Making Waves Historically

A historical perspective helps us better understand our radio arts. Radio receivers, transmitters and related devices all went through phases, starting out as purely mechanical-electrical devices. They progressed through vacuum tube electronics, and migrated to semiconductors and integrated circuits. Today’s receivers and transmitters are ever more reliant on digital implementations with software defined functions replacing physical circuits. One can well imagine the analog-to-digital and digital-to-analog direct sampling of signals right at the terminals of an antenna. In fact such implementations have been built! Their historical perspective was one of evolution from mechanical-electrical devices to software driven solutions.

Antennas and propagation of course have escaped digitization. We’ve noted before that the very first technical article in the premier December 1915 issue of QST was “Pictured Electro-Magnetic Waves,” by Clarence D. Tuska, the co-founder of the ARRL. More than a century later we still map radiation patterns, but with ever more precision using modern simulation tools. The tools went digital. Not long after Tuska’s article, Professors Hidetsugu Yagi and Shintaro Uda described their classic Yagi-Uda directional array antenna in 1926. It has since become one of the most popular antenna configurations, along with the half-wave dipole and the vertical antenna. We celebrate the Yagi-Uda array by reprinting the original article in these pages. The antenna originated in the 1920s, but its basic form remains the same. Its experimental and mathematical analysis continues to this day, bringing us extensions and versions optimized for various performance parameters.

Keep your perspective historical!

In This Issue

Hidetsugu Yagi and Shintaro Uda describe the classic Yagi-Uda antenna array in this reprint of their 1926 article.

Robert J. Zavrel, W7SX, extends the Yagi-Uda array concept to the “W7SX Array” by not restricting element lengths to a half wavelength.

Jerry Spring, VE6TL, discusses the onset of Solar Cycle 25 and the MG II index.

Eric Nichols, KL7AJ, in his Essay Series, discusses electro-mechanical devices and control theory.

Phil Salas, AD5X, describes his method and fixtures for measuring antenna tuner loss.

Kai Siwiak, KE4PT, describes lightning-induced electromagnetic pulse effects.

Peter DeNeef, AE7PD, addresses RF exposure from a 70 cm band collinear dipole array.

Writing for QEX

Keep the full-length QEX articles flowing in, or share a Technical Note of several hundred words in length plus a figure or two. QEX is edited by Kazimierz “Kai” Siwiak, KE4PT, (ksiwiak@arrl.org) and is published bimonthly. QEX is a forum for the free exchange of ideas among communications experimenters. All members can access digital editions of all four ARRL magazines: QST, On the Air, QEX, and NCF as a member benefit. The QEX printed edition annual subscription rate (6 issues per year) for members and non-members is $29 in the United States. First Class mail delivery in the US is available at an annual rate of $40. For international subscribers, including those in Canada and Mexico, QEX printed edition can be delivered by airmail for $35 annually, see www.arrl.org/qex.

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Very kindest regards, Kazimierz “Kai” Siwiak, KE4PT, QEX Editor