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Sunny in Seattle

Tom Perkins
Sr. Technical Editor



Microwave Week, also known as the IEEE Microwave Theory and Techniques Society International Microwave Symposium, held during the first week of June, brought unusually mild weather and clear skies to the beautiful city of Seattle. Overall the symposium was a great success, with only a few “glitches” that would likely be more apparent to someone like me who has served on past Boston steering committees. Thanks to the volunteers serving under Tom Raschko as well as the opportunity for

High Frequency Electronics to sponsor the well-attended Monday evening Welcome Reception.

Opening with the RFIC Symposium, workshops and short courses on Sunday, the conference had something for everyone. Consider, for example, *Self-Healing Mixed Signal Circuitry: Built-in Calibration and Compensation Techniques*. The Monday IMS Plenary Session, with speaker Dr. Patrick Ennis, was useful for those wishing to know more about entrepreneurship and inventing.

Congratulations to the new class of IEEE Fellows associated with MTT-S. They were recognized by one of our own, Dr. Peter Staecker, 2013 IEEE President and CEO.

A piece of technology that made a particular impression was a microwave oven by NXP using a solid-state source (instead of a magnetron) having significant agility, including beam-steering in the cavity. This could revolutionize how a dinner is cooked to perfection with lower energy cost.

Localized Cell Networks

Another area of technology is localized (mini, micro, nano etc.) cellular networks to minimize use of precious bandwidth. Workshops and papers on RF and microwave-assisted medicine reflect rapidly emerging technology. Of note, Doherty power amplifiers have become commonplace, and so have GaN based amplifiers. The use of innovative circuit techniques to linearize GaN amplifiers was described in talks at a workshop titled: *Multi-Octave High Efficiency, High Linearity High Power Amplifiers*. Flexibility and reconfigurability have become the mantra for Software Defined Radios (SDRs). Terahertz frequency work is rapidly advancing and companies are emerging—this is not just relegated to Universities anymore.

Connector companies are making products that could not be imagined a few years ago. Tiny coax connectors that to the naked eye look like DC pins (e.g. Southwest Microwave).

A strong thrust in CMOS, SiGe and silicon-on-insulator (SOI) is making serious challenges to GaAs devices. This will be an area to watch closely.

Many companies made interesting presentations at MicroApps. Of note were software simulation/modeling providers such as Agilent, Ansys, AWR Corporation and Sonnet Software, Inc.

Test Equipment

Test equipment continues to advance at rapid rates. I saw a number of noteworthy instruments including a Multi-Channel Phase Coherent Vector Signal Generator produced by XCOM, A Bird Technologies Company. This device can simulate a realistic dense signal environment. The message I got was that this 70+ year-old family-owned company has come a long way and does not just manufacture their traditional high quality RF watt meters. I was also impressed with the continuing growth of inexpensive measurement systems, e.g. Mini-Circuits and Copper Mountain Technologies. Anritsu demonstrated some new equipment that is bound to keep the test instrument marketplace competitive. I recommend their booklet *The Essentials of Vector Network Analysis From α to Z_0* .

Wednesday was Wireless Industry Day. Other significant activities included the Student Paper Competition and the Graduate Student Challenge. These are all great activities which have the side benefit of introducing students to the symposium at a young age. Thanks also to the many students who volunteered their time to assist in providing directions, signage, etc.

As a radio amateur, it was good to see the ARRL with a booth there for the first time. I'm a bit prejudiced as I really believe ham radio is the reason I became an electronic engineer with particular emphasis on RF and microwaves.

The closing session speakers were Dr. David Tennenhouse of Microsoft, and Michael Thorburn of the Joint ALMA Observatory Project (millimeter and submillimeter-wave array) in Chile. Both speakers delivered very interesting talks on diverse aspects of our technology.

Finally, the week ended with more workshops, short courses and the ARFTG Conference.

There were many social events and opportunities for spouses/families to have a memorable visit. I managed to go on a tour of Seattle with my wife on Monday morning, and got to observe many interesting sights, including the 18-foot-high Fremont Troll. Look it up and see what happened to the VW!

Here's looking forward to IMS 2014 in Tampa. Microwave Week next year will also include Wamicon on Friday June 6, a conference running concurrently with ARFTG. There will likely also be workshops and short courses, so plan on staying over to Friday.

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