Exhibit 51

227 Central Avenue
Metuchen, NJ 08840-1242
(732) 494-6400 Phone
(732) 494-6401 Fax

Merrill Weiss Group LLC

Consultants in Electronic Media Technology/Management

Technical Statement for Construction Permit Modification Application:

NBC Telemundo License Co.
KNBC
Digital Channel 36
Los Angeles, CA

Modification of Permit in File No. BPCDT-20050406ACJ for Distributed Transmission System (DTS) Operation

Introduction

This Technical Statement provides supplemental technical data and information associated with the FCC Form 301-DTV application of NBC Telemundo License Co. ("NBC") for a modified construction permit (CP) for authority to construct new digital television (DTV) Distributed Transmission System (DTS) facilities for Station KNBC, operating on Virtual Channel 4 and on Digital Channel 36 and licensed to the community of Los Angeles, CA. In particular, it addresses the system design and interference analyses connected with a network of four transmitters proposed for operation by Station KNBC. The instant application requests modification of the construction permit for the facility authorized on June 29, 2007 in File Number BPCDT-20050406ACJ. This Technical Statement also addresses the environmental considerations, notification requirements, and similar factors associated with the proposed operation. The amendment included herein consists of the addition of three "gap filler" transmitters to the main transmitter currently authorized. Application already has been made, in File No. BLCDT-20070820ACK, for license to cover the previously authorized facility, but, since that application has not been granted yet, this application takes the form of a modification request.

The current construction permit for KNBC provides for operation using a directional antenna at a site at the Mt. Wilson antenna farm, with 665 kW Effective Radiated Power (ERP) at a Height Above Average Terrain (HAAT) of 991 meters. The DTS network will add to the main Mt Wilson transmitter a trio of "gap-filler" transmitters. One gap-filler transmitter will be at a site at Table Mountain to provide service within the station's hypothetically maximized service area in the High Desert region. Table Mountain is on the north side of the San Gabriel mountain range, and the transmitter there will provide service in an area that hitherto has been obstructed by the San Gabriel range and has had service from only one full-service television broadcast station, despite being within the contours of numerous stations serving the Los Angeles television market from the Mt Wilson and Mt Harvard antenna farms. That anomaly arises from the obstruction by the San Gabriel Mountains of the signals from the transmitters located south of the mountain range, preventing the signals from providing more than spotty service to the communities on the north side of the mountain range.

The second and third gap-filler transmitters will be at a site at Oat Mountain, to fill in service within the station's hypothetical maximized service area in the western end of the Los Angeles market, in a region that historically has been obstructed from the television signals from the Mt Wilson/Mt Harvard antenna harm by the Verdugo Hills and other terrain obstructions. Oat Mountain overlooks a significant population in Los Angeles and Ventura Counties while, at the same time, offering possibilities for terrain isolation between transmitters there and those at the antenna farm.

The FCC's rules on DTS operations are contained in Section 73.626 and in the Report and Order that established them.[1] The rules include provisions that permit multiple transmitters to be located within the predicted noise-limited contour (PNLC) of the facilities authorized to a station combined with a "Table of Distances" limit, that require coverage of the station's entire replication service area such that every location within that area is within the PNLC of at least one DTS transmitter, that require service to the station's entire community of license with a City Grade (noise limited +7 dB) signal, that

[1] *Digital Television Distributed Transmission System Technologies*, Report and Order, MB Docket No. 05-312 (FCC 08-256, released November 7, 2008) (the "*DTS R&O*").

limit acceptable new interference to other stations to a maximum of 0.5 percent (the same as for single-transmitter operations), and that permit the contours of the several transmitters in a DTS network to extend beyond the authorized contour by a minimal amount as necessary to provide service within the authorized contour or Table of Distances circle. The DTS R&O also includes provisions for a Table of Distances alternative, which provisions allow the hypothetically maximized service area to equal the service area of the station having the largest service area in the market, as provided in §73.622(f)(5), and that permit the relocation of the station's reference point under certain conditions. Under the DTS rules, the interference determination is based on interference predicted to a neighboring station in a study cell using root-sum-squared (RSS) aggregation of the field strengths of the signals from the several transmitters in the DTS network. All of these precepts have been followed in the design and evaluation of the proposed DTS network.

This Technical Statement has sections treating Transmitter Sites, Facilities, Largest In Market Calculation, Service Areas, Principal Community Coverage, New Service, Interference Analyses, Considerations Regarding Class A Stations, Border Issues, Environmental Impact/Radio Frequency Radiation, and Notifications. Interference tables appear in line with the text; all other tables and figures appear at the end of this document. While the Commission has used the abbreviation DTS to identify Distributed Transmission Systems; the term DTx, as used by the ATSC, also is used herein to discuss various aspects of Distributed Transmission beyond the system per se.

Transmitter Sites

There are three transmitter sites proposed for four transmitters – the existing "main" site at Mt Wilson (DTS Site 1 on the Form 301 application), a new gap-filler site at Table Mountain (DTS Site 2), and a new gap-filler site at Oat Mountain that will have two transmitters (shown as DTS Sites 3 and 4 on the Form 301 application).[2] Their locations

[2] As described in the section on Facilities, there actually will be two directional antennas, which may be fed by a common transmitter through a power divider. Because the antennas will be at different heights on the tower, will have different mechanical beam tilts, and will be aimed in different directions, rather than creating a composite antenna pattern, they are treated on the application form and herein as separate transmitters and, hence, separate "sites."

are shown on the map in Figure 2. The main, Mt Wilson site is located at the reference point for KNBC established in the Appendix B DTV Table of Allotments.[3] It is an established part of the Mt Wilson/Mt Harvard antenna farm on the south face of the San Gabriel Mountains overlooking Los Angeles and is the site from which nearly all stations in the Los Angeles market operate. It does now and will continue to provide service to the principal community of Los Angeles, CA. It is the site at which KNBC currently is licensed to operate at an effective radiated power (ERP) of 380 kW and for which it holds a construction permit authorizing operation at 665 kW. (An application for license to cover operation at the higher, authorized ERP was filed in 2007 and is awaiting FCC approval.[4])

The first new transmitter location involves a site previously used as a microwave relay point for the now-obsolete long-haul telephone network. The site at Table Mountain is being developed by American Tower Corporation (ATC) to support a joint operation of gap filler transmitters by as many as half to three-quarters of the full service television stations in the Los Angeles market. The site currently has an access road and electrical power but will require addition of one or more communications links to deliver data signals to feed the transmitters. The existing platform tower at the site will be extended with a column for mounting the pair of UHF antennas and possibly a VHF antenna that will be required to accommodate all the stations that choose to participate in the facility.

The second new transmitter location involves one of several communications sites that currently are being developed at Oat Mountain by several organizations for use by broadcasters in a fashion similar to the facility at Table Mountain. Signals from the site at Oat Mountain can reach communities such as Santa Clarita, Simi Valley, Oxnard, and Ventura, all of which are at least partly blocked by the Verdugo Hills and other terrain obstructions in the region from signals emanating from the Mt Wilson and Mt Harvard sites that serve the rest of the Los Angeles market south of the San Gabriel Mountains.

[3] Memorandum Opinion and Order on Reconsideration of the Seventh Report and Order and the Eighth Report and Order *In the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service*, MB Docket No. 87-268 (FCC 08-72, released March 6, 2008).
[4] In FCC File No. BLCDT-20070820ACK.

Facilities

The facilities requested in this application include continued operation at 665 kW ERP at a height above average terrain of 991 meters at the Mt Wilson site, operation at 50 kW ERP at 696.5 meters HAAT at Table Mountain, and operation at 25.1 kW at 588.5 meters HAAT and at 16.74 kW at 568.5 meters HAAT at Oat Mountain. The currently authorized facility at the Mt Wilson site meets the requirements of §73.622(f)(5), as its combination of power and antenna height does not produce a predicted noise-limited contour the area of which exceeds that of the largest such area produced by another station in the same market. The relationships between the parameters in the cases of the gap-filler transmitters result in power/height combinations that meet the requirements for maximum allowable facilities specified by the table in §73.622(f)(8)(i) of the Commission's Rules. The basic characteristics of each of the transmitters proposed in the KNBC DTS network are given in Figures 1a, 1b, 1c, and 1d at the end of this Technical Statement and in the related DTS Engineering portions of the Form 301 application – one for each transmitter.

Three fundamental antenna designs are proposed for use in the KNBC DTS network. The Mt Wilson (DTS Site 1) antenna is a relatively conventional, omnidirectional, center-fed, slotted coaxial design. It has one degree of electrical beam tilt and is installed with one degree of mechanical beam tilt downward toward 215 degrees. It has been in service for KNBC since the station first initiated digital transmission in 1998.

The antenna design at the Table Mountain site (DTS Site 2) will be a panel array, using broadband panels and a corporate feed. It will consist of a total of sixteen panels in two columns of eight each and will have three main lobes in its azimuth pattern. A significant amount of electrical beam tilt will be used, with a substantial notch in the radiation above the main beam. The combination of the electrical beam tilt and the notch will permit the application of mechanical beam tilt to the antenna in such a way that the forward lobes will be oriented to a relatively conventional depression angle (0.7 degrees), while the back lobes will be driven into the ground, with the notch occurring at a depression angle that will permit substantial reduction in power toward a nearby scientific installation. This combination of factors is discussed in more detail below.

The antenna designs at the Oat Mountain site will be relatively simple, single-column arrays of six panels and four panels each for DTS Sites 3 and 4, respectively. Each will have a single main lobe in its azimuth pattern. No electrical beam tilt will be used, with only mechanical beam tilt applied to control the extent of signal projection from the antennas.

A plot of the proposed PNLCs[5] of the four transmitters is provided in Figure 2, where the existing Site 1 contour is in orange, the proposed Site 2 contour is in olive, the proposed Site 3 contour is in green, and the proposed Site 4 contour is in violet. In its current configuration, the main, Mt Wilson transmitter facility authorized by the existing construction permit (herein, DTS Site 1) already covers the entire authorized service area of the station;[6] thus, the requirements of §73.626(f)(1) would be met by that facility alone. By virtue of the overlap of the contours of the transmitters, they are contiguous, thereby meeting the requirements of §73.626(f)(3). Also shown in Figure 2, in blue, is the 48 dBu contour of the DTS Site 1 facility, which can be seen to encompass the entire County of Los Angeles, CA, in which is located the City of Los Angeles, to which KNBC is licensed. All four transmitters in the proposed DTS network are located within the KNBC "Largest Station" Alternative to the Table of Distances area (discussed in detail below), consequently meeting the requirements of §73.626(f)(6).

The characteristics of the DTS Site 1 (Mt Wilson) facility are fully described in Figure 1a. The antenna is installed with 1 degree of mechanical beam tilt downward in the direction of 215 degrees true. The antenna has elliptical polarization, with 16.67 percent of the power applied to the vertical polarization component. Elevation power gain of the antenna is 13.80 (11.38 dBd) in the horizontal polarization component and 2.80 (4.39 dBd) in the vertical polarization component at the vertical beam maximum (1.0 degree below the plane orthogonal to the axis of the antenna and through its radiation center). Azimuth power gain of the antenna in the horizontal polarization component is virtually

[5] To account for the dipole correction factor, the PNLCs are plotted at 40.9 dBu, with service statistics of F(50,90).

[6] Per §73.626(b), "For purposes of compliance with this section, a station's 'authorized service area' is defined as the area within its predicted noise-limited service contour determined using the facilities authorized for the station in a license or construction permit for non-DTS, single-transmitter-location operation."

nil (1.023 or 0.10 dBd). The mechanical beam tilt causes the gain of the horizontal polarization component to vary in the horizontal plane between 13.80 (11.38 dBd) at 35 degrees azimuth and 8.79 (9.44 dBd) at 215 degrees azimuth.

A plot of the azimuthal radiation pattern of the DTS Site 1 antenna in relative field values of the horizontal polarization component, prior to the application of mechanical beam tilt, (i.e., 1 degree below the plane orthogonal to the axis of the antenna and through its radiation center) is included as Figure 3. The azimuthal radiation pattern in relative field values of the horizontal polarization component in the horizontal plane, after application of mechanical beam tilt, is included as Figure 4.[7] The azimuthal power pattern of the horizontal polarization component, expressed in decibels relative to 1 kW (dBk), prior to the application of mechanical beam tilt, (i.e., 1 degree below the plane orthogonal to the axis of the antenna and through its radiation center) is included as Figure 5. The azimuthal power pattern of the horizontal polarization component, expressed in decibels relative to 1 kW (dBk) in the horizontal plane, is plotted in Figure 6. Tabulated azimuthal field and power values of the horizontal polarization component derived from the data arrays used to generate Figures 3 through 6 are given in Figure 7. The elevation radiation pattern in relative field values of the horizontal polarization component along the axis of the antenna is included as Figure 8. The elevation power pattern of the horizontal polarization component, expressed in decibels relative to 1 kW (dBk) along the axis of the antenna, is plotted in Figure 9. Tabulated elevation field and power values of the horizontal polarization component derived from the data arrays used to generate Figures 8 &9 are given in Figure 10.

Because of the mechanical beam tilt applied to the Site 1 antenna, its elevation pattern varies with azimuth, and its azimuth pattern varies with depression angle. Therefore, complete pattern data for the antenna for DTS Site 1 is being supplied through a complex elevation pattern data file uploaded to the CDBS Electronic Filing System. In that file, depression angle values are included in the first column, and azimuth values are included

[7] Figures 4 & 6, which include the effects of mechanical beam tilt on the pattern in the horizontal plane, are included for purposes of comparison with earlier filings with respect to the Mt Wilson facility. The full set of data with mechanical beam tilt applied is included only in the complex elevation pattern uploaded to the CDBS Electronic Filing System as part of the Form 301 DTS application.

in the first row. The azimuth and elevation pattern plots and tabular data supplied in this Technical Statement are for reference only and are intended to help in visualization of the characteristics of the antenna. Full specification of the antenna pattern is contained wholly and only within the elevation pattern data file uploaded with the Form 301 application.

It should be noted that, due to limitations in the Form 301 DTS Engineering pages in the CDBS Electronic Filing System (EFS) and because the values in the azimuth pattern relative field data input there are multiplied by the data in the elevation pattern data file in the Commission's processing software, it is not possible to enter data into the azimuth pattern input fields that are representative of the horizontal plane pattern subsequent to inclusion of the effects of mechanical beam tilt. Doing so would result in distortion of the actual pattern data and lead to incorrect analyses of the predicted interference from or to a station under study. Moreover, since the Commission's processing software does not have the ability to apply mechanical beam tilt to more than one antenna in a study and does not currently apply mechanical tilt in a non-distorting way to an antenna pattern, it is necessary to put data representing the radiation pattern of each antenna subsequent to application of mechanical tilt into the corresponding uploaded elevation pattern data file, which is the only available mechanism that has sufficient data representation capacity to carry the required amount of data. As a result of all of this, it is necessary either to set the check box related to the azimuth pattern input fields to "N/A," which parenthetically also indicates "Non-Directional," or not to check the "N/A" box but to put values of 1.000 in all of the azimuth pattern data fields. The latter approach at least indicates that the antenna is directional and therefore was taken in the instant application for each of the DTS Sites and their antenna patterns.

The proposed DTS Site 2 (Table Mountain) antenna will have columns of panels facing 62 and 327 degrees true, with resulting major azimuth lobes at 15, 61, and 328 degrees true. It will have an elevation pattern with its main lobe 3 degrees below the plane orthogonal to the axis of the antenna and through its radiation center. The elevation pattern also will contain a notch above the main lobe at 0.2 degree above the plane orthogonal to the axis of the antenna and through its radiation center. Mechanical beam tilt of 2.3 degrees downward will be applied to the antenna at a bearing of 204 degrees true. This will result in the main beam being lifted to a depression angle of 0.7 degrees toward a bearing of 24 degrees true and being pushed down to a depression angle of 5.3 degrees at the 204-degree bearing. It also will result in the notch above the main beam being pushed down to a depression angle of 2.1 degrees at the 204-degree bearing.

The characteristics and parameters of DTS Site 2 are fully described in Figure 1b. The DTS Site 2 antenna will have circular polarization, with equal power applied to both the horizontal and vertical polarization components; thus the effective radiated power of each individual component is based on half the power input to the antenna. Elevation power gain of the antenna design for DTS Site 2, at the azimuth of beam maximum (61 degrees) and in each of the horizontal and vertical polarization components, is 12.90 (11.12 dBd) at the beam maximum (3.0 degrees below the plane orthogonal to the axis of the antenna and through its radiation center) and just over 0.0029 (–25.36 dBd) at the null above the main beam (0.2 degrees above the plane orthogonal to the axis of the antenna and through its radiation center). The azimuth power gain, at the depression angle of beam maximum (3.0 degrees below the plane orthogonal to the axis of the antenna and through its radiation center) and in each of the horizontal and vertical polarization components is 2.90 (4.62 dB). The total power gain in each of the horizontal and vertical polarization components in the main beam is 37.41 (15.73 dBd). The mechanical beam tilt causes the gain of each of the horizontal and vertical polarization components to vary in the horizontal plane between 23.61 (13.73 dBd) at 53 degrees azimuth and 0.000002647 (-55.77 dBd) at 194 degrees azimuth.

