

**TEST REPORT:**

**TTI Wireless  
( WaveRider Communications, Inc. )**

**FCC 15.247(e) Jamming Margin Test**

*prepared for*

**Dragan Zivkovic**

May 13, 1998

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## PROJECT INFORMATION

PROJECT: TTI Wireless Jamming Margin Test

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***Technical Approval By:*** \_\_\_\_\_

## 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.

## 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] “The Treatment of Uncertainty in EMC Measurements” **NAMAS, NIS 81 Edition 1, May 1994. NAMAS Executive, National Physical Laboratory, Teddington Middlesex, TW11 0LW, England.**

[4] “ HFA3860 Direct Sequence Spread Spectrum Baseband Processor” **Harris Corporation Semiconductor Sector Preliminary Data Sheet**, Melbourne FL, June 1997.

[5] “ M-ary Orthogonal Keying BER Curve”, **Communication from Harris Corporation to L.S. Research, Inc.**

## 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-ratio (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].

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.

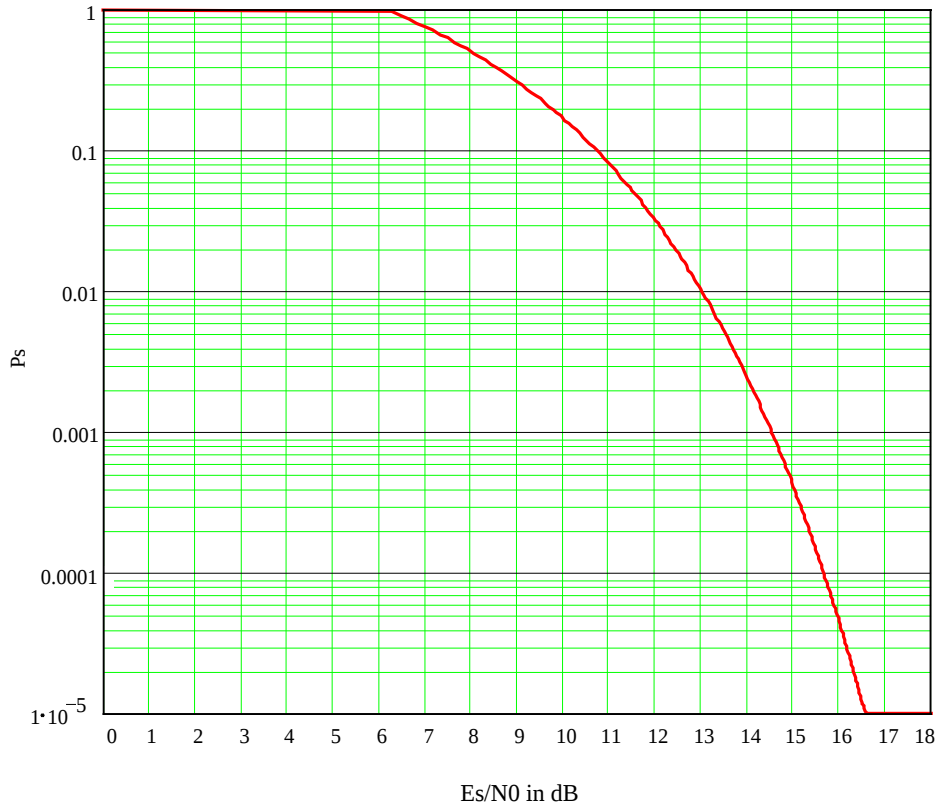
The maximum allowable system implementation loss is 2 dB.

The HFA3860 direct sequence spread spectrum baseband processor uses M-ary Bi-Orthogonal Keying. The BER performance curve is given by [5]:

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

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

This integral cannot be solved in closed form, and numerical integration must be used. This is done in a MATHCAD environment and is displayed in graphical format for M=2, 4, 8, and 16.” (Shown on next page for M=16).



M=16 QMBOK Es/No

The reference BER is specified as  $1 \cdot 10^{-5}$ . The corresponding Es/No (signal to noise ratio per symbol) is 16.6 dB. The Es/No required to achieve the desired BER with maximum system implementation losses is 18.6 dB. The minimum processing gain is again, 10 dB, therefore:

$$G_p = \left| \frac{E_s}{N_o} \right|_{\text{output}} + \left( \frac{J}{S} \right) + L_{\text{system}} = 16.6 \text{ dB} + 2.0 \text{ dB} + \left( \frac{J}{S} \right) \geq 10 \text{ dB}$$

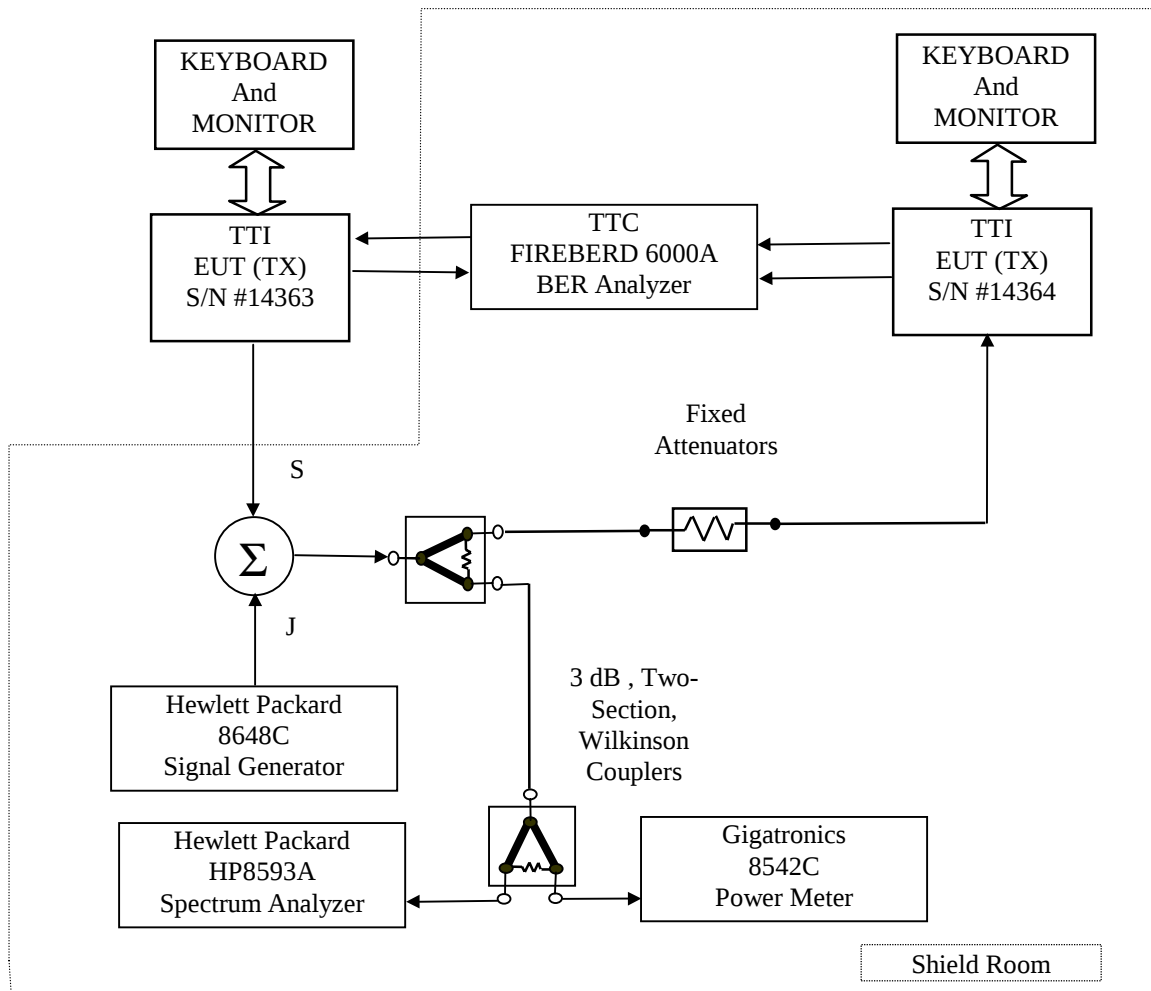
$$G_p = 18.6 \text{ dB} + \left| \frac{J}{S} \right| \geq 10 \text{ dB}$$

The minimum jammer to signal ratio is as follows:

$$\left| \frac{J}{S} \right| \geq -8.6 \text{ dB}$$

## 4.0 Test Configuration: CW Jamming Margin (15.247) (e)

### 4.1 Basic Test Block Diagram



## 4.2 Test Procedure

**4.2.1** Obtain the simplex link shown. Perform all independent instrumentation calibrations prior to this procedure. Set operating power levels using fixed and variable attenuators in system to meet the following objectives:

