ENGINEERING EXHIBIT
APPLICATION FOR CONSTRUCTION PERMIT
AUXILIARY ANTENNA
SARKES TARZIAN, INC.
CHATTANOOGA, TENNESSEE
CH. 13   18.2 KW (MAX-DA)   283 METERS

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SARKES TARZIAN, INC.
STATION WRCB-DT
CHATTANOOGA, TENNESSEE

The instant Engineering exhibit, of which this Statement is part, has been prepared on behalf of Sarkes Tarzian, Inc. (hereafter, STI), the licensee of station WRCB-DT, Chattanooga, Tennessee. Station WRCB-DT operates on Channel 13 (210-216 MHz) with maximum effective radiated power of 34.8 kW (average) and antenna radiation center height above average terrain of 335 meters.

STI now seeks a construction permit for an auxiliary antenna to be used by Station WRCB-DT whenever operation with the main antenna is not possible. The facilities proposed are for operation on Channel 13 with maximum effective radiated power of 18.2 kW and antenna radiation center height of 283 meters above average terrain. Except for the effective radiated power and a 2-meter correction in the antenna radiation center height above average terrain, this is the same system that had been authorized for use for WRCB-DT pursuant to a Special Temporary Authorization in BDSTA-20020206ABN, and which is already in place. As demonstrated herein, the proposed auxiliary operation will not extend coverage in any direction beyond that for the licensed operation.

The tower that supports the auxiliary antenna is less than 10 meters from the tower that supports the WRCB-DT main antenna. The auxiliary antenna supporting structure Antenna Structure Registration Number (ASRN) is 1044277. The site geographic coordinates are: 35° 09' 40" north latitude, 85° 18' 52" west longitude.

The antenna, a Dielectric, type THA-C2-1H / 2H-1R, is mounted on the tower with the radiation center 35 meters AGL; 663 meters above mean sea level. The azimuth radiation pattern for the antenna is provided in Figure 1. Figure 2 is a tabulation of

relative fields for the pattern of Figure 1 The elevation radiation pattern for the antenna is furnished in Figure 3, and Figure 4 is the tabulation of relative field data for the pattern of Figure 3.

The facilities for the auxiliary antenna do not extend coverage beyond that for the licensed main antenna in any direction as demonstrated in Figure 5. No question arises of compliance with the Section 73.625(a)(1) requirement for 43 dBu, F(50,90), signal strength level contour encompassment of the principal community. The map of Figure 5 demonstrates complete encompassment of Chattanooga by both the main and auxiliary antenna operations.

Supporting data for the contours depicted in Figure 5 are provided in Figure 6. The contours were calculated using an algorithm developed by EDX that incorporates the FCC's propagation curves and employs terrain elevations from the U.S.G.S. 30" terrain elevation database.

For the auxiliary operation, the type accepted transmitter will feed 8.57 dBk (7.20 kW) average power to a transmission line consisting of a 60.7 meter run of 7.9 cm, nominal diameter, Myat coaxial transmission line and a 15.5 meter run of 4.1 cm, nominal diameter, Myat coaxial transmission line. The transmission line total attenuation at Channel 13, for the combined lengths, is 0.41 dB. Taking into account the antenna maximum power gain of 4.39 dBd and the transmission line loss of 0.41 dB, an effective radiated power of 12.55 dBk is achieved. After rounding, and converting from the logarithmic notation to the linear notation in accordance with the FCC's administrative procedures, the effective radiated power becomes 18.2 kW.

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Radio frequency radiation (rfr) exposure effects have been considered. The nearby tower that supports the main WRCB-DT antenna, also, supports the antenna for WRCB-TV. WRCB-TV operates on Channel 3 (60-66 MHz) with peak visual effective radiated power of 100 kW. The aural effective radiated power is 10% of the peak visual power. The antenna employed is a RCA, TF-6AL, and the radiation center is 126 meters above ground level (AGL). The radiation center for the WRCB-DT main antenna is at an elevation of 82 meters AGL.

The main WRCB-DT antenna and the auxiliary WRCB-DT antenna will never operate simultaneously. Therefore, for the purposes of determining compliance of the auxiliary antenna operation with the FCC's adopted Standard for the avoidance of overexposure of humans to radio-frequency radiation, only the WRCB-TV and auxiliary WRCB-DT operations are considered.

