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ENGINEERING REPORT

K267CJ, Huntsville, TX, Channel 267D Minor Change

ENGINEERING STATEMENT

All required protections are met by contour non-overlap pursuant to Section 74.1204, with the exception of protection to KSAM-FM, Huntsville, TX, 269A. KSAM-FM is protected, as discussed below.

PROTECTION TO KSAM-FM

KSAM-FM is a second adjacent-channel station to the proposed channel 267D facility. The 60 dBu F50,50 service contour of KSAM-FM extends slightly beyond the proposed 267D transmitter site. Using the well-established *Living Way Ministries* Methodology, no actual interference to any population is predicted to exist to KSAM-FM.

Note that a rule waiver of Section 74.1204 for this second/third adjacent-channel protection using the well-established *Living Way Ministries* Methodology is respectfully requested if such a rule waiver is deemed necessary for protection to any station.

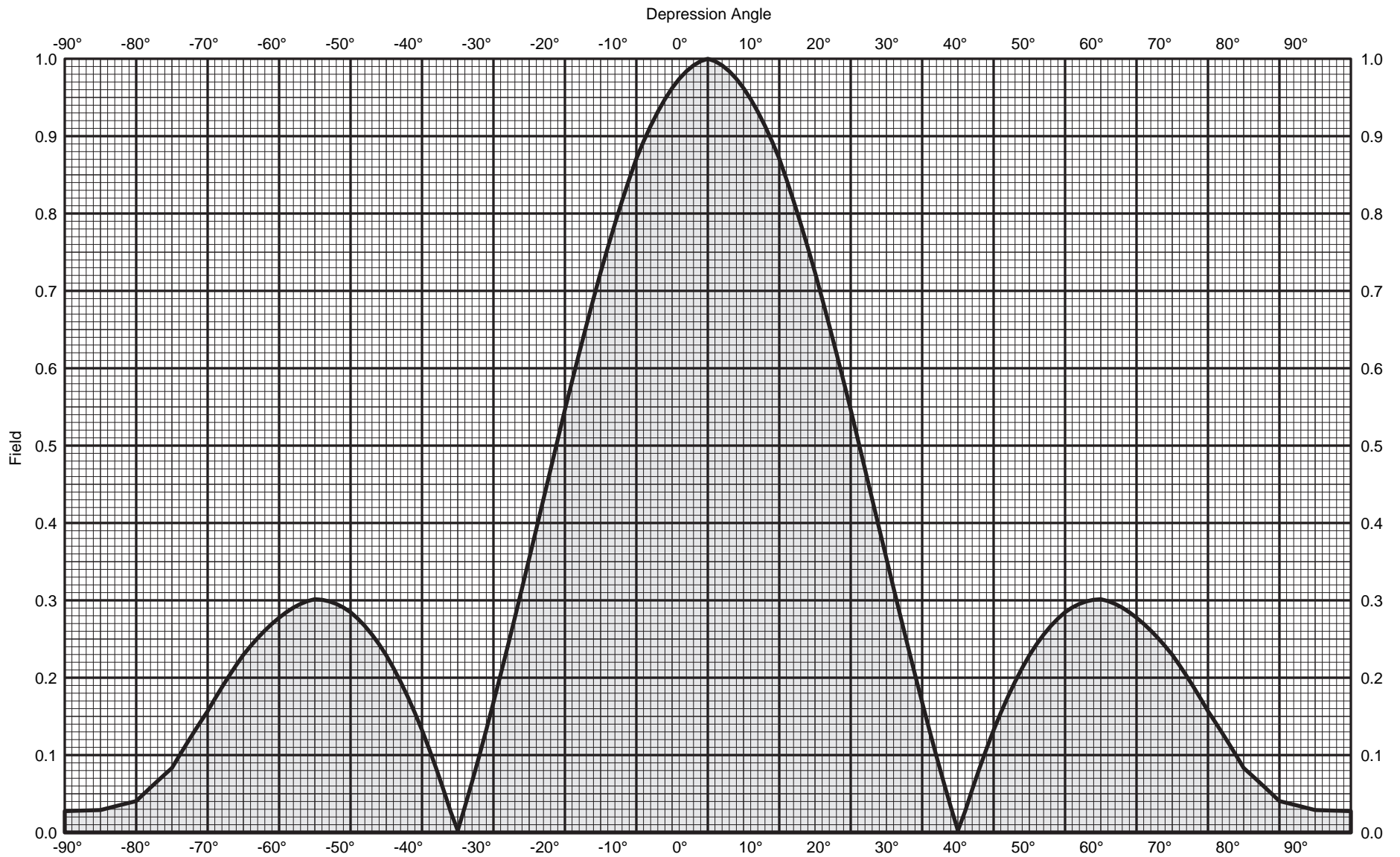
The F50,50 signal strength from KSAM-FM at the proposed 267D transmitter site is 62 dBu (the "desired" signal). The second/third adjacent-channel protection of Section 74.1204 is an undesired-to-desired ("U/D") dB signal strength ratio of 40:1. Therefore, predicted interference to KSAM-FM from the proposed 267D facility is a signal of greater than or equal to 102 dBu.

