

ENGINEERING STATEMENT

The engineering data contained herein have been prepared on behalf of UNIMAS DALLAS LLC, licensee of full-power digital television station KSTR-DT, Channel 48 in Irving, Texas, in support of its request for Special Temporary Authority to construct a distributed transmission system (DTS) in the Dallas-Fort Worth market in order to begin implementation of the ATSC-3.0 transmission standard for testing purposes. Once the station begins operating on its repack channel, Channel 34, the licensee will file an Application for Construction Permit to operate the DTS facility specified herein on the new channel.

The DTS facility is comprised of the presently licensed operation of KSTR-DT (BLCDT-20100826AFG) as well as operation with three SFN nodes at sites located within the KSTR-DT noise-limited service contour. Below are operating parameters for the main and single frequency network (SFN) node facilities:

KSTR-DT MAIN TRANSMITTER SITE (REFERENCE SITE)

Site Name : Cedar Hill

Site Coordinates (NAD83) : 32-32-36 N, 096-57-33 W

Tower ASRN : 1059733

Ground Elevation : 248.1 meters

Overall Tower Height Above Ground : 498.4 meters

Antenna Radiation Center Above Ground : 490.1 meters

Antenna Radiation Center Above Mean Sea Level : 738.2 meters

Effective Radiated Power : 1000 kW

Antenna Make/Model : Dielectric TFU-30GTH-R S200DC

Type : Horizontally Polarized, Directional

Orientation : 0 degrees true

KSTR-DT SFN-1 TRANSMITTER SITE

Site Name : Garland
Site Coordinates (NAD83) : 32-50-36.5 N, 096-33-49.3 W
Tower ASRN : 1050894
Ground Elevation : 152.7 meters
Overall Tower Height Above Ground : 123.1 meters
Antenna Radiation Center Above Ground : 103 meters
Antenna Radiation Center Above Mean Sea Level : 255.7 meters
Effective Radiated Power : 100 kW
Antenna Make/Model : Dielectric TFU-24WB
Type : Elliptically Polarized, Directional (Medium Cardioid Pattern)
Electrical Beam Tilt : 0.5 degrees
Orientation : 270 degrees true

KSTR-DT SFN-2 TRANSMITTER SITE

Site Name : Fort Worth
Site Coordinates (NAD83) : 32-45-01.0 N, 097-16-08.0 W
Tower ASRN : 1053406
Ground Elevation : 191.1 meters
Overall Tower Height Above Ground : 340.3 meters
Antenna Radiation Center Above Ground : 190 meters
Effective Radiated Power : 100 kW
Antenna Make/Model : Dielectric TFU-24WB
Type : Elliptically Polarized, Directional (Medium Cardioid Pattern)
Electrical Beam Tilt : 0.5 degrees
Orientation : 90 degrees true

KSTR-DT SFN-3 TRANSMITTER SITE

Site Name : Denton

Site Coordinates (NAD83) : 33-10-01.7 N, 097-06-43.2 W

Tower ASRN : 1048967

Ground Elevation : 201.5 meters

Overall Tower Height Above Ground : 64.6 meters

Antenna Radiation Center Above Ground : 67.7 meters

Effective Radiated Power : 75 kW

Antenna Make/Model : Dielectric TFU-24WB

Type : Elliptically Polarized, Directional (Medium Cardioid Pattern)

Electrical Beam Tilt : 0.5 degrees

Orientation : 135 degrees true

Exhibits B-1 is a map upon which the predicted service contours of licensed KSTR-DT are plotted. As shown, the community of Irving is completely encompassed by the 48 dBu city-grade service contour of the main (reference) KSTR-DT facility. Exhibits B-2, B-3 and B-4 are maps upon which the predicted service contours of the individual SFN facilities are plotted. Exhibit B-5 is a map which shows the combined coverage of the main and SFN facilities. Since it is intended to utilize the licensed facility of KSTR-DT as the reference for the DTS operation, it is clear that the DTS facility will cover all of the area presently served by reference station, as required by Commission Rules.

Instead of employing the 103-kilometer Table of Distances arc for limiting the coverage of UHF DTS proposals, we have chosen to compute the arc that pertains to the largest station in the market, as allowed under FCC Rules.

EXHIBIT A

We have determined that the largest station coverage in the Dallas-Fort Worth DMA belongs to WFAA-DT, Channel 8 in Dallas, Texas. The 36 dBu contour of the facility licensed in BLCDT-20110110AAH has a service area of 46,667 square kilometers. This area corresponds to a circle with a radius of 121.8 kilometers. It is this arc within which the individual noise-limited service contours of proposed KSTR-DT must be contained, as required by Commission Rules. As shown in Exhibit B-5, the entire coverage of the KSTR-DT DTS facility proposed herein lies within the 121.8-kilometer arc extending from the KSTR-DT reference site.

Elevation and azimuth pattern information for the main and SFN antenna are provided in Exhibits C-1 and C-2, respectively. It is important to note that the proposed SFN antenna patterns (azimuth and elevation) are identical for all three SFN node facilities. The only difference is the orientation of antenna with respect to true north at each site.

Exhibit D contains the summary results from a TVStudy interference study, which was conducted using a cell size of 2 kilometers and increment spacing of 1.0 kilometer. It concludes that the proposed KSTR-DT DTS facility on Channel 48 meets the Commission's *de minimis* interference criteria to all co-channel and adjacent-channel pre-repack full-power and Class A facilities, except one. The facility proposed herein causes 31.8% interference to the service population of licensed KUVN-CD, Channel 47 in Fort Worth, Texas. However, KUVN-CD is owned by the licensee of KSTR-DT, meaning that interference to the pre-repack facility of KUVN-CD is accepted and can be ignored. It is also important to note that KUVN-CD has been authorized to operate on post-repack Channel 11 in Fort Worth. Upon making the change to operation on Channel 11, the interference described above will be ameliorated.

EXHIBIT A

Power density calculations for both the main (reference) site and the SFN sites appear in Exhibit E.

I declare under penalty of perjury that the foregoing statements and the attached exhibits, which were prepared by me or under my immediate supervision, are true and correct to the best of my knowledge and belief.

A handwritten signature in blue ink, appearing to read 'K. T. Fisher', with a stylized flourish at the end.

KEVIN T. FISHER

March 7, 2018

CONTOUR POPULATION
2015 U.S. CENSUS DATA
CITY-GRADE : 7,145,195 (2,712,547 HH)
NOISE-LIMITED : 7,296,239 (2,776,866 HH)



FCC NOISE-LIMITED
SERVICE CONTOUR

FCC CITY-GRADE
CONTOUR

EXHIBIT B-1
PREDICTED SERVICE CONTOURS
KSTR-DT MAIN (REFERENCE)
CHANNEL 48 - IRVING, TEXAS

Scale 1:1,250,000

0 8 16 24 mi

CONTOUR POPULATION
2015 U.S. CENSUS DATA
CITY-GRADE : 4,693,301 (1,785,066 HH)
NOISE-LIMITED : 5,279,755 (1,999,860 HH)



**FCC NOISE-LIMITED
SERVICE CONTOUR**

**FCC CITY-GRADE
CONTOUR**

EXHIBIT B-2
PREDICTED SERVICE CONTOURS
KSTR-DT SFN-1 (GARLAND)
CHANNEL 48 - IRVING, TEXAS

Scale 1:700,000

0 8 16 24 mi

CONTOUR POPULATION
2015 U.S. CENSUS DATA
CITY-GRADE : 5,874,981 (2,249,307 HH)
NOISE-LIMITED : 6,370,915 (2,422,935 HH)