Calculations have been performed to determine the maximum equivalent plane wave power density contribution each station produces in areas close to the respective tower bases relative to the maximum permissible exposure (MPE) that is specified for uncontrolled locations by the F.C.C.'s adopted Standard. The calculations made were to an imaginary target that is located 2 meters above ground level at the tower base and at various distances from the tower base. A ground reflection coefficient of 1.6 was used, as recommended in O.E.T. Bulletin 65, Edition 97-01.

The MPE for Channel 13 is 0.2 mW/cm^2. The calculations for the WRCB-DT auxiliary antenna yielded a maximum power density of 0.103 mW/cm^2 at a distance of 40 meters from the base of the tower that supports the auxiliary antenna. The maximum radiation of 18.2 kW was employed with no adjustment for azimuth pattern directivity.

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The relative field elevation pattern of Figure 3 was considered in the calculations. The WRCB-DT auxiliary antenna's maximum fractional contribution to the MPE is 0.52.

For the 6-bay antenna employed for WRCB-TV, a test calculation to a target at the base of its supporting tower, and using a vertical plane relative field value of 0.2 for steep depression angles, yielded a power density level of 0.0043 mW/cm^2. This value corresponds to a fractional contribution of 0.02 relative to the MPE of 0.2 mW/cm^2 for Channel 3. The 0.2 vertical plane relative field value for steep depression angles that was used is consistent with the value suggested in the previously referenced O.E.T. Bulletin 65 for the type antenna employed.

The calculation to the target at the tower base represents the greatest exposure level that could occur anywhere within a radius of approximately 490 meters from the tower base, assuming flat earth. Beyond 490 meters from the transmitting tower and assuming maximum peak visual effective radiated power of 100 kW with 10% aural effective radiated power, the maximum power density that could occur is less than 0.008 mW/cm^2, corresponding to a fractional contribution of 0.04 relative to the MPE of 0.2 mW/cm^2. Use of the maximum radiation of 100 kW at a distance of 490 meters establishes the maximum power density that could result from WRCB-TV anywhere beyond 490 meters from the tower base.
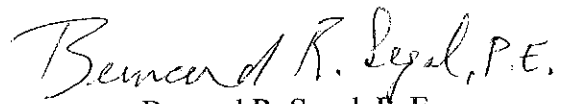

Hence, the total maximum fractional contribution to the MPE from the simultaneous operations of WRCB-TV and the WRCB-DT, auxiliary system, at worst, cannot exceed 52 % of the MPE. The combined effect of the two stations will comply with FCC's criteria for the avoidance of excessive radio frequency radiation exposure to the general public.

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

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As to the protection of workers, the following is germane. The towers are girded by a fence which is kept locked. Entry within the fenced area is permitted only to authorized personnel. Radiation hazard warning signs are posted, also, as reminders of the presence of high radiation levels on the towers. The procedures currently in effect for the avoidance of overexposure to rfr according to the FCC's adopted standard will continue to be employed. These procedures include a requirement for terminating or reducing excitation to an antenna whenever a worker must perform an activity on the tower near that antenna.

The foregoing discussion demonstrates that the proposed auxiliary antenna operation will comply with the FCC's criteria for the avoidance of overexposure by the public and workers to rfr. This proposal does not require an environmental assessment.

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 28, 2005.

Bernard R. Segal, P. E.

Dielectric

FIGURE 1

Proposal Number	
Date	**19 Oct 2001**
Call Letters	**WRCB-DT** Channel **13**
Location	**Chattanooga, TN**
Customer	
Antenna Type	**THA-C2-1H/2H-1-R**

