

11 PROCESSING GAIN MEASUREMENT

11.1 Standard Applicable

According to 15.247(e), the processing gain of a direct sequence system shall be at least 10 dB. The processing gain shall be determined from the ratio in dB of the signal to noise ratio with the system spreading code turned off to the signal to noise ratio with the system spreading code turned on, as measured at the demodulated output of the receiver.

11.2 Measurement Description

The processing gain measurement is based upon the CW jamming margin method suggested in the FCC document entitled "GUIDANCE ON MEASUREMENTS FOR DIRECT SEQUENCE SPREAD SPECTRUM SYSTEMS, 54597, July 12, 1995"

The test consists of stepping a CW signal generator in 50KHz increment across pass band of each three channels within 2400 – 2483 MHz band. This CW signal represents the jamming signal. The selected three channels are as followings:

Channel 01: centered at 2412 MHz

Channel 06: centered at 2437 MHz

Channel 11: centered at 2462 MHz

These three channels represents the Low, Mid and High frequency bands of the EUT, respectively. And, the processing gain of the EUT determined for these bands should be representative of the entire band.

(1). Measurement Configuration

The measurement configuration (draw in next page) is according to FCC document 54797, page 3.

(2) Procedures

- (a) The test-firmware loaded into EUT(Tx) transmits a length of random data packet that is generated by Hp3784 BER tester. After receiving a Tx command from host PC, EUT sends a clock to synchronize with BER tester (Hp3784A).
- (b) After receiving a Rx command from host PC, the test-firmware loaded into the EUT(Rx) will force EUT enter into Rx mode. The EUT(Rx) then, demodulates received data without CRC check, sends them to BER Tester. The BER Tester checks received data and the data stored in flash ROM, then calculates BER and accumulates the result.
- (c) The remote PC acts as a command bridge between RS-232 port and PCMCIA bus.
- (d) The host PC controls RF signal generator and spectrum analyzer via GPIB interface to get an appropriate J/S ratio.
- (e) The host PC issues TX command to EUT(Tx) then issues Rx query command received, the good Rx packet counter will be increased. When a fixed number of

good Rx packets had been reached, the accumulated error bits will be read from EUT(Rx) via RS-232 and Remote PC. The J/S ratio will be re-measured at the same time.

- (f) The test program in host PC increases or decreases jamming power and repeats step (d) and (e) to get a chosen BER, then records the J/S ratio.
- (g) The test program in Host PC repeats step (f) by increasing CW jamming frequency in 50KHz step across entire pass band of each test channel.

(3) Test Condition

- (a) The test configuration and procedure are according to the FCC document 54797, page 2-3.
- (b) The pass band of each channel is 22MHz.
- (c) The received data bit length executed in Host PC is fixed to 6.29×10^6 . The chosen bit error rate (BER) is sustained to 1×10^{-5} .
- (d) The power value of Signal and Jammer listed in the test results are read and recorded automatically by the program. The value is read directly from the function of "channel power measurement" of HP8563E Spectrum analyzer with the turn-off of signal or Jammer.

(4) Derivation of the Processing Gain

- (a) The Processing Gain (G_p) is calculated according to the following equations:

$$G_p = (S/N)_o + M_j + L_{sys} \dots (4-1) \dots \text{Refer to FCC document 54797 Page 3}$$

Where $M_j = J/S$ ratio (dB)

$L_{sys} =$ System losses (assumed to be 2 dB)

$(S/N)_o =$ the required signal to noise ratio at the receiver output for a given received signal quality

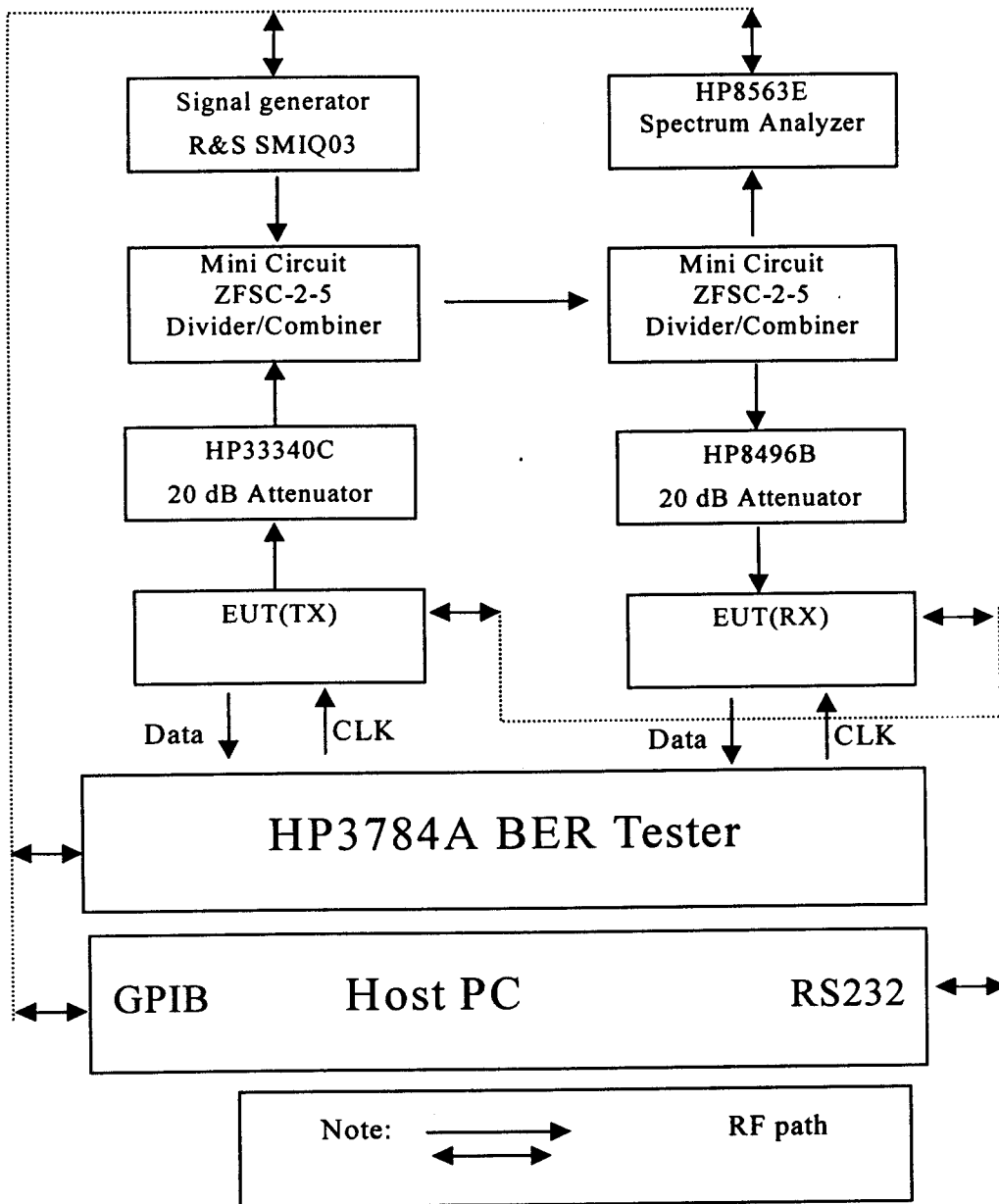
- (b) Since the EUT uses coherent DBPSK/DQPSK demodulation, A $(S/N)_o = 16.4$ dB is required to sustain a BER of 1×10^{-5} . The curve is shown in Fig.7.2, Viterbi, A.J. Principles of Coherent Communications, Page 192 (New York; McGraw-Hill, 1996), recommended by FCC document 54797.