FCC NOISE-LIMITED
SERVICE CONTOUR

FCC CITY-GRADE
CONTOUR

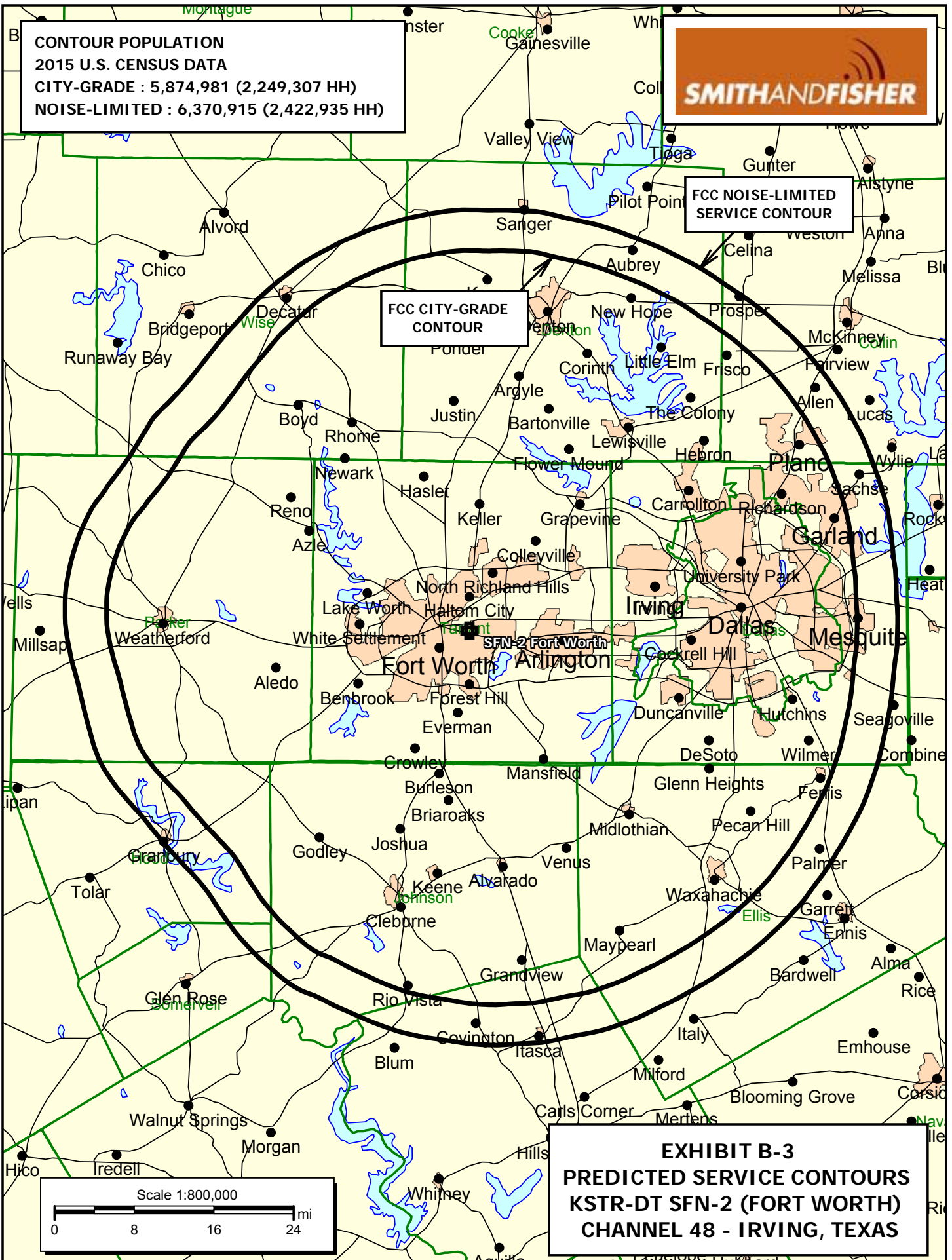
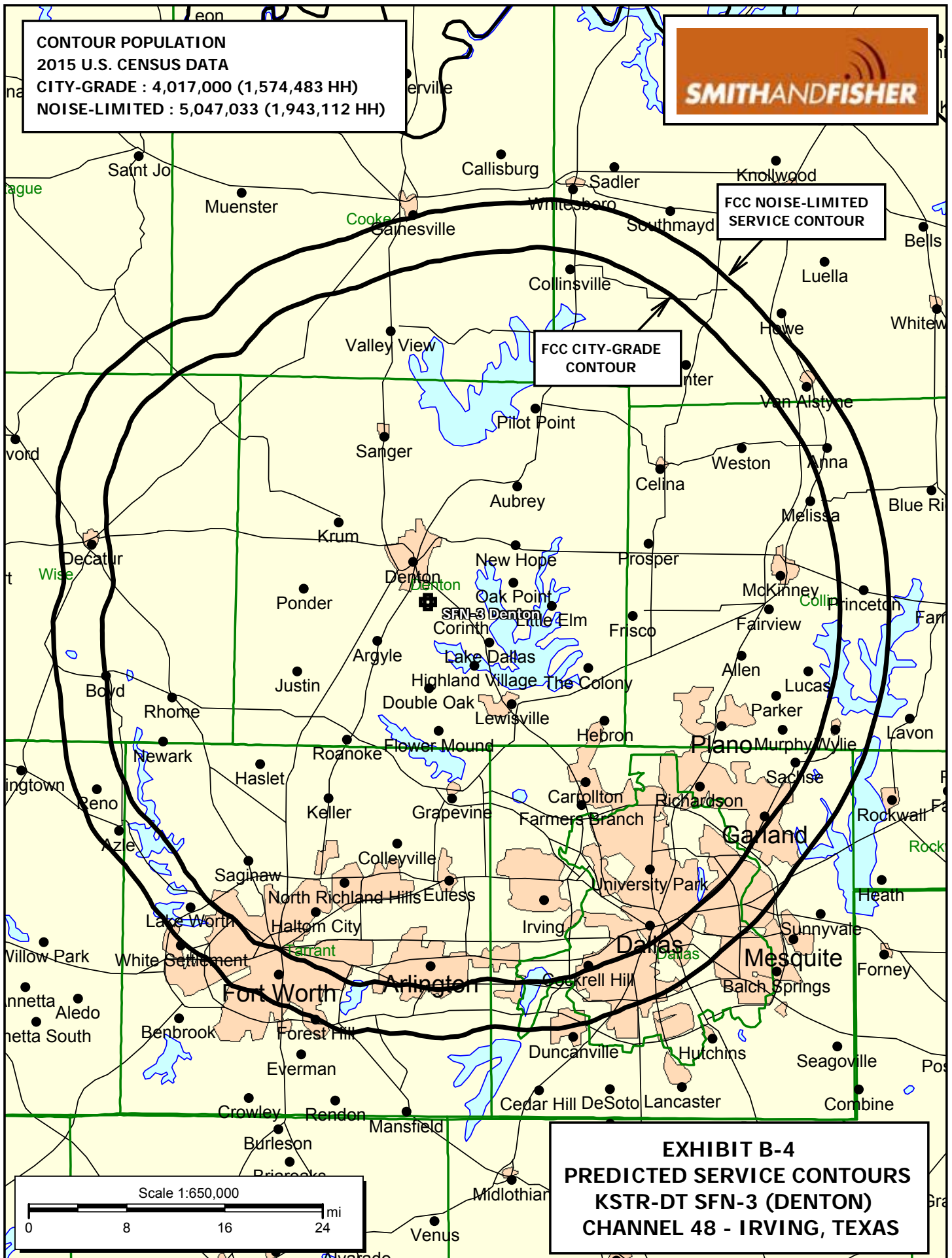
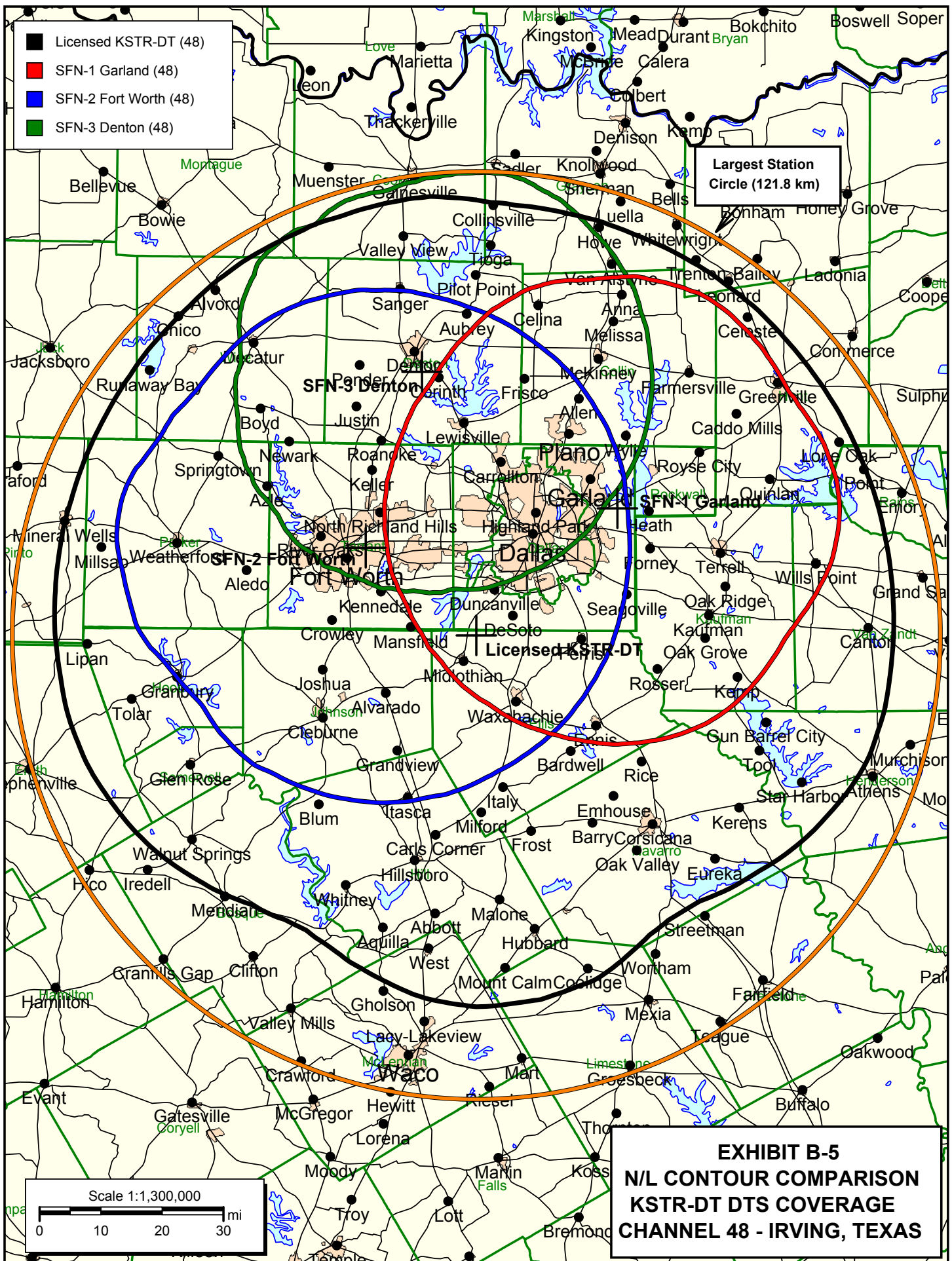


EXHIBIT B-3
PREDICTED SERVICE CONTOURS
KSTR-DT SFN-2 (FORT WORTH)
CHANNEL 48 - IRVING, TEXAS

CONTOUR POPULATION
2015 U.S. CENSUS DATA
CITY-GRADE : 4,017,000 (1,574,483 HH)
NOISE-LIMITED : 5,047,033 (1,943,112 HH)

