

**EXHIBIT D: PROCESSING GAIN INFORMATION [15.247(E)]**

PRODUCT NAME: AIRONET 4800B RADIO

NAME OF TEST: The Processing Gain of a Direct Sequence System.

FCC Part 15.247 (e) specifies:

The processing gain of a direct sequence system shall be at least 10 dB.

Guidance on measurement by FCC

The processing gain may be measured using the CW jamming margin method. The test consists of stepping a signal generator in 50kHz increments across the passband of the system. At each point, the generator level required to produce the recommended Bit Error Rate (10<sup>-5</sup>) is recorded. This is the jammer level. The output power of the transmitting unit is measured at the same point. The Jammer to Signal (J/S) ratio is then calculated. Discard the worst 20% of the J/S data points. Total losses in a system including transmitter and receiver, should be assumed to be no more than 2 dB.

therefore, processing gain = S/N + Mj + Lsys

Where :

S/N = Signal to noise ratio required at the receiver output for 10<sup>-5</sup> error rate of a ideal receiver for your demodulation scheme

Mj = Jammer to signal ratio

Lsys = System losses (2dB max)

Test results :

for 1 mb data rate:

S/N = 13 dB ; taken from Wireless Information Networks by Pahlavan & Levesque

Mj = - 4.2 dB ; worst case jamming margin from tests in lab

Lsys = 2.0 dB ; system losses

**therefore the processing gain at 1mb is 13 dB - 4.2 dB + 2.0 dB = 10.8 dB**

for 2 mb data rate:

S/N = 13 dB ; taken from Wireless Information Networks by Pahlavan & Levesque

Mj = - 4.2 dB ; worst case jamming margin from tests in lab

Lsys = 2.0 dB ; system losses

**therefore the processing gain at 2mb is 13 dB - 4.2 dB + 2.0 dB = 10.8 dB**



for 5.5 mb data rate:

S/N = 13.6 dB ; taken from Harris CCK encoding modulation

Mj = - 4.4 dB ; worst case jamming margin from tests in lab (after 20% discard)

Lsys = 2.0 dB ; system losses

**therefore the processing gain at 5.5mb is 13.6 dB - 4.4 dB + 2.0 dB = 11.2 dB**

for 11 mb data rate:

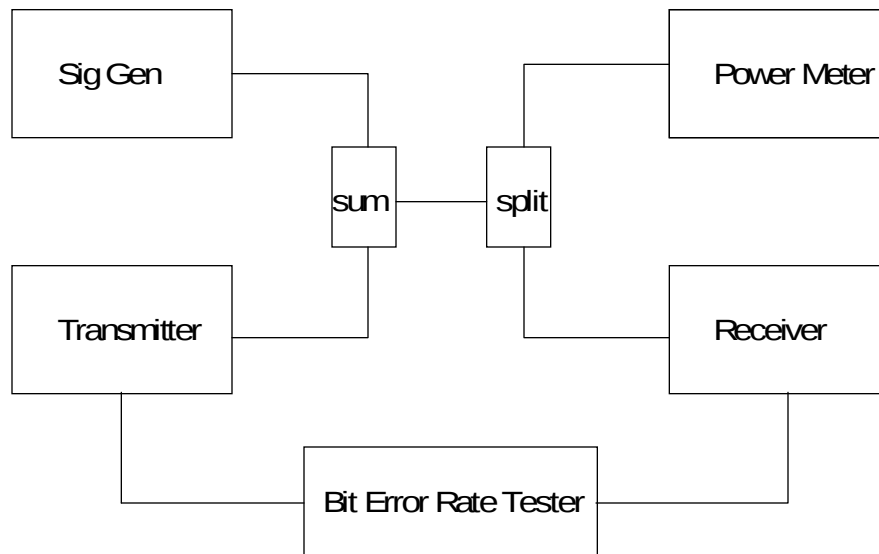
S/N = 16.0 dB ; taken from Harris CCK encoding modulation

Mj = - 7.4 dB ; worst case jamming margin from tests in lab (after 20% discarded)

Lsys = 2.0 dB ; system losses

**therefore the processing gain at 11mb is 16.0 dB - 7.4 dB + 2.0 dB = 10.6 dB**

### Jamming Test Setup



|                                        |                                             |
|----------------------------------------|---------------------------------------------|
| <b>AIRONET</b> RF Systems Engineering  |                                             |
| 2.4 GHz SPREAD SPECTRUM RADIO, 2nd GEN |                                             |
| Jammer Test, R240                      |                                             |
| eng. J. Friedmann<br>dwg. J. Friedmann | File: FCC025_2.ds4<br>Date: 3/21/96<br>rev: |

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Jamming margin at 11 mb (part1)

| processing gain by methode of jamming margin using BER tester                         |    |                                      |                |                          |                                      |                |      |                                      |                |      |                                      |
|---------------------------------------------------------------------------------------|----|--------------------------------------|----------------|--------------------------|--------------------------------------|----------------|------|--------------------------------------|----------------|------|--------------------------------------|
| radio conditions : supply voltage 5v, at room temp, rx s/n = #40, tx s/n = #27        |    |                                      |                |                          |                                      |                |      |                                      |                |      |                                      |
| tester name : Brian Ceato / Jim Friedmann                                             |    |                                      |                |                          |                                      |                |      |                                      |                |      |                                      |
| test date : 3/17/98                                                                   |    |                                      |                | radio carrier freq= 2465 |                                      |                |      |                                      |                |      |                                      |
| Gp = S/N + Mj + Lsys; where S/N = 16.6 dB as per Harris MBOK modulation; Lsys = 2dB   |    |                                      |                |                          |                                      |                |      |                                      |                |      |                                      |
| Input signal level = -30 dBm, jammer level = -38.1 dBm, then Mj= -8.1 dB for 10-5 BER |    |                                      |                |                          |                                      |                |      |                                      |                |      |                                      |
| Gp = 16.6 dB + -7.1 dB + 2 dB = 11.5 dB (worst case point after lowest 20% discarded) |    |                                      |                |                          |                                      |                |      |                                      |                |      |                                      |
| jammer<br>freq                                                                        | Gp | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp                       | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp   | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp   | pass (error<br>rate under<br>1x10-5) |
| MHz                                                                                   | dB | pass /<br>FAILURE                    | MHz            | dB                       | pass /<br>FAILURE                    | MHz            | dB   | pass /<br>FAILURE                    | MHz            | dB   | pass /<br>FAILURE                    |
| 1 2458.60                                                                             | 19 | pass                                 | 41 2458.50     | 12                       | pass                                 | 81 2460.50     | 10.5 | pass                                 | 121 2462.50    | 12.5 | pass                                 |
| 2 2458.65                                                                             | 19 | pass                                 | 42 2458.55     | 12                       | pass                                 | 82 2460.55     | 10.5 | pass                                 | 122 2462.55    | 12.5 | pass                                 |
| 3 2458.60                                                                             | 19 | pass                                 | 43 2458.60     | 12                       | pass                                 | 83 2460.60     | 10.5 | pass                                 | 123 2462.60    | 12.5 | pass                                 |
| 4 2458.65                                                                             | 19 | pass                                 | 44 2458.65     | 12                       | pass                                 | 84 2460.65     | 10.5 | pass                                 | 124 2462.65    | 12.5 | pass                                 |
| 5 2458.70                                                                             | 19 | pass                                 | 45 2458.70     | 12                       | pass                                 | 85 2460.70     | 10.5 | pass                                 | 125 2462.70    | 12.5 | pass                                 |
| 6 2458.75                                                                             | 19 | pass                                 | 46 2458.75     | 12                       | pass                                 | 86 2460.75     | 10.5 | pass                                 | 126 2462.75    | 11.5 | pass                                 |
| 7 2458.80                                                                             | 19 | pass                                 | 47 2458.80     | 12                       | pass                                 | 87 2460.80     | 10.5 | pass                                 | 127 2462.80    | 11.5 | pass                                 |
| 8 2458.85                                                                             | 19 | pass                                 | 48 2458.85     | 12                       | pass                                 | 88 2460.85     | 10.5 | pass                                 | 128 2462.85    | 11.5 | pass                                 |
| 9 2458.90                                                                             | 19 | pass                                 | 49 2458.90     | 12                       | pass                                 | 89 2460.90     | 10.5 | pass                                 | 129 2462.90    | 11.5 | pass                                 |
| 10 2458.95                                                                            | 19 | pass                                 | 50 2458.95     | 12                       | pass                                 | 90 2460.95     | 10.5 | pass                                 | 130 2462.95    | 11.5 | pass                                 |
| 11 2459.00                                                                            | 19 | pass                                 | 51 2459.00     | 10.5                     | pass                                 | 91 2461.00     | 11.5 | pass                                 | 131 2463.00    | 11.5 | pass                                 |
| 12 2459.05                                                                            | 16 | pass                                 | 52 2459.05     | 10.5                     | pass                                 | 92 2461.05     | 11   | pass                                 | 132 2463.05    | 11.5 | pass                                 |
| 13 2459.10                                                                            | 16 | pass                                 | 53 2459.10     | 10.5                     | pass                                 | 93 2461.10     | 11   | pass                                 | 133 2463.10    | 11.5 | pass                                 |
| 14 2459.15                                                                            | 16 | pass                                 | 54 2459.15     | 10.5                     | pass                                 | 94 2461.15     | 11   | pass                                 | 134 2463.15    | 11.5 | pass                                 |
| 15 2459.20                                                                            | 16 | pass                                 | 55 2459.20     | 10.5                     | pass                                 | 95 2461.20     | 11   | pass                                 | 135 2463.20    | 11.5 | pass                                 |
| 16 2459.25                                                                            | 16 | pass                                 | 56 2459.25     | 10.5                     | pass                                 | 96 2461.25     | 11   | pass                                 | 136 2463.25    | 11.5 | pass                                 |
| 17 2459.30                                                                            | 16 | pass                                 | 57 2459.30     | 10.5                     | pass                                 | 97 2461.30     | 10.5 | pass                                 | 137 2463.30    | 11.5 | pass                                 |
| 18 2459.35                                                                            | 16 | pass                                 | 58 2459.35     | 10.5                     | pass                                 | 98 2461.35     | 10.5 | pass                                 | 138 2463.35    | 11.5 | pass                                 |
| 19 2459.40                                                                            | 16 | pass                                 | 59 2459.40     | 10.5                     | pass                                 | 99 2461.40     | 10.5 | pass                                 | 139 2463.40    | 11.5 | pass                                 |
| 20 2459.45                                                                            | 16 | pass                                 | 60 2459.45     | 10.5                     | pass                                 | 100 2461.45    | 10.5 | pass                                 | 140 2463.45    | 11.5 | pass                                 |
| 21 2459.50                                                                            | 16 | pass                                 | 61 2459.50     | 10.5                     | pass                                 | 101 2461.50    | 10.5 | pass                                 | 141 2463.50    | 11.5 | pass                                 |
| 22 2459.55                                                                            | 16 | pass                                 | 62 2459.55     | 10.5                     | pass                                 | 102 2461.55    | 10.5 | pass                                 | 142 2463.55    | 11.5 | pass                                 |
| 23 2459.60                                                                            | 16 | pass                                 | 63 2459.60     | 10.5                     | pass                                 | 103 2461.60    | 10.5 | pass                                 | 143 2463.60    | 11.5 | pass                                 |
| 24 2459.65                                                                            | 16 | pass                                 | 64 2459.65     | 10.5                     | pass                                 | 104 2461.65    | 10.5 | pass                                 | 144 2463.65    | 11.5 | pass                                 |
| 25 2459.70                                                                            | 16 | pass                                 | 65 2459.70     | 10.5                     | pass                                 | 105 2461.70    | 10.5 | pass                                 | 145 2463.70    | 11.5 | pass                                 |
| 26 2459.75                                                                            | 16 | pass                                 | 66 2459.75     | 10.5                     | pass                                 | 106 2461.75    | 10.5 | pass                                 | 146 2463.75    | 11.5 | pass                                 |
| 27 2459.80                                                                            | 16 | pass                                 | 67 2459.80     | 10.5                     | pass                                 | 107 2461.80    | 11.5 | pass                                 | 147 2463.80    | 11.5 | pass                                 |
| 28 2459.85                                                                            | 16 | pass                                 | 68 2459.85     | 10.5                     | pass                                 | 108 2461.85    | 11.5 | pass                                 | 148 2463.85    | 11.5 | pass                                 |
| 29 2459.90                                                                            | 16 | pass                                 | 69 2459.90     | 10.5                     | pass                                 | 109 2461.90    | 12.5 | pass                                 | 149 2463.90    | 11.5 | pass                                 |
| 30 2459.95                                                                            | 16 | pass                                 | 70 2459.95     | 10.5                     | pass                                 | 110 2461.95    | 12.5 | pass                                 | 150 2463.95    | 11.5 | pass                                 |
| 31 2460.00                                                                            | 16 | pass                                 | 71 2460.00     | 10.5                     | pass                                 | 111 2462.00    | 12.5 | pass                                 | 151 2464.00    | 11.5 | pass                                 |
| 32 2460.05                                                                            | 12 | pass                                 | 72 2460.05     | 10.5                     | pass                                 | 112 2462.05    | 12.5 | pass                                 | 152 2464.05    | 11.5 | pass                                 |
| 33 2460.10                                                                            | 12 | pass                                 | 73 2460.10     | 10.5                     | pass                                 | 113 2462.10    | 12.5 | pass                                 | 153 2464.10    | 11.5 | pass                                 |
| 34 2460.15                                                                            | 12 | pass                                 | 74 2460.15     | 10.5                     | pass                                 | 114 2462.15    | 12.5 | pass                                 | 154 2464.15    | 11.5 | pass                                 |
| 35 2460.20                                                                            | 12 | pass                                 | 75 2460.20     | 10.5                     | pass                                 | 115 2462.20    | 12.5 | pass                                 | 155 2464.20    | 11.5 | pass                                 |
| 36 2460.25                                                                            | 12 | pass                                 | 76 2460.25     | 10.5                     | pass                                 | 116 2462.25    | 12.5 | pass                                 | 156 2464.25    | 11.5 | pass                                 |
| 37 2460.30                                                                            | 12 | pass                                 | 77 2460.30     | 10.5                     | pass                                 | 117 2462.30    | 12.5 | pass                                 | 157 2464.30    | 11.5 | pass                                 |
| 38 2460.35                                                                            | 12 | pass                                 | 78 2460.35     | 10.5                     | pass                                 | 118 2462.35    | 12.5 | pass                                 | 158 2464.35    | 11.5 | pass                                 |
| 39 2460.40                                                                            | 12 | pass                                 | 79 2460.40     | 10.5                     | pass                                 | 119 2462.40    | 12.5 | pass                                 | 159 2464.40    | 11.5 | pass                                 |
| 40 2460.45                                                                            | 12 | pass                                 | 80 2460.45     | 10.5                     | pass                                 | 120 2462.45    | 12.5 | pass                                 | 160 2464.45    | 11.5 | pass                                 |
| drop 20% = 340 x 20% = 68 ; therefore can drop up to 68 lowest pts                    |    |                                      |                |                          |                                      |                |      |                                      |                |      |                                      |

