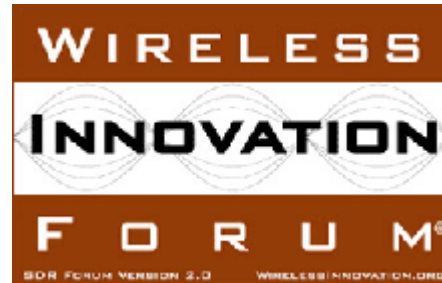
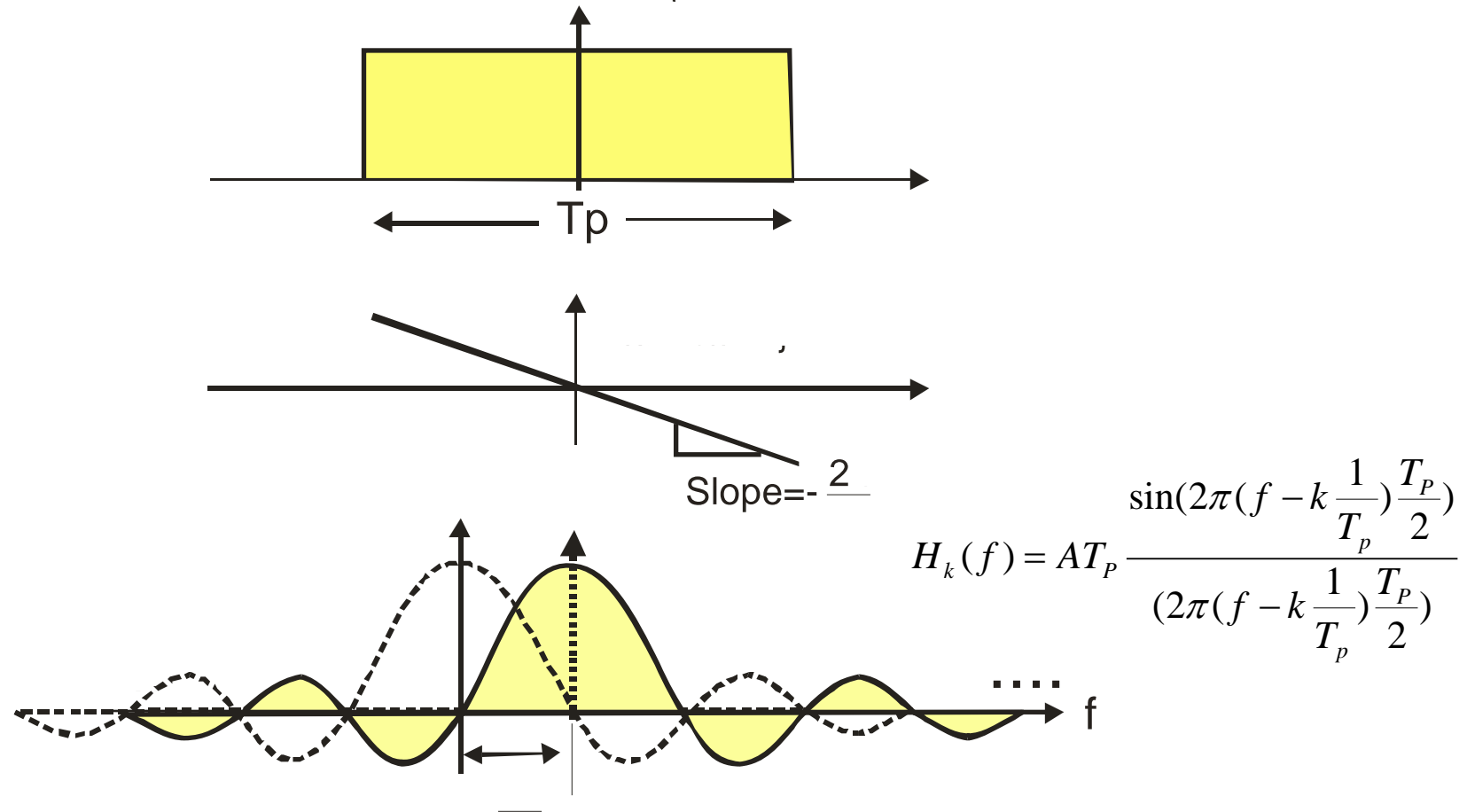


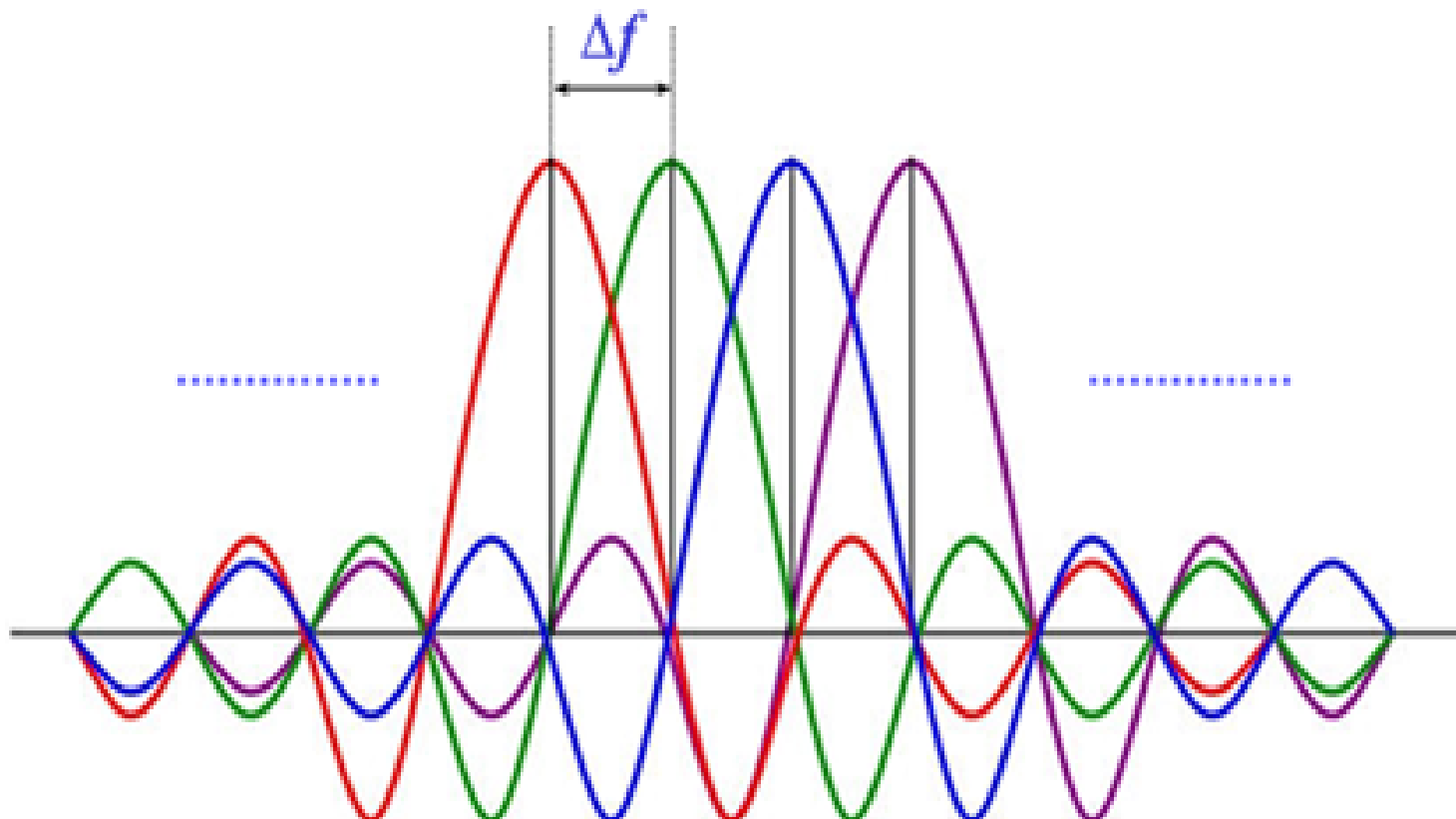
Design Considerations for Channelizer Based Receivers in Generalized Frequency Division Multiplexed OFDM Systems

fred harris, Chris Dick, Elettra Venosa, Xiaofei Chen

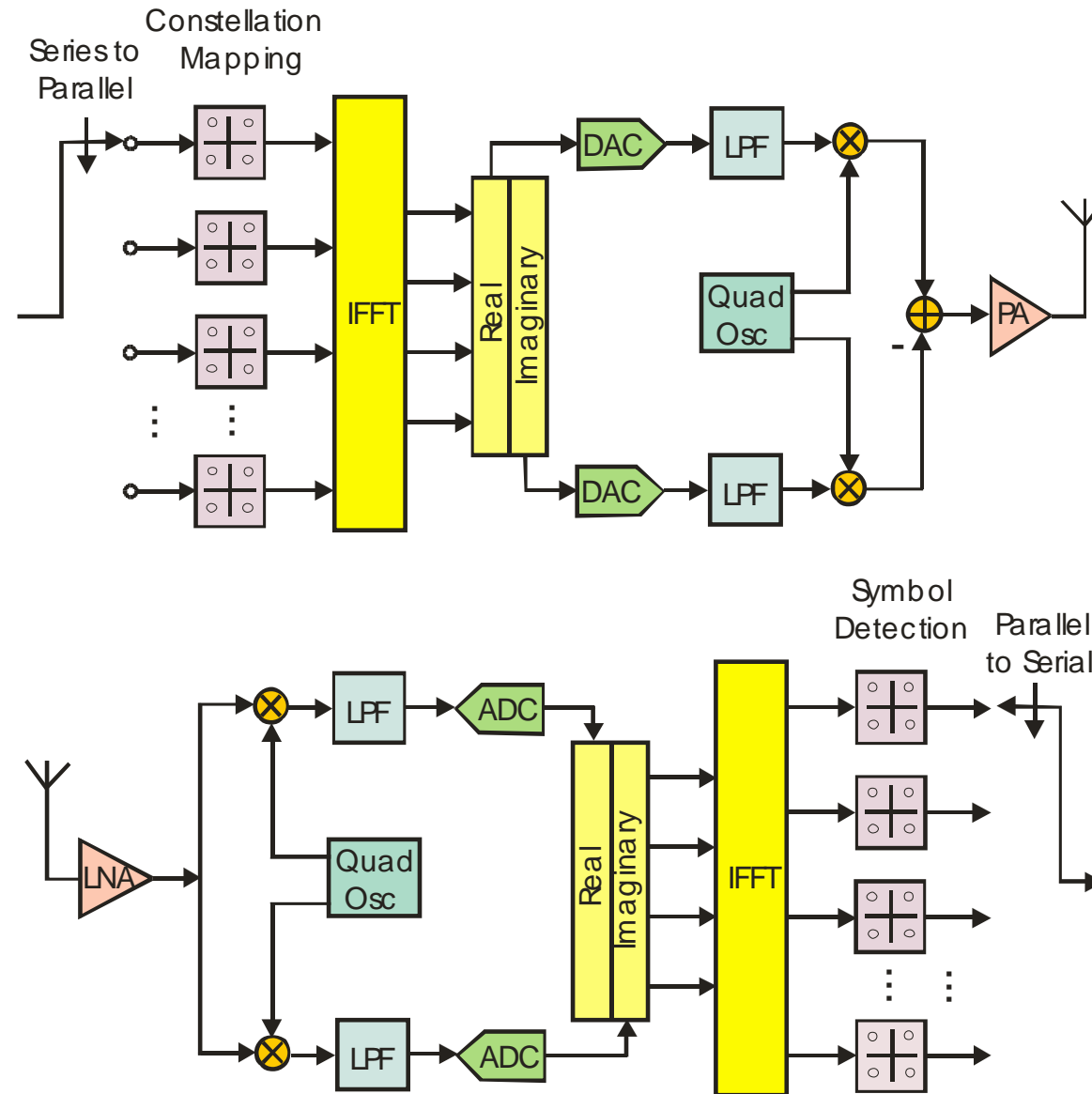


Shift Spectrum with Linear Phase on DC Pulse: Move Spectrum to First Spectral Zero



