



# RF and Digital Signal Processing for Software-Defined Radio: A Multi-Standard Multi-Mode Approach

*Tony J. Roush*

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## **RF and Digital Signal Processing for Software-Defined Radio: A Multi-Standard Multi-Mode Approach**

**Tony J. Roush**

### **Understand the RF and Digital Signal Processing Principles Driving Software-defined Radios!**

Software-defined radio (SDR) technology is a configurable, low cost, and power efficient solution for multimode and multistandard wireless designs. This book describes software-defined radio concepts and design principles from the perspective of RF and digital signal processing as performed within this system. After an introductory overview of essential SDR concepts, this book examines signal modulation techniques, RF and digital system analysis and requirements, Nyquist and oversampled data conversion techniques, and multirate digital signal processing..

#### **KEY TOPICS**

- Modulation techniques

Master analog and digital modulation schemes

- RF system-design parameters

Examine noise and link budget analysis and Non-linear signal analysis and design methodology

- Essentials of baseband and bandpass sampling and gain control

IF sampling architecture compared to traditional quadrature sampling, Nyquist zones, automatic gain control, and filtering

- Nyquist sampling converter architectures

Analysis and design of various Nyquist data converters

- Oversampled data converter architectures

Analysis and design of continuous-time and discrete-time Delta-Sigma converters

- Multirate signal processing

Gain knowledge of interpolation, decimation, and fractional data rate conversion

\*Offers readers a powerful set of analytical and design tools

\*Details real world designs

\*Comprehensive coverage makes this a must have in the RF/Wireless industry



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