

# Comprehensive Engineering Exhibit

## Minor Change of K221GV

### Facility ID 202298

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This application requests for K221GV a change of channel to mitigate interference. No change of location, power or height is requested. An informal objection to the operation of this facility on channel 221 has been filed against the license to cover, 0000214217, this application is responsive to that action.

#### **Antenna Location**

This proposal is to simply operate the current facility as authorized in application 0000213888 and modified by application 0000214217, except on channel 248 in place of 221. Below as **Figure 1** is an overlap and spacing study, from which it can be determined that this proposal is within the licensed and proposed contour of **second** adjacent channel station KEGL as well as **second** adjacent station KBFB.

#### **73.1204 Compliance**

We will demonstrate that a lack of population and/or other factors allow this proposal to be compliant with 74.1204. The process commonly called “Living Way”, allows for the use of D/U Analysis, also known as “signal strength ratio methodology” to be utilized to demonstrate compliance. In this instant case the facility to be protected is on a second or third adjacent channel and is to be afforded protection from signals 40 dB stronger than the protected facility presents near the proposed translator antenna location.

**Concerning KEGL Licensed Facility;** In **Figure 2** a map showing the predicted 86 dBu signal contour of the protected KEGL facility approximately 500 meters beyond the proposed translator antenna location is given. This proposal can only cause predicted interference to the protected facility by having a signal exceeding 126 dBu ( $86 + 40$ ) in a habitable/populated area. Utilizing the line of sight equation shown in **Figure 3** it has been determined that a 126 dBu signal developed by 0.5 watts, as proposed, emitted by the proposed antenna will not reach a habitable area. With examination of the image in **Figure 4** it can be determined that no habitable space extends into the confines of this contour.

**Concerning KBFB;** In **Figure 2** a map showing the predicted 87.0 dBu signal contour of the protected KBFB facility at the proposed translator antenna location is given. This is a stronger signal than KEGL, thus by protecting KEGL, KBFB is inherently protected.

**Fill-In and Minor Change Status** This proposal is to serve as a fill-in translator for station KKGM, Facility ID 87147, Fort Worth, TX. The map of **Figure 5** demonstrates that the proposed 60 dBu contour is contained within that of the 25 mile radius of that facility.

### **RF Fields Statement**

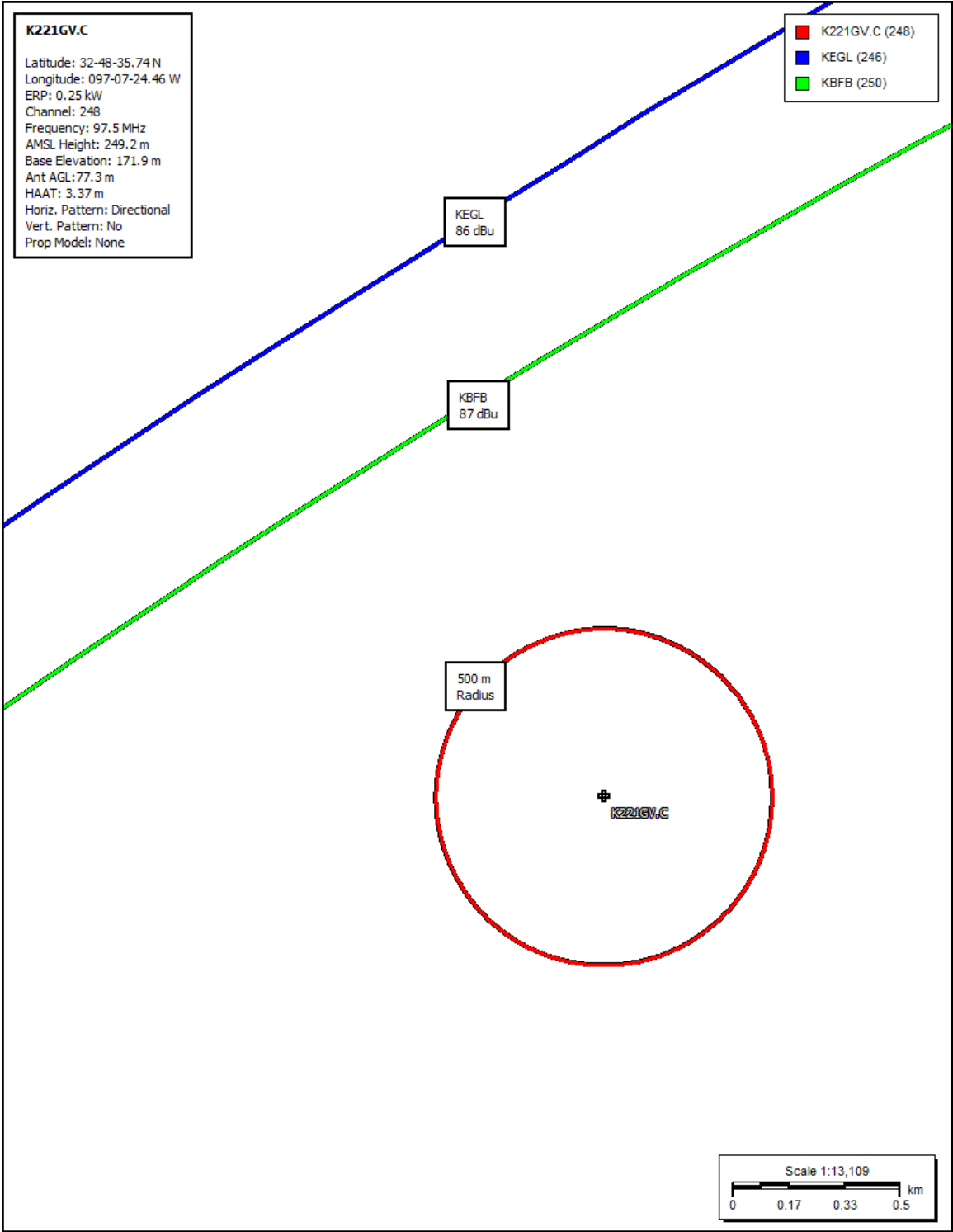
The proposed facilities were evaluated in terms of potential radio frequency field exposure at ground level in accordance with OET Bulletin No. 65, "Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radio frequency Radiation."

