Waverider Communications

WRM2000

Test Report: FCC 15.247(e) Jamming Margin Test

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Draft Jan 10, 2001.

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1.0 Scope

This report presents the test procedure, test configuration and test data associated with a FCC Part 15.247 (e) Jamming Margin test for the indirect measurement of processing gain on the Waverider Communications WRM2000 Radio.

2.0 Applicable Reference Documents.

1. "Operation within the bands 902-928 MHz, 2400-2483.5, and 5725-5850 MHz" ***Title 47 Part 15 section 247 (e) Code of Federal Regulations***. **(47 CFR 15.247).**

2. "Report and Order: Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spread Spectrum Transmitters. Appendix C: 'Guidance on Measurements for Direct Sequence Spread Spectrum Systems" ***FCC 97-114. ET Docket No. 96-8, RM-8435, RM-8608, RM-8609.***

3. "HFA3861B Direct Sequence Spread Spectrum Baseband Processor" ***Harris Corporation Semiconductor Sector Preliminary Data Sheet***, Melbourne FL, June 1999.

4. " M-ary Orthogonal Keying BER Curve",

5. "CCK Modulation Delivers 11Mbps for High Rate IEEE 802.11 Extension" ***Harris Semiconductor, Carl Andren/Mark Webster,*** Wireless Symposium/Portable by Design Conference Spring 1999

3.0 Test Background and Procedure.

According to FCC regulations [1], a direct sequence spread spectrum system must have a processing gain, G_p of at least 10 dB. Compliance to this requirement can be shown by demonstrating a relative bit-error-rate (BER) performance improvement (and corresponding signal to noise ratio per symbol improvement of at least 10 dB) between the case where spread spectrum processes (coding, modulation) are engaged relative to the processes being bypassed. In some practical systems, the spread spectrum processing cannot simply be bypassed. In these cases, the processing gain can be indirectly measured by a jamming margin test [2]. In accordance with the new NPRM 99-231, if the vendor has a system with less than 10 chips per symbol, the CW jamming results must be supported by a theoretical explanation of the system processing gain.

4.0 Theoretical calculations

The processing gain is related to the jamming margin as follows [2]:

$$G_p = BER_{REFERENCE} \leftrightarrow \left(\frac{S}{N}\right)_{output} + \left(\frac{J}{S}\right) + L_{system}$$

Where $BER_{REFERENCE}$ is the reference bit error ratio with its corresponding, theoretical output signal to noise ratio per symbol, $(S/N)_{output}$, (J/S) is the jamming margin (jamming signal power relative to desired signal power), and L_{system} are the system implementation losses.

The maximum allowed total system implementation loss is 2 dB.

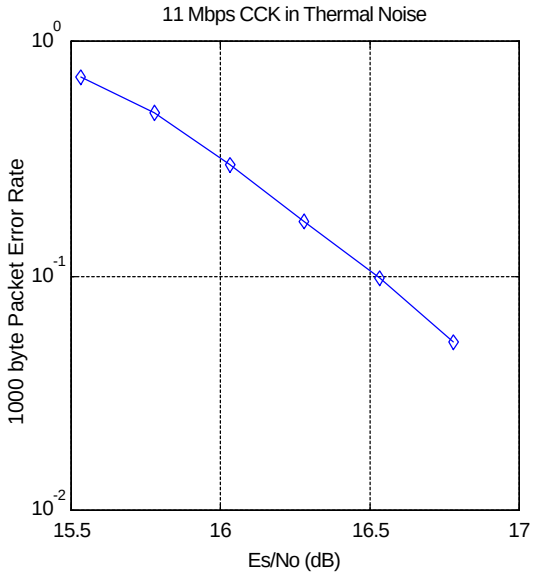
The HFA3861B direct sequence spread spectrum baseband processor uses CCK modulation which is a form of M-ary Orthogonal Keying. The BER performance curve is given by [4]:

" The probability of error for generalized M-ary Orthogonal signaling using coherent demodulation is given by:

$$P_e = 1 - P_{c1} = 1 - \frac{1}{\sqrt{2p}} \int_{-\frac{S_{01}}{N_0}}^{\infty} \left[2\left(1 - Q\left\{ z + \sqrt{2\frac{E_b}{h}} \right\}\right) \right]^{\frac{M}{2}-1} \exp\left\{ -\frac{z^2}{2} \right\} dz$$

This integral cannot be solved in closed form, and numerical integration must be used. There are error rate extensions for differential decoding and descrambling that are also to be accounted for. This is done in a MATHCAD environment and is displayed in graphical format below.

4.01 1000 byte PER vs. Es/No



The reference PER is specified as 8% . The corresponding Es/No (signal to noise ratio per symbol) is 16.4 dB. The Es/No required to achieve the desired PER with maximum system implementation losses is 18.4 dB. The minimum processing gain is again, 10 dB, therefore:

$$G_p = \left(\frac{E_s}{N_o}\right)_{output} + \left(\frac{J}{S}\right) + L_{system} = 16.4dB + 2.0dB + \left(\frac{J}{S}\right) \geq 10dB$$

$$G_p = 18.4dB + \left(\frac{J}{S}\right) \geq 10dB$$

The minimum jammer to signal ratio is as follows:

$$\left(\frac{J}{S}\right) \geq -8.4dB$$

For the case of the HFA3861B, the bit rates are 1, 2, 5.5, and 11 Mbps. The corresponding symbol rates are 1, 1, 1.375, and 1.375 MSps. The chip rate is always 11 MCps, so the ratio of chip rate to symbol rate is 11:1 for the 1 and 2 Mbps rates and 8:1

for the 5.5 and 11 Mbps rates. Since the symbol rate to bit rate is less than 10 for the higher rates, we supply the theoretical processing gain calculation for these cases where spread spectrum processing gain with embedded coding gain is utilized.

As can be seen from the curve of figure 1, the Es/N0 is 16.4 dB at the PER of 8%. This PER can be related to a BER of 1e-5 on 1000 byte packets. With 8 bits per symbol, the Eb/N0 is then 7.4 dB or 9 dB less than the Es/N0. It is well known that the Eb/N0 of BPSK is 9.6 dB for 1e-5 BER, so therefore the coding gain of CCK over BPSK is 2.2 dB. We add this to the processing gain of 9 dB to get 11.2 dB overall processing gain for the CW jammer test.

Taking the calculations above, if the $\left(\frac{J}{S}\right) \geq -8.4 dB$ then the equipment passes the CW jamming test.

Note:

Most of the above analysis was taken from the Harris PRISM technical data sheets on Jamming Margin and Processing Gain tests.

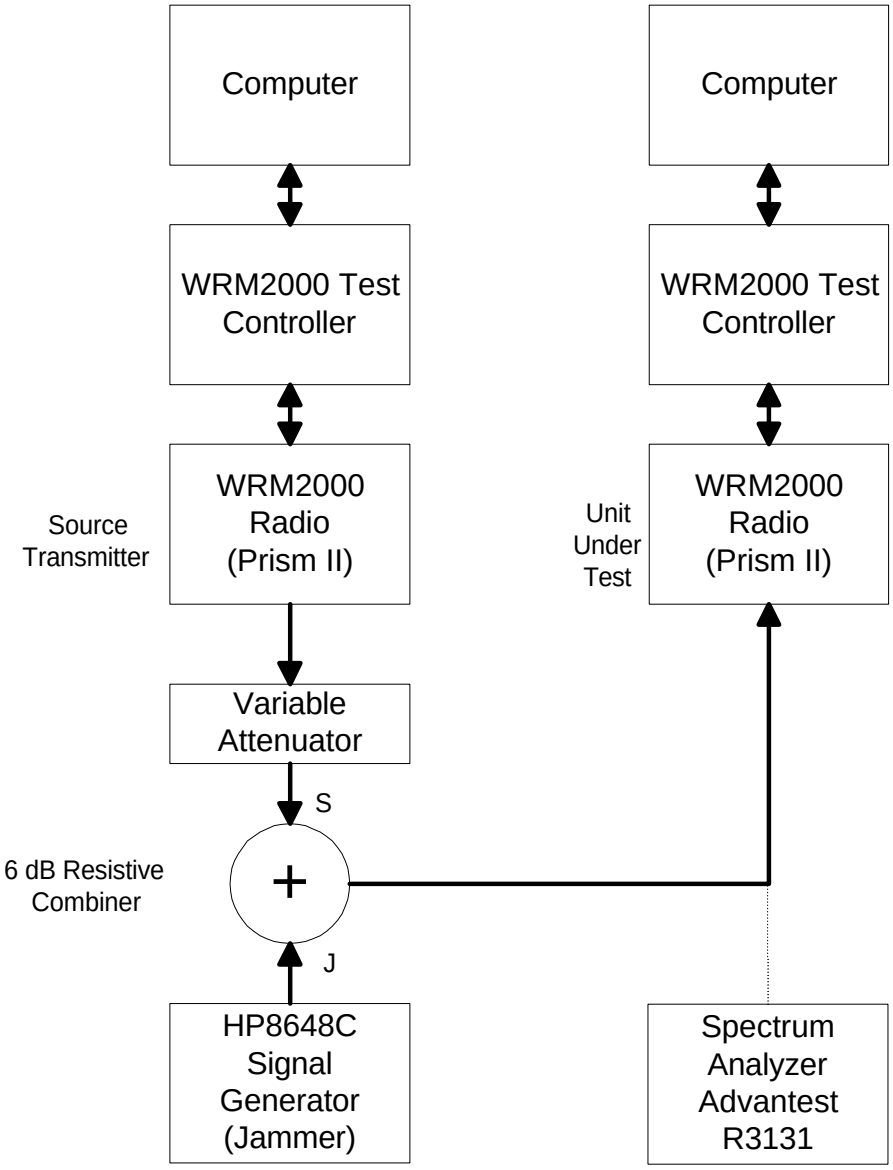
In this product (WRM2000) the main data rate is 11.0 Mbps and the fallback rate is 5.5 Mbps. Testing was done for both data rates at three channels corresponding to low band, mid band, and high band (2412 MHz, 2437MHz, 2462MHz).

The 5.5 Mbps Eb/No is approx 4 dB lower than the 11Mbps Eb/No due to being half the symbol rate, and using only the 4 best 8 bit orthogonal codes, rather than the 64 8 bit orthogonal codes used for the 11 Mbps chip rate. Thus the minimum Jammer to Signal margin for 5.5 Mbps data rate was 4.4 dB rather than 8.4 db. (refer to the references for more information).

There are six sets of data taken, the occupied bandwidth is 17 MHz in both cases, and the tests were made in 50 KHz increments.

5.0 Test Configuration: CW Jamming Margin (15.247) (e)

5.01 Basic Test Block Diagram



5.02 Test Procedure

Set up the simplex link. Set operating power levels using fixed and variable attenuators in system to meet the following objectives:

1. The Signal Power at the receiver is approximately -50 dBm (above thermal sensitivity such that thermal noise does not cause bit errors).
2. Measure the power from the Source transmitter at the input port to the WRM2000 Radio under test. Adjust the Tx power so the level is –50 dBm. Use the Spectrum Analyzer for the power measurement. Set the Analyzer bandwidth to 25 MHz, and use the Total Power measurement function.
3. Now measure the power from the CW Jammer (HP8648C) at the input port to the WRM2000 Radio under test. Note the cable/combiner loss as an offset for the CW jammer output power reading. Use the same Analyzer settings for measuring the Jammer. Reconnect the WRM2000 Radio under test.
4. Disable CW Jammer, establish link. PER test should be operating essentially error-free. The Computer is used to interface to the controller to setup the radio through an RS232 port.
5. Enable CW Jammer at a low power level and gradually increase the CW Jammer power until the PER is 8%. Note Jammer power setting. The computer is used to read the PER from the controller through an RS232 port.

This test is repeated for a fixed signal carrier frequency and for uniform steps in frequency increments of 50 kHz across the receiver passband with the CW Jammer. In this case the receiver passband is ±8.5 MHz.

5.03 Data Calculation

The nominal Jammer Level settings are tabulated versus offset frequency. The J/S ratio and the processing gain are then calculated by reading the Jammer Level, and adjusting by the cable loss.

The processing gain then is determined using the J/S ratio:

$$G_p = 18.4 dB + \left(\frac{J}{S} \right)$$

The number of points where the S/J fails to achieve 8.4 dB (is higher than 8.4 dB) is determined and if this is above 20% of the total, the test is failed. Otherwise it is passed.

The numerical data associated with the following radio channels is tabulated and presented for:

Channel Low: 2412 MHz

Channel Mid: 2437 MHz

Channel High: 2462 MHz

5.04 Measurement Equipment List

Equipment
HP8648C 3GHz Signal Gen.
Advantest R3131 Spectrum Analyzer
Mini-Circuits ZFSC-2-2500 Combiner
WRM2000 Radio (TX)
WRM2000 Test Controller(Tx)
WRM2000 Radio (RX-DUT)
WRM2000 Test Controller (Rx)
Computers (2)

6.0 Conclusions

The processing gain data was reviewed from each test, and found to be greater than 10dB for more than 80% of all test cases. The system passes the CW jamming margin test on all three channels with the results shown below for:

11 Mbps Data Rate

Channel	Min. Processing Gain (after 20% discarded)
Low 2412 MHz	11.5 dB
Mid 2437 MHz	12.5 dB
High 2462 MHz	12.5 dB

5.5 Mbps Data Rate

Channel	Min. Processing Gain (after 20% discarded)
Low 2412 MHz	12.0 dB
Mid 2437 MHz	12.5 dB
High 2462 MHz	13.0 dB

7.0 Test Data 11Mbps (Nominal Data Rate)

7.01 Channel Low : 2412 MHz

Transmitter : 2412 MHz Signal Level -50dBm

Frequency (MHz)	Jamming Level where PER<8%	Jamming to Signal Margin	Processing Gain
2403.50 Lev	-41.5	8.5	26.9
2403.55 Lev	-42	8	26.4
2403.60 Lev	-41.5	8.5	26.9
2403.65 Lev	-42	8	26.4
2403.70 Lev	-42	8	26.4
2403.75 Lev	-42.5	7.5	25.9
2403.80 Lev	-43	7	25.4
2403.85 Lev	-42.5	7.5	25.9
2403.90 Lev	-42.5	7.5	25.9
2403.95 Lev	-44.5	5.5	23.9
2404.00 Lev	-44	6	24.4
2404.05 Lev	-43	7	25.4
2404.10 Lev	-44	6	24.4
2404.15 Lev	-45	5	23.4
2404.20 Lev	-43	7	25.4
2404.25 Lev	-44	6	24.4
2404.30 Lev	-45.5	4.5	22.9
2404.35 Lev	-45.5	4.5	22.9
2404.40 Lev	-43.5	6.5	24.9
2404.45 Lev	-45.5	4.5	22.9
2404.50 Lev	-44.5	5.5	23.9
2404.55 Lev	-45.5	4.5	22.9
2404.60 Lev	-46.5	3.5	21.9
2404.65 Lev	-47.5	2.5	20.9
2404.70 Lev	-47	3	21.4
2404.75 Lev	-48.5	1.5	19.9
2404.80 Lev	-48	2	20.4
2404.85 Lev	-46.5	3.5	21.9
2404.90 Lev	-48	2	20.4
2404.95 Lev	-47.5	2.5	20.9