AZIMUTH PATTERN

RMS Gain at Main Lobe	**2.50 (3.98 dB)**	Frequency	**213 MHz**
Calculated / Measured	**Calculated**	Drawing #	**THA-C2-13**
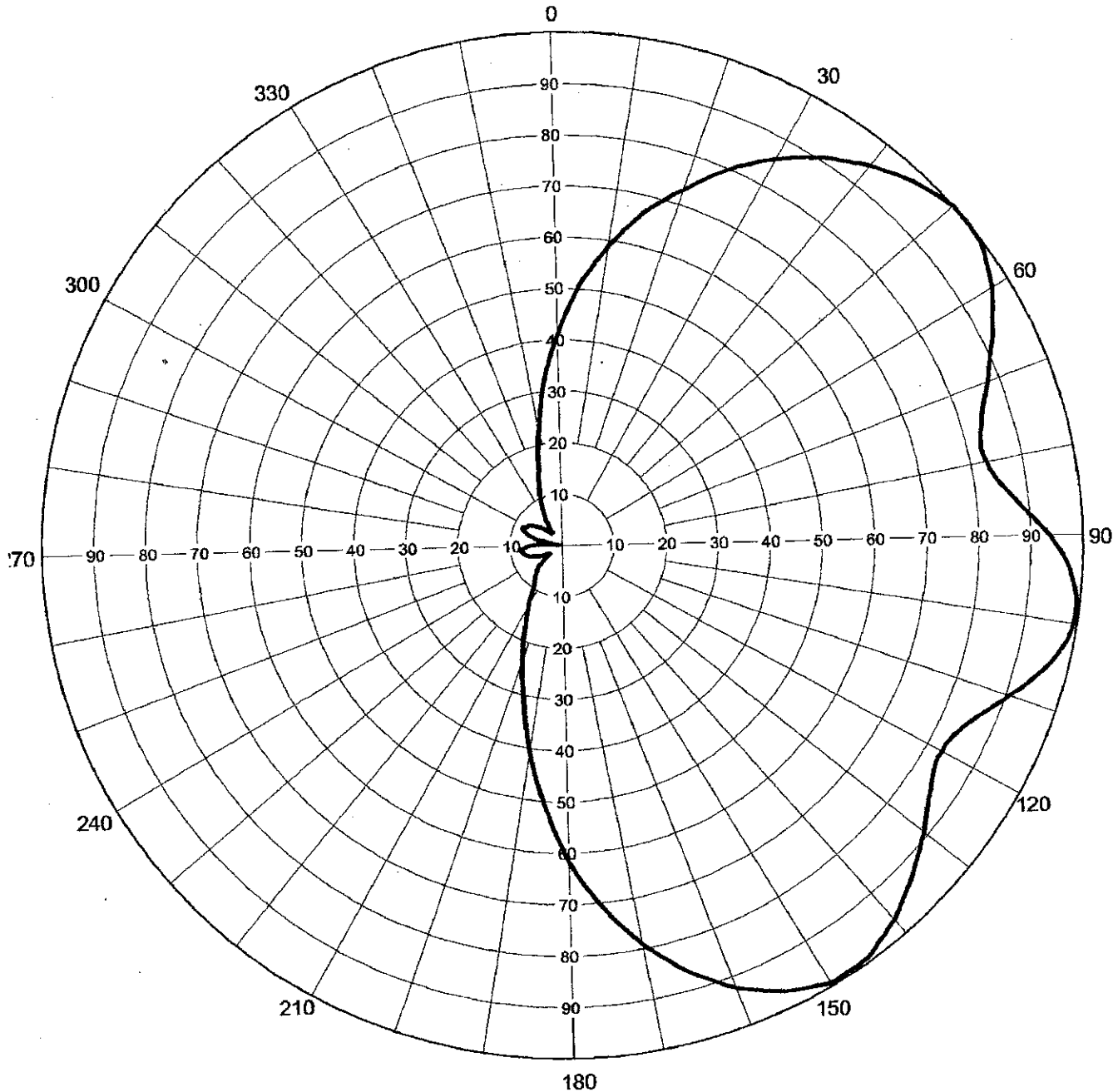
Remarks:

Figure 2

TABULATION OF AZIMUTH PATTERN DATA
WRCB-DT AUXILIARY ANTENNA

AZIMUTH (Degrees T)	RELATIVE FIELD	ERP (kW)
0	0.411	3.07
10	0.588	6.29
20	0.732	9.75
30	0.858	13.4
40	0.948	16.4
50	1.000	18.2
60	0.966	17.0
70	0.877	14.0
80	0.830	12.5
90	0.936	15.9
100	0.993	18.0
110	0.907	15.0
120	0.831	12.6
130	0.891	14.5
140	0.966	17.0
150	0.995	18.0
160	0.924	15.5
170	0.791	11.4
180	0.619	6.97
190	0.407	3.01
200	0.236	1.01
210	0.134	0.327
220	0.082	0.122
230	0.053	0.051
240	0.030	0.016
250	0.058	0.061
260	0.076	0.105
270	0.064	0.075
280	0.009	0.001
290	0.072	0.094
300	0.076	0.105
310	0.056	0.057
320	0.030	0.016
330	0.061	0.068
340	0.120	0.262
350	0.230	0.963