Therefore, from equation (4-1)

$$G_p = 16.4 + J/S + 2 \text{ (dB)} = 18.4 + J/S \text{ (dB)} \dots (4-2)$$

(5) Test Results

The tested data are listed in the following pages. After discarding the worst 20% of the J/S ratio data points, the lowest remaining J/S ratio is used to determine the processing gain (PG), according to the derivative equation(4/2), of each tested channel.



11.3 Measurement Instrument

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Hewlett-Packard	HP8563E	07/04/2001
RF Signal Generator	Rohde & Schwarz	SMIQ03	11/02/2000
Attenuator	Hewlett-Packard	AP33341C 20dB	N/A
Attenuator	Hewlett-Packard	HP8496B 20dB	N/A
Combiner / Splitter	Mini Circuit	ZFSC-2-5	N/A

11.4 Measurement Data

Test Date : OCT. 31, 2000 Temperature : 22 °C Humidity: 71 %

The processing gain is greater than 10 dB, please see Appendix 7 for details.

Data Rate = 2Mbps

For BPSK channel 1, PG =12.0 (2412 MHz)

BPSK channel 6, PG =12.6 (2437 MHz)

BPSK channel 11, PG =11.9 (2462 MHz)

Data Rate = 2Mbps

For QPSK channel 1, PG =11.5 (2412 MHz)

QPSK channel 6, PG =10.6 (2437 Mhz)

QPSK channel 11, PG =11.7 (2462 MHz)

In these three channels, the processing-gain values of EUT are all greater than 10dB, which satisfies §15.247(e).

Appendix 7 : Processing Gain Tested Data Sheets

2Mbps Channel 1 Processing Gain							
Gp=(S/N) _o +M _j +L _{sys}							
Freq. (MHz)	Gp (dB)	(S/N) _o (dB)	M _j = J/S (dB)	L _{sys} (dB)	Jammer (dBm)	Lvl (dBm)	FE R
2403.50	17.4	12.6	2.8	2	-27.2	-30	5.8
2403.55	17	12.6	2.4	2	-27.6	-30	6.7
2403.60	16.7	12.6	2.1	2	-27.9	-30	6.5
2403.65	16.6	12.6	2	2	-28	-30	6
2403.70	16.5	12.6	1.9	2	-28.1	-30	6.3
2403.75	16.4	12.6	1.8	2	-28.2	-30	6.8
2403.80	16.3	12.6	1.7	2	-28.3	-30	6
2403.85	16.4	12.6	1.8	2	-28.2	-30	5.9
2403.90	16.5	12.6	1.9	2	-28.1	-30	6.4
2403.95	16.5	12.6	1.9	2	-28.1	-30	5.6
2404.00	16.6	12.6	2	2	-28	-30	6.7
2404.05	16.6	12.6	2	2	-28	-30	6.3
2404.10	16.4	12.6	1.8	2	-28.2	-30	6.2
2404.15	16.5	12.6	1.9	2	-28.1	-30	5.4
2404.20	16.5	12.6	1.9	2	-28.1	-30	5.2
2404.25	16.4	12.6	1.8	2	-28.2	-30	6
2404.30	16.3	12.6	1.7	2	-28.3	-30	5.6
2404.35	16.2	12.6	1.6	2	-28.4	-30	6.4
2404.40	16.1	12.6	1.5	2	-28.5	-30	6.2
2404.45	16	12.6	1.4	2	-28.6	-30	6.7
2404.50	15.9	12.6	1.3	2	-28.7	-30	7.3
2404.55	15.7	12.6	1.1	2	-28.9	-30	6.1
2404.60	15.5	12.6	0.9	2	-29.1	-30	5.8
2404.65	15.4	12.6	0.8	2	-29.2	-30	6.9
2404.70	15.4	12.6	0.8	2	-29.2	-30	6.3
2404.75	15.3	12.6	0.7	2	-29.3	-30	6.4
2404.80	15.3	12.6	0.7	2	-29.3	-30	5.7
2404.85	15.2	12.6	0.6	2	-29.4	-30	5.6
2404.90	15.3	12.6	0.7	2	-29.3	-30	5.4
2404.95	15.4	12.6	0.8	2	-29.2	-30	5.1
2405.00	15.4	12.6	0.8	2	-29.2	-30	4.8
2405.05	15.5	12.6	0.9	2	-29.1	-30	5.1
2405.10	15.5	12.6	0.9	2	-29.1	-30	6.3

2405.15	15.5	12.6	0.9	2	-29.1	-30	6.2
2405.20	15.6	12.6	1	2	-29	-30	5.7
2405.25	15.5	12.6	0.9	2	-29.1	-30	5.6
2405.30	15.4	12.6	0.8	2	-29.2	-30	4.7
2405.35	15.3	12.6	0.7	2	-29.3	-30	5.8
2405.40	15.3	12.6	0.7	2	-29.3	-30	6.3
2405.45	14.8	12.6	0.2	2	-29.8	-30	6.7
2405.50	15.7	12.6	1.1	2	-28.9	-30	6.5
2405.55	14.3	12.6	-0.3	2	-30.3	-30	7.3
2405.60	14.2	12.6	-0.4	2	-30.4	-30	6.2
2405.65	14.1	12.6	-0.5	2	-30.5	-30	5.1
2405.70	14.1	12.6	-0.5	2	-30.5	-30	5.5
2405.75	14.1	12.6	-0.5	2	-30.5	-30	5.7
2405.80	14.1	12.6	-0.5	2	-30.5	-30	6
2405.85	14.1	12.6	-0.5	2	-30.5	-30	5.9
2405.90	14.3	12.6	-0.3	2	-30.3	-30	6.1
2405.95	14.4	12.6	-0.2	2	-30.2	-30	7.3
2406.00	14.5	12.6	-0.1	2	-30.1	-30	7.1
2406.05	14.8	12.6	0.2	2	-29.8	-30	6.5
2406.10	15	12.6	0.4	2	-29.6	-30	6.3
2406.15	14.9	12.6	0.3	2	-29.7	-30	6.1
2406.20	15.5	12.6	0.9	2	-29.1	-30	5.5
2406.25	16	12.6	1.4	2	-28.6	-30	5.8
2406.30	17.1	12.6	2.5	2	-27.5	-30	6.6
2406.35	16.8	12.6	2.2	2	-27.8	-30	6.1
2406.40	15.9	12.6	1.3	2	-28.7	-30	6.7
2406.45	16.3	12.6	1.7	2	-28.3	-30	6.5
2406.50	16.1	12.6	1.5	2	-28.5	-30	7.6
2406.55	15.7	12.6	1.1	2	-28.9	-30	7.1
2406.60	16	12.6	1.4	2	-28.6	-30	7.3
2406.65	16.2	12.6	1.6	2	-28.4	-30	6.8
2406.70	15.8	12.6	1.2	2	-28.8	-30	6.2
2406.75	15.6	12.6	1	2	-29	-30	5.9
2406.80	15.2	12.6	0.6	2	-29.4	-30	5.6
2406.85	14.9	12.6	0.3	2	-29.7	-30	5.4
2406.90	14.2	12.6	-0.4	2	-30.4	-30	5.9