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Jamming margin at 11 mb (part2)

| processing gain by methods of jamming margin using BER tester                                                            |                |      |                                      |     |                |      |                                      |     |                |    |                                      |
|--------------------------------------------------------------------------------------------------------------------------|----------------|------|--------------------------------------|-----|----------------|------|--------------------------------------|-----|----------------|----|--------------------------------------|
| radio conditions : supply voltage 5v, at room temp                                                                       |                |      |                                      |     |                |      |                                      |     |                |    |                                      |
| tester name : Brian Castro / Jim Friedmann                                                                               |                |      |                                      |     |                |      |                                      |     |                |    |                                      |
| Gp = S/N + Mj + Lsys; where S/N = 16.6 dB as per Harris MROC modulation; Lsys = 2dB                                      |                |      |                                      |     |                |      |                                      |     |                |    |                                      |
| Input signal level = -30 dBm, jammer level = -38.1 dBm, then Mj = -8.1 dB for 10-5 BER                                   |                |      |                                      |     |                |      |                                      |     |                |    |                                      |
| Gp = 16.6 dB + -7.1 dB + 2 dB = 11.5 dB (worst case point after lowest 20% discarded)                                    |                |      |                                      |     |                |      |                                      |     |                |    |                                      |
|                                                                                                                          | jammer<br>freq | Gp   | pass (error<br>rate under<br>1x10-5) |     | jammer<br>freq | Gp   | pass (error<br>rate under<br>1x10-5) |     | jammer<br>freq | Gp | pass (error<br>rate under<br>1x10-5) |
|                                                                                                                          | MHz            | dB   | pass /<br>FAILURE                    |     | MHz            | dB   | pass /<br>FAILURE                    |     | MHz            | dB | pass /<br>FAILURE                    |
| 161                                                                                                                      | 2464.50        | 11.8 | pass                                 | 206 | 2466.75        | 12   | pass                                 | 251 | 2469.00        | 12 | pass                                 |
| 162                                                                                                                      | 2464.55        | 11.8 | pass                                 | 207 | 2466.80        | 12   | pass                                 | 252 | 2469.05        | 12 | pass                                 |
| 163                                                                                                                      | 2464.60        | 11.8 | pass                                 | 208 | 2466.85        | 12   | pass                                 | 253 | 2469.10        | 12 | pass                                 |
| 164                                                                                                                      | 2464.65        | 11.8 | pass                                 | 209 | 2466.90        | 12   | pass                                 | 254 | 2469.15        | 12 | pass                                 |
| 165                                                                                                                      | 2464.70        | 11.8 | pass                                 | 210 | 2466.95        | 12   | pass                                 | 255 | 2469.20        | 12 | pass                                 |
| 166                                                                                                                      | 2464.75        | 11.8 | pass                                 | 211 | 2467.00        | 12   | pass                                 | 256 | 2469.25        | 12 | pass                                 |
| 167                                                                                                                      | 2464.80        | 11.8 | pass                                 | 212 | 2467.05        | 12   | pass                                 | 257 | 2469.30        | 12 | pass                                 |
| 168                                                                                                                      | 2464.85        | 11.8 | pass                                 | 213 | 2467.10        | 12   | pass                                 | 258 | 2469.35        | 12 | pass                                 |
| 169                                                                                                                      | 2464.90        | 11.8 | pass                                 | 214 | 2467.15        | 12   | pass                                 | 259 | 2469.40        | 12 | pass                                 |
| 170                                                                                                                      | 2464.95        | 11.8 | pass                                 | 215 | 2467.20        | 12   | pass                                 | 260 | 2469.45        | 12 | pass                                 |
| 171                                                                                                                      | 2465.00        | 13.5 | pass                                 | 216 | 2467.25        | 12   | pass                                 | 261 | 2469.50        | 12 | pass                                 |
| 172                                                                                                                      | 2465.05        | 13.5 | pass                                 | 217 | 2467.30        | 12   | pass                                 | 262 | 2469.55        | 12 | pass                                 |
| 173                                                                                                                      | 2465.10        | 13.5 | pass                                 | 218 | 2467.35        | 12   | pass                                 | 263 | 2469.60        | 12 | pass                                 |
| 174                                                                                                                      | 2465.15        | 13.5 | pass                                 | 219 | 2467.40        | 12   | pass                                 | 264 | 2469.65        | 12 | pass                                 |
| 175                                                                                                                      | 2465.20        | 13.5 | pass                                 | 220 | 2467.45        | 12   | pass                                 | 265 | 2469.70        | 12 | pass                                 |
| 176                                                                                                                      | 2465.25        | 13.5 | pass                                 | 221 | 2467.50        | 12   | pass                                 | 266 | 2469.75        | 12 | pass                                 |
| 177                                                                                                                      | 2465.30        | 13.5 | pass                                 | 222 | 2467.55        | 12   | pass                                 | 267 | 2469.80        | 12 | pass                                 |
| 178                                                                                                                      | 2465.35        | 13.5 | pass                                 | 223 | 2467.60        | 12   | pass                                 | 268 | 2469.85        | 12 | pass                                 |
| 179                                                                                                                      | 2465.40        | 13.5 | pass                                 | 224 | 2467.65        | 12   | pass                                 | 269 | 2469.90        | 12 | pass                                 |
| 180                                                                                                                      | 2465.45        | 13.5 | pass                                 | 225 | 2467.70        | 12   | pass                                 | 270 | 2469.95        | 12 | pass                                 |
| 181                                                                                                                      | 2465.50        | 13.5 | pass                                 | 226 | 2467.75        | 12   | pass                                 | 271 | 2470.00        | 12 | pass                                 |
| 182                                                                                                                      | 2465.55        | 13.5 | pass                                 | 227 | 2467.80        | 12   | pass                                 | 272 | 2470.05        | 12 | pass                                 |
| 183                                                                                                                      | 2465.60        | 13.5 | pass                                 | 228 | 2467.85        | 12   | pass                                 | 273 | 2470.10        | 12 | pass                                 |
| 184                                                                                                                      | 2465.65        | 13.5 | pass                                 | 229 | 2467.90        | 12   | pass                                 | 274 | 2470.15        | 12 | pass                                 |
| 185                                                                                                                      | 2465.70        | 13.5 | pass                                 | 230 | 2467.95        | 12   | pass                                 | 275 | 2470.20        | 12 | pass                                 |
| 186                                                                                                                      | 2465.75        | 13.5 | pass                                 | 231 | 2468.00        | 12.5 | pass                                 | 276 | 2470.25        | 12 | pass                                 |
| 187                                                                                                                      | 2465.80        | 13.5 | pass                                 | 232 | 2468.05        | 12.5 | pass                                 | 277 | 2470.30        | 12 | pass                                 |
| 188                                                                                                                      | 2465.85        | 13.5 | pass                                 | 233 | 2468.10        | 12.5 | pass                                 | 278 | 2470.35        | 12 | pass                                 |
| 189                                                                                                                      | 2465.90        | 13.5 | pass                                 | 234 | 2468.15        | 12.5 | pass                                 | 279 | 2470.40        | 12 | pass                                 |
| 190                                                                                                                      | 2465.95        | 13.5 | pass                                 | 235 | 2468.20        | 12.5 | pass                                 | 280 | 2470.45        | 12 | pass                                 |
| 191                                                                                                                      | 2466.00        | 12   | pass                                 | 236 | 2468.25        | 12.5 | pass                                 | 281 | 2470.50        | 12 | pass                                 |
| 192                                                                                                                      | 2466.05        | 12   | pass                                 | 237 | 2468.30        | 12.5 | pass                                 | 282 | 2470.55        | 12 | pass                                 |
| 193                                                                                                                      | 2466.10        | 12   | pass                                 | 238 | 2468.35        | 12.5 | pass                                 | 283 | 2470.60        | 12 | pass                                 |
| 194                                                                                                                      | 2466.15        | 12   | pass                                 | 239 | 2468.40        | 12.5 | pass                                 | 284 | 2470.65        | 12 | pass                                 |
| 195                                                                                                                      | 2466.20        | 12   | pass                                 | 240 | 2468.45        | 12.5 | pass                                 | 285 | 2470.70        | 12 | pass                                 |
| 196                                                                                                                      | 2466.25        | 12   | pass                                 | 241 | 2468.50        | 12.5 | pass                                 | 286 | 2470.75        | 12 | pass                                 |
| 197                                                                                                                      | 2466.30        | 12   | pass                                 | 242 | 2468.55        | 12.5 | pass                                 | 287 | 2470.80        | 12 | pass                                 |
| 198                                                                                                                      | 2466.35        | 12   | pass                                 | 243 | 2468.60        | 12.5 | pass                                 | 288 | 2470.85        | 12 | pass                                 |
| 199                                                                                                                      | 2466.40        | 12   | pass                                 | 244 | 2468.65        | 12.5 | pass                                 | 289 | 2470.90        | 12 | pass                                 |
| 200                                                                                                                      | 2466.45        | 12   | pass                                 | 245 | 2468.70        | 12.5 | pass                                 | 290 | 2470.95        | 12 | pass                                 |
| 201                                                                                                                      | 2466.50        | 12   | pass                                 | 246 | 2468.75        | 12.5 | pass                                 | 291 | 2471.00        | 12 | pass                                 |
| 202                                                                                                                      | 2466.55        | 12   | pass                                 | 247 | 2468.80        | 12.5 | pass                                 | 292 | 2471.05        | 12 | pass                                 |
| 203                                                                                                                      | 2466.60        | 12   | pass                                 | 248 | 2468.85        | 12.5 | pass                                 | 293 | 2471.10        | 12 | pass                                 |
| 204                                                                                                                      | 2466.65        | 12   | pass                                 | 249 | 2468.90        | 12.5 | pass                                 | 294 | 2471.15        | 12 | pass                                 |
| 205                                                                                                                      | 2466.70        | 12   | pass                                 | 250 | 2468.95        | 12.5 | pass                                 | 295 | 2471.20        | 12 | pass                                 |
| drop 20% = 340 x 20% = 68 ; therefore can drop 68 lowest pts, next lowest pt is 11.5 dB, therefore unit passes proc gain |                |      |                                      |     |                |      |                                      |     |                |    |                                      |
| (b)(1)                                                                                                                   |                |      |                                      |     |                |      |                                      |     |                |    |                                      |

