Kazimierz "Kai" Siwiak, KE4PT

Perspectives

It's a Digital World

Amateur Radio communications systems have steadily and increasingly embraced digital technologies. Among the earliest transitions to the digital world has been digital frequency synthesis, resulting in a dramatic increase in frequency stability of even two-decades old classic radios. This stability enabled the leap forward to *basic software defined systems* (SDS), which use the classic (or newer) frequency-stable radios as an RF front end with the "audio passband" as the last IF. Add a sound card for conversion between the analog and digital worlds, and for coupling and processing the signals on personal computers. The *software-defined* magic is on the computer in programs like *WSJT-X* and *fldigi* that encode and decode modes and provide capabilities that were not even dreamed of when that old radio was designed. Suddenly your classic transceiver's sensitivity jumps from 0.2 μV for native SSB to better than 0.004 μV for the software defined weak signal modes JT65 and JT9!

Furthermore, digital technology is also replacing formerly analog functions with digital radio architectures. The result is the modern *software defined radio* (SDR) that brings the digital world ever closer to the transceiver antenna ports.

Operationally, that magical software on your computer results in an increased propagation link-margin for both the SDS and SDR. It means that with those weak signal modes we can see tens of decibels deeper into a darker ionosphere, even with your classic radio.

We'd like to hear from you (**qex@arrl.org**), our readers and authors, about your forays into software defined systems, and how you are embracing the digital world, and what operational benefits *you* are seeing with SDS and SDR.

In This Issue

We feature a range of topics in this issue of *QEX*.

Elwood Downey, WBØOEW, designs an RF generator using an Arduino-controlled direct digital synthesizer stabilized with a GPS receiver.

James L. Tonne, W4ENE, presents some simple high performance circuitry to enhance transmitted speech signals.

Steve Cerwin, WA5FRF, investigates interesting ionospheric propagation phenomena during the August 2017 eclipse and November 2017 ARRL FMT.

Phil Salas, AD5X, shows how to protect the input of your high-power amplifier from potentially damaging transceiver power transients.

Luiz Duarte Lopes, CT1EOJ, tunes a dipole from a knowledge of impedance at the end of a transmission line.

Keep the full-length *QEX* articles flowing in, or share a **Technical Note** of several hundred words in length plus a figure or two. Add to the Amateur Radio *institutional memory* with your technical observation. Let us know that your submission is intended as a **Note**.

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Very best regards,

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