1. Signal Power at receiver approximately -60 dBm (above thermal sensitivity such that thermal noise does not cause bit errors).
2. Signal Power at power meter between -20 and -40 dBm for optimal linearity.
3. Use spectrum analyzer to monitor test.
4. Ensure that CW Jammer generator RF output is disabled and measure the power at the power meter port using the power meter. This is the relative signal power,  $S_r$ .
5. Disable Transmitter, and set CW Jammer generator RF output frequency equal to the carrier frequency and enable generator output. Set reference CW Jammer power level at power meter port equal to  $S_r$  (0 dB J/S reference level). Note the power level setting on the generator, this is the reference CW Jammer power setting,  $J_r$ .
6. Disable CW Jammer, re-establish link. BER test set should be operating error-free.
7. Enable CW Jammer at a low power level and gradually increase the CW Jammer power until the BER test set indicates the reference BER level ( $1 \bullet 10^{-5}$ ) or greater. Note nominal Jammer power setting,  $J_n$ .
8. The maximum Jamming signal level is limited such that the link is not degraded to the point where re-acquisition is necessary. This was necessary to allow the test to be automated and to be independent of the E.U.T. If the jammer power level were allowed to exceed the threshold in which the link is lost in the equipment, the test would be interrupted. The maximum jamming level is above the level necessary to detect the minimum processing gain.

**4.2.2** 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  $\pm 9.5$  MHz. The procedure can be illustrated as follows:

For offset frequency - 9.5 MHz to carrier frequency + 9.5 MHz , Step 50 kHz.

Begin at minimum Jammer Power

Do:

Increase Jammer Power Setting by 1dB.

Until:

Average BER is greater or equal to reference BER.

Record Indicated Nominal Jammer Level setting.

Next offset frequency.

**4.2.3** The nominal Jammer Level settings are tabulated versus offset frequency. The J/S ratio and the processing gain are then calculated as follows:

$$\left( \frac{J}{S} \right) = [(J_r - J_n)]$$

If  $J_n = J_r$  then:

$$\left( \frac{J}{S} \right) = 0dB$$

is the reference Jammer Power Level.

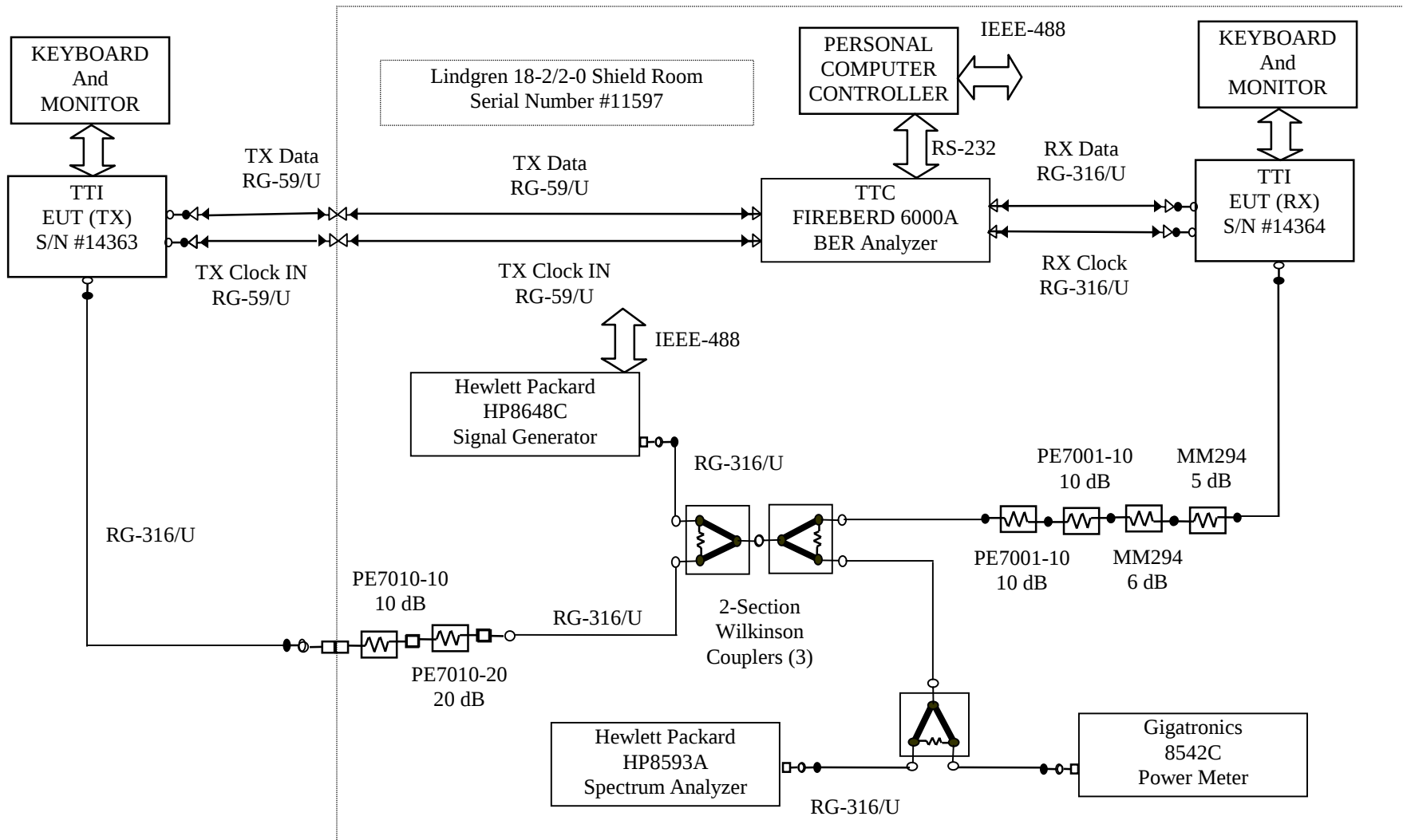
**4.2.4** The processing gain then is determined using the J/S ratio:

$$G_p = 18.6 \text{ dB} + \left| \frac{J}{S} \right|$$

**4.2.4** The numerical data associated with the following radio channels is tabulated and presented in Appendix A:

Sorted Data: Channels 1,3,6      Table entries:f,Gp for each Channel.

### 4.3 Test Electrical Configuration:



#### 4.4 Measurement Equipment List

| Equipment                                                                                                           | LSR Serial No. | Serial Number | Calibration  |
|---------------------------------------------------------------------------------------------------------------------|----------------|---------------|--------------|
| HP8596E Spectrum Analyzer                                                                                           | CC00130C       | 3205A00103    | Initial Only |
| Gigatronics 8542C Power Meter                                                                                       | EE960005       | 1831450       | 2/14/97      |
| Gigatronics 86301A Sensor                                                                                           | -              | 1830164       | 3/5/98       |
| TTC Fireberd 6000 BER Test Set<br>Test Interval 10 <sup>7</sup><br>Pattern: 2 <sup>23</sup> -1<br>External TX input | CC00164C       | 10016         | 11/29/96     |
| HP 8648C Signal Generator.                                                                                          | CC00129C       | 34119400344   | 6/16/94      |
| Wilkinson Power Couplers (3)                                                                                        | -              | 2400-1,-2,-3  | HP8753E      |

#### 4.5 Measurement Uncertainties for Absolute Measurements

The measurement uncertainties are determined by the methods specified in NAMAS NIS 81, Edition 1, May 1994, "The Treatment of Uncertainty in EMC Measurements". Relevant equipment specifications found in Appendix B.

| Equipment                           | Specified Characteristic                   | Probability Density | Specified Uncertainty                                          |
|-------------------------------------|--------------------------------------------|---------------------|----------------------------------------------------------------|
| HP8596E Spectrum Analyzer           | Reference Level                            | Uniform             | $\pm 0.3 \text{ dB} + 0.01 \bullet \text{ dB}$<br>from -20 dBm |
| HP8596E Spectrum Analyzer           | Calibrator Output                          | Uniform             | $\pm 0.4 \text{ dB}$                                           |
| HP8596E Spectrum Analyzer           | Absolute Amplitude Calibration Uncertainty | Uniform             | $\pm 0.15 \text{ dB}$                                          |
| Gigatronics 86301A Sensor           | Power Calibration Factor                   | Uniform             | 1.33 %                                                         |
| Wilkinson Couplers<br>2400-2500 MHz | Amplitude Imbalance                        | Uniform             | $\pm 0.1 \text{ dB}$                                           |
| HP 8648C                            | Output Power                               | Uniform             | $\pm 2.0 \text{ dB}$                                           |

**HP Spectrum Analyzer Total Uncertainty (-60 dBm level):**

Perform Root-Sum-Square of three uncertainties to find total uncertainty for a 95% confidence level:

Uniform uncertainties specify the probability density interval  $\pm a$ . The variance of the uniform density is  $a^2/3$ .