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Jamming margin at 5.5mb (part1)

| processing gain by methode of jamming margin using BER tester                          |    |                                      |                |    |                                      |                |    |                                      |                |      |                                      |
|----------------------------------------------------------------------------------------|----|--------------------------------------|----------------|----|--------------------------------------|----------------|----|--------------------------------------|----------------|------|--------------------------------------|
| radio conditions : supply voltage 5v, at room temp, rx s/n = #40, tx s/n = #27         |    |                                      |                |    |                                      |                |    |                                      |                |      |                                      |
| tester name : Brian Casto / Jim Friedmann                                              |    |                                      |                |    |                                      |                |    |                                      |                |      |                                      |
| test date : 3/17/98 radio carrier freq= 2465                                           |    |                                      |                |    |                                      |                |    |                                      |                |      |                                      |
| Gp = S/N + Mj + Lsys; where S/N = 13.6 dB as per Harris MOK modulation; Lsys = 0.5 dB  |    |                                      |                |    |                                      |                |    |                                      |                |      |                                      |
| Input signal level = -30 dBm, jammer level = -31.1 dBm, then Mj = -1.1 dB for 10-5 BER |    |                                      |                |    |                                      |                |    |                                      |                |      |                                      |
| Gp = 13.6 dB + -1.6 dB + 0.5 dB = 12.5 dB (worst case point)                           |    |                                      |                |    |                                      |                |    |                                      |                |      |                                      |
| jammer<br>freq                                                                         | Gp | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp   | pass (error<br>rate under<br>1x10-5) |
| MHz                                                                                    | dB | pass /<br>FAILURE                    | MHz            | dB | pass /<br>FAILURE                    | MHz            | dB | pass /<br>FAILURE                    | MHz            | dB   | pass /<br>FAILURE                    |
| 1 2456.50                                                                              | 19 | pass                                 | 41 2458.50     | 18 | pass                                 | 81 2460.50     | 13 | pass                                 | 121 2462.50    | 13.5 | pass                                 |
| 2 2458.55                                                                              | 19 | pass                                 | 42 2458.55     | 18 | pass                                 | 82 2460.55     | 13 | pass                                 | 122 2462.55    | 13.5 | pass                                 |
| 3 2458.60                                                                              | 19 | pass                                 | 43 2458.60     | 18 | pass                                 | 83 2460.60     | 13 | pass                                 | 123 2462.60    | 13.5 | pass                                 |
| 4 2458.65                                                                              | 19 | pass                                 | 44 2458.65     | 18 | pass                                 | 84 2460.65     | 13 | pass                                 | 124 2462.65    | 13.5 | pass                                 |
| 5 2458.70                                                                              | 19 | pass                                 | 45 2458.70     | 18 | pass                                 | 85 2460.70     | 13 | pass                                 | 125 2462.70    | 13.5 | pass                                 |
| 6 2458.75                                                                              | 19 | pass                                 | 46 2458.75     | 18 | pass                                 | 86 2460.75     | 13 | pass                                 | 126 2462.75    | 13.5 | pass                                 |
| 7 2458.80                                                                              | 19 | pass                                 | 47 2458.80     | 18 | pass                                 | 87 2460.80     | 13 | pass                                 | 127 2462.80    | 13.5 | pass                                 |
| 8 2458.85                                                                              | 19 | pass                                 | 48 2458.85     | 18 | pass                                 | 88 2460.85     | 13 | pass                                 | 128 2462.85    | 13.5 | pass                                 |
| 9 2458.90                                                                              | 19 | pass                                 | 49 2458.90     | 18 | pass                                 | 89 2460.90     | 13 | pass                                 | 129 2462.90    | 13.5 | pass                                 |
| 10 2458.95                                                                             | 19 | pass                                 | 50 2458.95     | 18 | pass                                 | 90 2460.95     | 13 | pass                                 | 130 2462.95    | 13.5 | pass                                 |
| 11 2459.00                                                                             | 19 | pass                                 | 51 2459.00     | 14 | pass                                 | 91 2461.00     | 14 | pass                                 | 131 2463.00    | 13.5 | pass                                 |
| 12 2459.05                                                                             | 19 | pass                                 | 52 2459.05     | 14 | pass                                 | 92 2461.05     | 14 | pass                                 | 132 2463.05    | 13.5 | pass                                 |
| 13 2459.10                                                                             | 19 | pass                                 | 53 2459.10     | 14 | pass                                 | 93 2461.10     | 14 | pass                                 | 133 2463.10    | 13.5 | pass                                 |
| 14 2459.15                                                                             | 19 | pass                                 | 54 2459.15     | 14 | pass                                 | 94 2461.15     | 14 | pass                                 | 134 2463.15    | 13.5 | pass                                 |
| 15 2459.20                                                                             | 19 | pass                                 | 55 2459.20     | 14 | pass                                 | 95 2461.20     | 14 | pass                                 | 135 2463.20    | 13.5 | pass                                 |
| 16 2459.25                                                                             | 19 | pass                                 | 56 2459.25     | 14 | pass                                 | 96 2461.25     | 14 | pass                                 | 136 2463.25    | 13.5 | pass                                 |
| 17 2459.30                                                                             | 19 | pass                                 | 57 2459.30     | 14 | pass                                 | 97 2461.30     | 14 | pass                                 | 137 2463.30    | 13.5 | pass                                 |
| 18 2459.35                                                                             | 19 | pass                                 | 58 2459.35     | 14 | pass                                 | 98 2461.35     | 14 | pass                                 | 138 2463.35    | 13.5 | pass                                 |
| 19 2459.40                                                                             | 19 | pass                                 | 59 2459.40     | 14 | pass                                 | 99 2461.40     | 14 | pass                                 | 139 2463.40    | 13.5 | pass                                 |
| 20 2459.45                                                                             | 19 | pass                                 | 60 2459.45     | 14 | pass                                 | 100 2461.45    | 14 | pass                                 | 140 2463.45    | 13.5 | pass                                 |
| 21 2459.50                                                                             | 19 | pass                                 | 61 2459.50     | 13 | pass                                 | 101 2461.50    | 13 | pass                                 | 141 2463.50    | 13.5 | pass                                 |
| 22 2459.55                                                                             | 19 | pass                                 | 62 2459.55     | 13 | pass                                 | 102 2461.55    | 13 | pass                                 | 142 2463.55    | 13.5 | pass                                 |
| 23 2459.60                                                                             | 19 | pass                                 | 63 2459.60     | 13 | pass                                 | 103 2461.60    | 13 | pass                                 | 143 2463.60    | 13.5 | pass                                 |
| 24 2459.65                                                                             | 19 | pass                                 | 64 2459.65     | 13 | pass                                 | 104 2461.65    | 13 | pass                                 | 144 2463.65    | 13.5 | pass                                 |
| 25 2459.70                                                                             | 19 | pass                                 | 65 2459.70     | 13 | pass                                 | 105 2461.70    | 13 | pass                                 | 145 2463.70    | 13.5 | pass                                 |
| 26 2459.75                                                                             | 19 | pass                                 | 66 2459.75     | 13 | pass                                 | 106 2461.75    | 13 | pass                                 | 146 2463.75    | 13.5 | pass                                 |
| 27 2459.80                                                                             | 19 | pass                                 | 67 2459.80     | 13 | pass                                 | 107 2461.80    | 13 | pass                                 | 147 2463.80    | 13.5 | pass                                 |
| 28 2459.85                                                                             | 19 | pass                                 | 68 2459.85     | 13 | pass                                 | 108 2461.85    | 13 | pass                                 | 148 2463.85    | 13.5 | pass                                 |
| 29 2459.90                                                                             | 19 | pass                                 | 69 2459.90     | 13 | pass                                 | 109 2461.90    | 13 | pass                                 | 149 2463.90    | 13.5 | pass                                 |
| 30 2459.95                                                                             | 19 | pass                                 | 70 2459.95     | 13 | pass                                 | 110 2461.95    | 13 | pass                                 | 150 2463.95    | 13.5 | pass                                 |
| 31 2460.00                                                                             | 16 | pass                                 | 71 2460.00     | 14 | pass                                 | 111 2462.00    | 13 | pass                                 | 151 2464.00    | 13.5 | pass                                 |
| 32 2460.05                                                                             | 16 | pass                                 | 72 2460.05     | 14 | pass                                 | 112 2462.05    | 13 | pass                                 | 152 2464.05    | 13.5 | pass                                 |
| 33 2460.10                                                                             | 16 | pass                                 | 73 2460.10     | 14 | pass                                 | 113 2462.10    | 16 | pass                                 | 153 2464.10    | 13.5 | pass                                 |
| 34 2460.15                                                                             | 16 | pass                                 | 74 2460.15     | 14 | pass                                 | 114 2462.15    | 16 | pass                                 | 154 2464.15    | 13.5 | pass                                 |
| 35 2460.20                                                                             | 16 | pass                                 | 75 2460.20     | 14 | pass                                 | 115 2462.20    | 16 | pass                                 | 155 2464.20    | 13.5 | pass                                 |
| 36 2460.25                                                                             | 16 | pass                                 | 76 2460.25     | 14 | pass                                 | 116 2462.25    | 16 | pass                                 | 156 2464.25    | 13.5 | pass                                 |
| 37 2460.30                                                                             | 16 | pass                                 | 77 2460.30     | 14 | pass                                 | 117 2462.30    | 16 | pass                                 | 157 2464.30    | 13.5 | pass                                 |
| 38 2460.35                                                                             | 16 | pass                                 | 78 2460.35     | 14 | pass                                 | 118 2462.35    | 16 | pass                                 | 158 2464.35    | 13.5 | pass                                 |
| 39 2460.40                                                                             | 16 | pass                                 | 79 2460.40     | 14 | pass                                 | 119 2462.40    | 16 | pass                                 | 159 2464.40    | 13.5 | pass                                 |
| 40 2460.45                                                                             | 16 | pass                                 | 80 2460.45     | 14 | pass                                 | 120 2462.45    | 16 | pass                                 | 160 2464.45    | 13.5 | pass                                 |