FIGURE 3

Dielectric

Proposal Number		
Date	**18 Oct 2001**	
Call Letters	**WRCB-DT**	Channel **13**
Location	**Chattanooga, TN**	
Customer		
Antenna Type	**THB-C2-1H/2H-1-R**	

ELEVATION PATTERN

RMS Gain at Main Lobe	**1.1 (0.41 dB)**	Beam Tilt	**0.00 Degrees**
RMS Gain at Horizontal	**1.1 (0.41 dB)**	Frequency	**213.00 MHz**
Calculated / Measured	**Calculated**	Drawing #	**01H011000-90**
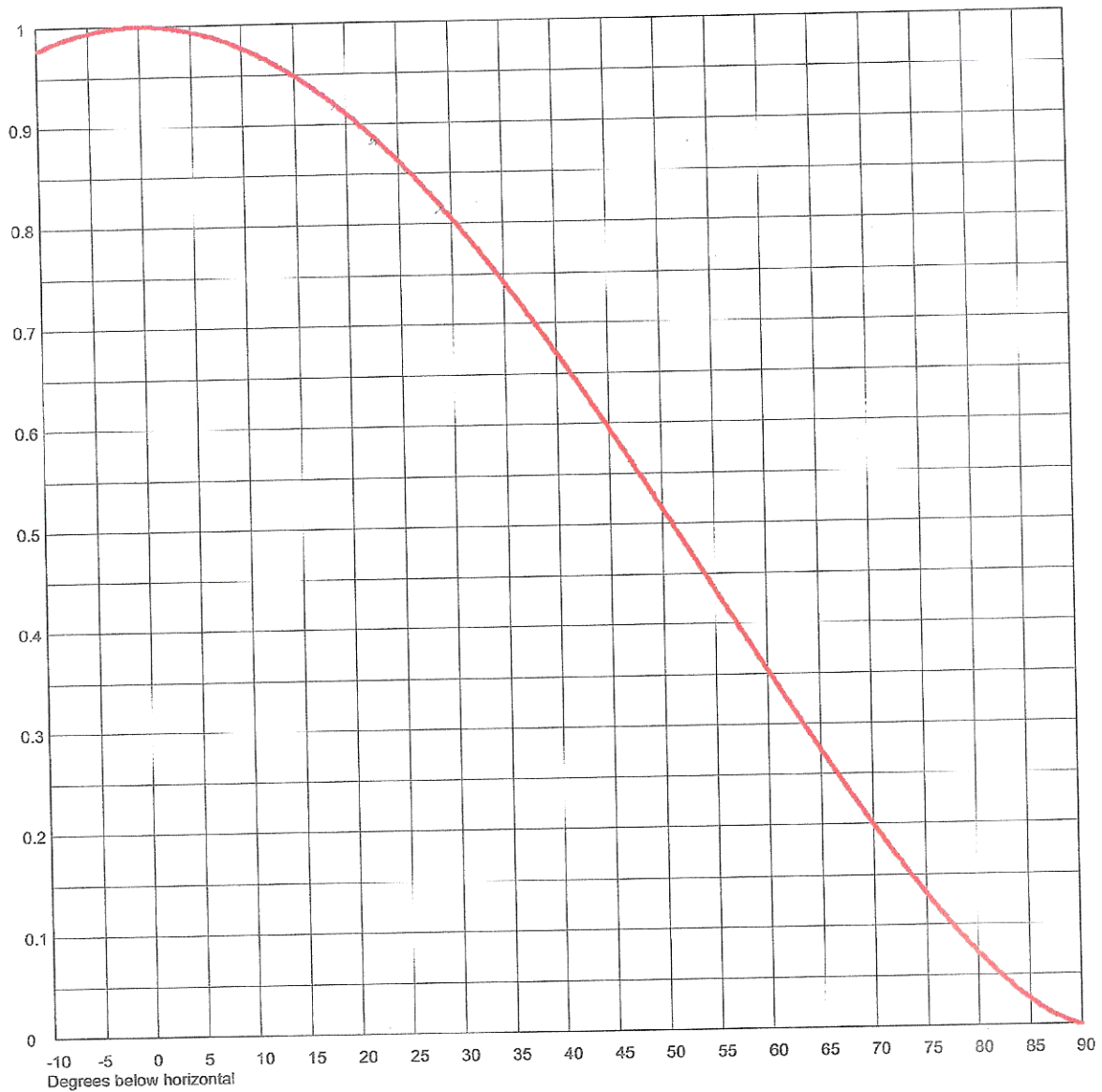
Degrees below horizontal