2405.00	Lev	-48.5	1.5	19.9
2405.05	Lev	-49	1	19.4
2405.10	Lev	-46.5	3.5	21.9
2405.15	Lev	-48.5	1.5	19.9
2405.20	Lev	-48.5	1.5	19.9
2405.25	Lev	-49	1	19.4
2405.30	Lev	-49.5	0.5	18.9
2405.35	Lev	-49.5	0.5	18.9
2405.40	Lev	-48.5	1.5	19.9
2405.45	Lev	-49.5	0.5	18.9
2405.50	Lev	-52	-2	16.4
2405.55	Lev	-49.5	0.5	18.9
2405.60	Lev	-50	0	18.4
2405.65	Lev	-51	-1	17.4
2405.70	Lev	-50.5	-0.5	17.9
2405.75	Lev	-52.5	-2.5	15.9
2405.80	Lev	-51.5	-1.5	16.9
2405.85	Lev	-51	-1	17.4
2405.90	Lev	-50.5	-0.5	17.9
2405.95	Lev	-51.5	-1.5	16.9
2406.00	Lev	-51.5	-1.5	16.9
2406.05	Lev	-52	-2	16.4
2406.10	Lev	-53	-3	15.4
2406.15	Lev	-51.5	-1.5	16.9
2406.20	Lev	-54	-4	14.4
2406.25	Lev	-54	-4	14.4
2406.30	Lev	-53.5	-3.5	14.9
2406.35	Lev	-53	-3	15.4
2406.40	Lev	-53	-3	15.4
2406.45	Lev	-53	-3	15.4
2406.50	Lev	-53	-3	15.4
2406.55	Lev	-53	-3	15.4
2406.60	Lev	-52.5	-2.5	15.9
2406.65	Lev	-55.5	-5.5	12.9
2406.70	Lev	-53	-3	15.4
2406.75	Lev	-55	-5	13.4
2406.80	Lev	-52	-2	16.4
2406.85	Lev	-53	-3	15.4
2406.90	Lev	-54	-4	14.4

2406.95	Lev	-56	-6	12.4
2407.00	Lev	-55	-5	13.4
2407.05	Lev	-54	-4	14.4
2407.10	Lev	-53.5	-3.5	14.9
2407.15	Lev	-54.5	-4.5	13.9
2407.20	Lev	-55.5	-5.5	12.9
2407.25	Lev	-54	-4	14.4
2407.30	Lev	-54.5	-4.5	13.9
2407.35	Lev	-53.5	-3.5	14.9
2407.40	Lev	-54.5	-4.5	13.9
2407.45	Lev	-55.5	-5.5	12.9
2407.50	Lev	-55.5	-5.5	12.9
2407.55	Lev	-54.5	-4.5	13.9
2407.60	Lev	-54	-4	14.4
2407.65	Lev	-55.5	-5.5	12.9
2407.70	Lev	-55.5	-5.5	12.9
2407.75	Lev	-54.5	-4.5	13.9
2407.80	Lev	-55.5	-5.5	12.9
2407.85	Lev	-55.5	-5.5	12.9
2407.90	Lev	-55	-5	13.4
2407.95	Lev	-56	-6	12.4
2408.00	Lev	-56.5	-6.5	11.9
2408.05	Lev	-56.5	-6.5	11.9
2408.10	Lev	-57.5	-7.5	10.9
2408.15	Lev	-55	-5	13.4
2408.20	Lev	-56.5	-6.5	11.9
2408.25	Lev	-57.5	-7.5	10.9
2408.30	Lev	-56	-6	12.4
2408.35	Lev	-57.5	-7.5	10.9
2408.40	Lev	-57	-7	11.4
2408.45	Lev	-56	-6	12.4
2408.50	Lev	-55	-5	13.4
2408.55	Lev	-56.5	-6.5	11.9
2408.60	Lev	-57	-7	11.4
2408.65	Lev	-58	-8	10.4
2408.70	Lev	-58.5	-8.5	9.9
2408.75	Lev	-58	-8	10.4
2408.80	Lev	-59	-9	9.4
2408.85	Lev	-58.5	-8.5	9.9

2408.90	Lev	-56.5	-6.5	11.9
2408.95	Lev	-57.5	-7.5	10.9
2409.00	Lev	-59.5	-9.5	8.9
2409.05	Lev	-57.5	-7.5	10.9
2409.10	Lev	-57	-7	11.4
2409.15	Lev	-57	-7	11.4
2409.20	Lev	-57	-7	11.4
2409.25	Lev	-56	-6	12.4
2409.30	Lev	-56.5	-6.5	11.9
2409.35	Lev	-58.5	-8.5	9.9
2409.40	Lev	-58.5	-8.5	9.9
2409.45	Lev	-60	-10	8.4
2409.50	Lev	-58.5	-8.5	9.9
2409.55	Lev	-57	-7	11.4
2409.60	Lev	-56.5	-6.5	11.9
2409.65	Lev	-57	-7	11.4
2409.70	Lev	-57	-7	11.4
2409.75	Lev	-57	-7	11.4
2409.80	Lev	-58	-8	10.4
2409.85	Lev	-57.5	-7.5	10.9
2409.90	Lev	-55.5	-5.5	12.9
2409.95	Lev	-55.5	-5.5	12.9
2410.00	Lev	-56	-6	12.4
2410.05	Lev	-58	-8	10.4
2410.10	Lev	-56.5	-6.5	11.9
2410.15	Lev	-56.5	-6.5	11.9
2410.20	Lev	-58	-8	10.4
2410.25	Lev	-57	-7	11.4
2410.30	Lev	-57.5	-7.5	10.9
2410.35	Lev	-58	-8	10.4
2410.40	Lev	-57	-7	11.4
2410.45	Lev	-58	-8	10.4
2410.50	Lev	-56	-6	12.4
2410.55	Lev	-57.5	-7.5	10.9
2410.60	Lev	-56.5	-6.5	11.9
2410.65	Lev	-57.5	-7.5	10.9
2410.70	Lev	-59	-9	9.4
2410.75	Lev	-57.5	-7.5	10.9
2410.80	Lev	-56.5	-6.5	11.9

2410.85	Lev	-57.5	-7.5	10.9
2410.90	Lev	-56.5	-6.5	11.9
2410.95	Lev	-58	-8	10.4
2411.00	Lev	-57.5	-7.5	10.9
2411.05	Lev	-57.5	-7.5	10.9
2411.10	Lev	-58	-8	10.4
2411.15	Lev	-58.5	-8.5	9.9
2411.20	Lev	-58	-8	10.4
2411.25	Lev	-58.5	-8.5	9.9
2411.30	Lev	-56.5	-6.5	11.9
2411.35	Lev	-58.5	-8.5	9.9
2411.40	Lev	-56.5	-6.5	11.9
2411.45	Lev	-57.5	-7.5	10.9
2411.50	Lev	-55.5	-5.5	12.9
2411.55	Lev	-54.5	-4.5	13.9
2411.60	Lev	-55	-5	13.4
2411.65	Lev	-56	-6	12.4
2411.70	Lev	-55.5	-5.5	12.9
2411.75	Lev	-56	-6	12.4
2411.80	Lev	-54.5	-4.5	13.9
2411.85	Lev	-55.5	-5.5	12.9
2411.90	Lev	-57	-7	11.4
2411.95	Lev	-57	-7	11.4
2412.00	Lev	-55.5	-5.5	12.9
2412.05	Lev	-55.5	-5.5	12.9
2412.10	Lev	-55.5	-5.5	12.9
2412.15	Lev	-57	-7	11.4
2412.20	Lev	-55.5	-5.5	12.9
2412.25	Lev	-55	-5	13.4
2412.30	Lev	-54	-4	14.4
2412.35	Lev	-54	-4	14.4
2412.40	Lev	-54.5	-4.5	13.9
2412.45	Lev	-54.5	-4.5	13.9
2412.50	Lev	-54	-4	14.4
2412.55	Lev	-54	-4	14.4
2412.60	Lev	-56	-6	12.4
2412.65	Lev	-54.5	-4.5	13.9
2412.70	Lev	-56	-6	12.4
2412.75	Lev	-55	-5	13.4

2412.80	Lev	-55	-5	13.4
2412.85	Lev	-55.5	-5.5	12.9
2412.90	Lev	-55	-5	13.4
2412.95	Lev	-55	-5	13.4
2413.00	Lev	-56	-6	12.4
2413.05	Lev	-54	-4	14.4
2413.10	Lev	-54	-4	14.4
2413.15	Lev	-54	-4	14.4
2413.20	Lev	-54.5	-4.5	13.9
2413.25	Lev	-55.5	-5.5	12.9
2413.30	Lev	-55.5	-5.5	12.9
2413.35	Lev	-56	-6	12.4
2413.40	Lev	-57	-7	11.4
2413.45	Lev	-55.5	-5.5	12.9
2413.50	Lev	-55.5	-5.5	12.9
2413.55	Lev	-55	-5	13.4
2413.60	Lev	-55.5	-5.5	12.9
2413.65	Lev	-55.5	-5.5	12.9
2413.70	Lev	-54.5	-4.5	13.9
2413.75	Lev	-54.5	-4.5	13.9
2413.80	Lev	-55	-5	13.4
2413.85	Lev	-54.5	-4.5	13.9
2413.90	Lev	-55	-5	13.4
2413.95	Lev	-56	-6	12.4
2414.00	Lev	-54.5	-4.5	13.9
2414.05	Lev	-54.5	-4.5	13.9
2414.10	Lev	-57	-7	11.4
2414.15	Lev	-55.5	-5.5	12.9
2414.20	Lev	-55.5	-5.5	12.9
2414.25	Lev	-55.5	-5.5	12.9
2414.30	Lev	-55.5	-5.5	12.9
2414.35	Lev	-56	-6	12.4
2414.40	Lev	-56	-6	12.4
2414.45	Lev	-57	-7	11.4
2414.50	Lev	-57	-7	11.4
2414.55	Lev	-55	-5	13.4
2414.60	Lev	-54.5	-4.5	13.9
2414.65	Lev	-54.5	-4.5	13.9
2414.70	Lev	-55	-5	13.4

2414.75	Lev	-56	-6	12.4
2414.80	Lev	-54.5	-4.5	13.9
2414.85	Lev	-55.5	-5.5	12.9
2414.90	Lev	-55	-5	13.4
2414.95	Lev	-57	-7	11.4
2415.00	Lev	-57	-7	11.4
2415.05	Lev	-56	-6	12.4
2415.10	Lev	-56	-6	12.4
2415.15	Lev	-56	-6	12.4
2415.20	Lev	-56	-6	12.4
2415.25	Lev	-55	-5	13.4
2415.30	Lev	-55	-5	13.4
2415.35	Lev	-54.5	-4.5	13.9
2415.40	Lev	-56	-6	12.4
2415.45	Lev	-56	-6	12.4
2415.50	Lev	-55	-5	13.4
2415.55	Lev	-55	-5	13.4
2415.60	Lev	-56	-6	12.4
2415.65	Lev	-55.5	-5.5	12.9
2415.70	Lev	-55.5	-5.5	12.9
2415.75	Lev	-55.5	-5.5	12.9
2415.80	Lev	-56	-6	12.4
2415.85	Lev	-57.5	-7.5	10.9
2415.90	Lev	-57	-7	11.4
2415.95	Lev	-55.5	-5.5	12.9
2416.00	Lev	-56	-6	12.4
2416.05	Lev	-56	-6	12.4
2416.10	Lev	-55	-5	13.4
2416.15	Lev	-54.5	-4.5	13.9
2416.20	Lev	-56.5	-6.5	11.9
2416.25	Lev	-54.5	-4.5	13.9
2416.30	Lev	-55	-5	13.4
2416.35	Lev	-54	-4	14.4
2416.40	Lev	-55	-5	13.4
2416.45	Lev	-56	-6	12.4
2416.50	Lev	-55.5	-5.5	12.9
2416.55	Lev	-54.5	-4.5	13.9
2416.60	Lev	-55.5	-5.5	12.9
2416.65	Lev	-56	-6	12.4

2416.70	Lev	-55.5	-5.5	12.9
2416.75	Lev	-54.5	-4.5	13.9
2416.80	Lev	-57	-7	11.4
2416.85	Lev	-54	-4	14.4
2416.90	Lev	-55	-5	13.4
2416.95	Lev	-54.5	-4.5	13.9
2417.00	Lev	-53	-3	15.4
2417.05	Lev	-54.5	-4.5	13.9
2417.10	Lev	-54	-4	14.4
2417.15	Lev	-53	-3	15.4
2417.20	Lev	-55	-5	13.4
2417.25	Lev	-53.5	-3.5	14.9
2417.30	Lev	-54	-4	14.4
2417.35	Lev	-54	-4	14.4
2417.40	Lev	-55.5	-5.5	12.9
2417.45	Lev	-55.5	-5.5	12.9
2417.50	Lev	-54.5	-4.5	13.9
2417.55	Lev	-54.5	-4.5	13.9
2417.60	Lev	-53	-3	15.4
2417.65	Lev	-53.5	-3.5	14.9
2417.70	Lev	-54.5	-4.5	13.9
2417.75	Lev	-51.5	-1.5	16.9
2417.80	Lev	-52.5	-2.5	15.9
2417.85	Lev	-51.5	-1.5	16.9
2417.90	Lev	-53	-3	15.4
2417.95	Lev	-53	-3	15.4
2418.00	Lev	-51.5	-1.5	16.9
2418.05	Lev	-50.5	-0.5	17.9
2418.10	Lev	-52.5	-2.5	15.9
2418.15	Lev	-53	-3	15.4
2418.20	Lev	-53	-3	15.4
2418.25	Lev	-54.5	-4.5	13.9
2418.30	Lev	-51.5	-1.5	16.9
2418.35	Lev	-50.5	-0.5	17.9
2418.40	Lev	-52.5	-2.5	15.9
2418.45	Lev	-51	-1	17.4
2418.50	Lev	-50.5	-0.5	17.9
2418.55	Lev	-50.5	-0.5	17.9
2418.60	Lev	-51	-1	17.4

