BERNARD R. SEGAL, P. E.
CONSULTING ENGINEER
KENSINGTON, MARYLAND

ENGINEERING EXHIBIT
APPLICATION FOR CONSTRUCTION PERMIT
KMBC HEARST-ARGYLE TELEVISION, INC.
STATION KMBC-DT, KANSAS CITY, MISSOURI
CHANNEL 7 85 KW AVG. (MAX-DA) 357 METERS

KMBC Hearst-Argyle Television, Inc. (hereafter, Hearst-Argyle), licensee of television station KMBC, Kansas City, Missouri, by means of the instant application, seeks permission to construct a new digital television (DTV) station.

In a Report and Order in MM-Docket Number 00-116, RM-9877, adopted July 24, 2001 and released July 27, 2001, the FCC substituted Channel 7 for Channel 14 at Kansas City, Missouri, in the DTV Table of Allotments, Section 73.622(b) of the Rules. The channel substitution request was initiated in a petition by Hearst-Argyle for station KMBC-DT use. The instant proposal meets the tests for a checklist application, so no allocation studies are required. The channel, power, antenna location and height, and directional radiation pattern are the same as proposed to the FCC in the underlying petition for rulemaking, as amended.[1]

Operation on allotted Channel 7 is proposed. The maximum effective radiated power proposed is 85 kW using the same directional antenna pattern and antenna make and model as set forth in the underlying Petition for Rulemaking .The proposed site is the same as set forth in the Report and Order: 39° 05' 01" north latitude; 94° 30' 57" west

[1]The original Petition for Rule Making specified a power of 115 kW, but the power was later amended to 85 kW with a concomitant modification of the antenna make and model.

longitude. The antenna radiation center height proposed is 357 meters above average terrain. This is the same height set forth in the Report and Order. Thus, all the tests for a checklist application are satisfied.

The antenna that will be employed is a Dielectric, type THV-11A7-R C170. The azimuth pattern for the antenna is furnished in Figure 1. A tabulation of relative fields for the pattern of Figure 1 is supplied in Figure 2. The vertical plane radiation pattern for the antenna is supplied in Figure 3, and a tabulation of relative fields is supplied in Figure 4.

The 36 dBu, F(50,90), contour value, originally, had been specified in the Rules as the one for principal city encompassment for a high band VHF DTV station, but that was later changed to the 43 dBu, F(50,90), contour value. A map showing the calculated 43 dBu, F(50,90), contour and its encompassment of Kansas City is furnished in Figure 5. Supporting information used for the determination of the distances to the 43 dBu, F(50,90), contour may be found in Figure 6.

The tower that will support the KMBC-DT antenna is already used for telecasting purposes, so from the standpoint of environmental impact, the only concern from among the list of environmentally sensitive issues in Section 1.1307 of the Rules that merits attention is the one related to human exposure to radio-frequency radiation (rfr). An analysis of the prospective impact of the proposed KMBC-DT operation has been performed in consonance with the guidelines provided in OET Bulletin 65, Edition 97-01. The analysis results permit a conclusion that implementation of the instant proposal will not significantly affect the environment. An environmental assessment is not required.

The FCC's adopted standard for determining rfr exposure compliance requires a two part analysis; one for general public, uncontrolled location, exposure situations, and the other for worker, controlled location, exposure situations.

In order to assess general public, uncontrolled location, exposure compliance, test calculations were performed using conservative criteria which yield results that exceed the levels of rfr exposure that will actually prevail The antenna vertical plane radiation pattern of Figure 3 shows that the relative field within the depression angle range from 10° to 90° below the horizontal plane does not exceed 15% of the maximum occurring at the 0.75° electrical beam tilt angle.

A calculation of the rfr exposure level at a target 2 meters above ground level at the tower base would represent the highest exposure level that could occur at any uncontrolled location at ground level within a radius of 1866 meters from the tower base. A height of two meters represents the approximate height of an adult person's head. A distance of 1866 meters is the earth impingement point for a ray from the antenna radiation center at a depression angle of 10° below the horizontal plane. The foregoing is based on an assumption of flat earth.

