Facilities

The facilities requested in this application include continued operation at 1000 kW ERP at a height above average terrain of 911 meters at the Mt Harvard 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 Harvard 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 KVEA 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 KVEA DTS network. The Mt Harvard (DTS Site 1) antenna is a relatively conventional, omnidirectional, end-fed, slotted coaxial design. It has 1.8 degrees of electrical beam tilt and is installed with 0.6 degree of mechanical beam tilt downward toward 245 degrees. It was recently installed and is operating under automatic program test authority pursuant to the authorization in the construction permit in File Number BPCDT-20080620ANU; application for a license to cover is in File Number BLCDT-20100629AZI.

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 contour of the Site 2 horizontal component is in olive and that of its vertical component is in grey,[6] the proposed Site 3 contour is in green, and the proposed Site 4 contour is in violet. In its current configuration, the main, Mt Harvard transmitter facility authorized by the existing construction permit (herein, DTS Site 1) already covers the entire authorized service area of the station;[7] 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 city of Corona, CA, to which KVEA is licensed. All four transmitters in the proposed DTS network are located within the KVEA "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 Harvard) facility are fully described in Figure 1a. The antenna is installed with 0.6 degree of mechanical beam tilt downward in the direction of 245 degrees true. The antenna has elliptical polarization, with 33.44 percent

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[5] To account for the dipole correction factor, the PNLCs are plotted at 41.1 dBu, with service statistics of F(50,90).

[6] The contour of the vertical component of the Site 2 antenna is shown separately because of its extension beyond the horizontal component of that antenna in some directions, as discussed in detail below.

[7] 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."

of the power applied to the vertical polarization component. Elevation power gain of the antenna is 4.37 (6.40 dBd) in the horizontal polarization component and 4.39 (6.43 dBd) in the vertical polarization component at the vertical beam maximum (1.8 degrees below the plane orthogonal to the axis of the antenna and through its radiation center). Azimuth power gain of the antenna is 4.60 (6.63 dBd) in the horizontal polarization component and 2.3 (3.62 dBd) in the vertical polarization component. Overall gain of the antenna in the main beam is 20.1 (13.03 dBd) in the horizontal polarization component and 10.1 (10.04 dBd) in the vertical polarization component. The mechanical beam tilt causes the gain of the horizontal polarization component to vary in the horizontal plane between 8.68 (9.38 dBd) at 102 degrees azimuth and 0.204 (–6.89 dBd) at 347 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., 1.8 degrees 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.[8] 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., 1.8 degrees 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

[8] 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 Harvard 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.

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 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 17, 65, 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 0.3 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 degree 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 2.0 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 (328 degrees in the horizontal component and 68 degrees in the vertical component), is 14.62 (11.65 dBd) at the beam maximum (3.0 degrees below the plane orthogonal to the axis of the antenna and through its radiation center) and 0.011 (–39.17 dBd) at the null above the main beam (0.3 degrees above the plane orthogonal to the axis of the antenna and through its radiation center). The azimuth directivity (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) in the horizontal polarization component is 2.88 (4.59 dB) and in the vertical polarization component is 2.90 (4.62 dB). The total power gain in the main beam in the horizontal polarization component is 42.11 (16.24 dBd) and in the vertical polarization component is 42.40 (16.27 dBd). In the horizontal plane, the mechanical beam tilt causes the gain of the horizontal polarization component to vary between 26.29 (14.20 dBd) at 57 degrees azimuth and 0.0003942 (-34.04 dBd) at 227 degrees azimuth and of the vertical polarization component to vary between 24.46 (13.88 dBd) at 60 degrees azimuth and 0.0004439 (-33.53 dBd) at 121 degrees azimuth.

