

SWANCO BROADCASTING OF KANSAS, INC.

RADIO STATION KLEO

1480 KC, 1 KW, 5 KW-LS, DA-2

WICHITA, KANSAS

APPLICATION FOR CONSTRUCTION PERMIT
TO CHANGE TRANSMITTER LOCATION, AND MAKE CHANGES IN
ANTENNA SYSTEM

A. EARL CULLUM, JR. AND ASSOCIATES

CONSULTING ENGINEERS

660420

ENGINEERING STATEMENT OF D. A. PETERSON OF THE FIRM OF A. EARL CULLUM, JR. AND ASSOCIATES,
CONSULTING ENGINEERS, IN CONNECTION WITH THE APPLICATION OF SWANCO BROADCASTING OF KANSAS, INC.,
FOR CONSTRUCTION PERMIT FOR RADIO STATION KLEO, WICHITA, KANSAS,
TO CHANGE TRANSMITTER LOCATION AND MAKE CHANGES IN THE ANTENNA SYSTEM

* * *

I, D. A. Peterson, am an engineer associated with the firm of A. Earl Cullum, Jr. and Associates, Consulting Engineers, with offices located in Dallas, Texas. I graduated from Southern Methodist University in 1934 with a Bachelor of Science Degree in Electrical Engineering. I have been employed in an engineering capacity by broadcast stations since 1933. I have been a partner in the firm of A. Earl Cullum, Jr. and Associates since 1940. My qualifications as an engineer are known to the Federal Communications Commission.

This firm has been employed by Swanco Broadcasting of Kansas, Inc., to prepare the engineering portion of an application for construction permit for Radio Station KLEO, Wichita, Kansas, to change transmitter location and make changes in the antenna system.

CHANGE IN LOCATION AND ANTENNA PATTERNS

Radio Station KLEO is presently authorized to operate on 1480 kilocycles with 5 kilowatts of power directional daytime and 1 kilowatt of power directional nighttime at a site on the west side of Wichita, Kansas. Since the station started operation at this site, the growth of the residential area of Wichita has resulted in large portions of the population being located outside the nighttime interference-free contour. It is proposed to relocate the transmitter site to the east side of Wichita and make changes in the antenna system to improve the nighttime coverage to Wichita. The proposed operation would reduce daytime prohibited overlap with other stations, and would not increase the nighttime interference to other stations. The present operation of KLEO uses four towers nighttime and two of those towers daytime. The proposed operation will require five towers in all with four towers being used nighttime and four towers being used daytime. Three of the towers are common to both the nighttime and daytime arrays.

ATTACHED MATERIAL

The following attached material has been prepared under my direction to show the results of the studies made in connection with this proposal and is true and correct to the best of my knowledge and belief.

Part I, code 660420.1 Existing Operation
Part II, code 660420.2 Proposed Daytime Operation
Part III, code 660420.3 Proposed Nighttime Operation
Part IV, code 660420.4 Proposed Site Information

DETERMINATION OF FIELD INTENSITY

The inverse-distance fields for KLEO were taken from the last proof of performance patterns on file with the Federal Communications Commission for the existing daytime and nighttime operations of KLEO and from the patterns proposed herein for the proposed operation. The inverse-distance fields from other facilities studied were determined from directional antenna patterns on file with the Federal Communications Commission and from the Official List for Information Setting Forth Notified Assignments of Standard Broadcast Stations of the United States as of December 29, 1966, and subsequent U. S. Notifications under the provisions of the 1950 NARBA and 1957 Agreement with Mexico.

The proof of performance made on KLEO at the existing site showed that the site was in an area of poor ground conductivity. The soil is sandy at the site. The proof of performance also showed that the equivalent ground conductivity was as high as the values on M3 as the radials progressed out of the site area. For this reason, the ground conductivity about both the existing and proposed KLEO sites was assumed to be that shown on M3 of the Rules, as well as about the sites of other facilities studied.

Projection of ground wave and skywave contours and the determination of interference were carried out in accordance with Sections 73.182, 73.183, and 73.184 of the Rules of the Commission. Foreign stations were sufficiently far removed from KLEO not to require study either daytime or nighttime.

DETERMINATION OF AREAS AND POPULATIONS

Areas were determined by use of a polar planimeter on the original coverage maps. The populations within the proposed blanket contours were determined from a count of the houses shown within the contours on the attached aerial photographs and by using a figure of 3.3 persons per unit dwelling as given in the United States 1960 Census for Sedgewick County, Kansas. The populations within the coverage and interference contours were determined by the use of 1960 United States Census figures and maps of minor civil divisions. Uniform distribution of rural population within each minor civil division was assumed. The populations of cities of 2,500 or greater and urbanized areas located outside the daytime 2-mv/m contour were deducted from the total population.

CONCLUSIONS

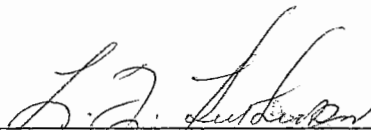
From the attached population analyses, it can be shown that the proposed daytime operation would result in a decrease of service to 22,076 persons within the daytime interference-free contour, but the proposed nighttime operation would result in an increase of service to 92,045 persons within the 25-mv/m contour and to 33,072 persons within the nighttime interference-free contour.

The loss of daytime service would be greatly offset by the reduction in interference to co-channel and adjacent-channel stations where the prohibited overlap would be reduced; furthermore, such losses occur near the perimeter of the daytime 0.5-mv/m contour. The gain in nighttime service is within the city of Wichita, Kansas and environs.



D. A. Peterson

Subscribed and sworn to before me
on this 17th day of June, 1966.
My Commission expires June 1, 1967.