A plot of the DTS Site 2 antenna azimuthal radiation pattern in relative field values, at the depression angle having maximum field (3.0 degrees below the plane orthogonal to the axis of the antenna and through its radiation center), is included as Figure 11. The azimuthal power pattern expressed in decibels relative to 1 kW (dBk), at the depression angle having maximum power (also 3.0 degrees below the plane orthogonal to the axis of the antenna and through its radiation center), is plotted in Figure 12. The tabulated azimuthal field and power values are given in Figure 13. The elevation radiation pattern in relative field values along the axis of the antenna, in the azimuthal direction having maximum field (61 degrees), is included as Figure 14. The elevation power pattern expressed in decibels relative to 1 kW (dBk) along the axis of the antenna, in the azimuthal direction having maximum power (also 61 degrees), is plotted in Figure 15. The tabulated elevation field and power values are given in Figure 16.

Because of the mechanical beam tilt applied to the DTS Site 2 antenna, its elevation pattern varies with azimuth, and its azimuth pattern varies with depression angle. Therefore, complete pattern data for the antenna for DTS Site 2 are being supplied through a complex elevation pattern data file uploaded to the CDBS Electronic Filing System. In that file, depression angle values are included in the first column, and azimuth values are included in the first row. The azimuth and elevation pattern plots and tabular data supplied in this Technical Statement are for reference only and are intended to help in visualization of the characteristics of the antenna. Full specification of the antenna pattern is contained wholly and only within the elevation pattern data file uploaded with the Form 301 application. It should be noted that the limitations of the CDBS EFS Form 301 DTS Engineering web page regarding inclusion of azimuth pattern relative field values and the related check box, described above with respect to the DTS Site 1 antenna, apply equally with respect to the DTS Site 2 antenna and that the same approach taken for Site 1 has been followed for Site 2.

The proposed DTS Sites 3 and 4 antennas (both of which will be at Oat Mountain) will be composed of single columns of panels – 6 for DTS Site 3 and 4 for DTS Site 4. There will be no electrical beam tilt applied to the elevation pattern of either antenna; only mechanical beam tilt will be applied to each of them. The DTS Site 3 antenna will be oriented with its main beam toward an azimuth of 255 degrees true and 1.5 degrees below the horizontal at the same heading. The DTS Site 4 antenna will be mounted 20 meters below the DTS Site 3 antenna on the same tower. It will be oriented with its main beam toward an azimuth of 15 degrees and 2.0 degrees below the horizontal at the same heading.

The characteristics and parameters of DTS Sites 3 and 4 are fully described in Figures 1c and 1d, respectively. Their antennas will have circular polarization, with equal power applied to both the horizontal and vertical polarization components; thus, the effective radiated power of each individual component is based on half the power input to its respective antenna. Elevation power gain of the antenna design for DTS Site 3, at the azimuth of beam maximum (255 degrees) and in each of the horizontal and vertical polarization components, is 14.24 (11.54 dBd) at the beam maximum (in the plane orthogonal to the axis of the antenna and through its radiation center). The azimuth power gain, at the depression angle of beam maximum (in the plane orthogonal to the axis of the antenna and through its radiation center) and in each of the horizontal and vertical polarization components is 5.63 (7.51 dB). The total power gain in each of the horizontal and vertical polarization components in the main beam is 80.17 (19.04 dBd). The mechanical beam tilt causes the gain of each of the horizontal and vertical polarization components to vary in the horizontal plane between 53.80 (17.31 dBd) at 255 degrees azimuth and 0.27878 (-5.55 dBd) at both 43 and 107 degrees azimuth.

Elevation power gain of the antenna design for DTS Site 4, at the azimuth of beam maximum (15 degrees) and in each of the horizontal and vertical polarization components, is 9.50 (9.78 dBd) at the beam maximum (in the plane orthogonal to the axis of the antenna and through its radiation center). The azimuth power gain, at the depression angle of beam maximum (in the plane orthogonal to the axis of the antenna and through its radiation center) and in each of the horizontal and vertical polarization components is 5.63 (7.51 dB). The total power gain in each of the horizontal and vertical polarization components in the main beam is 53.49 (17.28 dBd). The mechanical beam tilt causes the gain of each of the horizontal and vertical polarization components to vary in the horizontal plane between 38.83 (15.89 dBd) at 15 degrees azimuth and 0.1965 (-7.07 dBd) at both 163 and 227 degrees azimuth.

Plots of the azimuthal radiation patterns of the DTS Sites 3 & 4 antennas in relative field values, at the depression angles having maximum field (in the planes orthogonal to the axes of the antennas and through their radiation centers), are included as Figures 17a and 17b. The azimuthal power patterns expressed in decibels relative to 1 kW (dBk), at the depression angles having maximum power (also in the planes orthogonal to the axes of the antennas and through their radiation centers), are plotted in Figures 18a and 18b. The tabulated azimuthal field and power values for the DTS Sites 3 & 4 antennas are given in Figure 19. The elevation radiation patterns in relative field values along the axes of the antennas, in the azimuthal directions having maximum field (255 and 15 degrees for DTS Sites 3 & 4, respectively), are included as Figures 20a and 20b. The elevation power patterns expressed in decibels relative to 1 kW (dBk) along the axes of the antennas, in the azimuthal directions having maximum power (also 255 and 15 degrees for DTS Sites 3 & 4, respectively), are plotted in Figures 21a and 21b. The tabulated elevation field and power values are given in Figure 22.

Because of the mechanical beam tilt applied to the DTS Sites 3 & 4 antennas, their elevation patterns vary with azimuth, and their azimuth patterns vary with depression angle. Therefore, complete pattern data for the antennas for DTS Sites 3 & 4 are being supplied through complex elevation pattern data files uploaded to the CDBS Electronic Filing System. In those files, depression angle values are included in the first columns, and azimuth values are included in the first rows. The azimuth and elevation pattern plots and tabular data supplied in this Technical Statement are for reference only and are intended to help in visualization of the characteristics of the antennas. Full specifications of the antenna patterns are contained wholly and only within the elevation pattern data files uploaded with the Form 301 application. It should be noted that the limitations of the CDBS EFS Form 301 DTS Engineering web pages regarding inclusion of azimuth pattern relative field values and the related check boxes, described above with respect to the DTS Site 1 antenna, apply equally with respect to the DTS Sites 3 & 4 antennas and that the same approach taken for Site 1 has been followed for Sites 3 & 4.

All of the transmitters to be used in the KNBC DTS network will be Type Verified as per §73.1660 of the Commission’s Rules. All transmitters will be synchronized, emitting identical symbols on precisely the same frequency; they will transmit the RF Watermark transmitter identification signal defined in the ATSC A/110 transmitter synchronization standard.

Largest In Market Calculation

As noted above, §73.622(f)(5) provides that stations may exceed the limits on power and antenna height included in §73.622(f)(6) through (8) "up to that needed to provide the same geographic coverage area as the largest station within their market." The DTS R&O applies the same exception to DTS operations.[8] In ¶35 "Largest Station" Alternative, it states, "As an alternative to the Table of Distances Approach for determining the hypothetically maximized service area, full-power stations may use the 'largest station' provision in section 73.622(f)(5) of the rules."[9]

To implement the provisions of §73.622(f)(5), a method has been followed to determine the radius of a circle that matches the area contained within the contour of the largest station in the same market as that of the applicant. The market has been defined by the Commission as the DMA in which a station is located.[10] KNBC is located in the Los Angeles DMA. As noted in the First DTV Periodic Report and Order, "the geographical coverage determination is based on the area within the DTV station's noise-limited contour, calculated using predicted F(50,90) field strengths as set forth in section 73.622(e) of the rules and the procedure specified in §73.625(b) of the rules."[11] The largest station in the Los Angeles DMA appears to be KCOP-DT, which has a construction permit on Channel 13 with a directional antenna pattern at 120 kW ERP and Height Above Average Terrain (HAAT) of 905 meters. Using the method of §73.625(b) (as implemented in the EDX SignalPro program[12]) and a field strength of 36 dBu for the contour, as provided in OET Bulletin No. 69, as referenced in §73.622(e), the PNLC of KCOP-DT encloses an area of 57,254.953 km^2. Treating this area as the area of a circle, the radius is found by first dividing by Pi and then taking the square root. The result is

[8] DTS R&O, ¶35.
[9] *Digital Television Distributed Transmission System Technologies*, Report and Order, MB Docket No. 05-312, FCC 08-256, released November 7, 2008, at ¶35.
[10] See *Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, MM Docket No. 00-39, Report and Order, 16 FCC Rcd 5946, 5973-4, ¶¶73-74 (2001) ("First DTV Periodic Report and Order").
[11] Id.
[12] The Fortran code in the SignalPro program was evaluated to confirm its conformance with the method defined in §73.625(b) of the rules, including computation of the HAAT from 3.2 – 16.1 km, use of the formula provided in the rule for determination of depression angle, application of the 90-percent field factor in determination of the consequent power value, and use of the Commission's TVFMFS Fortran code for contour distance determination. It evaluates the contour distance on 1-degree-spaced radials, however, rather than at 45-degree-spaced headings.

134.999 km, which is the radius of the circle represented in black in Figure 2, based on the reference point for the KNBC DTS network. A circle of this size is termed a "Largest Station Circle" hereinafter.

Service Area

The Table of Distances circle, or the alternative Largest Station Circle, is determined based on a radius from the reference point for the station proposing DTS operation. The default reference point for a DTS operation is the reference point "established in the FCC Order that created or made final modifications to the Post-Transition DTV Table of Allotments, §73.622(i), and the corresponding facilities for the station's channel assignment as set forth in that FCC Order." The default Reference Point for the KNBC DTS network (34-13-32N, 118-3-52W) is the location of the Site 1 transmitter at Mount Wilson, which is the Reference Point established in the DTV Table of Allotments for KNBC.

As can be seen in Figure 2, the combined coverage contour of the proposed DTS network (as defined in §73.626(d)) is within the combination of the KNBC authorized service area (which matches the DTS Site 1contour shown in orange in Figure 2) and its Largest Station Circle (shown in black in Figure 2), with the exception of one area to the northeast of the DTS Site 2 transmitter where its contour extends beyond the Largest Station Circle by a significant amount and a small area to the north-northeast of the DTS Site 2 transmitter where its contour extends beyond the Largest Station Circle by a minuscule amount. The extensions result from operation with a common antenna that is being offered by American Tower Corporation for use by all Los Angeles television broadcasters that choose to operate from the Table Mountain site. The antenna has been designed to meet the constraints of fitting into the site, providing capacity for a large number of television services – many on adjacent channels to one another – and enabling protection to the nearby Jet Propulsion Laboratory site that is behind the antenna pattern. Given its nature as a common facility and the constraints of the site, the antenna cannot be optimized with respect to the contours of each of the stations using it in their respective DTS network operations, and there is insufficient tower capacity to permit each station to have its own antenna.

The contour extension to the northeast, while substantial in area, is in a desert region with very low population. It extends beyond the Largest Station Circle by 13.6 km at its widest and has an area of 948.6 km^2 but a population of only 3,030, per the 2000 U.S. Census. When compared to the population of 818,490 within the overall DTS Site 2 contour, the population within the extension area is less than 0.4 percent; when compared to the population of 16,552,662 within the original KNBC contour (now the DTS Site 1 contour), the population within the extension area is less than 0.018 percent. By either measure the population within the extension is *de minimis*. Of the people in the extension area, some 1,124 are predicted to receive new service from the DTS Site 2 transmitter. Significantly, for all of these people, the KNBC DTS signals will represent only the second full-service television signals that they are predicted to be able to receive. Thus, the extension will help to provide additional service in an existing gray area.

The smaller contour extension to the north-northeast also is located in a desert region, contains an area of 4.778 km^2, and has zero population; thus, it can be considered to be immaterial. Taken together, the contour extensions should be treated as "of a minimal amount," as provided by §73.626(f)(2), due to the *de minimis* nature of the population within them and the fact that the small population that is predicted to receive new service actually is a currently-underserved population in a gray area. Accordingly, the contour extensions are predicted to provide a public interest benefit. Nevertheless, should the Commission determine that such treatment of the contour extensions is inappropriate, then a waiver of §73.626(f)(2) to permit use of the common antenna at the DTS Site 2 (Table Mountain) facility is respectfully requested.

Principal Community Coverage

As required by §73.625(a)(1) of the FCC rules, the transmitter location must be chosen so as to put a minimum F(50,90) field strength of 48 dBu over the entire community to be served. §73.625(a)(2) further requires that "The location of the antenna must be so chosen that there is not a major obstruction in the path over the principal community to be served." Moreover, §73.626(f)(4) requires that the coverage from one or more DTS transmitters be shown to provide principal community coverage as required by §73.625(a). As demonstrated by the 48-dBu contour of the Mt Wilson transmitter (DTS

Site 1), shown in blue on the coverage map of Figure 2, the transmitter location chosen, combined with the other characteristics of the transmission system, indeed does deliver at least the minimum required field strength over the entire community to be served – Los Angeles, CA. The required coverage is evident from the fact that the DTS Site 1 48-dBu contour encompasses all of the County of Los Angeles, shown on the map in Figure 2, in which the City of Los Angeles is situated. Thus, the requirements of §73.626(f)(4) are met by a single transmitter.

Because of terrain within the city of Los Angeles, however, there remain obstructions in the paths over portions of the city. Those obstructions are various hills and mountains within Los Angeles and would impinge upon the propagation paths to one part of the city or another of signals from any transmission site that might be selected. The obstructions were in existence at the time the KNBC digital construction permit was granted and have remained in existence throughout the period of KNBC operation from Mt Wilson.[13]

Interference Analyses

The interference analysis process for the KNBC application for a DTS construction permit has been a complex and thorough undertaking. In particular, two precepts of the rules for authorization of DTS systems have been followed rigorously – namely, the requirement that, in each study cell, the field strength from the multiple transmitters in the network be aggregated using the root-sum-square (RSS) method prior to computing the D/U ratio and making a determination whether interference is predicted to that cell and the requirement that no more than 0.5 percent of additional interference be caused to any other station licensed by the Commission.

Interference analyses were conducted using a modified version of the Commission's TV_Process program. The program has been modified to conduct the interference analyses specified in the DTS rules and is a version of the software installed at the Commission for its evaluation of DTS proposals. The edits to the program have been

[13] "For either NTSC or DTV, there are situations where line-of-sight coverage over the entire community is not possible. In such situations, licensees should avoid obstruction to the extent possible." Memorandum Opinion and Order on Reconsideration of the Fifth Report and Order In the Matter of Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service, FCC 98-23, released February 23, 1998, at ¶95.

made by its author, William C. Meintel of Meintel, Sgrignoli and Wallace LLC. Aside from the changes being made to the program to meet the provisions of the DTS rules (as promulgated in §73.626 and the DTS R&O), one additional capability has been made accessible in the program used. It is the determination of the depression angle from a transmitting antenna to a receiving antenna in a study cell based on the difference in heights of the two antennas (transmitting and receiving), using the sum of the height of the ground level at each location plus the height of the antenna above ground to obtain the actual height of each antenna. In other words, the height of each antenna above mean sea level (AMSL) is used to find the depression angle from the transmitting antenna and the corresponding relative field of the antenna in the direction of the receiver. The ability to use antenna height AMSL to compute the depression angle and relative field for quite some time has been in the code used by the Commission but has not been activated. The edited version of the software provides a setup switch to enable its use when desired.

The importance of using antenna height AMSL correctly to determine the depression angle from transmitter to receiver and the corresponding relative field and transmitted power values was the subject of a filing with the Commission in the DTS rulemaking proceeding by a group of engineering firms.[14] The filing pointed out the erroneous results that would be obtained in areas having significant terrain variation without the use of the correct values for antenna height AMSL. A copy of the filing is attached hereto in Annex A. For purposes of this application, the interference analyses were conducted both ways – i.e., without applying the antenna height AMSL but just the height above ground level (AGL) and with the correct application of the antenna height AMSL. The results of both methods with respect to interference to other Commission licensees are reported separately below.

Because of the importance in the network design of the antenna elevation patterns to the avoidance of interference to other stations, particularly with respect to first adjacent channel operations within the same market and to co-channel stations in neighboring

[14] See *Reply Comments Of Cavell, Mertz & Associates, Inc.; Chesapeake RF Consultants, LLC; Du Treil, Lundin & Rackley, Inc.; Greg Best Consulting, Inc.; Hatfield & Dawson Consulting Engineers, LLC; Meintel, Sgrignoli, & Wallace, LLC; Merrill Weiss Group LLC; and Smith and Fisher LLC to Petition for Reconsideration of the Association for Maximum Service Television, Inc.*, filed May 8, 2009, in MB Docket 05-312.

markets, the capability of TV_Process to analyze interference using the combination of azimuth and elevation patterns of the transmitting antennas was employed. Generally, this capability has not been used much by the Commission in the past, but it has been included in the version of the TV_Process software that the Commission's staff routinely has used. The DTS rules require the submission of elevation patterns in addition to azimuth patterns, and both the CDBS Electronic Filing System and the TV_Process software make provisions for their inclusion in interference analyses. In the analyses reported herein, actual elevation patterns were applied to all DTS facilities.