2418.65	Lev	-50	0	18.4
2418.70	Lev	-50.5	-0.5	17.9
2418.75	Lev	-49	1	19.4
2418.80	Lev	-49	1	19.4
2418.85	Lev	-49.5	0.5	18.9
2418.90	Lev	-51.5	-1.5	16.9
2418.95	Lev	-49.5	0.5	18.9
2419.00	Lev	-49.5	0.5	18.9
2419.05	Lev	-51	-1	17.4
2419.10	Lev	-48	2	20.4
2419.15	Lev	-49.5	0.5	18.9
2419.20	Lev	-49.5	0.5	18.9
2419.25	Lev	-49	1	19.4
2419.30	Lev	-48	2	20.4
2419.35	Lev	-48	2	20.4
2419.40	Lev	-47	3	21.4
2419.45	Lev	-47	3	21.4
2419.50	Lev	-50.5	-0.5	17.9
2419.55	Lev	-47	3	21.4
2419.60	Lev	-48	2	20.4
2419.65	Lev	-46.5	3.5	21.9
2419.70	Lev	-45.5	4.5	22.9
2419.75	Lev	-46	4	22.4
2419.80	Lev	-46.5	3.5	21.9
2419.85	Lev	-46.5	3.5	21.9
2419.90	Lev	-45.5	4.5	22.9
2419.95	Lev	-45.5	4.5	22.9
2420.00	Lev	-44	6	24.4
2420.05	Lev	-45.5	4.5	22.9
2420.10	Lev	-43.5	6.5	24.9
2420.15	Lev	-44	6	24.4
2420.20	Lev	-43.5	6.5	24.9
2420.25	Lev	-44.5	5.5	23.9
2420.30	Lev	-43.5	6.5	24.9
2420.35	Lev	-43.5	6.5	24.9
2420.40	Lev	-44	6	24.4
2420.45	Lev	-43.5	6.5	24.9
2420.50	Lev	-43.5	6.5	24.9

7.02 Channel Med : 2437 MHz

Transmitter : 2437 MHz Signal Level -50dBm

Frequency (MHz)	Jamming Level where PER<8%	Jamming to Signal Margin	Processing Gain
2428.5 Lev	-43	7	25.4
2428.55 Lev	-43	7	25.4
2428.6 Lev	-43	7	25.4
2428.65 Lev	-43.5	6.5	24.9
2428.7 Lev	-43.5	6.5	24.9
2428.75 Lev	-43.5	6.5	24.9
2428.8 Lev	-43.5	6.5	24.9
2428.85 Lev	-44	6	24.4
2428.9 Lev	-44.5	5.5	23.9
2428.95 Lev	-44.5	5.5	23.9
2429 Lev	-43.5	6.5	24.9
2429.05 Lev	-44.5	5.5	23.9
2429.1 Lev	-43.5	6.5	24.9
2429.15 Lev	-45.5	4.5	22.9
2429.2 Lev	-45	5	23.4
2429.25 Lev	-46	4	22.4
2429.3 Lev	-45	5	23.4
2429.35 Lev	-46	4	22.4
2429.4 Lev	-46	4	22.4
2429.45 Lev	-46	4	22.4
2429.5 Lev	-46	4	22.4
2429.55 Lev	-49	1	19.4
2429.6 Lev	-48.5	1.5	19.9
2429.65 Lev	-48	2	20.4
2429.7 Lev	-49	1	19.4
2429.75 Lev	-48	2	20.4
2429.8 Lev	-48	2	20.4
2429.85 Lev	-48	2	20.4
2429.9 Lev	-48	2	20.4

2429.95	Lev	-47.5	2.5	20.9
2430	Lev	-48	2	20.4
2430.05	Lev	-47.5	2.5	20.9
2430.1	Lev	-48.5	1.5	19.9
2430.15	Lev	-48.5	1.5	19.9
2430.2	Lev	-49.5	0.5	18.9
2430.25	Lev	-50	0	18.4
2430.3	Lev	-49.5	0.5	18.9
2430.35	Lev	-49.5	0.5	18.9
2430.4	Lev	-49.5	0.5	18.9
2430.45	Lev	-50.5	-0.5	17.9
2430.5	Lev	-50	0	18.4
2430.55	Lev	-52	-2	16.4
2430.6	Lev	-51	-1	17.4
2430.65	Lev	-50.5	-0.5	17.9
2430.7	Lev	-52	-2	16.4
2430.75	Lev	-51	-1	17.4
2430.8	Lev	-51	-1	17.4
2430.85	Lev	-50.5	-0.5	17.9
2430.9	Lev	-51.5	-1.5	16.9
2430.95	Lev	-50.5	-0.5	17.9
2431	Lev	-50.5	-0.5	17.9
2431.05	Lev	-51	-1	17.4
2431.1	Lev	-52	-2	16.4
2431.15	Lev	-52	-2	16.4
2431.2	Lev	-53	-3	15.4
2431.25	Lev	-52.5	-2.5	15.9
2431.3	Lev	-52	-2	16.4
2431.35	Lev	-52.5	-2.5	15.9
2431.4	Lev	-53	-3	15.4
2431.45	Lev	-51	-1	17.4
2431.5	Lev	-52.5	-2.5	15.9
2431.55	Lev	-53	-3	15.4
2431.6	Lev	-53	-3	15.4
2431.65	Lev	-52.5	-2.5	15.9
2431.7	Lev	-52.5	-2.5	15.9
2431.75	Lev	-52.5	-2.5	15.9
2431.8	Lev	-52.5	-2.5	15.9
2431.85	Lev	-54.5	-4.5	13.9

2431.9	Lev	-53	-3	15.4
2431.95	Lev	-54.5	-4.5	13.9
2432	Lev	-53.5	-3.5	14.9
2432.05	Lev	-53.5	-3.5	14.9
2432.1	Lev	-52.5	-2.5	15.9
2432.15	Lev	-53	-3	15.4
2432.2	Lev	-56	-6	12.4
2432.25	Lev	-54	-4	14.4
2432.3	Lev	-54	-4	14.4
2432.35	Lev	-54.5	-4.5	13.9
2432.4	Lev	-54	-4	14.4
2432.45	Lev	-56	-6	12.4
2432.5	Lev	-54	-4	14.4
2432.55	Lev	-53	-3	15.4
2432.6	Lev	-54	-4	14.4
2432.65	Lev	-54.5	-4.5	13.9
2432.7	Lev	-54.5	-4.5	13.9
2432.75	Lev	-55	-5	13.4
2432.8	Lev	-54.5	-4.5	13.9
2432.85	Lev	-53.5	-3.5	14.9
2432.9	Lev	-54	-4	14.4
2432.95	Lev	-55	-5	13.4
2433	Lev	-55.5	-5.5	12.9
2433.05	Lev	-54.5	-4.5	13.9
2433.1	Lev	-53.5	-3.5	14.9
2433.15	Lev	-53.5	-3.5	14.9
2433.2	Lev	-54	-4	14.4
2433.25	Lev	-53.5	-3.5	14.9
2433.3	Lev	-53	-3	15.4
2433.35	Lev	-54.5	-4.5	13.9
2433.4	Lev	-55	-5	13.4
2433.45	Lev	-55.5	-5.5	12.9
2433.5	Lev	-56	-6	12.4
2433.55	Lev	-54.5	-4.5	13.9
2433.6	Lev	-56	-6	12.4
2433.65	Lev	-56.5	-6.5	11.9
2433.7	Lev	-55	-5	13.4
2433.75	Lev	-54.5	-4.5	13.9
2433.8	Lev	-56	-6	12.4

2433.85	Lev	-55	-5	13.4
2433.9	Lev	-55.5	-5.5	12.9
2433.95	Lev	-54.5	-4.5	13.9
2434	Lev	-55	-5	13.4
2434.05	Lev	-56	-6	12.4
2434.1	Lev	-56	-6	12.4
2434.15	Lev	-55	-5	13.4
2434.2	Lev	-57.5	-7.5	10.9
2434.25	Lev	-56	-6	12.4
2434.3	Lev	-56.5	-6.5	11.9
2434.35	Lev	-56.5	-6.5	11.9
2434.4	Lev	-56.5	-6.5	11.9
2434.45	Lev	-55.5	-5.5	12.9
2434.5	Lev	-58	-8	10.4
2434.55	Lev	-57	-7	11.4
2434.6	Lev	-57.5	-7.5	10.9
2434.65	Lev	-57	-7	11.4
2434.7	Lev	-56	-6	12.4
2434.75	Lev	-56.5	-6.5	11.9
2434.8	Lev	-55.5	-5.5	12.9
2434.85	Lev	-55.5	-5.5	12.9
2434.9	Lev	-55.5	-5.5	12.9
2434.95	Lev	-56	-6	12.4
2435	Lev	-56.5	-6.5	11.9
2435.05	Lev	-55	-5	13.4
2435.1	Lev	-55.5	-5.5	12.9
2435.15	Lev	-55.5	-5.5	12.9
2435.2	Lev	-56.5	-6.5	11.9
2435.25	Lev	-56.5	-6.5	11.9
2435.3	Lev	-55.5	-5.5	12.9
2435.35	Lev	-56	-6	12.4
2435.4	Lev	-55	-5	13.4
2435.45	Lev	-54.5	-4.5	13.9
2435.5	Lev	-55.5	-5.5	12.9
2435.55	Lev	-54.5	-4.5	13.9
2435.6	Lev	-55.5	-5.5	12.9
2435.65	Lev	-56	-6	12.4
2435.7	Lev	-56	-6	12.4
2435.75	Lev	-56	-6	12.4

2435.8	Lev	-55	-5	13.4
2435.85	Lev	-55	-5	13.4
2435.9	Lev	-57	-7	11.4
2435.95	Lev	-55.5	-5.5	12.9
2436	Lev	-55	-5	13.4
2436.05	Lev	-55.5	-5.5	12.9
2436.1	Lev	-55	-5	13.4
2436.15	Lev	-55	-5	13.4
2436.2	Lev	-56	-6	12.4
2436.25	Lev	-56.5	-6.5	11.9
2436.3	Lev	-54	-4	14.4
2436.35	Lev	-54.5	-4.5	13.9
2436.4	Lev	-55	-5	13.4
2436.45	Lev	-53.5	-3.5	14.9
2436.5	Lev	-54	-4	14.4
2436.55	Lev	-54.5	-4.5	13.9
2436.6	Lev	-55.5	-5.5	12.9
2436.65	Lev	-55.5	-5.5	12.9
2436.7	Lev	-54.5	-4.5	13.9
2436.75	Lev	-54.5	-4.5	13.9
2436.8	Lev	-55	-5	13.4
2436.85	Lev	-55	-5	13.4
2436.9	Lev	-56.5	-6.5	11.9
2436.95	Lev	-55	-5	13.4
2437	Lev	-54	-4	14.4
2437.05	Lev	-54	-4	14.4
2437.1	Lev	-53	-3	15.4
2437.15	Lev	-54.5	-4.5	13.9
2437.2	Lev	-55	-5	13.4
2437.25	Lev	-54.5	-4.5	13.9
2437.3	Lev	-54.5	-4.5	13.9
2437.35	Lev	-54.5	-4.5	13.9
2437.4	Lev	-55.5	-5.5	12.9
2437.45	Lev	-55.5	-5.5	12.9
2437.5	Lev	-56.5	-6.5	11.9
2437.55	Lev	-56	-6	12.4
2437.6	Lev	-55	-5	13.4
2437.65	Lev	-55.5	-5.5	12.9
2437.7	Lev	-55.5	-5.5	12.9

2437.75	Lev	-54.5	-4.5	13.9
2437.8	Lev	-55	-5	13.4
2437.85	Lev	-54.5	-4.5	13.9
2437.9	Lev	-55.5	-5.5	12.9
2437.95	Lev	-53.5	-3.5	14.9
2438	Lev	-55	-5	13.4
2438.05	Lev	-55	-5	13.4
2438.1	Lev	-55	-5	13.4
2438.15	Lev	-56	-6	12.4
2438.2	Lev	-56	-6	12.4
2438.25	Lev	-55.5	-5.5	12.9
2438.3	Lev	-56.5	-6.5	11.9
2438.35	Lev	-57	-7	11.4
2438.4	Lev	-57.5	-7.5	10.9
2438.45	Lev	-56	-6	12.4
2438.5	Lev	-56	-6	12.4
2438.55	Lev	-56	-6	12.4
2438.6	Lev	-56	-6	12.4
2438.65	Lev	-54	-4	14.4
2438.7	Lev	-55	-5	13.4
2438.75	Lev	-55.5	-5.5	12.9
2438.8	Lev	-56	-6	12.4
2438.85	Lev	-57	-7	11.4
2438.9	Lev	-56.5	-6.5	11.9
2438.95	Lev	-57	-7	11.4
2439	Lev	-56	-6	12.4
2439.05	Lev	-57.5	-7.5	10.9
2439.1	Lev	-56.5	-6.5	11.9
2439.15	Lev	-56	-6	12.4
2439.2	Lev	-55	-5	13.4
2439.25	Lev	-55.5	-5.5	12.9
2439.3	Lev	-56	-6	12.4
2439.35	Lev	-54	-4	14.4
2439.4	Lev	-55	-5	13.4
2439.45	Lev	-56	-6	12.4
2439.5	Lev	-56	-6	12.4
2439.55	Lev	-56	-6	12.4
2439.6	Lev	-56	-6	12.4
2439.65	Lev	-55	-5	13.4

2439.7	Lev	-55.5	-5.5	12.9
2439.75	Lev	-56	-6	12.4
2439.8	Lev	-56.5	-6.5	11.9
2439.85	Lev	-55.5	-5.5	12.9
2439.9	Lev	-56	-6	12.4
2439.95	Lev	-57	-7	11.4
2440	Lev	-55	-5	13.4
2440.05	Lev	-55.5	-5.5	12.9
2440.1	Lev	-55	-5	13.4
2440.15	Lev	-56	-6	12.4
2440.2	Lev	-54.5	-4.5	13.9
2440.25	Lev	-55	-5	13.4
2440.3	Lev	-54	-4	14.4
2440.35	Lev	-56	-6	12.4
2440.4	Lev	-55	-5	13.4
2440.45	Lev	-54	-4	14.4
2440.5	Lev	-58	-8	10.4
2440.55	Lev	-54.5	-4.5	13.9
2440.6	Lev	-55.5	-5.5	12.9
2440.65	Lev	-55.5	-5.5	12.9
2440.7	Lev	-55	-5	13.4
2440.75	Lev	-55	-5	13.4
2440.8	Lev	-55	-5	13.4
2440.85	Lev	-56	-6	12.4
2440.9	Lev	-54	-4	14.4
2440.95	Lev	-53.5	-3.5	14.9
2441	Lev	-53.5	-3.5	14.9
2441.05	Lev	-54.5	-4.5	13.9
2441.1	Lev	-54	-4	14.4
2441.15	Lev	-55	-5	13.4
2441.2	Lev	-55	-5	13.4
2441.25	Lev	-53	-3	15.4
2441.3	Lev	-55	-5	13.4
2441.35	Lev	-53.5	-3.5	14.9
2441.4	Lev	-54.5	-4.5	13.9
2441.45	Lev	-55.5	-5.5	12.9
2441.5	Lev	-55.5	-5.5	12.9
2441.55	Lev	-53.5	-3.5	14.9
2441.6	Lev	-53	-3	15.4

