portions are based on the same clock fundamental. The dual packet configuration utilized by the wireless communication device is according to any of the various embodiments described previously.

In further embodiments, the transmitter and receiver may each be capable of communicating in a super short mode in which only the second portion is utilized. The first, serial portion is not used, so that overall data throughput may be increased. The super short mode is used only for dual mode devices and is generally not compatible with single mode devices. For example, the parallel modulation mode is not compatible with the serial modulation techniques utilized by the 802.11b devices, so that a dual mode device may not coexist or communicate in the same area as active 802.11b devices. For embodiments in which the serial modulation for the first packet portions are 802.11b compatible, the super short mode is advantageous when 802.11b devices are shut off or otherwise not active in the same area, so that the dual packet mode devices may be operated with enhanced data throughputs.

In yet a further embodiment, the transmitter and receiver may each be capable of communicating in a standard mode in which the second portion is modulated according to the serial modulation. For example, this mode may be advantageous when the serial modulation is compatible with other devices, such as 802.11b devices. Thus, the dual mode devices may include the capability to communicate with the 802.11b devices in standard mode at the standard 802.11b rates, while also able to communicate with other dual mode devices at different or higher data rates.

A method of wireless communication using a dual packet configuration according to embodiments of the present invention includes modulating a first portion of each packet according to a serial modulation and modulating a second portion of each packet according to a parallel modulation. The serial modulation may be DSSS and the parallel modulation may be OFDM. The method may further include the various dual packet embodiments described previously. The method may further comprise switching to a super short mode of operation in which only the second portion modulated according to the parallel modulation is utilized for communications. The super short mode enables enhanced communications with other dual mode devices. The method may further include switching to a standard mode of operation in which the second portion is modulated according to the serial modulation of the first portion. For 802.11b compatible embodiments, the standard mode enables direct communication with 802.11b devices and enhanced communication with other dual mode devices.

A dual packet configuration for wireless communications in accordance with embodiments of the present invention provides a suitable solution to the 802.11 HRb proposal. Dual mode devices may be configured to communicate with or otherwise coexist within the same area as standard 802.11b devices, while communicating with each other at different or higher data rates.

BRIEF DESCRIPTION OF THE DRAWINGS

A better understanding of the present invention can be obtained when the following detailed description of the preferred embodiment is considered in conjunction with the following drawings, in which:

FIG. **1** is a block diagram of a WLAN system including four devices operating within the same room or area, where two of the devices are implemented according to the 802.11b standard and the other two are implemented according to the HRb proposal.

FIG. **2** is a simplified block diagram of an exemplary transceiver according to one embodiment of the present invention that may be utilized in either or both of the HRb devices of FIG. **1**.

FIG. **3**A is a graph diagram of a packet configuration utilizing a long preamble.

FIG. **3**B is a graph diagram of an alternative packet configuration utilizing a short preamble.

FIG. **4** is a graph diagram of an exemplary header, which may be used as the header for the packet configurations of FIG. **3**A or **3**B.

FIG. **5** is a graph diagram of a packet configuration implemented according to a dual clock fundamental embodiment of the present invention.

FIG. **6**A is a simplified block diagram of a transceiver configured to utilize the packet configuration of FIG. **5**.

FIG. **6**B is a simplified block diagram of an alternative transceiver configured to utilize the packet configuration of FIG. **5**.

FIGS. **7**A-**7**C are graph diagrams illustrating a packet configuration utilizing a single clock fundamental.

FIGS. **8**A-**8**C are graph diagrams illustrating another exemplary packet configuration utilizing a single clock fundamental and a standard number of samples in the guard interval.

FIG. **9**A is a graph diagram of packet configuration utilizing 48 subcarriers.

FIG. **9**B is a graph diagram illustrating the subcarriers of FIG. **9**A including 44 data subcarriers and four pilot tones.

FIG. **9**C is a graph diagram of an alternative subcarrier configuration for the packet configuration of FIG. **9** including 48 data subcarriers.

FIGS. **10**A and **10**B illustrate the packet configuration of FIG. **9** in which four of the 48 data subcarriers are replaced with pilot tones.

FIG. **11** is a table diagram illustrating comparisons of the various OFDM embodiments illustrating variations in data rates, OFDM symbol duration, spectral width, thermal noise and delay spread spectrum as a result of variations in the clock rates, number of subcarriers, number of pilot tones, and the number of samples in the guard interval.

FIG. **12** is a graph diagram of an exemplary packet configuration according a super short OFDM preamble embodiment.

DETAILED DESCRIPTION OF EMBODIMENT(S) OF THE INVENTION

FIG. **1** is a block diagram of a wireless local area network (WLAN) system **100** operating within a particular room or area **101**, including four WLAN devices **103**, **105**, **107** and **109** (**103**-**109**) are located within the area **101**. The devices **103** and **105** are implemented according to at least one of several embodiments of the present invention with the HRb proposal in mind, whereas the devices **107** and **109** are implemented according to the 802.11b standard. All of the devices **103**-**109** operate in the 2.4 GHz band. The devices **103**-**109** may be any type of wireless communication device, such as any type of computer (desktop, portable, laptop, etc.), any type of compatible telecommunication device, any type of personal digital assistant (PDA), or any other type of network device, such as printers, fax machines, scanners, hubs, switches, routers, etc. It is noted that the present invention is not limited to the HRb proposal, the 802.11b