Sum the uncorrelated variances to find the total variance:

$$\text{Total variance} = [(0.3 \text{ dB} + 0.01 \bullet 40 \text{ dB})/3 + (0.4)/3 + (0.15)/3] = 1.25/3 = 0.416$$

The uncertainty for a 95% confidence interval is 1.96 times the standard deviation:

$$\text{Total Uncertainty} = \pm 1.96 \bullet \sqrt{0.416} = 1.96 \bullet 0.644 = \pm 1.26 \text{ dB}$$

**Gigatronics Power Sensor Power Calibration Factor Uncertainty:**

Probable error in Power sensor:  $\pm 1.33\%$  ,  $\pm 10 \log_{10} (1.0133) = \pm 0.0574 \text{ dB}$

$$\text{Variance} = 0.0574^2/3 = 0.00109$$

$$\text{Total uncertainty} = \pm 1.96 \bullet \sqrt{0.00109} = \pm 0.27 \text{ dB}$$

**Signal Generator Output Power Uncertainty:**

$$\text{Level Accuracy} = \pm 2.0 \text{ dB}$$

$$\text{Variance} = 2.0^2/3 = 0.667$$

$$\text{Total uncertainty} = \pm 1.96 \bullet \sqrt{0.667} = \pm 1.6 \text{ dB}$$

To check the power setting accuracy, the output of the HP8648 C was varied at 2432 MHz over expected power level range and the power was measured at the output of the summing coupler. The power was measured with the Gigatronics Power meter.

| Power Setting (dBm) | Coupler Output Power (dBm) | Ideal Output Power (dBm) | Error (dB) |
|---------------------|----------------------------|--------------------------|------------|
| -17.5               | -30.3                      | -30.3                    | 0          |
| -18.5               | -31.3                      | -31.3                    | 0          |
| -19.5               | -32.3                      | -32.3                    | 0          |
| -20.5               | -33.2                      | -33.3                    | -0.1       |
| -21.5               | -34.2                      | -34.3                    | -0.1       |
| -22.5               | -35.2                      | -35.3                    | -0.1       |
| -23.5               | -36.1                      | -36.3                    | -0.2       |
| -24.5               | -37.1                      | -37.3                    | -0.2       |
| -25.5               | -38                        | -38.3                    | -0.3       |
| -26.5               | -39.4                      | -39.3                    | 0.1        |
| -27.5               | -40.4                      | -40.3                    | 0.1        |
| -28.5               | -41.5                      | -41.3                    | 0.2        |
| -29.5               | -42.5                      | -42.3                    | 0.2        |
| -30.5               | -43.5                      | -43.3                    | 0.2        |
| -31.5               | -44.6                      | -44.3                    | 0.3        |
| -32.5               | -45.6                      | -45.3                    | 0.3        |
| -33.5               | -46.7                      | -46.3                    | 0.4        |
| -34.5               | -47.8                      | -47.3                    | 0.5        |
| -35.5               | -48.9                      | -48.3                    | 0.6        |
| -36.5               | -49.9                      | -49.3                    | 0.6        |
| -37.5               | -50.5                      | -50.3                    | 0.2        |
| -38.5               | -50.9                      | -51.3                    | -0.4       |
| -39.5               | -51.4                      | -52.3                    | -0.9       |

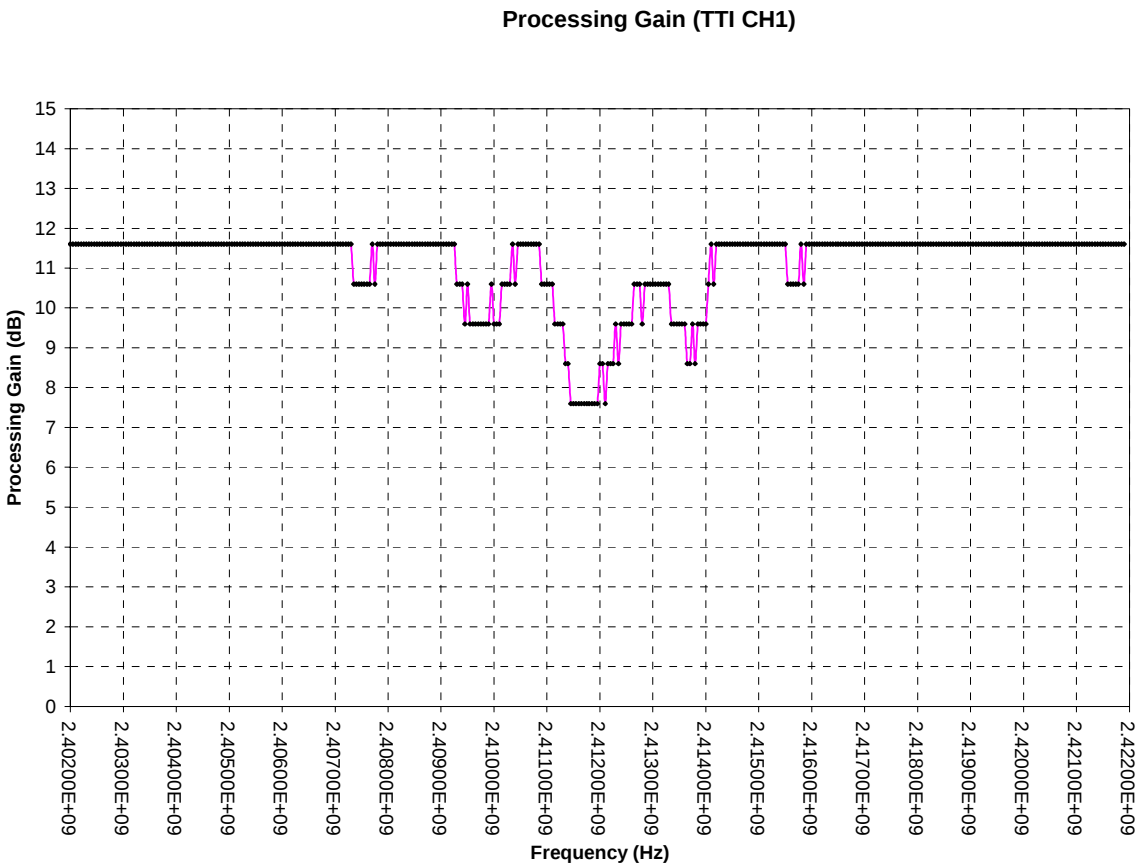
## 5.0 CW Jamming Margin Test Data

The tabulated numerical test data is presented in Appendix A. The numerical data is presented in graphical form here. Processing gain versus CW frequency for Channels 1,3, and 6 are presented. The measured relative signal power, reference jamming level, and reference jamming level setting are shown below for each channel:

|                                     | Channel 1<br>2412 MHz | Channel 3<br>2432 MHz | Channel 6<br>2462 MHz |
|-------------------------------------|-----------------------|-----------------------|-----------------------|
| Relative Signal Power , Sr          | -33.7 dBm             | -29.5 dBm             | -32.5 dBm             |
| Reference Jamming Level             | -33.9 dBm             | -29.8 dBm             | -32.6 dBm             |
| Reference Jamming Level Setting, Jr | -21 dBm               | -17.5 dBm             | -20 dBm               |