SMITHANDFISHER





Proposal Number

DCA-8309

Date

24-Jun-99

Call Letters

KHSX-DT

Channel

DT48

Location

Irving, TX

Customer

Antenna Type

TFU-30GTH-R S200 DC**AZIMUTH PATTERN**

Gain

2.00**(3.01 dB)**

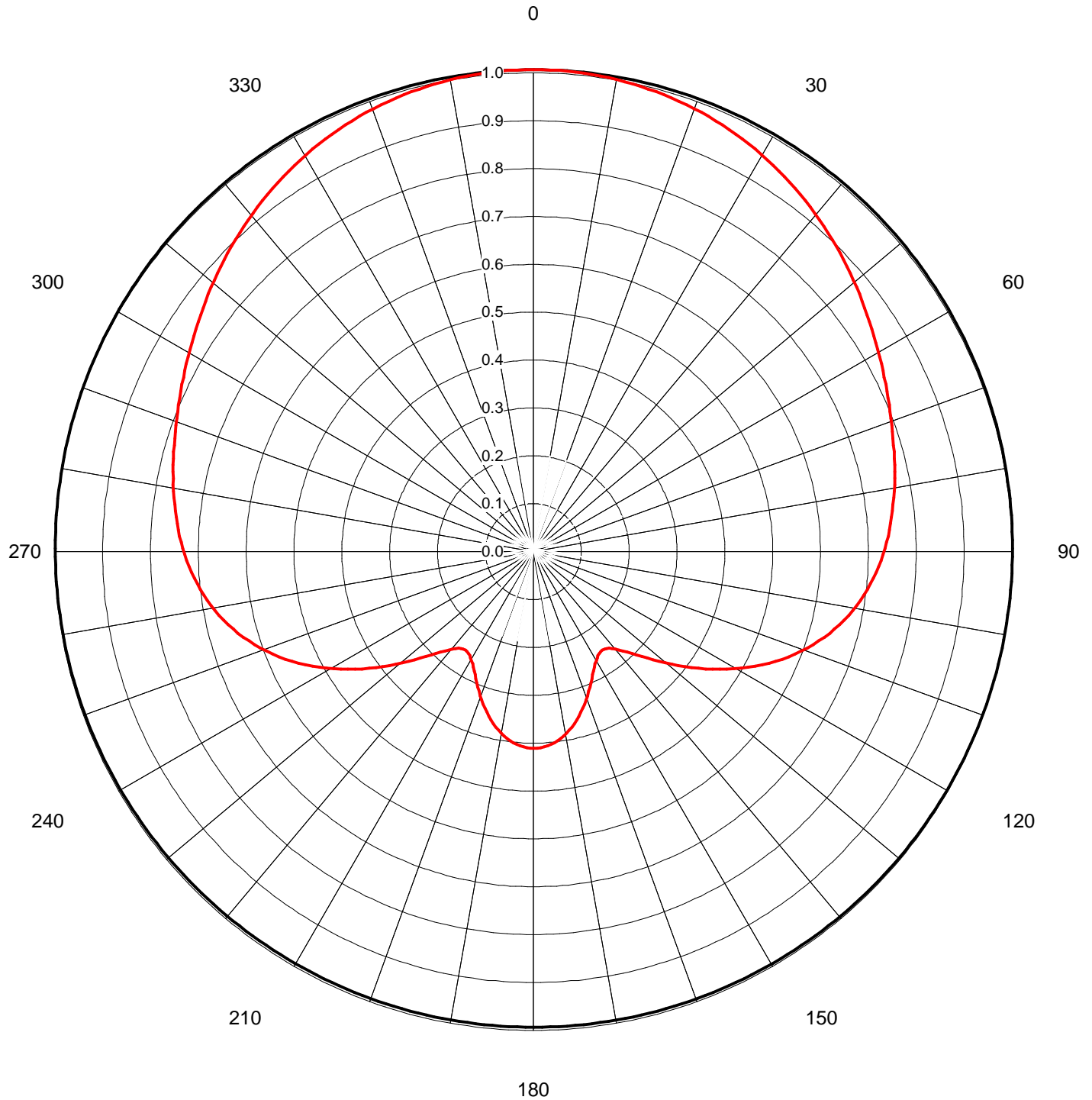
Calculated / Measured

Calculated

Frequency

677.00 MHz

Drawing #

S200

| | | |
|-----------------|----------------------------|-------------|
| Proposal Number | DCA-8309 | |
| Date | 24-Jun-99 | |
| Call Letters | KHSX-DT | Channel |
| Location | Irving, TX | DT48 |
| Customer | | |
| Antenna Type | TFU-30GTH-R S200 DC | |

TABULATION OF AZIMUTH PATTERNAzimuth Pattern Drawing #: **S200**

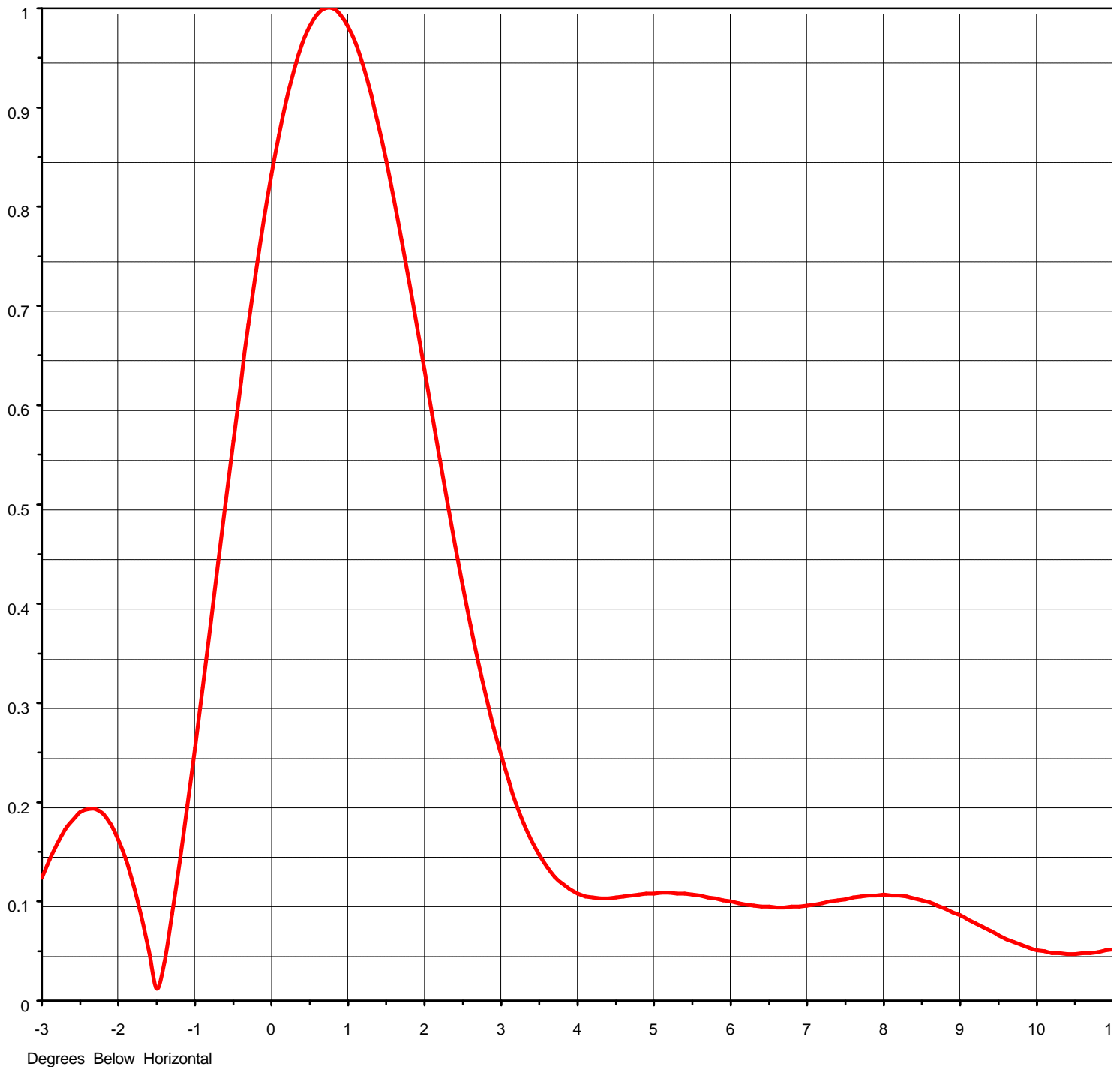
| Angle | Field | Angle | Field | Angle | Field | Angle | Field | Angle | Field | Angle | Field | Angle | Field | Angle | Field |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0 | 1.000 | 45 | 0.893 | 90 | 0.733 | 135 | 0.319 | 180 | 0.417 | 225 | 0.319 | 270 | 0.733 | 315 | 0.893 |
| 1 | 1.000 | 46 | 0.889 | 91 | 0.730 | 136 | 0.309 | 181 | 0.417 | 226 | 0.330 | 271 | 0.737 | 316 | 0.897 |
| 2 | 1.000 | 47 | 0.884 | 92 | 0.726 | 137 | 0.300 | 182 | 0.416 | 227 | 0.341 | 272 | 0.741 | 317 | 0.901 |
| 3 | 1.000 | 48 | 0.880 | 93 | 0.721 | 138 | 0.291 | 183 | 0.415 | 228 | 0.352 | 273 | 0.744 | 318 | 0.906 |
| 4 | 0.999 | 49 | 0.876 | 94 | 0.717 | 139 | 0.283 | 184 | 0.413 | 229 | 0.364 | 274 | 0.747 | 319 | 0.910 |
| 5 | 0.999 | 50 | 0.872 | 95 | 0.712 | 140 | 0.276 | 185 | 0.411 | 230 | 0.376 | 275 | 0.750 | 320 | 0.914 |
| 6 | 0.998 | 51 | 0.867 | 96 | 0.707 | 141 | 0.270 | 186 | 0.408 | 231 | 0.388 | 276 | 0.753 | 321 | 0.918 |
| 7 | 0.997 | 52 | 0.863 | 97 | 0.702 | 142 | 0.265 | 187 | 0.405 | 232 | 0.401 | 277 | 0.756 | 322 | 0.922 |
| 8 | 0.996 | 53 | 0.859 | 98 | 0.697 | 143 | 0.261 | 188 | 0.401 | 233 | 0.413 | 278 | 0.759 | 323 | 0.926 |
| 9 | 0.996 | 54 | 0.854 | 99 | 0.691 | 144 | 0.258 | 189 | 0.397 | 234 | 0.426 | 279 | 0.762 | 324 | 0.929 |
| 10 | 0.994 | 55 | 0.850 | 100 | 0.685 | 145 | 0.257 | 190 | 0.392 | 235 | 0.438 | 280 | 0.765 | 325 | 0.933 |
| 11 | 0.993 | 56 | 0.846 | 101 | 0.679 | 146 | 0.256 | 191 | 0.387 | 236 | 0.451 | 281 | 0.768 | 326 | 0.937 |
| 12 | 0.992 | 57 | 0.842 | 102 | 0.672 | 147 | 0.257 | 192 | 0.382 | 237 | 0.463 | 282 | 0.771 | 327 | 0.940 |
| 13 | 0.991 | 58 | 0.838 | 103 | 0.665 | 148 | 0.258 | 193 | 0.376 | 238 | 0.476 | 283 | 0.773 | 328 | 0.944 |
| 14 | 0.989 | 59 | 0.834 | 104 | 0.658 | 149 | 0.260 | 194 | 0.369 | 239 | 0.488 | 284 | 0.776 | 329 | 0.947 |
| 15 | 0.988 | 60 | 0.830 | 105 | 0.650 | 150 | 0.264 | 195 | 0.363 | 240 | 0.500 | 285 | 0.779 | 330 | 0.950 |
| 16 | 0.986 | 61 | 0.826 | 106 | 0.643 | 151 | 0.268 | 196 | 0.356 | 241 | 0.512 | 286 | 0.782 | 331 | 0.954 |
| 17 | 0.984 | 62 | 0.822 | 107 | 0.634 | 152 | 0.273 | 197 | 0.349 | 242 | 0.524 | 287 | 0.785 | 332 | 0.957 |
| 18 | 0.982 | 63 | 0.818 | 108 | 0.626 | 153 | 0.278 | 198 | 0.342 | 243 | 0.535 | 288 | 0.788 | 333 | 0.960 |
| 19 | 0.980 | 64 | 0.815 | 109 | 0.617 | 154 | 0.285 | 199 | 0.335 | 244 | 0.546 | 289 | 0.791 | 334 | 0.963 |
| 20 | 0.978 | 65 | 0.811 | 110 | 0.608 | 155 | 0.291 | 200 | 0.327 | 245 | 0.557 | 290 | 0.794 | 335 | 0.965 |
| 21 | 0.976 | 66 | 0.808 | 111 | 0.598 | 156 | 0.298 | 201 | 0.320 | 246 | 0.568 | 291 | 0.797 | 336 | 0.968 |
| 22 | 0.973 | 67 | 0.804 | 112 | 0.589 | 157 | 0.305 | 202 | 0.312 | 247 | 0.579 | 292 | 0.801 | 337 | 0.971 |
| 23 | 0.971 | 68 | 0.801 | 113 | 0.579 | 158 | 0.312 | 203 | 0.305 | 248 | 0.589 | 293 | 0.804 | 338 | 0.973 |
| 24 | 0.968 | 69 | 0.797 | 114 | 0.568 | 159 | 0.320 | 204 | 0.298 | 249 | 0.598 | 294 | 0.808 | 339 | 0.976 |
| 25 | 0.965 | 70 | 0.794 | 115 | 0.557 | 160 | 0.327 | 205 | 0.291 | 250 | 0.608 | 295 | 0.811 | 340 | 0.978 |
| 26 | 0.963 | 71 | 0.791 | 116 | 0.546 | 161 | 0.335 | 206 | 0.285 | 251 | 0.617 | 296 | 0.815 | 341 | 0.980 |
| 27 | 0.960 | 72 | 0.788 | 117 | 0.535 | 162 | 0.342 | 207 | 0.278 | 252 | 0.626 | 297 | 0.818 | 342 | 0.982 |
| 28 | 0.957 | 73 | 0.785 | 118 | 0.524 | 163 | 0.349 | 208 | 0.273 | 253 | 0.634 | 298 | 0.822 | 343 | 0.984 |
| 29 | 0.954 | 74 | 0.782 | 119 | 0.512 | 164 | 0.356 | 209 | 0.268 | 254 | 0.643 | 299 | 0.826 | 344 | 0.986 |
| 30 | 0.950 | 75 | 0.779 | 120 | 0.500 | 165 | 0.363 | 210 | 0.264 | 255 | 0.650 | 300 | 0.830 | 345 | 0.988 |
| 31 | 0.947 | 76 | 0.776 | 121 | 0.488 | 166 | 0.369 | 211 | 0.260 | 256 | 0.658 | 301 | 0.834 | 346 | 0.989 |
| 32 | 0.944 | 77 | 0.773 | 122 | 0.476 | 167 | 0.376 | 212 | 0.258 | 257 | 0.665 | 302 | 0.838 | 347 | 0.991 |
| 33 | 0.940 | 78 | 0.771 | 123 | 0.463 | 168 | 0.382 | 213 | 0.257 | 258 | 0.672 | 303 | 0.842 | 348 | 0.992 |
| 34 | 0.937 | 79 | 0.768 | 124 | 0.451 | 169 | 0.387 | 214 | 0.256 | 259 | 0.679 | 304 | 0.846 | 349 | 0.993 |
| 35 | 0.933 | 80 | 0.765 | 125 | 0.438 | 170 | 0.392 | 215 | 0.257 | 260 | 0.685 | 305 | 0.850 | 350 | 0.994 |
| 36 | 0.929 | 81 | 0.762 | 126 | 0.426 | 171 | 0.397 | 216 | 0.258 | 261 | 0.691 | 306 | 0.854 | 351 | 0.996 |
| 37 | 0.926 | 82 | 0.759 | 127 | 0.413 | 172 | 0.401 | 217 | 0.261 | 262 | 0.697 | 307 | 0.859 | 352 | 0.996 |
| 38 | 0.922 | 83 | 0.756 | 128 | 0.401 | 173 | 0.405 | 218 | 0.265 | 263 | 0.702 | 308 | 0.863 | 353 | 0.997 |
| 39 | 0.918 | 84 | 0.753 | 129 | 0.388 | 174 | 0.408 | 219 | 0.270 | 264 | 0.707 | 309 | 0.867 | 354 | 0.998 |
| 40 | 0.914 | 85 | 0.750 | 130 | 0.376 | 175 | 0.411 | 220 | 0.276 | 265 | 0.712 | 310 | 0.872 | 355 | 0.999 |
| 41 | 0.910 | 86 | 0.747 | 131 | 0.364 | 176 | 0.413 | 221 | 0.283 | 266 | 0.717 | 311 | 0.876 | 356 | 0.999 |
| 42 | 0.906 | 87 | 0.744 | 132 | 0.352 | 177 | 0.415 | 222 | 0.291 | 267 | 0.721 | 312 | 0.880 | 357 | 1.000 |
| 43 | 0.901 | 88 | 0.741 | 133 | 0.341 | 178 | 0.416 | 223 | 0.300 | 268 | 0.726 | 313 | 0.884 | 358 | 1.000 |
| 44 | 0.897 | 89 | 0.737 | 134 | 0.330 | 179 | 0.417 | 224 | 0.309 | 269 | 0.730 | 314 | 0.889 | 359 | 1.000 |