Figure EE1 is the vertical plane relative field pattern for the proposed Scala CA2-FM/CP two-bay (0.87 wavelength-spaced) antenna. By adjusting for the vertical plane downward relative field values of the proposed antenna, it is herein demonstrated that the 102 dBu interfering signal (using a free space field determination) does not exist at any point a ground level. (Actually, the study is made to 2 meters above ground level to account for a person's height.)

Attached as Figure EE2 is a tabulation of various points (at 2 meters above ground level) from the proposed translator tower base. (Column B is the different distances from the tower base to each studied point.) The actual distance from the

antenna to each point is listed in Column C, the hypotenuse of the vertical height (Column A) and the horizontal distance (Column B). Also, the vertical distance from the antenna bottom to the calculated interference signal for each studied point is provided in Column K. Because the calculated distance to the free space interfering signal (Column J) is less than the hypotenuse distance (Column C) and the interfering signal vertical distance (Column K) is less than the vertical distance (Column A) for each studied point, the interfering signal does not reach any studied point. (In other words, the interfering signal does not make it to 2 meters any point.) The clearance is at least 34 meters. An aerial photo of the proposed transmitter site shows no tall buildings within 485 meters. Therefore, pursuant to Section 74.1204(d) of the FCC Rules, KSAM-FM is adequately protected by the proposed facility.

FIGURE EE1 (1 of 3)





Two CA2-FM/CP yagis

Vertical plane pattern

Maximum array gain: 3.5 dBd (x 2.24)