The interference analysis method applied by the TV_Process program was divided into two stages. In the first stage, all stations having specific channel relationships to the proposed facilities and within defined distances of any of the DTS transmitters were identified for inclusion in the studies. Next, stations among the selected group were studied preliminarily to determine whether there were any study cells to which interference was predicted to be caused, without consideration of masking by other stations, by the combined signals of the transmitters in the DTS network. (All evaluations using the combined signals from multiple transmitters in the network used the RSS summation of the field strengths to represent the aggregated signal from the network.) Once stations predicted to receive any amount of unmasked interference were identified, in the second stage, they then were studied in detail to determine the amount of any increase in interference predicted with respect to the interference predicted to be caused by the reference facilities. Generally, the reference facilities are those provided for KNBC in the DTV Table of Allotments in Appendix B to the DTV Reconsideration Order.[15,16] The amount of interference is based upon population counts of those predicted to receive signals with less than the required ratio between desired and undesired signals as specified in the Commission's rules for the particular channel relationship.

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[15] *Memorandum Opinion and Order on Reconsideration of the Seventh Report and Order and Eighth Report and Order in the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service*, MB Docket No. 87-268, FCC 08-72, released March 6, 2008 (the "DTV Reconsideration Order").

[16] Due to its recent filing date, one Class A station was treated somewhat differently. See the section on Considerations Regarding Class A Stations for a description of the differences.

The results of the interference analyses are shown in Tables 1 and 2. Table 1 provides the results of studies that did not use the corrected evaluation of depression angle, deriving that value only from the height of the transmitting antenna above ground level, as previously implemented in the Commission's software. On the other hand, Table 2 provides the results of studies that correctly determine the depression angle by deriving it from the total heights of both the transmitting and receiving antennas AMSL. In these tables, each station that was identified by TV_Process as relevant and its basic identification information are listed in the leftmost four columns. Station configurations identified as being DTS facilities are identified with a plus sign (+) following the relevant Application Reference Number. The fifth column indicates which method was used to determine the depression angle from the transmitters to the receiver in each study cell. The five columns on the right side of the tables show the number of scenarios studied for each desired station, the baseline population against which changes are measured, the population predicted to receive interference from the reference facility, the population predicted to receive interference from the proposed facility, and the amount of change, expressed as a percentage.

Two symbols used in Tables 1 and 2 signify certain results reported by the TV_Process program. An asterisk (*) indicates that TV_Process reported that the "Proposed station is beyond the site to nearest cell evaluation distance." A dash (—) denotes that TV_Process reported that the "Proposal causes no interference." In both of these cases, the initial culling pass performed by TV_Process found that there would be no interference predicted to the subject stations. In the case of the asterisks, this resulted because the closest study cells were too far away from all the transmitters for evaluation. In the case of the dashes, the result occurred because an initial interference study found, without consideration of masking by other stations, that there was no interference predicted to any study cell in the service area of the desired station studied.

A total of nine stations were studied – two of them in multiple variations, with the number of variations totaling eleven. That is, licensed facilities and construction permit facilities (whether granted or still at the application stage) were studied separately. Of

Table 1 — KNBC DTS Interference Studies to Neighboring Stations Without Antenna Height AMSL Calculation

Chnl	Station	City	Application Reference Number	AMSL Used	# Scen-arios	Baseline Population	Ref IX Population	DTS IX Population	% IX Chg
35	KRCA	Riverside, CA	BPCDT-20080620AIN	No	3	14,917,372	203,667	511,811	2.0657
35	KTSB-CA	Santa Maria, CA	BDFCDTA-20081230AAM	No	*	*	*	*	*
36	K36DU	Lake Havasu, AZ	BLTTL-19960308IA	No	*	*	*	*	*
36	K36DU	Lake Havasu, AZ	BDFCDTA-20060331AKF	No	*	*	*	*	*
36	KAJB	Calipatria, CA	BLCDT-20090320AAI	No	—	—	—	—	—
36	KJCN-LP	Paso Robles, CA	BLTTL-19870602IA	No	—	—	—	—	—
36	KSKT-CA	San Marcos, CA	BDISDTA-20100520ACC	No	1	1,688,228	223,885	223,885	0.0000
36	KFRE-TV	Sanger, CA	BLCDT-20060421AAI	No	3	1,439,102	62	62	0.0000
38	KPAL-LP	Palmdale, CA	BLTTL-19900723II	No	—	—	—	—	—
38	KPAL-LP	Palmdale, CA	BSTA-20060104ACS	No	—	—	—	—	—
38	KSKJ-CD	Van Nuys, CA	BLTTA-20040625AAS	No	2	785,580	596,919	596,919	0.0000

Table 2 — KNBC DTS Interference Studies to Neighboring Stations With Antenna Height AMSL Calculation

Chnl	Station	City	Application Reference Number	AMSL Used	# Scen-arios	Baseline Population	Ref IX Population	DTS IX Population	% IX Chg
35	KRCA	Riverside, CA	BPCDT-20080620AIN	No	3	14,935,250	124,896	546,690	2.8242
35	KTSB-CA	Santa Maria, CA	BDFCDTA-20081230AAM	No	*	*	*	*	*
36	K36DU	Lake Havasu, AZ	BLTTL-19960308IA	No	*	*	*	*	*
36	K36DU	Lake Havasu, AZ	BDFCDTA-20060331AKF	No	*	*	*	*	*
36	KAJB	Calipatria, CA	BLCDT-20090320AAI	No	—	—	—	—	—
36	KJCN-LP	Paso Robles, CA	BLTTL-19870602IA	No	—	—	—	—	—
36	KSKT-CA	San Marcos, CA	BDISDTA-20100520ACC	No	1	1,677,780	233,157	233,157	0.0000
36	KFRE-TV	Sanger, CA	BLCDT-20060421AAI	No	3	1,434,593	142	152	0.0007
38	KPAL-LP	Palmdale, CA	BLTTL-19900723II	No	—	—	—	—	—
38	KPAL-LP	Palmdale, CA	BSTA-20060104ACS	No	—	—	—	—	—
38	KSKJ-CD	Van Nuys, CA	BLTTA-20040625AAS	No	—	—	—	—	—

the stations shown in the tables, six are Class A stations, which will be discussed in detail in a subsequent section of this Technical Statement. Per a recent FCC Public Notice,[17] DTV Plan (i.e., Appendix B) facilities no longer require protection. Consequently, when they were included in studies by the TV_Process software, they were not included herein.

Three full-service DTV stations (KRCA, KAJB, and KFRE-TV) were identified by the TV_Process program as requiring study for potential interference from the proposed DTS network. Of these, the program reported that "The proposal causes no interference" with respect to one of them (KAJB). For one of them (KFRE-TV), it showed zero additional predicted interference when radiation to study cells was calculated using the FCC method that depends upon height above ground level (AGL), and it returned a minuscule result (0.0007 percent) when antenna height above mean sea level (AMSL) served as the basis for interference calculations.

That leaves one station (KRCA) to address. In Table 1, in which the antenna AGL values are used by the TV_Process software (i.e., using the FCC default method), the program indicated an impermissible level of 2.0657 percent new interference. In Table 2, where antenna height AMSL is applied, an even higher level of new interference, 2.8242 percent, is predicted than shown in Table 1 for the same facilities. Supplementary studies showed that the added interference beyond the 0.5 percent that is permissible is all due to the transmitters at Oat Mountain – DTS Sites 3 & 4. It currently is anticipated that KRCA will join KNBC in use of the Oat Mountain facilities, collocating its own DTS transmitter(s) there, which would effectively eliminate the added interference. A letter from KRCA agreeing to accept the interference to signals from its current Mt Harvard facilities and indicating its intentions to join in the Oat Mountain operation is expected to be provided shortly. If such a letter is not forthcoming in a reasonable time period, then this application will be modified to reduce the interference level to KRCA so that it falls within the permissible limit.

[17] Public Notice: Media Bureau Announces the Modification of the Television Interference Analysis Program, DA-1082, released June 17,2010.

Considerations Regarding Class A Stations

Section 73.623(c)(5) of the FCC rules specifies the contour overlap method as the principal means for determining protection to Class A stations, but it provides, in §73.623(c)(5)(iii), that: "In support of a request for waiver of the interference protection requirements of this section, an applicant for a DTV broadcast station may make full use of terrain shielding and Longley-Rice terrain dependent propagation methods to demonstrate that the proposed facility would not be likely to cause interference to Class A TV stations." The cited rules section then points to the method of OET Bulletin No. 69 as the means for making the necessary demonstration. The TV_Process program is the Commission's implementation of the methodology of OET-69.

The Commission's TV_Process program was used to locate and evaluate predicted interference to Class A stations. The TV_Process program identified and examined a total of eight records for six Class A stations. Of these, it found contour overlap from two DTS sites to a total of two Class A stations in three records. Among these records, DTS Site 1, the currently authorized KNBC Mt Wilson facility, had contour overlap with all three records for the two stations (KPAL-LP & KSKJ-CD). Since the authorized KNBC Mt Wilson facility already was approved (in 2007), no further contour protection is required with respect to those Class A stations. The remaining contour overlap is between DTS Site 3 and the one record of KSKJ-CD. The contour overlap of this combination is addressed in the discussion to follow regarding analysis using the Longley-Rice methods of OET-69.

Notwithstanding the absence of contour overlap in all but one case, all eight records of the six Class A stations were studied by TV_Process using its two-step culling and modeling procedure. With respect to three records for two Class A stations (KTSB-CA & K36DU), TV_Process reported that the "proposed station is beyond the site to nearest cell evaluation distance," indicating that the initial culling study done by TV_Process found that there was no need to evaluate the records further because of the spacing between all of the DTS sites and all of the study cells for the respective Class A stations. With respect to three records for two other Class A stations (KJCN-LP & KPAL-LP), TV_Process reported that the "proposal causes no interference," indicating that the initial study without masking by other stations found no interference in any study cell. When studying the one station (KSKJ-CD) that showed contour overlap from one of the new DTS sites (DTS Site 3), TV_Process studied two scenarios and found zero change in predicted interference when antenna heights AGL were used and reported that the "proposal causes no interference," when antenna heights AMSL were used. For the remaining Class A station (KSKT-CA), TV_Process by itself initially reported new interference of 1.576 percent, but further investigation found that the interference reported all originated from the currently authorized Mt Wilson (DTS Site 1) facility, which was authorized years before the recent application (filed May 20, 2010) by the Class A station that was being studied. Consequently, the Reference Interference Population reported in the eighth columns in Tables 1 and 2 for that particular Class A station is the value obtained when the authorized KNBC Mt Wilson facility is studied as the undesired station with respect to the Class A facility as the desired station. The result is that there is zero change in predicted interference. This variation in procedure is noted beneath each of Tables 1 and 2.

As shown above, the only Class A stations with which the TV_Process program found contour overlap (KPAL-LP and KSKJ-CD) were also found by that program to result in findings that the "proposal causes no interference" when the Longley-Rice terrain-dependent analyses were conducted. Moreover, for the other Class A stations that were located but for which no contour overlap was found, there nonetheless was no new interference predicted using the methods of OET-69. Thus, it can be stated that the TV_Process program reported for all variations of all relevant Class A stations that no new interference is predicted to be caused by the proposed DTS facilities. Therefore, NBC respectfully requests a waiver of the interference protection requirements of §73.623(c)(5), based upon the provisions of §73.623(c)(5)(iii), in that an adequate showing has been presented that the Longley-Rice terrain-dependent methods of OET-69 have demonstrated that the proposed facility would not be likely to cause interference to Class A TV stations.

Border Issues

For the reasons explained in this section, it is believed that further coordination with Mexico is not required for the authorization of the KNBC DTS network. In particular, in accordance with the Memorandum of Understanding ("MOU") regarding DTV coordination between the United States and Mexico,[18] stations within 275 km of the U.S.-Mexico border require coordination between the U.S. and Mexican governments as part of the authorization process. At 207.3 km to the nearest point on the Mexican border, the Mt Wilson site of the currently licensed facilities falls within the coordination distance and was coordinated with Mexico during its approval process.[19] Based upon calculations performed by the TV_Process program, all of the distributed transmitters (DTxTs) in the current application are within the coordination distance, as shown in Table 3.

Table 3 — Distances from DTxTs to Mexican Border

Transmitter	Border Distance (km)
DTS Site 1	207.3
DTS Site 2	211.5
DTS Site 3	241.3
DTS Site 4	241.3

Specified in the MOU are minimum-separation distances between stations that, if met, are intended to lead to automatic approval by the other country upon notification by an administration seeking to implement facilities within its borders. Under Clause 3, when the facilities differ from those specified in the MOU, so long as the minimum separation distance is met, approval is deemed to have been given after a maximum of 45 days with no objection by the other administration. The minimum separation distances are given in Tables A and B of the MOU, and only the minimum separation distances for co-channel

[18] "Memorandum of Understanding Between the Federal Communications Commission of the United States of America and the Secretaria de Comunicaciones y Transportes of the United Mexican States Related to the Use of the 54-72 MHz, 76-88 MHz, 174-216 MHz, and 470-806 MHz Bands for the Digital Television Broadcasting Service Along the Common Border," effective July 22, 1998.
[19] The KNBC allotment on Channel 36, at its current location, is included in the table of Appendix 4 of the MOU without notation of a short spacing to any Mexican facility.

cases exceed the shortest distance from any of the DTxTs to the closest point on the U.S.-Mexico border. Thus, only co-channel separations need to be considered in this case. The minimum separation distance requirements for the UHF band are 244 km for DTV-to-NTSC co-channel cases and 223 km for DTV-to-DTV co-channel cases.

The only Mexican state within 244 km of any of the proposed KNBC DTxT sites is Baja California Norte (BCN). Upon examination of the table of Mexican NTSC Television Allotments in Appendix 1 and Mexican Digital Television Allotments in Appendix 3 of the MOU, there are within Baja California Norte no entries shown on Channel 36, the channel allotted to KNBC. The prior coordination with Mexico covers the facilities that are proposed for DTS Site 1 (i.e., the continuing operations at Mt Wilson, which will be unchanged). The other DTS sites all are farther from the nearest point on the Mexico/U.S. border, do not extend the combined contour toward the border, and, in fact, have the main beams of their antenna patterns aimed away from the border. Given the prior coordination of one transmitter at its authorized location and power, and given that the other transmitters do not extend the contour in the direction of Mexico and are separated from the border by additional, significant mountainous terrain obstructions beyond those that separate the originally coordinated site from the border, it is posited that no further coordination with Mexico is required.

Environmental Impact / Radio Frequency Radiation

None of the conditions specified in §1.1307 that would require the preparation of an Environmental Assessment pertain with respect to the proposed facilities at any of the sites included in this application. In particular, because they will be mounted on towers at existing sites, the new operations do not implicate many of the causes for further investigation and preparation of further reports. Any environmental issues resulting from construction of new towers or changes in the heights of the towers at the added transmitters (DTS Sites 2, 3, & 4) will be addressed by the site developers.

With respect to Radio Frequency Radiation exposure, OET Bulletin No. 65 provides methods for evaluating the level of exposure for both employees (occupational/controlled situations) and non-employees (general population/uncontrolled situations). The combinations of the antenna radiation patterns, as provided in the manufacturer's technical specifications, with the antenna heights above ground level and the operating power levels indicate that the potential exposure would be less than the Maximum Permissible Exposure (MPE) limit for general population / uncontrolled situations at all three locations (counting DTS Sites 3 & 4 as one). Specifically, application of the formulas provided in OET-65 yields values, in percent of the MPE limit, of 0.62 at DTS Site 1, 7.37 at DTS Site 2, and 20.32 in the aggregate at DTS Sites 3 & 4. It should be noted that these evaluations assume flat terrain around the various sites. Consequently, further analysis, using details of the terrain surrounding the sites, may result in a finding of lower predicted radiation values than reported herein. As a result of the low percentage of MPE, the DTS Site 1 operations are categorically excluded from the necessity to conduct detailed RF exposure analysis of the site. For DTS Sites 2, 3, & 4, measurements will be conducted to confirm that they do not contribute to radio frequency radiation, from all sources, in accessible areas, that exceeds the appropriate MPE limits.

Notwithstanding the foregoing, NBC recognizes its responsibility for the safety and health of employees and contractors when exposed to RF radiation conditions. It will take the steps necessary to assure that personnel working at each facility and on their towers and antennas are protected from exposure to RF radiation levels exceeding those specified in the Commission's rules. It will take such steps in coordination with other site users at sites that are shared. The steps to be taken will include measurements and monitoring as well as power reductions or turning off the transmitters, if necessary to ensure a safe working environment.

Notifications & Measurements

None of the proposed sites is in proximity to any of the government radio astronomy installations named in §73.1030, nor is it proximate to any of the named radio receiving locations. Furthermore, the nearest FCC monitoring station is just less than 475 km distant from the closest DTxT site (DTS Sites 3 & 4 – Oat Mountain). Thus, none of the notifications mandated or recommended by §73.1030 are required in this instance.