Remarks:

FIGURE 4

Proposal Number	
Date	**18 Oct 2001**
Call Letters	**WRCB-DT** Channel 13
Location	**Chattanooga, TN**
Customer	
Antenna Type	**THB-C2-1H/2H-1-R**

TABULATION OF ELEVATION PATTERN

Elevation Pattern Drawing #   **01H011000-90**

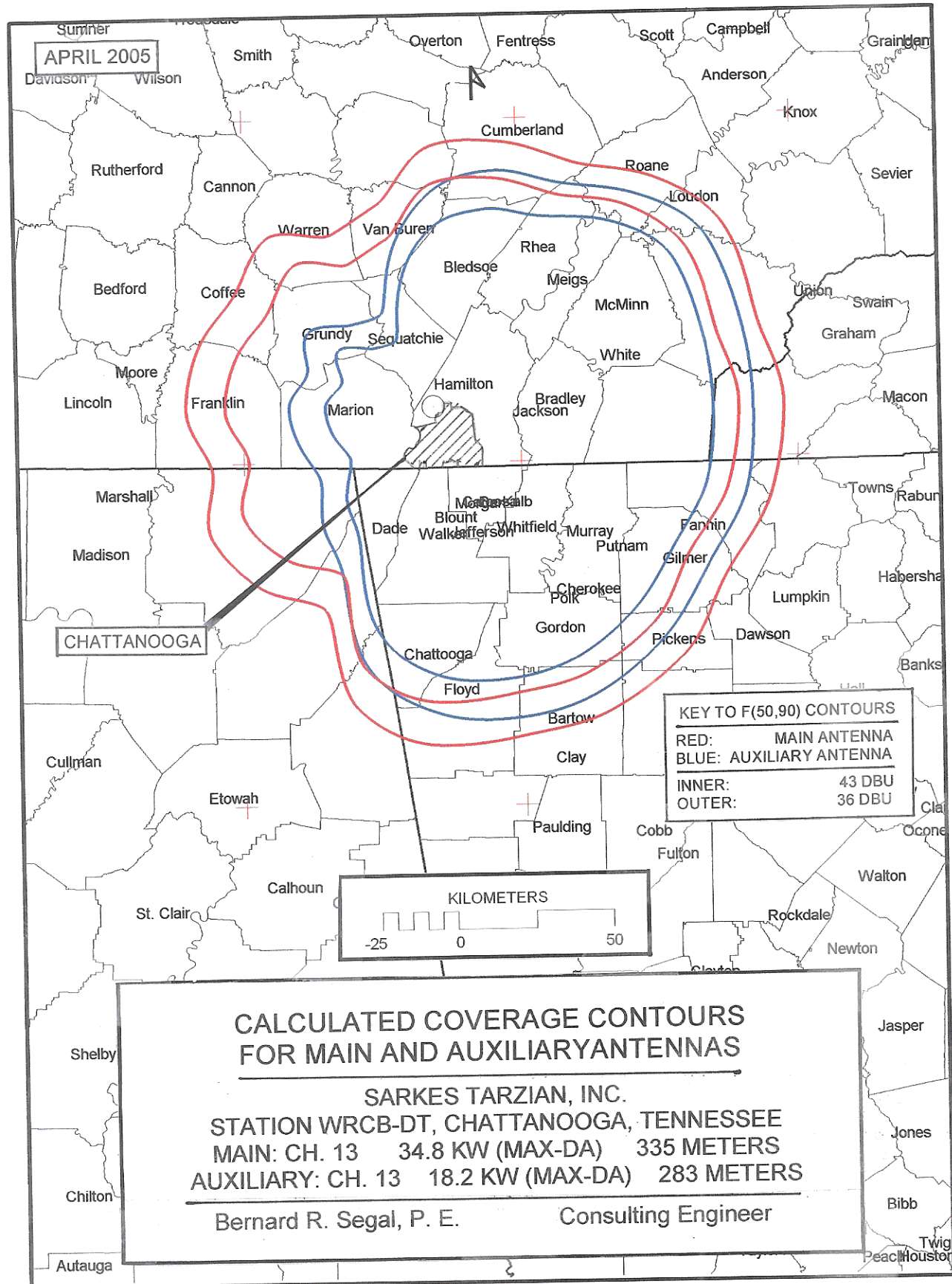| Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.977	2.4	0.999	10.6	0.975	30.5	0.800	51.0	0.499	71.5	0.179		
-9.5	0.979	2.6	0.998	10.8	0.974	31.0	0.794	51.5	0.491	72.0	0.172		
-9.0	0.982	2.8	0.998	11.0	0.973	31.5	0.787	52.0	0.483	72.5	0.165		
-8.5	0.984	3.0	0.998	11.5	0.970	32.0	0.781	52.5	0.475	73.0	0.158		
-8.0	0.985	3.2	0.998	12.0	0.967	32.5	0.775	53.0	0.467	73.5	0.151		
-7.5	0.987	3.4	0.997	12.5	0.965	33.0	0.768	53.5	0.459	74.0	0.145		
-7.0	0.989	3.6	0.997	13.0	0.962	33.5	0.761	54.0	0.451	74.5	0.138		
-6.5	0.990	3.8	0.997	13.5	0.959	34.0	0.755	54.5	0.443	75.0	0.132		
-6.0	0.992	4.0	0.996	14.0	0.956	34.5	0.748	55.0	0.434	75.5	0.125		
-5.5	0.993	4.2	0.996	14.5	0.953	35.0	0.741	55.5	0.426	76.0	0.119		
-5.0	0.994	4.4	0.996	15.0	0.949	35.5	0.735	56.0	0.418	76.5	0.113		
-4.5	0.995	4.6	0.995	15.5	0.946	36.0	0.728	56.5	0.410	77.0	0.107		
-4.0	0.996	4.8	0.995	16.0	0.942	36.5	0.721	57.0	0.402	77.5	0.101		
-3.5	0.997	5.0	0.994	16.5	0.939	37.0	0.714	57.5	0.394	78.0	0.095		
-3.0	0.998	5.2	0.994	17.0	0.935	37.5	0.707	58.0	0.386	78.5	0.089		
-2.8	0.998	5.4	0.993	17.5	0.931	38.0	0.700	58.5	0.378	79.0	0.083		
-2.6	0.998	5.6	0.993	18.0	0.927	38.5	0.692	59.0	0.370	79.5	0.078		
-2.4	0.999	5.8	0.992	18.5	0.923	39.0	0.685	59.5	0.362	80.0	0.072		