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Jamming margin at 5.5mb (part2)

| processing gain by methode of jamming margin using BER tester                          |                |      |                                      |                |         |                                      |                |     |                                      |                |                                      |
|----------------------------------------------------------------------------------------|----------------|------|--------------------------------------|----------------|---------|--------------------------------------|----------------|-----|--------------------------------------|----------------|--------------------------------------|
| radio conditions : supply voltage 5v, at room temp                                     |                |      |                                      |                |         |                                      |                |     |                                      |                |                                      |
| tester name : Brian Casto / Jim Friedmann                                              |                |      |                                      |                |         |                                      |                |     |                                      |                |                                      |
| Gp = S/N + Mj + Lsys; where S/N = 16.8 dB as per Harris MOK modulation; Lsys = 0.5 dB  |                |      |                                      |                |         |                                      |                |     |                                      |                |                                      |
| input signal level = -30 dBm, jammer level = -31.1 dBm, then Mj = -1.1 dB for 10-5 BER |                |      |                                      |                |         |                                      |                |     |                                      |                |                                      |
| Gp = 13.6 dB + -1.6 dB + 0.5 dB = 12.5 dB (worst case point)                           |                |      |                                      |                |         |                                      |                |     |                                      |                |                                      |
|                                                                                        | jammer<br>freq | Gp   | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp      | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp  | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | pass (error<br>rate under<br>1x10-5) |
|                                                                                        | MHz            | dB   | pass /<br>FAILURE                    | MHz            | dB      | pass /<br>FAILURE                    | MHz            | dB  | pass /<br>FAILURE                    | MHz            | pass /<br>FAILURE                    |
| 161                                                                                    | 2464.50        | 14   | pass                                 | 208            | 2465.75 | 13                                   | pass           | 251 | 2469.00                              | 13.5           | pass                                 |
| 162                                                                                    | 2464.55        | 14   | pass                                 | 207            | 2465.80 | 13                                   | pass           | 252 | 2469.05                              | 13.5           | pass                                 |
| 163                                                                                    | 2464.60        | 14   | pass                                 | 208            | 2465.85 | 13                                   | pass           | 253 | 2469.10                              | 13.5           | pass                                 |
| 164                                                                                    | 2464.65        | 14   | pass                                 | 209            | 2465.90 | 13                                   | pass           | 254 | 2469.15                              | 13.5           | pass                                 |
| 165                                                                                    | 2464.70        | 14   | pass                                 | 210            | 2465.95 | 13                                   | pass           | 255 | 2469.20                              | 13.5           | pass                                 |
| 166                                                                                    | 2464.75        | 14   | pass                                 | 211            | 2467.00 | 13                                   | pass           | 256 | 2469.25                              | 13.5           | pass                                 |
| 167                                                                                    | 2464.80        | 14   | pass                                 | 212            | 2467.05 | 13                                   | pass           | 257 | 2469.30                              | 13.5           | pass                                 |
| 168                                                                                    | 2464.85        | 14   | pass                                 | 213            | 2467.10 | 13                                   | pass           | 258 | 2469.35                              | 13.5           | pass                                 |
| 169                                                                                    | 2464.90        | 14   | pass                                 | 214            | 2467.15 | 13                                   | pass           | 259 | 2469.40                              | 13.5           | pass                                 |
| 170                                                                                    | 2464.95        | 14   | pass                                 | 215            | 2467.20 | 13                                   | pass           | 260 | 2469.45                              | 13.5           | pass                                 |
| 171                                                                                    | 2465.00        | 14   | pass                                 | 216            | 2467.25 | 13                                   | pass           | 261 | 2469.50                              | 12.5           | pass                                 |
| 172                                                                                    | 2465.05        | 14   | pass                                 | 217            | 2467.30 | 13                                   | pass           | 262 | 2469.55                              | 12.5           | pass                                 |
| 173                                                                                    | 2465.10        | 14   | pass                                 | 218            | 2467.35 | 13                                   | pass           | 263 | 2469.60                              | 12.5           | pass                                 |
| 174                                                                                    | 2465.15        | 14   | pass                                 | 219            | 2467.40 | 13                                   | pass           | 264 | 2469.65                              | 12.5           | pass                                 |
| 175                                                                                    | 2465.20        | 13.5 | pass                                 | 220            | 2467.45 | 13                                   | pass           | 265 | 2469.70                              | 12.5           | pass                                 |
| 176                                                                                    | 2465.25        | 13.5 | pass                                 | 221            | 2467.50 | 13                                   | pass           | 266 | 2469.75                              | 12.5           | pass                                 |
| 177                                                                                    | 2465.30        | 13.5 | pass                                 | 222            | 2467.55 | 13                                   | pass           | 267 | 2469.80                              | 12.5           | pass                                 |
| 178                                                                                    | 2465.35        | 13.5 | pass                                 | 223            | 2467.60 | 13                                   | pass           | 268 | 2469.85                              | 12.5           | pass                                 |
| 179                                                                                    | 2465.40        | 13.5 | pass                                 | 224            | 2467.65 | 13                                   | pass           | 269 | 2469.90                              | 12.5           | pass                                 |
| 180                                                                                    | 2465.45        | 13.5 | pass                                 | 225            | 2467.70 | 13                                   | pass           | 270 | 2469.95                              | 12.5           | pass                                 |
| 181                                                                                    | 2465.50        | 13.5 | pass                                 | 226            | 2467.75 | 13                                   | pass           | 271 | 2470.00                              | 13             | pass                                 |
| 182                                                                                    | 2465.55        | 13.5 | pass                                 | 227            | 2467.80 | 13                                   | pass           | 272 | 2470.05                              | 13             | pass                                 |
| 183                                                                                    | 2465.60        | 13.5 | pass                                 | 228            | 2467.85 | 13                                   | pass           | 273 | 2470.10                              | 13             | pass                                 |
| 184                                                                                    | 2465.65        | 13.5 | pass                                 | 229            | 2467.90 | 13                                   | pass           | 274 | 2470.15                              | 13             | pass                                 |
| 185                                                                                    | 2465.70        | 13.5 | pass                                 | 230            | 2467.95 | 13                                   | pass           | 275 | 2470.20                              | 13             | pass                                 |
| 186                                                                                    | 2465.75        | 13.5 | pass                                 | 231            | 2468.00 | 13.5                                 | pass           | 276 | 2470.25                              | 13             | pass                                 |
| 187                                                                                    | 2465.80        | 13.5 | pass                                 | 232            | 2468.05 | 13.5                                 | pass           | 277 | 2470.30                              | 13             | pass                                 |
| 188                                                                                    | 2465.85        | 13.5 | pass                                 | 233            | 2468.10 | 13.5                                 | pass           | 278 | 2470.35                              | 13             | pass                                 |
| 189                                                                                    | 2465.90        | 13.5 | pass                                 | 234            | 2468.15 | 13.5                                 | pass           | 279 | 2470.40                              | 12.5           | pass                                 |
| 190                                                                                    | 2465.95        | 13.5 | pass                                 | 235            | 2468.20 | 13.5                                 | pass           | 280 | 2470.45                              | 12.5           | pass                                 |
| 191                                                                                    | 2466.00        | 13.5 | pass                                 | 236            | 2468.25 | 13.5                                 | pass           | 281 | 2470.50                              | 12.5           | pass                                 |
| 192                                                                                    | 2466.05        | 13.5 | pass                                 | 237            | 2468.30 | 13.5                                 | pass           | 282 | 2470.55                              | 12.5           | pass                                 |
| 193                                                                                    | 2466.10        | 13.5 | pass                                 | 238            | 2468.35 | 13.5                                 | pass           | 283 | 2470.60                              | 12.5           | pass                                 |
| 194                                                                                    | 2466.15        | 13.5 | pass                                 | 239            | 2468.40 | 13.5                                 | pass           | 284 | 2470.65                              | 12.5           | pass                                 |
| 195                                                                                    | 2466.20        | 13.5 | pass                                 | 240            | 2468.45 | 13.5                                 | pass           | 285 | 2470.70                              | 12.5           | pass                                 |
| 196                                                                                    | 2466.25        | 13.5 | pass                                 | 241            | 2468.50 | 12.5                                 | pass           | 286 | 2470.75                              | 13             | pass                                 |
| 197                                                                                    | 2466.30        | 13.5 | pass                                 | 242            | 2468.55 | 12.5                                 | pass           | 287 | 2470.80                              | 13             | pass                                 |
| 198                                                                                    | 2466.35        | 13.5 | pass                                 | 243            | 2468.60 | 12.5                                 | pass           | 288 | 2470.85                              | 13             | pass                                 |
| 199                                                                                    | 2466.40        | 13.5 | pass                                 | 244            | 2468.65 | 12.5                                 | pass           | 289 | 2470.90                              | 13             | pass                                 |
| 200                                                                                    | 2466.45        | 13.5 | pass                                 | 245            | 2468.70 | 12.5                                 | pass           | 290 | 2470.95                              | 13             | pass                                 |
| 201                                                                                    | 2466.50        | 13.5 | pass                                 | 246            | 2468.75 | 12.5                                 | pass           | 291 | 2471.00                              | 13             | pass                                 |
| 202                                                                                    | 2466.55        | 13.5 | pass                                 | 247            | 2468.80 | 12.5                                 | pass           | 292 | 2471.05                              | 13             | pass                                 |
| 203                                                                                    | 2466.60        | 13.5 | pass                                 | 248            | 2468.85 | 12.5                                 | pass           | 293 | 2471.10                              | 13             | pass                                 |
| 204                                                                                    | 2466.65        | 13.5 | pass                                 | 249            | 2468.90 | 12.5                                 | pass           | 294 | 2471.15                              | 13             | pass                                 |
| 205                                                                                    | 2466.70        | 13.5 | pass                                 | 250            | 2468.95 | 12.5                                 | pass           | 295 | 2471.20                              | 13             | pass                                 |