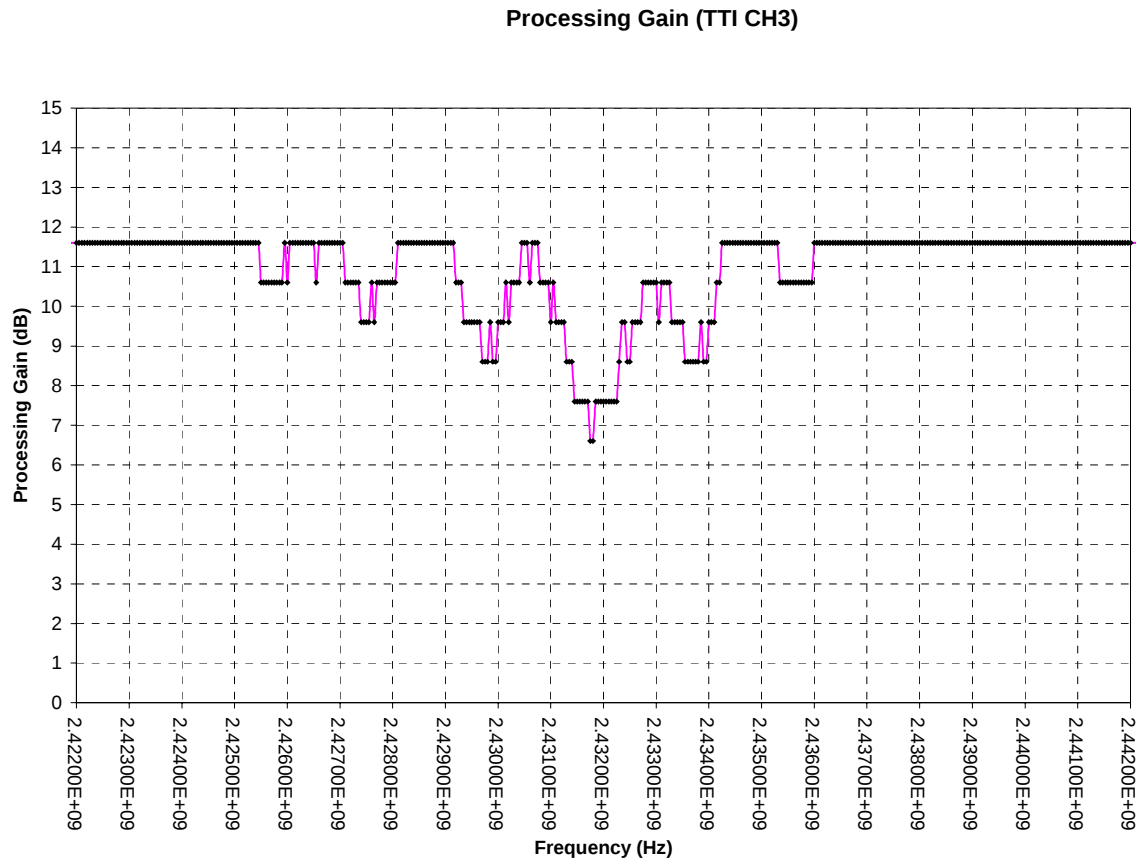
## 5.1 CW Jamming Test Data for Channel 1

The processing gain versus frequency offset from the carrier is presented below. The Jamming Margin test procedure [3] allows the worst 20% of the points to be discarded. The minimum processing gain is the minimum of the remaining points. The minimum of remaining points can be determined by calculating the upper bound of the 20<sup>th</sup> percentile of processing gain data. This number will be listed with the data and it represents the final compliance quantity.



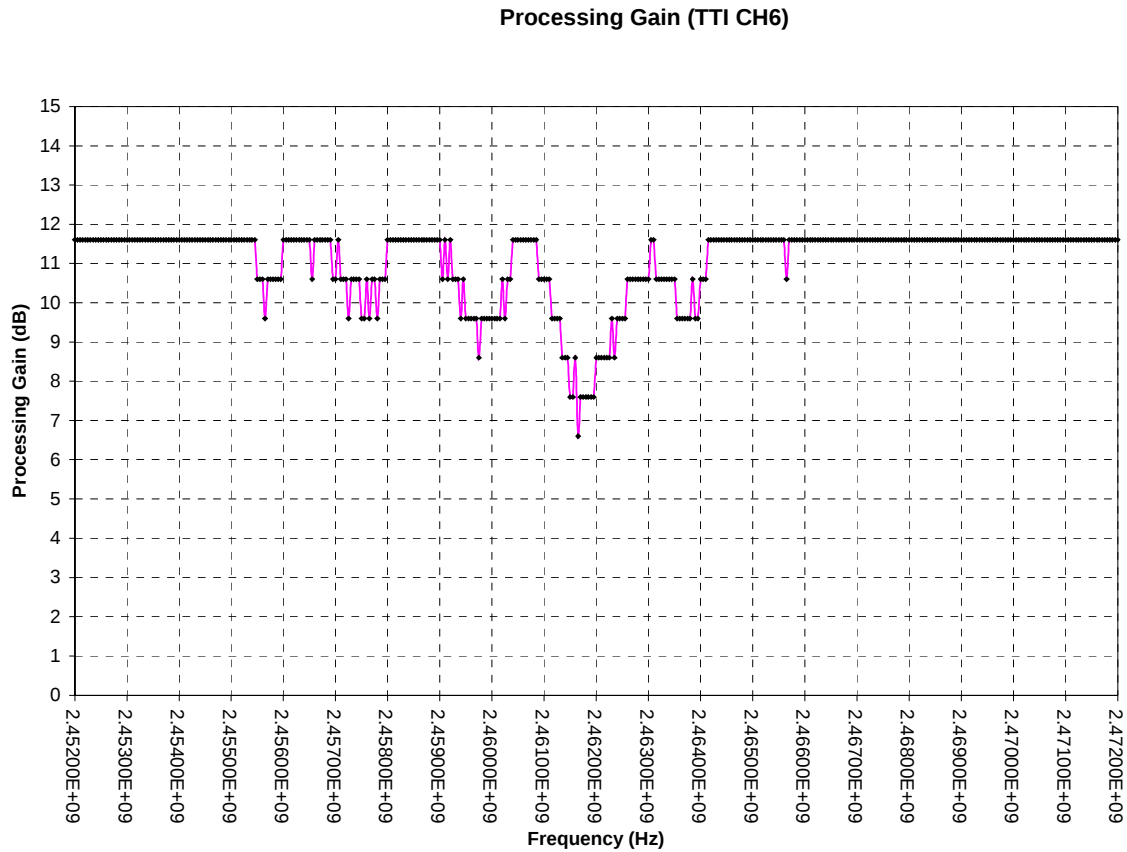
**The minimum processing gain with 20% worst points removed is 10.6 dB.**

## 5.2 CW Jamming Test Data for Channel 3



**The minimum processing gain with 20% worst points removed is 10.6 dB.**

### 5.3 CW Jamming Test Data for Channel 6:



**The minimum processing gain with 20% worst points removed is 10.6 dB.**

## **6.0 Analysis of Test Data**

The main conclusions associated with this set of tests are as follows:

1. The system passes the CW jamming margin test on Channel 1.
2. The system passes the CW jamming margin test on Channel 3.
3. The system passes the CW jamming margin test on Channel 6.

### **APPENDIX A: TABULATED DATA.**

### **APPENDIX A: PROCEEDS ON NEXT PAGE**

### **APPENDIX B: HP VEE PROGRAM USED FOR TEST.**

**APPENDIX B is presented as an attachment.**

### **APPENDIX C: MEASURING EQUIPMENT SPECIFICATIONS**

**APPENDIX C is presented as attachments**

## **Appendix A: Tabulated Data for Channel 1**

**Frequency (Hz) Processing Gain (dB)**

|            |      |
|------------|------|
| 2401000000 | 11.6 |
| 2401050000 | 11.6 |
| 2401100000 | 11.6 |
| 2401150000 | 11.6 |
| 2401200000 | 11.6 |
| 2401250000 | 11.6 |
| 2401300000 | 11.6 |
| 2401350000 | 11.6 |
| 2401400000 | 11.6 |
| 2401450000 | 11.6 |
| 2401500000 | 11.6 |
| 2401550000 | 11.6 |
| 2401600000 | 11.6 |
| 2401650000 | 11.6 |
| 2401700000 | 11.6 |
| 2401750000 | 11.6 |
| 2401800000 | 11.6 |
| 2401850000 | 11.6 |
| 2401900000 | 11.6 |
| 2401950000 | 11.6 |
| 2402000000 | 11.6 |
| 2402050000 | 11.6 |
| 2402100000 | 11.6 |
| 2402150000 | 11.6 |
| 2402200000 | 11.6 |
| 2402250000 | 11.6 |
| 2402300000 | 11.6 |
| 2402350000 | 11.6 |
| 2402400000 | 11.6 |
| 2402450000 | 11.6 |
| 2402500000 | 11.6 |
| 2402550000 | 11.6 |
| 2402600000 | 11.6 |
| 2402650000 | 11.6 |
| 2402700000 | 11.6 |
| 2402750000 | 11.6 |
| 2402800000 | 11.6 |
| 2402850000 | 11.6 |
| 2402900000 | 11.6 |
| 2402950000 | 11.6 |
| 2403000000 | 11.6 |
| 2403050000 | 11.6 |
| 2403100000 | 11.6 |
| 2403150000 | 11.6 |
| 2403200000 | 11.6 |
| 2403250000 | 11.6 |