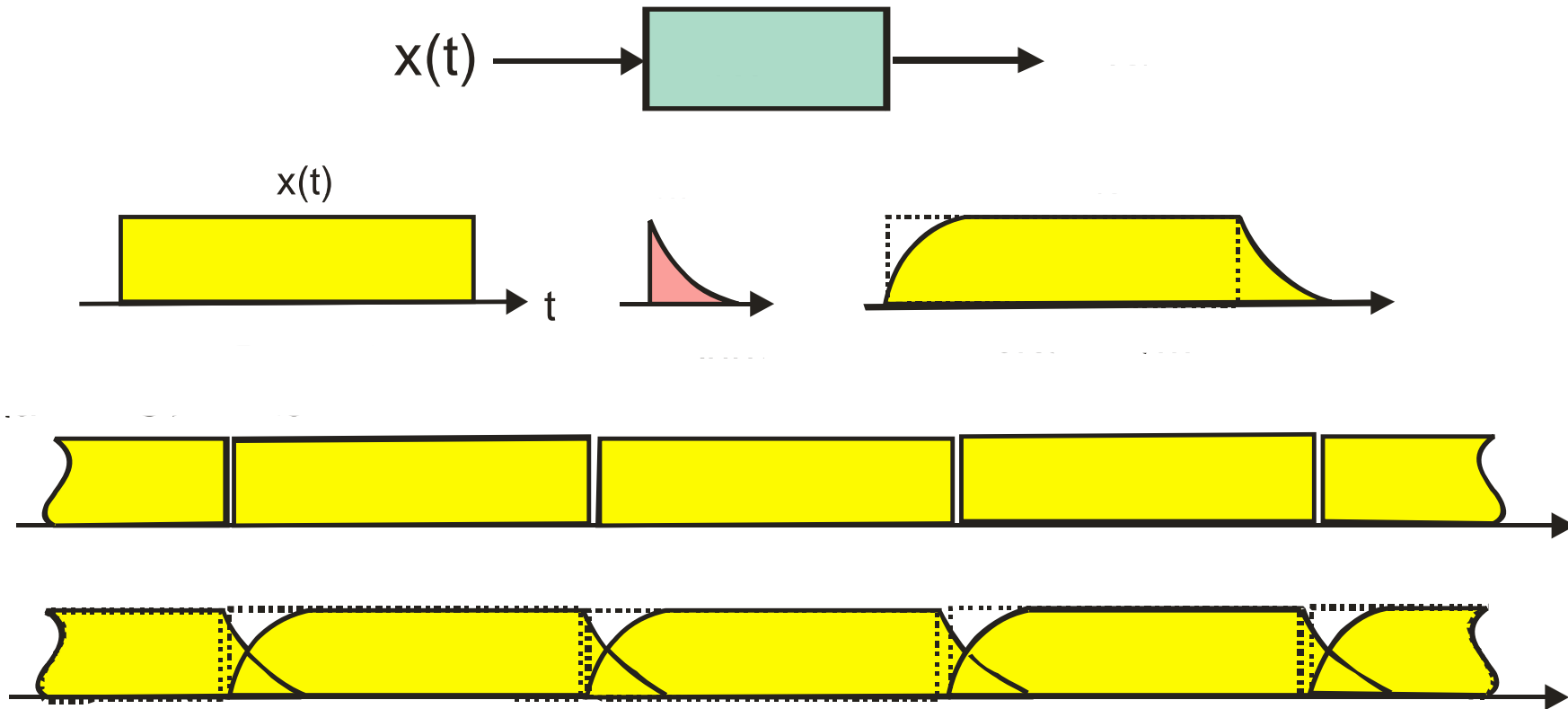


OFDM Modulator and Demodulator



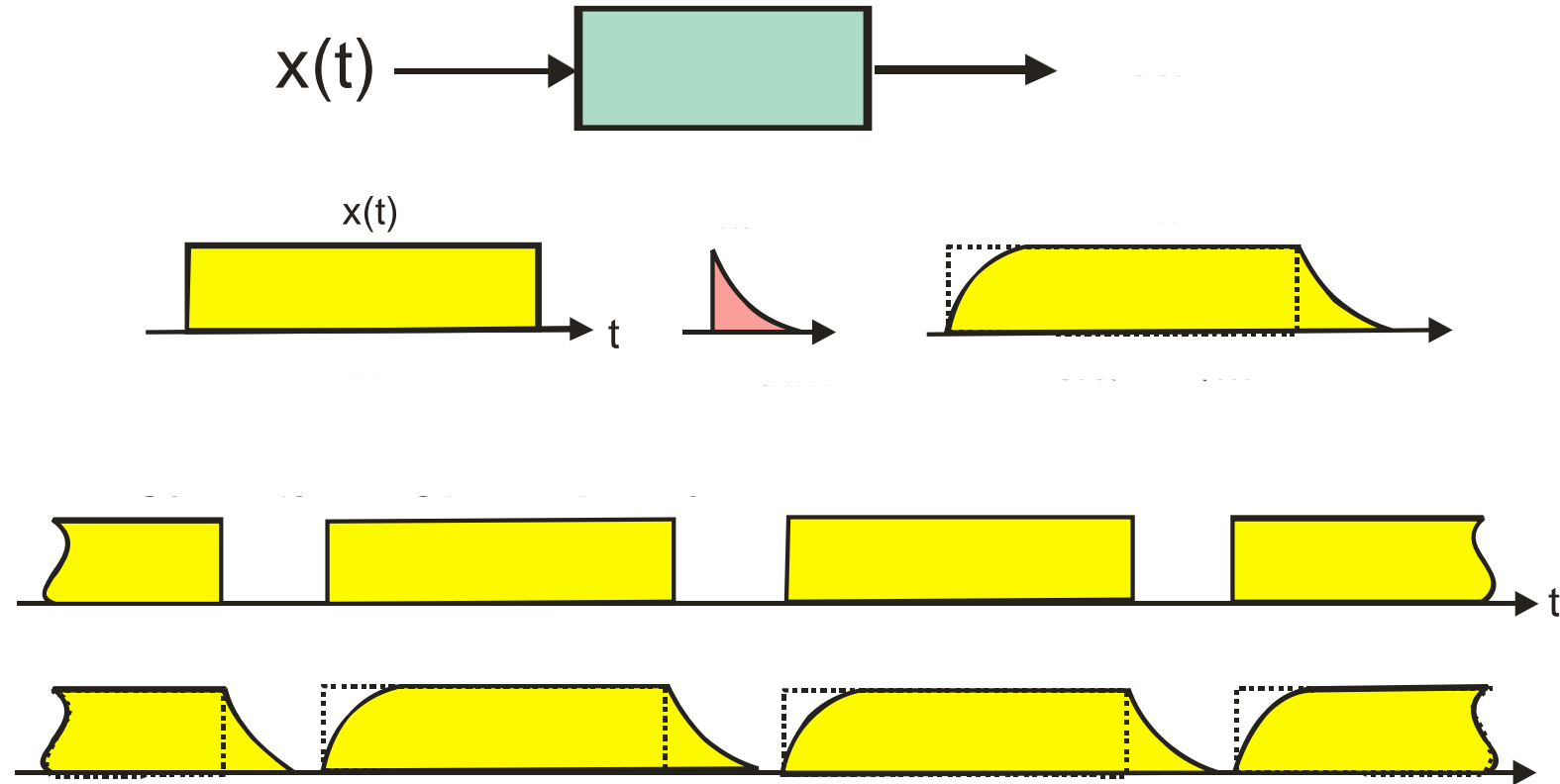
Adjacent Symbol Interference (ASI)

