DSSS PROCESSING GAIN CALCULATION [15.247 (4) (d)]
and
SPECTRAL WHITENING

The transmit module generates the spread spectrum binary sequence for output to the RF modulator, a directly modulated VCO.

The transmitter logic encodes two consecutive bits of data into one of four possible 32-bit (chip) PN sequences. Consequently, an improvement in the Signal-to-Noise Ratio is achieved since each pair of data bits is now represented by 32 chips. The improvement, or processing gain, in decibels, is calculated as:

Processing Gain = 10 log (32 chips/2 bits)

Processing Gain = 12dB

The transmitted PN sequence is further randomized by modulus-2 addition with a fixed 2047-bit PN sequence. This operation smoothes (spectrally whitens) the output spectrum by eliminating discrete spectral components.