Plots of the DTS Site 2 antenna azimuthal radiation patterns of the horizontal (in blue) and vertical (in green) polarization components, 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), are included as Figure 11. The azimuthal power patterns, expressed in decibels relative to 1 kW (dBk), of the horizontal (in blue) and vertical (in green) polarization components, 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), are plotted in Figure 12. 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 of the horizontal polarization component (328 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 of the horizontal polarization component (also 328 degrees), is plotted in Figure 15. Tabulated elevation field and power values are given in Figure 16.

Section 73.682(a)(14) of the Commission's rules, which deals with the use of circular and elliptical polarization, states, in part, "For either omnidirectional or directional antennas, the licensed effective radiated power of the vertically polarized component may not exceed the licensed effective radiated power of the horizontally polarized component. For directional antennas, the maximum effective radiated power of the vertically polarized component shall not exceed the maximum effective radiated power of the horizontally polarized component in any specified horizontal or vertical direction." While antennas designed for a single channel can be built to achieve the relationship described in the rule, as a practical matter, antennas designed for operation over a wide frequency range, and especially those with substantial pattern directivity, will have considerable differences and variability in their horizontal and vertical polarization component patterns over the bandwidth of the antenna and in the extremes of the pattern. It is impractical, in an antenna of this sort to provide for individually adjustable power division ratios for each of the stations involved. Thus, as can be seen in Figures 11 and 12, there are places in the azimuth pattern of the proposed antenna where the effective radiated power of the vertically polarized component is predicted to exceed that of the horizontally polarized component. This relationship results from the two components being fed equal amounts of power, having nearly identical overall power gains, but also having some differences in their null structures. It is a consequence of an antenna design to support operation across the UHF band by a large number of stations and will exist with any antenna designed for such a purpose when practical amounts of power are fed to the vertical component. In the case of the current proposal, the vertical component never exceeds the horizontal component by more than 1 dB in any direction except in the pattern nulls in the ranges of 122 – 142, 165 – 172, 224 – 229, and 255 – 269 degrees. Thus, in the principal operating directions of the antenna, the power in the horizontal and vertical components is matched within 1 dB. In any event, due to the technicality that there are some directions in which the power in the vertical component is expected to exceed the power in the horizontal component, a waiver of Section 73.682(a)(14) respectfully is requested.

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 KVEA 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.[9] 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."[10]

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.[11] KVEA 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."[12] The largest station in the Los Angeles DMA appears to be KCOP-DT, which has a

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[9] DTS R&O, ¶35.
[10] *Digital Television Distributed Transmission System Technologies*, Report and Order, MB Docket No. 05-312, FCC 08-256, released November 7, 2008, at ¶35.
[11] 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").
[12] Id.

Figure 1b — Technical Specifications — Proposed KVEA DTS Facility
Channel 39 — Corona, CA — Site 2: Table Mountain

Frequency

Channel	39
Frequency Band	620 – 626 MHz
Center Frequency	623 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