2406.95	13.8	12.6	-0.8	2	-30.8	-30	6
2407.00	13.7	12.6	-0.9	2	-30.9	-30	5.3
2407.05	13.4	12.6	-1.2	2	-31.2	-30	5.1
2407.10	13.6	12.6	-1	2	-31	-30	4.8
2407.15	13.5	12.6	-1.1	2	-31.1	-30	5.3
2407.20	13.1	12.6	-1.5	2	-31.5	-30	5.8
2407.25	13.2	12.6	-1.4	2	-31.4	-30	6.7
2407.30	13.5	12.6	-1.1	2	-31.1	-30	6.3
2407.35	13.1	12.6	-1.5	2	-31.5	-30	6.1
2407.40	13.5	12.6	-1.1	2	-31.1	-30	7.2
2407.45	13.6	12.6	-1	2	-31	-30	6.3
2407.50	13.8	12.6	-0.8	2	-30.8	-30	5.6
2407.55	14	12.6	-0.6	2	-30.6	-30	5.7
2407.60	13.8	12.6	-0.8	2	-30.8	-30	6.2
2407.65	13.7	12.6	-0.9	2	-30.9	-30	5.6
2407.70	13.8	12.6	-0.8	2	-30.8	-30	5.8
2407.75	13.8	12.6	-0.8	2	-30.8	-30	7.1
2407.80	13.7	12.6	-0.9	2	-30.9	-30	6.3
2407.85	13.7	12.6	-0.9	2	-30.9	-30	6.2
2407.90	13.7	12.6	-0.9	2	-30.9	-30	5.4
2407.95	13.6	12.6	-1	2	-31	-30	5.2
2408.00	13.6	12.6	-1	2	-31	-30	6.1
2408.05	13.3	12.6	-1.3	2	-31.3	-30	6.3
2408.10	13.1	12.6	-1.5	2	-31.5	-30	5.8
2408.15	13.1	12.6	-1.5	2	-31.5	-30	7.4
2408.20	12.9	12.6	-1.7	2	-31.7	-30	6.4
2408.25	13.1	12.6	-1.5	2	-31.5	-30	6.1
2408.30	12.8	12.6	-1.8	2	-31.8	-30	4.8
2408.35	12.8	12.6	-1.8	2	-31.8	-30	5.7
2408.40	12.8	12.6	-1.8	2	-31.8	-30	6.2
2408.45	12.9	12.6	-1.7	2	-31.7	-30	6.7
2408.50	12.9	12.6	-1.7	2	-31.7	-30	5.4
2408.55	12.8	12.6	-1.8	2	-31.8	-30	5.2
2408.60	13.1	12.6	-1.5	2	-31.5	-30	5.8
2408.65	13.2	12.6	-1.4	2	-31.4	-30	6.1
2408.70	12.8	12.6	-1.8	2	-31.8	-30	6.7

2408.75	12.8	12.6	-1.8	2	-31.8	-30	6.6
2408.80	12.9	12.6	-1.7	2	-31.7	-30	5.7
2408.85	12.7	12.6	-1.9	2	-31.9	-30	5.6
2408.90	12.7	12.6	-1.9	2	-31.9	-30	6.2
2408.95	12.5	12.6	-2.1	2	-32.1	-30	6.4
2409.00	12.4	12.6	-2.2	2	-32.2	-30	4.8
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2409.15	12.1	12.6	-2.5	2	-32.5	-30	6.1
2409.20	12.7	12.6	-1.9	2	-31.9	-30	6.2
2409.25	12.1	12.6	-2.5	2	-32.5	-30	5.8
2409.30	12.1	12.6	-2.5	2	-32.5	-30	6.7
2409.35	12.2	12.6	-2.4	2	-32.4	-30	6.2
2409.40	11.9	12.6	-2.7	2	-32.7	-30	6.3
2409.45	12.2	12.6	-2.4	2	-32.4	-30	6.6
2409.50	12.1	12.6	-2.5	2	-32.5	-30	6.5
2409.55	12	12.6	-2.6	2	-32.6	-30	6.9
2409.60	12.1	12.6	-2.5	2	-32.5	-30	7.6
2409.65	12.3	12.6	-2.3	2	-32.3	-30	6.3
2409.70	12.1	12.6	-2.5	2	-32.5	-30	5.9
2409.75	12	12.6	-2.6	2	-32.6	-30	6.4
2409.80	12.1	12.6	-2.5	2	-32.5	-30	6.1
2409.85	12.3	12.6	-2.3	2	-32.3	-30	6.2
2409.90	12	12.6	-2.6	2	-32.6	-30	5.8
2409.95	12	12.6	-2.6	2	-32.6	-30	5.3
2410.00	11.8	12.6	-2.8	2	-32.8	-30	5.6
2410.05	11.8	12.6	-2.8	2	-32.8	-30	5.5
2410.10	11.5	12.6	-3.1	2	-33.1	-30	6.3
2410.15	11.8	12.6	-2.8	2	-32.8	-30	9.8
2410.20	11.2	12.6	-3.4	2	-33.4	-30	6.6
2410.25	11.6	12.6	-3	2	-33	-30	6.1
2410.30	11.3	12.6	-3.3	2	-33.3	-30	6.7
2410.35	11.6	12.6	-3	2	-33	-30	5.7
2410.40	11.6	12.6	-3	2	-33	-30	7.6
2410.45	11.7	12.6	-2.9	2	-32.9	-30	7.2
2410.50	11.8	12.6	-2.8	2	-32.8	-30	7.1

2410.55	11.9	12.6	-2.7	2	-32.7	-30	6.8
2410.60	11.9	12.6	-2.7	2	-32.7	-30	6.3
2410.65	12	12.6	-2.6	2	-32.6	-30	6.5
2410.70	11.9	12.6	-2.7	2	-32.7	-30	6.1
2410.75	11.9	12.6	-2.7	2	-32.7	-30	6.2
2410.80	11.9	12.6	-2.7	2	-32.7	-30	6.9
2410.85	12.1	12.6	-2.5	2	-32.5	-30	6.6
2410.90	11.9	12.6	-2.7	2	-32.7	-30	6.1
2410.95	11.7	12.6	-2.9	2	-32.9	-30	6.7
2411.00	11.5	12.6	-3.1	2	-33.1	-30	6.6
2411.05	11.4	12.6	-3.2	2	-33.2	-30	6.3
2411.10	11	12.6	-3.6	2	-33.6	-30	6.8
2411.15	11.2	12.6	-3.4	2	-33.4	-30	6.1
2411.20	11	12.6	-3.6	2	-33.6	-30	6.7
2411.25	11.1	12.6	-3.5	2	-33.5	-30	6.4
2411.30	11.1	12.6	-3.5	2	-33.5	-30	4.8
2411.35	11.3	12.6	-3.3	2	-33.3	-30	5.6
2411.40	11.2	12.6	-3.4	2	-33.4	-30	6.3
2411.45	11.3	12.6	-3.3	2	-33.3	-30	6.7
2411.50	11.6	12.6	-3	2	-33	-30	6.2
2411.55	12.4	12.6	-2.2	2	-32.2	-30	6.8
2411.60	12.6	12.6	-2	2	-32	-30	6.3
2411.65	12.8	12.6	-1.8	2	-31.8	-30	5.9
2411.70	13.7	12.6	-0.9	2	-30.9	-30	6
2411.75	16	12.6	1.4	2	-28.6	-30	5.7
2411.80	16.4	12.6	1.8	2	-28.2	-30	7.9
2411.85	16.3	12.6	1.7	2	-28.3	-30	6.4
2411.90	16.6	12.6	2	2	-28	-30	4.8
2411.95	16.8	12.6	2.2	2	-27.8	-30	6.9
2412.00	16.5	12.6	1.9	2	-28.1	-30	5.4
2412.05	15.8	12.6	1.2	2	-28.8	-30	6.5
2412.10	15.7	12.6	1.1	2	-28.9	-30	7.6
2412.15	15.4	12.6	0.8	2	-29.2	-30	7.1
2412.20	15.2	12.6	0.6	2	-29.4	-30	6.7
2412.25	14.3	12.6	-0.3	2	-30.3	-30	5.6
2412.30	13	12.6	-1.6	2	-31.6	-30	7.4