This proposal K221GV is to operate with 0.5 watts, antenna system is a Scala, CL-FM, a one (1) element antenna, mounted 10 meters above ground. FM Model RF Fields program has been set to calculate values for an "Opposed V Dipole" elements operated with an effective radiated power of 0.5 watts. At 2 meters above the surface, at 1.8 meters from the base of the tower, this proposal will contribute worst case, 0.3 microwatts per square centimeter, or 0.03 percent of the allowable ANSI limit for controlled exposure, and 0.15 percent of the allowable limit for uncontrolled exposure. It is therefore believed that this proposal is in compliance with OET Bulletin Number 65 as required by the Federal Communications Commission.

Further, the applicant will see that signs are posted in the vicinity of the tower, warning of potential radio frequency hazards at the site. The site itself is restricted from public access. The applicant will cooperate with other users of the tower to reduce power of the facility, or discontinue operation, as necessary to limit human exposure to levels less than specified by the Federal Communications Commission should anyone be required to climb the tower for maintenance or inspection.

[illegible]

Figure 2. Contour Map



**Figure 3. Distance to Interference Signal Level**

| <b>Proposed Antenna:</b> Isotropic<br><b>Proposed Power:</b> 0.001 kW<br><b>Antenna Height AGL:</b> 10 meters<br><b>Interference Contour:</b> 126 dBu<br><b>Artificial Rcv Antenna Height:</b> 2 meters<br><b>Distance (Free Space) Equation:</b> $= (10^{((106.92 - [\text{desired dBu}] + [\text{ERP in dBk}]) / 20)}) * 1000$<br><b>Field Strength (dBu) Equation</b> $= 106.92 - (20 * (\text{LOG10}[\text{DistMeters} / 1000])) + [\text{ERP in dBk}]$ |          |       |        |           |                  |                  |                 |                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|--------|-----------|------------------|------------------|-----------------|----------------|
| Fill in "yellow" cells                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |       |        |           |                  |                  |                 |                |
| Depression                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |       |        | Distance  |                  |                  |                 |                |
| Angle                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Antenna  |       |        | from Ant. | Distance         | Field Strength   | Distance        | Field Strength |
| Below                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Relative | ERP   | ERP    | to Interf | rom Ant. to      | in dBu @         | from Ant.       | in dBu @       |
| Horizon                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Field    | in kW | in dBk | Contour   | Artificial Plane | Artificial Plane | to Ground Level | Ground Level   |
| 0°                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.000    | 0.001 | -30.00 | 3.52 m    | infinite         | ---              | infinite        | ---            |
| -5°                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.000    | 0.001 | -30.00 | 3.52 m    | 91.79 m          | 97.66 dBu        | 114.74 m        | 95.73 dBu      |
| -10°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 46.07 m          | 103.65 dBu       | 57.59 m         | 101.71 dBu     |
| -15°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 30.91 m          | 107.12 dBu       | 38.64 m         | 105.18 dBu     |
| -20°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 23.39 m          | 109.54 dBu       | 29.24 m         | 107.60 dBu     |
| -25°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 18.93 m          | 111.38 dBu       | 23.66 m         | 109.44 dBu     |
| -30°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 16.00 m          | 112.84 dBu       | 20.00 m         | 110.90 dBu     |
| -35°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 13.95 m          | 114.03 dBu       | 17.43 m         | 112.09 dBu     |
| -40°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 12.45 m          | 115.02 dBu       | 15.56 m         | 113.08 dBu     |
| -45°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 11.31 m          | 115.85 dBu       | 14.14 m         | 113.91 dBu     |
| -50°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 10.44 m          | 116.54 dBu       | 13.05 m         | 114.61 dBu     |
| -55°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 9.77 m           | 117.13 dBu       | 12.21 m         | 115.19 dBu     |
| -60°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 9.24 m           | 117.61 dBu       | 11.55 m         | 115.67 dBu     |
| -65°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 8.83 m           | 118.00 dBu       | 11.03 m         | 116.07 dBu     |
| -70°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 8.51 m           | 118.32 dBu       | 10.64 m         | 116.38 dBu     |
| -75°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 8.28 m           | 118.56 dBu       | 10.35 m         | 116.62 dBu     |
| -80°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 8.12 m           | 118.73 dBu       | 10.15 m         | 116.79 dBu     |
| -85°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 8.03 m           | 118.83 dBu       | 10.04 m         | 116.89 dBu     |
| -90°                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1.000    | 0.001 | -30.00 | 3.52 m    | 8.00 m           | 118.86 dBu       | 10.00 m         | 116.92 dBu     |

**Figure 4. Image of Support Structure**



**Figure 5. Fill-in Contour Map**