Figure 1a — Technical Specifications — Proposed KNBC DTS Facility
Channel 36 — Los Angeles, CA — Site 1: Mt Wilson

Frequency

Channel	36
Frequency Band	602 – 608 MHz
Center Frequency	605 MHz

Location

Site	Mt Wilson, CA
Geographic Coordinates (NAD27)	34° 13’ 32.00” N 118° 03’ 52.00” W
Tower Registration (FAA Study Number)	1026532 (1998-AWP-1515-OE)

Elevation

Elevation of site above mean sea level	1731.0 m
Overall height of tower above site elevation	166.0 m
Overall height of tower above mean sea level	1897.0 m
Height of antenna radiation center above site elevation	160.0 m
Elevation of average terrain (45-degree-spaced radials, 3.2-16.1 km)	900.0 m
Height of antenna radiation center above mean sea level	1891.0 m
Height of antenna radiation center above average terrain (HAAT)	991.0 m

Antenna

Manufacturer	Dielectric
Model	TFU-18GTH/VP-R O6
Description	Top-Mounted, Center-Fed, UHF Slot
Orientation (rotation around vertical axis)	N/A (Omnidirectional)
Electrical beam tilt	1.00°
Mechanical beam tilt	1.0° down toward 215° azimuth
Polarization	Elliptical
Gain (peak of beam – 1.00° depression – Hpol)	13.80 (11.38 dBd)
Gain (peak of beam – 1.00° depression – Vpol)	2.80 (4.39 dBd)

Power

Effective radiated power (ERP) (main beam – 1.0° depression – Hpol)	665.0 kW
Effective radiated power (ERP) (horizontal plane – 35° azimuth – Hpol)	665.0 kW

Figure 1b — Technical Specifications — Proposed KNBC DTS Facility
Channel 36 — Los Angeles, CA — Site 2: Table Mountain

Frequency

Channel	36
Frequency Band	602 – 608 MHz
Center Frequency	605 MHz

Location

Site	Table Mountain, Llano, CA
Geographic Coordinates (NAD27)	34° 22’ 58.80” N 117° 39’ 50.60” W
Tower Registration (FAA Study Number)	N/A (2008-AWP-7139-OE)

Elevation

Elevation of site above mean sea level	2274.8 m
Overall height of tower above site elevation	39.3 m
Overall height of tower above mean sea level	2314.1 m
Height of antenna radiation center above site elevation	33.5 m
Elevation of average terrain (45-degree-spaced radials, 3.2-16.1 km)	1606.8 m
Height of antenna radiation center above mean sea level	2308.3 m
Height of antenna radiation center above average terrain (HAAT)	701.5 m

Antenna

Manufacturer	Radio Frequency Systems
Model	PCP16B-2 (50H:50V)
Description	Top-Mounted UHF Panel
Orientation (axis of symmetry)	14.5° true
Electrical beam tilt	3.0°
Mechanical beam tilt	2.3° down toward 204° true
Polarization	Circular
Gain (peak of beam – 61° azimuth, 0.7° depression)	18.80 (12.74 dBd)
Gain (in horizontal plane – 53° azimuth, 0° depression)	11.86 (10.74 dBd)

Power

Effective radiated power (ERP) (main beam – 0.7° depression at 61° az.)	50.0 kW
Effective radiated power (ERP) (maximum in horizontal plane – 53° az.)	31.55 kW

Figure 1c — Technical Specifications — Proposed KNBC DTS Facility
Channel 36 — Los Angeles, CA — Site 3: Oat Mountain

Frequency

Channel	36
Frequency Band	602 – 608 MHz
Center Frequency	605 MHz

Location

Site	Oat Mountain, near Chatsworth, CA
Geographic Coordinates (NAD27)	34° 19’ 38.50” N 118° 35’ 23.30” W
Tower Registration (FAA Study Number)	N/A (N/A)

Elevation

Elevation of site above mean sea level	1012.0 m
Overall height of tower above site elevation	45.0m
Overall height of tower above mean sea level	1057.0 m
Height of antenna radiation center above site elevation	40.0m
Elevation of average terrain (45-degree-spaced radials, 3.2-16.1 km)	463.5 m
Height of antenna radiation center above mean sea level	1052.0 m
Height of antenna radiation center above average terrain (HAAT)	588.5 m

Antenna

Manufacturer	Dielectric
Model	TUL-C1-6/6-1
Description	Side-Mounted UHF Panel
Orientation (rotation around vertical axis)	255 degrees true
Electrical beam tilt	0.0
Mechanical beam tilt	1.5° down toward 255° true
Polarization	Circular
Gain (peak of beam – 255° azimuth, 1.5° depression)	80.17 (19.04 dBd)
Gain (in horizontal plane – 255° azimuth, 0° depression)	53.80 (17.31 dBd)

Power

Effective radiated power (ERP) (main beam – 1.5° depression at 255° az.)	25.1 kW
Effective radiated power (ERP) (maximum in horizontal plane – 255° az.)	16.8 kW

Figure 1d — Technical Specifications — Proposed KNBC DTS Facility
Channel 36 — Los Angeles, CA — Site 4: Oat Mountain

Frequency

Channel	36
Frequency Band	602 – 608 MHz
Center Frequency	605 MHz

Location

Site	Oat Mountain, near Chatsworth, CA
Geographic Coordinates (NAD27)	34° 19’ 38.50” N 118° 35’ 23.30” W
Tower Registration (FAA Study Number)	N/A (N/A)

Elevation

Elevation of site above mean sea level	1012.0 m
Overall height of tower above site elevation	45.0m
Overall height of tower above mean sea level	1057.0 m
Height of antenna radiation center above site elevation	20.0m
Elevation of average terrain (45-degree-spaced radials, 3.2-16.1 km)	463.5 m
Height of antenna radiation center above mean sea level	1032.0 m
Height of antenna radiation center above average terrain (HAAT)	568.5 m

Antenna

Manufacturer	Dielectric
Model	TUL-C1-4/4-1
Description	Side-Mounted UHF Panel
Orientation (rotation around vertical axis)	15 degrees true
Electrical beam tilt	0.0
Mechanical beam tilt	2.0° down toward 15° true
Polarization	Circular
Gain (peak of beam – 15° azimuth, 2.0° depression)	53.49 (17.28 dBd)
Gain (in horizontal plane – 15° azimuth, 0° depression)	38.83 (15.89 dBd)

Power

Effective radiated power (ERP) (main beam – 2.0° depression at 15° az.)	16.7 kW
Effective radiated power (ERP) (maximum in horizontal plane – 15° az.)	12.2 kW

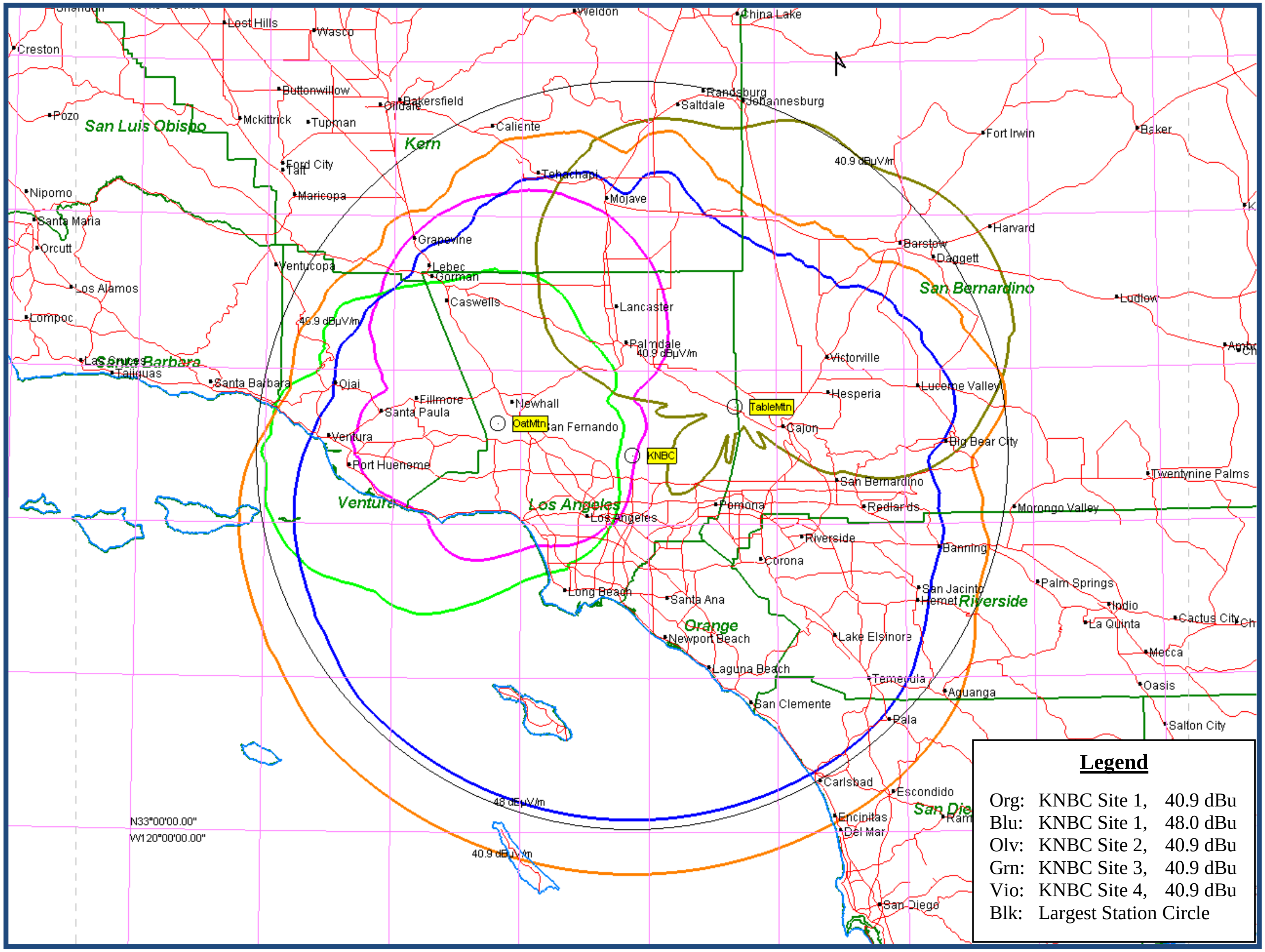

Figure 2 — KNBC DTS Network Predicted Noise-Limited Contours & Largest Station Circle

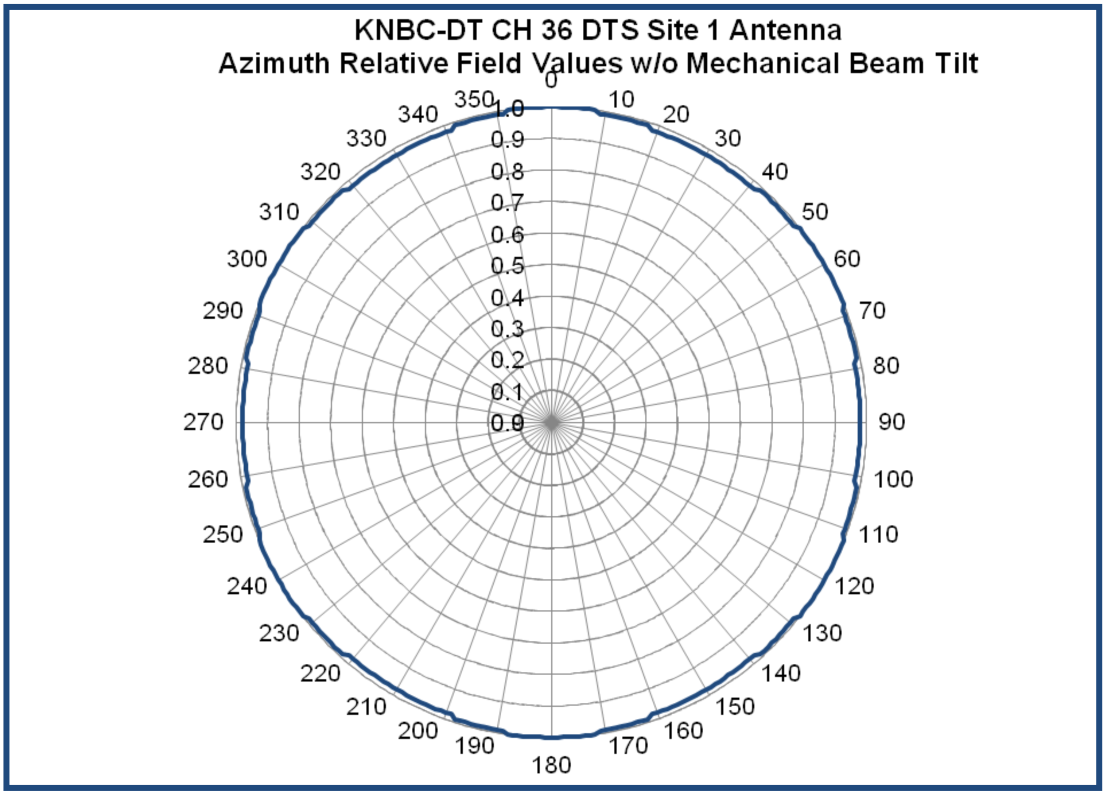

Figure 3 — KNBC Site 1 Azimuth Pattern in Relative Field Values

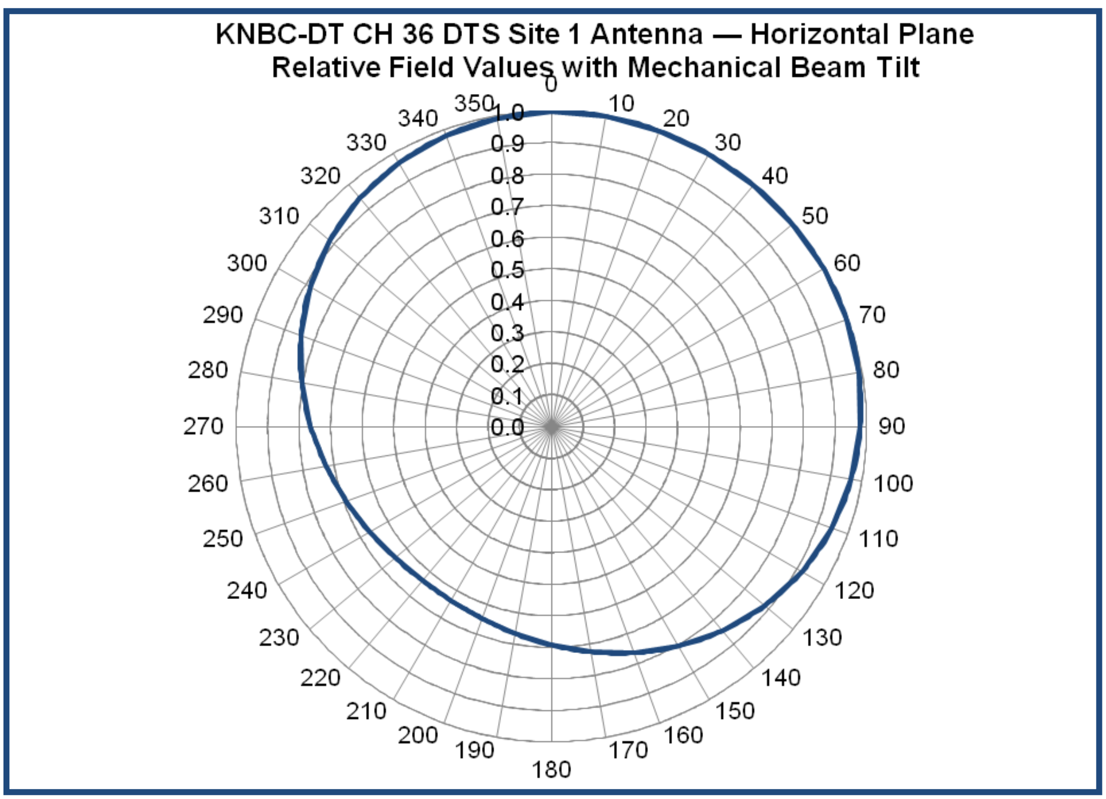

Figure 4 — KNBC Site 1 Horizontal Plane Azimuth Pattern with Effects of Mechanical Beam Tilt Shown