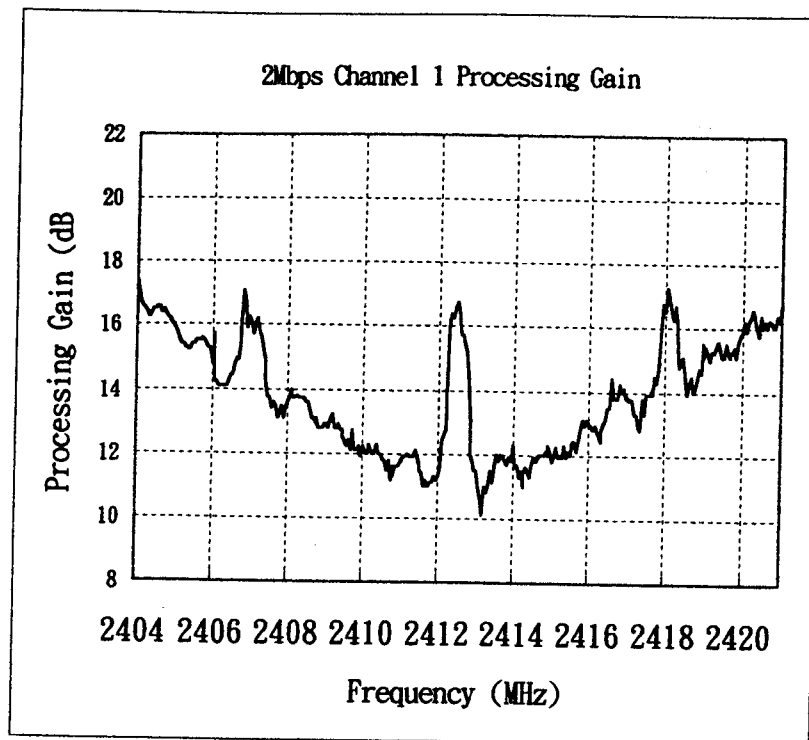
2412.35	12	12.6	-2.6	2	-32.6	-30	6.8
2412.40	11.8	12.6	-2.8	2	-32.8	-30	6.3
2412.45	11.5	12.6	-3.1	2	-33.1	-30	5.9
2412.50	11.5	12.6	-3.1	2	-33.1	-30	6.2
2412.55	10.9	12.6	-3.7	2	-33.7	-30	7.1
2412.60	10.6	12.6	-4	2	-34	-30	7.3
2412.65	10.1	12.6	-4.5	2	-34.5	-30	7.4
2412.70	11	12.6	-3.6	2	-33.6	-30	6.8
2412.75	10.8	12.6	-3.8	2	-33.8	-30	5.8
2412.80	11.1	12.6	-3.5	2	-33.5	-30	6.7
2412.85	11.5	12.6	-3.1	2	-33.1	-30	6.6
2412.90	11.1	12.6	-3.5	2	-33.5	-30	6.9
2412.95	11.7	12.6	-2.9	2	-32.9	-30	7
2413.00	12	12.6	-2.6	2	-32.6	-30	7.6
2413.05	11.9	12.6	-2.7	2	-32.7	-30	6.3
2413.10	11.8	12.6	-2.8	2	-32.8	-30	5.2
2413.15	12	12.6	-2.6	2	-32.6	-30	5.4
2413.20	11.9	12.6	-2.7	2	-32.7	-30	4.6
2413.25	11.8	12.6	-2.8	2	-32.8	-30	5.6
2413.30	11.7	12.6	-2.9	2	-32.9	-30	7.4
2413.35	11.9	12.6	-2.7	2	-32.7	-30	6.8
2413.40	11.8	12.6	-2.8	2	-32.8	-30	6.3
2413.45	12.3	12.6	-2.3	2	-32.3	-30	5.9
2413.50	11.6	12.6	-3	2	-33	-30	6.2
2413.55	11.7	12.6	-2.9	2	-32.9	-30	7.1
2413.60	11.3	12.6	-3.3	2	-33.3	-30	7.3
2413.65	11.5	12.6	-3.1	2	-33.1	-30	7.4
2413.70	11	12.6	-3.6	2	-33.6	-30	6.1
2413.75	11.4	12.6	-3.2	2	-33.2	-30	5.8
2413.80	11.6	12.6	-3	2	-33	-30	6.7
2413.85	11.5	12.6	-3.1	2	-33.1	-30	5.3
2413.90	11.3	12.6	-3.3	2	-33.3	-30	5.8
2413.95	11.7	12.6	-2.9	2	-32.9	-30	6.3
2414.00	11.9	12.6	-2.7	2	-32.7	-30	6.7
2414.05	11.8	12.6	-2.8	2	-32.8	-30	6.2
2414.10	11.9	12.6	-2.7	2	-32.7	-30	5.6

2414.15	12	12.6	-2.6	2	-32.6	-30	6.3
2414.20	12	12.6	-2.6	2	-32.6	-30	6.8
2414.25	12	12.6	-2.6	2	-32.6	-30	6.1
2414.30	12.1	12.6	-2.5	2	-32.5	-30	6.9
2414.35	12	12.6	-2.6	2	-32.6	-30	6.2
2414.40	12.3	12.6	-2.3	2	-32.3	-30	5.9
2414.45	12.1	12.6	-2.5	2	-32.5	-30	6.1
2414.50	11.8	12.6	-2.8	2	-32.8	-30	5.7
2414.55	12	12.6	-2.6	2	-32.6	-30	6.6
2414.60	12.2	12.6	-2.4	2	-32.4	-30	4.8
2414.65	11.9	12.6	-2.7	2	-32.7	-30	5
2414.70	12	12.6	-2.6	2	-32.6	-30	4.4
2414.75	11.9	12.6	-2.7	2	-32.7	-30	5.8
2414.80	12.3	12.6	-2.3	2	-32.3	-30	7.1
2414.85	11.9	12.6	-2.7	2	-32.7	-30	4.8
2414.90	12.1	12.6	-2.5	2	-32.5	-30	5.7
2414.95	12	12.6	-2.6	2	-32.6	-30	6.5
2415.00	12.4	12.6	-2.2	2	-32.2	-30	5.8
2415.05	12.3	12.6	-2.3	2	-32.3	-30	6.7
2415.10	12.4	12.6	-2.2	2	-32.2	-30	6.6
2415.15	12.1	12.6	-2.5	2	-32.5	-30	6.1
2415.20	12.5	12.6	-2.1	2	-32.1	-30	5.9
2415.25	12.8	12.6	-1.8	2	-31.8	-30	6.2
2415.30	13.1	12.6	-1.5	2	-31.5	-30	5.6
2415.35	12.9	12.6	-1.7	2	-31.7	-30	6.8
2415.40	13.1	12.6	-1.5	2	-31.5	-30	6.3
2415.45	13	12.6	-1.6	2	-31.6	-30	5.9
2415.50	12.9	12.6	-1.7	2	-31.7	-30	5.7
2415.55	12.8	12.6	-1.8	2	-31.8	-30	6.3
2415.60	12.9	12.6	-1.7	2	-31.7	-30	6
2415.65	12.8	12.6	-1.8	2	-31.8	-30	6.1
2415.70	12.6	12.6	-2	2	-32	-30	5.7
2415.75	12.4	12.6	-2.2	2	-32.2	-30	5.9
2415.80	12.8	12.6	-1.8	2	-31.8	-30	5.5
2415.85	13	12.6	-1.6	2	-31.6	-30	5.3
2415.90	13.1	12.6	-1.5	2	-31.5	-30	5.4