Circular polarization

Vertical stack at 0.87 wavelength

| Angle | Field | Rel.dB | dBd | PwrMult | Angle | Field | Rel.dB | dBd | PwrMult |
|-------|-------|--------|--------|---------|-------|-------|--------|--------|---------|
| -90 | 0.028 | -31.20 | -27.70 | 0.00 | -45 | 0.229 | -12.81 | -9.31 | 0.12 |
| -89 | 0.028 | -31.11 | -27.61 | 0.00 | -44 | 0.213 | -13.45 | -9.95 | 0.10 |
| -88 | 0.028 | -31.02 | -27.52 | 0.00 | -43 | 0.195 | -14.21 | -10.71 | 0.08 |
| -87 | 0.028 | -30.93 | -27.43 | 0.00 | -42 | 0.175 | -15.12 | -11.62 | 0.07 |
| -86 | 0.029 | -30.85 | -27.35 | 0.00 | -41 | 0.155 | -16.21 | -12.71 | 0.05 |
| -85 | 0.029 | -30.77 | -27.27 | 0.00 | -40 | 0.132 | -17.57 | -14.07 | 0.04 |
| -84 | 0.031 | -30.09 | -26.59 | 0.00 | -39 | 0.108 | -19.33 | -15.83 | 0.03 |
| -83 | 0.034 | -29.46 | -25.96 | 0.00 | -38 | 0.082 | -21.69 | -18.19 | 0.02 |
| -82 | 0.036 | -28.88 | -25.38 | 0.00 | -37 | 0.055 | -25.13 | -21.63 | 0.01 |
| -81 | 0.038 | -28.34 | -24.84 | 0.00 | -36 | 0.027 | -31.33 | -27.83 | 0.00 |
| -80 | 0.041 | -27.85 | -24.35 | 0.00 | -35 | 0.010 | -40.00 | -36.50 | 0.00 |
| -79 | 0.049 | -26.14 | -22.64 | 0.01 | -34 | 0.033 | -29.57 | -26.07 | 0.00 |
| -78 | 0.058 | -24.73 | -21.23 | 0.01 | -33 | 0.065 | -23.71 | -20.21 | 0.01 |
| -77 | 0.067 | -23.53 | -20.03 | 0.01 | -32 | 0.098 | -20.13 | -16.63 | 0.02 |
| -76 | 0.075 | -22.50 | -19.00 | 0.01 | -31 | 0.133 | -17.54 | -14.04 | 0.04 |
| -75 | 0.083 | -21.59 | -18.09 | 0.02 | -30 | 0.168 | -15.48 | -11.98 | 0.06 |
| -74 | 0.099 | -20.12 | -16.62 | 0.02 | -29 | 0.204 | -13.81 | -10.31 | 0.09 |
| -73 | 0.114 | -18.88 | -15.38 | 0.03 | -28 | 0.241 | -12.37 | -8.87 | 0.13 |
| -72 | 0.128 | -17.82 | -14.32 | 0.04 | -27 | 0.278 | -11.12 | -7.62 | 0.17 |
| -71 | 0.143 | -16.90 | -13.40 | 0.05 | -26 | 0.316 | -10.01 | -6.51 | 0.22 |
| -70 | 0.157 | -16.09 | -12.59 | 0.06 | -25 | 0.354 | -9.02 | -5.52 | 0.28 |
| -69 | 0.173 | -15.26 | -11.76 | 0.07 | -24 | 0.392 | -8.13 | -4.63 | 0.34 |
| -68 | 0.188 | -14.53 | -11.03 | 0.08 | -23 | 0.431 | -7.31 | -3.81 | 0.42 |
| -67 | 0.202 | -13.88 | -10.38 | 0.09 | -22 | 0.469 | -6.57 | -3.07 | 0.49 |
| -66 | 0.216 | -13.30 | -9.80 | 0.10 | -21 | 0.508 | -5.88 | -2.38 | 0.58 |
| -65 | 0.230 | -12.78 | -9.28 | 0.12 | -20 | 0.546 | -5.25 | -1.75 | 0.67 |
| -64 | 0.241 | -12.37 | -8.87 | 0.13 | -19 | 0.583 | -4.68 | -1.18 | 0.76 |
| -63 | 0.251 | -12.00 | -8.50 | 0.14 | -18 | 0.620 | -4.16 | -0.66 | 0.86 |
| -62 | 0.261 | -11.67 | -8.17 | 0.15 | -17 | 0.655 | -3.67 | -0.17 | 0.96 |
| -61 | 0.270 | -11.38 | -7.88 | 0.16 | -16 | 0.690 | -3.22 | 0.28 | 1.07 |
| -60 | 0.278 | -11.13 | -7.63 | 0.17 | -15 | 0.724 | -2.81 | 0.69 | 1.17 |
| -59 | 0.285 | -10.92 | -7.42 | 0.18 | -14 | 0.756 | -2.43 | 1.07 | 1.28 |
| -58 | 0.291 | -10.73 | -7.23 | 0.19 | -13 | 0.787 | -2.08 | 1.42 | 1.39 |
| -57 | 0.295 | -10.59 | -7.09 | 0.20 | -12 | 0.816 | -1.76 | 1.74 | 1.49 |
| -56 | 0.299 | -10.48 | -6.98 | 0.20 | -11 | 0.844 | -1.47 | 2.03 | 1.60 |
| -55 | 0.301 | -10.42 | -6.92 | 0.20 | -10 | 0.871 | -1.20 | 2.30 | 1.70 |
| -54 | 0.301 | -10.44 | -6.94 | 0.20 | -9 | 0.893 | -0.98 | 2.52 | 1.79 |
| -53 | 0.299 | -10.49 | -6.99 | 0.20 | -8 | 0.913 | -0.79 | 2.71 | 1.87 |
| -52 | 0.295 | -10.59 | -7.09 | 0.20 | -7 | 0.931 | -0.62 | 2.88 | 1.94 |
| -51 | 0.291 | -10.73 | -7.23 | 0.19 | -6 | 0.948 | -0.47 | 3.03 | 2.01 |
| -50 | 0.285 | -10.91 | -7.41 | 0.18 | -5 | 0.962 | -0.34 | 3.16 | 2.07 |
| -49 | 0.276 | -11.17 | -7.67 | 0.17 | -4 | 0.974 | -0.23 | 3.27 | 2.12 |
| -48 | 0.267 | -11.48 | -7.98 | 0.16 | -3 | 0.984 | -0.14 | 3.36 | 2.17 |
| -47 | 0.256 | -11.84 | -8.34 | 0.15 | -2 | 0.991 | -0.07 | 3.43 | 2.20 |
| -46 | 0.243 | -12.28 | -8.78 | 0.13 | -1 | 0.997 | -0.03 | 3.47 | 2.22 |
| | | | | | 0 | 1.000 | 0.00 | 3.50 | 2.24 |