Symbol Smearing Due to Channel

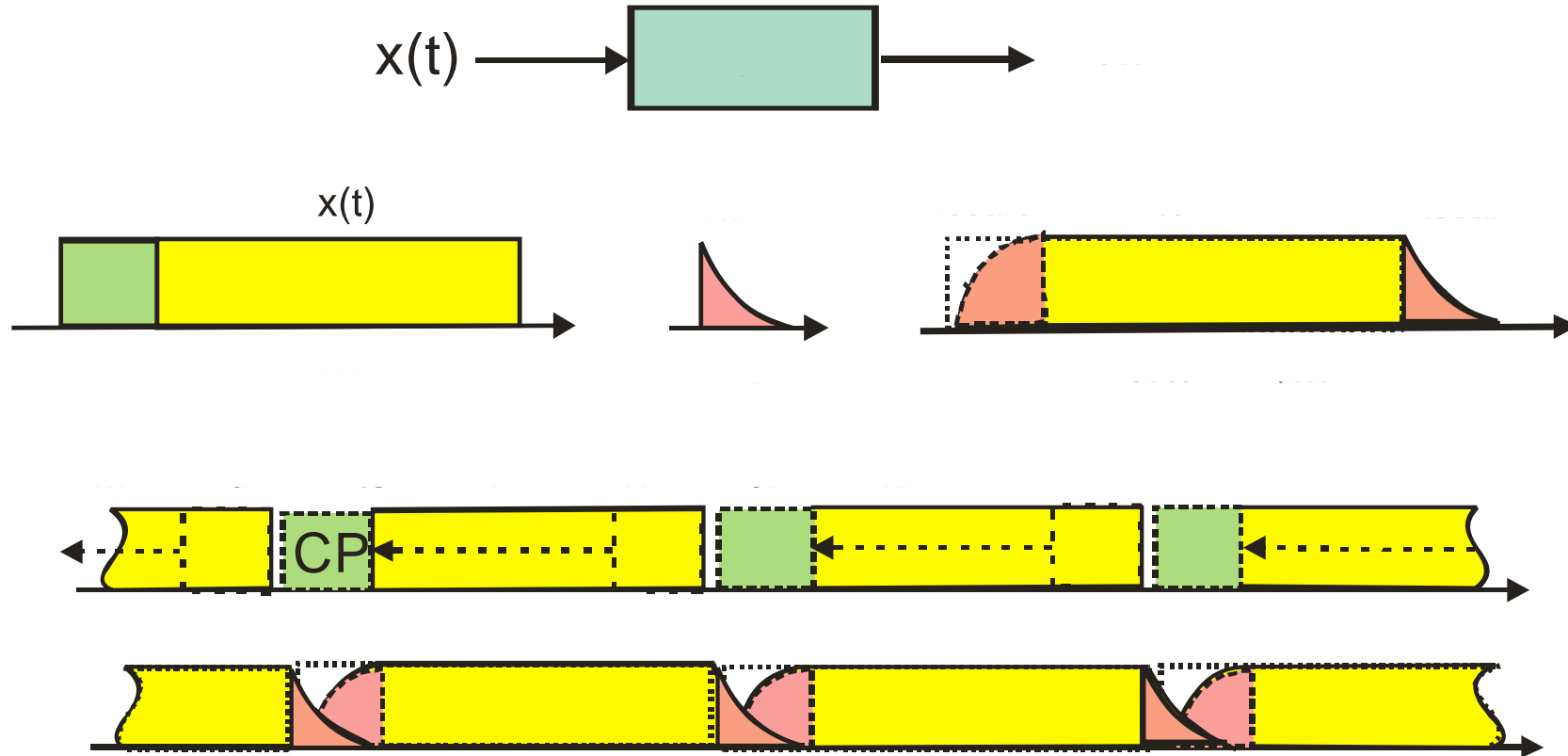


Guard Interval

Inserted Between Adjacent Symbols to Suppress ASI



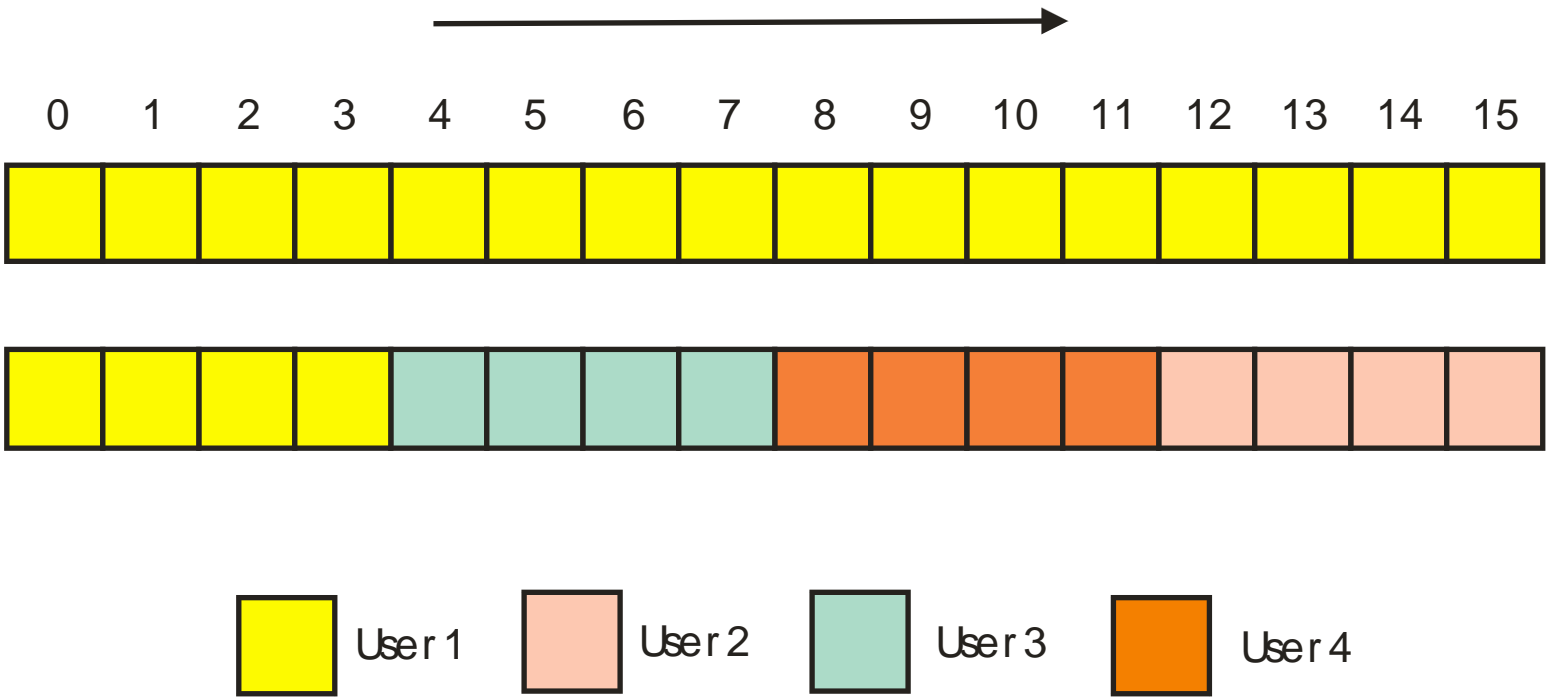
Cyclic Prefix Inserted in Guard Interval to Suppress Adjacent Channel Interference (ACI)



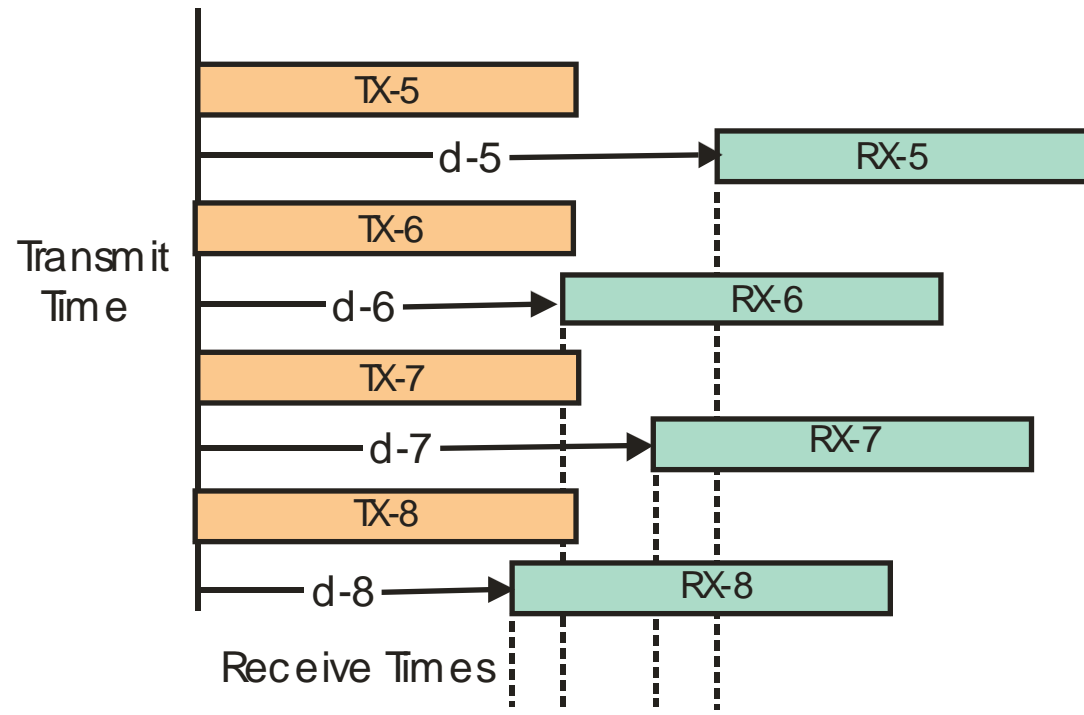
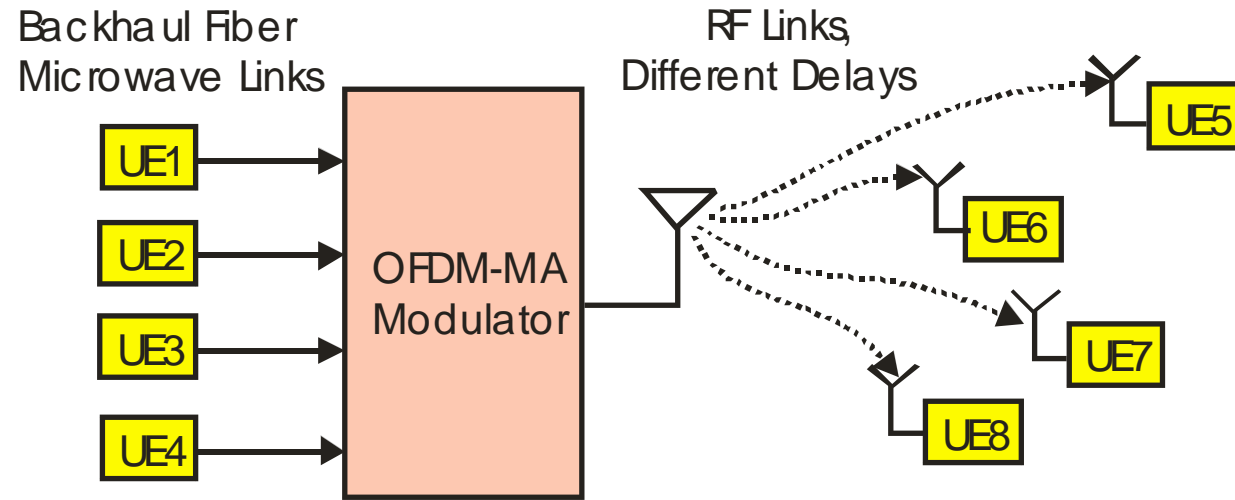
Single User: Simple Carrier Acquisition, Simple Timing Acquisition, Orthogonality

Multiple Users: Orthogonality at Cell Site Requires all
Signals to Arrive Aligned in Time and Aligned in