Notary Public, Dallas County, Texas

PART I

EXISTING OPERATION

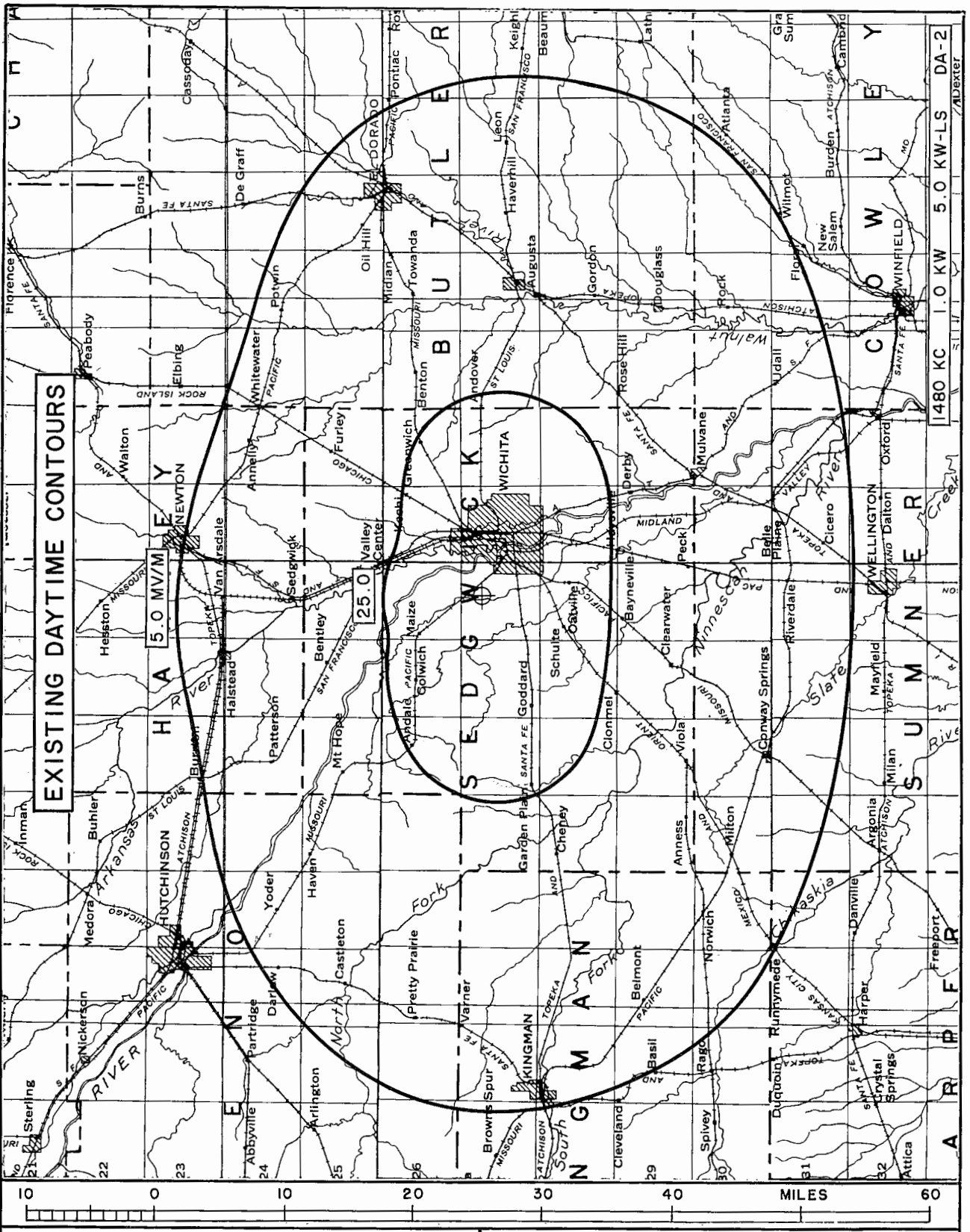
Part I contains the following in connection with the existing operation:

1. Conditions for existing operation
- 2A. Map showing the daytime 25- and 5-mv/m contours
- 2B. Map showing the daytime 2- and 0.5-mv/m contours and contour free of interference
- 3A. Map showing the nighttime 25- and 5-mv/m contours
- 3B. Map showing the nighttime 2.5-mv/m contour and the interference free contour
4. Tabulation of area and population analyses

RADIO STATION KLEO
WICHITA, KANSAS

CONDITIONS FOR EXISTING OPERATION

Frequency	1480 kilocycles			
Power	5 kw directional - day 1 kw directional - night			
Number of Towers	2 daytime 4 nighttime			
Type of Towers	Triangular, uniform cross-section, guyed, vertical, steel towers			
Excitation of Towers	Series Feed			
Height of Elements	200 feet above insulator 204 feet above ground			
Spacing and Orientation	Four towers arranged in parallelogram with long sides 484' (262°) long and bearing 18° true, short sides 203' (110°) long and bearing 38° true. The two towers on the short diagonal used daytime.			
Ground System	120 buried copper radials, each approximately 200 feet in length, plus 120 buried copper radials, each 30 feet in length, spaced about the base of each tower			
Directional Daytime Operation				
Tower Number	(1)	(2)	(3)	(4)
Tower Location	North	North Center	South Center	South
Theoretical Phasing - Degrees	-	0	-25	-
Theoretical Ratio	-	1.0	0.4	-
Directional Nighttime Operation				
Tower Number	(1)	(2)	(3)	(4)
Tower Location	North	North Center	South Center	South
Theoretical Phasing - Degrees	0	-75	12	-63
Theoretical Ratio	1.0	0.6	1.0	0.6
Geographic Coordinates	North Latitude	37° 42' 47"		
	West Longitude	97° 25' 23"		