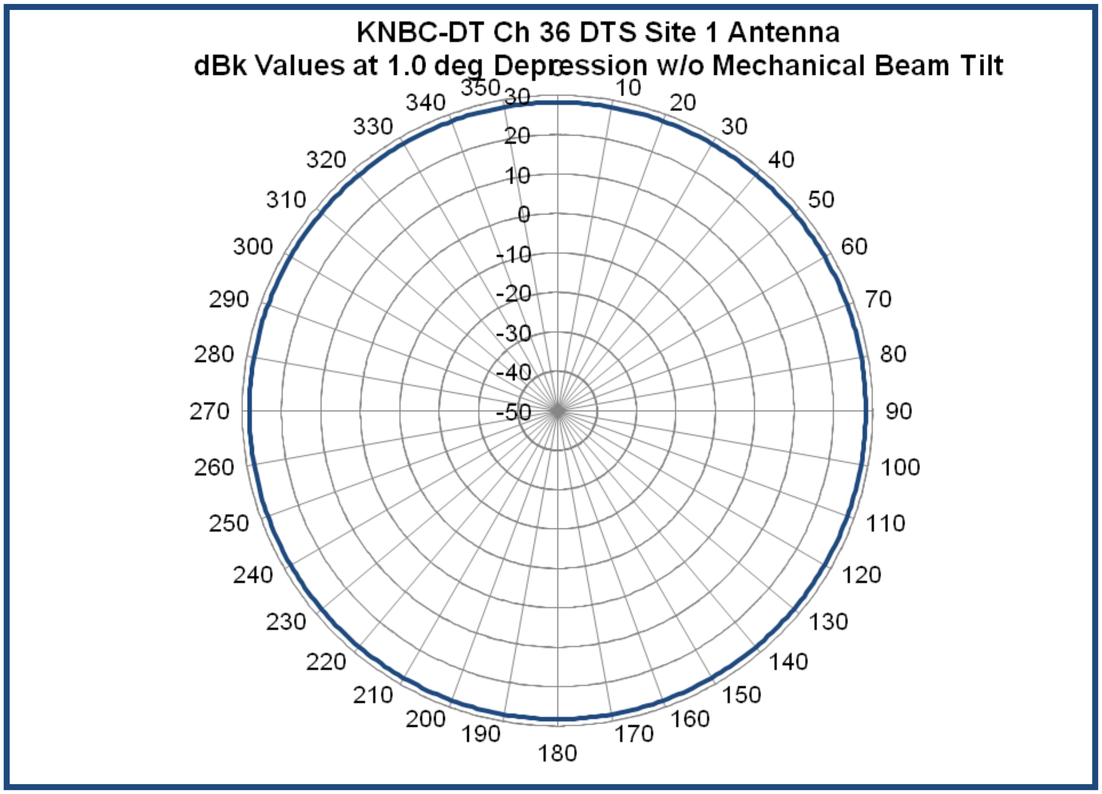

Figure 5 — KNBC Site 1 Azimuthal Radiation Pattern in dBk

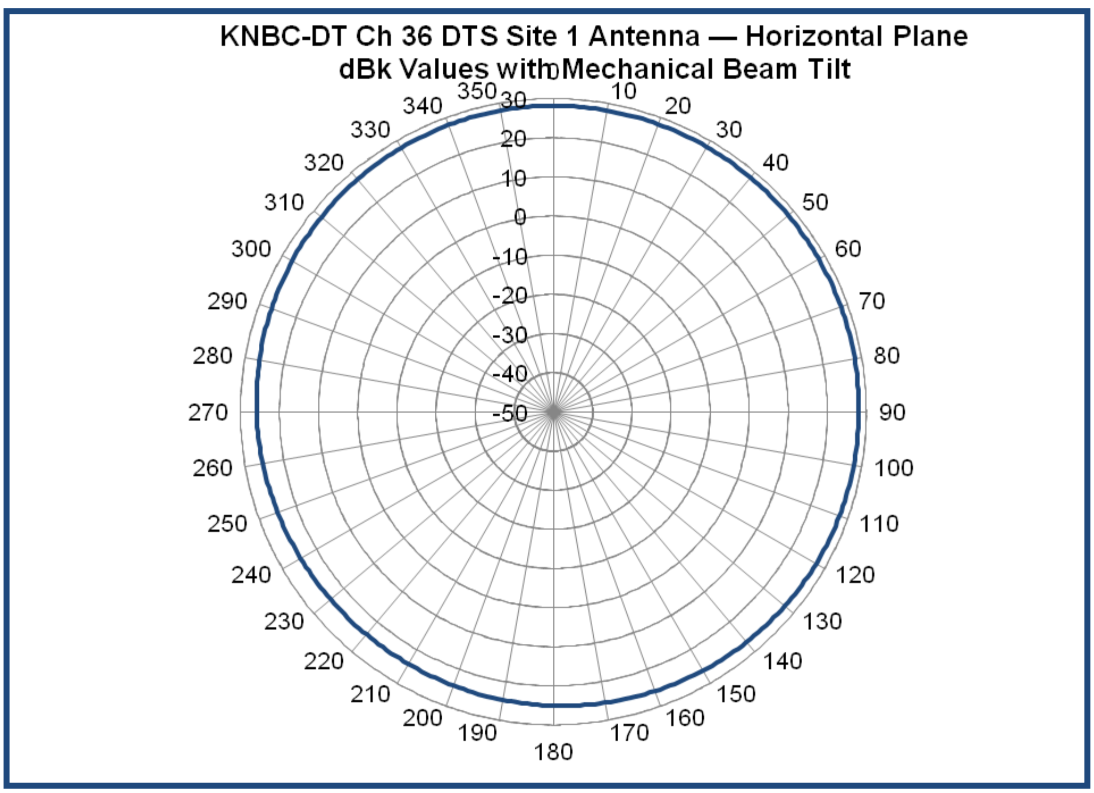

Figure 6 — KNBC Site 1 Horizontal Plane Pattern in dBk with Effects of Mechanical Beam Tilt Shown

Figure 7 — KNBC DTS Site 1 Azimuth Radiation Pattern Tabulated Data

Azimuth	Without Mechanical Beam Tilt		With Mechanical Beam Tilt at Horiz.		Azimuth	Without Mechanical Beam Tilt		With Mechanical Beam Tilt at Horiz.	
	Relative Field	ERP (dBk)	Relative Field	ERP (dBk)		Relative Field	ERP (dBk)	Relative Field	ERP (dBk)
0	1.000	28.228	0.997	28.205	190	0.999	28.220	0.666	24.702
10	0.999	28.220	0.998	28.211	200	0.998	28.211	0.647	24.441
20	0.998	28.211	0.998	28.208	210	0.998	28.211	0.637	24.310
30	0.998	28.211	0.998	28.210	220	0.998	28.211	0.637	24.310
40	0.998	28.211	0.998	28.210	230	0.999	28.220	0.647	24.450
50	0.999	28.220	0.999	28.217	240	1.000	28.228	0.667	24.711
60	1.000	28.228	0.999	28.220	250	0.999	28.220	0.693	25.037
70	0.999	28.220	0.996	28.197	260	0.998	28.211	0.725	25.440
80	0.998	28.211	0.990	28.144	270	0.998	28.211	0.764	25.889
90	0.998	28.211	0.981	28.059	280	0.998	28.211	0.805	26.339
100	0.998	28.211	0.966	27.924	290	0.999	28.220	0.846	26.772
110	0.999	28.220	0.945	27.739	300	1.000	28.228	0.885	27.163
120	1.000	28.228	0.919	27.490	310	0.999	28.220	0.918	27.482
130	0.999	28.220	0.884	27.154	320	0.998	28.211	0.944	27.731
140	0.998	28.211	0.845	26.763	330	0.998	28.211	0.966	27.924
150	0.998	28.211	0.805	26.339	340	0.998	28.211	0.981	28.059
160	0.998	28.211	0.764	25.889	350	0.999	28.220	0.991	28.153
170	0.999	28.220	0.726	25.449					
180	1.000	28.228	0.693	25.046					

Derived from data supplied by manufacturer

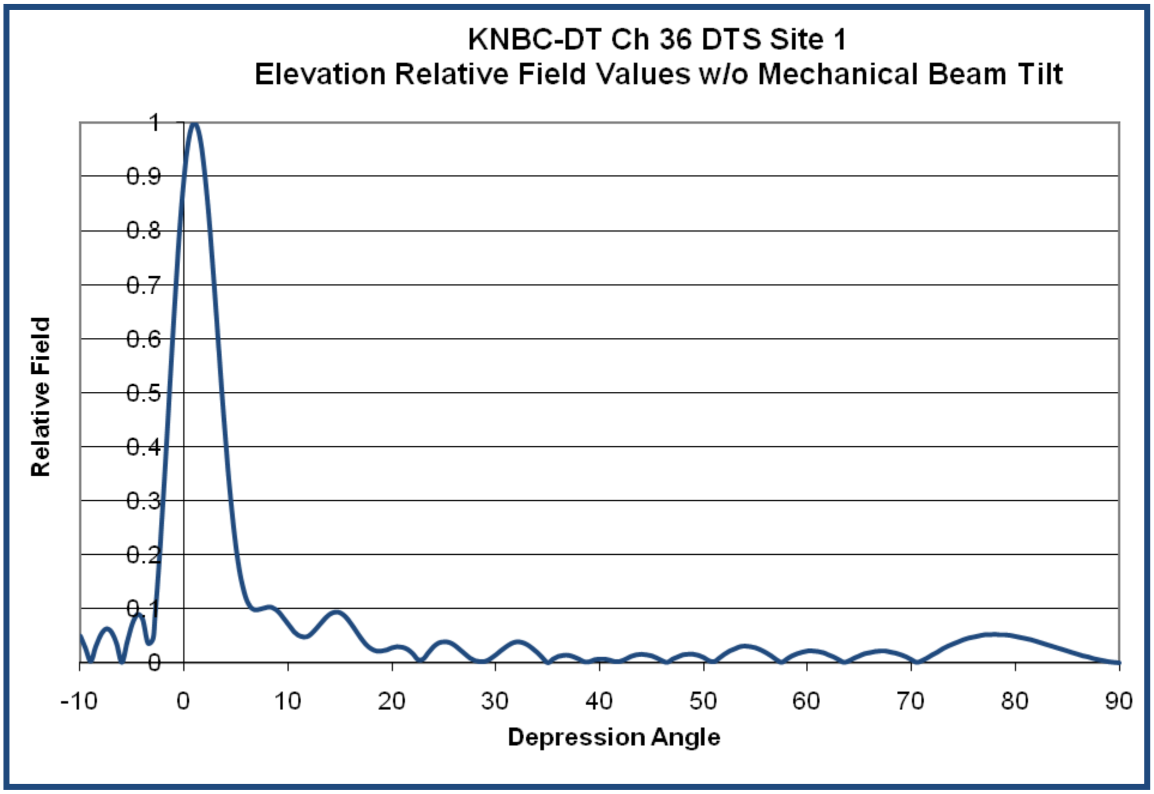

Figure 8 — KNBC Site 1 Elevation Pattern in Relative Field Values

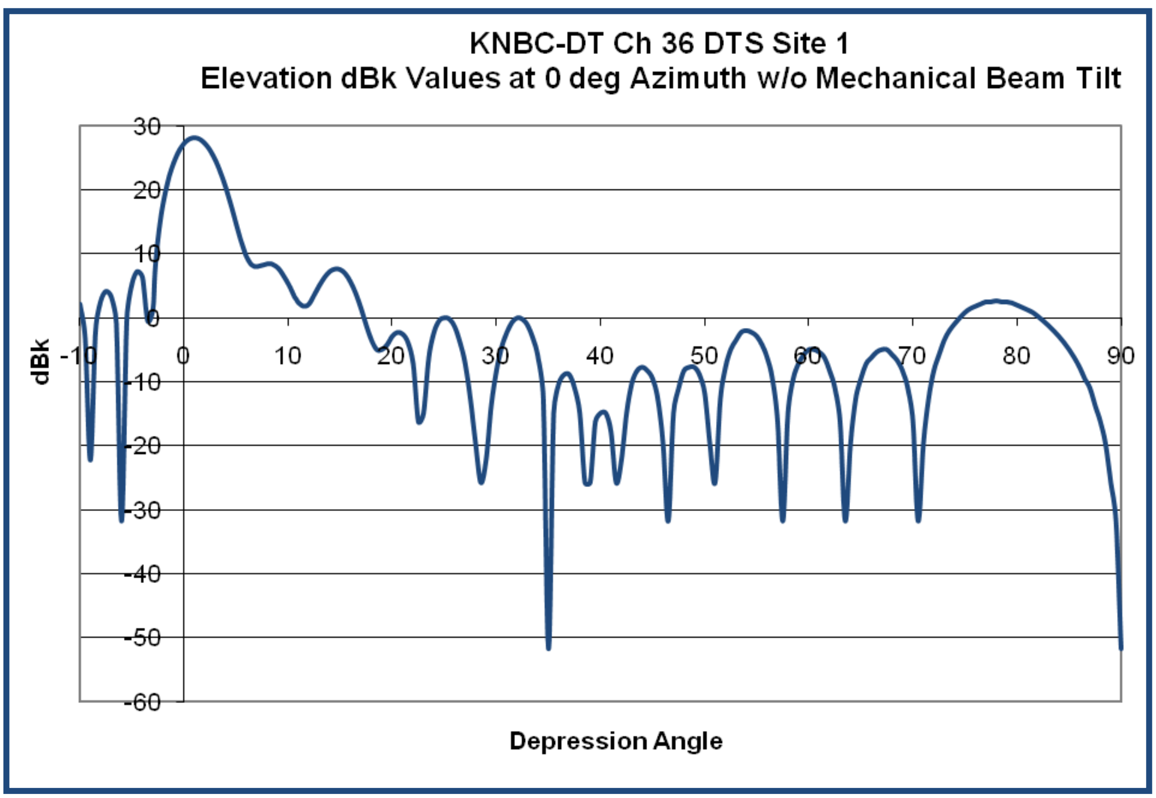

Figure 9 — KNBC Site 1 Elevation Pattern in dBk – without Effects of Mechanical Beam Tilt

Figure 10— KNBC Site 1 Elevation Radiation Pattern Tabulated Values

Depression Angle	Relative Field	Effective Radiated Power (dBk)	Depression Angle	Relative Field	Effective Radiated Power (dBk)
-5.0	0.072	5.375	9.5	0.085	6.762
-4.5	0.090	7.313	10.0	0.072	5.375
-4.0	0.081	6.398	10.5	0.060	3.711
-3.5	0.037	-0.408	11.0	0.051	2.380
-3.0	0.045	1.292	11.5	0.048	1.853
-2.5	0.164	12.406	12.0	0.050	2.208
-2.0	0.310	18.055	12.5	0.059	3.645
-1.5	0.474	21.713	13.0	0.070	5.130
-1.0	0.637	24.311	13.5	0.081	6.398
-0.5	0.785	26.120	14.0	0.090	7.313
0.0	0.902	27.332	14.5	0.094	7.691
0.5	0.976	28.017	15.0	0.093	7.598
1.0	1.000	28.228	15.5	0.086	6.918
1.5	0.973	27.990	16.0	0.074	5.613
2.0	0.902	27.332	16.5	0.060	3.791
2.5	0.796	26.243	17.0	0.046	1.483
3.0	0.669	24.737	17.5	0.034	-1.142
3.5	0.535	22.784	18.0	0.026	-3.472
4.0	0.408	20.441	18.5	0.022	-4.923
4.5	0.299	17.709	19.0	0.022	-4.923
5.0	0.212	14.755	19.5	0.024	-4.168
5.5	0.153	11.907	20.0	0.028	-2.829
6.0	0.117	9.592	20.5	0.030	-2.229
6.5	0.102	8.357	21.0	0.029	-2.524
7.0	0.098	8.053	21.5	0.025	-3.813
7.5	0.101	8.271	22.0	0.017	-7.163
8.0	0.103	8.485	22.5	0.006	-16.209
8.5	0.102	8.400	23.0	0.007	-14.870
9.0	0.096	7.874	23.5	0.019	-6.197

Note: Partial listing, derived from data supplied by manufacturer. A more complete data set, meeting the requirements spelled out in the form, is included in the file uploaded in Form 301 to the Commission's CDBS Electronic Filing System.

