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A HIGH-DATA-RATE WIRELESS LOCAL-AREA NETWORK

Abstract of the Invention

1 An apparatus and method for communicating data between at least two data
2 devices, suitable for use as a wireless local-area network, that provides robust data
3 communication via a radio communications channel corrupted by multipath
4 interference, particularly at high data rates. A preferred embodiment of the invention
5 represents data as a sequence of Walsh-function waveforms encoded by pseudo-noise
6 direct-sequence spread-spectrum modulation. Walsh-function-encoding of the data
7 provides a long symbol duration, thereby allowing the spread-spectrum modulation
8 to provide processing gain sufficient to substantially overcome multipath
9 interference, while providing a high data rate. In another preferred embodiment,
10 Walsh-function modulation is supplemented with various forms of phase modulation,
11 such as coherent PSK for bi-orthogonal signalling, and DPSK between orthogonal
12 symbols for noncoherent bi-orthogonal signalling, thereby further increasing data rate
13 without reducing processing gain. In another preferred embodiment, Walsh-function
14 modulation is supplemented with spectral shaping to allow increased bandwidth
15 occupancy, thereby further increasing the processing gain without sacrificing data
16 rate.

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