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High Frequency Electronics (USPS 024-316) is published monthly by Summit Technical Media, LLC, 3 Hawk Dr., Bedford, NH 03110. Vol. 6 No. 12, December 2007. Periodicals Postage Paid at Manchester, NH and at additional mailing offices.

POSTMASTER: Send address corrections to High Frequency Electronics, PO Box 10621, Bedford, NH 03110-0621.

Subscriptions are free to qualified technical and management personnel involved in the design, manufacture and distribution of electronic equipment and systems at high frequencies.

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## There's Little Evidence of Convergence in 4G Wireless

Gary Breed  
Editorial Director



It is interesting how industry buzz words become popular, then later show how well, or how poorly, their users predicted the future.

Two or three years ago, the term *convergence* seemed to be in every other sentence written or spoken by the leaders of the wireless industry. They talked of a mission to develop “one big pipe” of data that could support all the various types of telecommunications that a person or business wanted. While we have seen some small moves in this direction, the greater pattern is still toward *divergence*—today, there are more “pipes” than ever carrying wireless (and wired) data. This month’s Technology Report (page 40) makes this point quite clearly.

I am not a fan of convergence as an ultimate goal—I prefer the flexibility and redundancy that comes from having multiple options. The old saying, “Don’t put all your eggs in one basket,” certainly applies!

In addition, the particular collection of services to be converged into one system is defined differently by each user, as well as by the provider companies and their investors. There is no single package that is perfect for everyone. I recently saw a report that said 80% of wireless users are only interested in voice communications—the original “mobile phone” concept that started it all. Undoubtedly, this number will change over time, but as the wireless market approaches its 30th year, you might expect more enthusiasm for a wider range of services.

In hindsight, the lack of convergence is not really a surprise. Technology is still developing to deliver greater bandwidth in a mobile environment. Consumers have not had much of a chance to evaluate those capabilities, since some are not yet deployed, or are available only in limited areas. Nor is there enough market feedback to the provider companies to verify their business plans for the construction and use of new systems, and what fees their customers will tolerate.

I don’t believe we are done experimenting with all the potential combinations and permutations of wireless delivery systems. As things develop, there will be logical convergence of services for particular groups of users, but the dream of “one big pipe” is a long way off.

## W1GBE is Back On the Air

Raytheon has set up an amateur radio station to support emergency operations communications for Homeland Security at their Marlborough, Massachusetts facility. The station has HF capability for long-distance communication and VHF capability for tie-ins to local emergency management personnel and facilities. The station is licensed with the callsign W1GBE, which was formerly held by Raytheon engineer Percy Spencer. Spencer is best known as the inventor of the microwave oven.

While many of you know that I am an avid amateur radio operator, this event has extra special importance for *High Frequency Electronics*: Percy Spencer was the grandfather of our Publisher and co-owner Scott Spencer. Remembering his grandfather, Scott said, “I think

he’d be happy that his callsign is back on the air thirty-seven years after his death.”

Scott and I are both extremely pleased that Raytheon chose to honor one of its distinguished engineers in this way!

## A Few Thoughts for 2008

The combination of extremely active engineering development and volatile economics makes confident predictions difficult! So, rather than predictions, I’ll just write down a few thoughts about the near future and how it will affect our readers.

*More new ideas*—Sometime 10 years ago or so, a widespread realization arose that almost anything electronic could be done wirelessly. There will be no letup in the search to fit wireless technology with potential applications. This may be

obvious to most of you, but it is a reminder that R&D is still a fascinating part of engineering.

*Better computer simulations*—The extension of an engineer’s computational and analytical capabilities with computers will continue to develop. Good engineers are more productive; great engineers can develop more ideas.

*Wider reach of high frequency techniques*—This is well underway, with high speed digital and other non-RF technologies. Even “low frequency” electronics cannot escape the need to consider high frequency effects, if only to assure coexistence with the surrounding wireless world.

Hmmm... I guess my prediction for 2008 is a continuing, and growing, need for the expertise of engineers like our readers!