Applications of the Software Radio as a Seamless Interface Between the Atmosphere and the Fibersphere

Dr. Donald H. Steinbrecher
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Abstract

A "software radio" may be partitioned into two separate functional parts: 1) a part that acquires the "radio" signal and converts the signal to a digital representation using standard A/D techniques and 2) a part that processes the radio signal into something useful. The former may be characterized as an Air-Network interface system while the latter comprises a digital signal processing suite that operates on the digital objects created by the Air-Network interface.

If the air-network interface is generic in the sense that it creates a true digital replica of a captured radio frequency signal band, then the connected DSP engines will function as though each were provided unique access to the captured band. The resulting multi-functional radio system will provide virtually unlimited flexibility in the use of the air-interface capture area.

In this paper, we examine some of the ways in which the multi-functional aspects of software radio may be realized using existing protocols and architectures.