

QEX Review

D. Silage, *Digital Communications Systems Using SystemVue*, Da Vinci Engineering Press, Charles River Media, Hingham, Mass., 2006, ISBN 1-58450-850-7, 365 pp plus CD. Cover price: \$49.95 U.S., \$66.95 Canada.



Two timeless truths reverberate down the halls of academia, throughout engineering laboratories and around production shops worldwide. They are: “You must have the right tools for the job,” and “It’s nice to know what you’re doing at every stage of the game.” To those utterances, I’d have to add what Mom told me: “Son, there’s no substitute for experience.” *Digital Communications Systems Using SystemVue* gives all that to students of digital communications systems over a broad range of levels.

This new book is an outgrowth of the author’s direct experience teaching the theory and practice of both analog and digital systems. What makes it truly outstanding is its emphasis on simulating practical systems in realistic environments, rather than on the exact numerical solutions to equations. Thus the book includes little discussion of the underlying theory of digital systems; but as a supplement to theoretical studies, it is excellent and *SystemVue* is quite a versatile tool.

The Textbook Edition of the *SystemVue* software included with the book allows you to view block diagrams of digital communications systems on your computer screen and to analyze performance. Without doubt, such schematic entry makes it relatively fast and easy to explore trade-offs among noise, non-linearities and other deleterious effects while optimizing the design. Results may be presented in time and frequency domains. The proper approach to, and limitations of, simulation are illustrated.

The book specifically addresses various forms of digital modulation, including just about everything from pulse amplitude modulation (PAM) and frequency shift keying (FSK) to direct-sequence (DSSS) and frequency-hopping spread-spectrum (FHSS). Synchronization, channel modeling and equalization get fair coverage.

Naturally, a good understanding of analog signals is necessary for any communications designer, too. Chapter 6 contains a treatment of sampling and quantization, featuring spectra of sampled signals and analyses of coding schemes for audio. That part of the book deserves particular attention, since digital signal processors (DSPs) often embody the preferred implementations of systems these days.

The application of the Textbook Edition software included is intentionally limited to what's described in the book. An evaluation version of *SystemVue Professional* would allow models to be extended and new designs to be investigated. Check it out because it's very powerful software. Additional instructional and experimental materials are available on the author's Web site at <http://astro.temple.edu/~silage>.

Dennis Silage, Ph.D., K3DS, is Professor of Electrical and Computer Engineering at Temple University in Philadelphia. Dennis graciously gives his time to those interested in Amateur Radio—*Doug Smith, KF6DX, QEX Editor*.