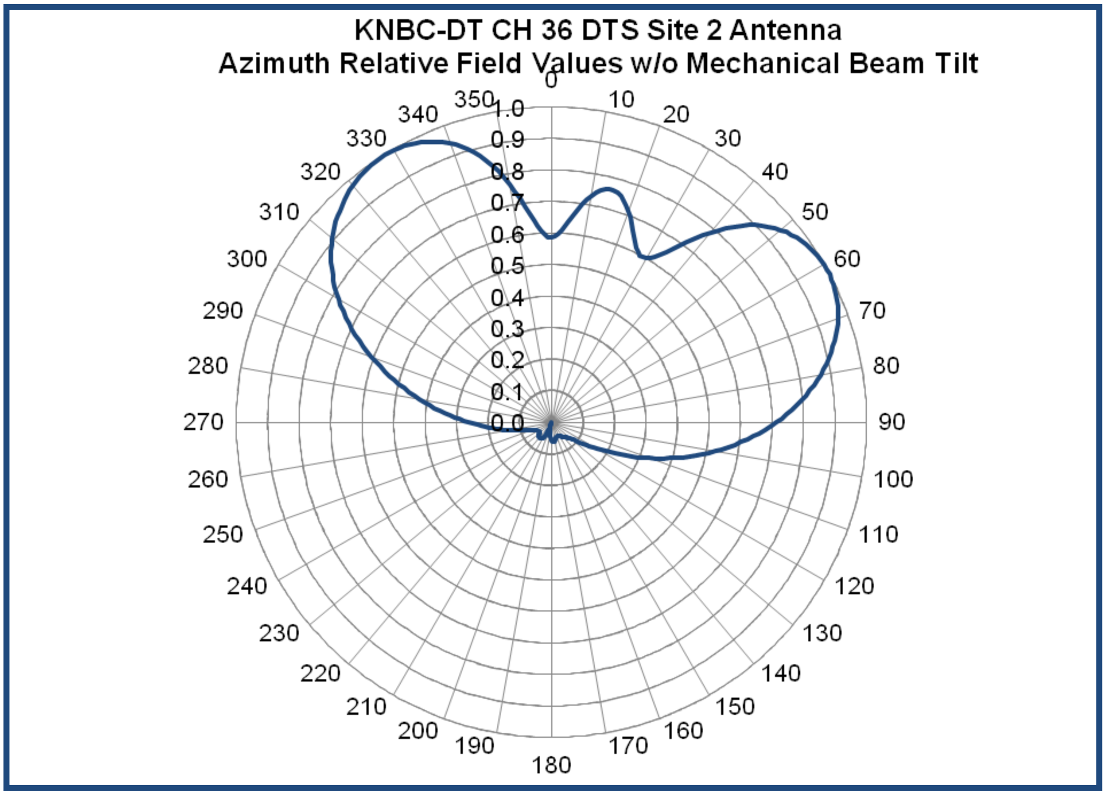

Figure 11 — KNBC DTS Site 2 Antenna Azimuth Relative Field Values

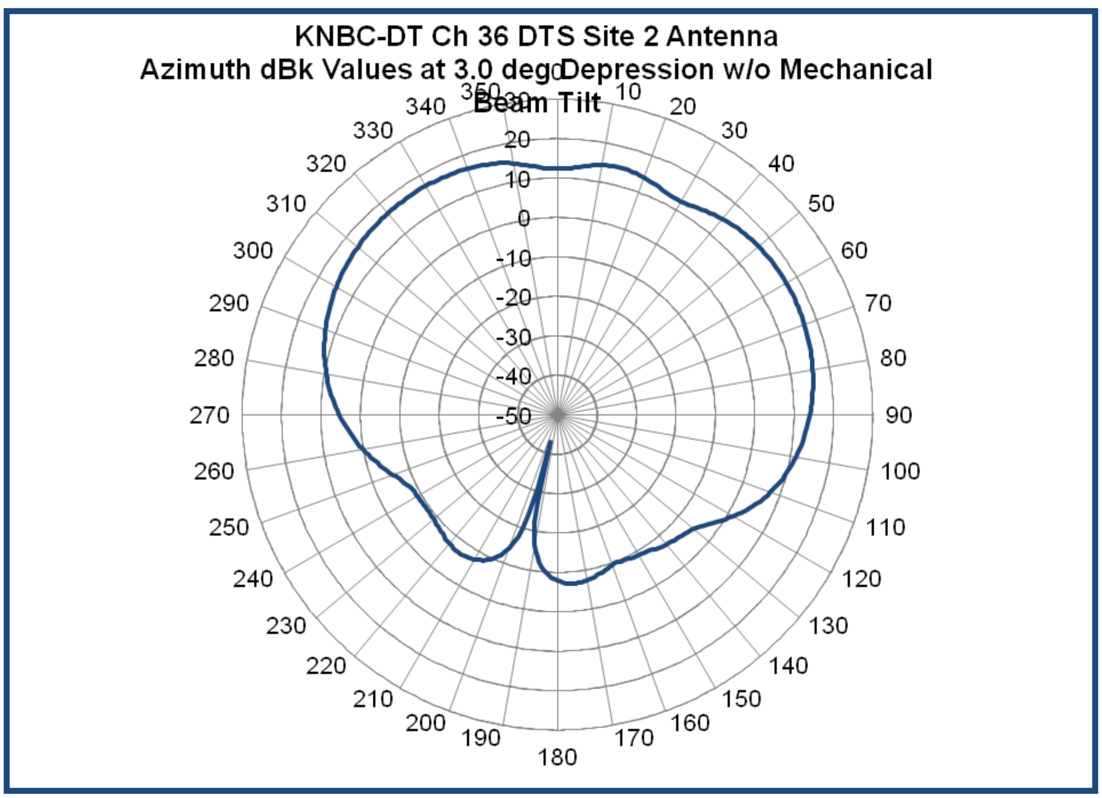

Figure 12 — DTS Site 2 Antenna Azimuth dBk Values — without Effects of Mechanical Beam Tilt

Figure 13— KNBC Site 2 Azimuthal Radiation Pattern Tabulated Values

Azimuth	Relative Field	Effective Radiated Power (dBk)	Azimuth	Relative Field	Effective Radiated Power (dBk)
min 0	0.586	12.348	190	0.021	-16.566
10	0.730	14.256	min 194	0.001	-43.010
max 15	0.763	14.640	200	0.028	-14.067
20	0.714	14.064	210	0.059	-7.593
min 30	0.601	12.567	max 215	0.063	-7.023
40	0.786	14.898	220	0.061	-7.304
50	0.949	16.535	230	0.050	-9.031
max 60	1.000	16.990	min 233	0.049	-9.206
70	0.968	16.707	240	0.051	-8.859
80	0.868	15.760	250	0.075	-5.509
90	0.714	14.064	260	0.145	0.217
100	0.527	11.426	270	0.263	5.389
110	0.333	7.439	280	0.425	9.557
120	0.168	1.496	290	0.609	12.682
130	0.081	-4.841	300	0.780	14.832
140	0.063	-7.023	310	0.908	16.151
150	0.050	-9.031	320	0.980	16.814
min 157	0.047	-26.558	max 328	0.999	16.981
160	0.048	-9.385	330	0.998	16.972
170	0.061	-7.304	340	0.943	16.480
max 175	0.063	-7.023	350	0.767	14.686
180	0.057	-7.893			

Notes: Derived from data supplied by manufacturer. Complete data set available upon request.

Values taken from slice through three-dimensional pattern at 1.4 degrees depression. Does not show the effects of variation of the elevation pattern with azimuth, which are included only in the file uploaded within Form 301 on FCC Electronic Filing System.

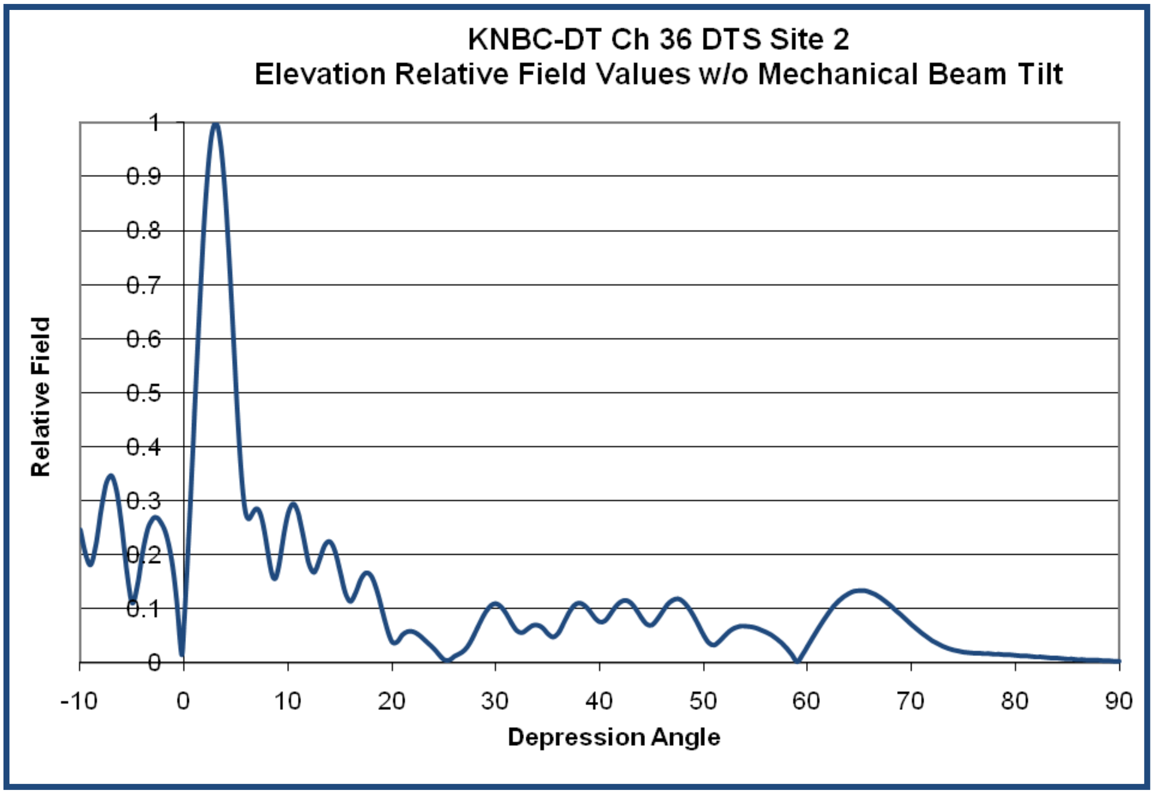

Figure 14 — KNBC DTS Site 2 Antenna Elevation Relative Field Values

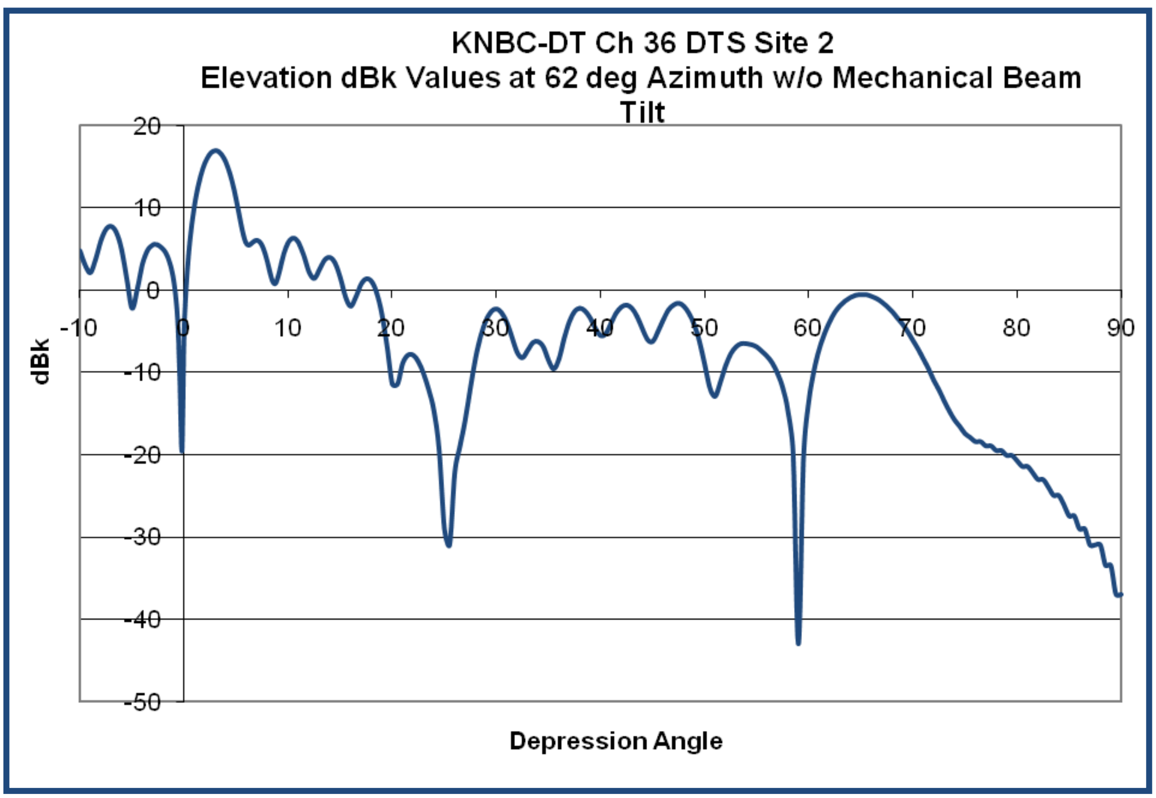

Figure 15 — KNBC DTS Site 2 Antenna Elevation dBk Values— without Effects of Mechanical Beam Tilt

Figure 16 — KNBC DTS Site 2 Elevation Radiation Pattern Tabulated Values

Depression Angle	Relative Field	Effective Radiated Power (dBk)	Depression Angle	Relative Field	Effective Radiated Power (dBk)
-5.0	0.110	-2.182	9.5	0.226	4.060
-4.5	0.143	0.096	10.0	0.276	5.808
-4.0	0.204	3.182	10.5	0.293	6.327
-3.5	0.248	4.879	11.0	0.275	5.776
-3.0	0.267	5.520	11.5	0.230	4.224
-2.5	0.266	5.487	12.0	0.183	2.239
-2.0	0.251	4.983	12.5	0.167	1.444
-1.5	0.219	3.772	13.0	0.189	2.519
-1.0	0.162	1.180	13.5	0.216	3.679
-0.5	0.064	-7.545	14.0	0.224	3.995
0.0	0.077	-5.280	14.5	0.207	3.309
0.5	0.259	5.256	15.0	0.169	1.547
1.0	0.464	10.320	15.5	0.129	-0.799
1.5	0.666	13.438	16.0	0.113	-1.949
2.0	0.840	15.475	16.5	0.129	-0.799
2.5	0.956	16.593	17.0	0.154	0.740
3.0	1.000	16.990	17.5	0.166	1.392
3.5	0.961	16.643	18.0	0.160	1.072
4.0	0.852	15.598	18.5	0.136	-0.340
4.5	0.688	13.730	19.0	0.101	-2.924
5.0	0.505	11.056	19.5	0.064	-6.887
5.5	0.350	7.849	20.0	0.038	-11.415
6.0	0.271	5.649	20.5	0.038	-11.415
6.5	0.274	5.728	21.0	0.051	-8.859
7.0	0.285	6.087	21.5	0.057	-7.893
7.5	0.263	5.385	22.0	0.057	-7.893
8.0	0.211	3.475	22.5	0.052	-8.690
8.5	0.162	1.148	23.0	0.044	-10.141
9.0	0.169	1.547	23.5	0.035	-12.129

Notes: Derived from data supplied by manufacturer. Complete data set available upon request.

Values taken from slice through three-dimensional pattern at 149 degrees azimuth. Does not show the effects of variation of the elevation pattern with azimuth, which are included only in the file uploaded within Form 301 on FCC Electronic Filing System.

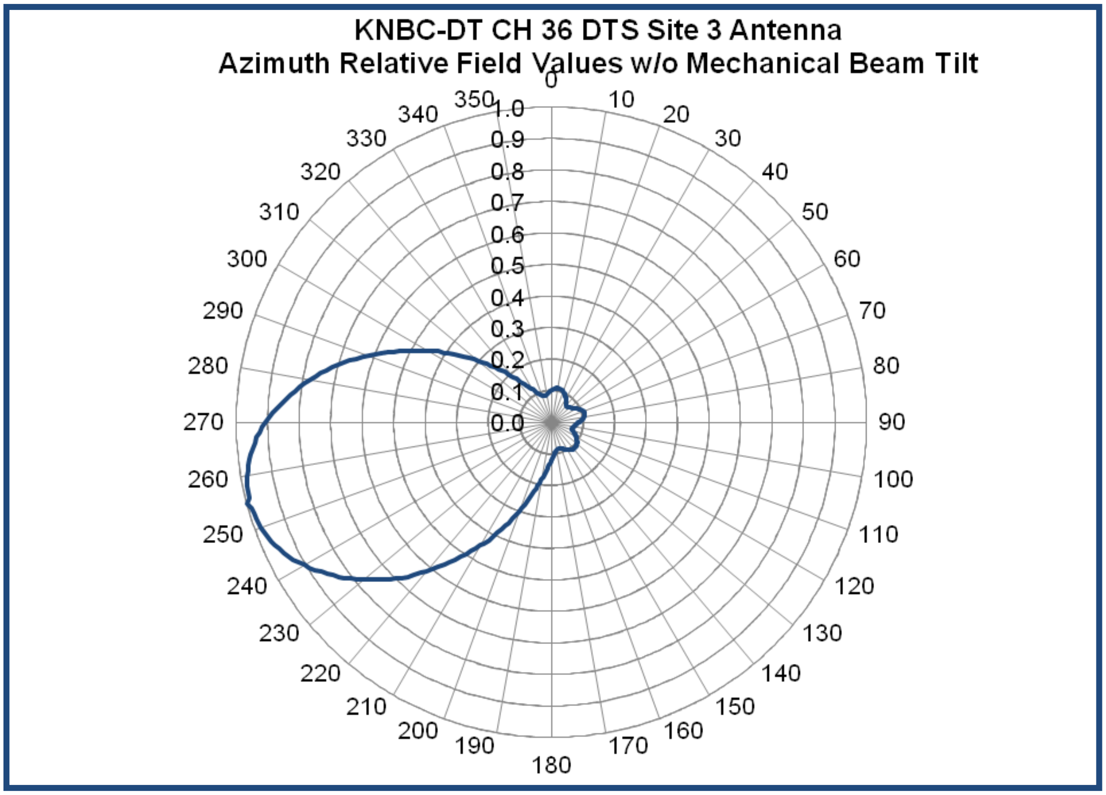

Figure 17a — KNBC DTS Site 3 Antenna Azimuth Relative Field Values

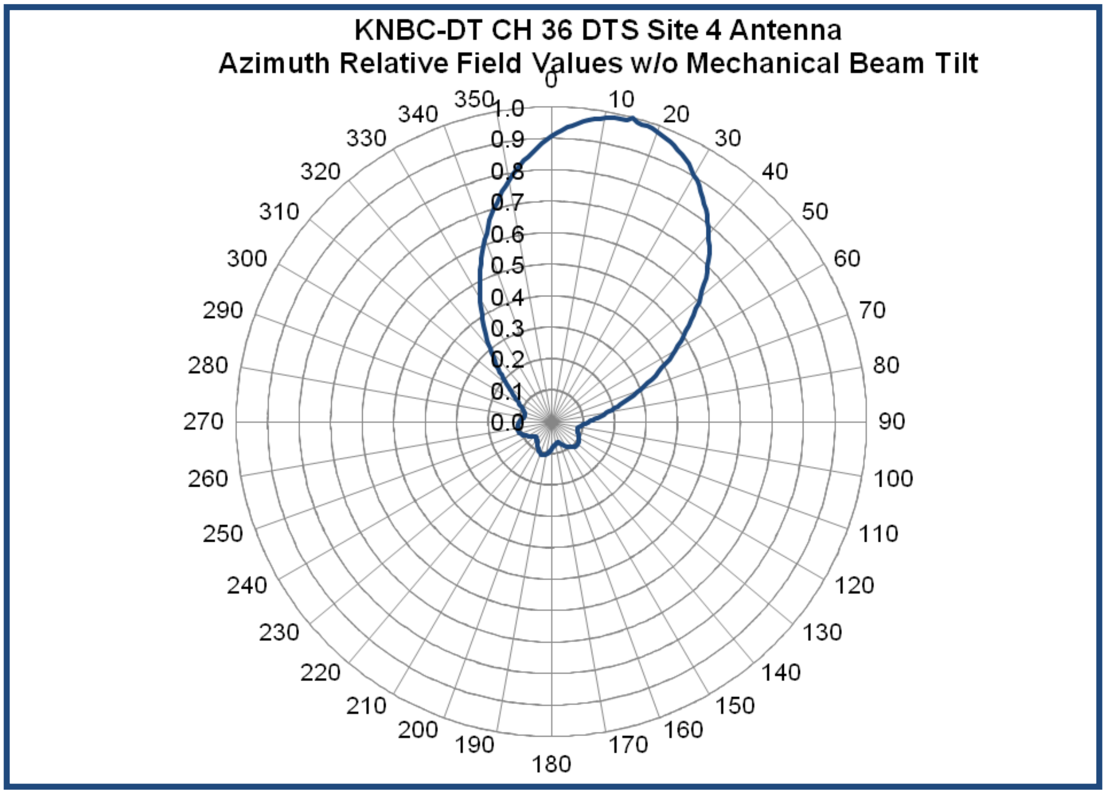

Figure 17b — KNBC DTS Site 4 Antenna Azimuth Relative Field Values – without Effects of Mechanical Beam Tilt