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Jamming margin at 2 mb (part1)

| processing gain by methode of jamming margin using BER tester                                                     |    |                                      |                |      |                                      |                |      |                                      |                |      |                                      |
|-------------------------------------------------------------------------------------------------------------------|----|--------------------------------------|----------------|------|--------------------------------------|----------------|------|--------------------------------------|----------------|------|--------------------------------------|
| radio conditions : supply voltage 5v, at room temp, rx s/n = #40, tx s/n = #27                                    |    |                                      |                |      |                                      |                |      |                                      |                |      |                                      |
| tester name : Brian Castro / Jim Friedmann                                                                        |    |                                      |                |      |                                      |                |      |                                      |                |      |                                      |
| test date : 3/17/98 radio carrier freq= 2465                                                                      |    |                                      |                |      |                                      |                |      |                                      |                |      |                                      |
| Gp = S/N + Mj + Lsys; where S/N = 13 dB as per Wireless Information Networks by Pahtavan & Levesque; Lsys = 0.5dB |    |                                      |                |      |                                      |                |      |                                      |                |      |                                      |
| Input signal level = -30 dBm, jammer level = -31.5 dBm, then Mj = -1.5 dB                                         |    |                                      |                |      |                                      |                |      |                                      |                |      |                                      |
| Gp = 13.0 dB + -1.5 dB + 0.5 dB = 12.0 dB (worst case point)                                                      |    |                                      |                |      |                                      |                |      |                                      |                |      |                                      |
| jammer<br>freq                                                                                                    | Gp | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp   | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp   | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp   | pass (error<br>rate under<br>1x10-5) |
| MHz                                                                                                               | dB | pass /<br>FAILURE                    | MHz            | dB   | pass /<br>FAILURE                    | MHz            | dB   | pass /<br>FAILURE                    | MHz            | dB   | pass /<br>FAILURE                    |
| 1 2455.50                                                                                                         | 18 | pass                                 | 41 2458.50     | 16   | pass                                 | 81 2460.60     | 14   | pass                                 | 121 2462.50    | 13.5 | pass                                 |
| 2 2455.55                                                                                                         | 18 | pass                                 | 42 2458.55     | 16   | pass                                 | 82 2460.55     | 14   | pass                                 | 122 2462.55    | 13.5 | pass                                 |
| 3 2455.60                                                                                                         | 18 | pass                                 | 43 2458.60     | 16   | pass                                 | 83 2460.60     | 14   | pass                                 | 123 2462.60    | 13.5 | pass                                 |
| 4 2455.65                                                                                                         | 18 | pass                                 | 44 2458.65     | 16   | pass                                 | 84 2460.65     | 14   | pass                                 | 124 2462.65    | 13.5 | pass                                 |
| 5 2455.70                                                                                                         | 18 | pass                                 | 45 2458.70     | 16   | pass                                 | 85 2460.70     | 14   | pass                                 | 125 2462.70    | 13.5 | pass                                 |
| 6 2455.75                                                                                                         | 18 | pass                                 | 46 2458.75     | 16   | pass                                 | 86 2460.75     | 14   | pass                                 | 126 2462.75    | 13.5 | pass                                 |
| 7 2455.80                                                                                                         | 18 | pass                                 | 47 2458.80     | 16   | pass                                 | 87 2460.80     | 14   | pass                                 | 127 2462.80    | 13.5 | pass                                 |
| 8 2455.85                                                                                                         | 18 | pass                                 | 48 2458.85     | 16   | pass                                 | 88 2460.85     | 14   | pass                                 | 128 2462.85    | 13.5 | pass                                 |
| 9 2455.90                                                                                                         | 18 | pass                                 | 49 2458.90     | 16   | pass                                 | 89 2460.90     | 14   | pass                                 | 129 2462.90    | 13.5 | pass                                 |
| 10 2455.95                                                                                                        | 18 | pass                                 | 50 2458.95     | 16   | pass                                 | 90 2460.95     | 14   | pass                                 | 130 2462.95    | 13.5 | pass                                 |
| 11 2457.00                                                                                                        | 18 | pass                                 | 51 2459.00     | 14.5 | pass                                 | 91 2461.00     | 14   | pass                                 | 131 2463.00    | 13.0 | pass                                 |
| 12 2457.05                                                                                                        | 18 | pass                                 | 52 2459.05     | 14.5 | pass                                 | 92 2461.05     | 14   | pass                                 | 132 2463.05    | 13.0 | pass                                 |
| 13 2457.10                                                                                                        | 18 | pass                                 | 53 2459.10     | 14.5 | pass                                 | 93 2461.10     | 14   | pass                                 | 133 2463.10    | 13.0 | pass                                 |
| 14 2457.15                                                                                                        | 18 | pass                                 | 54 2459.15     | 14.5 | pass                                 | 94 2461.15     | 14   | pass                                 | 134 2463.15    | 13.0 | pass                                 |
| 15 2457.20                                                                                                        | 18 | pass                                 | 55 2459.20     | 14.5 | pass                                 | 95 2461.20     | 14   | pass                                 | 135 2463.20    | 13.0 | pass                                 |
| 16 2457.25                                                                                                        | 18 | pass                                 | 56 2459.25     | 14.5 | pass                                 | 96 2461.25     | 14   | pass                                 | 136 2463.25    | 13.0 | pass                                 |
| 17 2457.30                                                                                                        | 18 | pass                                 | 57 2459.30     | 14.5 | pass                                 | 97 2461.30     | 14   | pass                                 | 137 2463.30    | 13.0 | pass                                 |
| 18 2457.35                                                                                                        | 18 | pass                                 | 58 2459.35     | 14.5 | pass                                 | 98 2461.35     | 14   | pass                                 | 138 2463.35    | 13.0 | pass                                 |
| 19 2457.40                                                                                                        | 18 | pass                                 | 59 2459.40     | 14.5 | pass                                 | 99 2461.40     | 14   | pass                                 | 139 2463.40    | 13.0 | pass                                 |
| 20 2457.45                                                                                                        | 18 | pass                                 | 60 2459.45     | 14.5 | pass                                 | 100 2461.45    | 14   | pass                                 | 140 2463.45    | 13.0 | pass                                 |
| 21 2457.50                                                                                                        | 18 | pass                                 | 61 2459.50     | 14.5 | pass                                 | 101 2461.50    | 14   | pass                                 | 141 2463.50    | 13.0 | pass                                 |
| 22 2457.55                                                                                                        | 18 | pass                                 | 62 2459.55     | 14.5 | pass                                 | 102 2461.55    | 14   | pass                                 | 142 2463.55    | 13.0 | pass                                 |
| 23 2457.60                                                                                                        | 18 | pass                                 | 63 2459.60     | 14.5 | pass                                 | 103 2461.60    | 14   | pass                                 | 143 2463.60    | 13.0 | pass                                 |
| 24 2457.65                                                                                                        | 18 | pass                                 | 64 2459.65     | 14.5 | pass                                 | 104 2461.65    | 14   | pass                                 | 144 2463.65    | 13.0 | pass                                 |
| 25 2457.70                                                                                                        | 18 | pass                                 | 65 2459.70     | 14.5 | pass                                 | 105 2461.70    | 14   | pass                                 | 145 2463.70    | 13.0 | pass                                 |
| 26 2457.75                                                                                                        | 18 | pass                                 | 66 2459.75     | 14.5 | pass                                 | 106 2461.75    | 14   | pass                                 | 146 2463.75    | 13.0 | pass                                 |
| 27 2457.80                                                                                                        | 18 | pass                                 | 67 2459.80     | 14.5 | pass                                 | 107 2461.80    | 14   | pass                                 | 147 2463.80    | 13.0 | pass                                 |
| 28 2457.85                                                                                                        | 18 | pass                                 | 68 2459.85     | 14.5 | pass                                 | 108 2461.85    | 13.5 | pass                                 | 148 2463.85    | 13.0 | pass                                 |
| 29 2457.90                                                                                                        | 18 | pass                                 | 69 2459.90     | 14   | pass                                 | 109 2461.90    | 13.5 | pass                                 | 149 2463.90    | 13.0 | pass                                 |
| 30 2457.95                                                                                                        | 18 | pass                                 | 70 2459.95     | 14   | pass                                 | 110 2461.95    | 13.5 | pass                                 | 150 2463.95    | 13.0 | pass                                 |
| 31 2458.00                                                                                                        | 18 | pass                                 | 71 2460.00     | 14   | pass                                 | 111 2462.00    | 13.5 | pass                                 | 151 2464.00    | 12.5 | pass                                 |
| 32 2458.05                                                                                                        | 16 | pass                                 | 72 2460.05     | 14   | pass                                 | 112 2462.05    | 13.5 | pass                                 | 152 2464.05    | 12.5 | pass                                 |
| 33 2458.10                                                                                                        | 16 | pass                                 | 73 2460.10     | 14   | pass                                 | 113 2462.10    | 13.5 | pass                                 | 153 2464.10    | 12.5 | pass                                 |
| 34 2458.15                                                                                                        | 16 | pass                                 | 74 2460.15     | 14   | pass                                 | 114 2462.15    | 13.5 | pass                                 | 154 2464.15    | 12.5 | pass                                 |
| 35 2458.20                                                                                                        | 16 | pass                                 | 75 2460.20     | 14   | pass                                 | 115 2462.20    | 13.5 | pass                                 | 155 2464.20    | 12.5 | pass                                 |
| 36 2458.25                                                                                                        | 16 | pass                                 | 76 2460.25     | 14   | pass                                 | 116 2462.25    | 13.5 | pass                                 | 156 2464.25    | 12.5 | pass                                 |
| 37 2458.30                                                                                                        | 16 | pass                                 | 77 2460.30     | 14   | pass                                 | 117 2462.30    | 13.5 | pass                                 | 157 2464.30    | 12.5 | pass                                 |
| 38 2458.35                                                                                                        | 16 | pass                                 | 78 2460.35     | 14   | pass                                 | 118 2462.35    | 13.5 | pass                                 | 158 2464.35    | 12.5 | pass                                 |
| 39 2458.40                                                                                                        | 16 | pass                                 | 79 2460.40     | 14   | pass                                 | 119 2462.40    | 13.5 | pass                                 | 159 2464.40    | 12.5 | pass                                 |
| 40 2458.45                                                                                                        | 16 | pass                                 | 80 2460.45     | 14   | pass                                 | 120 2462.45    | 13.5 | pass                                 | 160 2464.45    | 12.5 | pass                                 |
| drop 20% = 340 x 20% = 68 ; therefore can drop 68 failures                                                        |    |                                      |                |      |                                      |                |      |                                      |                |      |                                      |

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Jamming margin at 2 mb (part2)

