KHIZ-DT established in the Appendix B DTV Table of Allotments.[3] It is a communications site near Victorville, CA, and is the site from which the station has operated throughout its history. It does now and will continue to provide service to the principal community of Barstow, CA. It is the site for which an application already has been filed for a license to cover the facilities authorized in the construction permit currently held by the station.

The two new transmitter locations involve sites currently used by other television broadcasters. The site at Mt Harvard serves the Los Angeles basin and is part of the complex, together with Mt Wilson, at which transmitters for almost all other television stations in the Los Angeles market are situated. It is a shared site operated by American Tower Corporation. Locating a gap filler transmitter there effectively collocates it with its adjacent channel neighbors, thereby reducing interference to the adjacent channel stations. The Snow Peak site is a communications facility and also currently is used by the transmitter for Station KVMD-DT. It is privately owned, and KHIZ-DT will be a tenant of both the site owner and of KVMD for different aspects of the Snow Peak facility. The Snow Peak transmitter will provide a second DTV service to an area that currently is served by only one DTV station and no analog stations, as well as providing additional service in surrounding underserved areas.

Facilities

The facilities requested in this application include continued operation at 1000 kW ERP at a height above average terrain of 597 meters at the Quartzite site, operation at almost 170 kW ERP at 879 meters HAAT at Mt Harvard, and operation at 40 kW ERP at 768 meters HAAT at Snow Peak. The currently authorized facility at the Quartzite site meets the requirements of §73.622(f)(5) as it does not exceed "that needed to provide the same geographic coverage area as the largest station within [its] market." The relationships between the parameters in the cases of the added gap-filler transmitters result in power/height combinations that meet the requirements for maximum allowable facilities

[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).

specified by the formula in §73.622(f)(8)(ii) of the Commission's Rules. The basic characteristics of each of the transmitters proposed in the KHIZ-DT DTS network are given in Figures 1a, 1b, and 1c at the end of this report 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 KHIZ-DT DTS network. The Quartzite antenna is a cardioid, end-fed, slotted coaxial design with characteristics primarily intended to provide sufficient gain in both its azimuth and elevation patterns to meet the KHIZ-DT service objectives while permitting a more physically robust antenna to be installed than was originally put into operation by the station. As was noted in the Technical Statement that accompanied the application for the construction permit that this application seeks to modify, the original antenna twice failed physically. Consequently, it was necessary to add azimuth gain by reducing service in an area having little to no population in order to continue providing full service throughout the remainder of the KHIZ-DT service area. This situation and its solution were fully described in that earlier Technical Statement.

The antenna designs at Mt Harvard and Snow Peak will be similar, cavity-slot panel arrays, using panels that have azimuth patterns shaped through use of parasitic elements. Each will consist of a total of six panels in a single column. The Mt Harvard pattern will have a single main lobe, while the Snow Peak pattern will have a pair of main lobes in a "peanut" pattern. The azimuth patterns will be rather narrow in their main beams, with a smaller amount of radiation in other directions. A significant amount of electrical beam tilt will be used, with a sharp cut-off of the radiation above the main beam to control the extent of signal projection from each of the antennas, given their very high locations, to permit better control of interference to adjacent regions and within the DTS network. In addition, a small amount of mechanical beam tilt also will be applied to each antenna to position the contours as close to the authorized contour as possible while minimizing projections beyond the authorized contour.

A plot of the PNLCs[4] of the various transmitters is provided in Figure 2. Since the main, Quartzite Mountain transmitter facility authorized by the outstanding construction permit (herein DTS Site 1) already covers the entire authorized service area of the station,[5] the provisions of §73.626(f)(1) are met by that facility alone. By virtue of the overlap of the contours of the three transmitters, they are contiguous, thereby meeting the requirements of §73.626(f)(3). Also shown in Figure 2 is the 48 dBu contour of the DTS Site 1 facility, which can be seen to encompass the principal community of Barstow, CA. There are no major obstructions in the path over the principal community; thus, the requirements of §73.625(a) and correspondingly of §73.626(f)(4) also are met by the DTS Site 1 transmitter alone. All three transmitters in the proposed DTS network are located within the KHIZ authorized service area, consequently meeting the requirements of §73.626(f)(6).