2441.65	Lev	-54	-4	14.4
2441.7	Lev	-52.5	-2.5	15.9
2441.75	Lev	-53	-3	15.4
2441.8	Lev	-53	-3	15.4
2441.85	Lev	-51.5	-1.5	16.9
2441.9	Lev	-52.5	-2.5	15.9
2441.95	Lev	-52.5	-2.5	15.9
2442	Lev	-53.5	-3.5	14.9
2442.05	Lev	-52.5	-2.5	15.9
2442.1	Lev	-52.5	-2.5	15.9
2442.15	Lev	-52.5	-2.5	15.9
2442.2	Lev	-53	-3	15.4
2442.25	Lev	-53	-3	15.4
2442.3	Lev	-53	-3	15.4
2442.35	Lev	-53	-3	15.4
2442.4	Lev	-53	-3	15.4
2442.45	Lev	-51.5	-1.5	16.9
2442.5	Lev	-52	-2	16.4
2442.55	Lev	-51.5	-1.5	16.9
2442.6	Lev	-51	-1	17.4
2442.65	Lev	-51.5	-1.5	16.9
2442.7	Lev	-51	-1	17.4
2442.75	Lev	-50.5	-0.5	17.9
2442.8	Lev	-50.5	-0.5	17.9
2442.85	Lev	-49.5	0.5	18.9
2442.9	Lev	-50.5	-0.5	17.9
2442.95	Lev	-50	0	18.4
2443	Lev	-53	-3	15.4
2443.05	Lev	-50.5	-0.5	17.9
2443.1	Lev	-51	-1	17.4
2443.15	Lev	-50.5	-0.5	17.9
2443.2	Lev	-51	-1	17.4
2443.25	Lev	-51	-1	17.4
2443.3	Lev	-50.5	-0.5	17.9
2443.35	Lev	-50	0	18.4
2443.4	Lev	-49	1	19.4
2443.45	Lev	-48.5	1.5	19.9
2443.5	Lev	-50	0	18.4
2443.55	Lev	-49.5	0.5	18.9

2443.6	Lev	-48	2	20.4
2443.65	Lev	-48	2	20.4
2443.7	Lev	-49	1	19.4
2443.75	Lev	-47.5	2.5	20.9
2443.8	Lev	-48.5	1.5	19.9
2443.85	Lev	-49	1	19.4
2443.9	Lev	-48	2	20.4
2443.95	Lev	-50	0	18.4
2444	Lev	-46	4	22.4
2444.05	Lev	-46	4	22.4
2444.1	Lev	-46.4	3.6	22
2444.15	Lev	-46.5	3.5	21.9
2444.2	Lev	-46	4	22.4
2444.25	Lev	-46	4	22.4
2444.3	Lev	-46.5	3.5	21.9
2444.35	Lev	-46	4	22.4
2444.4	Lev	-45	5	23.4
2444.45	Lev	-45	5	23.4
2444.5	Lev	-45.5	4.5	22.9
2444.55	Lev	-45	5	23.4
2444.6	Lev	-45	5	23.4
2444.65	Lev	-45	5	23.4
2444.7	Lev	-44.5	5.5	23.9
2444.75	Lev	-44.5	5.5	23.9
2444.8	Lev	-44	6	24.4
2444.85	Lev	-43.5	6.5	24.9
2444.9	Lev	-43	7	25.4
2444.95	Lev	-43.5	6.5	24.9
2445	Lev	-42.5	7.5	25.9
2445.05	Lev	-42.5	7.5	25.9
2445.1	Lev	-42.5	7.5	25.9
2445.15	Lev	-42.5	7.5	25.9
2445.2	Lev	-43	7	25.4
2445.25	Lev	-43	7	25.4
2445.3	Lev	-43.5	6.5	24.9
2445.35	Lev	-43.5	6.5	24.9
2445.4	Lev	-43.5	6.5	24.9
2445.45	Lev	-43	7	25.4

7.03 Channel High: 2462 MHz

Transmitter : 2462 MHz Signal Level -50dBm

Frequency (MHz)	Jamming Level where PER<8%	Jamming to Signal Margin	Processing Gain
2453.5 Lev	-42.5	7.5	25.9
2453.55 Lev	-42.5	7.5	25.9
2453.6 Lev	-42.5	7.5	25.9
2453.65 Lev	-42.5	7.5	25.9
2453.7 Lev	-42.5	7.5	25.9
2453.75 Lev	-42.5	7.5	25.9
2453.8 Lev	-45.5	4.5	22.9
2453.85 Lev	-43	7	25.4
2453.9 Lev	-43	7	25.4
2453.95 Lev	-43	7	25.4
2454 Lev	-43.5	6.5	24.9
2454.05 Lev	-44	6	24.4
2454.1 Lev	-43.5	6.5	24.9
2454.15 Lev	-44	6	24.4
2454.2 Lev	-43	7	25.4
2454.25 Lev	-45	5	23.4
2454.3 Lev	-44.5	5.5	23.9
2454.35 Lev	-43	7	25.4
2454.4 Lev	-43.5	6.5	24.9
2454.45 Lev	-46	4	22.4
2454.5 Lev	-44	6	24.4
2454.55 Lev	-47	3	21.4
2454.6 Lev	-47	3	21.4
2454.65 Lev	-46.5	3.5	21.9
2454.7 Lev	-47	3	21.4
2454.75 Lev	-47	3	21.4
2454.8 Lev	-49	1	19.4
2454.85 Lev	-48	2	20.4
2454.9 Lev	-48	2	20.4
2454.95 Lev	-49	1	19.4
2455 Lev	-49	1	19.4
2455.05 Lev	-47	3	21.4

2455.1	Lev	-48	2	20.4
2455.15	Lev	-48	2	20.4
2455.2	Lev	-48.5	1.5	19.9
2455.25	Lev	-47	3	21.4
2455.3	Lev	-47	3	21.4
2455.35	Lev	-49.5	0.5	18.9
2455.4	Lev	-49	1	19.4
2455.45	Lev	-49.5	0.5	18.9
2455.5	Lev	-48.5	1.5	19.9
2455.55	Lev	-50	0	18.4
2455.6	Lev	-49.5	0.5	18.9
2455.65	Lev	-51	-1	17.4
2455.7	Lev	-50	0	18.4
2455.75	Lev	-50.5	-0.5	17.9
2455.8	Lev	-51	-1	17.4
2455.85	Lev	-51	-1	17.4
2455.9	Lev	-50	0	18.4
2455.95	Lev	-53	-3	15.4
2456	Lev	-50	0	18.4
2456.05	Lev	-50	0	18.4
2456.1	Lev	-49.5	0.5	18.9
2456.15	Lev	-51.5	-1.5	16.9
2456.2	Lev	-50.5	-0.5	17.9
2456.25	Lev	-50.5	-0.5	17.9
2456.3	Lev	-52	-2	16.4
2456.35	Lev	-51.5	-1.5	16.9
2456.4	Lev	-53.5	-3.5	14.9
2456.45	Lev	-51.5	-1.5	16.9
2456.5	Lev	-51.5	-1.5	16.9
2456.55	Lev	-53	-3	15.4
2456.6	Lev	-52	-2	16.4
2456.65	Lev	-53	-3	15.4
2456.7	Lev	-51.5	-1.5	16.9
2456.75	Lev	-53	-3	15.4
2456.8	Lev	-52	-2	16.4
2456.85	Lev	-51.5	-1.5	16.9
2456.9	Lev	-52	-2	16.4
2456.95	Lev	-52.5	-2.5	15.9
2457	Lev	-52.5	-2.5	15.9

2457.05	Lev	-53	-3	15.4
2457.1	Lev	-52.5	-2.5	15.9
2457.15	Lev	-54	-4	14.4
2457.2	Lev	-53.5	-3.5	14.9
2457.25	Lev	-53.5	-3.5	14.9
2457.3	Lev	-54	-4	14.4
2457.35	Lev	-53	-3	15.4
2457.4	Lev	-53.5	-3.5	14.9
2457.45	Lev	-52.5	-2.5	15.9
2457.5	Lev	-55	-5	13.4
2457.55	Lev	-52.5	-2.5	15.9
2457.6	Lev	-53	-3	15.4
2457.65	Lev	-54	-4	14.4
2457.7	Lev	-52.5	-2.5	15.9
2457.75	Lev	-53	-3	15.4
2457.8	Lev	-53	-3	15.4
2457.85	Lev	-55	-5	13.4
2457.9	Lev	-55	-5	13.4
2457.95	Lev	-54	-4	14.4
2458	Lev	-54.5	-4.5	13.9
2458.05	Lev	-55.5	-5.5	12.9
2458.1	Lev	-54.5	-4.5	13.9
2458.15	Lev	-54.5	-4.5	13.9
2458.2	Lev	-53.5	-3.5	14.9
2458.25	Lev	-54.5	-4.5	13.9
2458.3	Lev	-54.5	-4.5	13.9
2458.35	Lev	-55	-5	13.4
2458.4	Lev	-54.5	-4.5	13.9
2458.45	Lev	-54.5	-4.5	13.9
2458.5	Lev	-57	-7	11.4
2458.55	Lev	-54.5	-4.5	13.9
2458.6	Lev	-56.5	-6.5	11.9
2458.65	Lev	-55.5	-5.5	12.9
2458.7	Lev	-56	-6	12.4
2458.75	Lev	-56	-6	12.4
2458.8	Lev	-56.5	-6.5	11.9
2458.85	Lev	-55.5	-5.5	12.9
2458.9	Lev	-56	-6	12.4
2458.95	Lev	-56.5	-6.5	11.9

2459	Lev	-56.5	-6.5	11.9
2459.05	Lev	-54.5	-4.5	13.9
2459.1	Lev	-55.5	-5.5	12.9
2459.15	Lev	-55	-5	13.4
2459.2	Lev	-56	-6	12.4
2459.25	Lev	-54	-4	14.4
2459.3	Lev	-56	-6	12.4
2459.35	Lev	-56	-6	12.4
2459.4	Lev	-57	-7	11.4
2459.45	Lev	-56.5	-6.5	11.9
2459.5	Lev	-56.5	-6.5	11.9
2459.55	Lev	-57	-7	11.4
2459.6	Lev	-56	-6	12.4
2459.65	Lev	-56	-6	12.4
2459.7	Lev	-54	-4	14.4
2459.75	Lev	-57.5	-7.5	10.9
2459.8	Lev	-56	-6	12.4
2459.85	Lev	-55.5	-5.5	12.9
2459.9	Lev	-56.5	-6.5	11.9
2459.95	Lev	-55.5	-5.5	12.9
2460	Lev	-55	-5	13.4
2460.05	Lev	-55	-5	13.4
2460.1	Lev	-54	-4	14.4
2460.15	Lev	-55	-5	13.4
2460.2	Lev	-55.5	-5.5	12.9
2460.25	Lev	-56	-6	12.4
2460.3	Lev	-55	-5	13.4
2460.35	Lev	-55.5	-5.5	12.9
2460.4	Lev	-55	-5	13.4
2460.45	Lev	-55	-5	13.4
2460.5	Lev	-55	-5	13.4
2460.55	Lev	-56.5	-6.5	11.9
2460.6	Lev	-56	-6	12.4
2460.65	Lev	-55.5	-5.5	12.9
2460.7	Lev	-56	-6	12.4
2460.75	Lev	-55	-5	13.4
2460.8	Lev	-54	-4	14.4
2460.85	Lev	-54	-4	14.4
2460.9	Lev	-54.5	-4.5	13.9

2460.95	Lev	-55	-5	13.4
2461	Lev	-55.5	-5.5	12.9
2461.05	Lev	-55	-5	13.4
2461.1	Lev	-55.5	-5.5	12.9
2461.15	Lev	-54.5	-4.5	13.9
2461.2	Lev	-55.5	-5.5	12.9
2461.25	Lev	-56.5	-6.5	11.9
2461.3	Lev	-54	-4	14.4
2461.35	Lev	-54	-4	14.4
2461.4	Lev	-54.5	-4.5	13.9
2461.45	Lev	-53	-3	15.4
2461.5	Lev	-57	-7	11.4
2461.55	Lev	-54.5	-4.5	13.9
2461.6	Lev	-54	-4	14.4
2461.65	Lev	-55.5	-5.5	12.9
2461.7	Lev	-55.5	-5.5	12.9
2461.75	Lev	-54	-4	14.4
2461.8	Lev	-54.5	-4.5	13.9
2461.85	Lev	-54	-4	14.4
2461.9	Lev	-55	-5	13.4
2461.95	Lev	-54.5	-4.5	13.9
2462	Lev	-55	-5	13.4
2462.05	Lev	-54.5	-4.5	13.9
2462.1	Lev	-53.5	-3.5	14.9
2462.15	Lev	-54	-4	14.4
2462.2	Lev	-54.5	-4.5	13.9
2462.25	Lev	-54.5	-4.5	13.9
2462.3	Lev	-53.5	-3.5	14.9
2462.35	Lev	-53.5	-3.5	14.9
2462.4	Lev	-54.5	-4.5	13.9
2462.45	Lev	-55	-5	13.4
2462.5	Lev	-54.5	-4.5	13.9
2462.55	Lev	-54.5	-4.5	13.9
2462.6	Lev	-55.5	-5.5	12.9
2462.65	Lev	-55.5	-5.5	12.9
2462.7	Lev	-54	-4	14.4
2462.75	Lev	-55	-5	13.4
2462.8	Lev	-55	-5	13.4
2462.85	Lev	-55.5	-5.5	12.9