EXHIBIT C-1
(MAIN)

| | | | |
|-----------------|---------------------|---------|------|
| Proposal Number | DCA-8309 | Channel | DT48 |
| Date | 24-Jun-99 | | |
| Call Letters | KHSX-DT | | |
| Location | Irving, TX | | |
| Customer | | | |
| Antenna Type | TFU-30GTH-R S200 DC | | |

ELEVATION PATTERN

| | | | |
|------------------------|-------------------|-----------|------------|
| RMS Gain at Main Lobe | 25.0 (13.98 dB) | Beam Tilt | 0.75 deg |
| RMS Gain at Horizontal | 17.3 (12.38 dB) | Frequency | 677.00 MHz |
| Calculated / Measured | Calculated | Drawing # | 30G250075 |

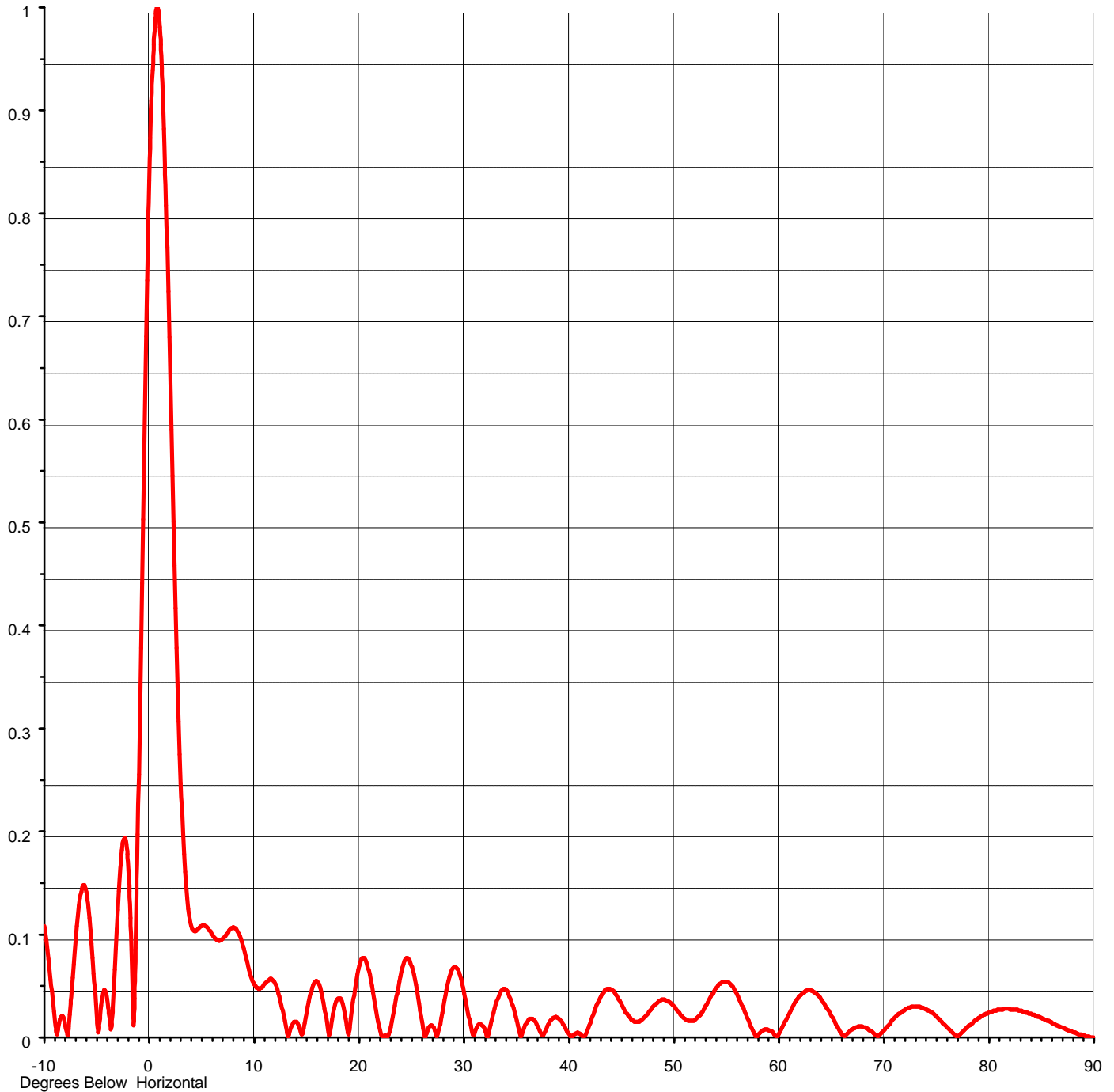


| | | |
|-----------------|----------------------------|---------------------|
| Proposal Number | DCA-8309 | |
| Date | 24-Jun-99 | |
| Call Letters | KHSX-DT | Channel DT48 |
| Location | Irving, TX | |
| Customer | | |
| Antenna Type | TFU-30GTH-R S200 DC | |

ELEVATION PATTERN

| | |
|------------------------|--------------------------|
| RMS Gain at Main Lobe | 25.0 (13.98 dB) |
| RMS Gain at Horizontal | 17.3 (12.38 dB) |
| Calculated / Measured | Calculated |

| | |
|-----------|---------------------|
| Beam Tilt | 0.75 deg |
| Frequency | 677.00 MHz |
| Drawing # | 30G250075-90 |



Proposal Number **DCA-8309**Date **24-Jun-99**Call Letters **KHSX-DT** Channel **DT48**Location **Irving, TX**

Customer

Antenna Type **TFU-30GTH-R S200 DC****TABULATION OF ELEVATION PATTERN**Elevation Pattern Drawing #: **30G250075-90**