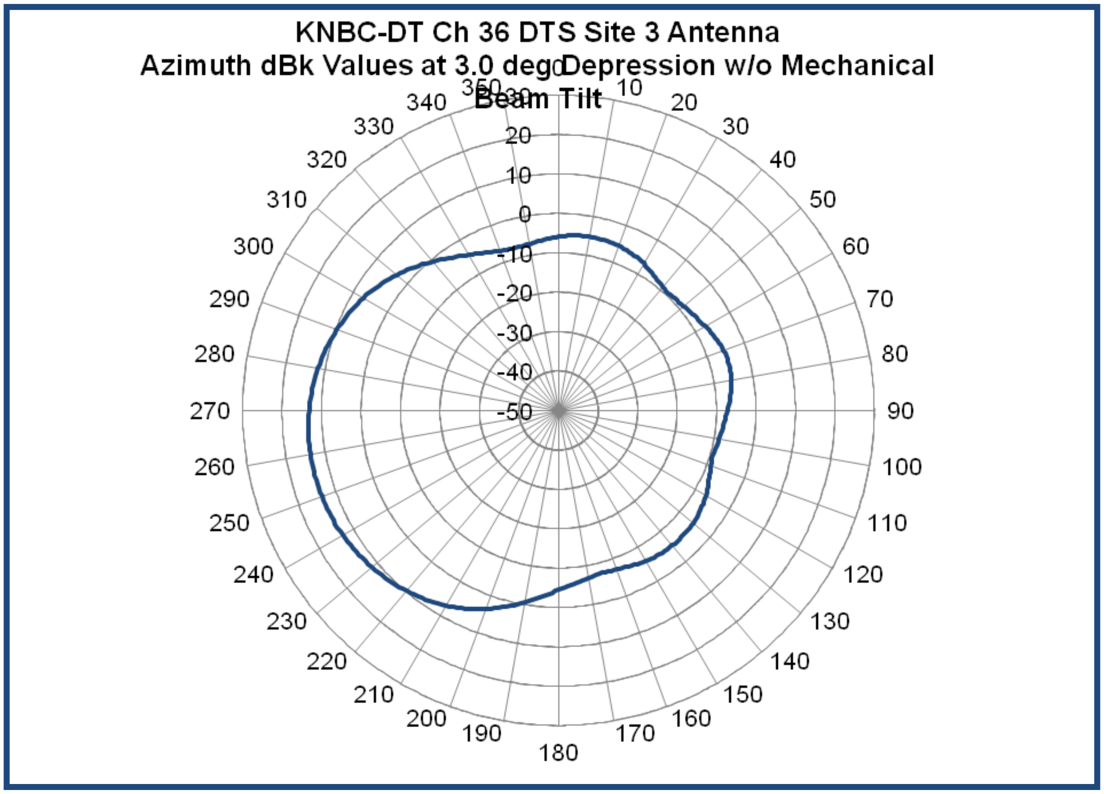

Figure 18a — KNBC DTS Site 3 Antenna Azimuth dBk Values

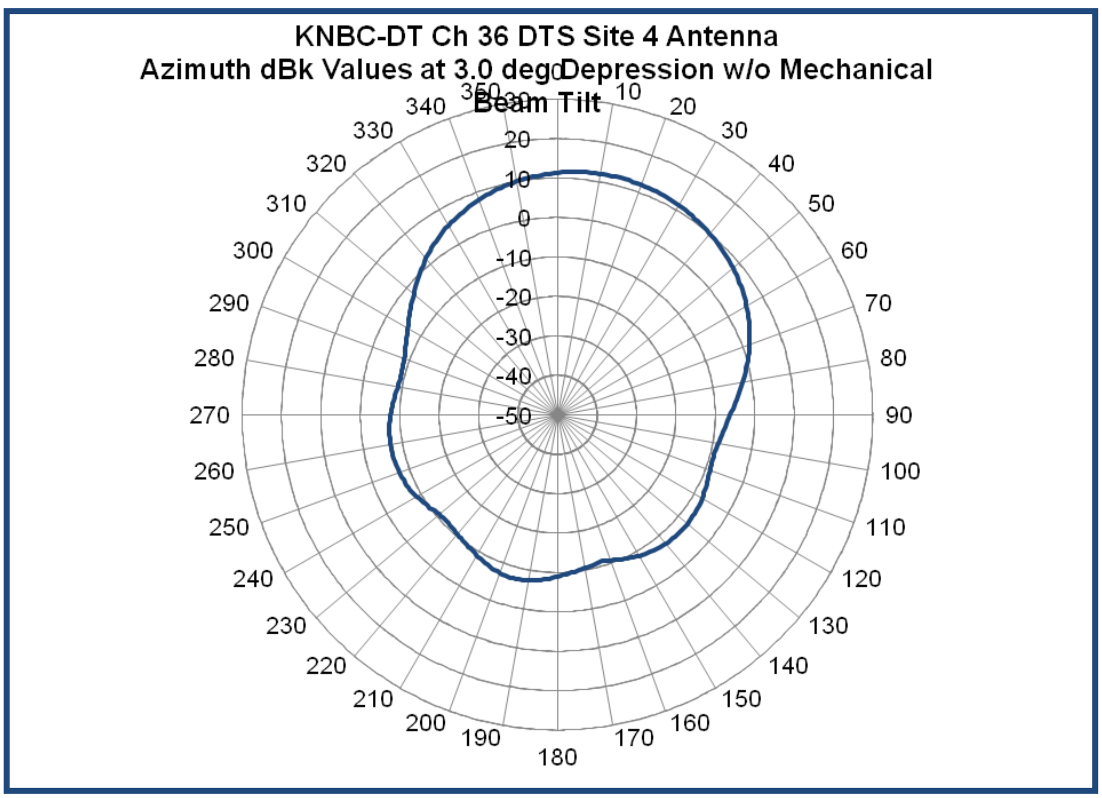

Figure 18b — KNBC DTS Site 4 Antenna Azimuth dBk Values – without Effects of Mechanical Beam Tilt

Figure 19 — KNBC DTS Sites 3 & 4 Azimuth Radiation Patterns Tabulated Data — Without Effects of Mechanical Beam Tilt

Azimuth	DTS Site 3		DTS Site 4		Azimuth	DTS Site 3		DTS Site 4	
	Relative Field	ERP (dBk)	Relative Field	ERP (dBk)		Relative Field	ERP (dBk)	Relative Field	ERP (dBk)
0	0.102	-5.870	0.906	11.378	180	0.120	-4.394	0.087	-8.947
10	0.109	-5.231	0.979	12.055	190	0.185	-0.650	0.106	-7.289
15	0.109	-5.247	1.000	12.238	200	0.302	3.601	0.106	-7.289
20	0.106	-5.501	0.979	12.055	210	0.452	7.091	0.087	-8.947
30	0.091	-6.861	0.906	11.378	220	0.618	9.819	0.073	-10.472
40	0.071	-8.960	0.777	10.047	230	0.777	11.806	0.071	-10.719
50	0.073	-8.713	0.618	8.059	240	0.906	13.137	0.091	-8.620
60	0.087	-7.188	0.452	5.332	250	0.979	13.814	0.106	-7.260
70	0.106	-5.530	0.302	1.842	255	1.000	13.997	0.109	-7.006
80	0.106	-5.530	0.185	-2.410	260	0.979	13.814	0.109	-6.990
90	0.087	-7.188	0.120	-6.154	270	0.906	13.137	0.102	-7.629
100	0.073	-8.713	0.090	-8.629	280	0.777	11.806	0.088	-8.853
110	0.071	-8.960	0.088	-8.853	290	0.618	9.819	0.090	-8.629
120	0.091	-6.861	0.102	-7.629	300	0.452	7.091	0.120	-6.154
130	0.106	-5.501	0.109	-6.990	310	0.302	3.601	0.185	-2.410
140	0.109	-5.231	0.106	-7.260	320	0.185	-0.650	0.302	1.842
150	0.102	-5.870	0.091	-8.620	330	0.120	-4.394	0.452	5.332
160	0.088	-7.094	0.071	-10.719	340	0.090	-6.870	0.618	8.059
170	0.090	-6.870	0.073	-10.472	350	0.088	-7.094	0.777	10.047

Derived from data supplied by manufacturer

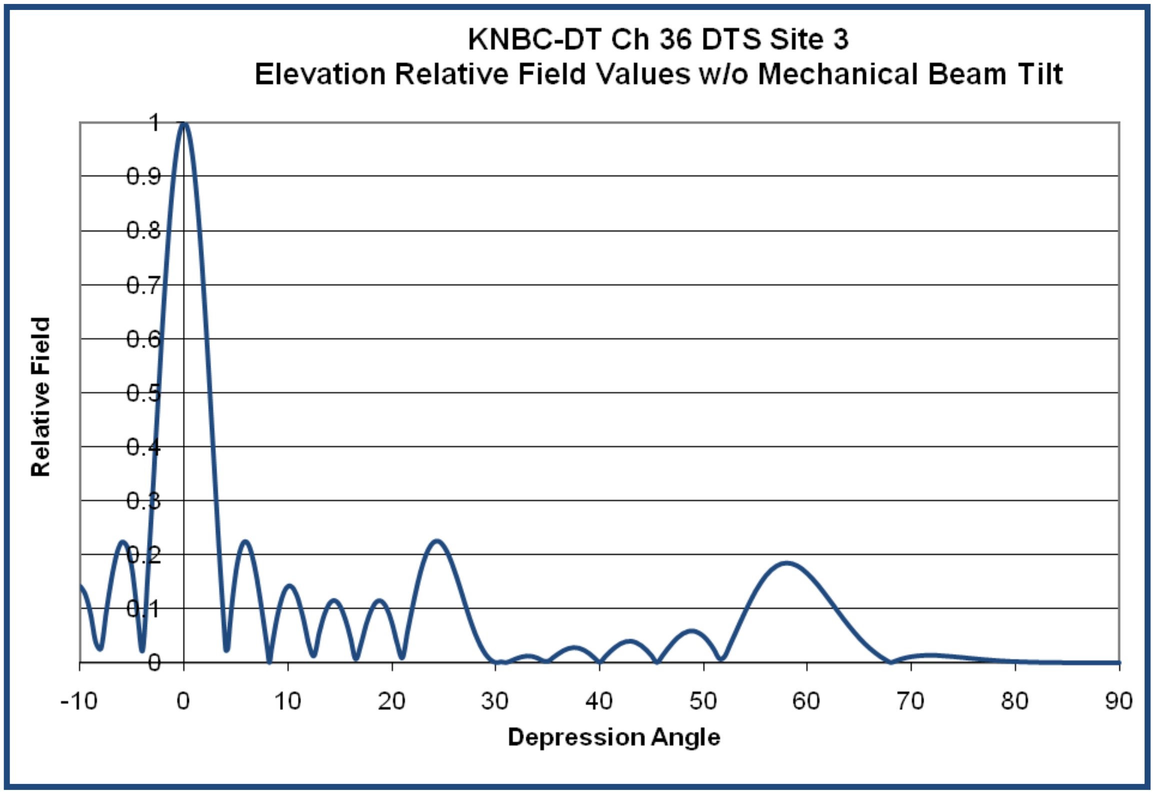

Figure 20a — DTS Site 3 Antenna Elevation Relative Field Values

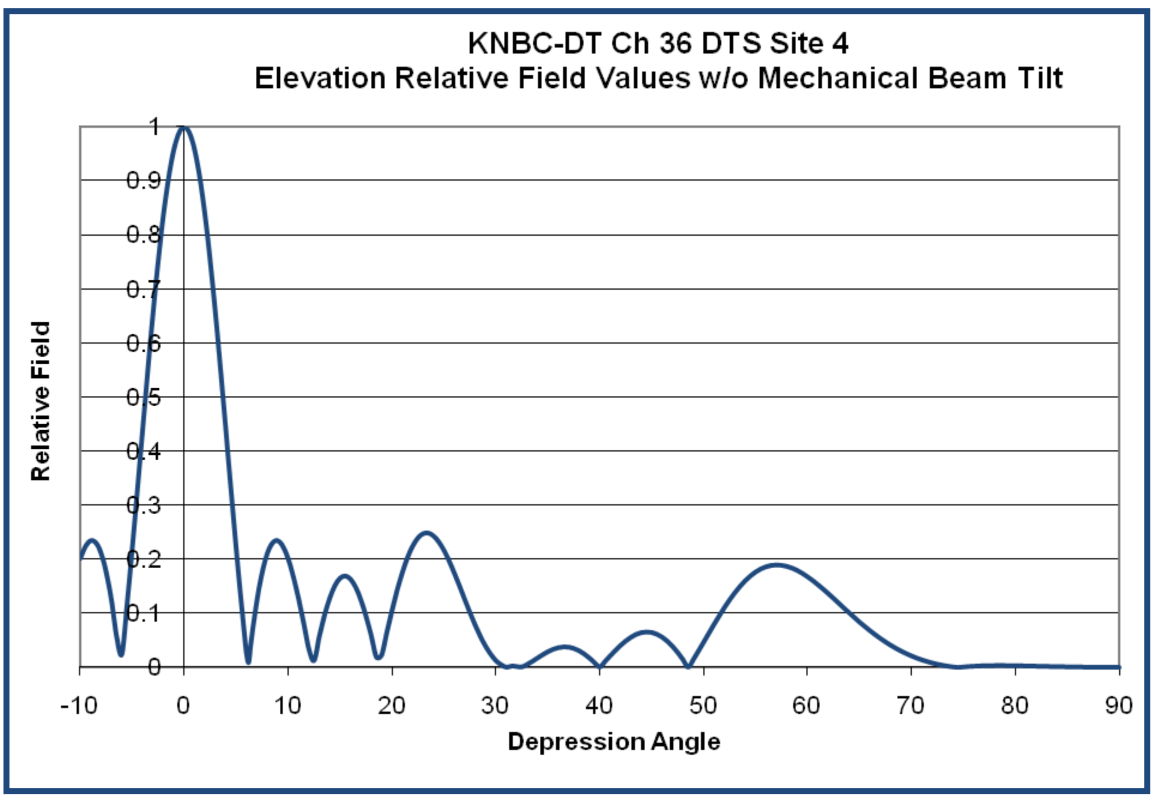

Figure 20b — DTS Site 4 Antenna Elevation Relative Field Values – without Effects of Mechanical Beam Tilt

