prove it.

The problem is that anyone can build an antenna and make all sorts of wild claims about its performance. Unless they've gone to the trouble of having it analyzed using antenna modeling software, or tested on a laboratory grade antenna test range, there is no way to know if what they are saying is true.

That's why *QST* requires proof; most other ham magazines don't. When you read an advertisement or an article where antenna gain figures are tossed around, be careful. Ask where those decibel figures came from!

### **“Less than 1.5:1 SWR on every band!”**

An antenna that can give you an SWR of 1.5:1 on any band is either grossly inefficient, or the advertisement isn't telling you that the low SWR is only present through a *limited portion* of every band.