| Angle | Field | Angle | Field | Angle | Field | Angle | Field | Angle | Field | Angle | Field |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| -10.0 | 0.108 | 2.4 | 0.458 | 10.6 | 0.047 | 30.5 | 0.022 | 51.0 | 0.019 | 71.5 | 0.023 |
| -9.5 | 0.066 | 2.6 | 0.378 | 10.8 | 0.048 | 31.0 | 0.002 | 51.5 | 0.016 | 72.0 | 0.027 |
| -9.0 | 0.015 | 2.8 | 0.307 | 11.0 | 0.051 | 31.5 | 0.013 | 52.0 | 0.016 | 72.5 | 0.029 |
| -8.5 | 0.018 | 3.0 | 0.247 | 11.5 | 0.056 | 32.0 | 0.009 | 52.5 | 0.021 | 73.0 | 0.030 |
| -8.0 | 0.012 | 3.2 | 0.198 | 12.0 | 0.054 | 32.5 | 0.008 | 53.0 | 0.029 | 73.5 | 0.029 |
| -7.5 | 0.033 | 3.4 | 0.161 | 12.5 | 0.040 | 33.0 | 0.028 | 53.5 | 0.038 | 74.0 | 0.027 |
| -7.0 | 0.096 | 3.6 | 0.135 | 13.0 | 0.016 | 33.5 | 0.043 | 54.0 | 0.047 | 74.5 | 0.024 |
| -6.5 | 0.141 | 3.8 | 0.118 | 13.5 | 0.007 | 34.0 | 0.047 | 54.5 | 0.052 | 75.0 | 0.020 |
| -6.0 | 0.141 | 4.0 | 0.108 | 14.0 | 0.015 | 34.5 | 0.038 | 55.0 | 0.054 | 75.5 | 0.015 |
| -5.5 | 0.091 | 4.2 | 0.104 | 14.5 | 0.006 | 35.0 | 0.020 | 55.5 | 0.051 | 76.0 | 0.010 |
| -5.0 | 0.017 | 4.4 | 0.103 | 15.0 | 0.019 | 35.5 | 0.001 | 56.0 | 0.044 | 76.5 | 0.005 |
| -4.5 | 0.038 | 4.6 | 0.105 | 15.5 | 0.044 | 36.0 | 0.014 | 56.5 | 0.033 | 77.0 | 0.001 |
| -4.0 | 0.037 | 4.8 | 0.107 | 16.0 | 0.055 | 36.5 | 0.018 | 57.0 | 0.020 | 77.5 | 0.006 |
| -3.5 | 0.029 | 5.0 | 0.108 | 16.5 | 0.044 | 37.0 | 0.013 | 57.5 | 0.009 | 78.0 | 0.011 |
| -3.0 | 0.124 | 5.2 | 0.109 | 17.0 | 0.015 | 37.5 | 0.002 | 58.0 | 0.001 | 78.5 | 0.015 |
| -2.8 | 0.158 | 5.4 | 0.108 | 17.5 | 0.017 | 38.0 | 0.011 | 58.5 | 0.007 | 79.0 | 0.019 |
| -2.6 | 0.182 | 5.6 | 0.106 | 18.0 | 0.037 | 38.5 | 0.018 | 59.0 | 0.008 | 79.5 | 0.022 |
| -2.4 | 0.193 | 5.8 | 0.103 | 18.5 | 0.033 | 39.0 | 0.019 | 59.5 | 0.005 | 80.0 | 0.024 |
| -2.2 | 0.188 | 6.0 | 0.100 | 19.0 | 0.005 | 39.5 | 0.013 | 60.0 | 0.002 | 80.5 | 0.026 |
| -2.0 | 0.162 | 6.2 | 0.097 | 19.5 | 0.034 | 40.0 | 0.005 | 60.5 | 0.012 | 81.0 | 0.027 |
| -1.8 | 0.116 | 6.4 | 0.095 | 20.0 | 0.066 | 40.5 | 0.003 | 61.0 | 0.022 | 81.5 | 0.028 |
| -1.6 | 0.050 | 6.6 | 0.094 | 20.5 | 0.077 | 41.0 | 0.004 | 61.5 | 0.032 | 82.0 | 0.027 |
| -1.4 | 0.038 | 6.8 | 0.095 | 21.0 | 0.065 | 41.5 | 0.001 | 62.0 | 0.040 | 82.5 | 0.027 |
| -1.2 | 0.140 | 7.0 | 0.096 | 21.5 | 0.038 | 42.0 | 0.012 | 62.5 | 0.044 | 83.0 | 0.026 |
| -1.0 | 0.255 | 7.2 | 0.098 | 22.0 | 0.011 | 42.5 | 0.025 | 63.0 | 0.046 | 83.5 | 0.024 |
| -0.8 | 0.378 | 7.4 | 0.101 | 22.5 | 0.002 | 43.0 | 0.038 | 63.5 | 0.044 | 84.0 | 0.023 |
| -0.6 | 0.503 | 7.6 | 0.104 | 23.0 | 0.006 | 43.5 | 0.046 | 64.0 | 0.039 | 84.5 | 0.021 |
| -0.4 | 0.624 | 7.8 | 0.106 | 23.5 | 0.031 | 44.0 | 0.047 | 64.5 | 0.029 | 85.0 | 0.019 |
| -0.2 | 0.735 | 8.0 | 0.107 | 24.0 | 0.059 | 44.5 | 0.042 | 65.0 | 0.020 | 85.5 | 0.016 |
| 0.0 | 0.832 | 8.2 | 0.106 | 24.5 | 0.076 | 45.0 | 0.034 | 65.5 | 0.011 | 86.0 | 0.014 |
| 0.2 | 0.909 | 8.4 | 0.103 | 25.0 | 0.072 | 45.5 | 0.024 | 66.0 | 0.003 | 86.5 | 0.012 |
| 0.4 | 0.964 | 8.6 | 0.099 | 25.5 | 0.051 | 46.0 | 0.017 | 66.5 | 0.004 | 87.0 | 0.010 |
| 0.6 | 0.994 | 8.8 | 0.093 | 26.0 | 0.020 | 46.5 | 0.015 | 67.0 | 0.008 | 87.5 | 0.007 |
| 0.8 | 1.000 | 9.0 | 0.086 | 26.5 | 0.004 | 47.0 | 0.017 | 67.5 | 0.011 | 88.0 | 0.005 |
| 1.0 | 0.981 | 9.2 | 0.078 | 27.0 | 0.012 | 47.5 | 0.022 | 68.0 | 0.010 | 88.5 | 0.003 |
| 1.2 | 0.941 | 9.4 | 0.070 | 27.5 | 0.001 | 48.0 | 0.029 | 68.5 | 0.008 | 89.0 | 0.002 |
| 1.4 | 0.882 | 9.6 | 0.062 | 28.0 | 0.024 | 48.5 | 0.034 | 69.0 | 0.004 | 89.5 | 0.001 |
| 1.6 | 0.808 | 9.8 | 0.059 | 28.5 | 0.051 | 49.0 | 0.037 | 69.5 | 0.002 | 90.0 | 0.000 |
| 1.8 | 0.724 | 10.0 | 0.053 | 29.0 | 0.067 | 49.5 | 0.035 | 70.0 | 0.007 | | |
| 2.0 | 0.635 | 10.2 | 0.050 | 29.5 | 0.066 | 50.0 | 0.031 | 70.5 | 0.013 | | |
| 2.2 | 0.545 | 10.4 | 0.048 | 30.0 | 0.048 | 50.5 | 0.025 | 71.0 | 0.019 | | |

EXHIBIT C-2 (SFN)

Horizontal Polarization AZIMUTH PATTERN

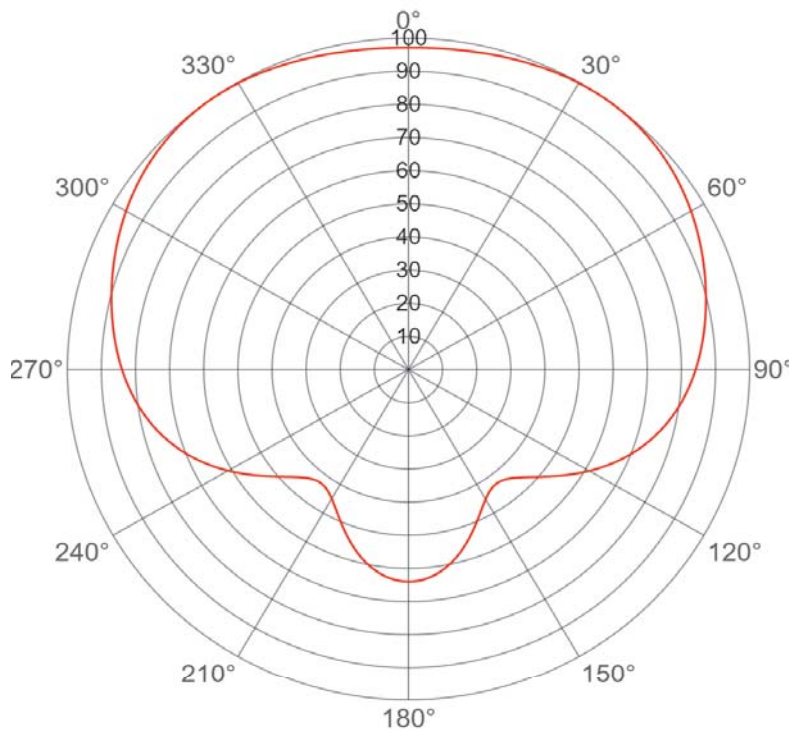


Exhibit No.
Date **10 Jan 2018**
Call Letters
Channel **48**
Antenna Type **TFU-24WB**
Location
Customer