C-27

| processing gain by methods of jamming margin using BER tester                                                     |         |                                      |                |         |                                      |                |         |                                      |                |         |                                      |
|-------------------------------------------------------------------------------------------------------------------|---------|--------------------------------------|----------------|---------|--------------------------------------|----------------|---------|--------------------------------------|----------------|---------|--------------------------------------|
| radio conditions : supply voltage 5v, at room temp                                                                |         |                                      |                |         |                                      |                |         |                                      |                |         |                                      |
| tester name : Brian Castro / Jim Friedmann                                                                        |         |                                      |                |         |                                      |                |         |                                      |                |         |                                      |
| Gp = S/N + Mj + Lsys; where S/N = 13 dB as per Wireless Information Networks by Pahlavan & Levesque; Lsys = 0.5dB |         |                                      |                |         |                                      |                |         |                                      |                |         |                                      |
| input signal level = -30 dBm, jammer level = -31.5 dBm, then Mj = -1.5 dB                                         |         |                                      |                |         |                                      |                |         |                                      |                |         |                                      |
| Gp = 13.0 dB + -1.5 dB + 0.5 dB = 12.0 dB (worst case point)                                                      |         |                                      |                |         |                                      |                |         |                                      |                |         |                                      |
| jammer<br>freq                                                                                                    | Gp      | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp      | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp      | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp      | pass (error<br>rate under<br>1x10-5) |
| MHz                                                                                                               | dB      | pass /<br>FAILURE                    | MHz            | dB      | pass /<br>FAILURE                    | MHz            | dB      | pass /<br>FAILURE                    | MHz            | dB      | pass /<br>FAILURE                    |
| 181                                                                                                               | 2464.50 | 12.5 pass                            | 206            | 2466.75 | 13 pass                              | 251            | 2469.00 | 13.5 pass                            | 296            | 2471.25 | 13.0 pass                            |
| 182                                                                                                               | 2464.55 | 12.5 pass                            | 207            | 2466.80 | 13 pass                              | 252            | 2469.05 | 13.5 pass                            | 297            | 2471.30 | 13.0 pass                            |
| 183                                                                                                               | 2464.60 | 12.5 pass                            | 208            | 2466.85 | 13 pass                              | 253            | 2469.10 | 13.5 pass                            | 298            | 2471.35 | 13.0 pass                            |
| 184                                                                                                               | 2464.65 | 12.5 pass                            | 209            | 2466.90 | 13 pass                              | 254            | 2469.15 | 13.5 pass                            | 299            | 2471.40 | 13.0 pass                            |
| 185                                                                                                               | 2464.70 | 12.5 pass                            | 210            | 2466.95 | 13 pass                              | 255            | 2469.20 | 13.5 pass                            | 300            | 2471.45 | 13.0 pass                            |
| 186                                                                                                               | 2464.75 | 12.5 pass                            | 211            | 2467.00 | 13 pass                              | 256            | 2469.25 | 13.5 pass                            | 301            | 2471.50 | 13.0 pass                            |
| 187                                                                                                               | 2464.80 | 12.5 pass                            | 212            | 2467.05 | 13 pass                              | 257            | 2469.30 | 13.5 pass                            | 302            | 2471.55 | 13.0 pass                            |
| 188                                                                                                               | 2464.85 | 12.5 pass                            | 213            | 2467.10 | 12.5 pass                            | 258            | 2469.35 | 13.5 pass                            | 303            | 2471.60 | 13.0 pass                            |
| 189                                                                                                               | 2464.90 | 12.5 pass                            | 214            | 2467.15 | 12.5 pass                            | 259            | 2469.40 | 13.5 pass                            | 304            | 2471.65 | 13.0 pass                            |
| 170                                                                                                               | 2464.95 | 12.5 pass                            | 215            | 2467.20 | 12.5 pass                            | 260            | 2469.45 | 13.5 pass                            | 305            | 2471.70 | 13.0 pass                            |
| 171                                                                                                               | 2465.00 | 12.5 pass                            | 216            | 2467.25 | 12.5 pass                            | 261            | 2469.50 | 13.5 pass                            | 306            | 2471.75 | 13.0 pass                            |
| 172                                                                                                               | 2465.05 | 12.5 pass                            | 217            | 2467.30 | 12.5 pass                            | 262            | 2469.55 | 13.5 pass                            | 307            | 2471.80 | 13.0 pass                            |
| 173                                                                                                               | 2465.10 | 12.5 pass                            | 218            | 2467.35 | 12.5 pass                            | 263            | 2469.60 | 13.5 pass                            | 308            | 2471.85 | 13.0 pass                            |
| 174                                                                                                               | 2465.15 | 12.5 pass                            | 219            | 2467.40 | 12.5 pass                            | 264            | 2469.65 | 13.5 pass                            | 309            | 2471.90 | 13.0 pass                            |
| 175                                                                                                               | 2465.20 | 12 pass                              | 220            | 2467.45 | 12.5 pass                            | 265            | 2469.70 | 13.5 pass                            | 310            | 2471.95 | 14.5 pass                            |
| 176                                                                                                               | 2465.25 | 12 pass                              | 221            | 2467.50 | 12.5 pass                            | 266            | 2469.75 | 13.5 pass                            | 311            | 2472.00 | 14.5 pass                            |
| 177                                                                                                               | 2465.30 | 12 pass                              | 222            | 2467.55 | 12.5 pass                            | 267            | 2469.80 | 13.5 pass                            | 312            | 2472.05 | 14.5 pass                            |
| 178                                                                                                               | 2465.35 | 12 pass                              | 223            | 2467.60 | 12.5 pass                            | 268            | 2469.85 | 13.5 pass                            | 313            | 2472.10 | 14.5 pass                            |
| 179                                                                                                               | 2465.40 | 12 pass                              | 224            | 2467.65 | 12.5 pass                            | 269            | 2469.90 | 13.5 pass                            | 314            | 2472.15 | 14.5 pass                            |
| 180                                                                                                               | 2465.45 | 12 pass                              | 225            | 2467.70 | 12.5 pass                            | 270            | 2469.95 | 13.5 pass                            | 315            | 2472.20 | 14.5 pass                            |
| 181                                                                                                               | 2465.50 | 12 pass                              | 226            | 2467.75 | 12.5 pass                            | 271            | 2470.00 | 14 pass                              | 316            | 2472.25 | 14.5 pass                            |
| 182                                                                                                               | 2465.55 | 12 pass                              | 227            | 2467.80 | 12.5 pass                            | 272            | 2470.05 | 14 pass                              | 317            | 2472.30 | 14.5 pass                            |
| 183                                                                                                               | 2465.60 | 12 pass                              | 228            | 2467.85 | 12.5 pass                            | 273            | 2470.10 | 14 pass                              | 318            | 2472.35 | 14.5 pass                            |
| 184                                                                                                               | 2465.65 | 12 pass                              | 229            | 2467.90 | 12.5 pass                            | 274            | 2470.15 | 14 pass                              | 319            | 2472.40 | 14.5 pass                            |
| 185                                                                                                               | 2465.70 | 12 pass                              | 230            | 2467.95 | 12.5 pass                            | 275            | 2470.20 | 14 pass                              | 320            | 2472.45 | 14.5 pass                            |
| 186                                                                                                               | 2465.75 | 12 pass                              | 231            | 2468.00 | 13.3 pass                            | 276            | 2470.25 | 14 pass                              | 321            | 2472.50 | 14.5 pass                            |
| 187                                                                                                               | 2465.80 | 12 pass                              | 232            | 2468.05 | 13.3 pass                            | 277            | 2470.30 | 14 pass                              | 322            | 2472.55 | 14.5 pass                            |
| 188                                                                                                               | 2465.85 | 12 pass                              | 233            | 2468.10 | 13.3 pass                            | 278            | 2470.35 | 14 pass                              | 323            | 2472.60 | 14.5 pass                            |
| 189                                                                                                               | 2465.90 | 12 pass                              | 234            | 2468.15 | 13.3 pass                            | 279            | 2470.40 | 14 pass                              | 324            | 2472.65 | 14.5 pass                            |
| 190                                                                                                               | 2465.95 | 12 pass                              | 235            | 2468.20 | 13.3 pass                            | 280            | 2470.45 | 14 pass                              | 325            | 2472.70 | 14.5 pass                            |
| 191                                                                                                               | 2466.00 | 12 pass                              | 236            | 2468.25 | 13.3 pass                            | 281            | 2470.50 | 14 pass                              | 326            | 2472.75 | 14.5 pass                            |
| 192                                                                                                               | 2466.05 | 13 pass                              | 237            | 2468.30 | 13.3 pass                            | 282            | 2470.55 | 14 pass                              | 327            | 2472.80 | 14.5 pass                            |
| 193                                                                                                               | 2466.10 | 13 pass                              | 238            | 2468.35 | 13.3 pass                            | 283            | 2470.60 | 14 pass                              | 328            | 2472.85 | 14.5 pass                            |
| 194                                                                                                               | 2466.15 | 13 pass                              | 239            | 2468.40 | 13.3 pass                            | 284            | 2470.65 | 14 pass                              | 329            | 2472.90 | 14.5 pass                            |
| 195                                                                                                               | 2466.20 | 13 pass                              | 240            | 2468.45 | 13.3 pass                            | 285            | 2470.70 | 14 pass                              | 330            | 2472.95 | 14.5 pass                            |
| 196                                                                                                               | 2466.25 | 13 pass                              | 241            | 2468.50 | 13.3 pass                            | 286            | 2470.75 | 14 pass                              | 331            | 2473.00 | 17 pass                              |
| 197                                                                                                               | 2466.30 | 13 pass                              | 242            | 2468.55 | 13.3 pass                            | 287            | 2470.80 | 14 pass                              | 332            | 2473.05 | 17 pass                              |
| 198                                                                                                               | 2466.35 | 13 pass                              | 243            | 2468.60 | 13.3 pass                            | 288            | 2470.85 | 13 pass                              | 333            | 2473.10 | 17 pass                              |
| 199                                                                                                               | 2466.40 | 13 pass                              | 244            | 2468.65 | 13.3 pass                            | 289            | 2470.90 | 13 pass                              | 334            | 2473.15 | 17 pass                              |
| 200                                                                                                               | 2466.45 | 13 pass                              | 245            | 2468.70 | 13.3 pass                            | 290            | 2470.95 | 13 pass                              | 335            | 2473.20 | 17 pass                              |
| 201                                                                                                               | 2466.50 | 13 pass                              | 246            | 2468.75 | 13.3 pass                            | 291            | 2471.00 | 13 pass                              | 336            | 2473.25 | 17 pass                              |
| 202                                                                                                               | 2466.55 | 13 pass                              | 247            | 2468.80 | 13.3 pass                            | 292            | 2471.05 | 13 pass                              | 337            | 2473.30 | 17 pass                              |
| 203                                                                                                               | 2466.60 | 13 pass                              | 248            | 2468.85 | 13.3 pass                            | 293            | 2471.10 | 13 pass                              | 338            | 2473.35 | 17 pass                              |
| 204                                                                                                               | 2466.65 | 13 pass                              | 249            | 2468.90 | 13.3 pass                            | 294            | 2471.15 | 13 pass                              | 339            | 2473.40 | 17 pass                              |
| 205                                                                                                               | 2466.70 | 13 pass                              | 250            | 2468.95 | 13.3 pass                            | 295            | 2471.20 | 13 pass                              | 340            | 2473.45 | 17 pass                              |