Using a ground reflection coefficient of 1.6, a maximum effective average power of 85 kW, and a relative field equal to 15% of the maximum, the maximum power density level that could occur is 0.00059 mW/cm^2. The maximum permissible exposure (MPE) at the Channel 7 mid-band frequency of 177 MHz is 0.2 mW/cm^2. Hence, the

KMBC-DT contribution to the MPE anywhere within the 1866 meter radius cannot exceed 0.3%.

For distances beyond 1866 meters from the tower base, a test calculation was performed using the maximum proposed radiation of 85.0 kW, a ground reflection coefficient of 1.6, and a distance of 1866 meters to determine the maximum power density that could occur. That calculation yielded a power density level of 0.00082 mW/cm^2, corresponding to a contribution of 0.4% to the MPE. The conservatively derived exposure levels for uncontrolled locations permits a conclusion that the proposed operation for KMBC-DT, when implemented, will not raise any concern regarding overexposure to the public.

With regard to worker exposure concerns, the procedures currently employed for the avoidance of overexposure for KMBC-TV workers will be continued. Those procedures require that whenever work must be performed on the tower candelabrum platform, power to the various antennas atop the platform is reduced or terminated. Only personnel authorized by the licensee are permitted within the fenced tower enclosure, which is kept locked at all times. Also, radiation hazard warning signs are posted to alert workers of the potential for excessive exposure.

In order to ascertain the extent of power reduction that may be required for the avoidance of overexposure when power extinguishment is not needed for the particular work activity involved, Hearst-Argyle, as part of the facility construction process, will have power density measurements performed atop the tower platform to establish the bounds for not exceeding the adopted MPE for various operating scenarios taking into

account the other antennas (KMBC-TV, Channel 9; KCWE(TV), Channel 29; and KCWE-DT, Channel 31), which already are or will be located, by then, atop the platform. The foregoing discussion demonstrates that compliance with the FCC's criteria for the avoidance of overexposure of the public and workers to rfr will be achieved. An environmental assessment of the instant proposal is not required.

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 11, 2001.

