

# **Optimizing Wideband Software Radio Performance**

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## ***Abstract***

The wide-band software radio concept is inherently sound because it builds on the digital environment that is so well established. By 'Software radio' we mean a system wherein a segment of the Radio-Frequency spectrum is converted to digital information without regard to the nature of signals that may be present in the spectrum segment. Then, a virtual "radio" is realized in software without regard to the location where the digital information was collected.

In other words, an analog spectrum segment in which signals may be propagating through the atmosphere is converted into a digital spectrum segment containing all of the same information. Further, the digital spectrum segment may be transmitted over a physical medium such as a fiber-optic network or other digital transmission line before any signal processing takes place. Then, one or more software radios may be realized on processors connected to the network.

A portion of the system, the Air-Network Interface, acts as a seamless connection between information propagating in an analog fashion through the atmosphere and the same information propagating as its digital image in a physical network medium. This paper describes some of the design considerations associated with optimizing the performance of the air-network interface.