



IEEE Systems Council Chapter presents IEEE Distinguished  
Lecture Series on

**The Things We Ought To Know  
About Digital Communications (Part 5)**

**Dr. Bernard Sklar**

Date: December 4, 2017 (Monday)

Time: 4:00 – 6:30 PM

Location: VEC 501, CSULB



**Abstract:** Part 5 of the whirlwind talks (on things that communications engineers should know) explains the creative technology of orthogonal frequency-division multiplexing (OFDM), and single-carrier OFDM (SC-OFDM). We start with a very quick overview of our "important-concept" listing, and the things we've already covered. Next, we use easy-to-understand methods to navigate through the interesting details of OFDM, such as the very-important function of the cyclic prefix. We present new visualizations to get an intuitive feeling of how OFDM combines the use of power-limited signaling for the subcarriers, and bandwidth-limited signaling for the data. We also show how the bandwidth efficiency of OFDM is improved by placing independent data on the positive copy and the negative copy of each subcarrier. We explain how SC-OFDM has evolved to solve the peak-to-average power ratio (PAPR) problem in ordinary OFDM. We consider real-world numerical examples. This intense talk is geared toward designers, managers, software developers, and whoever wants to partake in the passion that drives communication engineers.

**About Speaker:** Dr. Bernard Sklar has over 60 years of technical experience at: Republic Aviation, Hughes Aircraft, Litton Industries, and The Aerospace Corp. At Aerospace, he helped develop the MILSTAR satellite system, and was the principal architect for EHF Satellite Data Link Standards. Currently, he is Head of Advanced Systems at Communications Engineering Services, a consulting company he founded in 1984. He has taught engineering courses at several universities, including the UCLA and the University of Southern California, and has presented numerous training programs throughout the world. Dr. Sklar has published and presented scores of technical papers. He is the recipient of the 1984 Prize Paper Award from the IEEE Communications Society for his tutorial series on digital communications, and he is the author of the book, *Digital Communications: Fundamentals and Applications*, 2<sup>nd</sup> Edition, Prentice-Hall, 2001. He is past Chair of the Los Angeles Council IEEE Education Committee. He holds a Ph.D. degree in engineering from the University of California, Los Angeles.

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