2415.95	13.5	12.6	-1.1	2	-31.1	-30	5.1
2416.00	13.5	12.6	-1.1	2	-31.1	-30	5.4
2416.05	14.4	12.6	-0.2	2	-30.2	-30	6.3
2416.10	13.8	12.6	-0.8	2	-30.8	-30	7.6
2416.15	13.8	12.6	-0.8	2	-30.8	-30	7.1
2416.20	13.8	12.6	-0.8	2	-30.8	-30	7
2416.25	14.2	12.6	-0.4	2	-30.4	-30	6.3
2416.30	14	12.6	-0.6	2	-30.6	-30	5.4
2416.35	14.1	12.6	-0.5	2	-30.5	-30	5.8
2416.40	13.8	12.6	-0.8	2	-30.8	-30	6.2
2416.45	13.9	12.6	-0.7	2	-30.7	-30	7
2416.50	13.7	12.6	-0.9	2	-30.9	-30	6.3
2416.55	13.8	12.6	-0.8	2	-30.8	-30	6.9
2416.60	13.7	12.6	-0.9	2	-30.9	-30	5.7
2416.65	13.3	12.6	-1.3	2	-31.3	-30	5.2
2416.70	13.3	12.6	-1.3	2	-31.3	-30	7.1
2416.75	13	12.6	-1.6	2	-31.6	-30	6.7
2416.80	12.8	12.6	-1.8	2	-31.8	-30	6.3
2416.85	13.8	12.6	-0.8	2	-30.8	-30	6.4
2416.90	13.3	12.6	-1.3	2	-31.3	-30	6.8
2416.95	13.9	12.6	-0.7	2	-30.7	-30	7
2417.00	13.9	12.6	-0.7	2	-30.7	-30	6.3
2417.05	13.9	12.6	-0.7	2	-30.7	-30	6.7
2417.10	14.1	12.6	-0.5	2	-30.5	-30	6
2417.15	13.9	12.6	-0.7	2	-30.7	-30	6.3
2417.20	14.5	12.6	-0.1	2	-30.1	-30	6.6
2417.25	14.3	12.6	-0.3	2	-30.3	-30	7.2
2417.30	14.8	12.6	0.2	2	-29.8	-30	6.1
2417.35	16	12.6	1.4	2	-28.6	-30	6.4
2417.40	16.8	12.6	2.2	2	-27.8	-30	6.9
2417.45	16.5	12.6	1.9	2	-28.1	-30	6.8
2417.50	17.3	12.6	2.7	2	-27.3	-30	7.1
2417.55	16.9	12.6	2.3	2	-27.7	-30	6.3
2417.60	16.6	12.6	2	2	-28	-30	5.8
2417.65	16.3	12.6	1.7	2	-28.3	-30	6.5
2417.70	16.7	12.6	2.1	2	-27.9	-30	6.3

2417.75	16.1	12.6	1.5	2	-28.5	-30	5.7
2417.80	15.8	12.6	1.2	2	-28.8	-30	5.9
2417.85	14.8	12.6	0.2	2	-29.8	-30	6.1
2417.90	15	12.6	0.4	2	-29.6	-30	6
2417.95	15.1	12.6	0.5	2	-29.5	-30	6.3
2418.00	14.4	12.6	-0.2	2	-30.2	-30	5.9
2418.05	13.9	12.6	-0.7	2	-30.7	-30	6.5
2418.10	14.2	12.6	-0.4	2	-30.4	-30	7.1
2418.15	14.5	12.6	-0.1	2	-30.1	-30	6.7
2418.20	14	12.6	-0.6	2	-30.6	-30	6
2418.25	14.1	12.6	-0.5	2	-30.5	-30	6.4
2418.30	14.4	12.6	-0.2	2	-30.2	-30	6.6
2418.35	14.7	12.6	0.1	2	-29.9	-30	6.3
2418.40	14.6	12.6	0	2	-30	-30	6.2
2418.45	15.5	12.6	0.9	2	-29.1	-30	5.9
2418.50	15.1	12.6	0.5	2	-29.5	-30	6.2
2418.55	15.4	12.6	0.8	2	-29.2	-30	5.8
2418.60	15.2	12.6	0.6	2	-29.4	-30	5.6
2418.65	15	12.6	0.4	2	-29.6	-30	4.9
2418.70	15.3	12.6	0.7	2	-29.3	-30	5
2418.75	15.2	12.6	0.6	2	-29.4	-30	5.3
2418.80	15.4	12.6	0.8	2	-29.2	-30	5.7
2418.85	15.6	12.6	1	2	-29	-30	6
2418.90	15.4	12.6	0.8	2	-29.2	-30	6.2
2418.95	15.1	12.6	0.5	2	-29.5	-30	6
2419.00	15.1	12.6	0.5	2	-29.5	-30	6.1
2419.05	15.5	12.6	0.9	2	-29.1	-30	5.8
2419.10	15.3	12.6	0.7	2	-29.3	-30	5.6
2419.15	15.1	12.6	0.5	2	-29.5	-30	5.7
2419.20	15.3	12.6	0.7	2	-29.3	-30	5.2
2419.25	15.2	12.6	0.6	2	-29.4	-30	5.8
2419.30	15.4	12.6	0.8	2	-29.2	-30	6.4
2419.35	15.1	12.6	0.5	2	-29.5	-30	9.9
2419.40	15.6	12.6	1	2	-29	-30	7.4
2419.45	15.8	12.6	1.2	2	-28.8	-30	6.3
2419.50	15.9	12.6	1.3	2	-28.7	-30	5.6

2419.55	16.2	12.6	1.6	2	-28.4	-30	6.4
2419.60	15.9	12.6	1.3	2	-28.7	-30	7.6
2419.65	16.3	12.6	1.7	2	-28.3	-30	6.8
2419.70	16.4	12.6	1.8	2	-28.2	-30	6.6
2419.75	16.6	12.6	2	2	-28	-30	6.2
2419.80	16.4	12.6	1.8	2	-28.2	-30	6.8
2419.85	16.3	12.6	1.7	2	-28.3	-30	6.5
2419.90	16	12.6	1.4	2	-28.6	-30	6.3
2419.95	15.8	12.6	1.2	2	-28.8	-30	6.9
2420.00	16.4	12.6	1.8	2	-28.2	-30	7.3
2420.05	16	12.6	1.4	2	-28.6	-30	6.6
2420.10	16.2	12.6	1.6	2	-28.4	-30	6.8
2420.15	16	12.6	1.4	2	-28.6	-30	5.1
2420.20	16.3	12.6	1.7	2	-28.3	-30	6.3
2420.25	16.2	12.6	1.6	2	-28.4	-30	7.1
2420.30	16.1	12.6	1.5	2	-28.5	-30	6.6
2420.35	16.1	12.6	1.5	2	-28.5	-30	6.1
2420.40	16.4	12.6	1.8	2	-28.2	-30	5.7
2420.45	16.2	12.6	1.6	2	-28.4	-30	6.4
2420.50	16.7	12.6	2.1	2	-27.9	-30	6.2
Processing Gain (dB) @20th Percentile=				12			