Although they were filed in the Technical Statement accompanying the original construction permit application that this application now seeks to modify, a description and plots of the pattern characteristics for the DTS Site 1 (Quartzite) antenna nevertheless are reproduced herein. The DTS Site 1 antenna is oriented to place the center of the cardioid azimuth pattern at 218 degrees true. Elevation power gain of the antenna is 23.50 (13.71 dBd) at the vertical beam maximum (1.0 degree below horizontal), 12.10 (10.83 dBd) in the horizontal plane, and 22.02 (13.43 dBd) at 0.677 degree below horizontal, the average depression angle to the radio horizon (computed at 1-degree azimuth intervals). The azimuth power gain is 1.60 (2.04 dB), yielding a total power gain in the main beam of 37.60 (15.75 dBd), in the horizontal plane of 19.36 (12.87 dBd), and toward the radio horizon of 35.23 (15.47 dBd).

A plot of the azimuthal radiation pattern of the DTS Site 1 antenna in relative field values is included as Figure 3. The azimuthal power pattern expressed in decibels relative to 1 kW (dBk), at the depression angle having maximum power (1 degree depression), is

[4] To account for the dipole correction factor, the PNLCs are plotted at 41.5 dBu, with service statistics of F(50,90).

[5] 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."

plotted in Figure 4. The tabulated azimuthal field and power values are given in Figure 5. The elevation radiation pattern in relative field values is included as Figure 6. The elevation power pattern expressed in decibels relative to 1 kW (dBk) is plotted in Figure 7. The tabulated elevation field and power values are given in Figure 8. Also uploaded to the CDBS Electronic Filing System (EFS) web site is a version of the elevation pattern in Office Open XML format, with the first column containing depression angle values and the second column containing relative field values of elevation pattern data. Only a single elevation pattern applies to the antenna, and there is no mechanical beam tilt, so only a single column of elevation data is supplied.

The antennas for DTS Site 2 (Mt Harvard) and DTS Site 3 (Snow Peak) are similar to one another in their basic designs, the major difference being the azimuth patterns created by the attached parasitic elements. They also have slightly different electrical beam tilt characteristics, with the DTS Site 2 antenna having its main beam at a depression angle of 3.8 degrees, while the DTS Site 3 antenna has its main beam at a depression angle of 3.5 degrees. Each antenna has somewhat different mechanical beam tilt applied in addition to the electrical beam tilt. Their characteristics and orientations are fully described in Figures 1b and 1c. Because mechanical beam tilt will be used and complete elevation data for the antennas for DTS Sites 2 and 3 is being supplied through files input to the CDBS Electronic Filing System, the azimuth pattern plots supplied in this Technical Statement and the azimuth pattern data supplied in the CDBS input document are for reference only and are at right angles to the axes of the antennas in their respective main beams (i.e., at 3.8 degrees depression for the Site 2 antenna and at 3.5 degrees depression for Site 3). Consequently, the azimuth patterns and data do not take account of the mechanical beam tilt, the effect of which is reflected wholly within the elevation data files.

The essential elevation pattern design of the antennas for DTS Sites 2 and 3 is somewhat unusual. It includes main beams at depression angles of 3.8 and 3.5 degrees, with a rapid fall-off of relative field values above the main beams to deep nulls at depression angles of 0.8 and 0.5 degrees, respectively. The nulls serve two purposes: They help to control the locations of the contours while permitting stronger field strengths to be delivered within

Figure 1a — Technical Specifications — Proposed KHIZ-DTS Facility Channel 44 — Barstow, CA — Site 1: Quartzite Mtn

Frequency

Channel	44
Frequency Band	650 – 656 MHz
Center Frequency	653 MHz

Location

Site	Quartzite Mountain, Victorville, CA
Geographic Coordinates (NAD27)	34° 36’ 33.93” N 117° 17’ 10.94” W
Tower Registration (FAA Study Number)	1014642 (2002-AWP-2863-OE)