Gain **1.6 (1.90 dB)**
Calculated
Drawing # **WB-C160H**

| Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value |
|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|
| 0 | 0.971 | 36 | 1.000 | 72 | 0.914 | 108 | 0.730 | 144 | 0.430 | 180 | 0.640 | 216 | 0.428 | 252 | 0.728 | 288 | 0.913 | 324 | 1.000 |
| 1 | 0.971 | 37 | 1.000 | 73 | 0.910 | 109 | 0.721 | 145 | 0.432 | 181 | 0.640 | 217 | 0.428 | 253 | 0.736 | 289 | 0.916 | 325 | 1.000 |
| 2 | 0.972 | 38 | 1.000 | 74 | 0.906 | 110 | 0.713 | 146 | 0.434 | 182 | 0.639 | 218 | 0.429 | 254 | 0.744 | 290 | 0.920 | 326 | 0.999 |
| 3 | 0.972 | 39 | 0.999 | 75 | 0.902 | 111 | 0.703 | 147 | 0.438 | 183 | 0.637 | 219 | 0.430 | 255 | 0.752 | 291 | 0.924 | 327 | 0.999 |
| 4 | 0.972 | 40 | 0.998 | 76 | 0.899 | 112 | 0.694 | 148 | 0.442 | 184 | 0.635 | 220 | 0.433 | 256 | 0.759 | 292 | 0.928 | 328 | 0.999 |
| 5 | 0.973 | 41 | 0.998 | 77 | 0.895 | 113 | 0.685 | 149 | 0.447 | 185 | 0.632 | 221 | 0.436 | 257 | 0.766 | 293 | 0.931 | 329 | 0.998 |
| 6 | 0.973 | 42 | 0.997 | 78 | 0.891 | 114 | 0.675 | 150 | 0.452 | 186 | 0.628 | 222 | 0.441 | 258 | 0.773 | 294 | 0.935 | 330 | 0.998 |
| 7 | 0.974 | 43 | 0.996 | 79 | 0.887 | 115 | 0.665 | 151 | 0.459 | 187 | 0.624 | 223 | 0.446 | 259 | 0.780 | 295 | 0.939 | 331 | 0.997 |
| 8 | 0.975 | 44 | 0.995 | 80 | 0.883 | 116 | 0.655 | 152 | 0.465 | 188 | 0.620 | 224 | 0.452 | 260 | 0.786 | 296 | 0.942 | 332 | 0.996 |
| 9 | 0.975 | 45 | 0.993 | 81 | 0.880 | 117 | 0.644 | 153 | 0.473 | 189 | 0.615 | 225 | 0.459 | 261 | 0.792 | 297 | 0.946 | 333 | 0.995 |
| 10 | 0.976 | 46 | 0.992 | 82 | 0.876 | 118 | 0.634 | 154 | 0.481 | 190 | 0.609 | 226 | 0.467 | 262 | 0.798 | 298 | 0.949 | 334 | 0.994 |
| 11 | 0.977 | 47 | 0.990 | 83 | 0.872 | 119 | 0.623 | 155 | 0.489 | 191 | 0.603 | 227 | 0.475 | 263 | 0.804 | 299 | 0.953 | 335 | 0.993 |
| 12 | 0.978 | 48 | 0.988 | 84 | 0.868 | 120 | 0.612 | 156 | 0.497 | 192 | 0.596 | 228 | 0.484 | 264 | 0.810 | 300 | 0.956 | 336 | 0.992 |
| 13 | 0.979 | 49 | 0.986 | 85 | 0.864 | 121 | 0.601 | 157 | 0.506 | 193 | 0.589 | 229 | 0.493 | 265 | 0.815 | 301 | 0.959 | 337 | 0.991 |
| 14 | 0.981 | 50 | 0.984 | 86 | 0.859 | 122 | 0.590 | 158 | 0.515 | 194 | 0.582 | 230 | 0.503 | 266 | 0.820 | 302 | 0.962 | 338 | 0.990 |
| 15 | 0.982 | 51 | 0.982 | 87 | 0.855 | 123 | 0.579 | 159 | 0.524 | 195 | 0.574 | 231 | 0.513 | 267 | 0.825 | 303 | 0.965 | 339 | 0.989 |
| 16 | 0.983 | 52 | 0.979 | 88 | 0.851 | 124 | 0.568 | 160 | 0.533 | 196 | 0.566 | 232 | 0.523 | 268 | 0.830 | 304 | 0.968 | 340 | 0.987 |
| 17 | 0.984 | 53 | 0.977 | 89 | 0.847 | 125 | 0.557 | 161 | 0.542 | 197 | 0.557 | 233 | 0.534 | 269 | 0.835 | 305 | 0.971 | 341 | 0.986 |
| 18 | 0.986 | 54 | 0.974 | 90 | 0.842 | 126 | 0.546 | 162 | 0.550 | 198 | 0.548 | 234 | 0.545 | 270 | 0.840 | 306 | 0.974 | 342 | 0.985 |
| 19 | 0.987 | 55 | 0.972 | 91 | 0.837 | 127 | 0.535 | 163 | 0.559 | 199 | 0.540 | 235 | 0.556 | 271 | 0.844 | 307 | 0.977 | 343 | 0.984 |
| 20 | 0.988 | 56 | 0.969 | 92 | 0.833 | 128 | 0.524 | 164 | 0.567 | 200 | 0.531 | 236 | 0.567 | 272 | 0.849 | 308 | 0.979 | 344 | 0.983 |
| 21 | 0.989 | 57 | 0.966 | 93 | 0.828 | 129 | 0.514 | 165 | 0.575 | 201 | 0.522 | 237 | 0.578 | 273 | 0.853 | 309 | 0.982 | 345 | 0.981 |
| 22 | 0.990 | 58 | 0.963 | 94 | 0.823 | 130 | 0.504 | 166 | 0.583 | 202 | 0.513 | 238 | 0.589 | 274 | 0.857 | 310 | 0.984 | 346 | 0.980 |
| 23 | 0.992 | 59 | 0.960 | 95 | 0.817 | 131 | 0.494 | 167 | 0.590 | 203 | 0.504 | 239 | 0.600 | 275 | 0.862 | 311 | 0.986 | 347 | 0.979 |
| 24 | 0.993 | 60 | 0.956 | 96 | 0.812 | 132 | 0.485 | 168 | 0.597 | 204 | 0.495 | 240 | 0.611 | 276 | 0.866 | 312 | 0.988 | 348 | 0.978 |
| 25 | 0.994 | 61 | 0.953 | 97 | 0.806 | 133 | 0.476 | 169 | 0.604 | 205 | 0.487 | 241 | 0.622 | 277 | 0.870 | 313 | 0.990 | 349 | 0.977 |
| 26 | 0.995 | 62 | 0.950 | 98 | 0.801 | 134 | 0.468 | 170 | 0.610 | 206 | 0.478 | 242 | 0.632 | 278 | 0.874 | 314 | 0.991 | 350 | 0.976 |
| 27 | 0.996 | 63 | 0.946 | 99 | 0.795 | 135 | 0.461 | 171 | 0.616 | 207 | 0.470 | 243 | 0.643 | 279 | 0.878 | 315 | 0.993 | 351 | 0.975 |
| 28 | 0.997 | 64 | 0.943 | 100 | 0.788 | 136 | 0.454 | 172 | 0.621 | 208 | 0.463 | 244 | 0.653 | 280 | 0.882 | 316 | 0.994 | 352 | 0.974 |
| 29 | 0.998 | 65 | 0.939 | 101 | 0.782 | 137 | 0.448 | 173 | 0.625 | 209 | 0.456 | 245 | 0.663 | 281 | 0.886 | 317 | 0.996 | 353 | 0.974 |
| 30 | 0.998 | 66 | 0.936 | 102 | 0.775 | 138 | 0.442 | 174 | 0.629 | 210 | 0.450 | 246 | 0.673 | 282 | 0.889 | 318 | 0.997 | 354 | 0.973 |
| 31 | 0.999 | 67 | 0.932 | 103 | 0.768 | 139 | 0.438 | 175 | 0.632 | 211 | 0.444 | 247 | 0.683 | 283 | 0.893 | 319 | 0.997 | 355 | 0.972 |
| 32 | 0.999 | 68 | 0.928 | 104 | 0.761 | 140 | 0.435 | 176 | 0.635 | 212 | 0.440 | 248 | 0.693 | 284 | 0.897 | 320 | 0.998 | 356 | 0.972 |
| 33 | 1.000 | 69 | 0.925 | 105 | 0.754 | 141 | 0.432 | 177 | 0.637 | 213 | 0.435 | 249 | 0.702 | 285 | 0.901 | 321 | 0.999 | 357 | 0.972 |
| 34 | 1.000 | 70 | 0.921 | 106 | 0.746 | 142 | 0.431 | 178 | 0.639 | 214 | 0.432 | 250 | 0.711 | 286 | 0.905 | 322 | 0.999 | 358 | 0.971 |
| 35 | 1.000 | 71 | 0.917 | 107 | 0.738 | 143 | 0.430 | 179 | 0.640 | 215 | 0.430 | 251 | 0.720 | 287 | 0.909 | 323 | 0.999 | 359 | 0.971 |

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EXHIBIT C-2 (SFN)

Vertical Polarization AZIMUTH PATTERN

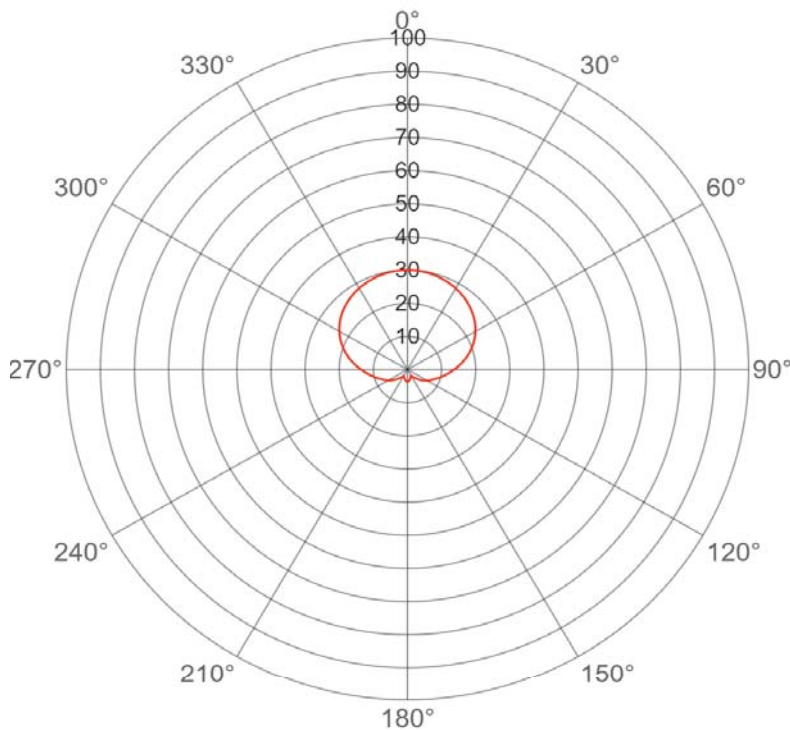


Exhibit No.
Date **10 Jan 2018**
Call Letters
Channel **48**
Antenna Type **TFU-24WB**
Location
Customer

