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# Accurate Technical Language is Not Always Easy

Gary Breed  
Editorial Director



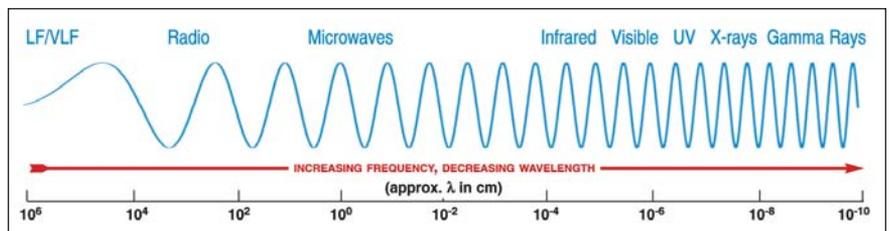
Precision is more than a requirement for technical design and manufacturing; it is a requirement for technical language, too. We all make occasional mistakes in our writing and speaking—saying “more than” instead of “less than,” getting a + or – sign wrong, mis-labeling a graph, or a hundred other things.

I even make these errors myself, despite being in the business of getting the language right. In the July issue tutorial, “Design Guidelines for Electromagnetic Compatibility,” I made a mis-statement of a fundamental principle, saying that square waves have only even-order harmonics. I know darn well that it’s the fundamental and *odd-order* harmonics. Then I managed a mis-labeled chart in the October tutorial on visualization of electromagnetic concepts. The corrected Figure 1 is shown below, and both of the above errors have been corrected in the version archived on our Web site.

It has become easier than ever to make these kinds of mistakes. Our computers have made writing and editing quick and easy. We can cut-and-paste information instantly and modify it without much thinking—which can easily result in an incomplete sentence, inadvertently delete a key word, or combine unrelated statements. Of course, “without much thinking” is the operative phrase for this problem!

Precision in language also includes descriptive terms, such as using *input* and *output* when *source* and *load* is what is really meant. Related terms are a common source of error, so be sure which meaning is intended when using terms like *Return Loss*, *Reflection Coefficient* or *VSWR*.

I get regular reminders to label graphical information correctly, too. It



Corrected Figure 1 from the October 2007 tutorial, “Fields and Waves—Visualizing Important Electromagnetic Concepts.”

is easy to interchange MHz and GHz on the frequency axis, or get amplitude and loss confused on the other axis. For example, *loss* is not a negative number unless it's actually *gain*, so be sure the vertical axes are labeled correctly for your choice of terminology.

### More Serious Errors

At a recent conference, I observed a different kind of error in one of the technical papers. In a session on metamaterials, the author described a filter that employed "left-handed resonators," a term I had not heard before. I know that resonators are an important component in left-handed materials, but I've never seen any reference to the resonators themselves having that property and could not imagine how it could be applied to them.

My doubt was confirmed when the first question from the audience made this point. The author was unable to offer a satisfactory response, so I hope the author and questioner got together after the session to clarify matters.

My conclusion is that innovative resonator structures have arisen from left-handed materials research, and this paper simply adapted one of those structures for use in a very compact filter. The application was interesting, the design was clever, but the "left handed" attribute assigned to the resonator was incorrect.

This particular mis-statement may not be too bad, but it's easy to see how similar errors can be serious. Imagine if Maxwell or Einstein had made a simple typo! Even if the work is corrected later, the paper has been published and the

mistaken concept will become part of "the literature." In this case, I am also left wondering whether the reviewers of the paper knew the subject well enough.

The perpetuation of errors is a common problem in the academic literature, especially when the initial work was believed to be correct when it was published. Making the corrections permanent is difficult, since it is always the original paper that becomes the key reference on any given subject.

We'll keep trying to find the errors, omissions and mis-statements in the material published in *High Frequency Electronics*. When we miss one, it's OK to let us know, so we don't do it again. Actually, there are a few readers who give us this kind of feedback from time-to-time, which is greatly appreciated.