EXISTING DAYTIME CONTOURS

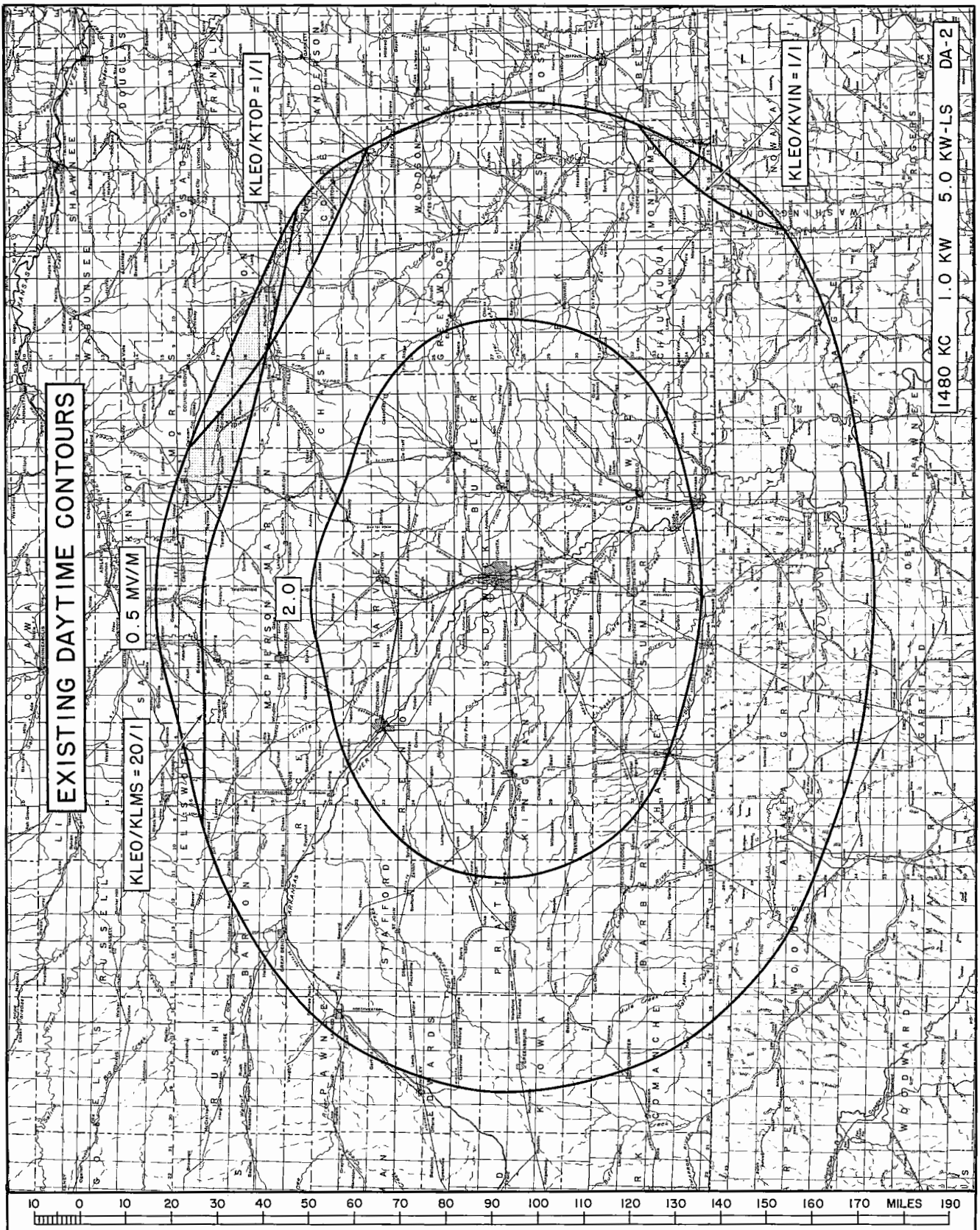
5.0 MV/M

25.0

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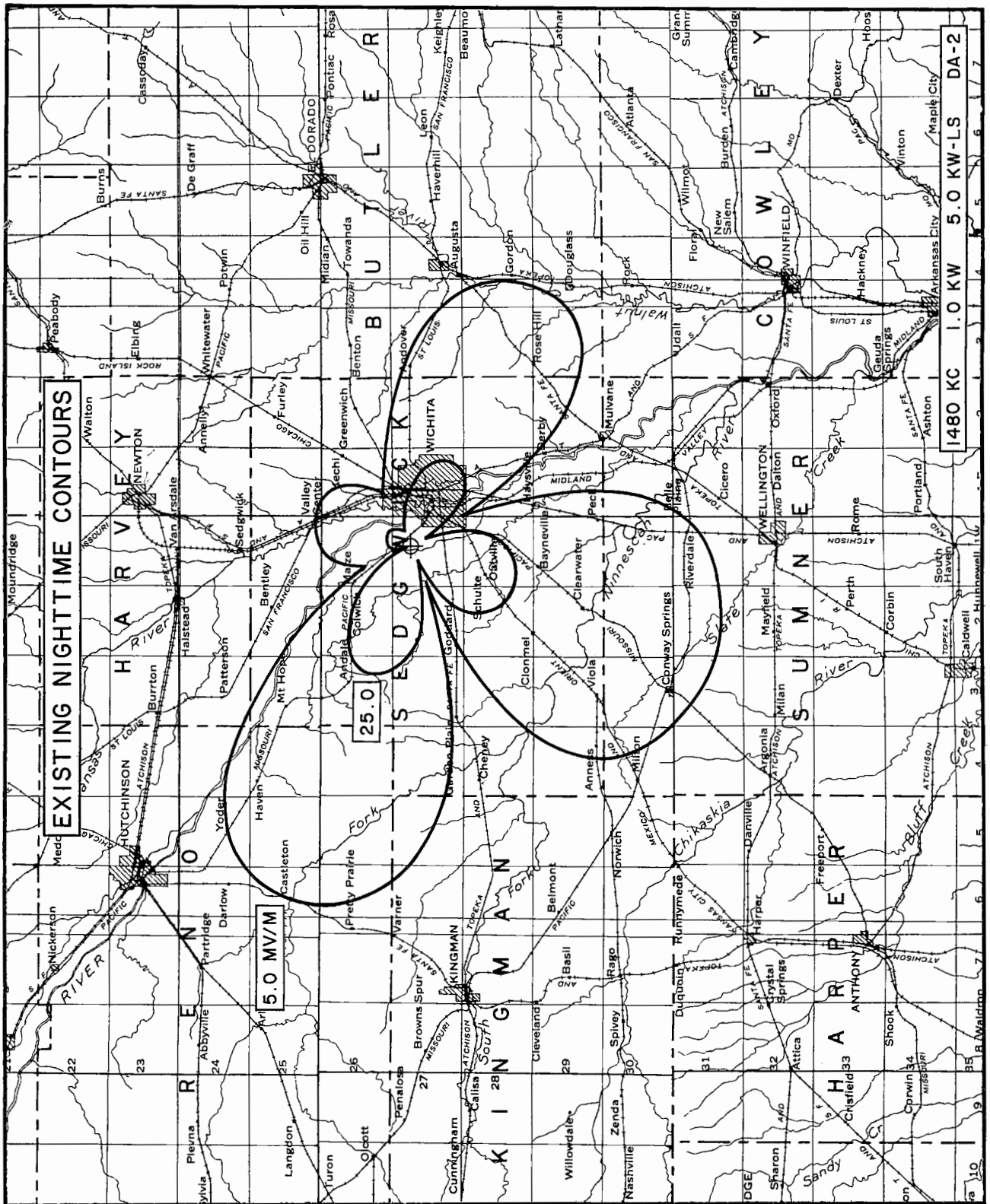
RADIO STATION KLEO
WICHITA, KANSAS
660420.1 FIGURE 2A