-2.2	0.999	6.0	0.992	19.0	0.919	39.5	0.678	60.0	0.354	80.5	0.067		
-2.0	0.999	6.2	0.991	19.5	0.915	40.0	0.670	60.5	0.346	81.0	0.062		
-1.8	0.999	6.4	0.991	20.0	0.911	40.5	0.663	61.0	0.338	81.5	0.057		
-1.6	0.999	6.6	0.990	20.5	0.907	41.0	0.656	61.5	0.330	82.0	0.052		
-1.4	1.000	6.8	0.989	21.0	0.902	41.5	0.648	62.0	0.322	82.5	0.047		
-1.2	1.000	7.0	0.989	21.5	0.897	42.0	0.641	62.5	0.314	83.0	0.043		
-1.0	1.000	7.2	0.988	22.0	0.893	42.5	0.633	63.0	0.306	83.5	0.038		
-0.8	1.000	7.4	0.988	22.5	0.888	43.0	0.625	63.5	0.298	84.0	0.034		
-0.6	1.000	7.6	0.987	23.0	0.883	43.5	0.618	64.0	0.290	84.5	0.030		
-0.4	1.000	7.8	0.986	23.5	0.878	44.0	0.610	64.5	0.282	85.0	0.026		
-0.2	1.000	8.0	0.985	24.0	0.873	44.5	0.602	65.0	0.275	85.5	0.022		
0.0	1.000	8.2	0.985	24.5	0.868	45.0	0.595	65.5	0.267	86.0	0.018		
0.2	1.000	8.4	0.984	25.0	0.863	45.5	0.587	66.0	0.259	86.5	0.015		
0.4	1.000	8.6	0.983	25.5	0.857	46.0	0.579	66.5	0.252	87.0	0.012		
0.6	1.000	8.8	0.982	26.0	0.852	46.5	0.571	67.0	0.244	87.5	0.009		
0.8	1.000	9.0	0.982	26.5	0.847	47.0	0.563	67.5	0.237	88.0	0.007		
1.0	1.000	9.2	0.981	27.0	0.841	47.5	0.555	68.0	0.229	88.5	0.004		
1.2	1.000	9.4	0.980	27.5	0.835	48.0	0.547	68.5	0.222	89.0	0.002		
1.4	1.000	9.6	0.979	28.0	0.830	48.5	0.539	69.0	0.215	89.5	0.001		
1.6	0.999	9.8	0.978	28.5	0.824	49.0	0.531	69.5	0.207	90.0	0.000		
1.8	0.999	10.0	0.977	29.0	0.818	49.5	0.523	70.0	0.200				
2.0	0.999	10.2	0.976	29.5	0.812	50.0	0.515	70.5	0.193				
2.2	0.999	10.4	0.975	30.0	0.806	50.5	0.507	71.0	0.186				