Two CA2-FM/CP yagis

Vertical plane pattern

Maximum array gain: 3.5 dBd (x 2.24)

Circular polarization

Vertical stack at 0.87 wavelength

| Angle | Field | Rel.dB | dBd | PwrMult | Angle | Field | Rel.dB | dBd | PwrMult |
|-------|-------|--------|--------|---------|-------|-------|--------|--------|---------|
| 0 | 1.000 | 0.00 | 3.50 | 2.24 | 45 | 0.229 | -12.81 | -9.31 | 0.12 |
| 1 | 0.997 | -0.03 | 3.47 | 2.22 | 46 | 0.243 | -12.29 | -8.79 | 0.13 |
| 2 | 0.991 | -0.07 | 3.43 | 2.20 | 47 | 0.256 | -11.85 | -8.35 | 0.15 |
| 3 | 0.984 | -0.14 | 3.36 | 2.17 | 48 | 0.267 | -11.48 | -7.98 | 0.16 |
| 4 | 0.974 | -0.23 | 3.27 | 2.12 | 49 | 0.276 | -11.17 | -7.67 | 0.17 |
| 5 | 0.962 | -0.34 | 3.16 | 2.07 | 50 | 0.285 | -10.91 | -7.41 | 0.18 |
| 6 | 0.948 | -0.47 | 3.03 | 2.01 | 51 | 0.291 | -10.73 | -7.23 | 0.19 |
| 7 | 0.931 | -0.62 | 2.88 | 1.94 | 52 | 0.295 | -10.59 | -7.09 | 0.20 |
| 8 | 0.913 | -0.79 | 2.71 | 1.87 | 53 | 0.299 | -10.49 | -6.99 | 0.20 |
| 9 | 0.893 | -0.98 | 2.52 | 1.79 | 54 | 0.301 | -10.44 | -6.94 | 0.20 |
| 10 | 0.871 | -1.20 | 2.30 | 1.70 | 55 | 0.301 | -10.42 | -6.92 | 0.20 |
| 11 | 0.844 | -1.47 | 2.03 | 1.60 | 56 | 0.299 | -10.48 | -6.98 | 0.20 |
| 12 | 0.816 | -1.76 | 1.74 | 1.49 | 57 | 0.295 | -10.59 | -7.09 | 0.20 |
| 13 | 0.787 | -2.08 | 1.42 | 1.39 | 58 | 0.291 | -10.73 | -7.23 | 0.19 |
| 14 | 0.756 | -2.43 | 1.07 | 1.28 | 59 | 0.285 | -10.92 | -7.42 | 0.18 |
| 15 | 0.724 | -2.81 | 0.69 | 1.17 | 60 | 0.278 | -11.13 | -7.63 | 0.17 |
| 16 | 0.690 | -3.22 | 0.28 | 1.07 | 61 | 0.270 | -11.38 | -7.88 | 0.16 |
| 17 | 0.655 | -3.67 | -0.17 | 0.96 | 62 | 0.261 | -11.67 | -8.17 | 0.15 |
| 18 | 0.620 | -4.16 | -0.66 | 0.86 | 63 | 0.251 | -12.00 | -8.50 | 0.14 |
| 19 | 0.583 | -4.68 | -1.18 | 0.76 | 64 | 0.241 | -12.37 | -8.87 | 0.13 |
| 20 | 0.546 | -5.25 | -1.75 | 0.67 | 65 | 0.230 | -12.78 | -9.28 | 0.12 |