2Mbps Channel 6 Processing Gain							
$G_p = (S/N)_o + M_j + L_{sys}$							
Freq. (MHz)	G_p (dB)	$(S/N)_o$ (dB)	$M_j = J/S$ (dB)	L_{sys} (dB)	Jammer (dBm)	Lvl (dBm)	FE R
2428.50	18.3	12.6	3.7	2	-28.5	-32.2	7
2428.55	17.5	12.6	2.9	2	-29.3	-32.2	6.8
2428.60	18.6	12.6	4	2	-28.2	-32.2	6.5
2428.65	18.5	12.6	3.9	2	-28.3	-32.2	6.7
2428.70	18.4	12.6	3.8	2	-28.4	-32.2	7.5
2428.75	18.4	12.6	3.8	2	-28.4	-32.2	7.2
2428.80	18.4	12.6	3.8	2	-28.4	-32.2	7.4
2428.85	18.5	12.6	3.9	2	-28.3	-32.2	7.6
2428.90	18.3	12.6	3.7	2	-28.5	-32.2	7.5
2428.95	18.3	12.6	3.7	2	-28.5	-32.2	6.5
2429.00	18.2	12.6	3.6	2	-28.6	-32.2	6.3
2429.05	18.1	12.6	3.5	2	-28.7	-32.2	5.9
2429.10	17.9	12.6	3.3	2	-28.9	-32.2	6.5
2429.15	17.7	12.6	3.1	2	-29.1	-32.2	6
2429.20	17.6	12.6	3	2	-29.2	-32.2	5.7
2429.25	17.5	12.6	2.9	2	-29.3	-32.2	5.8
2429.30	17.4	12.6	2.8	2	-29.4	-32.2	6.8
2429.35	17.33	12.6	2.73	2	-29.47	-32.2	6.2
2429.40	17.3	12.6	2.7	2	-29.5	-32.2	7
2429.45	17.2	12.6	2.6	2	-29.6	-32.2	6.4
2429.50	17	12.6	2.4	2	-29.8	-32.2	7.3
2429.55	16.9	12.6	2.3	2	-29.9	-32.2	5.8
2429.60	16.8	12.6	2.2	2	-30	-32.2	5.1
2429.65	16.7	12.6	2.1	2	-30.1	-32.2	6.3
2429.70	16.6	12.6	2	2	-30.2	-32.2	6.9
2429.75	16.6	12.6	2	2	-30.2	-32.2	7
2429.80	16.5	12.6	1.9	2	-30.3	-32.2	5.4
2429.85	16.5	12.6	1.9	2	-30.3	-32.2	7.1
2429.90	16.6	12.6	2	2	-30.2	-32.2	7.6
2429.95	16.5	12.6	1.9	2	-30.3	-32.2	6.8
2430.00	16.6	12.6	2	2	-30.2	-32.2	6.8
2430.05	16.6	12.6	2	2	-30.2	-32.2	6.2

2430.10	16.6	12.6	2	2	-30.2	-32.2	5.6
2430.15	16.7	12.6	2.1	2	-30.1	-32.2	6.3
2430.20	16.8	12.6	2.2	2	-30	-32.2	6.7
2430.25	16.6	12.6	2	2	-30.2	-32.2	4.8
2430.30	16.6	12.6	2	2	-30.2	-32.2	5.6
2430.35	16.5	12.6	1.9	2	-30.3	-32.2	5.1
2430.40	16.4	12.6	1.8	2	-30.4	-32.2	7
2430.45	16.3	12.6	1.7	2	-30.5	-32.2	5.3
2430.50	16.2	12.6	1.6	2	-30.6	-32.2	6.7
2430.55	15.8	12.6	1.2	2	-31	-32.2	7.3
2430.60	15.6	12.6	1	2	-31.2	-32.2	5.7
2430.65	15.6	12.6	1	2	-31.2	-32.2	6.4
2430.70	15.5	12.6	0.9	2	-31.3	-32.2	5.9
2430.75	15.4	12.6	0.8	2	-31.4	-32.2	5.7
2430.80	15.3	12.6	0.7	2	-31.5	-32.2	5.6
2430.85	15.1	12.6	0.5	2	-31.7	-32.2	5.7
2430.90	15.1	12.6	0.5	2	-31.7	-32.2	5.6
2430.95	15.3	12.6	0.7	2	-31.5	-32.2	6
2431.00	15.6	12.6	1	2	-31.2	-32.2	7.6
2431.05	15.7	12.6	1.1	2	-31.1	-32.2	6.4
2431.10	15.7	12.6	1.1	2	-31.1	-32.2	5.3
2431.15	15.9	12.6	1.3	2	-30.9	-32.2	5.9
2431.20	16.6	12.6	2	2	-30.2	-32.2	6.1
2431.25	16.5	12.6	1.9	2	-30.3	-32.2	6.3
2431.30	16.3	12.6	1.7	2	-30.5	-32.2	5.7
2431.35	16.2	12.6	1.6	2	-30.6	-32.2	6.4
2431.40	16	12.6	1.4	2	-30.8	-32.2	7.2
2431.45	15.8	12.6	1.2	2	-31	-32.2	7.3
2431.50	15.6	12.6	1	2	-31.2	-32.2	6.2
2431.55	15.8	12.6	1.2	2	-31	-32.2	6.3
2431.60	15.8	12.6	1.2	2	-31	-32.2	6.5
2431.65	15.4	12.6	0.8	2	-31.4	-32.2	6.7
2431.70	15.2	12.6	0.6	2	-31.6	-32.2	6.8
2431.75	15.4	12.6	0.8	2	-31.4	-32.2	7.1
2431.80	15.2	12.6	0.6	2	-31.6	-32.2	5.8
2431.85	15	12.6	0.4	2	-31.8	-32.2	5.9

2431.90	14.8	12.6	0.2	2	-32	-32.2	5.6
2431.95	15	12.6	0.4	2	-31.8	-32.2	6.2
2432.00	14.8	12.6	0.2	2	-32	-32.2	6.3
2432.05	14.6	12.6	0	2	-32.2	-32.2	6
2432.10	14.3	12.6	-0.3	2	-32.5	-32.2	7.5
2432.15	14.2	12.6	-0.4	2	-32.6	-32.2	6.8
2432.20	14.1	12.6	-0.5	2	-32.7	-32.2	7.4
2432.25	14.2	12.6	-0.4	2	-32.6	-32.2	7.1
2432.30	14.3	12.6	-0.3	2	-32.5	-32.2	7.7
2432.35	14.4	12.6	-0.2	2	-32.4	-32.2	7.3
2432.40	14.4	12.6	-0.2	2	-32.4	-32.2	6
2432.45	14.6	12.6	0	2	-32.2	-32.2	5.4
2432.50	14.7	12.6	0.1	2	-32.1	-32.2	6.1
2432.55	14.6	12.6	0	2	-32.2	-32.2	7.1
2432.60	14.4	12.6	-0.2	2	-32.4	-32.2	5.7
2432.65	15	12.6	0.4	2	-31.8	-32.2	6.1
2432.70	14.8	12.6	0.2	2	-32	-32.2	5.6
2432.75	14.9	12.6	0.3	2	-31.9	-32.2	6.3
2432.80	14.8	12.6	0.2	2	-32	-32.2	5.7
2432.85	14.8	12.6	0.2	2	-32	-32.2	5.8
2432.90	14.7	12.6	0.1	2	-32.1	-32.2	7.3
2432.95	14.4	12.6	-0.2	2	-32.4	-32.2	5.9
2433.00	14	12.6	-0.6	2	-32.8	-32.2	7.4
2433.05	13.9	12.6	-0.7	2	-32.9	-32.2	6.3
2433.10	13.7	12.6	-0.9	2	-33.1	-32.2	5.7
2433.15	13.5	12.6	-1.1	2	-33.3	-32.2	6.8
2433.20	13.5	12.6	-1.1	2	-33.3	-32.2	6.3
2433.25	13.6	12.6	-1	2	-33.2	-32.2	6.2
2433.30	13.7	12.6	-0.9	2	-33.1	-32.2	5.2
2433.35	13.7	12.6	-0.9	2	-33.1	-32.2	5.8
2433.40	13.8	12.6	-0.8	2	-33	-32.2	4.5
2433.45	13.7	12.6	-0.9	2	-33.1	-32.2	6.2
2433.50	13.8	12.6	-0.8	2	-33	-32.2	5.6
2433.55	13.9	12.6	-0.7	2	-32.9	-32.2	5.7
2433.60	14	12.6	-0.6	2	-32.8	-32.2	5.4
2433.65	13.9	12.6	-0.7	2	-32.9	-32.2	6