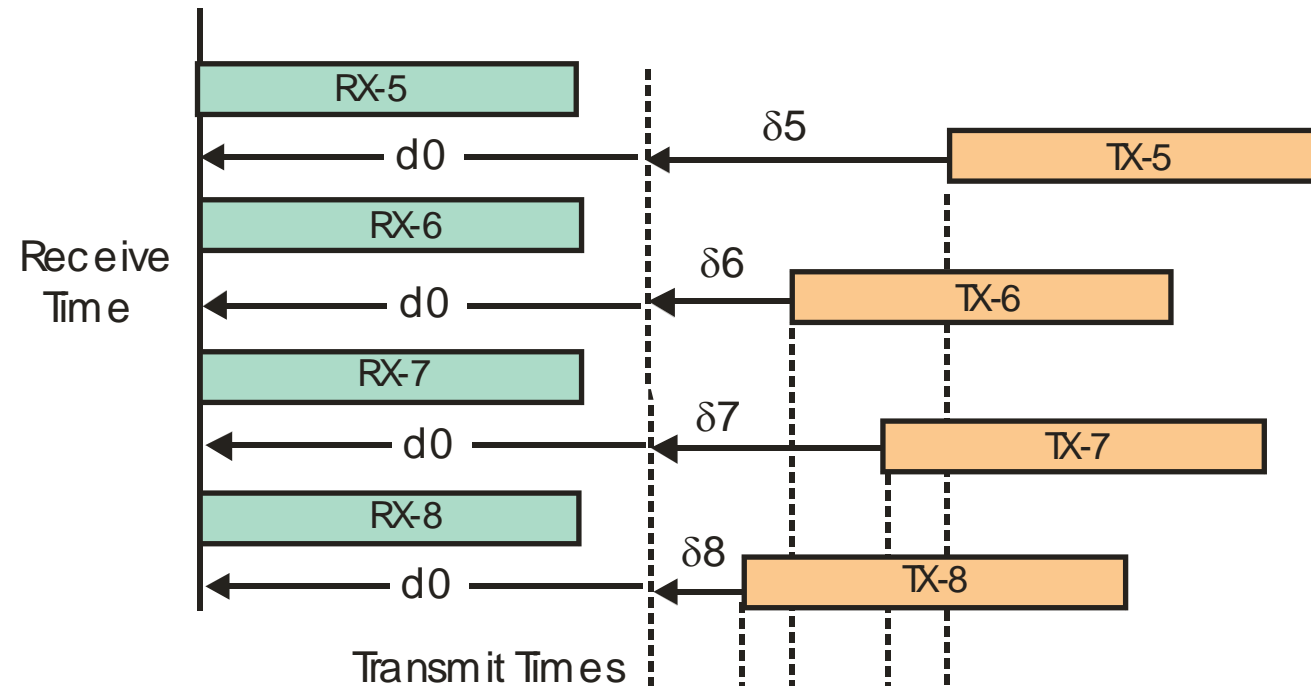
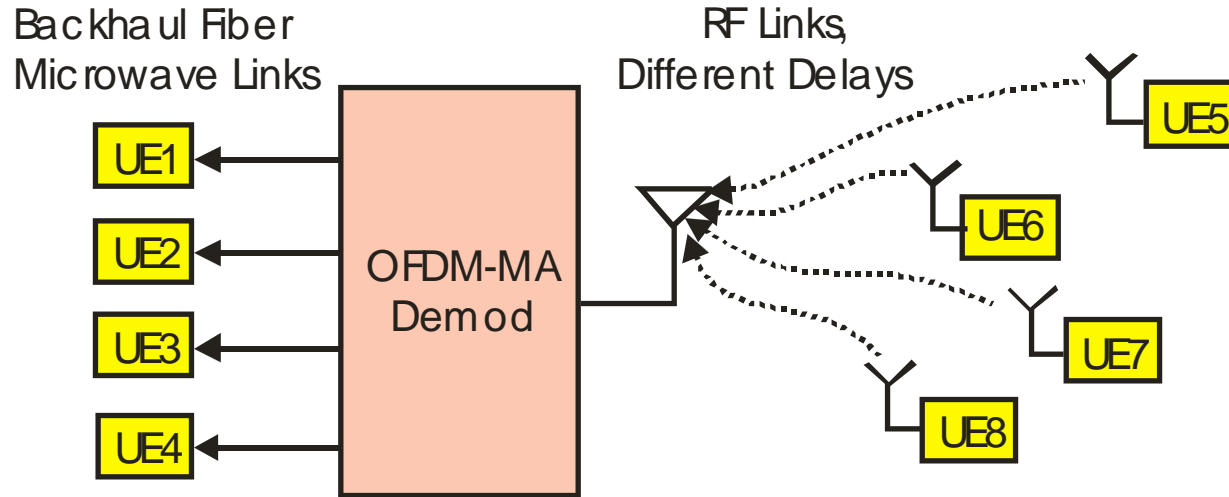
Frequency Bins



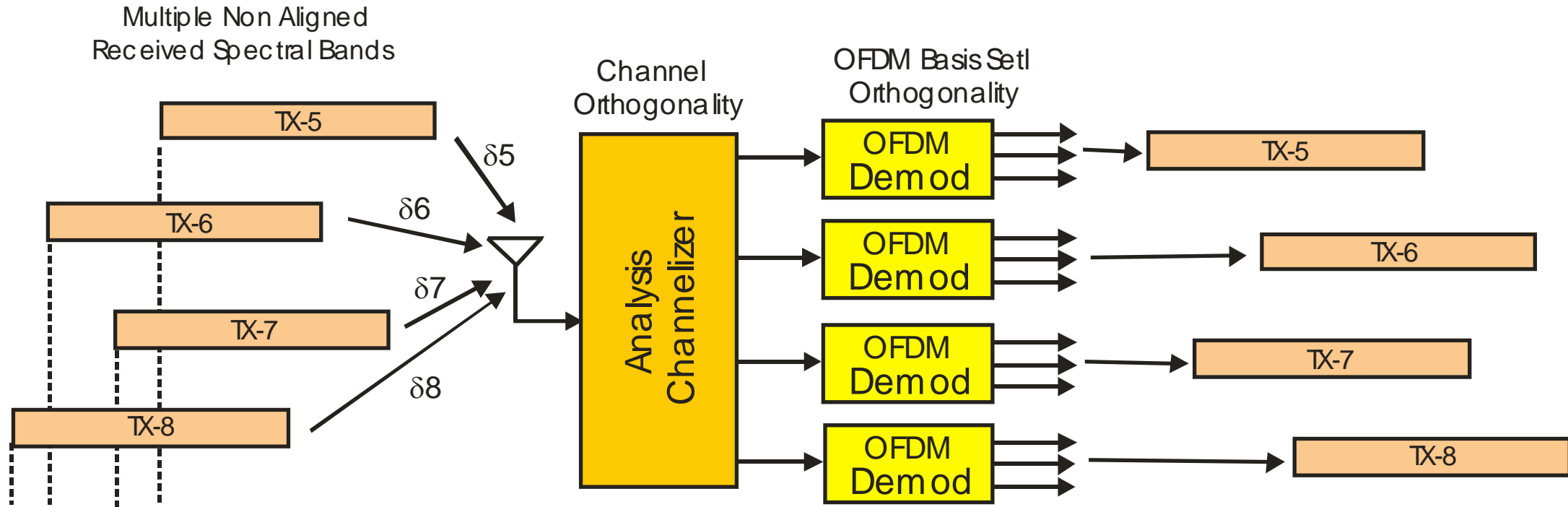
Differential Delays from Modulator to Mobile Phones



Differential Transmission Times from Mobiles to Cell Site



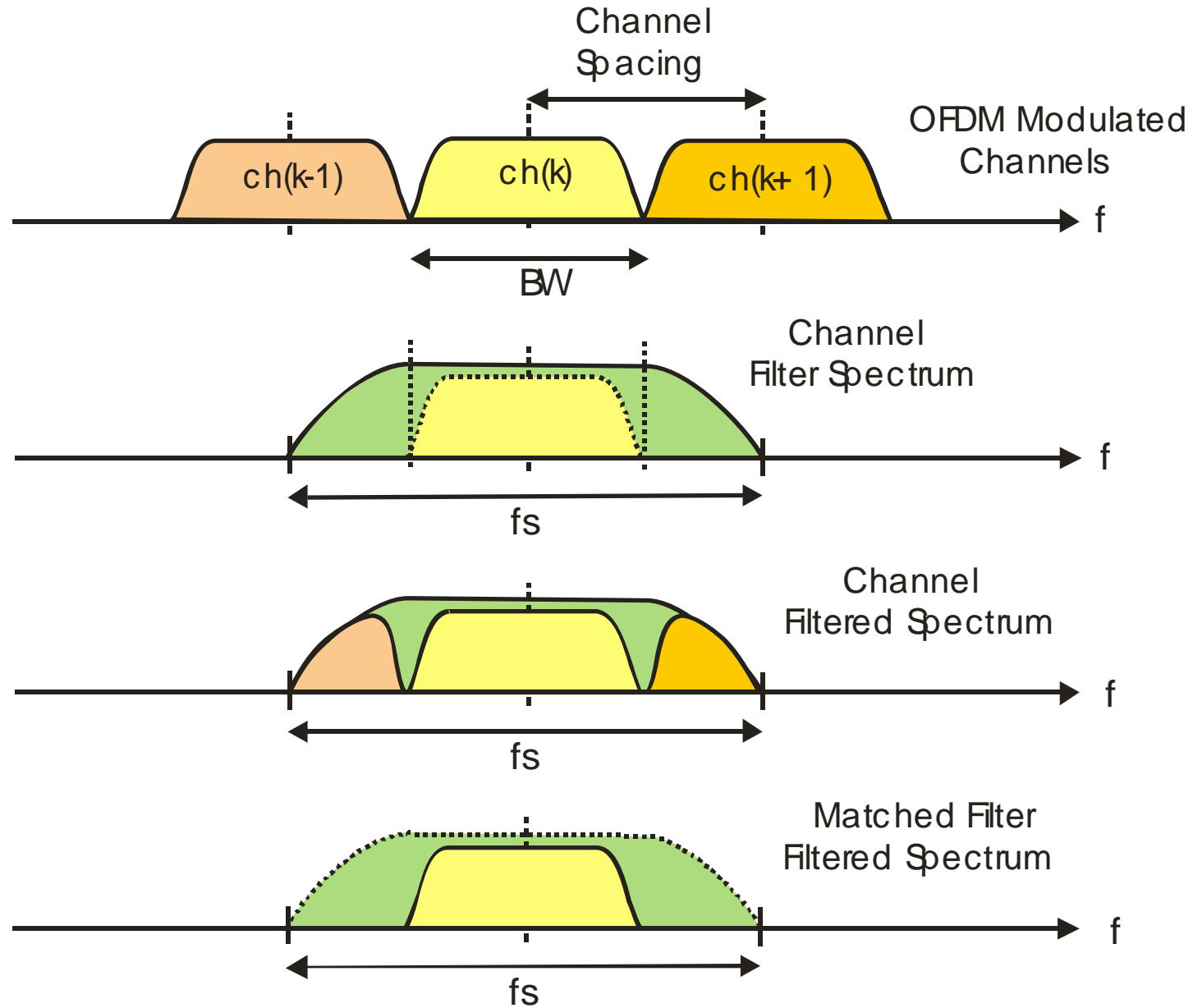
Channelizer Enables Orthogonality of Adjacent OFDM Frequency Blocks