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|            |      |
|------------|------|
| 2403300000 | 11.6 |
| 2403350000 | 11.6 |
| 2403400000 | 11.6 |
| 2403450000 | 11.6 |
| 2403500000 | 11.6 |
| 2403550000 | 11.6 |
| 2403600000 | 11.6 |
| 2403650000 | 11.6 |
| 2403700000 | 11.6 |
| 2403750000 | 11.6 |
| 2403800000 | 11.6 |
| 2403850000 | 11.6 |
| 2403900000 | 11.6 |
| 2403950000 | 11.6 |
| 2404000000 | 11.6 |
| 2404050000 | 11.6 |
| 2404100000 | 11.6 |
| 2404150000 | 11.6 |
| 2404200000 | 11.6 |
| 2404250000 | 11.6 |
| 2404300000 | 11.6 |
| 2404350000 | 11.6 |
| 2404400000 | 11.6 |
| 2404450000 | 11.6 |
| 2404500000 | 11.6 |
| 2404550000 | 11.6 |
| 2404600000 | 11.6 |
| 2404650000 | 11.6 |
| 2404700000 | 11.6 |
| 2404750000 | 11.6 |
| 2404800000 | 11.6 |
| 2404850000 | 11.6 |
| 2404900000 | 11.6 |
| 2404950000 | 11.6 |
| 2405000000 | 11.6 |
| 2405050000 | 11.6 |
| 2405100000 | 11.6 |
| 2405150000 | 11.6 |
| 2405200000 | 11.6 |
| 2405250000 | 11.6 |
| 2405300000 | 11.6 |
| 2405350000 | 11.6 |
| 2405400000 | 11.6 |
| 2405450000 | 11.6 |
| 2405500000 | 11.6 |
| 2405550000 | 11.6 |
| 2405600000 | 11.6 |
| 2405650000 | 11.6 |
| 2405700000 | 11.6 |
| 2405750000 | 11.6 |

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|            |      |
|------------|------|
| 2405800000 | 11.6 |
| 2405850000 | 11.6 |
| 2405900000 | 11.6 |
| 2405950000 | 11.6 |
| 2406000000 | 11.6 |
| 2406050000 | 11.6 |
| 2406100000 | 11.6 |
| 2406150000 | 11.6 |
| 2406200000 | 11.6 |
| 2406250000 | 11.6 |
| 2406300000 | 11.6 |
| 2406350000 | 11.6 |
| 2406400000 | 11.6 |
| 2406450000 | 11.6 |
| 2406500000 | 11.6 |
| 2406550000 | 11.6 |
| 2406600000 | 11.6 |
| 2406650000 | 11.6 |
| 2406700000 | 11.6 |
| 2406750000 | 11.6 |
| 2406800000 | 11.6 |
| 2406850000 | 11.6 |
| 2406900000 | 11.6 |
| 2406950000 | 11.6 |
| 2407000000 | 11.6 |
| 2407050000 | 11.6 |
| 2407100000 | 11.6 |
| 2407150000 | 11.6 |
| 2407200000 | 11.6 |
| 2407250000 | 11.6 |
| 2407300000 | 11.6 |
| 2407350000 | 10.6 |
| 2407400000 | 10.6 |
| 2407450000 | 10.6 |
| 2407500000 | 10.6 |
| 2407550000 | 10.6 |
| 2407600000 | 10.6 |
| 2407650000 | 10.6 |
| 2407700000 | 11.6 |
| 2407750000 | 10.6 |
| 2407800000 | 11.6 |
| 2407850000 | 11.6 |
| 2407900000 | 11.6 |
| 2407950000 | 11.6 |
| 2408000000 | 11.6 |
| 2408050000 | 11.6 |
| 2408100000 | 11.6 |
| 2408150000 | 11.6 |
| 2408200000 | 11.6 |
| 2408250000 | 11.6 |

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|            |      |
|------------|------|
| 2408300000 | 11.6 |
| 2408350000 | 11.6 |
| 2408400000 | 11.6 |
| 2408450000 | 11.6 |
| 2408500000 | 11.6 |
| 2408550000 | 11.6 |
| 2408600000 | 11.6 |
| 2408650000 | 11.6 |
| 2408700000 | 11.6 |
| 2408750000 | 11.6 |
| 2408800000 | 11.6 |
| 2408850000 | 11.6 |
| 2408900000 | 11.6 |
| 2408950000 | 11.6 |
| 2409000000 | 11.6 |
| 2409050000 | 11.6 |
| 2409100000 | 11.6 |
| 2409150000 | 11.6 |
| 2409200000 | 11.6 |
| 2409250000 | 11.6 |
| 2409300000 | 10.6 |
| 2409350000 | 10.6 |
| 2409400000 | 10.6 |
| 2409450000 | 9.6  |
| 2409500000 | 10.6 |
| 2409550000 | 9.6  |
| 2409600000 | 9.6  |
| 2409650000 | 9.6  |
| 2409700000 | 9.6  |
| 2409750000 | 9.6  |
| 2409800000 | 9.6  |
| 2409850000 | 9.6  |
| 2409900000 | 9.6  |
| 2409950000 | 10.6 |
| 2410000000 | 9.6  |
| 2410050000 | 9.6  |
| 2410100000 | 9.6  |
| 2410150000 | 10.6 |
| 2410200000 | 10.6 |
| 2410250000 | 10.6 |
| 2410300000 | 10.6 |
| 2410350000 | 11.6 |
| 2410400000 | 10.6 |
| 2410450000 | 11.6 |
| 2410500000 | 11.6 |
| 2410550000 | 11.6 |
| 2410600000 | 11.6 |
| 2410650000 | 11.6 |
| 2410700000 | 11.6 |
| 2410750000 | 11.6 |

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|            |      |
|------------|------|
| 2410800000 | 11.6 |
| 2410850000 | 11.6 |
| 2410900000 | 10.6 |
| 2410950000 | 10.6 |
| 2411000000 | 10.6 |
| 2411050000 | 10.6 |
| 2411100000 | 10.6 |
| 2411150000 | 9.6  |
| 2411200000 | 9.6  |
| 2411250000 | 9.6  |
| 2411300000 | 9.6  |
| 2411350000 | 8.6  |
| 2411400000 | 8.6  |
| 2411450000 | 7.6  |
| 2411500000 | 7.6  |
| 2411550000 | 7.6  |
| 2411600000 | 7.6  |
| 2411650000 | 7.6  |
| 2411700000 | 7.6  |
| 2411750000 | 7.6  |
| 2411800000 | 7.6  |
| 2411850000 | 7.6  |
| 2411900000 | 7.6  |
| 2411950000 | 7.6  |
| 2412000000 | 8.6  |
| 2412050000 | 8.6  |
| 2412100000 | 7.6  |
| 2412150000 | 8.6  |
| 2412200000 | 8.6  |
| 2412250000 | 8.6  |
| 2412300000 | 9.6  |
| 2412350000 | 8.6  |
| 2412400000 | 9.6  |
| 2412450000 | 9.6  |
| 2412500000 | 9.6  |
| 2412550000 | 9.6  |
| 2412600000 | 9.6  |
| 2412650000 | 10.6 |
| 2412700000 | 10.6 |
| 2412750000 | 10.6 |
| 2412800000 | 9.6  |
| 2412850000 | 10.6 |
| 2412900000 | 10.6 |
| 2412950000 | 10.6 |
| 2413000000 | 10.6 |
| 2413050000 | 10.6 |
| 2413100000 | 10.6 |
| 2413150000 | 10.6 |
| 2413200000 | 10.6 |
| 2413250000 | 10.6 |