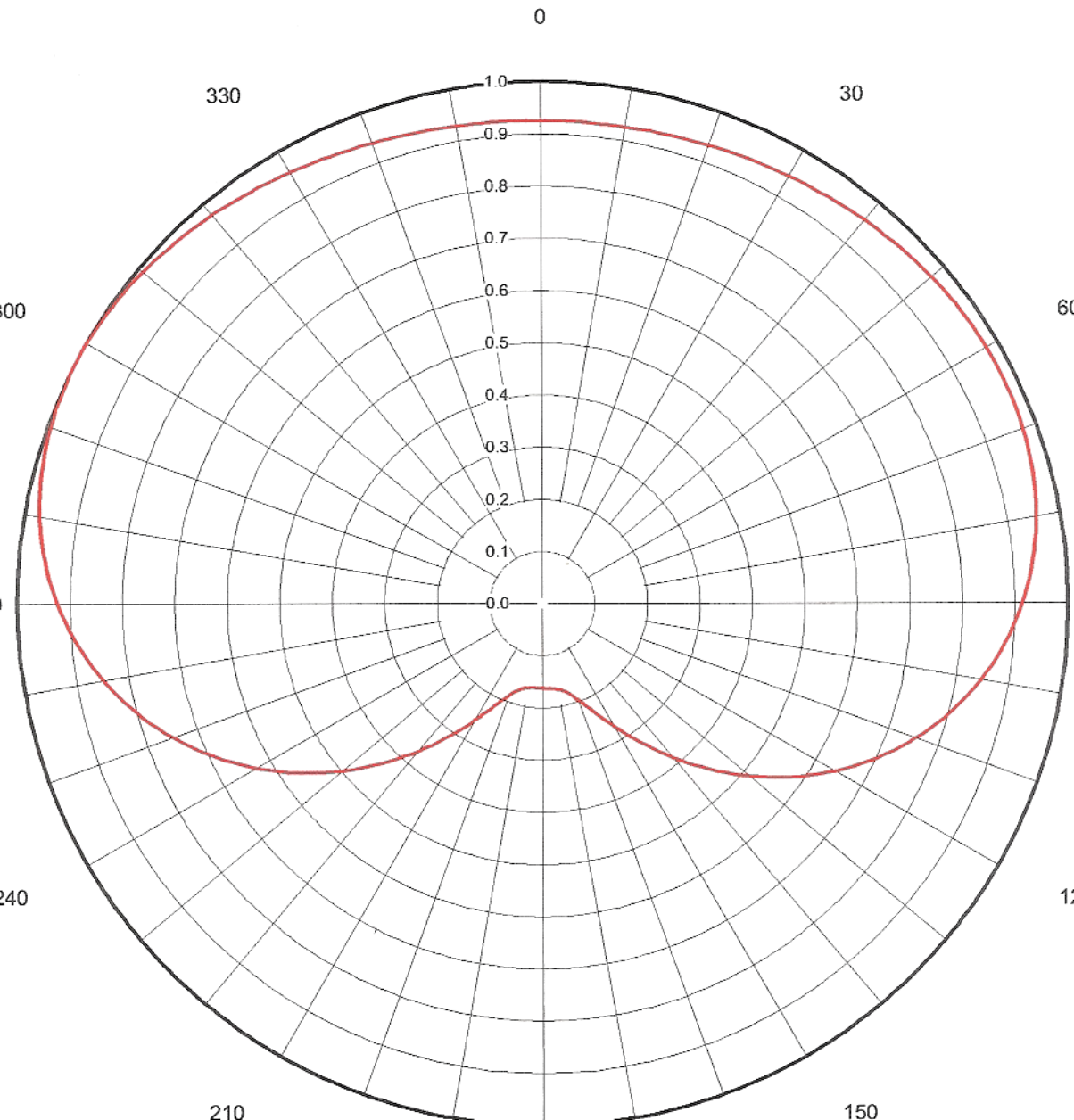
Bernard R. Segal, P. E.

Dielectric

Proposal Number	DCA-8887	Revision:
Date	9-Aug-01	
Call Letters	KMBC-DT	Channel
Location	Kansas City, MO	
Customer	Hearst-Argyle	
Antenna Type	THV-11A7-R C170	

AZIMUTH PATTERN

Gain	1.70	(2.30 dB)	Frequency	177.00 MHz
Calculated / Measured		Calculated	Drawing #	THV-C170-7



BERNARD R. SEGAL, P. E.
CONSULTING ENGINEER
KENSINGTON, MARYLAND

FIGURE 2

TABULATION OF AZIMUTH PATTERN DATA
KMBC-DT, KANSAS CITY, MISSOURI
CHANNEL 7 85 KW AVG. (MAX-DA) 357 METERS

Azimuth (Degrees T.)	Relative Field	Effective Radiated Power (kW)
0-	0.924	72.6
10	0.926	72.9
20	0.932	73.8
30	0.943	75.6
40	0.957	77.8
50	0.969	79.8
60+	0.977	81.1
70	0.974	80.6
80	0.954	77.4
90	0.913	70.9
100	0.847	61.0
110	0.755	48.5
120	0.642	35.0
130	0.514	22.5
140	0.385	12.6
150	0.272	6.29
160	0.196	3.27
170	0.167	2.37
180-	0.162	2.23
190	0.164	2.29
200	0.187	2.97
210	0.257	5.61
220	0.368	11.5
230	0.497	21.0
240	0.629	33.6
250	0.748	47.6
260	0.848	61.1
270	0.923	72.4
280	0.971	80.1
290	0.995	84.2
300+	1.000	85.0
310	0.990	83.3
320	0.973	80.5
330	0.955	77.5
340	0.939	75.0
350	0.929	73.4