| 21 | 0.508 | -5.88 | -2.38 | 0.58 | 66 | 0.216 | -13.30 | -9.80 | 0.10 |
| 22 | 0.469 | -6.57 | -3.07 | 0.49 | 67 | 0.202 | -13.88 | -10.38 | 0.09 |
| 23 | 0.431 | -7.31 | -3.81 | 0.42 | 68 | 0.188 | -14.53 | -11.03 | 0.08 |
| 24 | 0.392 | -8.13 | -4.63 | 0.34 | 69 | 0.173 | -15.26 | -11.76 | 0.07 |
| 25 | 0.354 | -9.02 | -5.52 | 0.28 | 70 | 0.157 | -16.09 | -12.59 | 0.06 |
| 26 | 0.316 | -10.01 | -6.51 | 0.22 | 71 | 0.143 | -16.90 | -13.40 | 0.05 |
| 27 | 0.278 | -11.12 | -7.62 | 0.17 | 72 | 0.128 | -17.82 | -14.32 | 0.04 |
| 28 | 0.241 | -12.37 | -8.87 | 0.13 | 73 | 0.114 | -18.88 | -15.38 | 0.03 |
| 29 | 0.204 | -13.81 | -10.31 | 0.09 | 74 | 0.099 | -20.12 | -16.62 | 0.02 |
| 30 | 0.168 | -15.48 | -11.98 | 0.06 | 75 | 0.083 | -21.59 | -18.09 | 0.02 |
| 31 | 0.133 | -17.54 | -14.04 | 0.04 | 76 | 0.075 | -22.50 | -19.00 | 0.01 |
| 32 | 0.098 | -20.13 | -16.63 | 0.02 | 77 | 0.067 | -23.53 | -20.03 | 0.01 |
| 33 | 0.065 | -23.70 | -20.20 | 0.01 | 78 | 0.058 | -24.73 | -21.23 | 0.01 |
| 34 | 0.033 | -29.56 | -26.06 | 0.00 | 79 | 0.049 | -26.14 | -22.64 | 0.01 |
| 35 | 0.010 | -40.00 | -36.50 | 0.00 | 80 | 0.041 | -27.85 | -24.35 | 0.00 |
| 36 | 0.027 | -31.33 | -27.83 | 0.00 | 81 | 0.038 | -28.34 | -24.84 | 0.00 |
| 37 | 0.055 | -25.13 | -21.63 | 0.01 | 82 | 0.036 | -28.88 | -25.38 | 0.00 |
| 38 | 0.082 | -21.69 | -18.19 | 0.02 | 83 | 0.034 | -29.46 | -25.96 | 0.00 |
| 39 | 0.108 | -19.33 | -15.83 | 0.03 | 84 | 0.031 | -30.09 | -26.59 | 0.00 |
| 40 | 0.132 | -17.57 | -14.07 | 0.04 | 85 | 0.029 | -30.77 | -27.27 | 0.00 |
| 41 | 0.155 | -16.22 | -12.72 | 0.05 | 86 | 0.029 | -30.85 | -27.35 | 0.00 |
| 42 | 0.175 | -15.12 | -11.62 | 0.07 | 87 | 0.028 | -30.93 | -27.43 | 0.00 |
| 43 | 0.195 | -14.21 | -10.71 | 0.08 | 88 | 0.028 | -31.02 | -27.52 | 0.00 |
| 44 | 0.213 | -13.45 | -9.95 | 0.10 | 89 | 0.028 | -31.11 | -27.61 | 0.00 |
| | | | | | 90 | 0.028 | -31.20 | -27.70 | 0.00 |