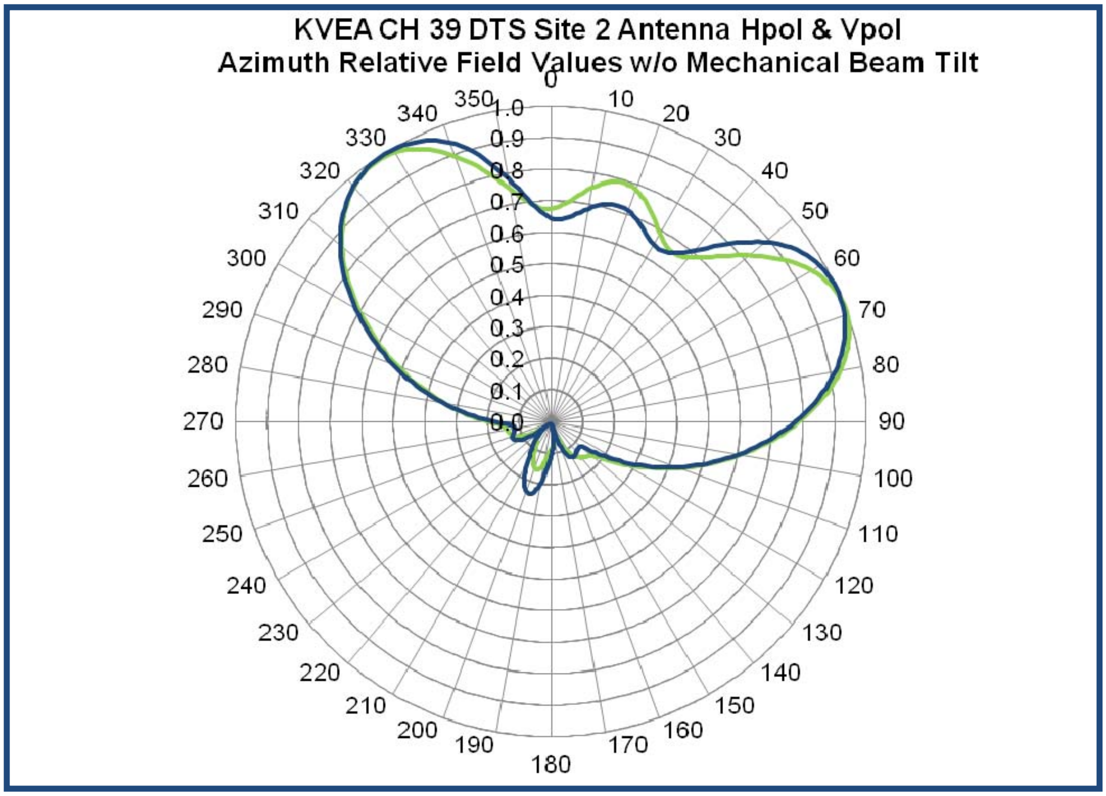

Figure 11 — KVEA DTS Site 2 Antenna Azimuth Relative Field Values

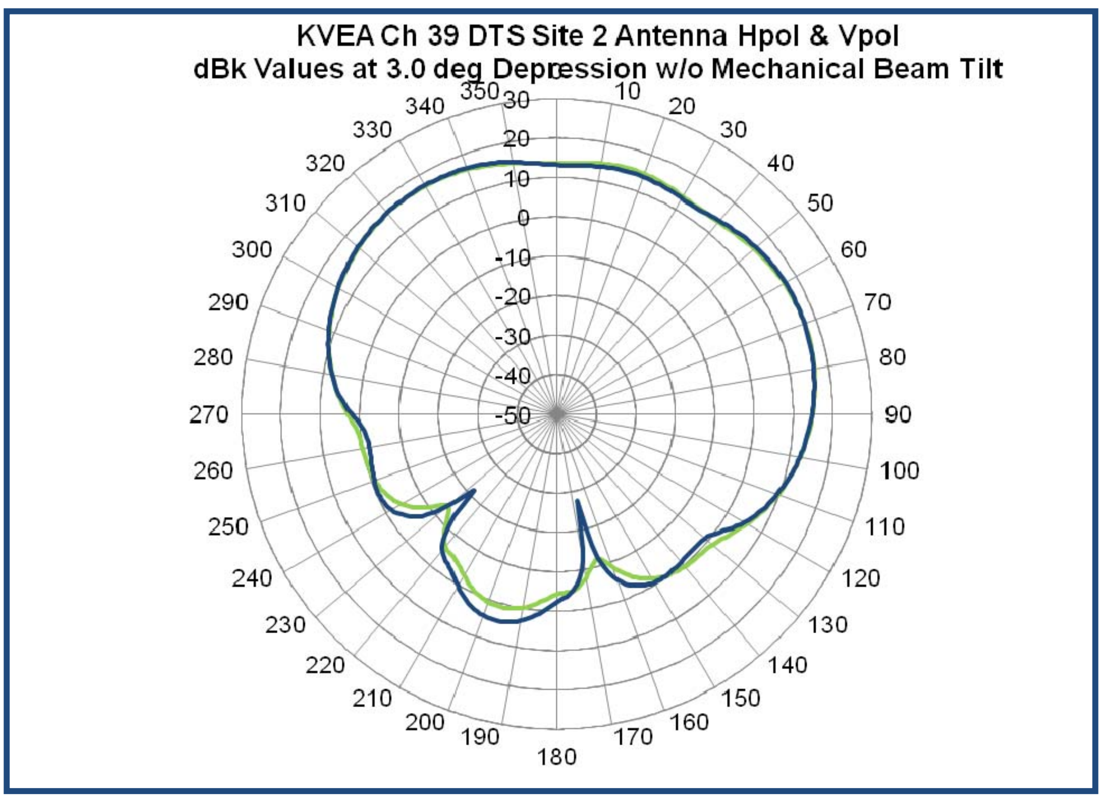

Figure 12 — KVEA DTS Site 2 Antenna Azimuth dBk Values — without Effects of Mechanical Beam Tilt

Figure 13— KVEA Site 2 Azimuthal Radiation Pattern Tabulated Values

Azimuth	Relative Field		ERP (dBk)		Azimuth	Relative Field		ERP (dBk)	
	Hpol	Vpol	Hpol	Vpol		Hpol	Vpol	Hpol	Vpol
0	0.645	0.675	13.186	13.574	180	0.108	0.087	-2.326	-4.220
10	0.685	0.753	13.709	14.527	190	0.206	0.140	3.254	-0.106
20	0.713	0.784	14.048	14.874	200	0.233	0.155	4.348	0.819
30	0.651	0.691	13.256	13.775	210	0.147	0.102	0.318	-2.830
40	0.709	0.680	14.001	13.641	220	0.081	0.069	-4.873	-6.208
50	0.885	0.819	15.931	15.256	230	0.032	0.029	-12.934	-13.913
60	0.987	0.956	16.874	16.602	240	0.118	0.084	-1.558	-4.483
69	0.994	1.000	16.936	16.990	250	0.130	0.128	-0.758	-0.886
70	0.991	0.999	16.907	16.982	260	0.117	0.143	-1.676	0.084
80	0.915	0.931	16.216	16.372	270	0.181	0.201	2.134	3.036
90	0.776	0.787	14.786	14.913	280	0.351	0.347	7.901	7.804
100	0.604	0.610	12.603	12.689	290	0.534	0.521	11.544	11.320
110	0.425	0.431	9.547	9.683	300	0.715	0.702	14.079	13.911
120	0.250	0.273	4.959	5.716	310	0.872	0.864	15.803	15.721
130	0.125	0.169	-1.044	1.568	320	0.974	0.972	16.759	16.740
140	0.126	0.150	-1.024	0.483	328	1.000	0.992	16.990	16.920
150	0.131	0.115	-0.672	-1.789	330	0.999	0.986	16.978	16.870
160	0.076	0.052	-5.371	-8.757	340	0.942	0.897	16.471	16.046
170	0.035	0.058	-12.030	-7.742	350	0.783	0.751	14.860	14.497

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

Values taken from slice through three-dimensional pattern, 3.0 degrees below the plane orthogonal to the axis of the antenna and through its radiation center. Does not show the effects of variation of the azimuth pattern with depression angle due to mechanical beam tilt, which are included only in the file uploaded within Form 301 on FCC Electronic Filing System.