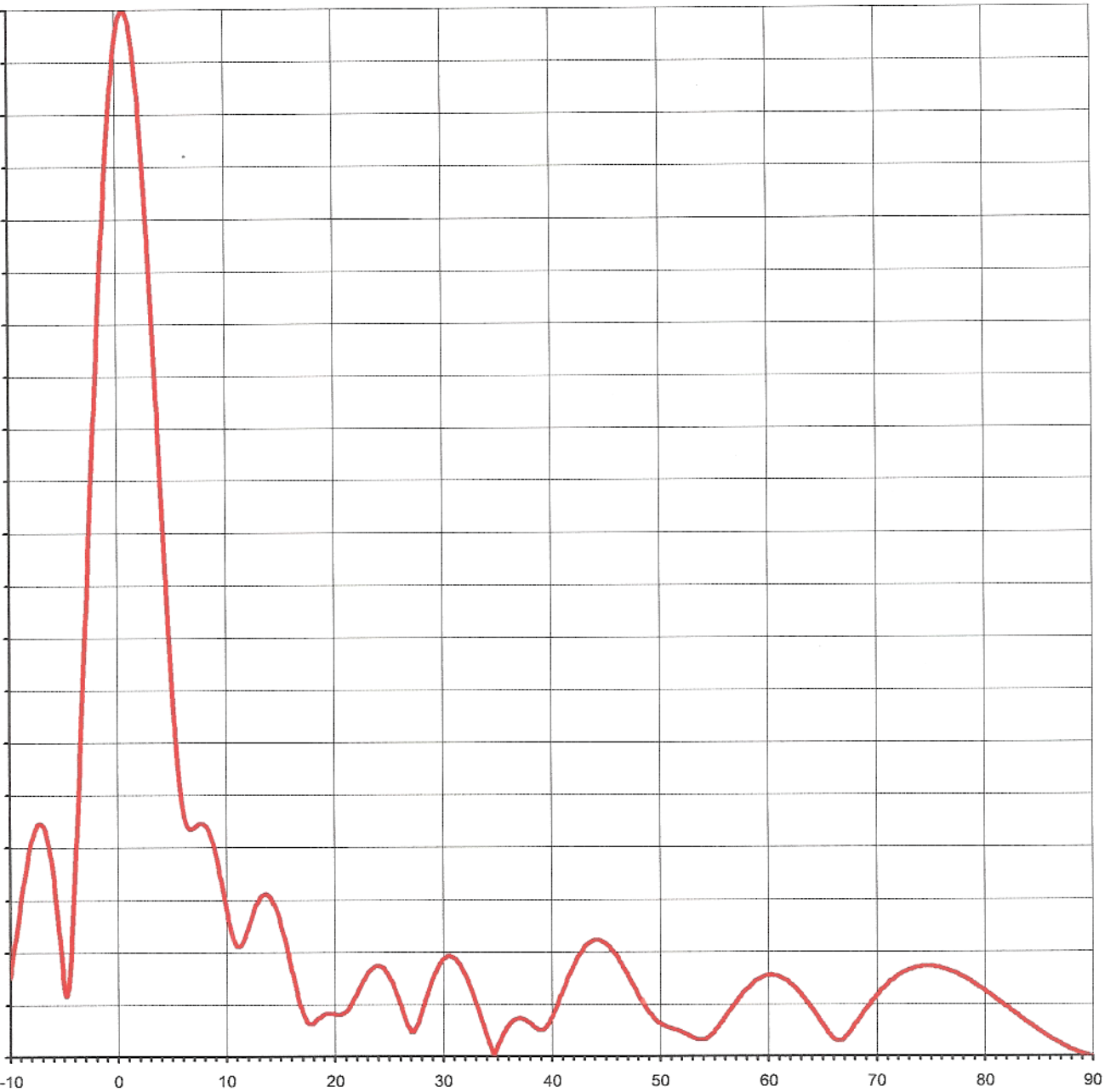
otes a local maximum; - denotes a local minimum

Dielectric

Proposal Number	DCA-8887	Revision:	1
Date	9-Aug-01		
Call Letters	KMBC-DT	Channel	7
Location	Kansas City, MO		
Customer	Hearst-Argyle		
Antenna Type	THV-11A7-R C170		