1480 KC 1.0 KW 5.0 KW-LS DA-2



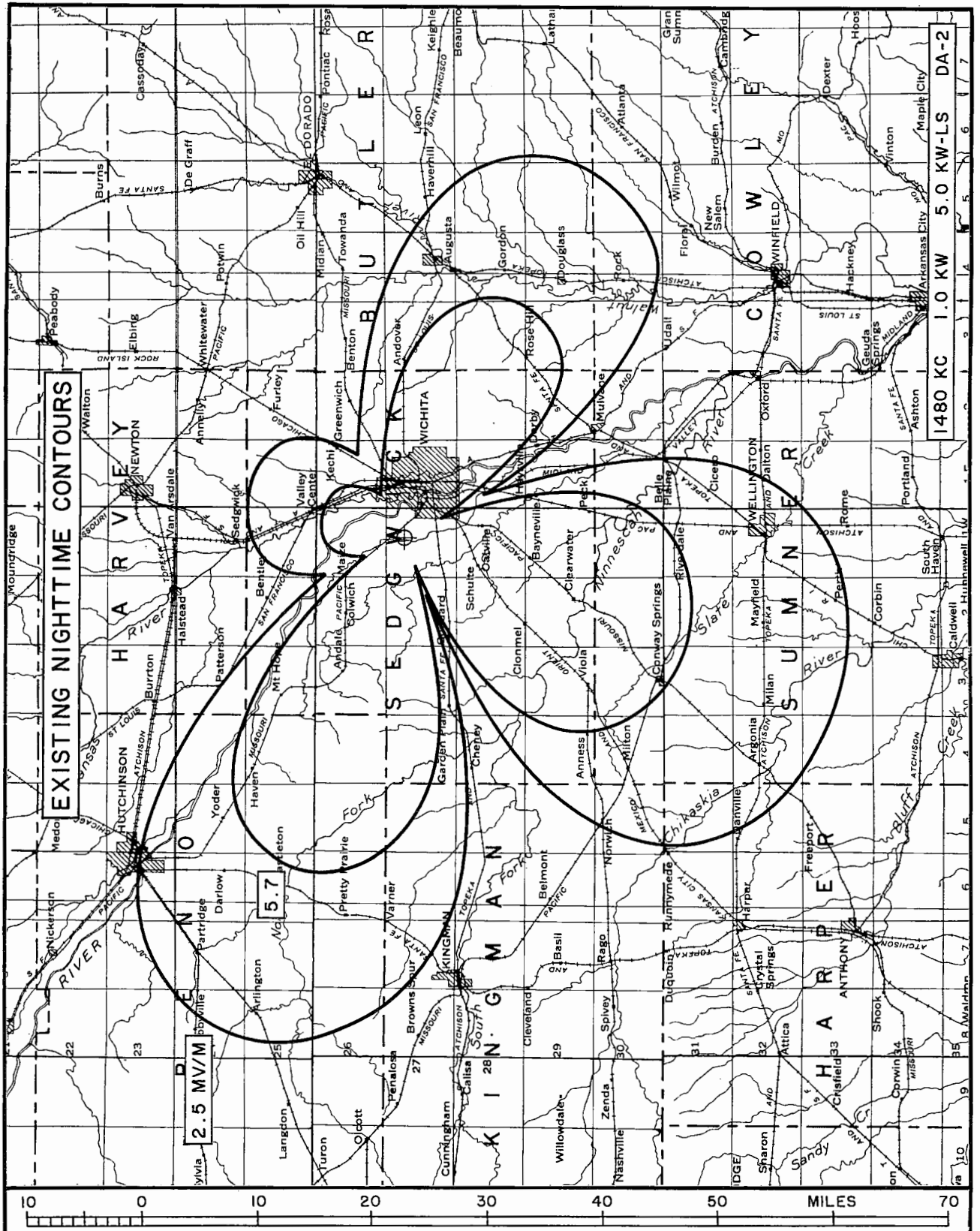
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RADIO STATION KLEO
 WICHITA, KANSAS
 660420.1 FIGURE 2B



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RADIO STATION KLEO
 WICHITA, KANSAS
 660420.1 FIGURE 3A



EXISTING NIGHTTIME CONTOURS

2.5 MV/M

5.7

10 0 10 20 30 40 50 60 70 MILES

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RADIO STATION KLEO
WICHITA, KANSAS
660420.1 FIGURE 3B

1480 KC 1.0 KW 5.0 KW-LS DA-2

RADIO STATION KLEO
WICHITA, KANSAS

AREA AND POPULATION ANALYSES
EXISTING DAYTIME CONTOURS

<u>CONTOUR</u>	<u>AREA - SQ. MI.</u>	<u>POPULATION</u>
Within 25 mv/m	456	314,104
5	3,351	408,835
2	8,061	534,741
0.5	26,424	709,926
Interference from KVIN	161	3,584
Interference from KTOP alone	474	6,246
Interference from KLMS alone	1,012	8,687
Resulting Interference Free	25,011	693,123