2433.70	13.8	12.6	-0.8	2	-33	-32.2	5.6
2433.75	13.7	12.6	-0.9	2	-33.1	-32.2	6.3
2433.80	13.6	12.6	-1	2	-33.2	-32.2	6.3
2433.85	13.5	12.6	-1.1	2	-33.3	-32.2	6.4
2433.90	13.4	12.6	-1.2	2	-33.4	-32.2	5.5
2433.95	13.3	12.6	-1.3	2	-33.5	-32.2	5.8
2434.00	13.2	12.6	-1.4	2	-33.6	-32.2	5.6
2434.05	14.2	12.6	-0.4	2	-32.6	-32.2	5.7
2434.10	13	12.6	-1.6	2	-33.8	-32.2	5.7
2434.15	13	12.6	-1.6	2	-33.8	-32.2	5.9
2434.20	12.8	12.6	-1.8	2	-34	-32.2	5.6
2434.25	14.2	12.6	-0.4	2	-32.6	-32.2	6.1
2434.30	13.9	12.6	-0.7	2	-32.9	-32.2	6.4
2434.35	13.8	12.6	-0.8	2	-33	-32.2	6.3
2434.40	12.8	12.6	-1.8	2	-34	-32.2	5.6
2434.45	13	12.6	-1.6	2	-33.8	-32.2	6.4
2434.50	13	12.6	-1.6	2	-33.8	-32.2	6.6
2434.55	12.9	12.6	-1.7	2	-33.9	-32.2	4.9
2434.60	13	12.6	-1.6	2	-33.8	-32.2	5.7
2434.65	12.9	12.6	-1.7	2	-33.9	-32.2	4.8
2434.70	12.8	12.6	-1.8	2	-34	-32.2	6.2
2434.75	12.9	12.6	-1.7	2	-33.9	-32.2	5.1
2434.80	12.9	12.6	-1.7	2	-33.9	-32.2	6.3
2434.85	12.9	12.6	-1.7	2	-33.9	-32.2	5.8
2434.90	12.8	12.6	-1.8	2	-34	-32.2	6.1
2434.95	12.6	12.6	-2	2	-34.2	-32.2	5.7
2435.00	12.4	12.6	-2.2	2	-34.4	-32.2	6.8
2435.05	12.3	12.6	-2.3	2	-34.5	-32.2	6.1
2435.10	12	12.6	-2.6	2	-34.8	-32.2	6.4
2435.15	11.8	12.6	-2.8	2	-35	-32.2	6.3
2435.20	11.8	12.6	-2.8	2	-35	-32.2	5.6
2435.25	12	12.6	-2.6	2	-34.8	-32.2	6.4
2435.30	12	12.6	-2.6	2	-34.8	-32.2	5.3
2435.35	12.1	12.6	-2.5	2	-34.7	-32.2	5.7
2435.40	12.1	12.6	-2.5	2	-34.7	-32.2	5.7
2435.45	12.3	12.6	-2.3	2	-34.5	-32.2	5.8

2435.50	12.4	12.6	-2.2	2	-34.4	-32.2	7
2435.55	12.6	12.6	-2	2	-34.2	-32.2	6
2435.60	12.7	12.6	-1.9	2	-34.1	-32.2	6.4
2435.65	12.6	12.6	-2	2	-34.2	-32.2	6.3
2435.70	12.6	12.6	-2	2	-34.2	-32.2	6.7
2435.75	12.6	12.6	-2	2	-34.2	-32.2	6.5
2435.80	12.6	12.6	-2	2	-34.2	-32.2	7.3
2435.85	11.7	12.6	-2.9	2	-35.1	-32.2	5.7
2435.90	12.6	12.6	-2	2	-34.2	-32.2	6
2435.95	11.9	12.6	-2.7	2	-34.9	-32.2	7.1
2436.00	12.1	12.6	-2.5	2	-34.7	-32.2	6.7
2436.05	11.8	12.6	-2.8	2	-35	-32.2	7.4
2436.10	11.5	12.6	-3.1	2	-35.3	-32.2	6.9
2436.15	11.4	12.6	-3.2	2	-35.4	-32.2	6.8
2436.20	11.3	12.6	-3.3	2	-35.5	-32.2	5.2
2436.25	11.4	12.6	-3.2	2	-35.4	-32.2	5.6
2436.30	11.4	12.6	-3.2	2	-35.4	-32.2	5.4
2436.35	11.6	12.6	-3	2	-35.2	-32.2	6.1
2436.40	11.6	12.6	-3	2	-35.2	-32.2	5.2
2436.45	12	12.6	-2.6	2	-34.8	-32.2	6.3
2436.50	12.2	12.6	-2.4	2	-34.6	-32.2	5.2
2436.55	13.3	12.6	-1.3	2	-33.5	-32.2	5.7
2436.60	14.9	12.6	0.3	2	-31.9	-32.2	6.8
2436.65	14.8	12.6	0.2	2	-32	-32.2	5.3
2436.70	14.7	12.6	0.1	2	-32.1	-32.2	6.2
2436.75	15.4	12.6	0.8	2	-31.4	-32.2	6.1
2436.80	15.7	12.6	1.1	2	-31.1	-32.2	3.2
2436.85	16.6	12.6	2	2	-30.2	-32.2	4.2
2436.90	17.3	12.6	2.7	2	-29.5	-32.2	4.8
2436.95	17.5	12.6	2.9	2	-29.3	-32.2	5.5
2437.00	17.6	12.6	3	2	-29.2	-32.2	7.4
2437.05	17.5	12.6	2.9	2	-29.3	-32.2	5.2
2437.10	17.1	12.6	2.5	2	-29.7	-32.2	5.4
2437.15	16.9	12.6	2.3	2	-29.9	-32.2	5.3
2437.20	15.5	12.6	0.9	2	-31.3	-32.2	5.3
2437.25	15.2	12.6	0.6	2	-31.6	-32.2	6.2