ELEVATION PATTERN

RMS Gain at Main Lobe	11.00 (10.41 dB)	Beam Tilt	0.75 deg
RMS Gain at Horizontal	10.40 (10.17 dB)	Frequency	177.00 MHz
Calculated / Measured	Calculated	Drawing #	11K110075-90



Dielectric

Proposal Number	DCA-8887	Revision:	1
Date	9-Aug-01		
Call Letters	KMBC-DT	Channel	7
Location	Kansas City, MO		
Customer	Hearst-Argyle		
Antenna Type	THV-11A7-R C170		

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing #: **11K110075-90**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.076	2.4	0.863	10.6	0.118	30.5	0.096	51.0	0.027	71.5	0.073
-9.5	0.111	2.6	0.831	10.8	0.111	31.0	0.095	51.5	0.025	72.0	0.077
-9.0	0.146	2.8	0.796	11.0	0.107	31.5	0.090	52.0	0.024	72.5	0.080
-8.5	0.179	3.0	0.759	11.5	0.107	32.0	0.081	52.5	0.021	73.0	0.083
-8.0	0.205	3.2	0.720	12.0	0.119	32.5	0.069	53.0	0.019	73.5	0.084
-7.5	0.221	3.4	0.680	12.5	0.135	33.0	0.055	53.5	0.016	74.0	0.085
-7.0	0.222	3.6	0.638	13.0	0.148	33.5	0.039	54.0	0.016	74.5	0.086
-6.5	0.208	3.8	0.596	13.5	0.155	34.0	0.023	54.5	0.018	75.0	0.086
-6.0	0.175	4.0	0.554	14.0	0.154	34.5	0.008	55.0	0.022	75.5	0.085
-5.5	0.126	4.2	0.513	14.5	0.146	35.0	0.007	55.5	0.028	76.0	0.084
-5.0	0.070	4.4	0.472	15.0	0.132	35.5	0.019	56.0	0.036	76.5	0.083
-4.5	0.077	4.6	0.432	15.5	0.112	36.0	0.028	56.5	0.043	77.0	0.081
-4.0	0.166	4.8	0.395	16.0	0.090	36.5	0.034	57.0	0.050	77.5	0.079
-3.5	0.279	5.0	0.359	16.5	0.067	37.0	0.036	57.5	0.057	78.0	0.076
-3.0	0.400	5.2	0.327	17.0	0.047	37.5	0.036	58.0	0.063	78.5	0.073
-2.8	0.449	5.4	0.299	17.5	0.034	38.0	0.033	58.5	0.068	79.0	0.070
-2.6	0.498	5.6	0.274	18.0	0.031	38.5	0.028	59.0	0.073	79.5	0.066
-2.4	0.547	5.8	0.254	18.5	0.036	39.0	0.025	59.5	0.075	80.0	0.063
-2.2	0.595	6.0	0.238	19.0	0.040	39.5	0.027	60.0	0.077	80.5	0.059
-2.0	0.642	6.2	0.227	19.5	0.041	40.0	0.035	60.5	0.078	81.0	0.055
-1.8	0.687	6.4	0.221	20.0	0.041	40.5	0.046	61.0	0.077	81.5	0.051
-1.6	0.730	6.6	0.218	20.5	0.040	41.0	0.059	61.5	0.074	82.0	0.047
-1.4	0.771	6.8	0.217	21.0	0.042	41.5	0.072	62.0	0.071	82.5	0.043
-1.2	0.809	7.0	0.218	21.5	0.048	42.0	0.084	62.5	0.067	83.0	0.040
-1.0	0.845	7.2	0.220	22.0	0.058	42.5	0.094	63.0	0.061	83.5	0.036
-0.8	0.877	7.4	0.222	22.5	0.068	43.0	0.102	63.5	0.055	84.0	0.032
-0.6	0.906	7.6	0.223	23.0	0.078	43.5	0.108	64.0	0.048	84.5	0.028
-0.4	0.932	7.8	0.223	23.5	0.084	44.0	0.111	64.5	0.039	85.0	0.024
-0.2	0.953	8.0	0.222	24.0	0.087	44.5	0.111	65.0	0.031	85.5	0.021
0.0	0.971	8.2	0.220	24.5	0.086	45.0	0.109	65.5	0.023	86.0	0.018
0.2	0.985	8.4	0.216	25.0	0.079	45.5	0.104	66.0	0.017	86.5	0.015
0.4	0.994	8.6	0.210	25.5	0.069	46.0	0.098	66.5	0.015	87.0	0.012
0.6	0.999	8.8	0.204	26.0	0.055	46.5	0.090	67.0	0.017	87.5	0.009
0.8	1.000	9.0	0.195	26.5	0.039	47.0	0.080	67.5	0.023	88.0	0.006
1.0	0.996	9.2	0.186	27.0	0.026	47.5	0.071	68.0	0.030	88.5	0.004
1.2	0.989	9.4	0.175	27.5	0.026	48.0	0.061	68.5	0.038	89.0	0.002
1.4	0.977	9.6	0.165	28.0	0.039	48.5	0.052	69.0	0.045	89.5	0.001
1.6	0.962	9.8	0.159	28.5	0.056	49.0	0.044	69.5	0.052	90.0	0.000
1.8	0.942	10.0	0.148	29.0	0.071	49.5	0.037	70.0	0.058		
2.0	0.919	10.2	0.137	29.5	0.083	50.0	0.032	70.5	0.064		
2.2	0.893	10.4	0.127	30.0	0.092	50.5	0.029	71.0	0.069		