AREA AND POPULATION ANALYSES
EXISTING NIGHTTIME CONTOURS

<u>CONTOUR</u>	<u>AREA - SQ. MI.</u>	<u>POPULATION</u>
Within 25 mv/m	123	121,208
5.7 (1)	971	314,229
5.0	1,151	327,195
2.5 (2)	2,519	387,225

- (1) Limited by interference
(2) Normally protected

PART II

PROPOSED DAYTIME OPERATION

Part II contains the following in connection with the proposed daytime operation:

1. Conditions for proposed daytime operation
2. Directional antenna design formula
3. Directional antenna calculations
- 4A. Daytime directional antenna radiation data
- 4B. Daytime horizontal radiation pattern
- 5A. Map showing the daytime 1-v/m contour
- 5B. Map showing the daytime 25- and 5-mv/m contours
- 5C. Map showing the daytime 2- and 0.5-mv/m contours and contour free of interference
6. M-3 allocation map showing the proposed daytime conditions
7. Tabulation of area and population analyses
8. Tabulation of azimuths, inverse-distance fields, and conductivities used

RADIO STATION KLEO
WICHITA, KANSAS

CONDITIONS FOR PROPOSED DAYTIME OPERATION

Frequency	1480 kilocycles
Power	5 kw directional
Number of Towers	4 towers of 5 towers
Type of Towers	Triangular, uniform cross-section, guyed, vertical, steel towers
Excitation of Towers	Series Feed
Height of Elements Without Beacon	166 feet above insulator
Without Beacon	169 feet above ground
Without Beacon	1549 feet above sea level
With Beacon	1552 feet above sea level
Spacing and Orientation	Five towers arranged to form two parallelograms. The four towers used for daytime operation (Towers 1, 2, 3, and 4) form a parallelogram with long sides 245.5 feet (133°) long and bearing N 171.62° E and short sides 166 feet (90°) long and bearing N 205° E. Tower 5 used for nighttime operation only is located 166 feet (90°) from tower 4 on a bearing of N 205° E.
Ground System	120 copper radials 166 feet long buried 2 to 4 inches out to 30 feet and 6 to 8 inches beyond 30 feet plus 120 copper radials 30 feet long buried 2 to 4 inches equally spaced about each tower. Intersecting radials are shortened and bonded to transverse copper busses midway between adjacent towers.
Geographic Coordinates	North Latitude $37^{\circ} 43' 28''$ West Longitude $97^{\circ} 12' 57''$

RADIO STATION KLEO
WICHITA, KANSAS

DIRECTIONAL ANTENNA DESIGN FORMULA

$$F(E) = \frac{1.000}{0.0} + \frac{0.600}{-100} + \frac{90 \cos(\theta - 205)}{100} \\ + \frac{0.400}{50} + \frac{133 \cos(\theta - 171.6)}{100} \\ + \frac{0.240}{-50} + \frac{214 \cos(\theta - 185)}{100}$$

$$K = 1 - \cos G$$

$$P = \sum_{n=1}^n (R_n \times I_n^2)$$

$$E = 37.25 \times I \times K \times F(E)$$

Where:

θ is the azimuthal bearing from true north

G is the electrical height of the towers

R_n is the base resistance of the nth tower operating directionally

I_n is the base current of the nth tower operating directionally

K is the form factor for the towers

I is the unit vector current for the antenna system

E is the computed inverse-distance field at one mile at any azimuth θ

P is the total power into the array

RADIO STATION KLEO
WICHITA, KANSAS

DIRECTIONAL ANTENNA CALCULATIONS

GIVEN:

Rated Power	5 kilowatts
Tower Height	166 feet

ASSUMED:

Current distribution in elements	sinusoidal
Electrical height of elements	90 degrees
Surface of earth	plane
Conductivity of earth	infinite
Coupling equipment losses	5.0 percent
Antenna and power losses	1.0 ohm at base of towers

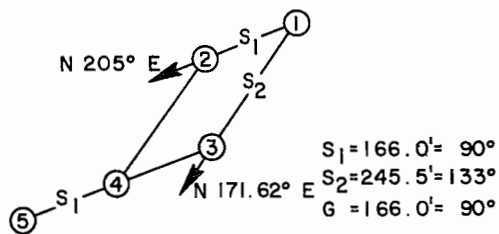
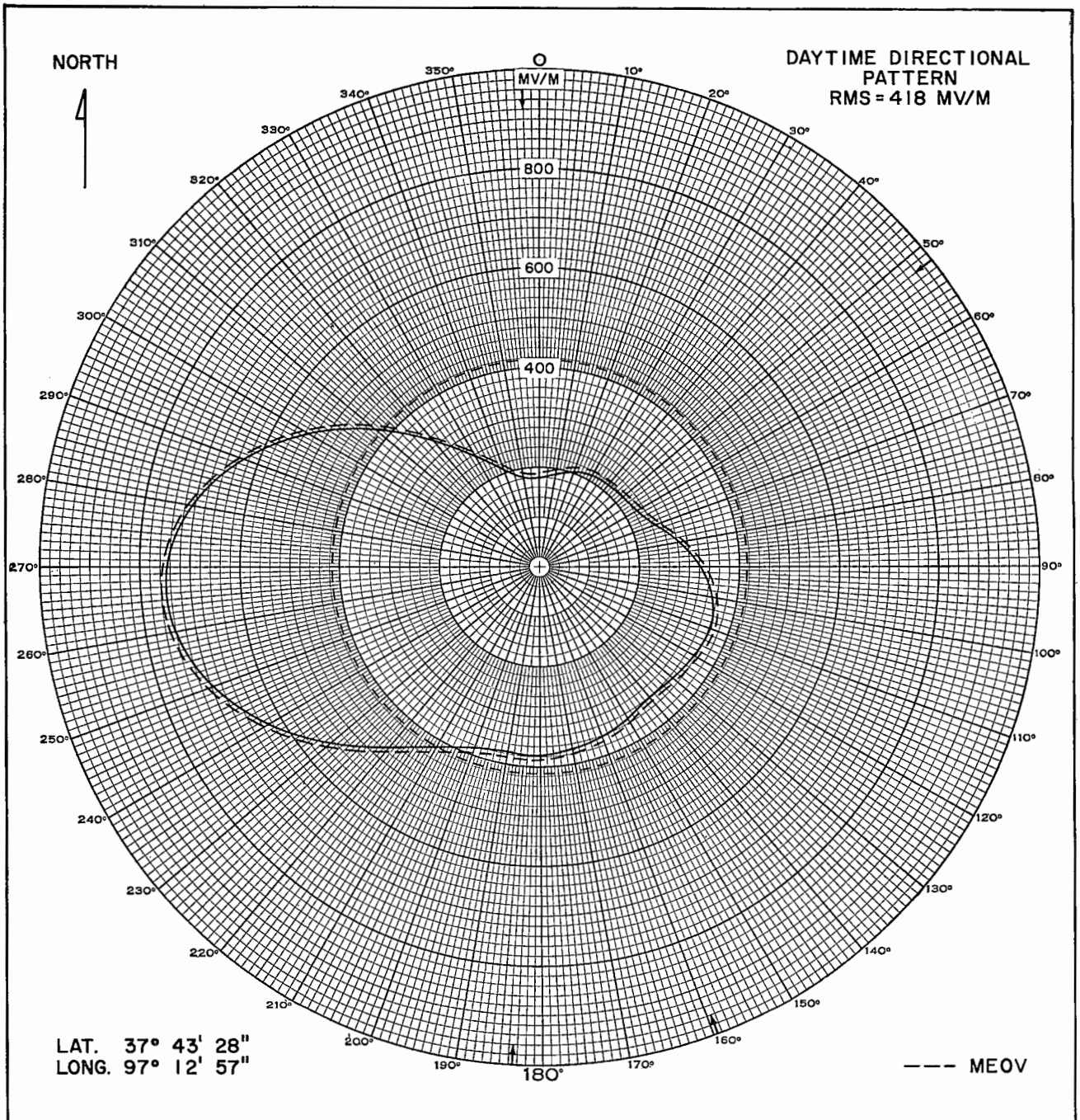
EXPECTED RESULTS:

Tower Number	1	2	3	4	5
Tower Location	N	W	E	S	SW
Relative Phase, Degrees	0	-100	50	-50	-
Relative Field	1.00	0.60	0.40	0.24	-
Base Current, Amperes	10.61	6.37	4.24	2.55	-
Base Resistance, Ohms	31.5	51.1	-36.8	27.4	-
Base Power, Watts	3,546	2,074	-662	178	-
Vector Current	I is 10.61 amperes				
Form Factor	K is 1.0				
Inverse-Distance Field	E = 395.2 x F(E) mv/m				

RADIO STATION KLEO
WICHITA, KANSAS

PROPOSED DAYTIME DIRECTIONAL ANTENNA RADIATION DATA - MV/M

<u>AZIMUTH</u>	<u>MV/M</u>	<u>AZIMUTH</u>	<u>MV/M</u>
000	179	180	375
010	189	190	378
020	202	200	388
030	212	210	418
040	217	220	471
050	219	230	546
060	226	240	628
070	248	250	699
080	285	260	742
090	324	270	745
100	352	280	706
110	362	290	631
120	356	300	533
130	347	310	429
140	344	320	333
150	350	330	256
160	362	340	205
170	371	350	181

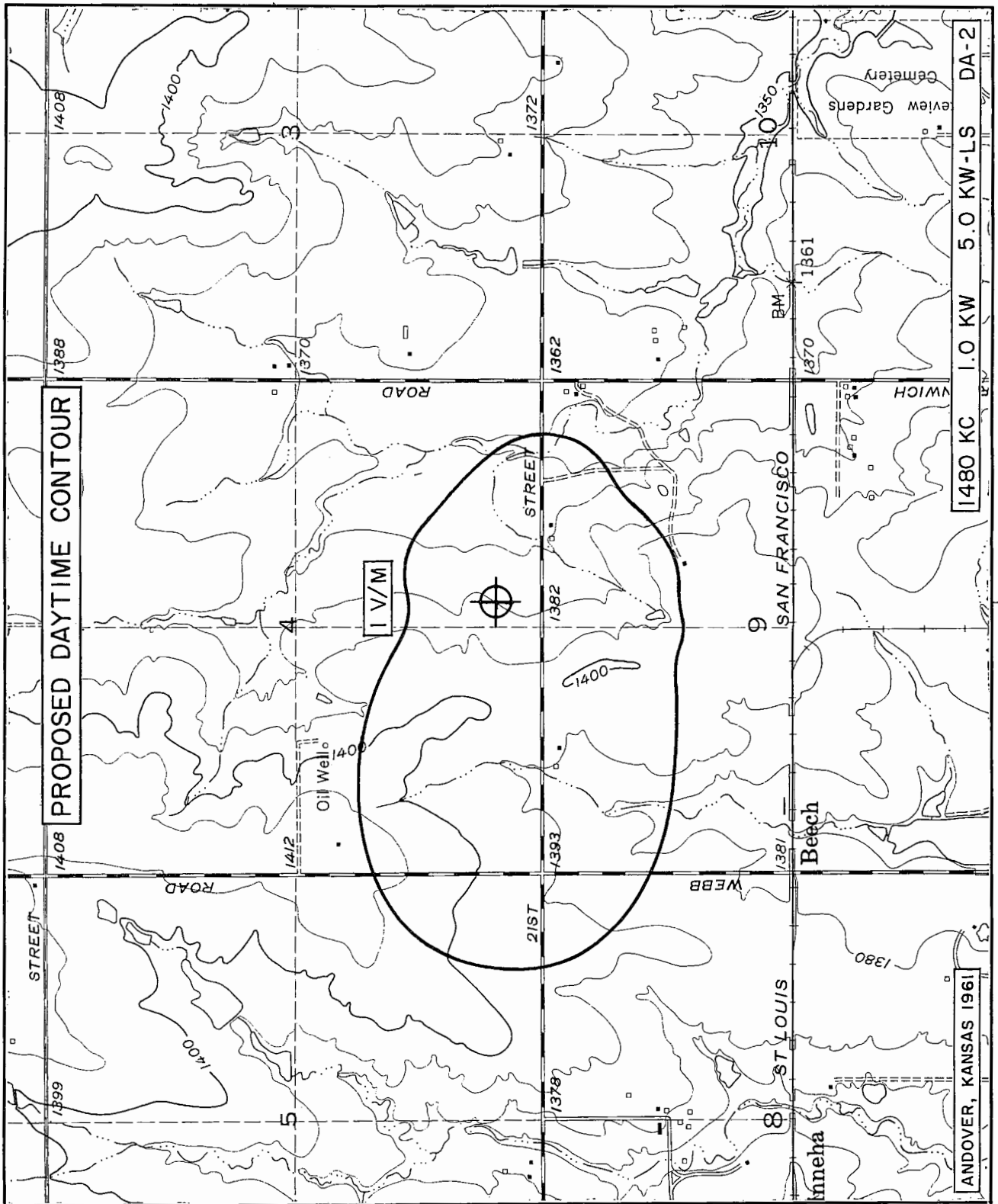


THEORETICAL PARAMETERS

<u>TOWER</u>	<u>FIELD</u>	<u>PHASE</u>
1	1.000	0.00°
2	0.600	-100.00°
3	0.400	50.00°
4	0.240	-50.00°
5	-	-

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RADIO STATION KLEO
1480 KC 1 KW 5 KW-LS DA-2
660420.2 FIGURE 4B