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|            |      |
|------------|------|
| 2413300000 | 10.6 |
| 2413350000 | 9.6  |
| 2413400000 | 9.6  |
| 2413450000 | 9.6  |
| 2413500000 | 9.6  |
| 2413550000 | 9.6  |
| 2413600000 | 9.6  |
| 2413650000 | 8.6  |
| 2413700000 | 8.6  |
| 2413750000 | 9.6  |
| 2413800000 | 8.6  |
| 2413850000 | 9.6  |
| 2413900000 | 9.6  |
| 2413950000 | 9.6  |
| 2414000000 | 9.6  |
| 2414050000 | 10.6 |
| 2414100000 | 11.6 |
| 2414150000 | 10.6 |
| 2414200000 | 11.6 |
| 2414250000 | 11.6 |
| 2414300000 | 11.6 |
| 2414350000 | 11.6 |
| 2414400000 | 11.6 |
| 2414450000 | 11.6 |
| 2414500000 | 11.6 |
| 2414550000 | 11.6 |
| 2414600000 | 11.6 |
| 2414650000 | 11.6 |
| 2414700000 | 11.6 |
| 2414750000 | 11.6 |
| 2414800000 | 11.6 |
| 2414850000 | 11.6 |
| 2414900000 | 11.6 |
| 2414950000 | 11.6 |
| 2415000000 | 11.6 |
| 2415050000 | 11.6 |
| 2415100000 | 11.6 |
| 2415150000 | 11.6 |
| 2415200000 | 11.6 |
| 2415250000 | 11.6 |
| 2415300000 | 11.6 |
| 2415350000 | 11.6 |
| 2415400000 | 11.6 |
| 2415450000 | 11.6 |
| 2415500000 | 11.6 |
| 2415550000 | 10.6 |
| 2415600000 | 10.6 |
| 2415650000 | 10.6 |
| 2415700000 | 10.6 |
| 2415750000 | 10.6 |

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|            |      |
|------------|------|
| 2415800000 | 11.6 |
| 2415850000 | 10.6 |
| 2415900000 | 11.6 |
| 2415950000 | 11.6 |
| 2416000000 | 11.6 |
| 2416050000 | 11.6 |
| 2416100000 | 11.6 |
| 2416150000 | 11.6 |
| 2416200000 | 11.6 |
| 2416250000 | 11.6 |
| 2416300000 | 11.6 |
| 2416350000 | 11.6 |
| 2416400000 | 11.6 |
| 2416450000 | 11.6 |
| 2416500000 | 11.6 |
| 2416550000 | 11.6 |
| 2416600000 | 11.6 |
| 2416650000 | 11.6 |
| 2416700000 | 11.6 |
| 2416750000 | 11.6 |
| 2416800000 | 11.6 |
| 2416850000 | 11.6 |
| 2416900000 | 11.6 |
| 2416950000 | 11.6 |
| 2417000000 | 11.6 |
| 2417050000 | 11.6 |
| 2417100000 | 11.6 |
| 2417150000 | 11.6 |
| 2417200000 | 11.6 |
| 2417250000 | 11.6 |
| 2417300000 | 11.6 |
| 2417350000 | 11.6 |
| 2417400000 | 11.6 |
| 2417450000 | 11.6 |
| 2417500000 | 11.6 |
| 2417550000 | 11.6 |
| 2417600000 | 11.6 |
| 2417650000 | 11.6 |
| 2417700000 | 11.6 |
| 2417750000 | 11.6 |
| 2417800000 | 11.6 |
| 2417850000 | 11.6 |
| 2417900000 | 11.6 |
| 2417950000 | 11.6 |
| 2418000000 | 11.6 |
| 2418050000 | 11.6 |
| 2418100000 | 11.6 |
| 2418150000 | 11.6 |
| 2418200000 | 11.6 |
| 2418250000 | 11.6 |

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|            |      |
|------------|------|
| 2418300000 | 11.6 |
| 2418350000 | 11.6 |
| 2418400000 | 11.6 |
| 2418450000 | 11.6 |
| 2418500000 | 11.6 |
| 2418550000 | 11.6 |
| 2418600000 | 11.6 |
| 2418650000 | 11.6 |
| 2418700000 | 11.6 |
| 2418750000 | 11.6 |
| 2418800000 | 11.6 |
| 2418850000 | 11.6 |
| 2418900000 | 11.6 |
| 2418950000 | 11.6 |
| 2419000000 | 11.6 |
| 2419050000 | 11.6 |
| 2419100000 | 11.6 |
| 2419150000 | 11.6 |
| 2419200000 | 11.6 |
| 2419250000 | 11.6 |
| 2419300000 | 11.6 |
| 2419350000 | 11.6 |
| 2419400000 | 11.6 |
| 2419450000 | 11.6 |
| 2419500000 | 11.6 |
| 2419550000 | 11.6 |
| 2419600000 | 11.6 |
| 2419650000 | 11.6 |
| 2419700000 | 11.6 |
| 2419750000 | 11.6 |
| 2419800000 | 11.6 |
| 2419850000 | 11.6 |
| 2419900000 | 11.6 |
| 2419950000 | 11.6 |
| 2420000000 | 11.6 |
| 2420050000 | 11.6 |
| 2420100000 | 11.6 |
| 2420150000 | 11.6 |
| 2420200000 | 11.6 |
| 2420250000 | 11.6 |
| 2420300000 | 11.6 |
| 2420350000 | 11.6 |
| 2420400000 | 11.6 |
| 2420450000 | 11.6 |
| 2420500000 | 11.6 |
| 2420550000 | 11.6 |
| 2420600000 | 11.6 |
| 2420650000 | 11.6 |
| 2420700000 | 11.6 |
| 2420750000 | 11.6 |

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|            |      |
|------------|------|
| 2420800000 | 11.6 |
| 2420850000 | 11.6 |
| 2420900000 | 11.6 |
| 2420950000 | 11.6 |
| 2421000000 | 11.6 |
| 2421050000 | 11.6 |
| 2421100000 | 11.6 |
| 2421150000 | 11.6 |
| 2421200000 | 11.6 |
| 2421250000 | 11.6 |
| 2421300000 | 11.6 |
| 2421350000 | 11.6 |
| 2421400000 | 11.6 |
| 2421450000 | 11.6 |
| 2421500000 | 11.6 |
| 2421550000 | 11.6 |
| 2421600000 | 11.6 |
| 2421650000 | 11.6 |
| 2421700000 | 11.6 |
| 2421750000 | 11.6 |
| 2421800000 | 11.6 |
| 2421850000 | 11.6 |
| 2421900000 | 11.6 |

**Tabulated Data for Channel 3.**

**Frequency (Hz) Processing Gain (dB)**

|            |      |
|------------|------|
| 2421000000 | 11.6 |
| 2421050000 | 11.6 |
| 2421100000 | 11.6 |
| 2421150000 | 11.6 |
| 2421200000 | 11.6 |
| 2421250000 | 11.6 |
| 2421300000 | 11.6 |
| 2421350000 | 11.6 |
| 2421400000 | 11.6 |
| 2421450000 | 11.6 |
| 2421500000 | 11.6 |
| 2421550000 | 11.6 |
| 2421600000 | 11.6 |
| 2421650000 | 11.6 |
| 2421700000 | 11.6 |
| 2421750000 | 11.6 |
| 2421800000 | 11.6 |
| 2421850000 | 11.6 |
| 2421900000 | 11.6 |
| 2421950000 | 11.6 |
| 2422000000 | 11.6 |
| 2422050000 | 11.6 |
| 2422100000 | 11.6 |
| 2422150000 | 11.6 |
| 2422200000 | 11.6 |
| 2422250000 | 11.6 |
| 2422300000 | 11.6 |
| 2422350000 | 11.6 |
| 2422400000 | 11.6 |
| 2422450000 | 11.6 |
| 2422500000 | 11.6 |
| 2422550000 | 11.6 |
| 2422600000 | 11.6 |
| 2422650000 | 11.6 |
| 2422700000 | 11.6 |
| 2422750000 | 11.6 |
| 2422800000 | 11.6 |
| 2422850000 | 11.6 |
| 2422900000 | 11.6 |
| 2422950000 | 11.6 |
| 2423000000 | 11.6 |
| 2423050000 | 11.6 |
| 2423100000 | 11.6 |
| 2423150000 | 11.6 |
| 2423200000 | 11.6 |
| 2423250000 | 11.6 |

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|            |      |
|------------|------|
| 2423300000 | 11.6 |
| 2423350000 | 11.6 |
| 2423400000 | 11.6 |
| 2423450000 | 11.6 |
| 2423500000 | 11.6 |
| 2423550000 | 11.6 |
| 2423600000 | 11.6 |
| 2423650000 | 11.6 |
| 2423700000 | 11.6 |
| 2423750000 | 11.6 |
| 2423800000 | 11.6 |
| 2423850000 | 11.6 |
| 2423900000 | 11.6 |
| 2423950000 | 11.6 |
| 2424000000 | 11.6 |
| 2424050000 | 11.6 |
| 2424100000 | 11.6 |
| 2424150000 | 11.6 |
| 2424200000 | 11.6 |
| 2424250000 | 11.6 |
| 2424300000 | 11.6 |
| 2424350000 | 11.6 |
| 2424400000 | 11.6 |
| 2424450000 | 11.6 |
| 2424500000 | 11.6 |
| 2424550000 | 11.6 |
| 2424600000 | 11.6 |
| 2424650000 | 11.6 |
| 2424700000 | 11.6 |
| 2424750000 | 11.6 |
| 2424800000 | 11.6 |
| 2424850000 | 11.6 |
| 2424900000 | 11.6 |
| 2424950000 | 11.6 |
| 2425000000 | 11.6 |
| 2425050000 | 11.6 |
| 2425100000 | 11.6 |
| 2425150000 | 11.6 |
| 2425200000 | 11.6 |
| 2425250000 | 11.6 |
| 2425300000 | 11.6 |
| 2425350000 | 11.6 |
| 2425400000 | 11.6 |
| 2425450000 | 11.6 |
| 2425500000 | 10.6 |
| 2425550000 | 10.6 |
| 2425600000 | 10.6 |
| 2425650000 | 10.6 |
| 2425700000 | 10.6 |
| 2425750000 | 10.6 |