2462.9	Lev	-54.5	-4.5	13.9
2462.95	Lev	-54.5	-4.5	13.9
2463	Lev	-54	-4	14.4
2463.05	Lev	-54.5	-4.5	13.9
2463.1	Lev	-55.5	-5.5	12.9
2463.15	Lev	-54.5	-4.5	13.9
2463.2	Lev	-56	-6	12.4
2463.25	Lev	-55.5	-5.5	12.9
2463.3	Lev	-56.5	-6.5	11.9
2463.35	Lev	-56	-6	12.4
2463.4	Lev	-56	-6	12.4
2463.45	Lev	-56	-6	12.4
2463.5	Lev	-55.5	-5.5	12.9
2463.55	Lev	-56	-6	12.4
2463.6	Lev	-56.5	-6.5	11.9
2463.65	Lev	-56	-6	12.4
2463.7	Lev	-55.5	-5.5	12.9
2463.75	Lev	-54.5	-4.5	13.9
2463.8	Lev	-54.5	-4.5	13.9
2463.85	Lev	-55.5	-5.5	12.9
2463.9	Lev	-54.5	-4.5	13.9
2463.95	Lev	-56	-6	12.4
2464	Lev	-54.5	-4.5	13.9
2464.05	Lev	-54.5	-4.5	13.9
2464.1	Lev	-55.5	-5.5	12.9
2464.15	Lev	-56	-6	12.4
2464.2	Lev	-55.5	-5.5	12.9
2464.25	Lev	-55.5	-5.5	12.9
2464.3	Lev	-55.5	-5.5	12.9
2464.35	Lev	-54.5	-4.5	13.9
2464.4	Lev	-56.5	-6.5	11.9
2464.45	Lev	-56	-6	12.4
2464.5	Lev	-56	-6	12.4
2464.55	Lev	-55.5	-5.5	12.9
2464.6	Lev	-56	-6	12.4
2464.65	Lev	-55.5	-5.5	12.9
2464.7	Lev	-53.5	-3.5	14.9
2464.75	Lev	-53.5	-3.5	14.9
2464.8	Lev	-54	-4	14.4

2464.85	Lev	-55.5	-5.5	12.9
2464.9	Lev	-54.5	-4.5	13.9
2464.95	Lev	-56.5	-6.5	11.9
2465	Lev	-56.5	-6.5	11.9
2465.05	Lev	-55	-5	13.4
2465.1	Lev	-55.5	-5.5	12.9
2465.15	Lev	-55.5	-5.5	12.9
2465.2	Lev	-56.5	-6.5	11.9
2465.25	Lev	-56	-6	12.4
2465.3	Lev	-54.5	-4.5	13.9
2465.35	Lev	-54.5	-4.5	13.9
2465.4	Lev	-55.5	-5.5	12.9
2465.45	Lev	-56.5	-6.5	11.9
2465.5	Lev	-54	-4	14.4
2465.55	Lev	-54.5	-4.5	13.9
2465.6	Lev	-55.5	-5.5	12.9
2465.65	Lev	-55	-5	13.4
2465.7	Lev	-54	-4	14.4
2465.75	Lev	-55	-5	13.4
2465.8	Lev	-55	-5	13.4
2465.85	Lev	-54.5	-4.5	13.9
2465.9	Lev	-55.5	-5.5	12.9
2465.95	Lev	-56.5	-6.5	11.9
2466	Lev	-53.5	-3.5	14.9
2466.05	Lev	-53.5	-3.5	14.9
2466.1	Lev	-53	-3	15.4
2466.15	Lev	-53.5	-3.5	14.9
2466.2	Lev	-53.5	-3.5	14.9
2466.25	Lev	-54.5	-4.5	13.9
2466.3	Lev	-52.5	-2.5	15.9
2466.35	Lev	-52.5	-2.5	15.9
2466.4	Lev	-52.5	-2.5	15.9
2466.45	Lev	-54	-4	14.4
2466.5	Lev	-54.5	-4.5	13.9
2466.55	Lev	-52.5	-2.5	15.9
2466.6	Lev	-53.5	-3.5	14.9
2466.65	Lev	-53	-3	15.4
2466.7	Lev	-54.5	-4.5	13.9
2466.75	Lev	-53	-3	15.4

2466.8	Lev	-53.5	-3.5	14.9
2466.85	Lev	-53.5	-3.5	14.9
2466.9	Lev	-52.5	-2.5	15.9
2466.95	Lev	-52.5	-2.5	15.9
2467	Lev	-53	-3	15.4
2467.05	Lev	-52	-2	16.4
2467.1	Lev	-51.5	-1.5	16.9
2467.15	Lev	-52	-2	16.4
2467.2	Lev	-53	-3	15.4
2467.25	Lev	-51.5	-1.5	16.9
2467.3	Lev	-53	-3	15.4
2467.35	Lev	-52	-2	16.4
2467.4	Lev	-52.5	-2.5	15.9
2467.45	Lev	-52.5	-2.5	15.9
2467.5	Lev	-53.5	-3.5	14.9
2467.55	Lev	-51.5	-1.5	16.9
2467.6	Lev	-51.5	-1.5	16.9
2467.65	Lev	-51	-1	17.4
2467.7	Lev	-50.5	-0.5	17.9
2467.75	Lev	-50.5	-0.5	17.9
2467.8	Lev	-50	0	18.4
2467.85	Lev	-49.5	0.5	18.9
2467.9	Lev	-50.5	-0.5	17.9
2467.95	Lev	-51	-1	17.4
2468	Lev	-50.5	-0.5	17.9
2468.05	Lev	-50.5	-0.5	17.9
2468.1	Lev	-50.5	-0.5	17.9
2468.15	Lev	-51	-1	17.4
2468.2	Lev	-51.5	-1.5	16.9
2468.25	Lev	-49.5	0.5	18.9
2468.3	Lev	-51.5	-1.5	16.9
2468.35	Lev	-49	1	19.4
2468.4	Lev	-49.5	0.5	18.9
2468.45	Lev	-49.5	0.5	18.9
2468.5	Lev	-48.5	1.5	19.9
2468.55	Lev	-48.5	1.5	19.9
2468.6	Lev	-48.5	1.5	19.9
2468.65	Lev	-48.5	1.5	19.9
2468.7	Lev	-48.5	1.5	19.9

2468.75	Lev	-48.5	1.5	19.9
2468.8	Lev	-48.5	1.5	19.9
2468.85	Lev	-47	3	21.4
2468.9	Lev	-49	1	19.4
2468.95	Lev	-48.5	1.5	19.9
2469	Lev	-47.5	2.5	20.9
2469.05	Lev	-50	0	18.4
2469.1	Lev	-47	3	21.4
2469.15	Lev	-47.5	2.5	20.9
2469.2	Lev	-48	2	20.4
2469.25	Lev	-46.5	3.5	21.9
2469.3	Lev	-48	2	20.4
2469.35	Lev	-46	4	22.4
2469.4	Lev	-45.5	4.5	22.9
2469.45	Lev	-44.5	5.5	23.9
2469.5	Lev	-44	6	24.4
2469.55	Lev	-45.5	4.5	22.9
2469.6	Lev	-45.5	4.5	22.9
2469.65	Lev	-45	5	23.4
2469.7	Lev	-43.5	6.5	24.9
2469.75	Lev	-45.5	4.5	22.9
2469.8	Lev	-45	5	23.4
2469.85	Lev	-44.5	5.5	23.9
2469.9	Lev	-44	6	24.4
2469.95	Lev	-44	6	24.4
2470	Lev	-44	6	24.4
2470.05	Lev	-43	7	25.4
2470.1	Lev	-42.5	7.5	25.9
2470.15	Lev	-42.5	7.5	25.9
2470.2	Lev	-45.5	4.5	22.9
2470.25	Lev	-44.5	5.5	23.9
2470.3	Lev	-42.5	7.5	25.9
2470.35	Lev	-42.5	7.5	25.9
2470.4	Lev	-42.5	7.5	25.9
2470.45	Lev	-43	7	25.4
2470.5	Lev	-43	7	25.4

8.0 Test Data 5.5 Mbps (Fallback Data Rate)

8.01 Channel Low : 2412 MHz

Transmitter : 2412 MHz Signal Level -50dBm

Frequency (MHz)	Jamming Level where PER<8%	Jamming to Signal Margin	Processing Gain
2403.5 Lev	-44	6	20.4
2403.55 Lev	-44.5	5.5	19.9
2403.6 Lev	-44.5	5.5	19.9
2403.65 Lev	-44.5	5.5	19.9
2403.7 Lev	-44.5	5.5	19.9
2403.75 Lev	-44.5	5.5	19.9
2403.8 Lev	-44.5	5.5	19.9
2403.85 Lev	-45	5	19.4
2403.9 Lev	-45	5	19.4
2403.95 Lev	-45	5	19.4
2404 Lev	-45.5	4.5	18.9
2404.05 Lev	-45.5	4.5	18.9
2404.1 Lev	-45	5	19.4
2404.15 Lev	-45	5	19.4
2404.2 Lev	-45	5	19.4
2404.25 Lev	-45	5	19.4
2404.3 Lev	-44.5	5.5	19.9
2404.35 Lev	-45	5	19.4
2404.4 Lev	-45	5	19.4
2404.45 Lev	-45	5	19.4
2404.5 Lev	-45.5	4.5	18.9
2404.55 Lev	-45.5	4.5	18.9
2404.6 Lev	-46	4	18.4
2404.65 Lev	-46	4	18.4
2404.7 Lev	-46	4	18.4
2404.75 Lev	-46.5	3.5	17.9
2404.8 Lev	-46.5	3.5	17.9
2404.85 Lev	-47	3	17.4
2404.9 Lev	-47	3	17.4

2404.95	Lev	-46.5	3.5	17.9
2405	Lev	-46	4	18.4
2405.05	Lev	-46.5	3.5	17.9
2405.1	Lev	-45.5	4.5	18.9
2405.15	Lev	-45.5	4.5	18.9
2405.2	Lev	-47	3	17.4
2405.25	Lev	-47	3	17.4
2405.3	Lev	-46.5	3.5	17.9
2405.35	Lev	-46	4	18.4
2405.4	Lev	-46	4	18.4
2405.45	Lev	-47	3	17.4
2405.5	Lev	-47	3	17.4
2405.55	Lev	-47.5	2.5	16.9
2405.6	Lev	-47.5	2.5	16.9
2405.65	Lev	-48	2	16.4
2405.7	Lev	-48	2	16.4
2405.75	Lev	-47.5	2.5	16.9
2405.8	Lev	-48	2	16.4
2405.85	Lev	-47.5	2.5	16.9
2405.9	Lev	-48	2	16.4
2405.95	Lev	-47	3	17.4
2406	Lev	-47	3	17.4
2406.05	Lev	-48	2	16.4
2406.1	Lev	-47	3	17.4
2406.15	Lev	-47	3	17.4
2406.2	Lev	-48.5	1.5	15.9
2406.25	Lev	-48.5	1.5	15.9
2406.3	Lev	-47	3	17.4
2406.35	Lev	-46.5	3.5	17.9
2406.4	Lev	-47.5	2.5	16.9
2406.45	Lev	-47	3	17.4
2406.5	Lev	-47	3	17.4
2406.55	Lev	-46.5	3.5	17.9
2406.6	Lev	-47.5	2.5	16.9
2406.65	Lev	-47	3	17.4
2406.7	Lev	-47	3	17.4
2406.75	Lev	-48	2	16.4
2406.8	Lev	-48.5	1.5	15.9
2406.85	Lev	-48.5	1.5	15.9

2406.9	Lev	-48.5	1.5	15.9
2406.95	Lev	-50	0	14.4
2407	Lev	-48.5	1.5	15.9
2407.05	Lev	-50	0	14.4
2407.1	Lev	-49.5	0.5	14.9
2407.15	Lev	-50	0	14.4
2407.2	Lev	-50	0	14.4
2407.25	Lev	-50.5	-0.5	13.9
2407.3	Lev	-49.5	0.5	14.9
2407.35	Lev	-49.5	0.5	14.9
2407.4	Lev	-49	1	15.4
2407.45	Lev	-48.5	1.5	15.9
2407.5	Lev	-49	1	15.4
2407.55	Lev	-49	1	15.4
2407.6	Lev	-49	1	15.4
2407.65	Lev	-49.5	0.5	14.9
2407.7	Lev	-51	-1	13.4
2407.75	Lev	-50.5	-0.5	13.9
2407.8	Lev	-52	-2	12.4
2407.85	Lev	-50	0	14.4
2407.9	Lev	-50.5	-0.5	13.9
2407.95	Lev	-50.5	-0.5	13.9
2408	Lev	-52	-2	12.4
2408.05	Lev	-51	-1	13.4
2408.1	Lev	-51.5	-1.5	12.9
2408.15	Lev	-51.5	-1.5	12.9
2408.2	Lev	-50.5	-0.5	13.9
2408.25	Lev	-50	0	14.4
2408.3	Lev	-50	0	14.4
2408.35	Lev	-50.5	-0.5	13.9
2408.4	Lev	-48.5	1.5	15.9
2408.45	Lev	-49.5	0.5	14.9
2408.5	Lev	-50	0	14.4
2408.55	Lev	-50.5	-0.5	13.9
2408.6	Lev	-50.5	-0.5	13.9
2408.65	Lev	-51	-1	13.4
2408.7	Lev	-52	-2	12.4
2408.75	Lev	-52.5	-2.5	11.9
2408.8	Lev	-52	-2	12.4

2408.85	Lev	-52.5	-2.5	11.9
2408.9	Lev	-51	-1	13.4
2408.95	Lev	-51.5	-1.5	12.9
2409	Lev	-51	-1	13.4
2409.05	Lev	-52.5	-2.5	11.9
2409.1	Lev	-51.5	-1.5	12.9
2409.15	Lev	-51	-1	13.4
2409.2	Lev	-52	-2	12.4
2409.25	Lev	-52.5	-2.5	11.9
2409.3	Lev	-51.5	-1.5	12.9
2409.35	Lev	-52	-2	12.4
2409.4	Lev	-51.5	-1.5	12.9
2409.45	Lev	-52.5	-2.5	11.9
2409.5	Lev	-53.5	-3.5	10.9
2409.55	Lev	-53.5	-3.5	10.9
2409.6	Lev	-52.5	-2.5	11.9
2409.65	Lev	-52.5	-2.5	11.9
2409.7	Lev	-52.5	-2.5	11.9
2409.75	Lev	-52	-2	12.4
2409.8	Lev	-51	-1	13.4
2409.85	Lev	-51.5	-1.5	12.9
2409.9	Lev	-51	-1	13.4
2409.95	Lev	-51	-1	13.4
2410	Lev	-51	-1	13.4
2410.05	Lev	-50.5	-0.5	13.9
2410.1	Lev	-51	-1	13.4
2410.15	Lev	-51.5	-1.5	12.9
2410.2	Lev	-52.5	-2.5	11.9
2410.25	Lev	-51.5	-1.5	12.9
2410.3	Lev	-52	-2	12.4
2410.35	Lev	-52	-2	12.4
2410.4	Lev	-51.5	-1.5	12.9
2410.45	Lev	-52	-2	12.4
2410.5	Lev	-52	-2	12.4
2410.55	Lev	-52	-2	12.4
2410.6	Lev	-52	-2	12.4
2410.65	Lev	-51.5	-1.5	12.9
2410.7	Lev	-53	-3	11.4
2410.75	Lev	-51.5	-1.5	12.9