2437.30	14.1	12.6	-0.5	2	-32.7	-32.2	5.2
2437.35	12.3	12.6	-2.3	2	-34.5	-32.2	6.7
2437.40	12.8	12.6	-1.8	2	-34	-32.2	4.8
2437.45	12.4	12.6	-2.2	2	-34.4	-32.2	6.8
2437.50	12	12.6	-2.6	2	-34.8	-32.2	6.1
2437.55	11.8	12.6	-2.8	2	-35	-32.2	7.1
2437.60	11.5	12.6	-3.1	2	-35.3	-32.2	6.3
2437.65	11.3	12.6	-3.3	2	-35.5	-32.2	7.3
2437.70	11.1	12.6	-3.5	2	-35.7	-32.2	6.6
2437.75	11.6	12.6	-3	2	-35.2	-32.2	5.8
2437.80	11.3	12.6	-3.3	2	-35.5	-32.2	5.4
2437.85	11.5	12.6	-3.1	2	-35.3	-32.2	5.4
2437.90	11.7	12.6	-2.9	2	-35.1	-32.2	6.3
2437.95	11.8	12.6	-2.8	2	-35	-32.2	5.3
2438.00	12	12.6	-2.6	2	-34.8	-32.2	5.2
2438.05	11.9	12.6	-2.7	2	-34.9	-32.2	6.6
2438.10	12.1	12.6	-2.5	2	-34.7	-32.2	5.7
2438.15	11.8	12.6	-2.8	2	-35	-32.2	6
2438.20	12.5	12.6	-2.1	2	-34.3	-32.2	6
2438.25	12.6	12.6	-2	2	-34.2	-32.2	7.1
2438.30	12.7	12.6	-1.9	2	-34.1	-32.2	6.2
2438.35	12.6	12.6	-2	2	-34.2	-32.2	5.9
2438.40	12.4	12.6	-2.2	2	-34.4	-32.2	5.3
2438.45	12.3	12.6	-2.3	2	-34.5	-32.2	6.1
2438.50	11.8	12.6	-2.8	2	-35	-32.2	6.5
2438.55	12	12.6	-2.6	2	-34.8	-32.2	6.3
2438.60	11.8	12.6	-2.8	2	-35	-32.2	7
2438.65	11.7	12.6	-2.9	2	-35.1	-32.2	4.8
2438.70	11.2	12.6	-3.4	2	-35.6	-32.2	5.4
2438.75	11.5	12.6	-3.1	2	-35.3	-32.2	5.7
2438.80	11.9	12.6	-2.7	2	-34.9	-32.2	6.9
2438.85	12.1	12.6	-2.5	2	-34.7	-32.2	7
2438.90	12.2	12.6	-2.4	2	-34.6	-32.2	7
2438.95	12.3	12.6	-2.3	2	-34.5	-32.2	5.8
2439.00	12.4	12.6	-2.2	2	-34.4	-32.2	7.3
2439.05	12.4	12.6	-2.2	2	-34.4	-32.2	5.3

2439.10	12.5	12.6	-2.1	2	-34.3	-32.2	4.9
2439.15	12.6	12.6	-2	2	-34.2	-32.2	5.3
2439.20	12.6	12.6	-2	2	-34.2	-32.2	5.1
2439.25	12.8	12.6	-1.8	2	-34	-32.2	5.6
2439.30	12.7	12.6	-1.9	2	-34.1	-32.2	6.8
2439.35	12.8	12.6	-1.8	2	-34	-32.2	5.3
2439.40	12.7	12.6	-1.9	2	-34.1	-32.2	7.4
2439.45	12.7	12.6	-1.9	2	-34.1	-32.2	7.9
2439.50	12.6	12.6	-2	2	-34.2	-32.2	6.6
2439.55	12.6	12.6	-2	2	-34.2	-32.2	6.3
2439.60	12.5	12.6	-2.1	2	-34.3	-32.2	5.7
2439.65	12.5	12.6	-2.1	2	-34.3	-32.2	5.7
2439.70	12.4	12.6	-2.2	2	-34.4	-32.2	7.2
2439.75	12.4	12.6	-2.2	2	-34.4	-32.2	7.3
2439.80	12.5	12.6	-2.1	2	-34.3	-32.2	7
2439.85	12.8	12.6	-1.8	2	-34	-32.2	6.8
2439.90	12.8	12.6	-1.8	2	-34	-32.2	6.6
2439.95	12.9	12.6	-1.7	2	-33.9	-32.2	6.2
2440.00	12.8	12.6	-1.8	2	-34	-32.2	5.6
2440.05	12.9	12.6	-1.7	2	-33.9	-32.2	5.8
2440.10	12.8	12.6	-1.8	2	-34	-32.2	6.7
2440.15	13.5	12.6	-1.1	2	-33.3	-32.2	6.3
2440.20	13.3	12.6	-1.3	2	-33.5	-32.2	6.3
2440.25	13.4	12.6	-1.2	2	-33.4	-32.2	5.9
2440.30	13.6	12.6	-1	2	-33.2	-32.2	5.4
2440.35	13.5	12.6	-1.1	2	-33.3	-32.2	5.3
2440.40	13.4	12.6	-1.2	2	-33.4	-32.2	7.3
2440.45	13.5	12.6	-1.1	2	-33.3	-32.2	5.7
2440.50	13.6	12.6	-1	2	-33.2	-32.2	5.9
2440.55	13.5	12.6	-1.1	2	-33.3	-32.2	6.1
2440.60	13.4	12.6	-1.2	2	-33.4	-32.2	6.3
2440.65	13.4	12.6	-1.2	2	-33.4	-32.2	5.8
2440.70	13.4	12.6	-1.2	2	-33.4	-32.2	5.4
2440.75	13.6	12.6	-1	2	-33.2	-32.2	5.6
2440.80	13.6	12.6	-1	2	-33.2	-32.2	5
2440.85	13.7	12.6	-0.9	2	-33.1	-32.2	7.3

2440.90	13.7	12.6	-0.9	2	-33.1	-32.2	6.3
2440.95	14.1	12.6	-0.5	2	-32.7	-32.2	5.8
2441.00	14.1	12.6	-0.5	2	-32.7	-32.2	7.2
2441.05	14.3	12.6	-0.3	2	-32.5	-32.2	5.9
2441.10	14.3	12.6	-0.3	2	-32.5	-32.2	6
2441.15	14.8	12.6	0.2	2	-32	-32.2	5.8
2441.20	14.7	12.6	0.1	2	-32.1	-32.2	6.2
2441.25	14.6	12.6	0	2	-32.2	-32.2	6.1
2441.30	14.5	12.6	-0.1	2	-32.3	-32.2	5.2
2441.35	14.7	12.6	0.1	2	-32.1	-32.2	5.3
2441.40	14.8	12.6	0.2	2	-32	-32.2	7.3
2441.45	14.8	12.6	0.2	2	-32	-32.2	7.1
2441.50	14.8	12.6	0.2	2	-32	-32.2	6.6
2441.55	14.6	12.6	0	2	-32.2	-32.2	6.8
2441.60	14.3	12.6	-0.3	2	-32.5	-32.2	6.7
2441.65	14.3	12.6	-0.3	2	-32.5	-32.2	4.9
2441.70	14	12.6	-0.6	2	-32.8	-32.2	6.3
2441.75	13.9	12.6	-0.7	2	-32.9	-32.2	5.1
2441.80	13.8	12.6	-0.8	2	-33	-32.2	6.4
2441.85	13.9	12.6	-0.7	2	-32.9	-32.2	5.3
2441.90	14	12.6	-0.6	2	-32.8	-32.2	5.8
2441.95	14.7	12.6	0.1	2	-32.1	-32.2	5.7
2442.00	14.4	12.6	-0.2	2	-32.4	-32.2	5.3
2442.05	14.8	12.6	0.2	2	-32	-32.2	5.1
2442.10	14.8	12.6	0.2	2	-32	-32.2	6.1
2442.15	15.2	12.6	0.6	2	-31.6	-32.2	5.8
2442.20	15.7	12.6	1.1	2	-31.1	-32.2	4.9
2442.25	16	12.6	1.4	2	-30.8	-32.2	5.7
2442.30	16.6	12.6	2	2	-30.2	-32.2	5.8
2442.35	16.4	12.6	1.8	2	-30.4	-32.2	5.9
2442.40	16.52	12.6	1.92	2	-30.28	-32.2	6.1
2442.45	16.8	12.6	2.2	2	-30	-32.2	7.1
2442.50	17.2	12.6	2.6	2	-29.6	-32.2	4.8
2442.55	17.1	12.6	2.5	2	-29.7	-32.2	7.3
2442.60	17.4	12.6	2.8	2	-29.4	-32.2	4.7
2442.65	17	12.6	2.4	2	-29.8	-32.2	7.4