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|            |      |
|------------|------|
| 2425800000 | 10.6 |
| 2425850000 | 10.6 |
| 2425900000 | 10.6 |
| 2425950000 | 11.6 |
| 2426000000 | 10.6 |
| 2426050000 | 11.6 |
| 2426100000 | 11.6 |
| 2426150000 | 11.6 |
| 2426200000 | 11.6 |
| 2426250000 | 11.6 |
| 2426300000 | 11.6 |
| 2426350000 | 11.6 |
| 2426400000 | 11.6 |
| 2426450000 | 11.6 |
| 2426500000 | 11.6 |
| 2426550000 | 10.6 |
| 2426600000 | 11.6 |
| 2426650000 | 11.6 |
| 2426700000 | 11.6 |
| 2426750000 | 11.6 |
| 2426800000 | 11.6 |
| 2426850000 | 11.6 |
| 2426900000 | 11.6 |
| 2426950000 | 11.6 |
| 2427000000 | 11.6 |
| 2427050000 | 11.6 |
| 2427100000 | 10.6 |
| 2427150000 | 10.6 |
| 2427200000 | 10.6 |
| 2427250000 | 10.6 |
| 2427300000 | 10.6 |
| 2427350000 | 10.6 |
| 2427400000 | 9.6  |
| 2427450000 | 9.6  |
| 2427500000 | 9.6  |
| 2427550000 | 9.6  |
| 2427600000 | 10.6 |
| 2427650000 | 9.6  |
| 2427700000 | 10.6 |
| 2427750000 | 10.6 |
| 2427800000 | 10.6 |
| 2427850000 | 10.6 |
| 2427900000 | 10.6 |
| 2427950000 | 10.6 |
| 2428000000 | 10.6 |
| 2428050000 | 10.6 |
| 2428100000 | 11.6 |
| 2428150000 | 11.6 |
| 2428200000 | 11.6 |
| 2428250000 | 11.6 |

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|            |      |
|------------|------|
| 2428300000 | 11.6 |
| 2428350000 | 11.6 |
| 2428400000 | 11.6 |
| 2428450000 | 11.6 |
| 2428500000 | 11.6 |
| 2428550000 | 11.6 |
| 2428600000 | 11.6 |
| 2428650000 | 11.6 |
| 2428700000 | 11.6 |
| 2428750000 | 11.6 |
| 2428800000 | 11.6 |
| 2428850000 | 11.6 |
| 2428900000 | 11.6 |
| 2428950000 | 11.6 |
| 2429000000 | 11.6 |
| 2429050000 | 11.6 |
| 2429100000 | 11.6 |
| 2429150000 | 11.6 |
| 2429200000 | 10.6 |
| 2429250000 | 10.6 |
| 2429300000 | 10.6 |
| 2429350000 | 9.6  |
| 2429400000 | 9.6  |
| 2429450000 | 9.6  |
| 2429500000 | 9.6  |
| 2429550000 | 9.6  |
| 2429600000 | 9.6  |
| 2429650000 | 9.6  |
| 2429700000 | 8.6  |
| 2429750000 | 8.6  |
| 2429800000 | 8.6  |
| 2429850000 | 9.6  |
| 2429900000 | 8.6  |
| 2429950000 | 8.6  |
| 2430000000 | 9.6  |
| 2430050000 | 9.6  |
| 2430100000 | 9.6  |
| 2430150000 | 10.6 |
| 2430200000 | 9.6  |
| 2430250000 | 10.6 |
| 2430300000 | 10.6 |
| 2430350000 | 10.6 |
| 2430400000 | 10.6 |
| 2430450000 | 11.6 |
| 2430500000 | 11.6 |
| 2430550000 | 11.6 |
| 2430600000 | 10.6 |
| 2430650000 | 11.6 |
| 2430700000 | 11.6 |
| 2430750000 | 11.6 |

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|            |      |
|------------|------|
| 2430800000 | 10.6 |
| 2430850000 | 10.6 |
| 2430900000 | 10.6 |
| 2430950000 | 10.6 |
| 2431000000 | 9.6  |
| 2431050000 | 10.6 |
| 2431100000 | 9.6  |
| 2431150000 | 9.6  |
| 2431200000 | 9.6  |
| 2431250000 | 9.6  |
| 2431300000 | 8.6  |
| 2431350000 | 8.6  |
| 2431400000 | 8.6  |
| 2431450000 | 7.6  |
| 2431500000 | 7.6  |
| 2431550000 | 7.6  |
| 2431600000 | 7.6  |
| 2431650000 | 7.6  |
| 2431700000 | 7.6  |
| 2431750000 | 6.6  |
| 2431800000 | 6.6  |
| 2431850000 | 7.6  |
| 2431900000 | 7.6  |
| 2431950000 | 7.6  |
| 2432000000 | 7.6  |
| 2432050000 | 7.6  |
| 2432100000 | 7.6  |
| 2432150000 | 7.6  |
| 2432200000 | 7.6  |
| 2432250000 | 7.6  |
| 2432300000 | 8.6  |
| 2432350000 | 9.6  |
| 2432400000 | 9.6  |
| 2432450000 | 8.6  |
| 2432500000 | 8.6  |
| 2432550000 | 9.6  |
| 2432600000 | 9.6  |
| 2432650000 | 9.6  |
| 2432700000 | 9.6  |
| 2432750000 | 10.6 |
| 2432800000 | 10.6 |
| 2432850000 | 10.6 |
| 2432900000 | 10.6 |
| 2432950000 | 10.6 |
| 2433000000 | 10.6 |
| 2433050000 | 9.6  |
| 2433100000 | 10.6 |
| 2433150000 | 10.6 |
| 2433200000 | 10.6 |
| 2433250000 | 10.6 |

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|            |      |
|------------|------|
| 2433300000 | 9.6  |
| 2433350000 | 9.6  |
| 2433400000 | 9.6  |
| 2433450000 | 9.6  |
| 2433500000 | 9.6  |
| 2433550000 | 8.6  |
| 2433600000 | 8.6  |
| 2433650000 | 8.6  |
| 2433700000 | 8.6  |
| 2433750000 | 8.6  |
| 2433800000 | 8.6  |
| 2433850000 | 9.6  |
| 2433900000 | 8.6  |
| 2433950000 | 8.6  |
| 2434000000 | 9.6  |
| 2434050000 | 9.6  |
| 2434100000 | 9.6  |
| 2434150000 | 10.6 |
| 2434200000 | 10.6 |
| 2434250000 | 11.6 |
| 2434300000 | 11.6 |
| 2434350000 | 11.6 |
| 2434400000 | 11.6 |
| 2434450000 | 11.6 |
| 2434500000 | 11.6 |
| 2434550000 | 11.6 |
| 2434600000 | 11.6 |
| 2434650000 | 11.6 |
| 2434700000 | 11.6 |
| 2434750000 | 11.6 |
| 2434800000 | 11.6 |
| 2434850000 | 11.6 |
| 2434900000 | 11.6 |
| 2434950000 | 11.6 |
| 2435000000 | 11.6 |
| 2435050000 | 11.6 |
| 2435100000 | 11.6 |
| 2435150000 | 11.6 |
| 2435200000 | 11.6 |
| 2435250000 | 11.6 |
| 2435300000 | 11.6 |
| 2435350000 | 10.6 |
| 2435400000 | 10.6 |
| 2435450000 | 10.6 |
| 2435500000 | 10.6 |
| 2435550000 | 10.6 |
| 2435600000 | 10.6 |
| 2435650000 | 10.6 |
| 2435700000 | 10.6 |
| 2435750000 | 10.6 |

