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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
PO Box 10621
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

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

Send subscription inquiries and address changes to the above contact person. You may send them by mail to:
High Frequency Electronics
PO Box 10621
Bedford, NH 03110-0621

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A Few Things to Think About for the New Year

Gary Breed
Editorial Director

We have a lot on our minds as 2011 begins. Big picture things include the economy and politics, which can have major effects on our personal lives. Global power shifts and continuing conflicts are things we are concerned about, as well. At the personal level, there many short-term and long-term issues—both promising and worrisome—that affect our lives. Technology is a big part of it, with Internet communities expanding our concept of "local" and wireless capabilities helping eliminate the need for us to have a specific "location".

There are many more things that are getting our personal and professional attention. I've collected a few notes on some of those that are pertinent to the high frequency techniques and technologies we practice.

Resources and Environment

Although the specific definition of "green" keeps changing (exactly how did CO_2 become such a big villain?), the general idea remains the same: natural resources are not unlimited, dangerous things should not be in our environment, and the size and scope of human activity has an effect on the entire planet. Scientists, politicians and activists will keep arguing, but regardless of viewpoint, there are things that engineers are involved in. These include the European Reduction of Hazardous Substances (RoHS) that has changed the design and fabrication of many electronic components and products. And research into the interaction of electromagnetic radiation with the human body continues—as it should.

On a smaller scale, we will be involved in the design of sensors, communications links, and networks that monitor the environment, both for research and for practical operations such as improving the efficiency of homes and commercial buildings. Wireless technology is already a major help in reducing the need for local commutes and long distance travel.

Social Networking and Personal Communication

At first, you might not think of this subject as engineering-related, but Internet-based social networking is already having a major influence on the way we stay in touch with one another, and how we see the world at a personal level. Extending this influence into our professional lives in

inevitable, but the right way to use it is still being developed.

Has it moved from personal use to your everyday work? I would love hear your stories of how Facebook, Twitter, LinkedIn and other services are being used for professional development, information sharing and other activities.

Virtual Laboratories

Near-total reliance on computer simulation and analysis has moved from the future to *right now*. Sure, the intuition of personal experience is still essential, but the software tools and powerful hardware at our disposal is replacing more lab bench engineering tasks every day. 2011 may be the last year we consider this an area deserving special attention—and it is this final step into everyday usage that I think is newsworthy.

Education

The traditional approaches for education from early childhood through advanced university degrees are changing. Exponential growth of human knowledge makes it impossible to teach a sample of everything, and changing social attitudes have required schools to take on some responsibilities that parents, families and communities once provided.

Problem solving skills that once were learned through unsupervised neighborhood and school playground activities are being replaced by classroom exercises. Hands-on learning by helping your dad, a neighbor or an uncle work on a car, home repair or other project has largely disappeared.

In this latter case, it means that new engineering students may not be accustomed to working with tools. This means that getting started in the EE school lab takes longer than it used to, and professors need to adjust their teaching methods. It may sound contradictory to my comments on computer simulation, but I think it is completely appropriate to learn things first in a hands-on environment, using real hardware. Simulation is learned as well, to compare the real world with the mathematics. What is different is that the ratio of time spent in the instrument lab and computer lab is changing to ensure that students become familiar with the most important tools.

This month's photo was taken while I was visiting the new engineering building at the University of Wisconsin-Platteville.

Next month, I'll have more notes on our changing times, and how we respond to those changes.

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