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Jamming margin at 1 mb (part1)

13/7/96

| processing gain by methode of jamming margin using BER tester                                                   |    |                                      |                |    |                                      |                |    |                                      |                |    |                                      |
|-----------------------------------------------------------------------------------------------------------------|----|--------------------------------------|----------------|----|--------------------------------------|----------------|----|--------------------------------------|----------------|----|--------------------------------------|
| radio conditions : supply voltage 5v, at room temp, rx s/n = #40, tx s/n = #27                                  |    |                                      |                |    |                                      |                |    |                                      |                |    |                                      |
| tester name : Brian Casto / Jim Friedmann                                                                       |    |                                      |                |    |                                      |                |    |                                      |                |    |                                      |
| test date : 3/17/96 radio carrier freq= 2465                                                                    |    |                                      |                |    |                                      |                |    |                                      |                |    |                                      |
| Gp = S/N + Mj + Lsys; where S/N = 13 dB as per Wireless Information Networks by Pahlavan & Levesque; Lsys = 0dB |    |                                      |                |    |                                      |                |    |                                      |                |    |                                      |
| input signal level = -30 dBm, jammer level = -30.1 dBm, then Mj = -0.1 dB                                       |    |                                      |                |    |                                      |                |    |                                      |                |    |                                      |
| Gp = 13.0 dB + -0.1 dB = 12.9 dB (worst case point)                                                             |    |                                      |                |    |                                      |                |    |                                      |                |    |                                      |
| jammer<br>freq                                                                                                  | Gp | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp | pass (error<br>rate under<br>1x10-5) | jammer<br>freq | Gp | pass (error<br>rate under<br>1x10-5) |
| MHz                                                                                                             | dB | pass /<br>FAILURE                    | MHz            | dB | pass /<br>FAILURE                    | MHz            | dB | pass /<br>FAILURE                    | MHz            | dB | pass /<br>FAILURE                    |
| 1 2456.50                                                                                                       | 19 | pass                                 | 41 2458.50     | 17 | pass                                 | 81 2460.50     | 15 | pass                                 | 121 2462.50    | 14 | pass                                 |
| 2 2456.55                                                                                                       | 19 | pass                                 | 42 2458.55     | 17 | pass                                 | 82 2460.55     | 15 | pass                                 | 122 2462.55    | 14 | pass                                 |
| 3 2456.60                                                                                                       | 19 | pass                                 | 43 2458.60     | 17 | pass                                 | 83 2460.60     | 15 | pass                                 | 123 2462.60    | 14 | pass                                 |
| 4 2456.65                                                                                                       | 19 | pass                                 | 44 2458.65     | 17 | pass                                 | 84 2460.65     | 15 | pass                                 | 124 2462.65    | 14 | pass                                 |
| 5 2456.70                                                                                                       | 19 | pass                                 | 45 2458.70     | 17 | pass                                 | 85 2460.70     | 15 | pass                                 | 125 2462.70    | 14 | pass                                 |
| 6 2456.75                                                                                                       | 19 | pass                                 | 46 2458.75     | 17 | pass                                 | 86 2460.75     | 15 | pass                                 | 126 2462.75    | 14 | pass                                 |
| 7 2456.80                                                                                                       | 19 | pass                                 | 47 2458.80     | 17 | pass                                 | 87 2460.80     | 15 | pass                                 | 127 2462.80    | 14 | pass                                 |
| 8 2456.85                                                                                                       | 19 | pass                                 | 48 2458.85     | 17 | pass                                 | 88 2460.85     | 15 | pass                                 | 128 2462.85    | 14 | pass                                 |
| 9 2456.90                                                                                                       | 19 | pass                                 | 49 2458.90     | 17 | pass                                 | 89 2460.90     | 15 | pass                                 | 129 2462.90    | 14 | pass                                 |
| 10 2456.95                                                                                                      | 19 | pass                                 | 50 2458.95     | 17 | pass                                 | 90 2460.95     | 15 | pass                                 | 130 2462.95    | 14 | pass                                 |
| 11 2457.00                                                                                                      | 19 | pass                                 | 51 2459.00     | 15 | pass                                 | 91 2461.00     | 15 | pass                                 | 131 2463.00    | 14 | pass                                 |
| 12 2457.05                                                                                                      | 19 | pass                                 | 52 2459.05     | 15 | pass                                 | 92 2461.05     | 15 | pass                                 | 132 2463.05    | 14 | pass                                 |
| 13 2457.10                                                                                                      | 19 | pass                                 | 53 2459.10     | 15 | pass                                 | 93 2461.10     | 15 | pass                                 | 133 2463.10    | 14 | pass                                 |
| 14 2457.15                                                                                                      | 19 | pass                                 | 54 2459.15     | 15 | pass                                 | 94 2461.15     | 15 | pass                                 | 134 2463.15    | 14 | pass                                 |
| 15 2457.20                                                                                                      | 19 | pass                                 | 55 2459.20     | 15 | pass                                 | 95 2461.20     | 15 | pass                                 | 135 2463.20    | 14 | pass                                 |
| 16 2457.25                                                                                                      | 19 | pass                                 | 56 2459.25     | 15 | pass                                 | 96 2461.25     | 15 | pass                                 | 136 2463.25    | 14 | pass                                 |
| 17 2457.30                                                                                                      | 19 | pass                                 | 57 2459.30     | 15 | pass                                 | 97 2461.30     | 15 | pass                                 | 137 2463.30    | 14 | pass                                 |
| 18 2457.35                                                                                                      | 19 | pass                                 | 58 2459.35     | 15 | pass                                 | 98 2461.35     | 15 | pass                                 | 138 2463.35    | 14 | pass                                 |
| 19 2457.40                                                                                                      | 19 | pass                                 | 59 2459.40     | 15 | pass                                 | 99 2461.40     | 15 | pass                                 | 139 2463.40    | 14 | pass                                 |
| 20 2457.45                                                                                                      | 19 | pass                                 | 60 2459.45     | 15 | pass                                 | 100 2461.45    | 15 | pass                                 | 140 2463.45    | 14 | pass                                 |
| 21 2457.50                                                                                                      | 19 | pass                                 | 61 2459.50     | 15 | pass                                 | 101 2461.50    | 15 | pass                                 | 141 2463.50    | 14 | pass                                 |
| 22 2457.55                                                                                                      | 19 | pass                                 | 62 2459.55     | 15 | pass                                 | 102 2461.55    | 15 | pass                                 | 142 2463.55    | 14 | pass                                 |
| 23 2457.60                                                                                                      | 19 | pass                                 | 63 2459.60     | 15 | pass                                 | 103 2461.60    | 15 | pass                                 | 143 2463.60    | 14 | pass                                 |
| 24 2457.65                                                                                                      | 19 | pass                                 | 64 2459.65     | 15 | pass                                 | 104 2461.65    | 15 | pass                                 | 144 2463.65    | 14 | pass                                 |
| 25 2457.70                                                                                                      | 19 | pass                                 | 65 2459.70     | 15 | pass                                 | 105 2461.70    | 15 | pass                                 | 145 2463.70    | 14 | pass                                 |
| 26 2457.75                                                                                                      | 19 | pass                                 | 66 2459.75     | 15 | pass                                 | 106 2461.75    | 15 | pass                                 | 146 2463.75    | 14 | pass                                 |
| 27 2457.80                                                                                                      | 19 | pass                                 | 67 2459.80     | 15 | pass                                 | 107 2461.80    | 15 | pass                                 | 147 2463.80    | 14 | pass                                 |
| 28 2457.85                                                                                                      | 19 | pass                                 | 68 2459.85     | 15 | pass                                 | 108 2461.85    | 15 | pass                                 | 148 2463.85    | 14 | pass                                 |
| 29 2457.90                                                                                                      | 19 | pass                                 | 69 2459.90     | 15 | pass                                 | 109 2461.90    | 15 | pass                                 | 149 2463.90    | 14 | pass                                 |
| 30 2457.95                                                                                                      | 19 | pass                                 | 70 2459.95     | 15 | pass                                 | 110 2461.95    | 15 | pass                                 | 150 2463.95    | 14 | pass                                 |
| 31 2458.00                                                                                                      | 17 | pass                                 | 71 2460.00     | 15 | pass                                 | 111 2462.00    | 15 | pass                                 | 151 2464.00    | 14 | pass                                 |
| 32 2458.05                                                                                                      | 17 | pass                                 | 72 2460.05     | 15 | pass                                 | 112 2462.05    | 15 | pass                                 | 152 2464.05    | 14 | pass                                 |
| 33 2458.10                                                                                                      | 17 | pass                                 | 73 2460.10     | 15 | pass                                 | 113 2462.10    | 15 | pass                                 | 153 2464.10    | 14 | pass                                 |
| 34 2458.15                                                                                                      | 17 | pass                                 | 74 2460.15     | 15 | pass                                 | 114 2462.15    | 15 | pass                                 | 154 2464.15    | 14 | pass                                 |
| 35 2458.20                                                                                                      | 17 | pass                                 | 75 2460.20     | 15 | pass                                 | 115 2462.20    | 15 | pass                                 | 155 2464.20    | 14 | pass                                 |
| 36 2458.25                                                                                                      | 17 | pass                                 | 76 2460.25     | 15 | pass                                 | 116 2462.25    | 15 | pass                                 | 156 2464.25    | 14 | pass                                 |
| 37 2458.30                                                                                                      | 17 | pass                                 | 77 2460.30     | 15 | pass                                 | 117 2462.30    | 15 | pass                                 | 157 2464.30    | 14 | pass                                 |
| 38 2458.35                                                                                                      | 17 | pass                                 | 78 2460.35     | 15 | pass                                 | 118 2462.35    | 15 | pass                                 | 158 2464.35    | 14 | pass                                 |
| 39 2458.40                                                                                                      | 17 | pass                                 | 79 2460.40     | 15 | pass                                 | 119 2462.40    | 15 | pass                                 | 159 2464.40    | 14 | pass                                 |
| 40 2458.45                                                                                                      | 17 | pass                                 | 80 2460.45     | 15 | pass                                 | 120 2462.45    | 15 | pass                                 | 160 2464.45    | 14 | pass                                 |
| drop 20% = 340 x 20% = 68 : therefore can drop 68 failures                                                      |    |                                      |                |    |                                      |                |    |                                      |                |    |                                      |

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Jamming margin at 1 mb (part2)