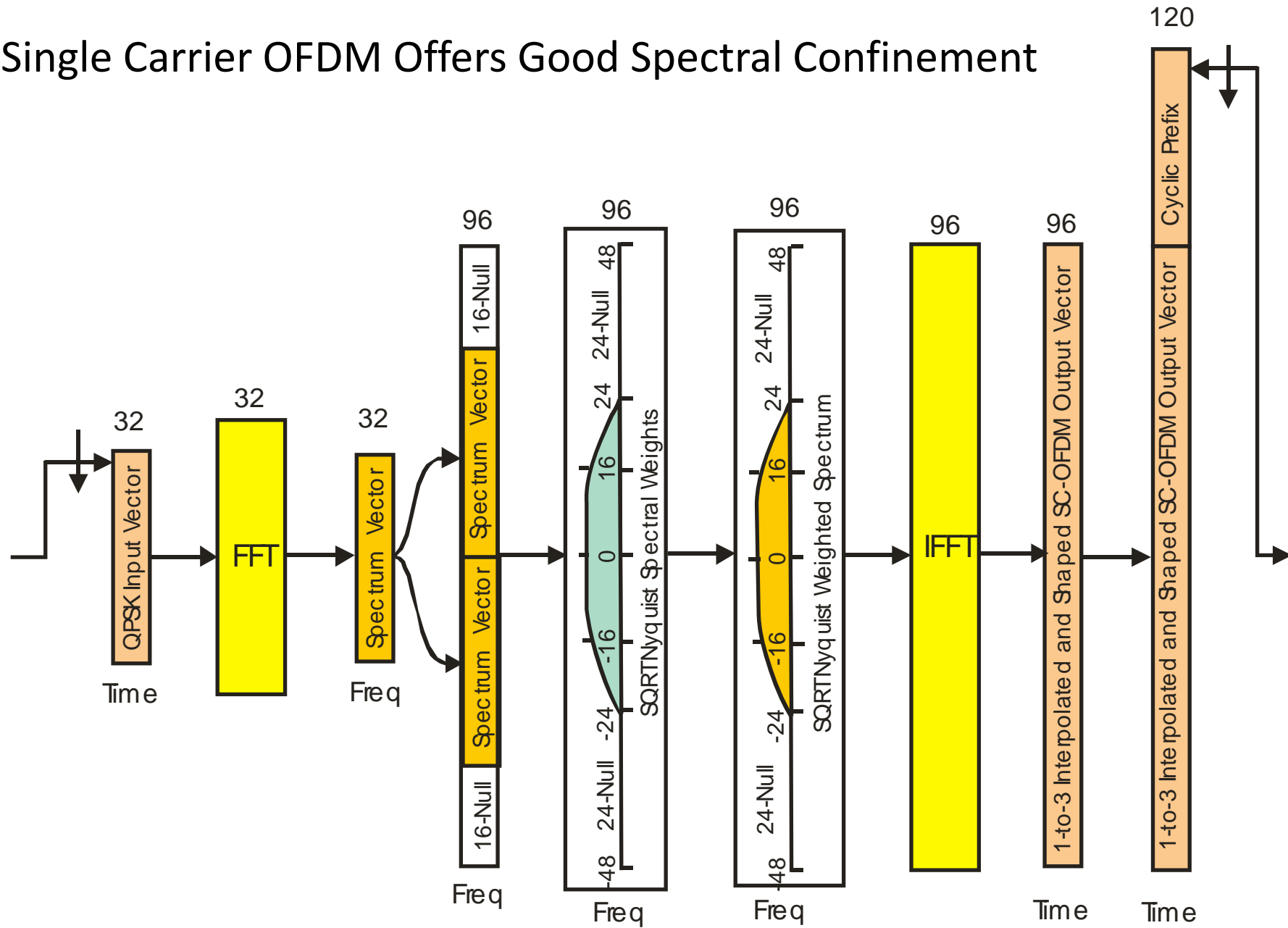
Questions

- i) Does the Channelizer Affect the OFDM Modulated Signal?
- ii) Can The channelizer Sustain Adjacent Channel Orthogonality?
- iii) Does the Channelizer Maintain OFDM Spectral Efficiency?

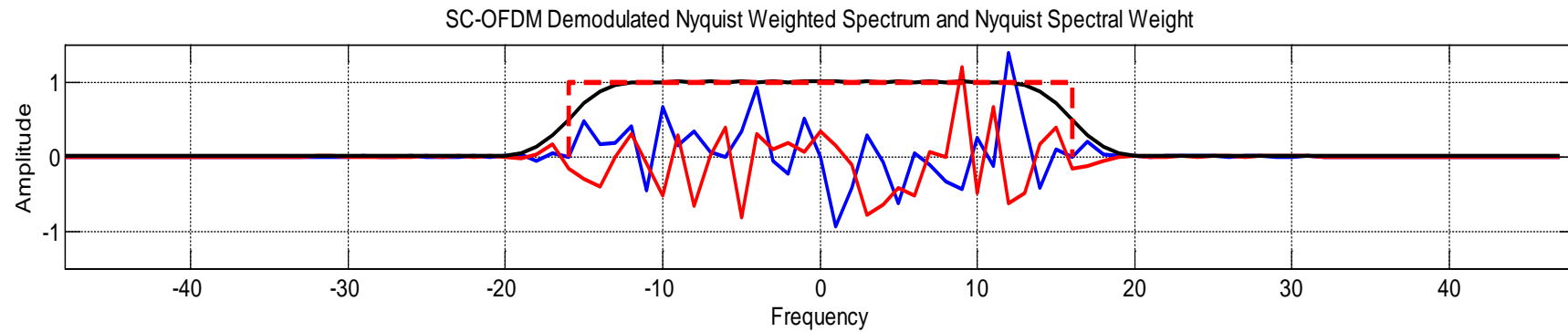
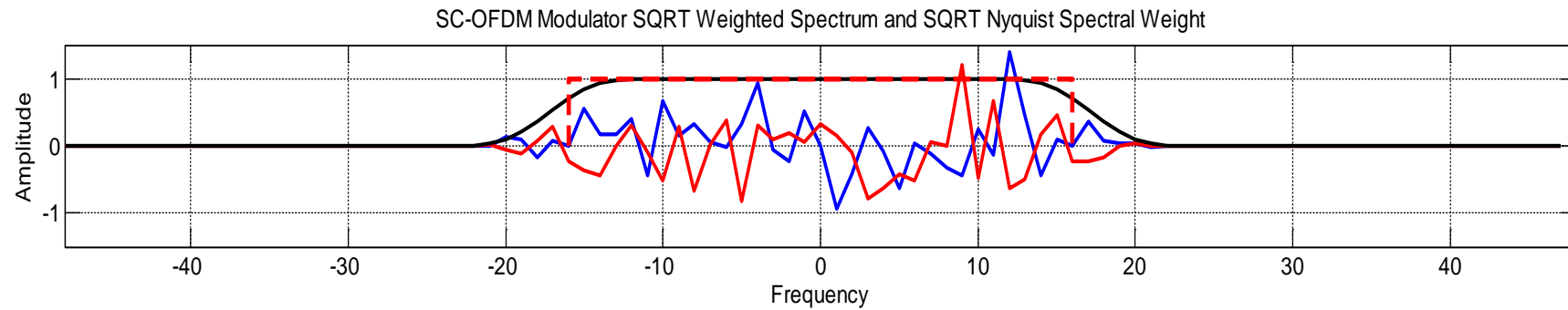
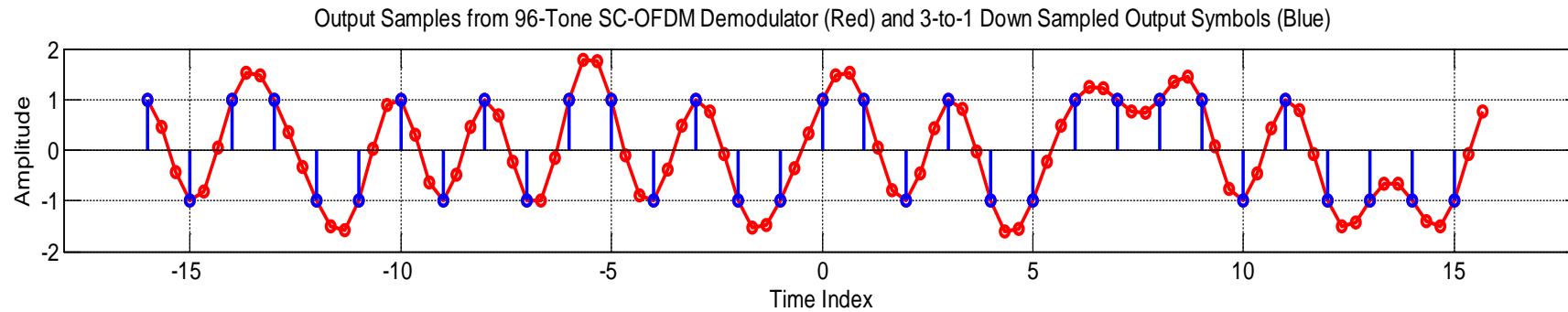
Signal Channel and Analysis Channelizer Spectral Spans



