IEEE 802.11 DSSS PHY

Characteristics:

- 2.4 GHz ISM band (FCC 15.247)
- 1 and 2 Mbit/s datarate (DBPSK and DQPSK modulation)
- > 10 dB processing gain
- spreading sequence 11 chip Barker sequence

Operating frequency range

- 2.4 to 2.4835 GHz
- 11 overlapping channels with centerfrequencies from 2412 MHz to 2462 MHz with 5 MHz spacing

Spreading sequence

- Each symbol is spreaded with 11 chip Barker sequence
- +1, -1, +1, +1, -1, +1, +1, +1, -1, -1, -1
- chipping rate 11 MHz
- Chipping rate of 11 MHz over 1 MHz symbols gives a processing gain of theoretical 10.4 dB

Datarates and Modulation

- 1 Mbit/s Differential Binary Phase Shift Keying
- 2 Mbit/s Differential Quadrature Phase Shift Keying
- Symbol rate is 1 MHz.

Encoding tables

Bit Input	Phase Change (+jω)
0	0
1	π

Table 1, 1 Mb/s DBPSK Encoding Table

Dibit pattern (d0,d1) d0 is first in time	Phase Change (+jω)
00	0
01	$\pi/2$
11	π
10	$3\pi/2$ $(-\pi/2)$

Table 2, 2 Mb/s DQPSK Encoding Table

# Scrambler

- All bits are being scrambled with:

Scrambler Polynomial; $G(z) = Z^{-7} + Z^{-4} + 1$
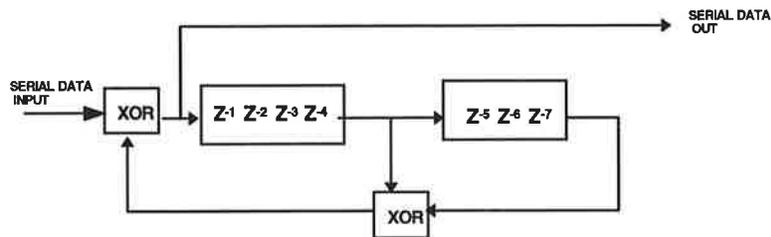
Transmit Power level

- The maximum allowable output power is 1000mW according to FCC 15.247

Transmit Spectrum Mask
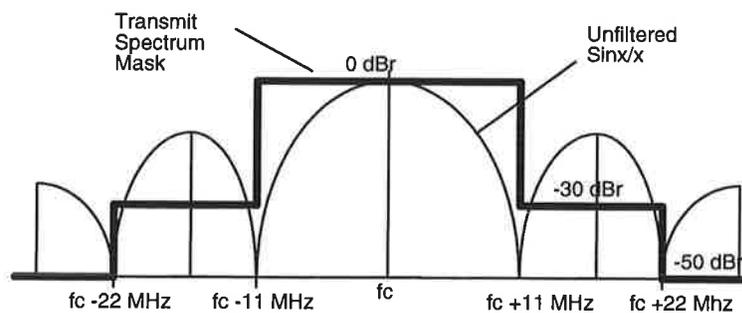
Spurious Emissions

- The DSSS PHY shall conform with in-band and out of band spurious emissions as set by regulatory bodies
- For USA: refer to FCC 15.247, FCC 15.205 and FCC 15.209

Antenna Gain

- Not defined in standard, but should be conform FCC 15.247

Carrier suppression

- Carrier suppresion shall be at least 15 dB below the peak sin(x)/x power spectrum