5750

| processing gain by methods of jamming margin using BER tester                                                   |                |      |                                      |     |                |    |                                      |     |                |    |                                      |     |                |    |                                      |
|-----------------------------------------------------------------------------------------------------------------|----------------|------|--------------------------------------|-----|----------------|----|--------------------------------------|-----|----------------|----|--------------------------------------|-----|----------------|----|--------------------------------------|
| radio conditions : supply voltage 5v. at room temp                                                              |                |      |                                      |     |                |    |                                      |     |                |    |                                      |     |                |    |                                      |
| tester name : Brian Gasto / Jim Friedmann                                                                       |                |      |                                      |     |                |    |                                      |     |                |    |                                      |     |                |    |                                      |
| Gp = S/N + Mj + Lsys; where S/N = 13 dB as per Wireless Information Networks by Pahlavan & Levesque; Lsys = 0dB |                |      |                                      |     |                |    |                                      |     |                |    |                                      |     |                |    |                                      |
| input signal level = -30 dBm, jammer level = -33.0 dBm, then Mj= -3.0 dB                                        |                |      |                                      |     |                |    |                                      |     |                |    |                                      |     |                |    |                                      |
| Gp = 13.0 dB + -0.1 dB = 12.9 dB (worst case point)                                                             |                |      |                                      |     |                |    |                                      |     |                |    |                                      |     |                |    |                                      |
|                                                                                                                 | jammer<br>freq | Gp   | pass (error<br>rate under<br>1x10-5) |     | jammer<br>freq | Gp | pass (error<br>rate under<br>1x10-5) |     | jammer<br>freq | Gp | pass (error<br>rate under<br>1x10-5) |     | jammer<br>freq | Gp | pass (error<br>rate under<br>1x10-5) |
|                                                                                                                 | MHz            | dB   | pass /<br>FAILURE                    |     | MHz            | dB | pass /<br>FAILURE                    |     | MHz            | dB | pass /<br>FAILURE                    |     | MHz            | dB | pass /<br>FAILURE                    |
| 161                                                                                                             | 2464.50        | 13   | pass                                 | 206 | 2466.75        | 14 | pass                                 | 251 | 2469.00        | 14 | pass                                 | 296 | 2471.25        | 14 | pass                                 |
| 162                                                                                                             | 2464.55        | 13   | pass                                 | 207 | 2466.80        | 14 | pass                                 | 252 | 2469.05        | 14 | pass                                 | 297 | 2471.30        | 14 | pass                                 |
| 163                                                                                                             | 2464.60        | 13   | pass                                 | 208 | 2466.85        | 14 | pass                                 | 253 | 2469.10        | 14 | pass                                 | 298 | 2471.35        | 14 | pass                                 |
| 164                                                                                                             | 2464.65        | 13   | pass                                 | 209 | 2466.90        | 14 | pass                                 | 254 | 2469.15        | 14 | pass                                 | 299 | 2471.40        | 14 | pass                                 |
| 165                                                                                                             | 2464.70        | 12.9 | pass                                 | 210 | 2466.95        | 14 | pass                                 | 255 | 2469.20        | 14 | pass                                 | 300 | 2471.45        | 14 | pass                                 |
| 166                                                                                                             | 2464.75        | 12.9 | pass                                 | 211 | 2467.00        | 14 | pass                                 | 256 | 2469.25        | 14 | pass                                 | 301 | 2471.50        | 14 | pass                                 |
| 167                                                                                                             | 2464.80        | 12.9 | pass                                 | 212 | 2467.05        | 14 | pass                                 | 257 | 2469.30        | 14 | pass                                 | 302 | 2471.55        | 14 | pass                                 |
| 168                                                                                                             | 2464.85        | 13   | pass                                 | 213 | 2467.10        | 14 | pass                                 | 258 | 2469.35        | 14 | pass                                 | 303 | 2471.60        | 14 | pass                                 |
| 169                                                                                                             | 2464.90        | 13   | pass                                 | 214 | 2467.15        | 14 | pass                                 | 259 | 2469.40        | 14 | pass                                 | 304 | 2471.65        | 14 | pass                                 |
| 170                                                                                                             | 2464.95        | 13   | pass                                 | 215 | 2467.20        | 14 | pass                                 | 260 | 2469.45        | 14 | pass                                 | 305 | 2471.70        | 14 | pass                                 |
| 171                                                                                                             | 2465.00        | 13   | pass                                 | 216 | 2467.25        | 14 | pass                                 | 261 | 2469.50        | 14 | pass                                 | 306 | 2471.75        | 14 | pass                                 |
| 172                                                                                                             | 2465.05        | 13   | pass                                 | 217 | 2467.30        | 14 | pass                                 | 262 | 2469.55        | 14 | pass                                 | 307 | 2471.80        | 14 | pass                                 |
| 173                                                                                                             | 2465.10        | 13   | pass                                 | 218 | 2467.35        | 14 | pass                                 | 263 | 2469.60        | 14 | pass                                 | 308 | 2471.85        | 14 | pass                                 |
| 174                                                                                                             | 2465.15        | 13   | pass                                 | 219 | 2467.40        | 14 | pass                                 | 264 | 2469.65        | 14 | pass                                 | 309 | 2471.90        | 14 | pass                                 |
| 175                                                                                                             | 2465.20        | 13   | pass                                 | 220 | 2467.45        | 14 | pass                                 | 265 | 2469.70        | 14 | pass                                 | 310 | 2471.95        | 14 | pass                                 |
| 176                                                                                                             | 2465.25        | 14   | pass                                 | 221 | 2467.50        | 14 | pass                                 | 266 | 2469.75        | 14 | pass                                 | 311 | 2472.00        | 15 | pass                                 |
| 177                                                                                                             | 2465.30        | 14   | pass                                 | 222 | 2467.55        | 14 | pass                                 | 267 | 2469.80        | 14 | pass                                 | 312 | 2472.05        | 15 | pass                                 |
| 178                                                                                                             | 2465.35        | 14   | pass                                 | 223 | 2467.60        | 14 | pass                                 | 268 | 2469.85        | 14 | pass                                 | 313 | 2472.10        | 15 | pass                                 |
| 179                                                                                                             | 2465.40        | 14   | pass                                 | 224 | 2467.65        | 14 | pass                                 | 269 | 2469.90        | 14 | pass                                 | 314 | 2472.15        | 15 | pass                                 |
| 180                                                                                                             | 2465.45        | 14   | pass                                 | 225 | 2467.70        | 14 | pass                                 | 270 | 2469.95        | 14 | pass                                 | 315 | 2472.20        | 15 | pass                                 |
| 181                                                                                                             | 2465.50        | 14   | pass                                 | 226 | 2467.75        | 14 | pass                                 | 271 | 2470.00        | 14 | pass                                 | 316 | 2472.25        | 15 | pass                                 |
| 182                                                                                                             | 2465.55        | 14   | pass                                 | 227 | 2467.80        | 14 | pass                                 | 272 | 2470.05        | 14 | pass                                 | 317 | 2472.30        | 15 | pass                                 |
| 183                                                                                                             | 2465.60        | 14   | pass                                 | 228 | 2467.85        | 14 | pass                                 | 273 | 2470.10        | 14 | pass                                 | 318 | 2472.35        | 15 | pass                                 |
| 184                                                                                                             | 2465.65        | 14   | pass                                 | 229 | 2467.90        | 14 | pass                                 | 274 | 2470.15        | 14 | pass                                 | 319 | 2472.40        | 15 | pass                                 |
| 185                                                                                                             | 2465.70        | 14   | pass                                 | 230 | 2467.95        | 14 | pass                                 | 275 | 2470.20        | 14 | pass                                 | 320 | 2472.45        | 15 | pass                                 |
| 186                                                                                                             | 2465.75        | 14   | pass                                 | 231 | 2468.00        | 14 | pass                                 | 276 | 2470.25        | 14 | pass                                 | 321 | 2472.50        | 15 | pass                                 |
| 187                                                                                                             | 2465.80        | 15   | pass                                 | 232 | 2468.05        | 14 | pass                                 | 277 | 2470.30        | 14 | pass                                 | 322 | 2472.55        | 15 | pass                                 |
| 188                                                                                                             | 2465.85        | 15   | pass                                 | 233 | 2468.10        | 14 | pass                                 | 278 | 2470.35        | 14 | pass                                 | 323 | 2472.60        | 15 | pass                                 |
| 189                                                                                                             | 2465.90        | 15   | pass                                 | 234 | 2468.15        | 14 | pass                                 | 279 | 2470.40        | 14 | pass                                 | 324 | 2472.65        | 15 | pass                                 |
| 190                                                                                                             | 2465.95        | 15   | pass                                 | 235 | 2468.20        | 14 | pass                                 | 280 | 2470.45        | 14 | pass                                 | 325 | 2472.70        | 15 | pass                                 |
| 191                                                                                                             | 2466.00        | 15   | pass                                 | 236 | 2468.25        | 14 | pass                                 | 281 | 2470.50        | 14 | pass                                 | 326 | 2472.75        | 15 | pass                                 |
| 192                                                                                                             | 2466.05        | 15   | pass                                 | 237 | 2468.30        | 14 | pass                                 | 282 | 2470.55        | 14 | pass                                 | 327 | 2472.80        | 15 | pass                                 |
| 193                                                                                                             | 2466.10        | 15   | pass                                 | 238 | 2468.35        | 14 | pass                                 | 283 | 2470.60        | 14 | pass                                 | 328 | 2472.85        | 15 | pass                                 |
| 194                                                                                                             | 2466.15        | 15   | pass                                 | 239 | 2468.40        | 14 | pass                                 | 284 | 2470.65        | 14 | pass                                 | 329 | 2472.90        | 15 | pass                                 |
| 195                                                                                                             | 2466.20        | 15   | pass                                 | 240 | 2468.45        | 14 | pass                                 | 285 | 2470.70        | 14 | pass                                 | 330 | 2472.95        | 15 | pass                                 |
| 196                                                                                                             | 2466.25        | 15   | pass                                 | 241 | 2468.50        | 14 | pass                                 | 286 | 2470.75        | 14 | pass                                 | 331 | 2473.00        | 18 | pass                                 |
| 197                                                                                                             | 2466.30        | 15   | pass                                 | 242 | 2468.55        | 14 | pass                                 | 287 | 2470.80        | 14 | pass                                 | 332 | 2473.05        | 18 | pass                                 |
| 198                                                                                                             | 2466.35        | 15   | pass                                 | 243 | 2468.60        | 14 | pass                                 | 288 | 2470.85        | 14 | pass                                 | 333 | 2473.10        | 18 | pass                                 |
| 199                                                                                                             | 2466.40        | 15   | pass                                 | 244 | 2468.65        | 14 | pass                                 | 289 | 2470.90        | 14 | pass                                 | 334 | 2473.15        | 18 | pass                                 |
| 200                                                                                                             | 2466.45        | 15   | pass                                 | 245 | 2468.70        | 14 | pass                                 | 290 | 2470.95        | 14 | pass                                 | 335 | 2473.20        | 18 | pass                                 |
| 201                                                                                                             | 2466.50        | 15   | pass                                 | 246 | 2468.75        | 14 | pass                                 | 291 | 2471.00        | 14 | pass                                 | 336 | 2473.25        | 18 | pass                                 |
| 202                                                                                                             | 2466.55        | 15   | pass                                 | 247 | 2468.80        | 14 | pass                                 | 292 | 2471.05        | 14 | pass                                 | 337 | 2473.30        | 18 | pass                                 |
| 203                                                                                                             | 2466.60        | 15   | pass                                 | 248 | 2468.85        | 14 | pass                                 | 293 | 2471.10        | 14 | pass                                 | 338 | 2473.35        | 18 | pass                                 |
| 204                                                                                                             | 2466.65        | 15   | pass                                 | 249 | 2468.90        | 14 | pass                                 | 294 | 2471.15        | 14 | pass                                 | 339 | 2473.40        | 18 | pass                                 |
| 205                                                                                                             | 2466.70        | 15   | pass                                 | 250 | 2468.95        | 14 | pass                                 | 295 | 2471.20        | 14 | pass                                 | 340 | 2473.45        | 18 | pass                                 |