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|            |      |
|------------|------|
| 2435800000 | 10.6 |
| 2435850000 | 10.6 |
| 2435900000 | 10.6 |
| 2435950000 | 10.6 |
| 2436000000 | 11.6 |
| 2436050000 | 11.6 |
| 2436100000 | 11.6 |
| 2436150000 | 11.6 |
| 2436200000 | 11.6 |
| 2436250000 | 11.6 |
| 2436300000 | 11.6 |
| 2436350000 | 11.6 |
| 2436400000 | 11.6 |
| 2436450000 | 11.6 |
| 2436500000 | 11.6 |
| 2436550000 | 11.6 |
| 2436600000 | 11.6 |
| 2436650000 | 11.6 |
| 2436700000 | 11.6 |
| 2436750000 | 11.6 |
| 2436800000 | 11.6 |
| 2436850000 | 11.6 |
| 2436900000 | 11.6 |
| 2436950000 | 11.6 |
| 2437000000 | 11.6 |
| 2437050000 | 11.6 |
| 2437100000 | 11.6 |
| 2437150000 | 11.6 |
| 2437200000 | 11.6 |
| 2437250000 | 11.6 |
| 2437300000 | 11.6 |
| 2437350000 | 11.6 |
| 2437400000 | 11.6 |
| 2437450000 | 11.6 |
| 2437500000 | 11.6 |
| 2437550000 | 11.6 |
| 2437600000 | 11.6 |
| 2437650000 | 11.6 |
| 2437700000 | 11.6 |
| 2437750000 | 11.6 |
| 2437800000 | 11.6 |
| 2437850000 | 11.6 |
| 2437900000 | 11.6 |
| 2437950000 | 11.6 |
| 2438000000 | 11.6 |
| 2438050000 | 11.6 |
| 2438100000 | 11.6 |
| 2438150000 | 11.6 |
| 2438200000 | 11.6 |
| 2438250000 | 11.6 |

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|            |      |
|------------|------|
| 2438300000 | 11.6 |
| 2438350000 | 11.6 |
| 2438400000 | 11.6 |
| 2438450000 | 11.6 |
| 2438500000 | 11.6 |
| 2438550000 | 11.6 |
| 2438600000 | 11.6 |
| 2438650000 | 11.6 |
| 2438700000 | 11.6 |
| 2438750000 | 11.6 |
| 2438800000 | 11.6 |
| 2438850000 | 11.6 |
| 2438900000 | 11.6 |
| 2438950000 | 11.6 |
| 2439000000 | 11.6 |
| 2439050000 | 11.6 |
| 2439100000 | 11.6 |
| 2439150000 | 11.6 |
| 2439200000 | 11.6 |
| 2439250000 | 11.6 |
| 2439300000 | 11.6 |
| 2439350000 | 11.6 |
| 2439400000 | 11.6 |
| 2439450000 | 11.6 |
| 2439500000 | 11.6 |
| 2439550000 | 11.6 |
| 2439600000 | 11.6 |
| 2439650000 | 11.6 |
| 2439700000 | 11.6 |
| 2439750000 | 11.6 |
| 2439800000 | 11.6 |
| 2439850000 | 11.6 |
| 2439900000 | 11.6 |
| 2439950000 | 11.6 |
| 2440000000 | 11.6 |
| 2440050000 | 11.6 |
| 2440100000 | 11.6 |
| 2440150000 | 11.6 |
| 2440200000 | 11.6 |
| 2440250000 | 11.6 |
| 2440300000 | 11.6 |
| 2440350000 | 11.6 |
| 2440400000 | 11.6 |
| 2440450000 | 11.6 |
| 2440500000 | 11.6 |
| 2440550000 | 11.6 |
| 2440600000 | 11.6 |
| 2440650000 | 11.6 |
| 2440700000 | 11.6 |
| 2440750000 | 11.6 |

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|            |      |
|------------|------|
| 2440800000 | 11.6 |
| 2440850000 | 11.6 |
| 2440900000 | 11.6 |
| 2440950000 | 11.6 |
| 2441000000 | 11.6 |
| 2441050000 | 11.6 |
| 2441100000 | 11.6 |
| 2441150000 | 11.6 |
| 2441200000 | 11.6 |
| 2441250000 | 11.6 |
| 2441300000 | 11.6 |
| 2441350000 | 11.6 |
| 2441400000 | 11.6 |
| 2441450000 | 11.6 |
| 2441500000 | 11.6 |
| 2441550000 | 11.6 |
| 2441600000 | 11.6 |
| 2441650000 | 11.6 |
| 2441700000 | 11.6 |
| 2441750000 | 11.6 |
| 2441800000 | 11.6 |
| 2441850000 | 11.6 |
| 2441900000 | 11.6 |
| 2441950000 | 11.6 |
| 2442000000 | 11.6 |
| 2442050000 | 11.6 |
| 2442100000 | 11.6 |
| 2442150000 | 11.6 |
| 2442200000 | 11.6 |
| 2442250000 | 11.6 |
| 2442300000 | 11.6 |
| 2442350000 | 11.6 |
| 2442400000 | 11.6 |
| 2442450000 | 11.6 |
| 2442500000 | 11.6 |
| 2442550000 | 11.6 |
| 2442600000 | 11.6 |
| 2442650000 | 11.6 |
| 2442700000 | 11.6 |
| 2442750000 | 11.6 |
| 2442800000 | 11.6 |
| 2442850000 | 11.6 |
| 2442900000 | 11.6 |
| 2442950000 | 11.6 |
| 2443000000 | 11.6 |

## Tabulated Data for Channel 6

Frequency (Hz) Processing Gain (dB)

|            |      |
|------------|------|
| 2451000000 | 11.6 |
| 2451050000 | 11.6 |
| 2451100000 | 11.6 |
| 2451150000 | 11.6 |
| 2451200000 | 11.6 |
| 2451250000 | 11.6 |
| 2451300000 | 11.6 |
| 2451350000 | 11.6 |
| 2451400000 | 11.6 |
| 2451450000 | 11.6 |
| 2451500000 | 11.6 |
| 2451550000 | 11.6 |
| 2451600000 | 11.6 |
| 2451650000 | 11.6 |
| 2451700000 | 11.6 |
| 2451750000 | 11.6 |
| 2451800000 | 11.6 |
| 2451850000 | 11.6 |
| 2451900000 | 11.6 |
| 2451950000 | 11.6 |
| 2452000000 | 11.6 |
| 2452050000 | 11.6 |
| 2452100000 | 11.6 |
| 2452150000 | 11.6 |
| 2452200000 | 11.6 |
| 2452250000 | 11.6 |
| 2452300000 | 11.6 |
| 2452350000 | 11.6 |
| 2452400000 | 11.6 |

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|            |      |
|------------|------|
| 2452450000 | 11.6 |
| 2452500000 | 11.6 |
| 2452550000 | 11.6 |
| 2452600000 | 11.6 |
| 2452650000 | 11.6 |
| 2452700000 | 11.6 |
| 2452750000 | 11.6 |
| 2452800000 | 11.6 |
| 2452850000 | 11.6 |
| 2452900000 | 11.6 |
| 2452950000 | 11.6 |
| 2453000000 | 11.6 |
| 2453050000 | 11.6 |
| 2453100000 | 11.6 |
| 2453150000 | 11.6 |
| 2453200000 | 11.6 |
| 2453250000 | 11.6 |
| 2453300000 | 11.6 |
| 2453350000 | 11.6 |
| 2453400000 | 11.6 |
| 2453450000 | 11.6 |
| 2453500000 | 11.6 |
| 2453550000 | 11.6 |
| 2453600000 | 11.6 |
| 2453650000 | 11.6 |
| 2453700000 | 11.6 |
| 2453750000 | 11.6 |
| 2453800000 | 11.6 |
| 2453850000 | 11.6 |
| 2453900000 | 11.6 |
| 2453950000 | 11.6 |
| 2454000000 | 11.6 |
| 2454050000 | 11.6 |
| 2454100000 | 11.6 |
| 2454150000 | 11.6 |
| 2454200000 | 11.6 |
| 2454250000 | 11.6 |
| 2454300000 | 11.6 |
| 2454350000 | 11.6 |
| 2454400000 | 11.6 |
| 2454450000 | 11.6 |
| 2454500000 | 11.6 |
| 2454550000 | 11.6 |
| 2454600000 | 11.6 |
| 2454650000 | 11.6 |
| 2454700000 | 11.6 |
| 2454750000 | 11.6 |
| 2454800000 | 11.6 |
| 2454850000 | 11.6 |
| 2454900000 | 11.6 |

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|            |      |
|------------|------|
| 2454950000 | 11.6 |
| 2455000000 | 11.6 |
| 2455050000 | 11.6 |
| 2455100000 | 11.6 |
| 2455150000 | 11.6 |
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