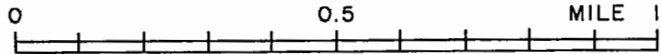


PROPOSED DAYTIME CONTOUR

I V/M

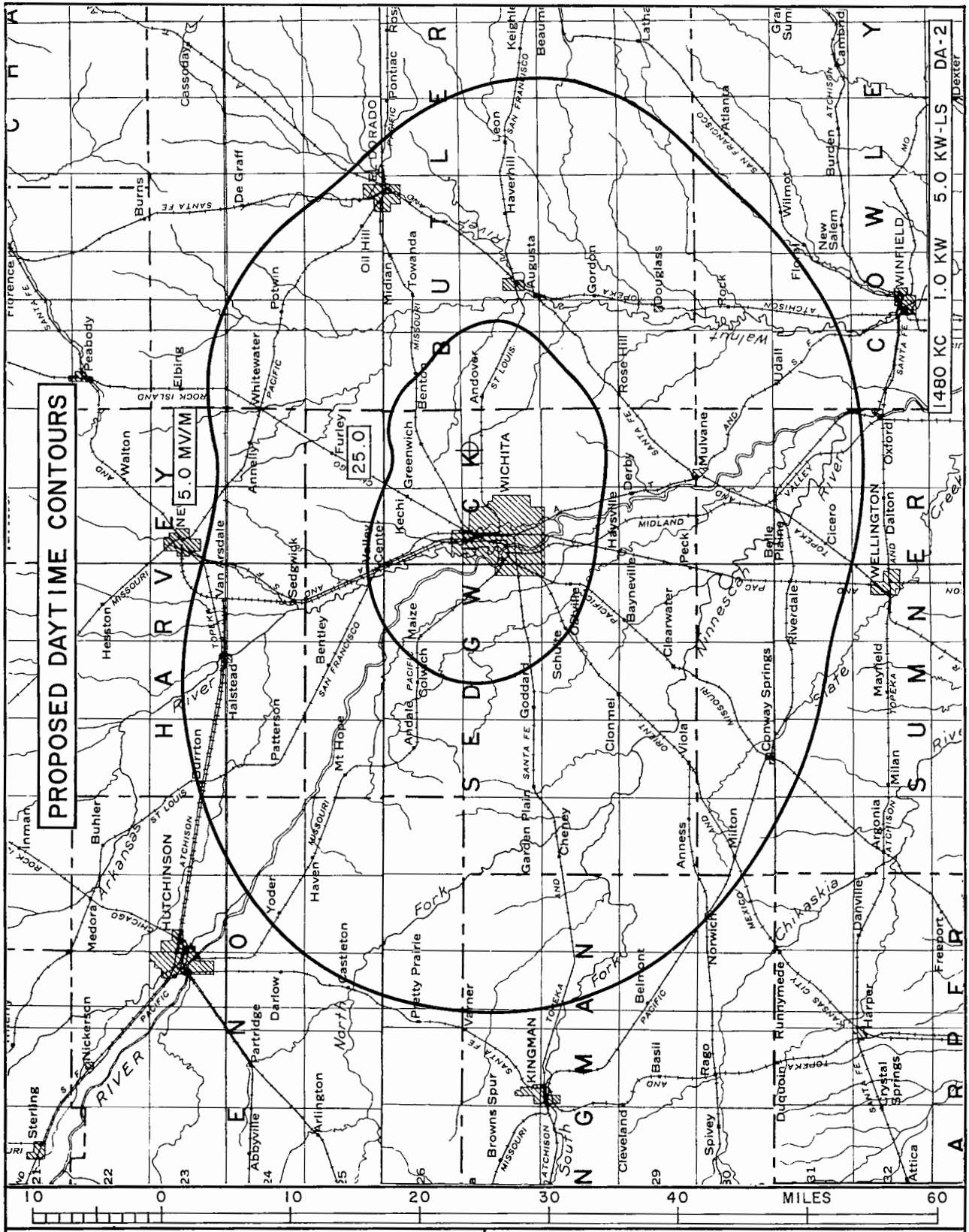
1480 KC 1.0 KW 5.0 KW-LS DA-2

ANDOVER, KANSAS 1961



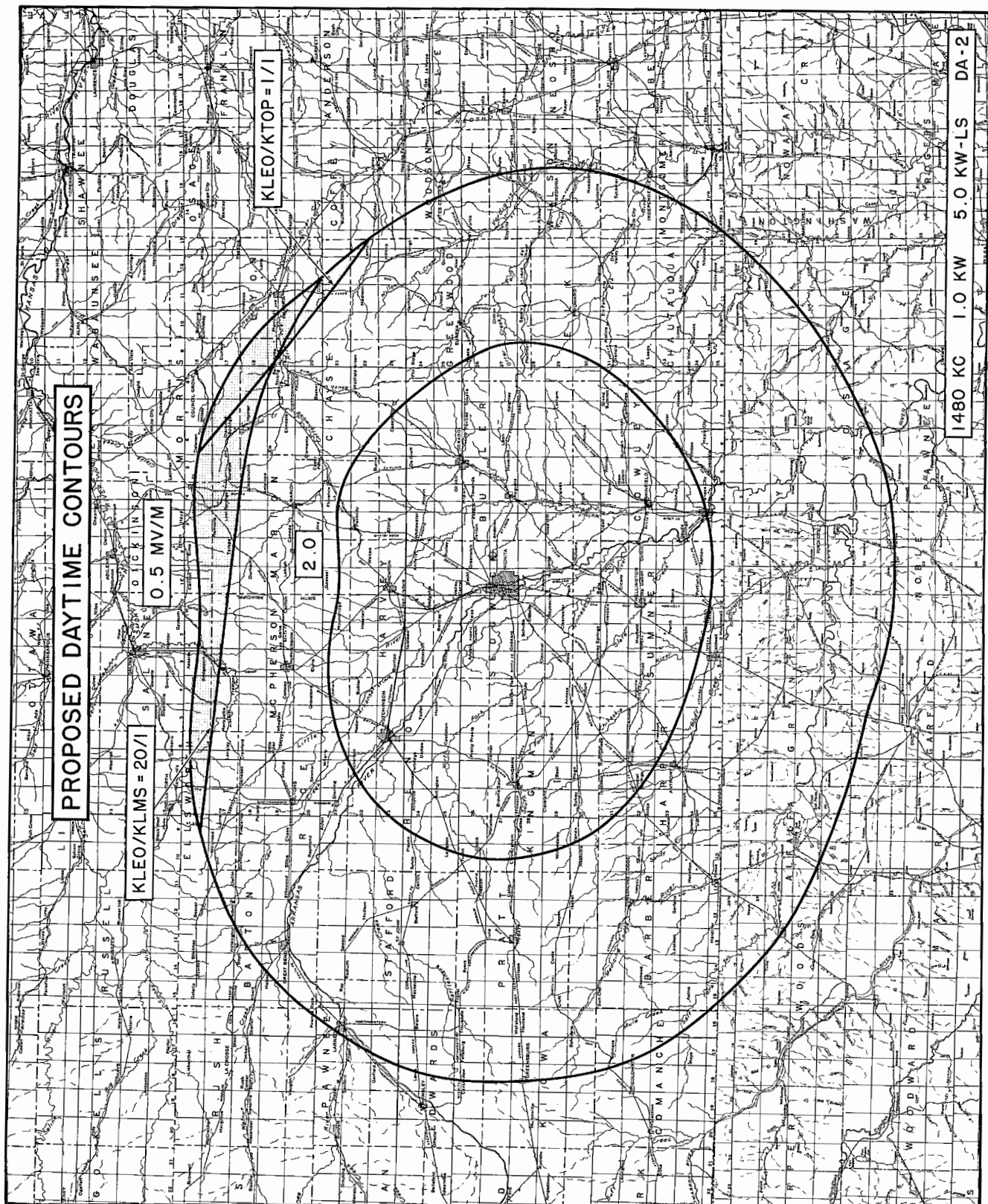
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RADIO STATION KLEO
 WICHITA, KANSAS
 660420.2 FIGURE 5A



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RADIO STATION KLEO
 WICHITA, KANSAS
 660420.2 FIGURE 5B



PROPOSED DAYTIME CONTOURS

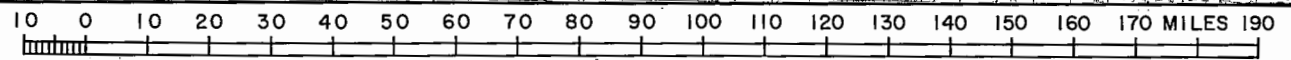
KLEO/KLMS = 20/1

0.5 MV/M

KLEO/KTOP = 1/1

2.0

1480 KC 1.0 KW 5.0 KW-LS DA-2



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RADIO STATION KLEO
 WICHITA, KANSAS
 660420.2 FIGURE 5C

RADIO STATION KLEO
WICHITA, KANSAS

AREA AND POPULATION ANALYSES
PROPOSED DAYTIME CONTOURS

<u>CONTOUR</u>	<u>AREA - SQ. MI.</u>	<u>POPULATION</u>
Within 1 v/m	0.56	7
25 mv/m	391	313,718
5 mv/m	2,952	397,666
2 mv/m	7,301	531,198
0.5 mv/m	23,908	676,383
Interference from KTOP alone	245	1,877