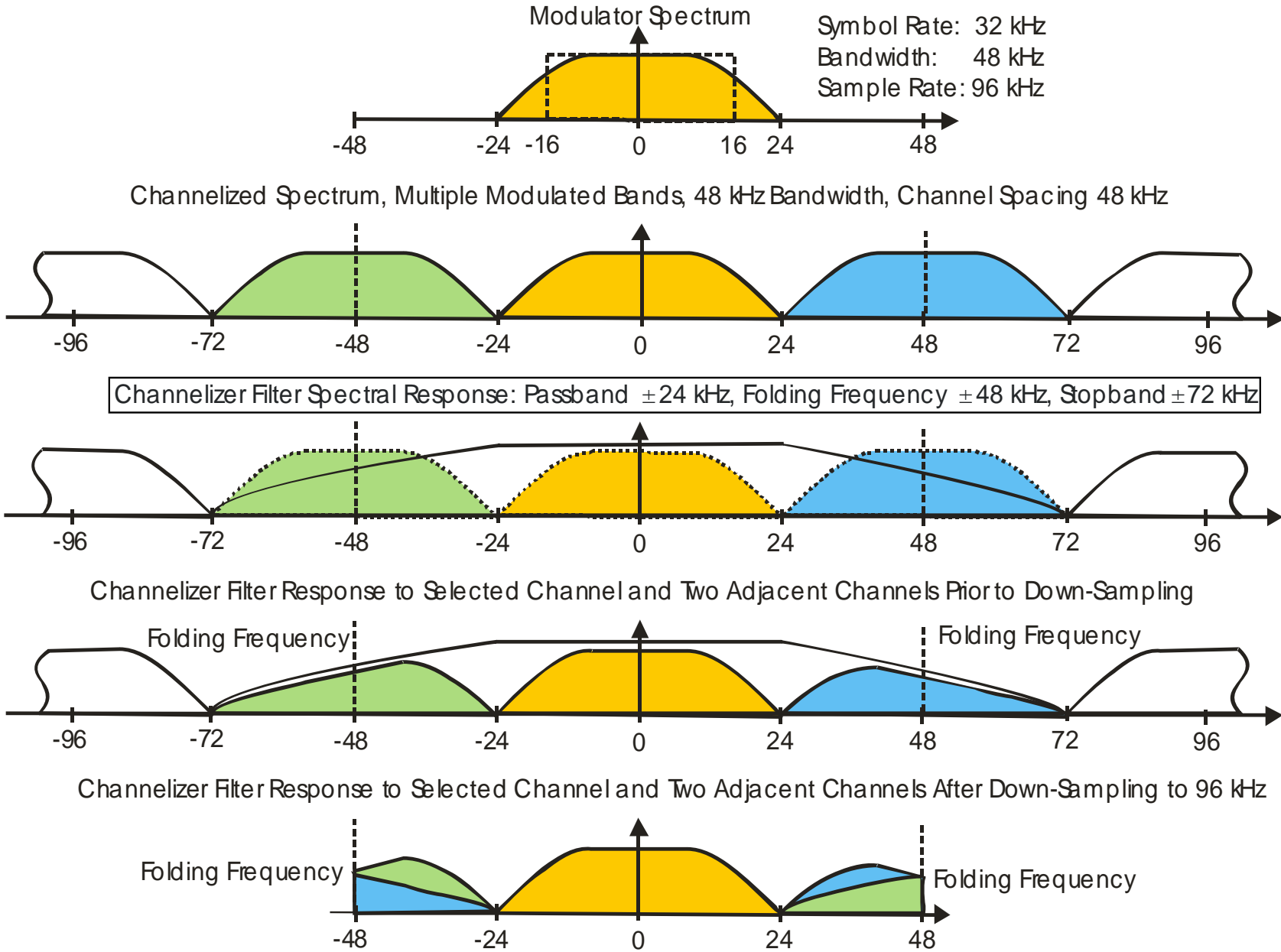
Shaped Single Carrier OFDM Offers Good Spectral Confinement



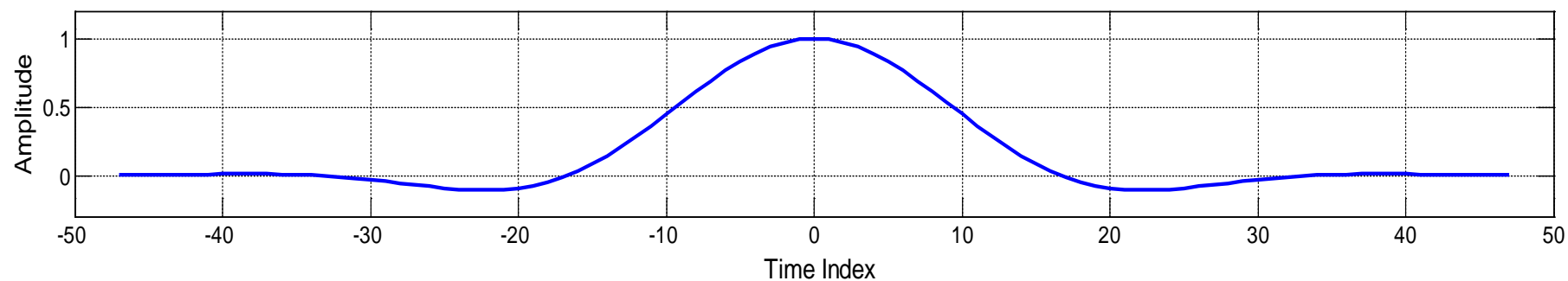
Time and Spectral Profiles of Shaped Single Carrier OFDM Signal



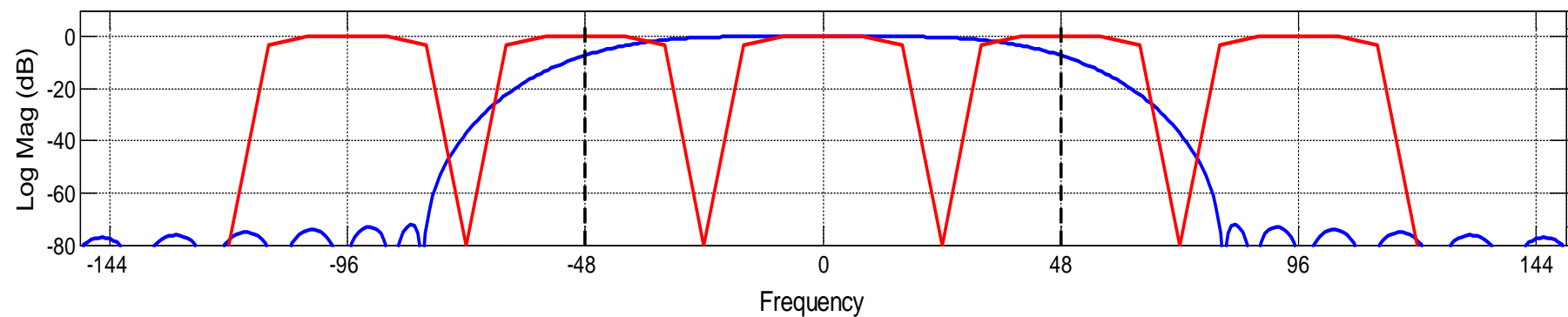
Specific Modulation Channel and Channelizer Spectral Characteristics



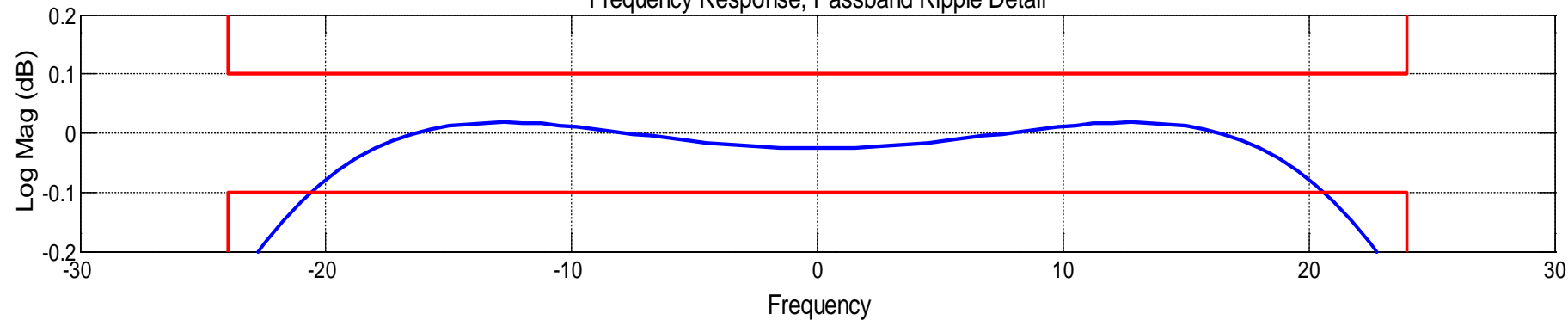
Impulse Response, 95-Tap Prototype Channelizer Filter for Synthesizing Channelized Spectrum and Extracting Separate Channels From Composite

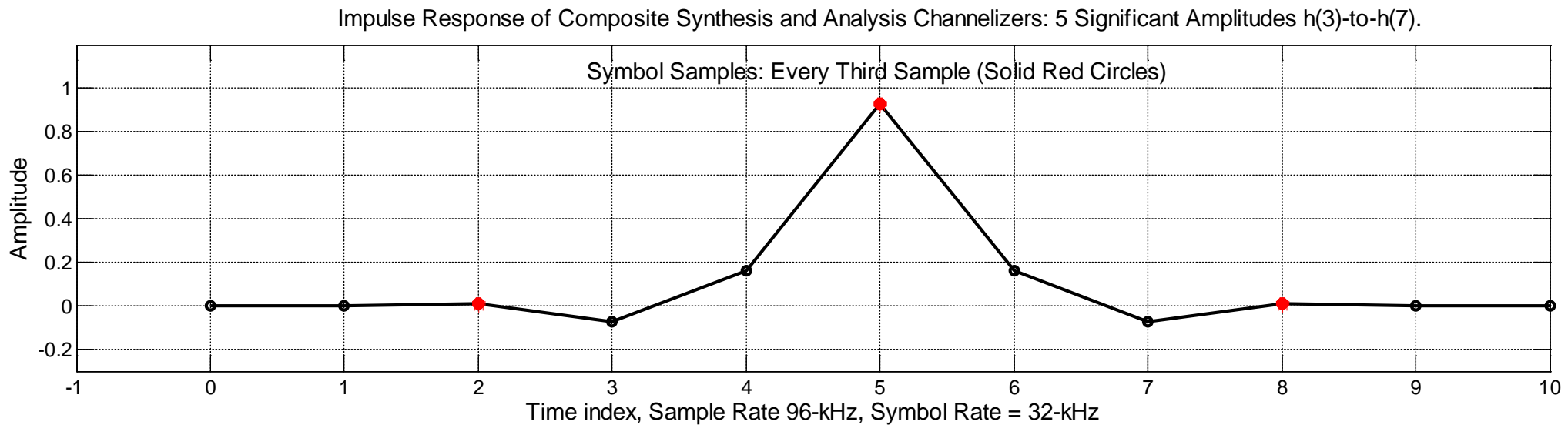
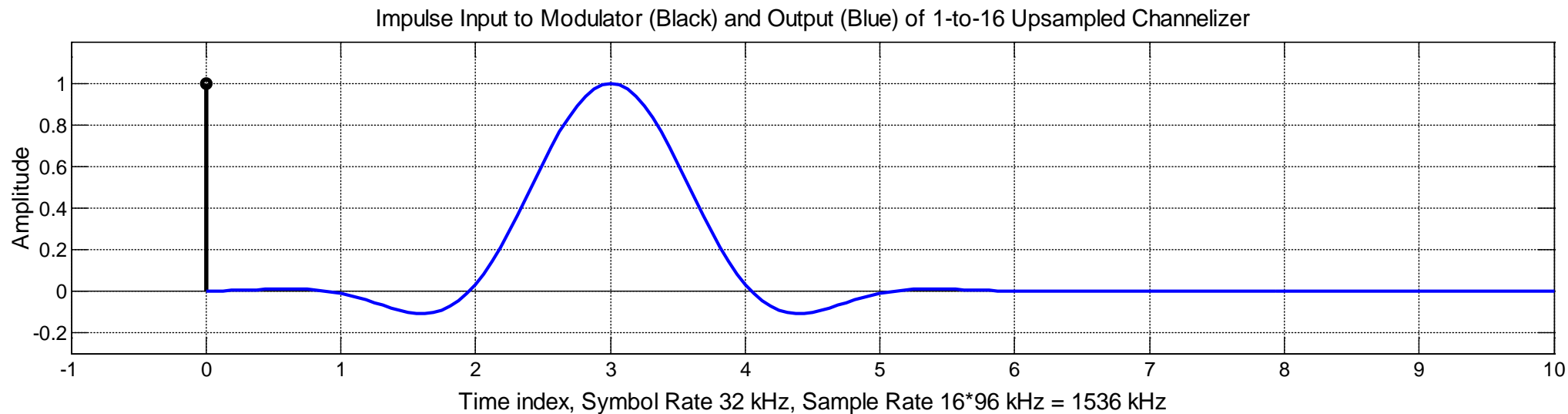


