



The Amateur in You, Part 1

What have you been pondering?



The “ish” of ham radio

Several years ago, a ham approached me with a homemade copper J-pole in his hand. He said that he accidentally cut one of the elements about a quarter-inch too short, and asked whether that boo-boo will affect his antenna’s performance. I told him that, even if he had tripled that mistake, it would work perfectly. He decided to test my theory, and actually cut it another quarter-inch (believing that, if it no longer worked, he could still add a ½” cap to the element). When we connected the J-pole to my analyzer, it showed a near-perfect SWR across the 2-meter band.

My friend was puzzled, because the drawing he read specified element lengths down to sixteenths-of-an-inch. Furthermore, he got it on the air, and received nothing but perfect signal reports, even on simplex into the next county. How was it that the plans for the antenna were so detailed, yet still worked, and worked well, even after its actual dimensions deviated this far from the specifications?

Precisely

As one person put it, *amateur radio is the inexact application of an exact science*. I suppose the same can be said about many disciplines, hobbies, and endeavors.

To be sure, there are indeed times and places in which some degree of preciseness is required in amateur radio, such as the design of some receiver circuits or the ability to remain on a particular transmit frequency. But even those intricate electronics are often augmented by feedback designs that help keep the intended signal within specified limits.

For example, say you own a VHF transceiver, which was designed and built using close-tolerance components, within maybe 1% of their ratings. You tune that rig to 146.520 MHz, but during your transmission, the tuned circuit drifts by 0.5% due to component

warming, which is well within tolerance. However, 0.5% off 146.520 MHz could place your signal 732.6 kHz off, at 145.7874 MHz or 147.2526 MHz, nearly a fifth of the entire band in either direction. To correct for this huge deviation, electronic feedback circuitry was developed to help the radio maintain its transmit or receive frequency.

Approximately

This kind of exact engineering is not required for the rest of us mortals, however, especially when we apply our craft to the world of radio waves.

So, why are there so many drawings, plans, and calculations that instruct us to cut our antenna elements to such precise measurements? Because those numbers are intended to only *give us a starting point*, from which to tune our elements by cutting, raising, and shaping them. We say that the plans help get our lengths *within the ballpark*, and then we’re responsible for fine-tuning them for actual use, including the location. In other words, *ish*, which in our context means “roughly” or “more or less” or “close enough.”

What this means is that *most of the parameters we can control, do not require the fine detail we often imagine*.

Line-of-sight

For example, many will tell you that VHF is useful only by line-of-sight (LOS); that is, only when the two stations are within sight of each other. Yet by experience, we know that we can still communicate by simplex, even when we’re out-of-sight from each other, due to knife-edging, ducting (including inversion), signal reflection, and scattering. Still, there are times when two stations are within LOS, and still can’t hear each other. So, does VHF require line-of-sight? Ish.



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continued



Power supply voltage

Can we use a power supply or battery specified at 12 volts, when our equipment specifies a requirement of 13.8 volts? Most of the time, yes, because our equipment voltage requirement is often accompanied by a tolerance, typically around 15%, and 12 volts is within that tolerance for 13.8 volts. So, will your 13.8-volt equipment work with a 12-volt supply? Pretty much, ish.

1.0:1 SWR

Many seem to always be looking for that elusive 1.0:1 SWR in their antennas. An SWR greater than 2.0:1 might force your transceiver to reduce its power output, so you should try and keep it below that level. But, as long as the SWR is low enough to keep the transceiver's output power amplifier from reducing its output power, will an SWR of 1.9:1 work for you? Sure it will...ish.

Radials

A few HF ham operators get caught up in the confusion about radial and counterpoise lengths, when it comes to vertical (and a few other) antenna types. Some of them go to great lengths to cut some to precise fractions of wavelengths for each intended band, when in reality, no such exactness is required. If you install radials, cut them all the same length if possible, at least a quarter-wavelength of the lowest frequency you plan to use. For example, if your vertical supports 80, 40, 20, and 10 meters, install eight to sixteen radials, and cut all of them about 66-ish feet long each. If you need to cut a few shorter, that'll still work just fine.

And what if you can only install 13 radials? Or what if you have to bend some of the radials around an obstacle? Or what if your yard is just too small? Is there any hope of you being able to work distant stations under those conditions? Of course, ish.

Car antenna placement

If you were to install an antenna on your car, you're likely told that you should stick it right in the middle of the roof. That's good, if it's possible, but sometimes there are obstructions, such as roof ribbing, side air bags, and a moon roof. Will your antenna still work if it's not located in the dead center of your roof? Of course it will, ish.

Antenna orientation

And if your antenna orientation is a few degrees off, will that affect your signal performance? Probably not, ish.

Dipole height

You've also been told that you must get your 40-meter dipole at least 66 feet above ground, to work effectively. Will it work if you can only get it up 50 feet? You bet, ish. Or will your NVIS antenna work if it's a little too low-to-the-ground? Yes, ish.

Operating behavior

If I don't speak very loudly, or if I have an accent, or a mild speech impediment, will those keep me from being an effective ham radio operator? Probably not, ish. Or what if I'm a little shy, and hesitate, and trip over my words, or I'm just getting old...should I stay off the radio? Absolutely not!

Let the facts speak for themselves

So, in spite of precisely engineered and calculated directions, it's still possible for you to compromise on some measurements, yet work ham radio effectively. Many of us have installed imperfect antennas, using imperfect feed lines, imperfect radials, imperfect power supplies, and imperfect radios, with less-than-perfect operating habits, and yet enjoy amateur radio almost as well as the ham with the finest setup, ish.

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