2410.8	Lev	-52.5	-2.5	11.9
2410.85	Lev	-51.5	-1.5	12.9
2410.9	Lev	-52	-2	12.4
2410.95	Lev	-51	-1	13.4
2411	Lev	-51.5	-1.5	12.9
2411.05	Lev	-51.5	-1.5	12.9
2411.1	Lev	-51.5	-1.5	12.9
2411.15	Lev	-52.5	-2.5	11.9
2411.2	Lev	-52	-2	12.4
2411.25	Lev	-52.5	-2.5	11.9
2411.3	Lev	-52.5	-2.5	11.9
2411.35	Lev	-53	-3	11.4
2411.4	Lev	-52.5	-2.5	11.9
2411.45	Lev	-52.5	-2.5	11.9
2411.5	Lev	-52.5	-2.5	11.9
2411.55	Lev	-52.5	-2.5	11.9
2411.6	Lev	-52.5	-2.5	11.9
2411.65	Lev	-53	-3	11.4
2411.7	Lev	-52	-2	12.4
2411.75	Lev	-52.5	-2.5	11.9
2411.8	Lev	-52.5	-2.5	11.9
2411.85	Lev	-53	-3	11.4
2411.9	Lev	-53	-3	11.4
2411.95	Lev	-51.5	-1.5	12.9
2412	Lev	-52	-2	12.4
2412.05	Lev	-51.5	-1.5	12.9
2412.1	Lev	-52	-2	12.4
2412.15	Lev	-51.5	-1.5	12.9
2412.2	Lev	-53	-3	11.4
2412.25	Lev	-52	-2	12.4
2412.3	Lev	-52	-2	12.4
2412.35	Lev	-52	-2	12.4
2412.4	Lev	-52	-2	12.4
2412.45	Lev	-53.5	-3.5	10.9
2412.5	Lev	-53	-3	11.4
2412.55	Lev	-52.5	-2.5	11.9
2412.6	Lev	-52.5	-2.5	11.9
2412.65	Lev	-52.5	-2.5	11.9
2412.7	Lev	-52.5	-2.5	11.9

2412.75	Lev	-52.5	-2.5	11.9
2412.8	Lev	-52	-2	12.4
2412.85	Lev	-51.5	-1.5	12.9
2412.9	Lev	-51.5	-1.5	12.9
2412.95	Lev	-51.5	-1.5	12.9
2413	Lev	-51.5	-1.5	12.9
2413.05	Lev	-51.5	-1.5	12.9
2413.1	Lev	-51	-1	13.4
2413.15	Lev	-52	-2	12.4
2413.2	Lev	-52	-2	12.4
2413.25	Lev	-52	-2	12.4
2413.3	Lev	-53.5	-3.5	10.9
2413.35	Lev	-52.5	-2.5	11.9
2413.4	Lev	-53	-3	11.4
2413.45	Lev	-53	-3	11.4
2413.5	Lev	-52.5	-2.5	11.9
2413.55	Lev	-52	-2	12.4
2413.6	Lev	-52	-2	12.4
2413.65	Lev	-52	-2	12.4
2413.7	Lev	-52.5	-2.5	11.9
2413.75	Lev	-52	-2	12.4
2413.8	Lev	-50.5	-0.5	13.9
2413.85	Lev	-50.5	-0.5	13.9
2413.9	Lev	-50	0	14.4
2413.95	Lev	-50	0	14.4
2414	Lev	-51.5	-1.5	12.9
2414.05	Lev	-51	-1	13.4
2414.1	Lev	-52	-2	12.4
2414.15	Lev	-52.5	-2.5	11.9
2414.2	Lev	-51.5	-1.5	12.9
2414.25	Lev	-51.5	-1.5	12.9
2414.3	Lev	-52	-2	12.4
2414.35	Lev	-53	-3	11.4
2414.4	Lev	-51.5	-1.5	12.9
2414.45	Lev	-52	-2	12.4
2414.5	Lev	-51.5	-1.5	12.9
2414.55	Lev	-51.5	-1.5	12.9
2414.6	Lev	-51.5	-1.5	12.9
2414.65	Lev	-51.5	-1.5	12.9

2414.7	Lev	-51	-1	13.4
2414.75	Lev	-52	-2	12.4
2414.8	Lev	-52	-2	12.4
2414.85	Lev	-51.5	-1.5	12.9
2414.9	Lev	-52	-2	12.4
2414.95	Lev	-52	-2	12.4
2415	Lev	-52	-2	12.4
2415.05	Lev	-51.5	-1.5	12.9
2415.1	Lev	-54	-4	10.4
2415.15	Lev	-52	-2	12.4
2415.2	Lev	-52	-2	12.4
2415.25	Lev	-50.5	-0.5	13.9
2415.3	Lev	-50.5	-0.5	13.9
2415.35	Lev	-50	0	14.4
2415.4	Lev	-50	0	14.4
2415.45	Lev	-50	0	14.4
2415.5	Lev	-49.5	0.5	14.9
2415.55	Lev	-50.5	-0.5	13.9
2415.6	Lev	-50	0	14.4
2415.65	Lev	-52	-2	12.4
2415.7	Lev	-51.5	-1.5	12.9
2415.75	Lev	-53	-3	11.4
2415.8	Lev	-52	-2	12.4
2415.85	Lev	-52	-2	12.4
2415.9	Lev	-51.5	-1.5	12.9
2415.95	Lev	-52	-2	12.4
2416	Lev	-52	-2	12.4
2416.05	Lev	-51.5	-1.5	12.9
2416.1	Lev	-51	-1	13.4
2416.15	Lev	-51.5	-1.5	12.9
2416.2	Lev	-50.5	-0.5	13.9
2416.25	Lev	-50.5	-0.5	13.9
2416.3	Lev	-50.5	-0.5	13.9
2416.35	Lev	-50	0	14.4
2416.4	Lev	-49.5	0.5	14.9
2416.45	Lev	-49	1	15.4
2416.5	Lev	-48.5	1.5	15.9
2416.55	Lev	-49.5	0.5	14.9
2416.6	Lev	-50	0	14.4

2416.65	Lev	-49	1	15.4
2416.7	Lev	-50	0	14.4
2416.75	Lev	-49	1	15.4
2416.8	Lev	-50	0	14.4
2416.85	Lev	-50.5	-0.5	13.9
2416.9	Lev	-49.5	0.5	14.9
2416.95	Lev	-48.5	1.5	15.9
2417	Lev	-49.5	0.5	14.9
2417.05	Lev	-48.5	1.5	15.9
2417.1	Lev	-49.5	0.5	14.9
2417.15	Lev	-49	1	15.4
2417.2	Lev	-49.5	0.5	14.9
2417.25	Lev	-48.5	1.5	15.9
2417.3	Lev	-48.5	1.5	15.9
2417.35	Lev	-48.5	1.5	15.9
2417.4	Lev	-48	2	16.4
2417.45	Lev	-47.5	2.5	16.9
2417.5	Lev	-48	2	16.4
2417.55	Lev	-48	2	16.4
2417.6	Lev	-47	3	17.4
2417.65	Lev	-47.5	2.5	16.9
2417.7	Lev	-47.5	2.5	16.9
2417.75	Lev	-47	3	17.4
2417.8	Lev	-47	3	17.4
2417.85	Lev	-48	2	16.4
2417.9	Lev	-47.5	2.5	16.9
2417.95	Lev	-48.5	1.5	15.9
2418	Lev	-47.5	2.5	16.9
2418.05	Lev	-48	2	16.4
2418.1	Lev	-48.5	1.5	15.9
2418.15	Lev	-48.5	1.5	15.9
2418.2	Lev	-48.5	1.5	15.9
2418.25	Lev	-48.5	1.5	15.9
2418.3	Lev	-48	2	16.4
2418.35	Lev	-48	2	16.4
2418.4	Lev	-47.5	2.5	16.9
2418.45	Lev	-47	3	17.4
2418.5	Lev	-47	3	17.4
2418.55	Lev	-46.5	3.5	17.9

2418.6	Lev	-46.5	3.5	17.9
2418.65	Lev	-46.5	3.5	17.9
2418.7	Lev	-46	4	18.4
2418.75	Lev	-47	3	17.4
2418.8	Lev	-47.5	2.5	16.9
2418.85	Lev	-47.5	2.5	16.9
2418.9	Lev	-47.5	2.5	16.9
2418.95	Lev	-47.5	2.5	16.9
2419	Lev	-47.5	2.5	16.9
2419.05	Lev	-47.5	2.5	16.9
2419.1	Lev	-47.5	2.5	16.9
2419.15	Lev	-47	3	17.4
2419.2	Lev	-47	3	17.4
2419.25	Lev	-47	3	17.4
2419.3	Lev	-46.5	3.5	17.9
2419.35	Lev	-46.5	3.5	17.9
2419.4	Lev	-46.5	3.5	17.9
2419.45	Lev	-46	4	18.4
2419.5	Lev	-47	3	17.4
2419.55	Lev	-46	4	18.4
2419.6	Lev	-46	4	18.4
2419.65	Lev	-46	4	18.4
2419.7	Lev	-46.5	3.5	17.9
2419.75	Lev	-46.5	3.5	17.9
2419.8	Lev	-46.5	3.5	17.9
2419.85	Lev	-46.5	3.5	17.9
2419.9	Lev	-46	4	18.4
2419.95	Lev	-46	4	18.4
2420	Lev	-46	4	18.4
2420.05	Lev	-45.5	4.5	18.9
2420.1	Lev	-45.5	4.5	18.9
2420.15	Lev	-45.5	4.5	18.9
2420.2	Lev	-45.5	4.5	18.9
2420.25	Lev	-45.5	4.5	18.9
2420.3	Lev	-46	4	18.4
2420.35	Lev	-45.5	4.5	18.9
2420.4	Lev	-46	4	18.4
2420.45	Lev	-46	4	18.4
2420.5	Lev	-46	4	18.4

8.02 Channel Mid : 2437 MHz

Transmitter : 2437 MHz Signal Level -50dBm

Frequency (MHz)	Jamming Level where PER<8%	Jamming to Signal Margin	Processing Gain
2428.5 Lev	-44	6	20.4
2428.55 Lev	-44	6	20.4
2428.6 Lev	-44	6	20.4
2428.65 Lev	-44.5	5.5	19.9
2428.7 Lev	-44.5	5.5	19.9
2428.75 Lev	-45	5	19.4
2428.8 Lev	-45.5	4.5	18.9
2428.85 Lev	-45	5	19.4
2428.9 Lev	-45	5	19.4
2428.95 Lev	-45	5	19.4
2429 Lev	-45	5	19.4
2429.05 Lev	-44.5	5.5	19.9
2429.1 Lev	-44.5	5.5	19.9
2429.15 Lev	-44.5	5.5	19.9
2429.2 Lev	-44.5	5.5	19.9
2429.25 Lev	-44.5	5.5	19.9
2429.3 Lev	-45	5	19.4
2429.35 Lev	-45	5	19.4
2429.4 Lev	-45	5	19.4
2429.45 Lev	-45.5	4.5	18.9
2429.5 Lev	-46	4	18.4
2429.55 Lev	-46	4	18.4
2429.6 Lev	-46	4	18.4
2429.65 Lev	-46.5	3.5	17.9
2429.7 Lev	-46	4	18.4

2429.75	Lev	-46	4	18.4
2429.8	Lev	-46	4	18.4
2429.85	Lev	-46	4	18.4
2429.9	Lev	-46	4	18.4
2429.95	Lev	-45.5	4.5	18.9
2430	Lev	-45	5	19.4
2430.05	Lev	-45.5	4.5	18.9
2430.1	Lev	-45	5	19.4
2430.15	Lev	-46	4	18.4
2430.2	Lev	-45.5	4.5	18.9
2430.25	Lev	-46	4	18.4
2430.3	Lev	-45.5	4.5	18.9
2430.35	Lev	-46.5	3.5	17.9
2430.4	Lev	-46.5	3.5	17.9
2430.45	Lev	-47	3	17.4
2430.5	Lev	-47	3	17.4
2430.55	Lev	-46.5	3.5	17.9
2430.6	Lev	-47	3	17.4
2430.65	Lev	-47	3	17.4
2430.7	Lev	-46.5	3.5	17.9
2430.75	Lev	-46.5	3.5	17.9
2430.8	Lev	-47.5	2.5	16.9
2430.85	Lev	-47	3	17.4
2430.9	Lev	-46.5	3.5	17.9
2430.95	Lev	-47	3	17.4
2431	Lev	-47	3	17.4
2431.05	Lev	-46.5	3.5	17.9
2431.1	Lev	-46	4	18.4
2431.15	Lev	-46.5	3.5	17.9
2431.2	Lev	-47	3	17.4
2431.25	Lev	-47.5	2.5	16.9
2431.3	Lev	-45.5	4.5	18.9
2431.35	Lev	-45.5	4.5	18.9
2431.4	Lev	-46.5	3.5	17.9
2431.45	Lev	-46	4	18.4
2431.5	Lev	-45.5	4.5	18.9
2431.55	Lev	-45.5	4.5	18.9
2431.6	Lev	-45.5	4.5	18.9
2431.65	Lev	-47	3	17.4

2431.7	Lev	-47.5	2.5	16.9
2431.75	Lev	-48	2	16.4
2431.8	Lev	-48	2	16.4
2431.85	Lev	-48	2	16.4
2431.9	Lev	-48	2	16.4
2431.95	Lev	-49	1	15.4
2432	Lev	-49	1	15.4
2432.05	Lev	-50	0	14.4
2432.1	Lev	-49	1	15.4
2432.15	Lev	-48.5	1.5	15.9
2432.2	Lev	-48	2	16.4
2432.25	Lev	-48.5	1.5	15.9
2432.3	Lev	-47.5	2.5	16.9
2432.35	Lev	-47.5	2.5	16.9
2432.4	Lev	-47	3	17.4
2432.45	Lev	-47	3	17.4
2432.5	Lev	-48	2	16.4
2432.55	Lev	-49	1	15.4
2432.6	Lev	-48.5	1.5	15.9
2432.65	Lev	-49	1	15.4
2432.7	Lev	-49.5	0.5	14.9
2432.75	Lev	-50	0	14.4
2432.8	Lev	-50.5	-0.5	13.9
2432.85	Lev	-50	0	14.4
2432.9	Lev	-49.5	0.5	14.9
2432.95	Lev	-50	0	14.4
2433	Lev	-50	0	14.4
2433.05	Lev	-50	0	14.4
2433.1	Lev	-49.5	0.5	14.9
2433.15	Lev	-49.5	0.5	14.9
2433.2	Lev	-49.5	0.5	14.9
2433.25	Lev	-50	0	14.4
2433.3	Lev	-48.5	1.5	15.9
2433.35	Lev	-48.5	1.5	15.9
2433.4	Lev	-48.5	1.5	15.9
2433.45	Lev	-48	2	16.4
2433.5	Lev	-49	1	15.4
2433.55	Lev	-49.5	0.5	14.9
2433.6	Lev	-49.5	0.5	14.9