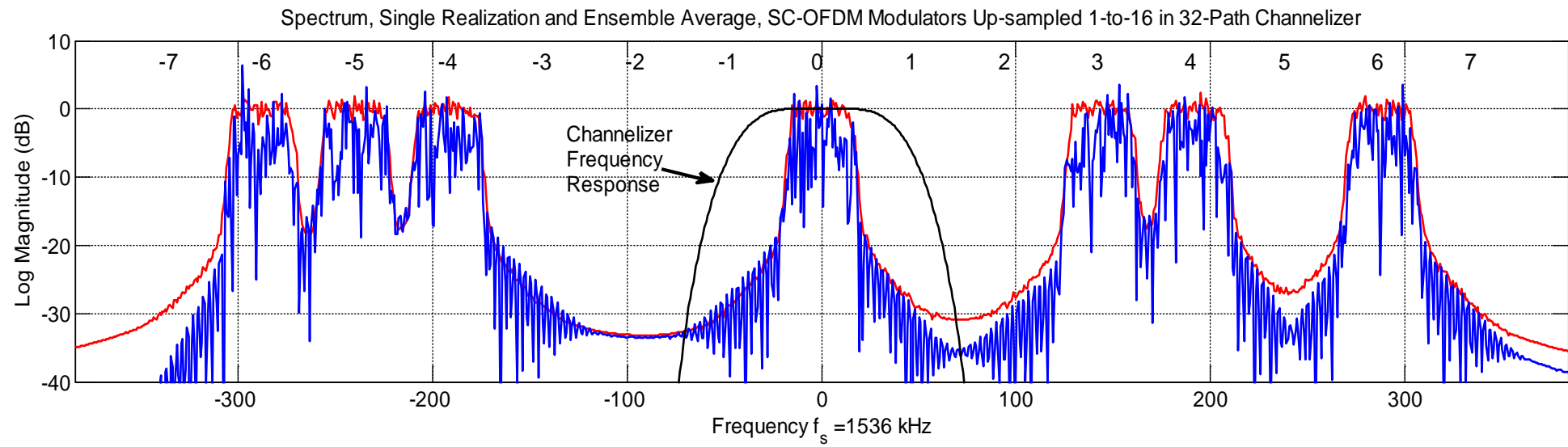
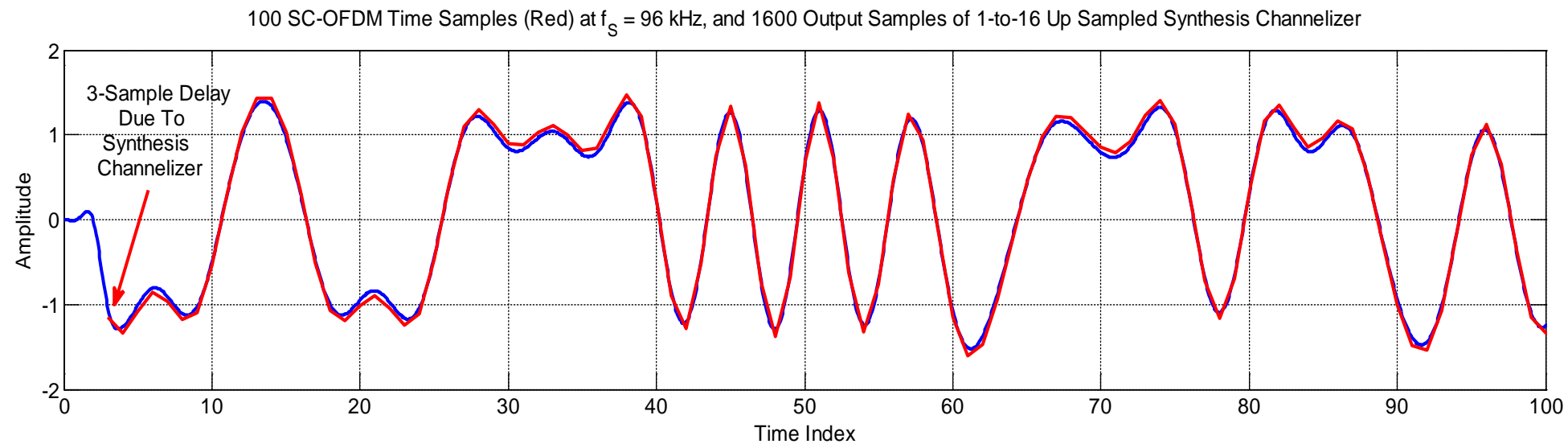
Channelizer Frequency Response, 48 kHz Channel Bandwidths, 48-kHz Center Frequencies, and ± 48 -kHz Folding Frequencies of Analysis Channelizer



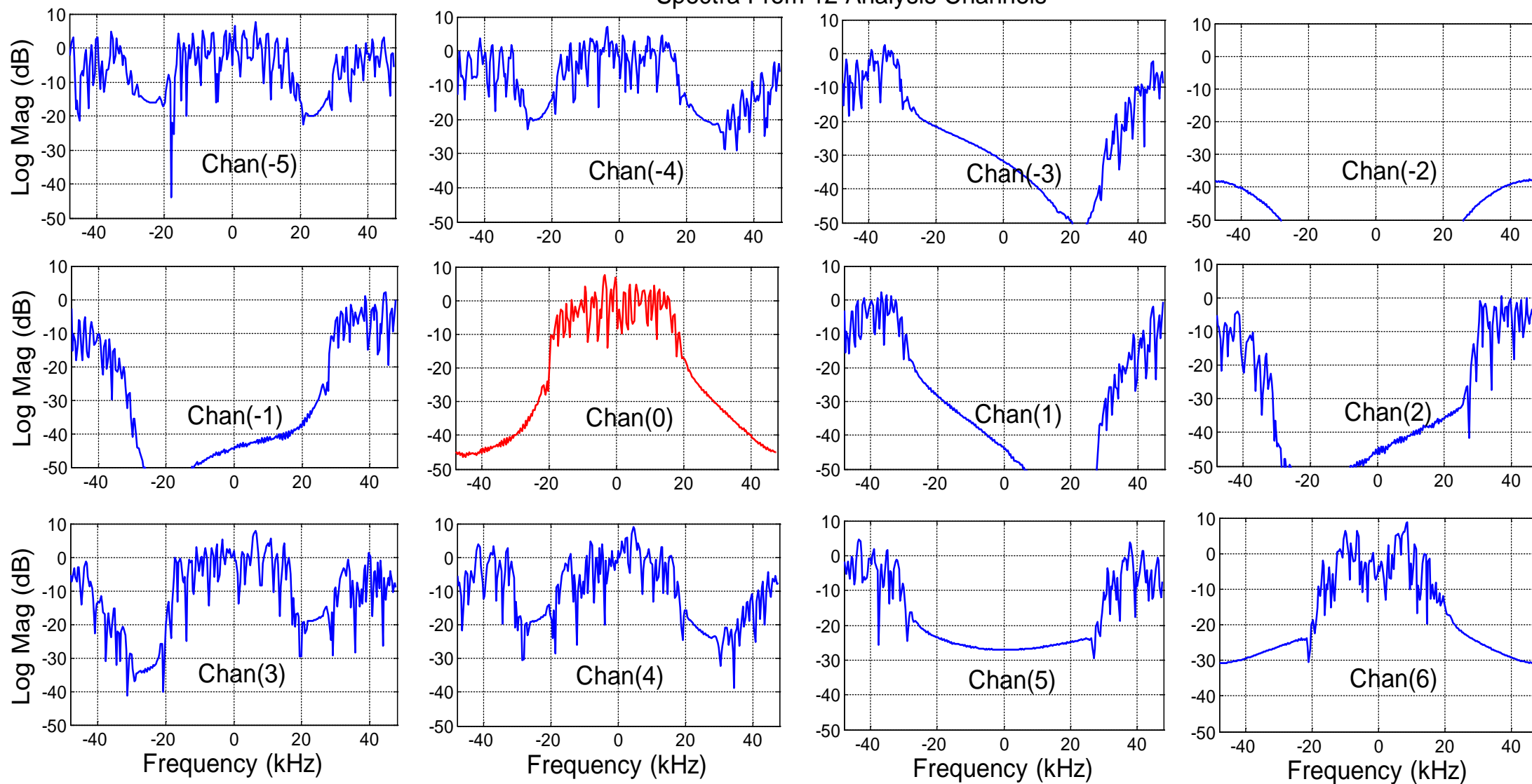
Frequency Response, Passband Ripple Detail