Gain **1.6 (1.90 dB)**
Calculated
Drawing # **WB-C160H**

| Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value |
|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|
| 0 | 0.300 | 36 | 0.275 | 72 | 0.196 | 108 | 0.089 | 144 | 0.027 | 180 | 0.036 | 216 | 0.027 | 252 | 0.088 | 288 | 0.196 | 324 | 0.276 |
| 1 | 0.300 | 37 | 0.274 | 73 | 0.193 | 109 | 0.087 | 145 | 0.026 | 181 | 0.036 | 217 | 0.028 | 253 | 0.090 | 289 | 0.199 | 325 | 0.277 |
| 2 | 0.300 | 38 | 0.272 | 74 | 0.190 | 110 | 0.084 | 146 | 0.025 | 182 | 0.036 | 218 | 0.030 | 254 | 0.092 | 290 | 0.202 | 326 | 0.278 |
| 3 | 0.300 | 39 | 0.271 | 75 | 0.186 | 111 | 0.082 | 147 | 0.024 | 183 | 0.036 | 219 | 0.031 | 255 | 0.094 | 291 | 0.205 | 327 | 0.280 |
| 4 | 0.300 | 40 | 0.269 | 76 | 0.183 | 112 | 0.080 | 148 | 0.023 | 184 | 0.036 | 220 | 0.032 | 256 | 0.097 | 292 | 0.208 | 328 | 0.281 |
| 5 | 0.300 | 41 | 0.268 | 77 | 0.180 | 113 | 0.079 | 149 | 0.023 | 185 | 0.036 | 221 | 0.033 | 257 | 0.099 | 293 | 0.211 | 329 | 0.282 |
| 6 | 0.299 | 42 | 0.266 | 78 | 0.176 | 114 | 0.077 | 150 | 0.022 | 186 | 0.035 | 222 | 0.035 | 258 | 0.102 | 294 | 0.214 | 330 | 0.283 |
| 7 | 0.299 | 43 | 0.265 | 79 | 0.173 | 115 | 0.075 | 151 | 0.022 | 187 | 0.035 | 223 | 0.036 | 259 | 0.104 | 295 | 0.217 | 331 | 0.284 |
| 8 | 0.299 | 44 | 0.263 | 80 | 0.170 | 116 | 0.073 | 152 | 0.022 | 188 | 0.034 | 224 | 0.038 | 260 | 0.107 | 296 | 0.220 | 332 | 0.285 |
| 9 | 0.299 | 45 | 0.261 | 81 | 0.167 | 117 | 0.071 | 153 | 0.022 | 189 | 0.034 | 225 | 0.039 | 261 | 0.110 | 297 | 0.223 | 333 | 0.286 |
| 10 | 0.298 | 46 | 0.260 | 82 | 0.163 | 118 | 0.069 | 154 | 0.022 | 190 | 0.033 | 226 | 0.041 | 262 | 0.112 | 298 | 0.225 | 334 | 0.287 |
| 11 | 0.298 | 47 | 0.258 | 83 | 0.160 | 119 | 0.067 | 155 | 0.022 | 191 | 0.033 | 227 | 0.042 | 263 | 0.115 | 299 | 0.228 | 335 | 0.288 |
| 12 | 0.297 | 48 | 0.256 | 84 | 0.157 | 120 | 0.066 | 156 | 0.023 | 192 | 0.032 | 228 | 0.044 | 264 | 0.118 | 300 | 0.231 | 336 | 0.289 |
| 13 | 0.297 | 49 | 0.254 | 85 | 0.153 | 121 | 0.064 | 157 | 0.023 | 193 | 0.031 | 229 | 0.046 | 265 | 0.121 | 301 | 0.233 | 337 | 0.290 |
| 14 | 0.296 | 50 | 0.252 | 86 | 0.150 | 122 | 0.062 | 158 | 0.024 | 194 | 0.031 | 230 | 0.047 | 266 | 0.124 | 302 | 0.236 | 338 | 0.291 |
| 15 | 0.296 | 51 | 0.250 | 87 | 0.147 | 123 | 0.060 | 159 | 0.024 | 195 | 0.030 | 231 | 0.049 | 267 | 0.127 | 303 | 0.238 | 339 | 0.292 |
| 16 | 0.295 | 52 | 0.248 | 88 | 0.143 | 124 | 0.059 | 160 | 0.025 | 196 | 0.029 | 232 | 0.051 | 268 | 0.130 | 304 | 0.240 | 340 | 0.292 |
| 17 | 0.295 | 53 | 0.246 | 89 | 0.140 | 125 | 0.057 | 161 | 0.026 | 197 | 0.029 | 233 | 0.052 | 269 | 0.133 | 305 | 0.243 | 341 | 0.293 |
| 18 | 0.294 | 54 | 0.244 | 90 | 0.137 | 126 | 0.055 | 162 | 0.027 | 198 | 0.028 | 234 | 0.054 | 270 | 0.136 | 306 | 0.245 | 342 | 0.294 |
| 19 | 0.293 | 55 | 0.242 | 91 | 0.134 | 127 | 0.053 | 163 | 0.028 | 199 | 0.027 | 235 | 0.056 | 271 | 0.140 | 307 | 0.247 | 343 | 0.294 |
| 20 | 0.292 | 56 | 0.239 | 92 | 0.131 | 128 | 0.052 | 164 | 0.028 | 200 | 0.026 | 236 | 0.057 | 272 | 0.143 | 308 | 0.249 | 344 | 0.295 |
| 21 | 0.292 | 57 | 0.237 | 93 | 0.128 | 129 | 0.050 | 165 | 0.029 | 201 | 0.026 | 237 | 0.059 | 273 | 0.146 | 309 | 0.251 | 345 | 0.296 |
| 22 | 0.291 | 58 | 0.235 | 94 | 0.125 | 130 | 0.048 | 166 | 0.030 | 202 | 0.025 | 238 | 0.061 | 274 | 0.149 | 310 | 0.253 | 346 | 0.296 |
| 23 | 0.290 | 59 | 0.232 | 95 | 0.122 | 131 | 0.046 | 167 | 0.031 | 203 | 0.024 | 239 | 0.063 | 275 | 0.153 | 311 | 0.255 | 347 | 0.297 |
| 24 | 0.289 | 60 | 0.230 | 96 | 0.119 | 132 | 0.045 | 168 | 0.031 | 204 | 0.024 | 240 | 0.064 | 276 | 0.156 | 312 | 0.257 | 348 | 0.297 |
| 25 | 0.288 | 61 | 0.227 | 97 | 0.116 | 133 | 0.043 | 169 | 0.032 | 205 | 0.024 | 241 | 0.066 | 277 | 0.159 | 313 | 0.259 | 349 | 0.298 |
| 26 | 0.287 | 62 | 0.225 | 98 | 0.113 | 134 | 0.041 | 170 | 0.033 | 206 | 0.023 | 242 | 0.068 | 278 | 0.163 | 314 | 0.261 | 350 | 0.298 |
| 27 | 0.286 | 63 | 0.222 | 99 | 0.110 | 135 | 0.040 | 171 | 0.033 | 207 | 0.023 | 243 | 0.070 | 279 | 0.166 | 315 | 0.262 | 351 | 0.298 |
| 28 | 0.285 | 64 | 0.219 | 100 | 0.108 | 136 | 0.038 | 172 | 0.034 | 208 | 0.023 | 244 | 0.072 | 280 | 0.170 | 316 | 0.264 | 352 | 0.299 |
| 29 | 0.284 | 65 | 0.217 | 101 | 0.105 | 137 | 0.037 | 173 | 0.034 | 209 | 0.023 | 245 | 0.074 | 281 | 0.173 | 317 | 0.266 | 353 | 0.299 |
| 30 | 0.283 | 66 | 0.214 | 102 | 0.103 | 138 | 0.035 | 174 | 0.035 | 210 | 0.023 | 246 | 0.075 | 282 | 0.176 | 318 | 0.267 | 354 | 0.299 |
| 31 | 0.282 | 67 | 0.211 | 103 | 0.100 | 139 | 0.033 | 175 | 0.035 | 211 | 0.024 | 247 | 0.077 | 283 | 0.180 | 319 | 0.269 | 355 | 0.300 |
| 32 | 0.280 | 68 | 0.208 | 104 | 0.098 | 140 | 0.032 | 176 | 0.036 | 212 | 0.024 | 248 | 0.079 | 284 | 0.183 | 320 | 0.270 | 356 | 0.300 |
| 33 | 0.279 | 69 | 0.205 | 105 | 0.095 | 141 | 0.031 | 177 | 0.036 | 213 | 0.025 | 249 | 0.081 | 285 | 0.186 | 321 | 0.272 | 357 | 0.300 |
| 34 | 0.278 | 70 | 0.202 | 106 | 0.093 | 142 | 0.029 | 178 | 0.036 | 214 | 0.026 | 250 | 0.083 | 286 | 0.190 | 322 | 0.273 | 358 | 0.300 |
| 35 | 0.277 | 71 | 0.199 | 107 | 0.091 | 143 | 0.028 | 179 | 0.036 | 215 | 0.026 | 251 | 0.086 | 287 | 0.193 | 323 | 0.275 | 359 | 0.300 |

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EXHIBIT C-2 (SFN)

ELEVATION PATTERN

Exhibit No.

Date

10 Jan 2018

Call Letters

Channel

48

Antenna Type

TFU-24WB

Location

Customer

RMS Gain at Main Lobe

21.6 (13.35 dB)

Beam Tilt

0.5 Degrees

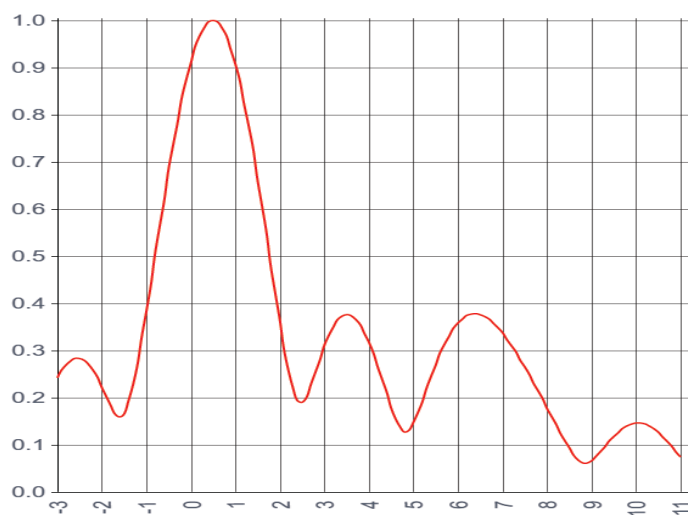
RMS Gain at Horizontal

18.0 (12.56 dB)

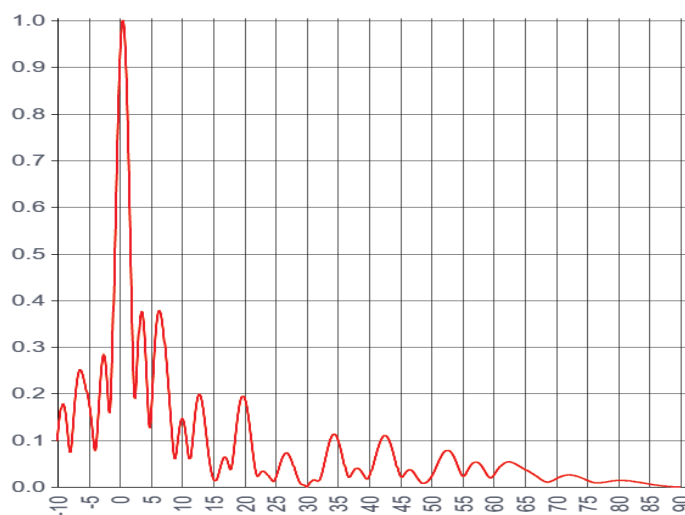
Drawing #

24I2161050

Calculated



Degrees below horizontal



Degrees below horizontal

| Angle | Field | Angle | Field | Angle | Field | Angle | Field | Angle | Field |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| -10 | 0.099 | 10 | 0.146 | 30 | 0.000 | 50 | 0.022 | 70 | 0.017 |
| -9 | 0.176 | 11 | 0.074 | 31 | 0.014 | 51 | 0.049 | 71 | 0.023 |
| -8 | 0.075 | 12 | 0.146 | 32 | 0.014 | 52 | 0.074 | 72 | 0.026 |
| -7 | 0.208 | 13 | 0.194 | 33 | 0.062 | 53 | 0.076 | 73 | 0.024 |
| -6 | 0.244 | 14 | 0.101 | 34 | 0.108 | 54 | 0.053 | 74 | 0.020 |
| -5 | 0.184 | 15 | 0.020 | 35 | 0.103 | 55 | 0.024 | 75 | 0.014 |
| -4 | 0.078 | 16 | 0.036 | 36 | 0.051 | 56 | 0.039 | 76 | 0.010 |
| -3 | 0.242 | 17 | 0.063 | 37 | 0.023 | 57 | 0.053 | 77 | 0.009 |
| -2 | 0.224 | 18 | 0.044 | 38 | 0.040 | 58 | 0.046 | 78 | 0.011 |
| -1 | 0.382 | 19 | 0.154 | 39 | 0.029 | 59 | 0.025 | 79 | 0.013 |
| 0 | 0.913 | 20 | 0.191 | 40 | 0.021 | 60 | 0.024 | 80 | 0.014 |
| 1 | 0.909 | 21 | 0.112 | 41 | 0.064 | 61 | 0.043 | 81 | 0.014 |
| 2 | 0.360 | 22 | 0.025 | 42 | 0.103 | 62 | 0.053 | 82 | 0.013 |
| 3 | 0.309 | 23 | 0.034 | 43 | 0.106 | 63 | 0.052 | 83 | 0.011 |
| 4 | 0.317 | 24 | 0.021 | 44 | 0.069 | 64 | 0.046 | 84 | 0.009 |
| 5 | 0.145 | 25 | 0.019 | 45 | 0.024 | 65 | 0.038 | 85 | 0.006 |
| 6 | 0.358 | 26 | 0.059 | 46 | 0.033 | 66 | 0.030 | 86 | 0.004 |
| 7 | 0.337 | 27 | 0.072 | 47 | 0.034 | 67 | 0.022 | 87 | 0.002 |
| 8 | 0.178 | 28 | 0.041 | 48 | 0.016 | 68 | 0.013 | 88 | 0.001 |
| 9 | 0.066 | 29 | 0.007 | 49 | 0.009 | 69 | 0.011 | 89 | 0.000 |