2433.65	Lev	-50	0	14.4
2433.7	Lev	-50	0	14.4
2433.75	Lev	-49.5	0.5	14.9
2433.8	Lev	-50	0	14.4
2433.85	Lev	-50	0	14.4
2433.9	Lev	-49	1	15.4
2433.95	Lev	-50.5	-0.5	13.9
2434	Lev	-50	0	14.4
2434.05	Lev	-50	0	14.4
2434.1	Lev	-50	0	14.4
2434.15	Lev	-50	0	14.4
2434.2	Lev	-51	-1	13.4
2434.25	Lev	-50.5	-0.5	13.9
2434.3	Lev	-51	-1	13.4
2434.35	Lev	-51	-1	13.4
2434.4	Lev	-51	-1	13.4
2434.45	Lev	-50.5	-0.5	13.9
2434.5	Lev	-51	-1	13.4
2434.55	Lev	-50	0	14.4
2434.6	Lev	-51.5	-1.5	12.9
2434.65	Lev	-50	0	14.4
2434.7	Lev	-50	0	14.4
2434.75	Lev	-51	-1	13.4
2434.8	Lev	-48.5	1.5	15.9
2434.85	Lev	-50	0	14.4
2434.9	Lev	-49.5	0.5	14.9
2434.95	Lev	-51	-1	13.4
2435	Lev	-50	0	14.4
2435.05	Lev	-50	0	14.4
2435.1	Lev	-49	1	15.4
2435.15	Lev	-50	0	14.4
2435.2	Lev	-50	0	14.4
2435.25	Lev	-51.5	-1.5	12.9
2435.3	Lev	-51	-1	13.4
2435.35	Lev	-50.5	-0.5	13.9
2435.4	Lev	-50	0	14.4
2435.45	Lev	-50.5	-0.5	13.9
2435.5	Lev	-50	0	14.4
2435.55	Lev	-50.5	-0.5	13.9

2435.6	Lev	-50	0	14.4
2435.65	Lev	-51	-1	13.4
2435.7	Lev	-50	0	14.4
2435.75	Lev	-50	0	14.4
2435.8	Lev	-51	-1	13.4
2435.85	Lev	-51	-1	13.4
2435.9	Lev	-50.5	-0.5	13.9
2435.95	Lev	-50	0	14.4
2436	Lev	-50	0	14.4
2436.05	Lev	-50	0	14.4
2436.1	Lev	-50	0	14.4
2436.15	Lev	-50	0	14.4
2436.2	Lev	-50	0	14.4
2436.25	Lev	-50.5	-0.5	13.9
2436.3	Lev	-50.5	-0.5	13.9
2436.35	Lev	-50.5	-0.5	13.9
2436.4	Lev	-50	0	14.4
2436.45	Lev	-50.5	-0.5	13.9
2436.5	Lev	-50.5	-0.5	13.9
2436.55	Lev	-50.5	-0.5	13.9
2436.6	Lev	-51	-1	13.4
2436.65	Lev	-50.5	-0.5	13.9
2436.7	Lev	-51.5	-1.5	12.9
2436.75	Lev	-51.5	-1.5	12.9
2436.8	Lev	-51	-1	13.4
2436.85	Lev	-51	-1	13.4
2436.9	Lev	-50	0	14.4
2436.95	Lev	-49.5	0.5	14.9
2437	Lev	-49.5	0.5	14.9
2437.05	Lev	-49.5	0.5	14.9
2437.1	Lev	-49.5	0.5	14.9
2437.15	Lev	-50	0	14.4
2437.2	Lev	-50.5	-0.5	13.9
2437.25	Lev	-50	0	14.4
2437.3	Lev	-50	0	14.4
2437.35	Lev	-51	-1	13.4
2437.4	Lev	-51	-1	13.4
2437.45	Lev	-51.5	-1.5	12.9
2437.5	Lev	-51.5	-1.5	12.9

2437.55	Lev	-51.5	-1.5	12.9
2437.6	Lev	-51.5	-1.5	12.9
2437.65	Lev	-51	-1	13.4
2437.7	Lev	-50	0	14.4
2437.75	Lev	-50	0	14.4
2437.8	Lev	-49.5	0.5	14.9
2437.85	Lev	-49	1	15.4
2437.9	Lev	-50	0	14.4
2437.95	Lev	-49	1	15.4
2438	Lev	-50.5	-0.5	13.9
2438.05	Lev	-50	0	14.4
2438.1	Lev	-50	0	14.4
2438.15	Lev	-50.5	-0.5	13.9
2438.2	Lev	-49.5	0.5	14.9
2438.25	Lev	-50.5	-0.5	13.9
2438.3	Lev	-51	-1	13.4
2438.35	Lev	-51	-1	13.4
2438.4	Lev	-51	-1	13.4
2438.45	Lev	-51	-1	13.4
2438.5	Lev	-51.5	-1.5	12.9
2438.55	Lev	-50	0	14.4
2438.6	Lev	-49.5	0.5	14.9
2438.65	Lev	-49.5	0.5	14.9
2438.7	Lev	-50.5	-0.5	13.9
2438.75	Lev	-49	1	15.4
2438.8	Lev	-49.5	0.5	14.9
2438.85	Lev	-50	0	14.4
2438.9	Lev	-49	1	15.4
2438.95	Lev	-49.5	0.5	14.9
2439	Lev	-50	0	14.4
2439.05	Lev	-50	0	14.4
2439.1	Lev	-50	0	14.4
2439.15	Lev	-50.5	-0.5	13.9
2439.2	Lev	-50.5	-0.5	13.9
2439.25	Lev	-50.5	-0.5	13.9
2439.3	Lev	-50	0	14.4
2439.35	Lev	-50	0	14.4
2439.4	Lev	-49.5	0.5	14.9
2439.45	Lev	-50	0	14.4

2439.5	Lev	-50	0	14.4
2439.55	Lev	-50.5	-0.5	13.9
2439.6	Lev	-50	0	14.4
2439.65	Lev	-51	-1	13.4
2439.7	Lev	-50.5	-0.5	13.9
2439.75	Lev	-50.5	-0.5	13.9
2439.8	Lev	-51	-1	13.4
2439.85	Lev	-51.5	-1.5	12.9
2439.9	Lev	-50.5	-0.5	13.9
2439.95	Lev	-52	-2	12.4
2440	Lev	-50.5	-0.5	13.9
2440.05	Lev	-50	0	14.4
2440.1	Lev	-50	0	14.4
2440.15	Lev	-50	0	14.4
2440.2	Lev	-50.5	-0.5	13.9
2440.25	Lev	-48.5	1.5	15.9
2440.3	Lev	-48.5	1.5	15.9
2440.35	Lev	-48	2	16.4
2440.4	Lev	-48.5	1.5	15.9
2440.45	Lev	-47.5	2.5	16.9
2440.5	Lev	-48.5	1.5	15.9
2440.55	Lev	-48.5	1.5	15.9
2440.6	Lev	-50	0	14.4
2440.65	Lev	-48.5	1.5	15.9
2440.7	Lev	-51	-1	13.4
2440.75	Lev	-50	0	14.4
2440.8	Lev	-50	0	14.4
2440.85	Lev	-49	1	15.4
2440.9	Lev	-49	1	15.4
2440.95	Lev	-49	1	15.4
2441	Lev	-48	2	16.4
2441.05	Lev	-48.5	1.5	15.9
2441.1	Lev	-48.5	1.5	15.9
2441.15	Lev	-49.5	0.5	14.9
2441.2	Lev	-50	0	14.4
2441.25	Lev	-49.5	0.5	14.9
2441.3	Lev	-48.5	1.5	15.9
2441.35	Lev	-48	2	16.4
2441.4	Lev	-48	2	16.4

2441.45	Lev	-47.5	2.5	16.9
2441.5	Lev	-48	2	16.4
2441.55	Lev	-47.5	2.5	16.9
2441.6	Lev	-48	2	16.4
2441.65	Lev	-48	2	16.4
2441.7	Lev	-48	2	16.4
2441.75	Lev	-47.5	2.5	16.9
2441.8	Lev	-47	3	17.4
2441.85	Lev	-48	2	16.4
2441.9	Lev	-48	2	16.4
2441.95	Lev	-47	3	17.4
2442	Lev	-47.5	2.5	16.9
2442.05	Lev	-48	2	16.4
2442.1	Lev	-48	2	16.4
2442.15	Lev	-48	2	16.4
2442.2	Lev	-48	2	16.4
2442.25	Lev	-47.5	2.5	16.9
2442.3	Lev	-46.5	3.5	17.9
2442.35	Lev	-46.5	3.5	17.9
2442.4	Lev	-45.5	4.5	18.9
2442.45	Lev	-45	5	19.4
2442.5	Lev	-45.5	4.5	18.9
2442.55	Lev	-45	5	19.4
2442.6	Lev	-44	6	20.4
2442.65	Lev	-45	5	19.4
2442.7	Lev	-45.5	4.5	18.9
2442.75	Lev	-45.5	4.5	18.9
2442.8	Lev	-45	5	19.4
2442.85	Lev	-46	4	18.4
2442.9	Lev	-46	4	18.4
2442.95	Lev	-46	4	18.4
2443	Lev	-46	4	18.4
2443.05	Lev	-47.5	2.5	16.9
2443.1	Lev	-46.5	3.5	17.9
2443.15	Lev	-46.5	3.5	17.9
2443.2	Lev	-46.5	3.5	17.9
2443.25	Lev	-46	4	18.4
2443.3	Lev	-46	4	18.4
2443.35	Lev	-45.5	4.5	18.9

2443.4	Lev	-45	5	19.4
2443.45	Lev	-45	5	19.4
2443.5	Lev	-45	5	19.4
2443.55	Lev	-44.5	5.5	19.9
2443.6	Lev	-44.5	5.5	19.9
2443.65	Lev	-44.5	5.5	19.9
2443.7	Lev	-46.5	3.5	17.9
2443.75	Lev	-45	5	19.4
2443.8	Lev	-45	5	19.4
2443.85	Lev	-45.5	4.5	18.9
2443.9	Lev	-45.5	4.5	18.9
2443.95	Lev	-46	4	18.4
2444	Lev	-45.5	4.5	18.9
2444.05	Lev	-45	5	19.4
2444.1	Lev	-45	5	19.4
2444.15	Lev	-44.5	5.5	19.9
2444.2	Lev	-44.5	5.5	19.9
2444.25	Lev	-44.5	5.5	19.9
2444.3	Lev	-44.5	5.5	19.9
2444.35	Lev	-44.5	5.5	19.9
2444.4	Lev	-44.5	5.5	19.9
2444.45	Lev	-44.5	5.5	19.9
2444.5	Lev	-44.5	5.5	19.9
2444.55	Lev	-44.5	5.5	19.9
2444.6	Lev	-44.5	5.5	19.9
2444.65	Lev	-44.5	5.5	19.9
2444.7	Lev	-45	5	19.4
2444.75	Lev	-44	6	20.4
2444.8	Lev	-44	6	20.4
2444.85	Lev	-44	6	20.4
2444.9	Lev	-43.5	6.5	20.9
2444.95	Lev	-43.5	6.5	20.9
2445	Lev	-43.5	6.5	20.9
2445.05	Lev	-43.5	6.5	20.9
2445.1	Lev	-43.5	6.5	20.9
2445.15	Lev	-43.5	6.5	20.9
2445.2	Lev	-43.5	6.5	20.9
2445.25	Lev	-44	6	20.4
2445.3	Lev	-44	6	20.4

2445.35	Lev	-44	6	20.4
2445.4	Lev	-44	6	20.4
2445.45	Lev	-44	6	20.4
2445.5	Lev	-44	6	20.4

8.03 Channel High : 2462 MHz

Transmitter : 2462 MHz Signal Level -50dBm

Frequency (MHz)	Jamming Level where PER<8%	Jamming to Signal Margin	Processing Gain
2453.5 Lev	-44.5	5.5	19.9
2453.55 Lev	-44.5	5.5	19.9
2453.6 Lev	-44.5	5.5	19.9
2453.65 Lev	-44.5	5.5	19.9
2453.7 Lev	-44.5	5.5	19.9
2453.75 Lev	-44.5	5.5	19.9
2453.8 Lev	-45	5	19.4
2453.85 Lev	-45	5	19.4
2453.9 Lev	-45.5	4.5	18.9
2453.95 Lev	-45.5	4.5	18.9
2454 Lev	-45	5	19.4
2454.05 Lev	-45.5	4.5	18.9
2454.1 Lev	-45	5	19.4
2454.15 Lev	-45	5	19.4
2454.2 Lev	-45	5	19.4
2454.25 Lev	-45	5	19.4
2454.3 Lev	-44.5	5.5	19.9
2454.35 Lev	-44.5	5.5	19.9
2454.4 Lev	-45	5	19.4
2454.45 Lev	-45	5	19.4
2454.5 Lev	-46	4	18.4
2454.55 Lev	-45.5	4.5	18.9
2454.6 Lev	-46	4	18.4
2454.65 Lev	-46	4	18.4
2454.7 Lev	-46	4	18.4
2454.75 Lev	-46.5	3.5	17.9
2454.8 Lev	-46.5	3.5	17.9
2454.85 Lev	-46.5	3.5	17.9
2454.9 Lev	-46.5	3.5	17.9
2454.95 Lev	-46.5	3.5	17.9
2455 Lev	-46	4	18.4