FIGURE EE2

FREE SPACE FIELD STRENGTH AT A DISTANCE STUDY RESULTS

PROJECT: HUNTSVILLE, TX, CHANNEL 267D

4-Oct-16

| | Column A | Column B | Column C | Column D | Column E | Column F | Column G | Column H | Column I | Column J | Column K |
|----|----------|----------|--------------|----------------------|----------|-----------------------|----------|----------|-----------------------|----------|-----------------------|
| | Vert | Horiz | Hypot- | Down- | | | Pattern | Free | Adjusted | Interf | Vert |
| | Dist | Dist | enuse | ward | | | Relative | Space | ERP in | Distance | Interf |
| | From | From | Dist | Angle | | | Field at | Inter- | Down- | along | Distance |
| | Ant | Tower | fr Ant | fr Ant | Max | Max | Down- | ferring | ward | Hypot- | below |
| | Bottom | Base | Bottom | Bottom | ERP | ERP | ward | Signal | Angle | enuse | Antenna |
| Pt | (meters) | (meters) | (meters) | (degrees) | (watts) | (dBmw) | Angle | (dBu) | (dBmW) | (meters) | (meters) |
| 1 | 154 | 0.1 | 154.0 | 90.0 | 75 | 48.75 | 0.028 | 102.0 | 17.69 | 13.6 | 13.6 |
| 2 | 154 | 20 | 155.3 | 82.6 | 75 | 48.75 | 0.036 | 102.0 | 19.88 | 17.4 | 17.3 |
| 3 | 154 | 40 | 159.1 | 75.4 | 75 | 48.75 | 0.083 | 102.0 | 27.13 | 40.2 | 38.9 |
| 4 | 154 | 60 | 165.3 | 68.7 | 75 | 48.75 | 0.188 | 102.0 | 34.23 | 91.0 | 84.8 |
| 5 | 154 | 80 | 173.5 | 62.5 | 75 | 48.75 | 0.261 | 102.0 | 37.08 | 126.4 | 112.1 |
| 6 | 154 | 100 | 183.6 | 57.0 | 75 | 48.75 | 0.295 | 102.0 | 38.15 | 142.8 | 119.8 |
| 7 | 154 | 150 | 215.0 | 45.8 | 75 | 48.75 | 0.243 | 102.0 | 36.46 | 117.7 | 84.3 |
| 8 | 154 | 200 | 252.4 | 37.6 | 75 | 48.75 | 0.082 | 102.0 | 27.03 | 39.7 | 24.2 |
| 9 | 154 | 250 | 293.6 | 31.6 | 75 | 48.75 | 0.133 | 102.0 | 31.23 | 64.4 | 33.8 |
| 10 | 154 | 300 | 337.2 | 27.2 | 75 | 48.75 | 0.278 | 102.0 | 37.63 | 134.6 | 61.5 |
| 11 | 154 | 350 | 382.4 | 23.7 | 75 | 48.75 | 0.431 | 102.0 | 41.44 | 208.7 | 84.0 |
| 12 | 154 | 400 | 428.6 | 21.1 | 75 | 48.75 | 0.508 | 102.0 | 42.87 | 246.0 | 88.4 |
| 13 | 154 | 450 | 475.6 | 18.9 | 75 | 48.75 | 0.620 | 102.0 | 44.60 | 300.2 | 97.2 |
| 14 | 154 | 500 | 523.2 | 17.1 | 75 | 48.75 | 0.655 | 102.0 | 45.08 | 317.2 | 93.4 |
| 15 | 154 | 531 | 552.9 | 16.2 | 75 | 48.75 | 0.690 | 102.0 | 45.53 | 334.1 | 93.1 |

NOTE: Study point at 2 meters above ground (or rooftop, see write-up) level.

RESULTS: COLUMN J DISTANCES ARE LESS THAN COLUMN C AND COLUMN K DISTANCES ARE LESS THAN COLUMN A DISTANCES IN ALL INSTANCES; THEREFORE, INTERFERRING SIGNAL DOES NOT EXIST AT ANY LOCATION (TWO METERS OR LESS ABOVE GROUND LEVEL)



Google earth

feet 3000
meters 900