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TVSTUDY INTERFERENCE ANALYSIS RESULTS
PROPOSED KSTR-DT DTS FACILITY
CHANNEL 48 – IRVING, TEXAS

Study created: 2018.03.07 12:44:35

Study build station data: LMS TV 2018-03-07 (7)

Proposal: KSTR D48 DD Dallas, TX
Facility ID: 94000
Station data: User record
Record ID: 156
Country: U.S.
Ref. lat.: 32 32 34.80 N
Ref. long.: 96 57 32.40 W
DTS sites: 4

Build options:
Protect pre-transition records not on baseline channel

Search options:
All post-transition APP, CP, and baseline records excluded

Stations potentially affected by proposal:

| IX | Call | Chan | Svc | Status | City, State | File Number | Distance |
|-----|---------|------|-----|--------|-----------------|------------------|----------|
| Yes | KUVN-CD | D47 | DC | LIC | FORT WORTH, TX | BLANK0000001650 | 42.0 km |
| Yes | KTMD | D48 | DT | LIC | GALVESTON, TX | BLCDT20040325AEO | 357.9 |
| No | WOAI-TV | D48 | DT | LIC | SAN ANTONIO, TX | BLCDT20090731ADF | 384.5 |
| No | KNVA | D49 | DT | LIC | AUSTIN, TX | BLCDT20080808ACP | 259.0 |

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied, DTS site # 1:

Channel: D48
Latitude: 32 32 34.80 N (NAD83)
Longitude: 96 57 32.40 W
Height AMSL: 738.2 m
HAAT: 557.0 m
Peak ERP: 1000 kW

Antenna: 0.0 deg
Elev Pattn:

41.8 dBu contour:

| Azimuth | ERP | HAAT | Distance |
|---------|---------|---------|----------|
| 0.0 deg | 1000 kW | 523.6 m | 114.3 km |
| 45.0 | 797 | 528.9 | 112.5 |
| 90.0 | 537 | 538.0 | 109.5 |
| 135.0 | 106 | 523.3 | 94.1 |
| 180.0 | 174 | 514.9 | 97.6 |
| 225.0 | 106 | 538.2 | 95.2 |
| 270.0 | 537 | 554.1 | 110.5 |
| 315.0 | 797 | 557.4 | 114.3 |

Database HAAT does not agree with computed HAAT
Database HAAT: 557 m Computed HAAT: 535 m

ERP exceeds maximum
ERP: 1000 kW ERP maximum: 430 kW

Record parameters as studied, DTS site # 2:

Channel: D48
Latitude: 32 50 27.60 N (NAD83)
Longitude: 96 33 50.40 W
Height AMSL: 254.6 m
HAAT: 125.0 m
Peak ERP: 100 kW
Antenna: 0.0 deg
Elev Pattn:

41.8 dBu contour:

| Azimuth | ERP | HAAT | Distance |
|---------|---------|---------|----------|
| 0.0 deg | 70.9 kW | 104.2 m | 60.3 km |
| 45.0 | 21.2 | 113.3 | 55.8 |
| 90.0 | 41.0 | 105.3 | 58.0 |
| 135.0 | 21.1 | 124.2 | 56.6 |
| 180.0 | 70.4 | 118.3 | 61.6 |
| 225.0 | 98.6 | 100.4 | 61.3 |
| 270.0 | 94.5 | 97.6 | 60.8 |
| 315.0 | 98.6 | 87.4 | 59.6 |

Database HAAT does not agree with computed HAAT
Database HAAT: 125 m Computed HAAT: 106 m

Record parameters as studied, DTS site # 3:

Channel: D48
Latitude: 33 10 1.20 N (NAD83)
Longitude: 97 6 43.20 W
Height AMSL: 273.2 m
HAAT: 105.0 m
Peak ERP: 100 kW
Antenna: 0.0 deg
Elev Pattn:

41.8 dBu contour:

| Azimuth | ERP | HAAT | Distance |
|---------|---------|--------|----------|
| 0.0 deg | 21.1 kW | 84.6 m | 52.5 km |
| 45.0 | 70.4 | 98.7 | 59.6 |
| 90.0 | 98.6 | 105.1 | 61.9 |
| 135.0 | 94.5 | 105.7 | 61.7 |
| 180.0 | 98.6 | 86.0 | 59.4 |
| 225.0 | 70.9 | 68.2 | 55.3 |
| 270.0 | 21.2 | 69.8 | 50.2 |
| 315.0 | 41.0 | 64.8 | 52.4 |

Database HAAT does not agree with computed HAAT
Database HAAT: 105 m Computed HAAT: 85 m

Record parameters as studied, DTS site # 4:

Channel: D48
Latitude: 32 45 0.00 N (NAD83)
Longitude: 97 16 8.40 W
Height AMSL: 367.3 m
HAAT: 204.0 m
Peak ERP: 100 kW
Antenna: 0.0 deg
Elev Pattn:

41.8 dBu contour:

| Azimuth | ERP | HAAT | Distance |
|---------|---------|---------|----------|
| 0.0 deg | 70.4 kW | 187.4 m | 67.0 km |
| 45.0 | 98.6 | 203.7 | 69.8 |
| 90.0 | 94.5 | 191.7 | 68.8 |
| 135.0 | 98.6 | 183.7 | 68.4 |
| 180.0 | 70.9 | 170.2 | 65.8 |
| 225.0 | 21.2 | 150.6 | 58.6 |
| 270.0 | 41.0 | 186.4 | 64.3 |
| 315.0 | 21.1 | 168.6 | 59.8 |

Database HAAT does not agree with computed HAAT

Database HAAT: 204 m Computed HAAT: 180 m

**DTS proposal has coverage outside reference facility and distance limit

Distance to Canadian border: 1554.6 km

Distance to Mexican border: 513.5 km

Conditions at FCC monitoring station: Kingsville TX

DTS site # 1 Bearing: 189.2 degrees Distance: 573.9 km

DTS site # 2 Bearing: 192.3 degrees Distance: 613.4 km

DTS site # 3 Bearing: 186.8 degrees Distance: 640.7 km

DTS site # 4 Bearing: 185.9 degrees Distance: 593.0 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:

DTS site # 1 Bearing: 321.1 degrees Distance: 1120.0 km

DTS site # 2 Bearing: 318.8 degrees Distance: 1118.4 km

DTS site # 3 Bearing: 319.2 degrees Distance: 1057.6 km

DTS site # 4 Bearing: 321.3 degrees Distance: 1083.9 km

Study cell size: 2.00 km

Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%

Maximum new IX to LPTV: 2.00%

**IX check failure to BLANK0000001650 LIC scenario 1, 31.77% interference caused

POWER DENSITY CALCULATION

PROPOSED KSTR-DT DTS FACILITY
CHANNEL 48 – IRVING, TEXAS

Since the FCC considers the possible biological effects of RF transmissions in its environmental determinations, we have studied the matter with respect to this Irving facility. Below are the calculations for the main and SFN node sites:

KSTR-DT Main Site (Cedar Hill)

Employing the methods set forth in *OET Bulletin No. 65* and considering a main-lobe effective radiated power of 1000 kW, an antenna radiation center 490 meters above ground, and the specific elevation pattern of the licensed Dielectric antenna, maximum power density two meters above ground of 0.00027 mW/cm^2 is calculated to occur 342 meters north of the base of the tower. Since this is less than 0.1 percent of the 0.45 mW/cm^2 reference for uncontrolled environments (areas with public access) surrounding a facility operating on Channel 48 (674-680 MHz), a grant of this proposal may be considered a minor environmental action with respect to public exposure to non-ionizing electromagnetic radiation.

Further, the station owner will take whatever precautionary steps are necessary, such as reducing power or leaving the air temporarily, to ensure that workers operating in the vicinity of the antenna are not exposed to excessive non-ionizing radiation.

EXHIBIT E

KSTR-DT SFN-1 Site (Garland)

Employing the methods set forth in *OET Bulletin No. 65* and considering a main-lobe effective radiated power of 100 kW (H,V), an antenna radiation center 103 meters above ground, and the specific elevation pattern of the proposed Dielectric antenna, maximum power density two meters above ground of 0.0034 mW/cm^2 is calculated to occur 108 meters west of the base of the tower. Since this is only 0.8 percent of the 0.45 mW/cm^2 reference for uncontrolled environments (areas with public access) surrounding a facility operating on Channel 48 (674-680 MHz), a grant of this proposal may be considered a minor environmental action with respect to public exposure to non-ionizing electromagnetic radiation.

Further, the station owner will take whatever precautionary steps are necessary, such as reducing power or leaving the air temporarily, to ensure that workers operating in the vicinity of the antenna are not exposed to excessive non-ionizing radiation.

KSTR-DT SFN-2 Site (Fort Worth)

Employing the methods set forth in *OET Bulletin No. 65* and considering a main-lobe effective radiated power of 100 kW (H,V), an antenna radiation center 190 meters above ground, and the specific elevation pattern of the proposed Dielectric antenna, maximum power density two meters above ground of 0.00099 mW/cm^2 is calculated to occur 202 meters east of the base of the tower. Since this is only 0.2 percent of the 0.45 mW/cm^2 reference for uncontrolled environments (areas with public access) surrounding a facility operating on Channel 48 (674-680 MHz), a grant of this proposal may be considered a minor environmental action with respect to public exposure to non-ionizing electromagnetic radiation.

EXHIBIT E

Further, the station owner will take whatever precautionary steps are necessary, such as reducing power or leaving the air temporarily, to ensure that workers operating in the vicinity of the antenna are not exposed to excessive non-ionizing radiation.

KSTR-DT SFN-3 Site (Denton)

Employing the methods set forth in *OET Bulletin No. 65* and considering a main-lobe effective radiated power of 75 kW (H,V), an antenna radiation center 67.7 meters above ground, and the specific elevation pattern of the proposed Dielectric antenna, maximum power density two meters above ground of 0.0061 mW/cm^2 is calculated to occur 70 meters southeast of the base of the tower. Since this is only 1.3 percent of the 0.45 mW/cm^2 reference for uncontrolled environments (areas with public access) surrounding a facility operating on Channel 48 (674-680 MHz), a grant of this proposal may be considered a minor environmental action with respect to public exposure to non-ionizing electromagnetic radiation.

Further, the station owner will take whatever precautionary steps are necessary, such as reducing power or leaving the air temporarily, to ensure that workers operating in the vicinity of the antenna are not exposed to excessive non-ionizing radiation.