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Wireless Access Method and Physical Layer Specification

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TITLE: **HIGH AND LOW PHY SIGNALING RATE
WITH A COMMON CHIPPING RATE**

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PROPOSAL FOR TWO RATES

It is a goal to have two different types of radio LAN work in the same frequency space and coverage area, but with time interleaving. Given as follows is a numerical example of a two speed common chipping rate arrangement:

Low rate:	1.2 Mb/s x 31 chips/bit	=	37.2 Mc/s
High rate:	12.4 Mb/s x 3 sends/bit	=	37.2 Mb/s
Medium rate:	7.44 Mb/s x 5 sends/bit	=	37.2 Mb/s*

*   The medium rate is shown for possible discussion, but is not proposed.

DISCUSSION

The low rate would be used in channelized plans, and the high rate in plans entirely based on time division. It may be possible to use both rates alternately in single system supporting both work stations and portable units.

In an asynchronous system, the exact rate in the medium is unimportant though some numbers are more aesthetic than others.

Low rate

The low rate anticipates using a multi-vector, 31-chip spread spectrum code division plan (e.g. Cheah's 12 vector). The derived channels would be used to separate overlapping coverage areas.

High Rate-Logical Combining

The high rate anticipates using the same rf modulation and demodulation as the low rate to a point.

First, the data stream would be processed using one-chip = one-bit. The resulting bit stream would be used as three sequential sends of the same information.

The assumed access protocol limits the maximum length of packets. To store all of the bits of three sends would require about 2400 bits of buffer memory per stored send.

Each send would be read and stored. If at the end of one send the CRC checks, then that message is received and accepted. If the CRC does not check, the bits received are held in buffer, and the next two sends are similarly checked and stored. The possibility exists that there is no correct copy after three sends.

Concurrently with receiving the last send, a 2-out-of-3 logical majority voting takes place for the same bit position in each of the messages writing a fourth version of the message. If the CRC of the majority-voted message pattern is correct, the message is accepted.

High Rate--Linear Combining

It is possible to do a linear combining of the three sends to produce a result like a 3-bit spreading code. The performance might be disappointing. This is a matter for further investigation.

It is often better to avoid the damage a bad channel can do to the good ones, than it is to be too concerned about including the energy of all transmissions received.