Elevation

Elevation of site above mean sea level	1367.6 m
Overall height of tower above site elevation	156.0 m
Overall height of tower above mean sea level	1523.6 m
Height of antenna radiation center above site elevation	146.0 m
Elevation of average terrain (45-degree-spaced radials, 3.2-16.1 km)	916.7 m
Height of antenna radiation center above mean sea level	1513.6 m
Height of antenna radiation center above average terrain (HAAT)	596.9 m

Antenna

Manufacturer	Electronics Research, Inc.
Model	ATW24H4-HSCX-44H
Description	Side-Mounted UHF Slot
Orientation (rotation around vertical axis)	218 degrees true
Electrical beam tilt	1.0°
Mechanical beam tilt	None
Polarization	Horizontal
Gain (in horizontal plane – 0° depression)	19.36 (12.87 dBd)
Gain (peak of beam – 1.0° depression)	37.60 (15.75 dBd)

Power

Effective radiated power (ERP) (main beam – 1.0° depression)	1000 kW
Effective radiated power (ERP) (toward avg. radio horizon – 0.677° dn.)	937 kW
Effective radiated power (ERP) (horizontal plane)	515 kW

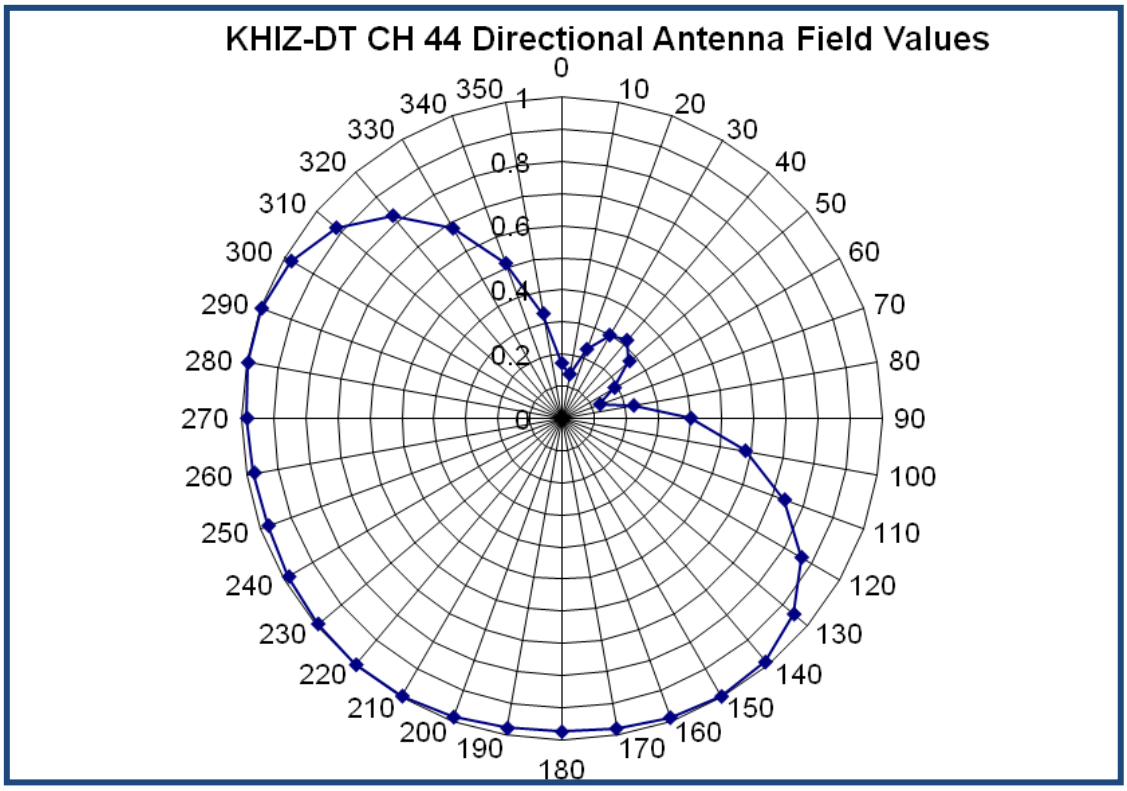

Figure 3 — KHIZ-DT Site 1 Azimuth Pattern in Relative Field Values

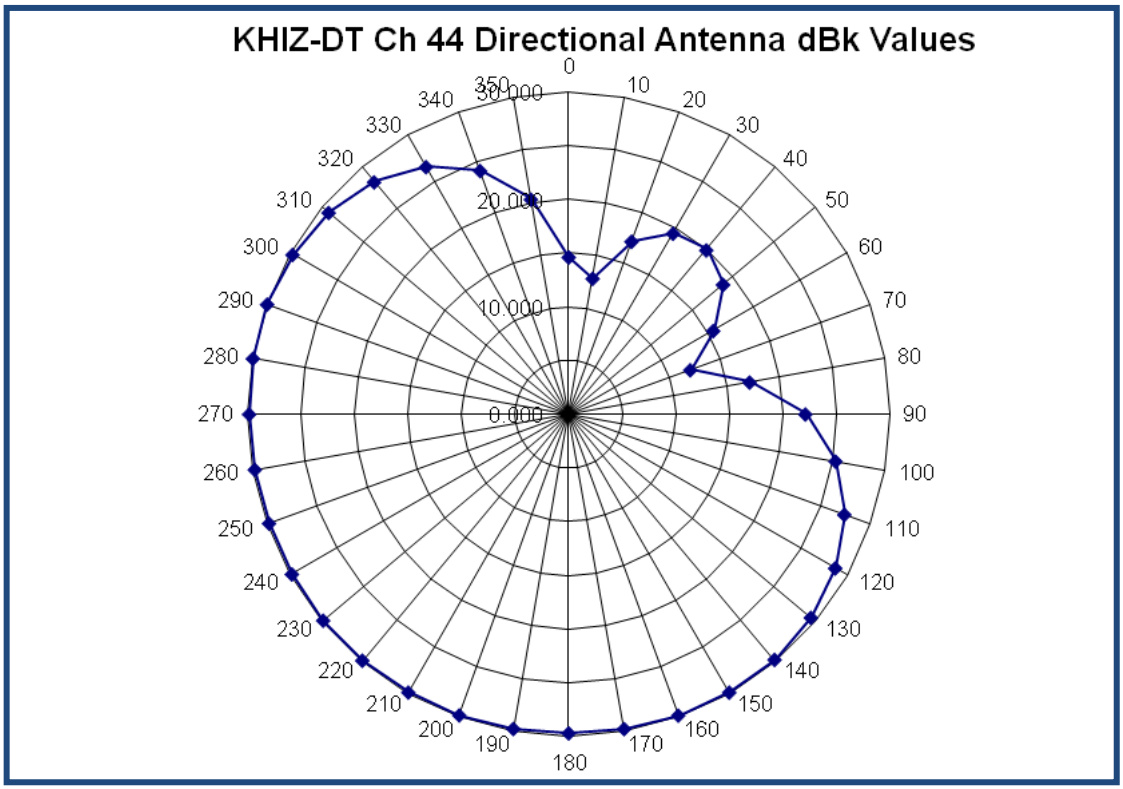

Figure 4 — KHIZ-DT Site 1 Azimuth Pattern in dBk

Figure 5 — KHIZ-DT Site 1 Azimuthal Radiation Pattern Tabulated Values

Azimuth	Relative Field	Effective Radiated Power (dBk)	Azimuth	Relative Field	Effective Radiated Power (dBk)
0	0.171	14.660	180	0.974	29.771
min 6	0.127	12.076	190	0.978	29.807
10	0.139	12.860	200	0.988	29.895
20	0.228	17.159	210	0.997	29.974
30	0.298	19.484	max 218	1.000	30.000
max 38	0.317	20.021	220	1.000	30.000
40	0.316	19.994	230	0.994	29.948
50	0.276	18.818	240	0.984	29.860
60	0.190	15.575	250	0.975	29.780
min 70	0.127	12.076	260	0.975	29.780
80	0.228	17.159	270	0.983	29.851
90	0.403	22.106	280	0.995	29.956
100	0.582	25.298	290	0.998	29.983
110	0.741	27.396	300	0.976	29.789
120	0.865	28.740	310	0.920	29.276
130	0.947	29.527	320	0.821	28.287
140	0.989	29.904	330	0.681	26.663
150	0.998	29.983	340	0.512	24.185
160	0.990	29.913	350	0.330	20.370
170	0.979	29.816			