2455.05	Lev	-46	4	18.4
2455.1	Lev	-45.5	4.5	18.9
2455.15	Lev	-45.5	4.5	18.9
2455.2	Lev	-46	4	18.4
2455.25	Lev	-45.5	4.5	18.9
2455.3	Lev	-46	4	18.4
2455.35	Lev	-45.5	4.5	18.9
2455.4	Lev	-46	4	18.4
2455.45	Lev	-46.5	3.5	17.9
2455.5	Lev	-46.5	3.5	17.9
2455.55	Lev	-47.5	2.5	16.9
2455.6	Lev	-47.5	2.5	16.9
2455.65	Lev	-47.5	2.5	16.9
2455.7	Lev	-47.5	2.5	16.9
2455.75	Lev	-48	2	16.4
2455.8	Lev	-47.5	2.5	16.9
2455.85	Lev	-47.5	2.5	16.9
2455.9	Lev	-47.5	2.5	16.9
2455.95	Lev	-47.5	2.5	16.9
2456	Lev	-47	3	17.4
2456.05	Lev	-47	3	17.4
2456.1	Lev	-45.5	4.5	18.9
2456.15	Lev	-47.5	2.5	16.9
2456.2	Lev	-47	3	17.4
2456.25	Lev	-48	2	16.4
2456.3	Lev	-47	3	17.4
2456.35	Lev	-46	4	18.4
2456.4	Lev	-46	4	18.4
2456.45	Lev	-46.5	3.5	17.9
2456.5	Lev	-46	4	18.4
2456.55	Lev	-45.5	4.5	18.9
2456.6	Lev	-46.5	3.5	17.9
2456.65	Lev	-47	3	17.4
2456.7	Lev	-47.5	2.5	16.9
2456.75	Lev	-48	2	16.4
2456.8	Lev	-47.5	2.5	16.9
2456.85	Lev	-48	2	16.4
2456.9	Lev	-47.5	2.5	16.9
2456.95	Lev	-49.5	0.5	14.9

2457	Lev	-48.5	1.5	15.9
2457.05	Lev	-49	1	15.4
2457.1	Lev	-49	1	15.4
2457.15	Lev	-48.5	1.5	15.9
2457.2	Lev	-49.5	0.5	14.9
2457.25	Lev	-49	1	15.4
2457.3	Lev	-48.5	1.5	15.9
2457.35	Lev	-48	2	16.4
2457.4	Lev	-48	2	16.4
2457.45	Lev	-48.5	1.5	15.9
2457.5	Lev	-47.5	2.5	16.9
2457.55	Lev	-49	1	15.4
2457.6	Lev	-49	1	15.4
2457.65	Lev	-49.5	0.5	14.9
2457.7	Lev	-50.5	-0.5	13.9
2457.75	Lev	-49.5	0.5	14.9
2457.8	Lev	-51	-1	13.4
2457.85	Lev	-50	0	14.4
2457.9	Lev	-50	0	14.4
2457.95	Lev	-50	0	14.4
2458	Lev	-50.5	-0.5	13.9
2458.05	Lev	-51	-1	13.4
2458.1	Lev	-50	0	14.4
2458.15	Lev	-49.5	0.5	14.9
2458.2	Lev	-51.5	-1.5	12.9
2458.25	Lev	-49.5	0.5	14.9
2458.3	Lev	-50.5	-0.5	13.9
2458.35	Lev	-48.5	1.5	15.9
2458.4	Lev	-48.5	1.5	15.9
2458.45	Lev	-49	1	15.4
2458.5	Lev	-49	1	15.4
2458.55	Lev	-48.5	1.5	15.9
2458.6	Lev	-49	1	15.4
2458.65	Lev	-50	0	14.4
2458.7	Lev	-51	-1	13.4
2458.75	Lev	-50.5	-0.5	13.9
2458.8	Lev	-50	0	14.4
2458.85	Lev	-51	-1	13.4
2458.9	Lev	-50.5	-0.5	13.9

2458.95	Lev	-51	-1	13.4
2459	Lev	-50.5	-0.5	13.9
2459.05	Lev	-50	0	14.4
2459.1	Lev	-50.5	-0.5	13.9
2459.15	Lev	-50.5	-0.5	13.9
2459.2	Lev	-51.5	-1.5	12.9
2459.25	Lev	-51	-1	13.4
2459.3	Lev	-51	-1	13.4
2459.35	Lev	-50.5	-0.5	13.9
2459.4	Lev	-51.5	-1.5	12.9
2459.45	Lev	-51	-1	13.4
2459.5	Lev	-51	-1	13.4
2459.55	Lev	-51	-1	13.4
2459.6	Lev	-51.5	-1.5	12.9
2459.65	Lev	-51	-1	13.4
2459.7	Lev	-51	-1	13.4
2459.75	Lev	-51.5	-1.5	12.9
2459.8	Lev	-50.5	-0.5	13.9
2459.85	Lev	-50.5	-0.5	13.9
2459.9	Lev	-49.5	0.5	14.9
2459.95	Lev	-50.5	-0.5	13.9
2460	Lev	-49.5	0.5	14.9
2460.05	Lev	-49	1	15.4
2460.1	Lev	-49.5	0.5	14.9
2460.15	Lev	-50.5	-0.5	13.9
2460.2	Lev	-50.5	-0.5	13.9
2460.25	Lev	-51.5	-1.5	12.9
2460.3	Lev	-50.5	-0.5	13.9
2460.35	Lev	-50.5	-0.5	13.9
2460.4	Lev	-51	-1	13.4
2460.45	Lev	-51.5	-1.5	12.9
2460.5	Lev	-51	-1	13.4
2460.55	Lev	-52	-2	12.4
2460.6	Lev	-50.5	-0.5	13.9
2460.65	Lev	-51	-1	13.4
2460.7	Lev	-49.5	0.5	14.9
2460.75	Lev	-50	0	14.4
2460.8	Lev	-51	-1	13.4
2460.85	Lev	-50	0	14.4

2460.9	Lev	-51	-1	13.4
2460.95	Lev	-50.5	-0.5	13.9
2461	Lev	-50.5	-0.5	13.9
2461.05	Lev	-50.5	-0.5	13.9
2461.1	Lev	-51	-1	13.4
2461.15	Lev	-50.5	-0.5	13.9
2461.2	Lev	-51	-1	13.4
2461.25	Lev	-51.5	-1.5	12.9
2461.3	Lev	-52	-2	12.4
2461.35	Lev	-51	-1	13.4
2461.4	Lev	-52	-2	12.4
2461.45	Lev	-52	-2	12.4
2461.5	Lev	-51.5	-1.5	12.9
2461.55	Lev	-51	-1	13.4
2461.6	Lev	-50.5	-0.5	13.9
2461.65	Lev	-50.5	-0.5	13.9
2461.7	Lev	-51	-1	13.4
2461.75	Lev	-51.5	-1.5	12.9
2461.8	Lev	-51	-1	13.4
2461.85	Lev	-51	-1	13.4
2461.9	Lev	-51.5	-1.5	12.9
2461.95	Lev	-50.5	-0.5	13.9
2462	Lev	-52	-2	12.4
2462.05	Lev	-50	0	14.4
2462.1	Lev	-50.5	-0.5	13.9
2462.15	Lev	-51	-1	13.4
2462.2	Lev	-50.5	-0.5	13.9
2462.25	Lev	-51	-1	13.4
2462.3	Lev	-51	-1	13.4
2462.35	Lev	-51	-1	13.4
2462.4	Lev	-51	-1	13.4
2462.45	Lev	-51	-1	13.4
2462.5	Lev	-51	-1	13.4
2462.55	Lev	-51.5	-1.5	12.9
2462.6	Lev	-51.5	-1.5	12.9
2462.65	Lev	-51.5	-1.5	12.9
2462.7	Lev	-51.5	-1.5	12.9
2462.75	Lev	-51	-1	13.4
2462.8	Lev	-51.5	-1.5	12.9

2462.85	Lev	-50.5	-0.5	13.9
2462.9	Lev	-50.5	-0.5	13.9
2462.95	Lev	-49.5	0.5	14.9
2463	Lev	-50	0	14.4
2463.05	Lev	-50	0	14.4
2463.1	Lev	-50	0	14.4
2463.15	Lev	-50.5	-0.5	13.9
2463.2	Lev	-51.5	-1.5	12.9
2463.25	Lev	-51	-1	13.4
2463.3	Lev	-51.5	-1.5	12.9
2463.35	Lev	-50.5	-0.5	13.9
2463.4	Lev	-52	-2	12.4
2463.45	Lev	-52.5	-2.5	11.9
2463.5	Lev	-51.5	-1.5	12.9
2463.55	Lev	-51.5	-1.5	12.9
2463.6	Lev	-51	-1	13.4
2463.65	Lev	-51.5	-1.5	12.9
2463.7	Lev	-51	-1	13.4
2463.75	Lev	-50	0	14.4
2463.8	Lev	-49.5	0.5	14.9
2463.85	Lev	-49.5	0.5	14.9
2463.9	Lev	-50.5	-0.5	13.9
2463.95	Lev	-49	1	15.4
2464	Lev	-50.5	-0.5	13.9
2464.05	Lev	-50	0	14.4
2464.1	Lev	-50	0	14.4
2464.15	Lev	-50.5	-0.5	13.9
2464.2	Lev	-51.5	-1.5	12.9
2464.25	Lev	-51	-1	13.4
2464.3	Lev	-51	-1	13.4
2464.35	Lev	-51.5	-1.5	12.9
2464.4	Lev	-51	-1	13.4
2464.45	Lev	-51	-1	13.4
2464.5	Lev	-51	-1	13.4
2464.55	Lev	-51	-1	13.4
2464.6	Lev	-51	-1	13.4
2464.65	Lev	-51.5	-1.5	12.9
2464.7	Lev	-51	-1	13.4
2464.75	Lev	-50.5	-0.5	13.9

2464.8	Lev	-50.5	-0.5	13.9
2464.85	Lev	-50.5	-0.5	13.9
2464.9	Lev	-50.5	-0.5	13.9
2464.95	Lev	-51	-1	13.4
2465	Lev	-51	-1	13.4
2465.05	Lev	-51	-1	13.4
2465.1	Lev	-50.5	-0.5	13.9
2465.15	Lev	-51.5	-1.5	12.9
2465.2	Lev	-51	-1	13.4
2465.25	Lev	-50.5	-0.5	13.9
2465.3	Lev	-50	0	14.4
2465.35	Lev	-49	1	15.4
2465.4	Lev	-50	0	14.4
2465.45	Lev	-48	2	16.4
2465.5	Lev	-49	1	15.4
2465.55	Lev	-49	1	15.4
2465.6	Lev	-49	1	15.4
2465.65	Lev	-50.5	-0.5	13.9
2465.7	Lev	-50.5	-0.5	13.9
2465.75	Lev	-50.5	-0.5	13.9
2465.8	Lev	-50.5	-0.5	13.9
2465.85	Lev	-51.5	-1.5	12.9
2465.9	Lev	-50.5	-0.5	13.9
2465.95	Lev	-50.5	-0.5	13.9
2466	Lev	-51.5	-1.5	12.9
2466.05	Lev	-49.5	0.5	14.9
2466.1	Lev	-50	0	14.4
2466.15	Lev	-50.5	-0.5	13.9
2466.2	Lev	-50	0	14.4
2466.25	Lev	-49.5	0.5	14.9
2466.3	Lev	-49	1	15.4
2466.35	Lev	-48	2	16.4
2466.4	Lev	-48.5	1.5	15.9
2466.45	Lev	-47.5	2.5	16.9
2466.5	Lev	-48	2	16.4
2466.55	Lev	-48	2	16.4
2466.6	Lev	-48.5	1.5	15.9
2466.65	Lev	-49	1	15.4
2466.7	Lev	-49.5	0.5	14.9

2466.75	Lev	-49	1	15.4
2466.8	Lev	-49	1	15.4
2466.85	Lev	-48.5	1.5	15.9
2466.9	Lev	-48.5	1.5	15.9
2466.95	Lev	-47.5	2.5	16.9
2467	Lev	-47.5	2.5	16.9
2467.05	Lev	-47.5	2.5	16.9
2467.1	Lev	-48	2	16.4
2467.15	Lev	-48	2	16.4
2467.2	Lev	-48	2	16.4
2467.25	Lev	-47	3	17.4
2467.3	Lev	-47	3	17.4
2467.35	Lev	-47	3	17.4
2467.4	Lev	-46.5	3.5	17.9
2467.45	Lev	-47	3	17.4
2467.5	Lev	-46	4	18.4
2467.55	Lev	-47	3	17.4
2467.6	Lev	-46.5	3.5	17.9
2467.65	Lev	-46	4	18.4
2467.7	Lev	-45.5	4.5	18.9
2467.75	Lev	-46.5	3.5	17.9
2467.8	Lev	-48	2	16.4
2467.85	Lev	-46.5	3.5	17.9
2467.9	Lev	-46	4	18.4
2467.95	Lev	-46	4	18.4
2468	Lev	-47	3	17.4
2468.05	Lev	-47	3	17.4
2468.1	Lev	-47.5	2.5	16.9
2468.15	Lev	-47.5	2.5	16.9
2468.2	Lev	-48	2	16.4
2468.25	Lev	-48	2	16.4
2468.3	Lev	-47	3	17.4
2468.35	Lev	-47	3	17.4
2468.4	Lev	-47	3	17.4
2468.45	Lev	-46.5	3.5	17.9
2468.5	Lev	-46	4	18.4
2468.55	Lev	-45.5	4.5	18.9
2468.6	Lev	-45.5	4.5	18.9
2468.65	Lev	-45.5	4.5	18.9

2468.7	Lev	-45	5	19.4
2468.75	Lev	-45.5	4.5	18.9
2468.8	Lev	-45.5	4.5	18.9
2468.85	Lev	-46	4	18.4
2468.9	Lev	-46.5	3.5	17.9
2468.95	Lev	-46.5	3.5	17.9
2469	Lev	-46.5	3.5	17.9
2469.05	Lev	-47	3	17.4
2469.1	Lev	-46.5	3.5	17.9
2469.15	Lev	-46	4	18.4
2469.2	Lev	-46.5	3.5	17.9
2469.25	Lev	-46	4	18.4
2469.3	Lev	-46	4	18.4
2469.35	Lev	-45.5	4.5	18.9
2469.4	Lev	-45.5	4.5	18.9
2469.45	Lev	-45	5	19.4
2469.5	Lev	-45	5	19.4
2469.55	Lev	-45	5	19.4
2469.6	Lev	-45	5	19.4
2469.65	Lev	-45	5	19.4
2469.7	Lev	-45	5	19.4
2469.75	Lev	-46	4	18.4
2469.8	Lev	-45.5	4.5	18.9
2469.85	Lev	-45.5	4.5	18.9
2469.9	Lev	-45.5	4.5	18.9
2469.95	Lev	-45.5	4.5	18.9
2470	Lev	-45	5	19.4
2470.05	Lev	-45	5	19.4
2470.1	Lev	-45	5	19.4
2470.15	Lev	-44.5	5.5	19.9
2470.2	Lev	-44.5	5.5	19.9
2470.25	Lev	-44.5	5.5	19.9
2470.3	Lev	-44.5	5.5	19.9
2470.35	Lev	-44.5	5.5	19.9
2470.4	Lev	-45	5	19.4
2470.45	Lev	-44.5	5.5	19.9
2470.5	Lev	-44.5	5.5	19.9