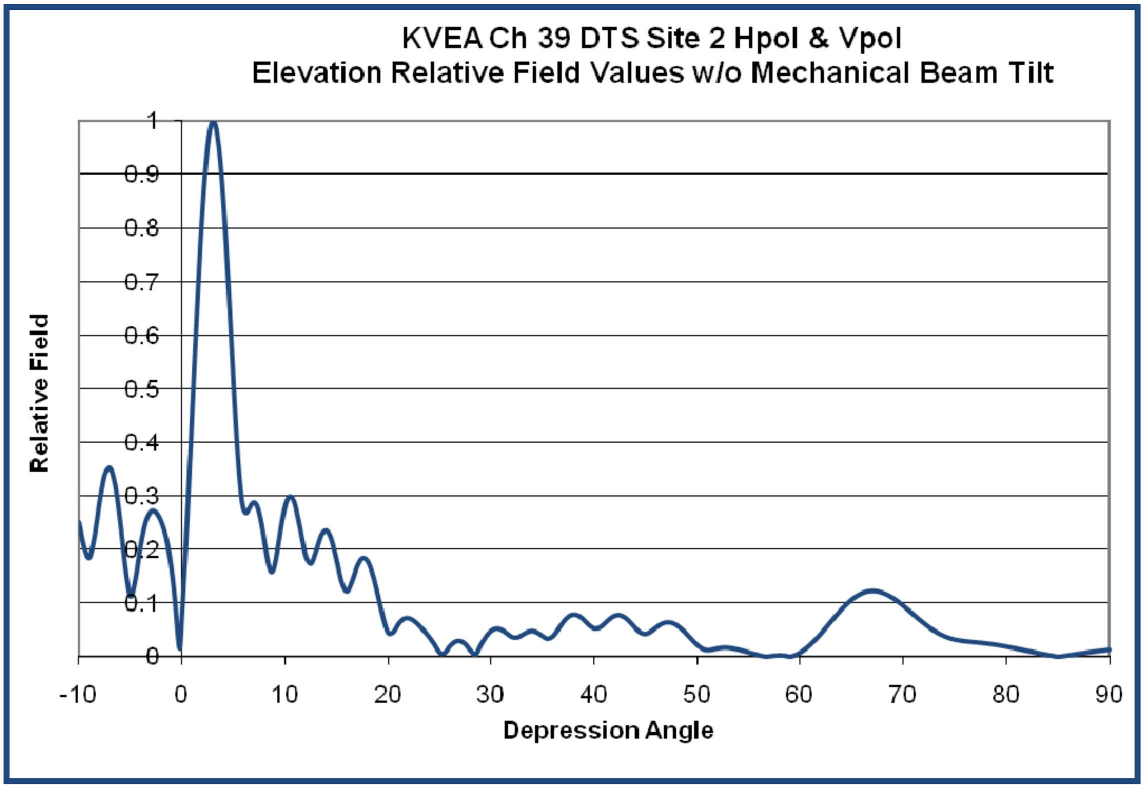

Figure 14 — KVEA DTS Site 2 Antenna Elevation Relative Field Values

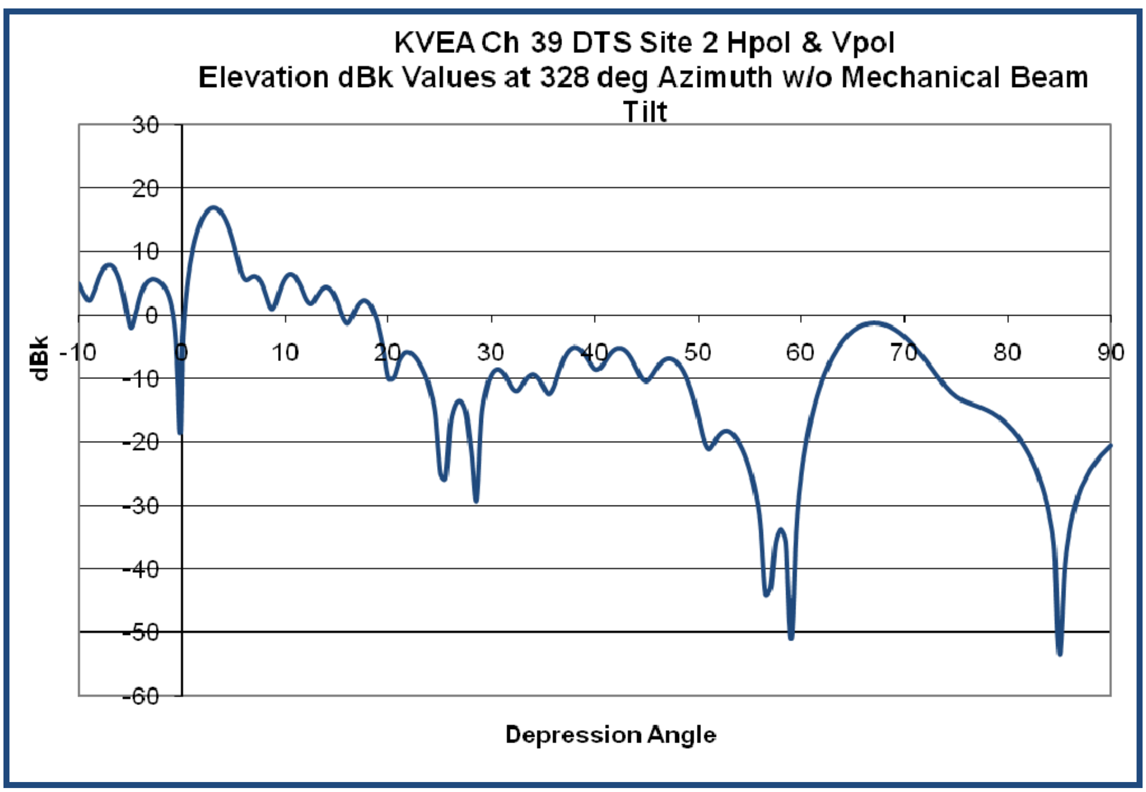

Figure 15 — KVEA DTS Site 2 Antenna Elevation dBk Values— without Effects of Mechanical Beam Tilt

Figure 16 — KVEA 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	0.113	-1.956	9.5	0.229	4.185
-4.5	0.148	0.389	10.0	0.281	5.961
-4.0	0.210	3.442	10.5	0.299	6.509
-3.5	0.254	5.090	11.0	0.282	5.985
-3.0	0.272	5.684	11.5	0.236	4.463
-2.5	0.269	5.584	12.0	0.189	2.519
-2.0	0.252	5.014	12.5	0.174	1.801
-1.5	0.218	3.764	13.0	0.197	2.892
-1.0	0.160	1.067	13.5	0.227	4.091
-0.5	0.062	-7.899	14.0	0.236	4.455
0.0	0.079	-5.091	14.5	0.219	3.807
0.5	0.259	5.269	15.0	0.181	2.138
1.0	0.463	10.305	15.5	0.139	-0.150
1.5	0.665	13.430	16.0	0.122	-1.269
2.0	0.838	15.458	16.5	0.141	-0.020
2.5	0.954	16.583	17.0	0.169	1.563
3.0	1.000	16.990	17.5	0.184	2.305
3.5	0.988	16.883	18.0	0.179	2.047
4.0	0.962	16.655	18.5	0.154	0.751
4.5	0.854	15.621	19.0	0.116	-1.714
5.0	0.691	13.770	19.5	0.075	-5.556
5.5	0.509	11.122	20.0	0.045	-9.965
6.0	0.354	7.940	20.5	0.046	-9.717
6.5	0.274	5.745	21.0	0.061	-7.247
7.0	0.276	5.817	21.5	0.071	-5.973
7.5	0.289	6.196	22.0	0.072	-5.828
8.0	0.267	5.529	22.5	0.067	-6.450
8.5	0.215	3.647	23.0	0.059	-7.638
9.0	0.166	1.360	23.5	0.049	-9.295

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

Values taken from slice through three-dimensional pattern at 328 degrees azimuth (Hpol) and at 69 degrees azimuth (Vpol). Does not show the effects of variation of the elevation pattern with azimuth due to mechanical beam tilt, which are included only in the file uploaded within Form 301 on FCC Electronic Filing System.