

Editorial Director

Gary Breed
gary@highfrequencyelectronics.com
Tel: 608-437-9800
Fax: 608-437-9801

Publisher

Scott Spencer
scott@highfrequencyelectronics.com
Tel: 603-472-8261
Fax: 603-471-0716

Associate Publisher

Tim Burkhard
tim@highfrequencyelectronics.com
Tel: 707-544-9977
Fax: 707-544-9375

Associate Editor

Katie Landmark
katie@highfrequencyelectronics.com
Tel: 608-437-9800
Fax: 608-437-9801

Business Office

High Frequency Electronics
7 Colby Court, Suite 7-436
Bedford, NH 03110

Editorial and Production Office

High Frequency Electronics
104 S. Grove Street
Mount Horeb, WI 53572

Also Published Online at

www.highfrequencyelectronics.com

Subscriptions

Sue Ackerman
Tel: 651-292-0629
Fax: 651-292-1517
circulation@highfrequencyelectronics.com



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Products Have More Than Just the High Frequency Circuitry

Gary Breed
Editorial Director



Once in while, someone asks if I run out of things to say in my editorial column. So far, I haven't, for several reasons:

First, this is a busy segment of the electronics industry, and there are certainly 12 things per year worth some type of comment (although I'm glad I don't need to find more than that!).

The technology we cover is my #1 interest. I've been doing electronics, mainly RF, for fun or as a career in one way or another since the age of nine. I still spend some of my personal time designing, building—or just exploring—antennas, receivers, power amplifiers, filters, and other RF circuits.

I am keenly interested in what you are working on, and how you go about those tasks. As long as you allow me to muse about a wide variety of technical subjects, I'll continue to find something to say.

At *High Frequency Electronics*, our emphasis is on technology. If you want business analysis (or industry gossip) about the alleged importance of some merger or acquisition, a big contract, or battles over adoption of a particular standard, that's usually the role of other magazines and their editors. However, I may have an opinion on these things from time to time when it has a major impact on the work of our readers.

All Those Other Technologies

This month's column is one of those musings on a technical subject—all those "other" technologies that are required to make a complete product. Certainly, additional components and materials are needed for the care and feeding of a product that has a primary function in RF, microwave, optical or high speed digital. We need power supplies or batteries, regulators and protection devices. All electronic products have some mix of displays, switches and controls, printed circuit boards, general purpose components, assembly hardware, heat sinks and enclosures.

Often, these other things are central to the design. For example, my antenna experimentation relies heavily on practical mechanical construction. The materials used must have the proper electrical characteristics, but also need to provide the necessary mechanical strength and withstand the environmental conditions of outdoor installation, often in areas with

limited access, such as the top of a tall tower.

Another example is power amplifier design. These circuits must have robust thermal design to handle heat dissipation and achieve high reliability, and they are surrounded by high current DC power distribution circuits. Analog and digital control circuitry is used for monitoring and control of the amplifier's operation.

Sometimes it works the other way—our contribution is a small part of a larger system, and our high frequency expertise is considered to be part of the “other” technologies that have a supporting role. We might be providing a wireless telemetry link for an environmental monitoring and control system, a high speed DSP module for a mechanical test system, or perhaps something as esoteric as a high

power microwave driver for a particle accelerator used for research.

Our expertise may not even be implemented in hardware. Among the unsung heroes in many “non-RF” industries are the EMC compliance testing and troubleshooting engineers who make it possible to meet regulatory standards and avoid the problems of noise, crosstalk and interference.

I think we need an occasional reminder of the “big picture,” including all those things that a project requires, not just the part that lies within our specialty. As noted in my comments above, they are integral to the success of the finished product and should not be overlooked.

Perhaps most important, you will be working with other people whose primary responsibilities include those other things—engi-

neers with different specialities, technicians, purchasing agents, suppliers, machinists, manufacturing assembly workers, etc. It is a natural tendency among engineers to concentrate intensely on the specific task in front of us. While this is needed to get through difficult portions of the work, we also need to get out of the cubicle regularly, and interact with the other members of the design team. Don't try to do all the cross-specialty communication in formal meetings!

We are recruiting articles on some of the most important things that surround the high frequency portion of a design: power management, thermal considerations, mechanical design and packaging. Hopefully, we'll find authors who can help you understand how *all* the pieces work together.