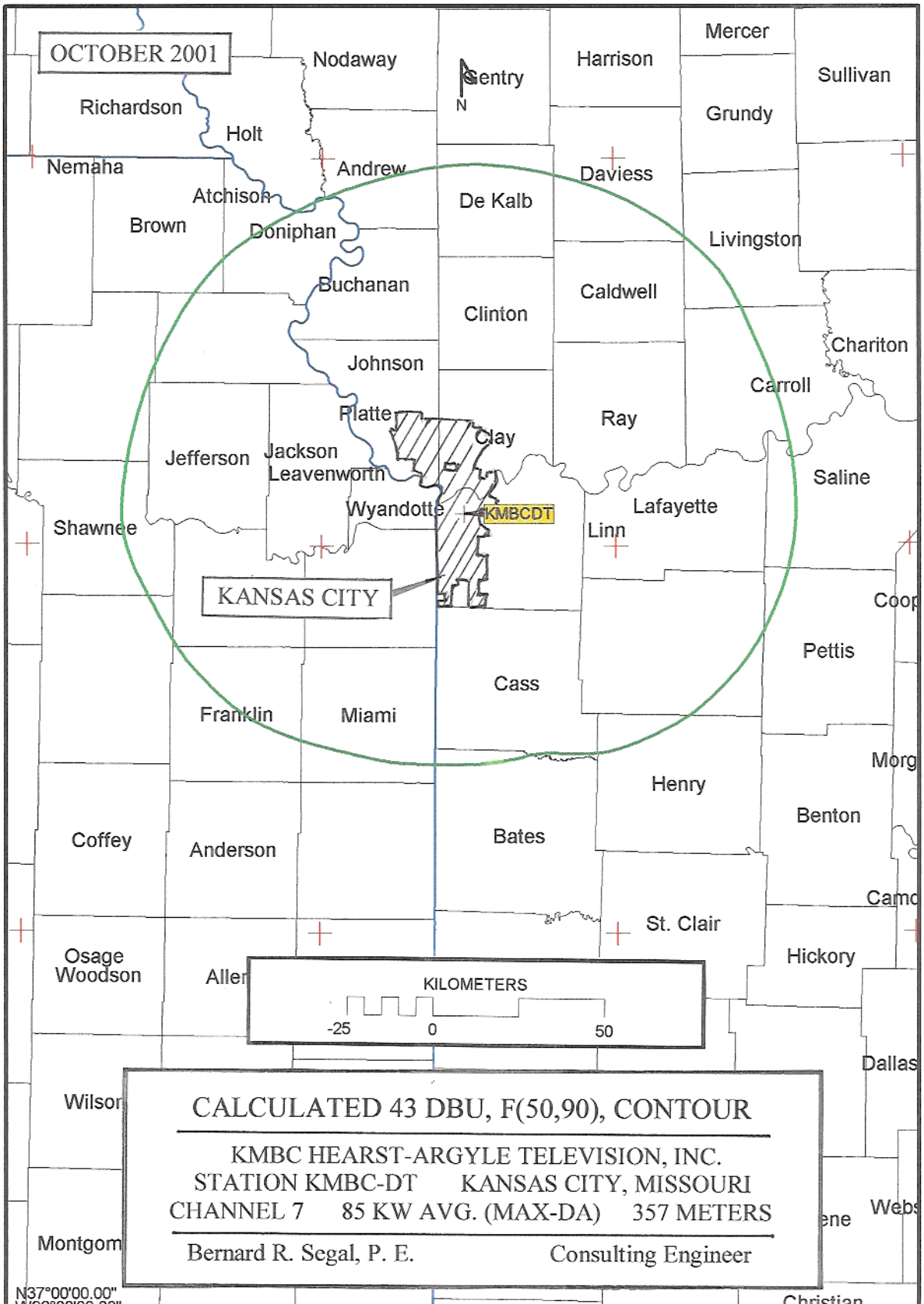

OCTOBER 2001
Nodaway
Sentry
N
Harrison
Mercer
Sullivan
Grundy
Richardson
Holt
Nemaha
Andrew
Daviess
Atchison
De Kalb
Brown
Doniphan
Livingston
Buchanan
Caldwell
Clinton
Chariton
Johnson
Carroll
Platte
Ray
Clay
Jefferson
Jackson
Leavenworth
Saline
Wyandotte
KMBCDT
Lafayette
Shawnee
Linn
KANSAS CITY
Pettis
Cass
Franklin
Miami
Henry
Benton
Coffey
Anderson
Bates
St. Clair
Osage
Woodson
Hickory
KILOMETERS
-25
0
50
Wilson
Dallas
CALCULATED 43 DBU, F(50,90), CONTOUR
KMBC HEARST-ARGYLE TELEVISION, INC.
STATION KMBC-DT KANSAS CITY, MISSOURI
CHANNEL 7 85 KW AVG. (MAX-DA) 357 METERS
Bernard R. Segal, P. E. Consulting Engineer
Montgom
N37°00'00.00"
W96°00'00.00"
Newton
Christian

FIGURE 6

KMBC-DT, KANSAS CITY, MISSOURI
CH. 7 85.0 KW AVG. (MAX-DA) 357 METERS

Tabulation of Average Elevations, ERP's Employed, and Distances to the 43 dBu, F(50,90) Contour

Site Coordinates: 39° 05' 01" North Latitude
94° 30' 57" West Longitude

Antenna Radiation Center: 613 m AMSL

Azimuth (Deg. T.)	Radiation Center Above 3.2-16.1 km Terrain Avg. (meters)	ERP (kW)	Distance to 43 dBu, F(50,90) Contour (km)
0	368	72.6	100.2
15	375	73.3	100.8
30	390	75.6	102.1
45	394	78.8	102.6
60	346	81.1	99.1
75	328	79.0	97.8
90	337	70.9	97.4
105	335	54.5	95.3
120	331	35.0	91.6
135	332	17.1	86.1
150	338	6.29	79.2
165	330	2.78	71.9
180	349	2.23	72.0
195	360	2.63	74.0
210	332	5.61	77.9
225	323	15.9	85.0
240	319	33.6	90.5
255	331	54.1	95.1
270	327	72.4	100.4
285	352	82.1	99.9
300	360	85.0	100.6
315	378	81.8	101.7
330	359	77.5	99.8
345	350	74.1	99.1
Average*	357		

* The average is for the eight standard radials.