Derived from data supplied by manufacturer

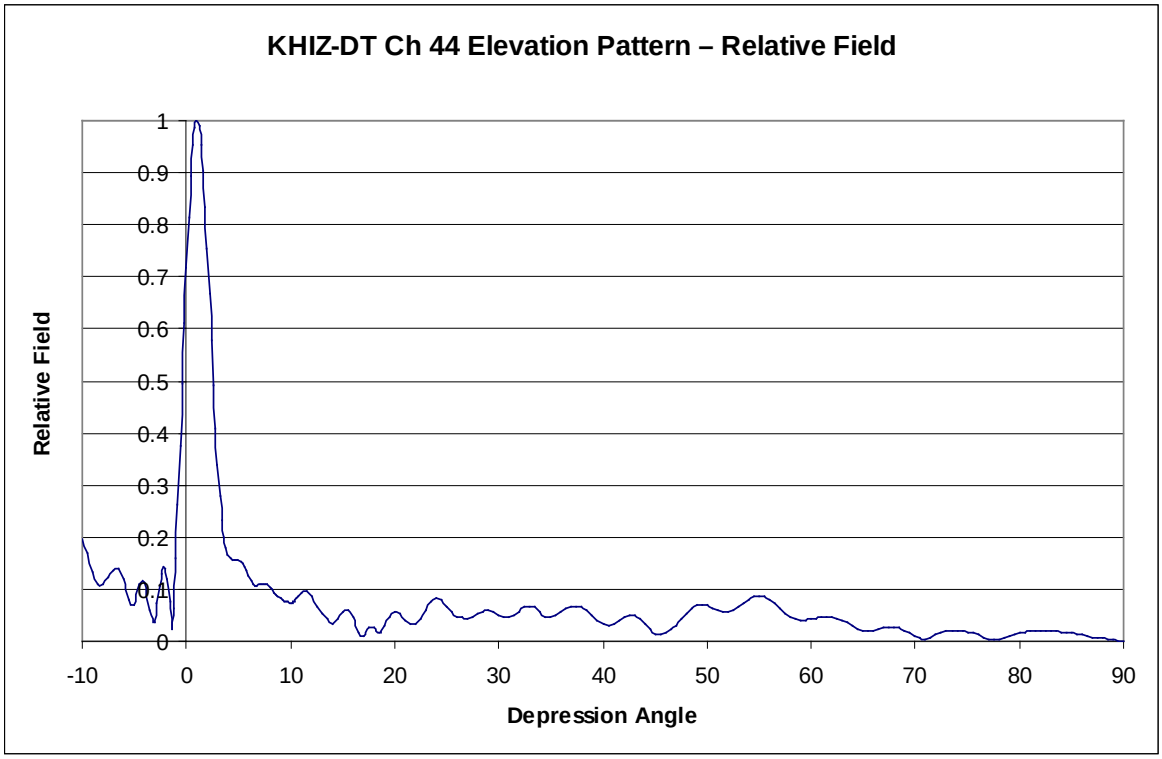

Figure 6 — KHIZ-DT Site 1 Elevation Pattern in Relative Field Values

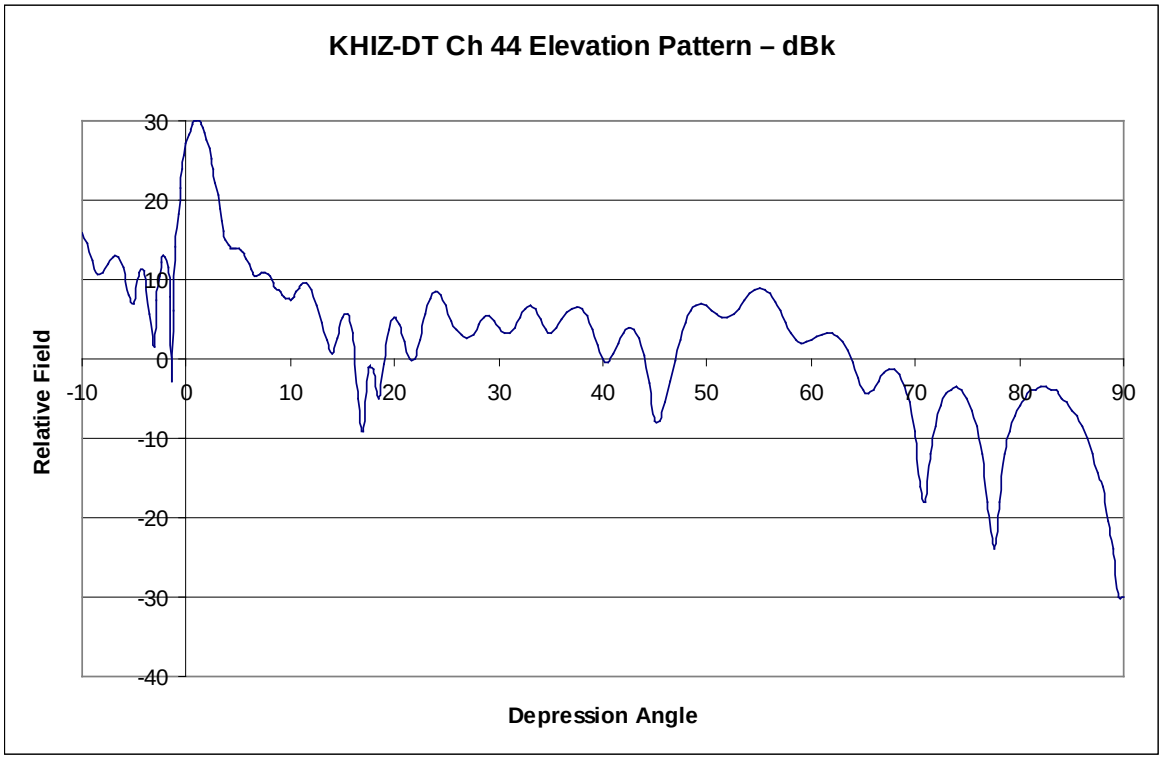

Figure 7 — KHIZ-DT Site 1 Elevation Pattern in dBk (at Azimuth w/Maximum)

Figure 8 — KHIZ-DT 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	0.070	6.902	9.0	0.083	8.382
-4.5	0.110	10.828	9.5	0.077	7.729
-4.0	0.113	11.062	10.0	0.074	7.385
-3.5	0.061	5.707	10.5	0.081	8.112
-3.0	0.038	1.596	11.0	0.092	9.276
-2.5	0.118	11.392	11.5	0.096	9.645
-2.0	0.139	12.860	12.0	0.086	8.690
-1.5	0.051	2.538	12.5	0.068	6.650
-1.0	0.160	14.082	13.0	0.053	4.486
-0.5	0.436	22.701	13.5	0.042	2.465
0.0	0.718	27.122	14.0	0.034	0.630
0.5	0.923	29.295	14.5	0.043	2.669
1.0	1.000	30.000	15.0	0.058	5.269
1.5	0.929	29.357	15.5	0.061	5.707
2.0	0.754	27.547	16.0	0.046	3.255
2.5	0.535	24.530	16.5	0.018	-4.895
3.0	0.339	20.604	17.0	0.011	-9.172
3.5	0.217	16.702	17.5	0.028	-1.057
4.0	0.165	14.350	18.0	0.027	-1.373
4.5	0.155	13.807	18.5	0.018	-4.895
5.0	0.156	13.862	19.0	0.029	-0.752
5.5	0.147	13.345	19.5	0.048	3.625
6.0	0.126	12.007	20.0	0.057	5.117
6.5	0.108	10.667	20.5	0.052	4.320
7.0	0.108	10.668	21.0	0.041	2.256
7.5	0.111	10.906	21.5	0.032	0.103
8.0	0.104	10.341	22.0	0.032	0.103
8.5	0.092	9.225	22.5	0.042	2.465

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 Electronic Filing System.