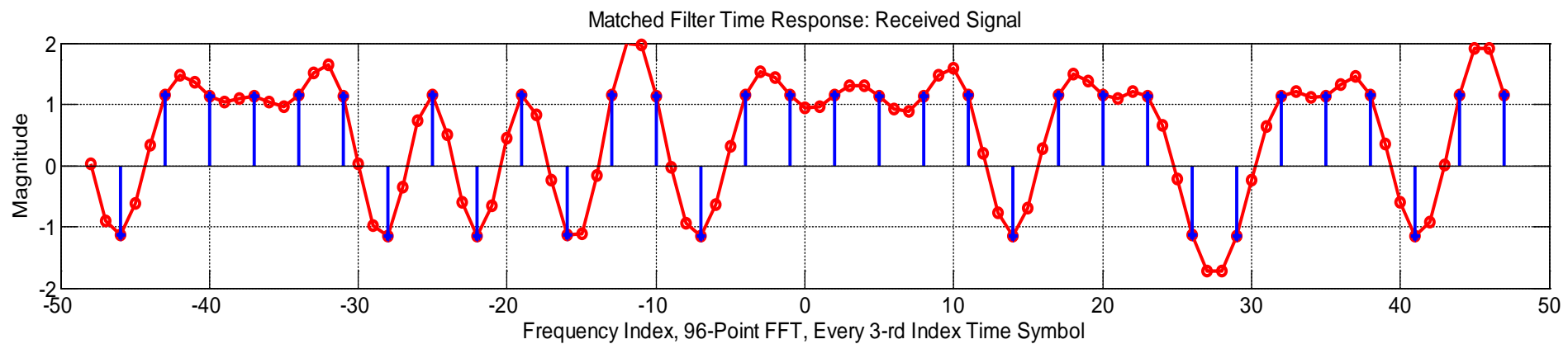
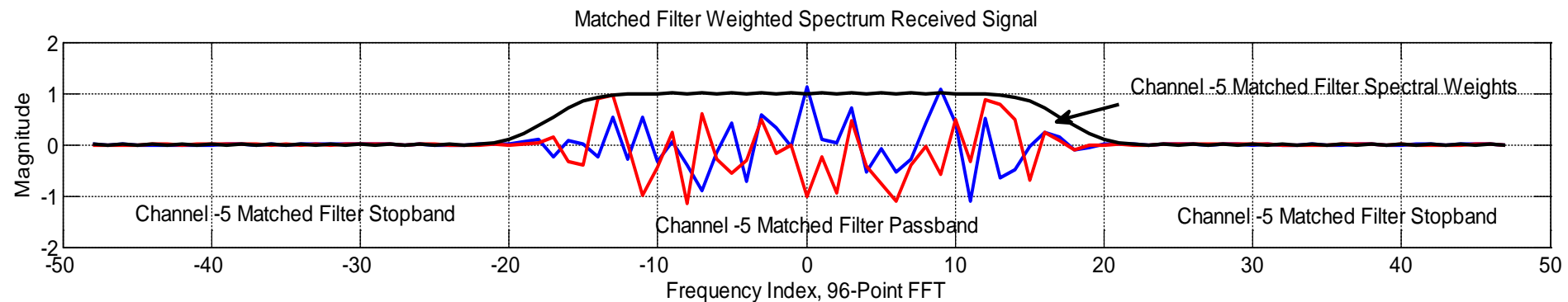
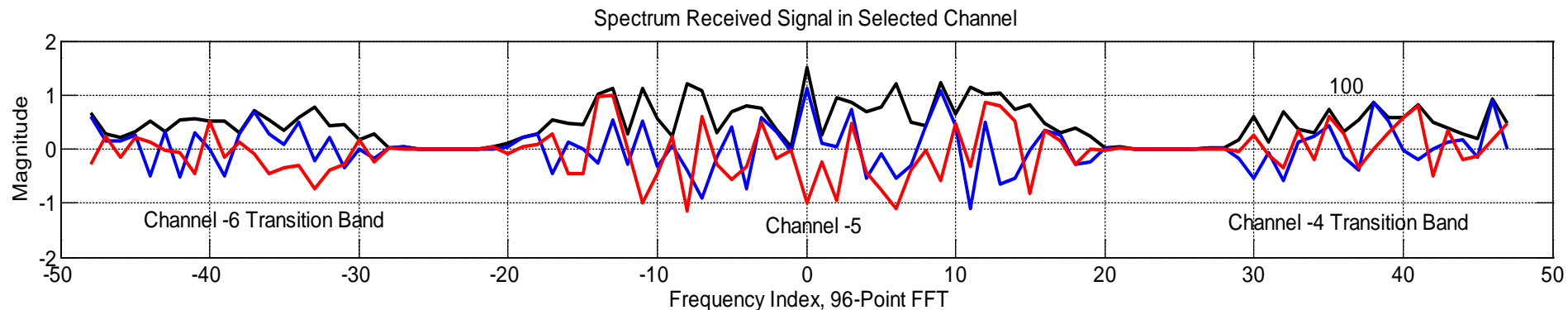


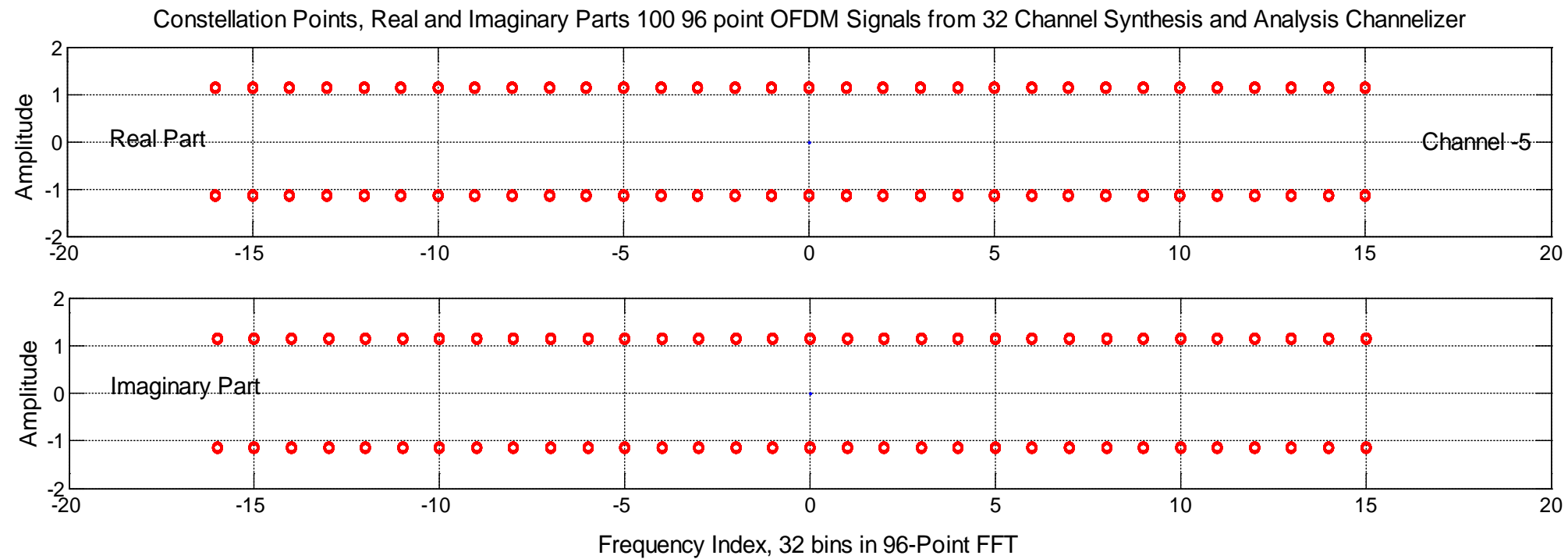




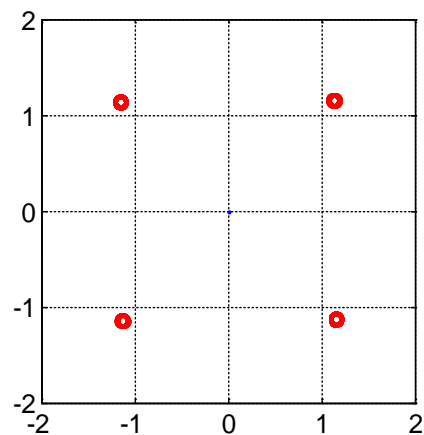
Spectra From 12 Analysis Channels

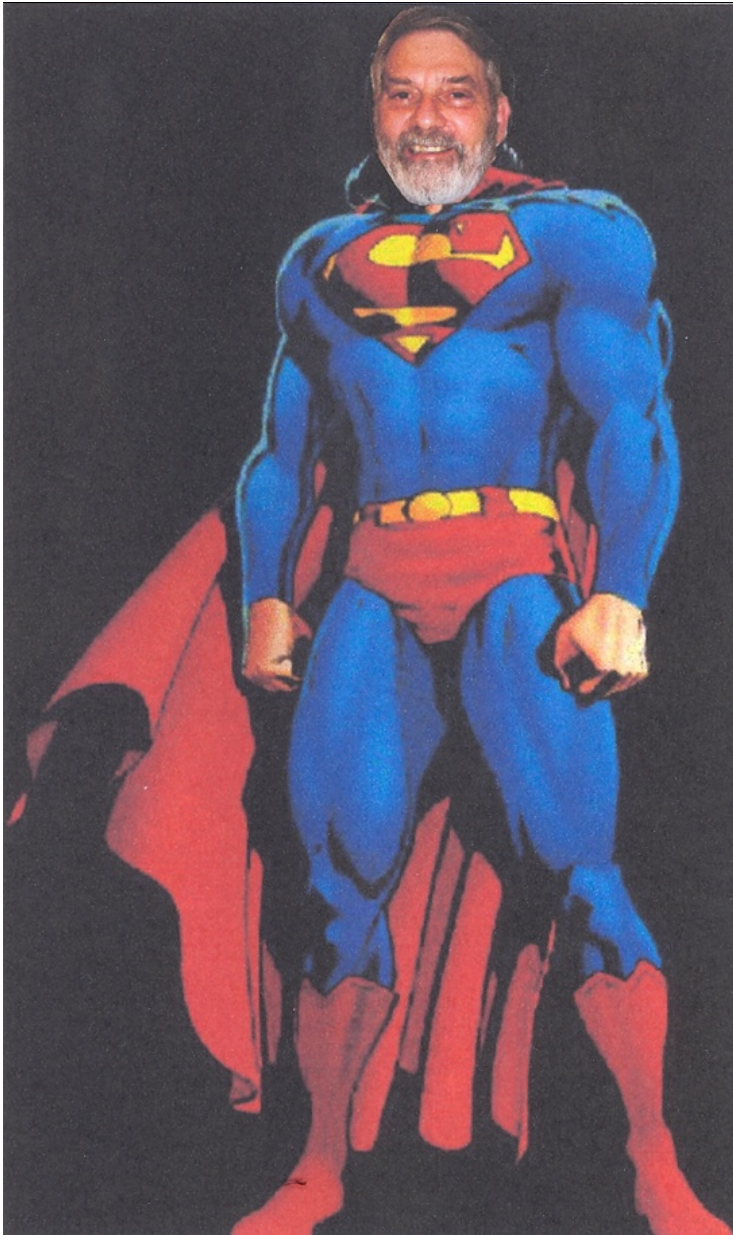






Constellation,
100 OFDM Symbols,
32 Bins/Symbol





SOFTWARE DEFINED RADIO MAN

Is Open For Questions

