Theoretical processing gain and Jammer to Signal ratios (11 Mbps DSSS radio).

Data rate (Mbps)	Modulation type	Symbol rate (SyR) Symbols/second (Msps)	Spread rate (SpR) Chips/symbol (Mcps)	Processing gain $Gp=10log(Spr/Syr)$	(S/N)o + Lsys (dB)	Calculated J/S (dB)	Allowed J/S for 10 dB PG, 10dB - (S/N)o + Lsys (dB)
2	DBPSK	1	11	10.4	21.3	-10.9	-11.3
11	CCK	1.375	8	7.6	19.0	-11.4	-9.0

All data as stated above has been provided by Intersil and the datasheet of the HFA3861A DSSS baseband processor.

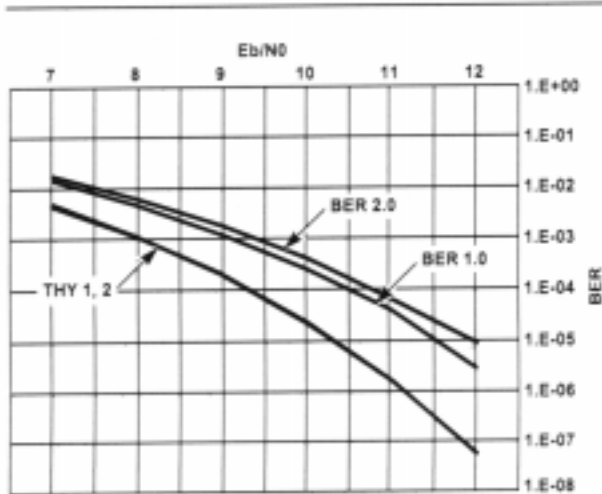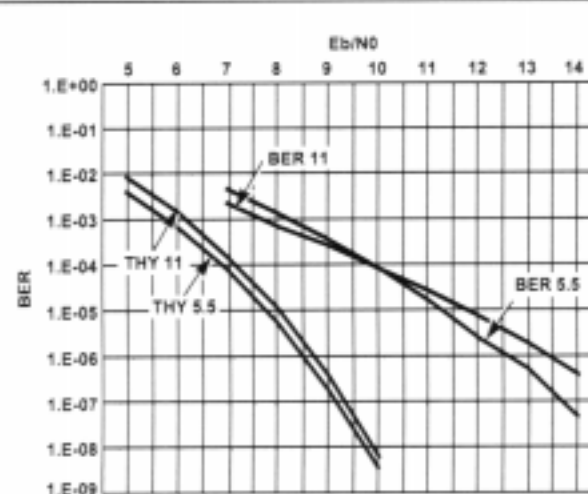

Figure 1 - Copy of datasheet

Explanation of theoretical processing gain calculations.

BER = 1.E-5, Data rate = 2 Mbps

$Gp = 10log(Spr/Syr) = 10log(11/1) = 10.4$

$Eb/N0 = 10.3$ dB (from figure 1, copy of datasheet of DSSS baseband processor)

$(S/N)o = Es/N0 = Eb/N0 +$ correction factor for 8 bits/symbol $= 10.3$ dB $+ 10log(8)$ dB $= 10.3$ dB $+ 9$ dB $= 19.3$ dB

$Lsys = 2$ dB max.

$Gp = (S/N)o + Mj + Lsys$

Calculated $Mj = J/S = Gp - (S/N)o - Lsys = 10.4$ dB $- 19.3$ dB $- 2$ dB $= -10.9$ dB

Allowed J/S for 10 dB PG $= Gp - (S/N)o - Lsys = 10$ dB $- (S/N)o - Lsys = 10$ dB $- 19.3$ dB $- 2$ dB $= -11.3$ dB

BER = 1.E-5, Data rate = 11 Mbps

$Gp = 10log(Spr/Syr) = 10log(8/1.375) = 7.6$

$Eb/N0 = 8$ dB (from figure 1, copy of datasheet of DSSS baseband processor)

$(S/N)o = Es/N0 = Eb/N0 +$ correction factor for 8 bits/symbol $= 8$ dB $+ 10log(8)$ dB $= 8$ dB $+ 9$ dB $= 17$ dB

$Lsys = 2$ dB max.

$Gp = (S/N)o + Mj + Lsys$

Calculated $Mj = J/S = Gp - (S/N)o - Lsys = 7.6$ dB $- 17$ dB $- 2$ dB $= -11.4$ dB

Allowed J/S for 10 dB PG $= Gp - (S/N)o - Lsys = 10$ dB $- (S/N)o - Lsys = 10$ dB $- 17$ dB $- 2$ dB $= -9$ dB