Remarks:

FIGURE 5

APRIL 2005

CHATTANOOGA

KEY TO F(50,90) CONTOURS

RED: MAIN ANTENNA
BLUE: AUXILIARY ANTENNA

INNER: 43 DBU
OUTER: 36 DBU

KILOMETERS

-25   0   50

CALCULATED COVERAGE CONTOURS
FOR MAIN AND AUXILIARYANTENNAS

SARKES TARZIAN, INC.
STATION WRCB-DT, CHATTANOOGA, TENNESSEE
MAIN: CH. 13   34.8 KW (MAX-DA)   335 METERS
AUXILIARY: CH. 13   18.2 KW (MAX-DA)   283 METERS

Bernard R. Segal, P. E.   Consulting Engineer

FIGURE 6

Tabulation of Data For Main and Auxiliary Coverage Contours

Site Coordinates: 35° 09' 40" North Latitude
85° 18' 52" West Longitude

Main Antenna Radiation Center: 715 m AMSL
Auxiliary Antenna Radiation Center: 663 mAMSL

	Main Antenna				Auxiliary Antenna			
	Radiation Center Above 3.2-16.1 km		Distance To		Radiation Center Above 3.2-16.1 km		Distance to	
			43 dBu	36 dBu			43 dBu	36 dBu
Azimuth	Terrain Avg.	ERP	Contour	Contour	Terrain Avg.	ERP	Contour	Contour
(Deg. T.)	(meters)	(kW)	(km)	(km)	(meters)	(kW)	(km)	(km)
0	181	9.30	72.0	84.5	129	3.07	57.8	69.6
15	192	14.6	76.6	88.7	140	7.93	66.1	79.0
30	197	20.1	79.4	91.3	145	13.4	71.0	83.4
45	345	26.8	91.2	103.9	293	17.3	83.9	96.2
60	473	22.2	97.8	112.3	421	17.0	92.4	105.5
75	492	15.2	96.2	110.1	440	13.2	91.6	104.8
90	479	29.7	100.4	115.1	427	15.9	92.0	105.1
105	487	25.5	100.1	114.4	435	16.4	92.9	106.3
120	484	16.5	96.2	110.3	432	12.6	90.8	103.7
135	495	25.8	100.4	114.7	443	15.7	92.8	106.2
150	486	24.8	99.8	114.1	434	18.0	93.6	107.1
165	486	16.5	96.4	110.4	434	13.4	91.4	104.4
180	492	14.2	95.6	109.5	440	6.97	86.8	99.1
195	463	6.92	88.3	100.9	411	1.89	74.6	87.2
210	268	1.20	62.0	74.5	216	0.327	49.7	61.3
225	284	2.81	69.1	81.7	232	0.084	40.7	52.1
240	334	2.61	72.1	84.5	282	0.016	31.9	43.7
255	196	2.46	63.0	75.6	144	0.082	34.1	45.7
270	218	4.31	68.5	81.3	166	0.075	35.4	47.3
285	244	2.63	66.5	79.4	192	0.029	30.9	42.6
300	196	2.21	62.2	74.7	144	0.105	36.0	47.6
315	184	3.52	64.8	77.4	132	0.034	26.9	37.9
330	126	1.82	53.9	65.1	74	0.061	24.4	34.3
345	142	1.99	56.5	68.1	90	0.557	40.4	51.2
Average:	335				283			

Note: The averages are for the standard eight 45° spaced radials. The U.S.G.S. 30" terrain elevation database was employed for determining 3.2-16.1 kilometer terrain averages.