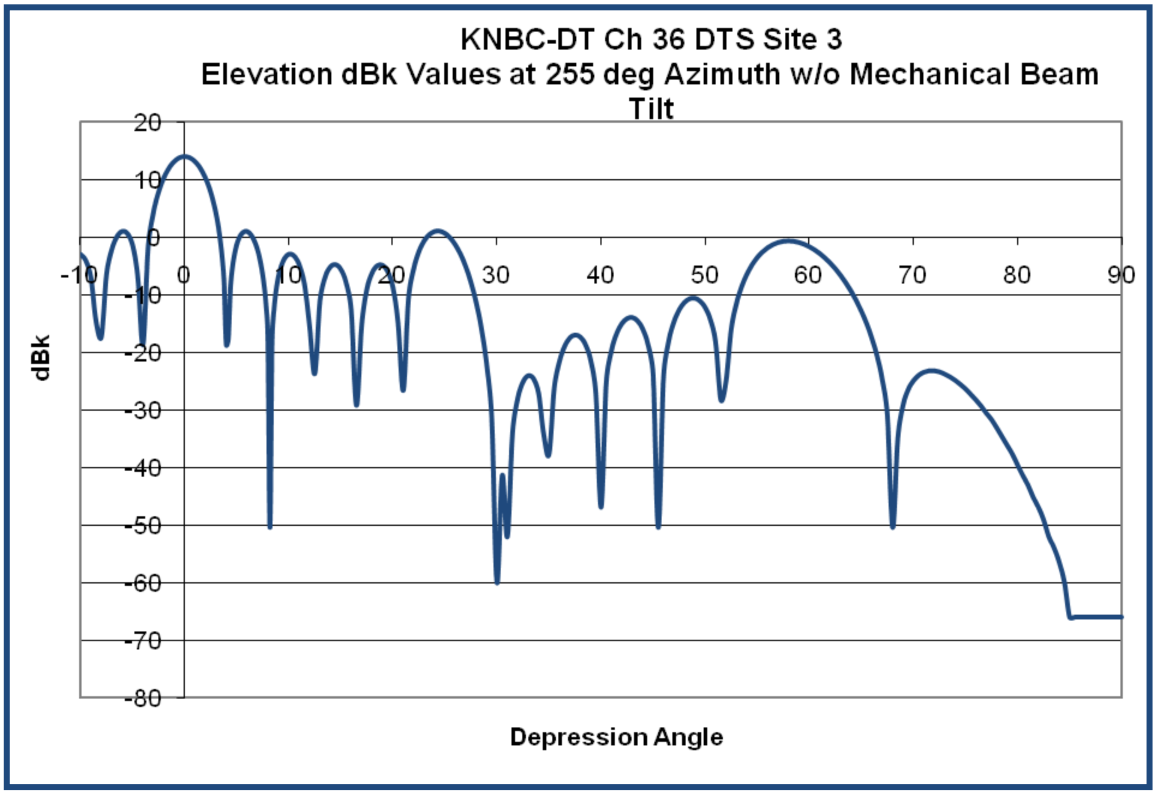

Figure 21a — DTS Site 3 Antenna dBk Values

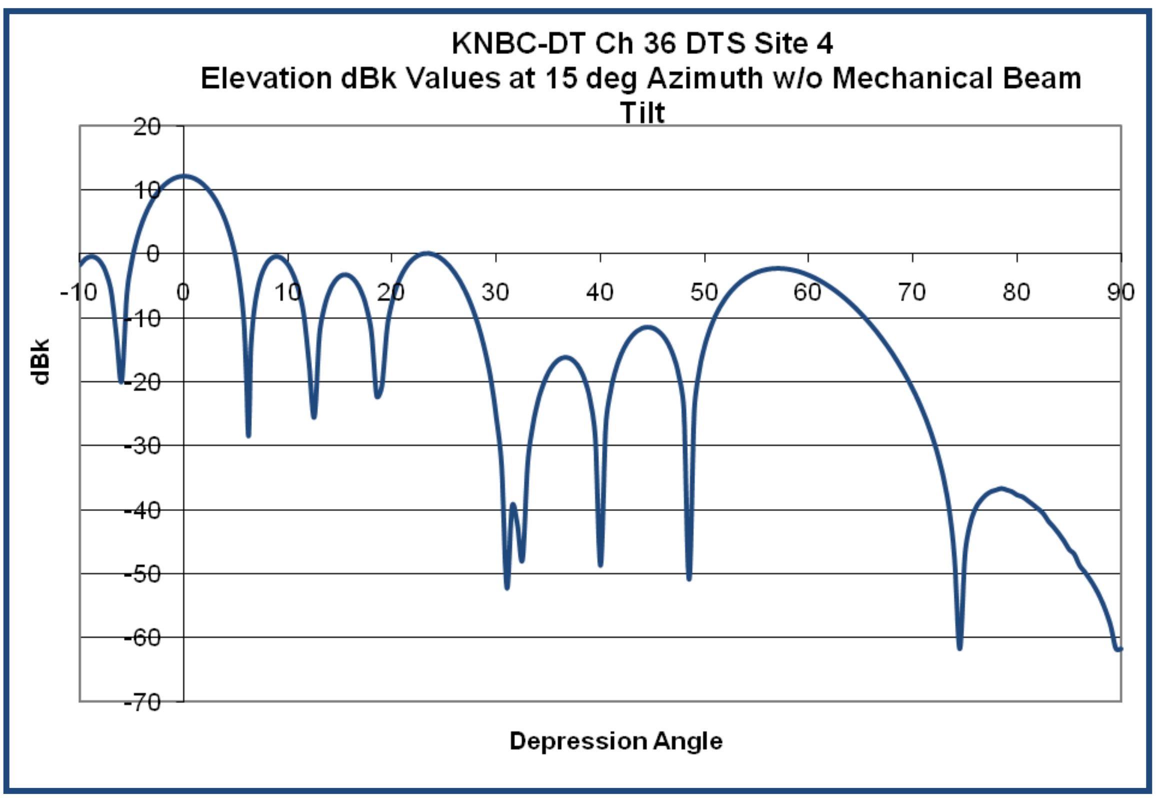

Figure 21b — DTS Site 4 Antenna dBk Values – without Effects of Mechanical Beam Tilt

Figure 22 — KNBC Sites 3 & 4 Elevation Radiation Patterns Tabulated Values — Without Effects of Mechanical Beam Tilt

Depression Angle	DTS Site 3		DTS Site 4		Depression Angle	DTS Site 3		DTS Site 4	
	Relative Field	ERP (dBk)	Relative Field	ERP (dBk)		Relative Field	ERP (dBk)	Relative Field	ERP (dBk)
-5.0	0.171	-1.338	0.221	-0.890	9.5	0.125	-4.066	0.224	-0.762
-4.5	0.091	-6.842	0.329	2.587	10.0	0.142	-2.970	0.202	-1.677
-4.0	0.023	-18.694	0.441	5.120	10.5	0.137	-3.255	0.168	-3.252
-3.5	0.165	-1.659	0.551	7.054	11.0	0.115	-4.767	0.128	-5.632
-3.0	0.325	4.240	0.656	8.578	11.5	0.079	-8.062	0.082	-9.476
-2.5	0.492	7.813	0.752	9.762	12.0	0.034	-15.348	0.034	-17.057
-2.0	0.653	10.294	0.837	10.695	12.5	0.013	-23.724	0.013	-25.484
-1.5	0.794	11.984	0.906	11.376	13.0	0.056	-11.040	0.057	-12.615
-1.0	0.905	13.133	0.958	11.862	13.5	0.090	-6.947	0.096	-8.099
-0.5	0.974	13.772	0.988	12.137	14.0	0.110	-5.168	0.128	-5.611
0.0	1.000	13.997	1.000	12.238	14.5	0.115	-4.774	0.151	-4.160
0.5	0.975	13.780	0.989	12.141	15.0	0.105	-5.579	0.165	-3.397
1.0	0.905	13.133	0.958	11.862	15.5	0.081	-7.834	0.169	-3.189
1.5	0.794	11.984	0.906	11.376	16.0	0.047	-12.598	0.164	-3.487
2.0	0.653	10.294	0.837	10.695	16.5	0.007	-29.226	0.149	-4.328
2.5	0.492	7.813	0.752	9.762	17.0	0.034	-15.451	0.125	-5.810
3.0	0.325	4.240	0.656	8.578	17.5	0.070	-9.114	0.095	-8.226
3.5	0.165	-1.788	0.551	7.047	18.0	0.097	-6.232	0.059	-12.375
4.0	0.023	-18.694	0.441	5.120	18.5	0.113	-4.972	0.019	-22.187
4.5	0.090	-7.113	0.329	2.567	19.0	0.114	-4.880	0.023	-20.604
5.0	0.171	-1.338	0.221	-0.890	19.5	0.101	-5.960	0.065	-11.518
5.5	0.214	0.613	0.118	-6.436	20.0	0.074	-8.654	0.105	-7.306
6.0	0.224	0.990	0.025	-19.873	20.5	0.036	-14.877	0.143	-4.662
6.5	0.201	0.049	0.056	-13.084	21.0	0.009	-26.634	0.176	-2.847
7.0	0.155	-2.180	0.124	-5.908	21.5	0.058	-10.720	0.204	-1.583
7.5	0.094	-6.641	0.175	-2.905	22.0	0.106	-5.489	0.225	-0.715
8.0	0.027	-17.376	0.211	-1.269	22.5	0.150	-2.510	0.240	-0.162
8.5	0.037	-15.228	0.230	-0.519	23.0	0.185	-0.665	0.248	0.113
9.0	0.090	-6.967	0.235	-0.356	23.5	0.210	0.441	0.249	0.151

Notes: Derived from data supplied by manufacturer. Complete data set available upon request.

Values taken from slice through three-dimensional pattern at 255 degrees (DTS Site 3) and 15 degrees (DTS Site 4) azimuths prior to mechanical beam tilt. Does not show the effects of variation of the elevation pattern with azimuth, which are included only in the file uploaded within Form 301 on FCC CDBS Electronic Filing System.

Annex A

Reply Comments
In
MB Docket #05-312
by
Group of Engineering Firms

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Digital Television Distributed Transmission System Technologies	)	MB Docket No. 05-312
	)	
	)	

REPLY COMMENTS OF CAVELL, MERTZ & ASSOCIATES, INC.; CHESAPEAKE RF CONSULTANTS, LLC; DU TREIL, LUNDIN & RACKLEY, INC.; GREG BEST CONSULTING, INC.; HATFIELD & DAWSON CONSULTING ENGINEERS, LLC; MEINTEL, SGRIGNOLI, & WALLACE, LLC; MERRILL WEISS GROUP LLC; and SMITH and FISHER LLC
TO PETITION FOR RECONSIDERATION OF THE ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC.

The firms Cavell, Mertz & Associates, Inc.; Chesapeake RF Consultants, LLC; du Treil, Lundin & Rackley, Inc.; Greg Best Consulting, Inc.; Hatfield & Dawson Consulting Engineers, LLC; Meintel, Sgrignoli, & Wallace, LLC; Merrill Weiss Group LLC; and Smith and Fisher LLC (hereinafter, the "Engineering Firms") jointly file these comments in response to the Petition for Reconsideration of the Association for Maximum Service Television, Inc. (MSTV) in the above-captioned proceeding. The FCC released its Report and Order on Distributed Transmission System Technologies, FCC 08-256 (the "DTS R&O"), on November 7, 2008. MSTV filed its petition on December 31, 2008, and the Engineering Firms have waited since that time for notice of the petition to appear in the Federal Register. Since the petition has not yet been published in the Federal Register, the Engineering Firms now file these Reply Comments with the intention that they will be of assistance to the Commission staff as they proceed with implementation of the processing methodology for DTS systems.

As does MSTV, the Engineering Firms applaud the adoption by the Federal Communications Commission of rules for the routine licensing of digital television broadcast stations utilizing Distributed Transmission Systems (DTS) technology. As engineering and technical consultants who design transmission systems for licensed television stations and who prepare technical filings for those stations, we strongly recommend that the Commission adopt an interference evaluation regime for DTS that will yield the most accurate results that can be obtained within the general methodological approach of OET Bulletin No. 69.

In this regard, we support the request of MSTV that stations be required to submit and use the actual elevation patterns of their DTS antennas instead of the OET-69 standard pattern to more accurately evaluate the interference impact of the DTS transmitters. We find the MSTV suggestion that actual antenna elevation patterns should be applied to all stations involved in interference analyses to be the correct approach. We also find, however, that the MSTV request did not specify all important aspects of the issues surrounding use of elevation patterns in conducting the necessary interference analyses. These comments are filed to bring to the attention of the Commission at least one other factor that must be included in the adoption of the use of elevation patterns and to respectfully request its adoption upon reconsideration of the DTS Report and Order or its inclusion in a revision of OET-69 and its supporting software, as appropriate.

When both the azimuth and elevation patterns of transmitting antennas are to be taken into account in the analysis of interference between two or more stations, it is necessary to determine the received signal levels from all relevant stations at each geographic point to be studied for the presence of interference. To correctly compute the received signal levels, the relevant launch angles from the transmitting antennas must be determined to either the receiving antenna itself or to appropriate representations of any obstacles that obstruct the paths to that receiving antenna. Those launch angles comprise combinations of the azimuthal directions from the transmitting to receiving antennas and the depression angles from the transmitting antennas either to the receiving antennas or to any obstacles in the paths to those receiving antennas. From the launch angle information, the relative field values from the transmitting antennas can be determined for the relevant paths.

To determine the depression angle from a transmitting antenna, it is necessary to calculate the difference in heights of the transmitting and receiving antennas (or the transmitting antenna and any obstacle in the path) and the distance between them. The depression angle then is the arc-tangent of the ratio of the distance divided by the height difference. For improved precision, the height difference should be compensated for the curvature of the earth.

The difference in heights of the transmitting and receiving antennas (or obstacles) is found by adding the height above ground level (AGL) of each antenna to the height of the terrain above mean sea level (AMSL) at the antenna location to obtain the total height of each antenna AMSL. Of course, for obstacles in the path, the height is just the height of the obstacle as it is represented in the propagation model in use. The difference in heights then is just the difference in the two total height values.

Unfortunately, the mathematical process currently embodied in the Commission's software implementing the Longley-Rice propagation model according to OET Bulletin No. 69 leaves out an important step in the calculation of the difference in heights of the two antennas (or of the transmitting antenna and of any obstacle). It does not add the height of the terrain at the antenna location to the antenna height AGL. Rather it skips the step of adding the height of the terrain at the antenna location and uses only the height AGL in making the depression angle calculation.

Such a shortcut approach will be reasonably accurate in locations where the terrain is flat; this might be the case in some locations in the Midwest or the Great Plains, for example. But it clearly leads to serious errors in the computation of depression angle in markets with significant terrain variation, which is the case in much of the United States. Modern antenna design software permits both azimuth and elevation patterns to be achieved that were not previously possible. This enables obtaining results such as uniform field strengths over large areas around an antenna, with no "hot spots" in the region near the antenna itself, or placing sharp nulls in patterns – both in azimuth and elevation. The former of these techniques is valuable for providing protection to adjacent-channel stations in the same market, while the latter technique is useful for providing protection to stations in neighboring markets. Both of these methods have been applied in DTS networks designed to date; indeed, they both have been applied in the design of a single such network.

The principal objective in the design of a television transmission system is to obtain the best possible service to viewers of each station while minimizing interference to neighboring stations. This maximizes the efficiency of spectrum utilization. There is no economic method for accurately determining the actual interference results in the field, so the Commission's methodology is predicated on limiting actual interference by limiting predicted interference and assuming the prediction to be reasonably accurate. It therefore is important that the model used reflect the real world as much as possible within the context of the general methodology applied. Given the foregoing discussion, we make the following recommendation for the process the FCC uses in collecting data and analyzing interference:

- Correct the methodology applied in the software associated with OET Bulletin No. 69 to include computation of the total antenna height AMSL for both transmitting and receiving antennas before determination of the depression angle from the transmitting antenna and the corresponding relative field of the emission toward the studied receiving location.

Please note that our recommendation does not deal with the issue of the launch angle toward any obstruction(s) that may be in the path from transmitter to receiver. That issue is rather complex, and the solution to it is not as readily apparent as is the case with unobstructed paths. Thus, we are not making a recommendation at this time for its solution, but we do strongly recommend that the actual height of the transmitting antenna AMSL be used in all calculations, as it resolves with the simplest of solutions the most serious of the problems in the Commission's software regarding the use of elevation patterns.

We are gratified that the collection of information on the elevation patterns at least of the antennas of DTS facilities already has been provided for in the new Form 301 that recently was approved by the Office of Management and Budget. Given that, it is our belief that our suggestion can be implemented through changes that we expect to be required in OET Bulletin No. 69 and in the software that supports interference analysis using the methodology of OET-69. Since that document and software already will be in revision, now is an opportune time to make a change that long has been pointed out by members of the engineering community as being necessary to improve the accuracy of the Commission's prediction of interference. The alternative is that DTS transmitter facilities will be designed to achieve the best predicted interference performance, but those predictions will not be correctly reflected in the real world.

Respectfully submitted,

Garrison C. Cavell
Cavell, Mertz & Associates, Inc.

Joseph M. Davis, P.E.
Chesapeake RF Consultants, LLC

Louis R. du Treil, Jr., P.E.
du Treil, Lundin & Rackley, Inc.

Gregory L. Best, P.E.
Greg Best Consulting, Inc.

Benjamin F. Dawson III, P.E.
Hatfield & Dawson Consulting Engineers, LLC

Dennis Wallace
Meintel, Sgrignoli & Wallace, LLC

S. Merrill Weiss
Merrill Weiss Group LLC

Kevin Fisher
Smith and Fisher LLC