Interference from KLMS alone	794	4,351
Resulting Interference Free	23,071	671,047

TABULATION OF AZIMUTHS, INVERSE-DISTANCE FIELDS,
AND CONDUCTIVITIES USED IN THE STUDIES

RADIO STATION KLEO
WICHITA, KANSAS
1480 KC 1 KW 5 KW-LS DA-2

<u>Azimuth-Degrees</u>	<u>Present Eo-MV/M</u>	<u>Proposed Eo-MV/M</u>	<u>Conductivity</u>
00	240	179*	M-3
10	240	189	M-3
20	240	202	M-3
30	250	212	M-3
40	275	217	M-3
50	320	219	M-3
60	410	226	M-3
70	510	248	M-3
80	585	285	M-3
90	630	324	M-3
100	650	352	M-3
110	640	362	M-3
120	605	356	M-3
130	540	347	M-3
140	465	344	M-3
150	400	350	M-3
160	360	362	M-3
170	340	371	M-3
180	340	375	M-3
190	340	378	M-3
200	360	388	M-3
210	385	418	M-3
220	435	471	M-3
230	505	546	M-3
240	570	628	M-3
250	620	699	M-3
260	640	742	M-3
270	640	745	M-3
280	600	706	M-3
290	530	631	M-3
300	450	533	M-3
310	375	429	M-3
320	310	333	M-3
330	265	256	M-3
340	245	205	M-3
350	240	181	M-3

*MEOV is 10 mv/m greater than the computed pattern

TABULATION OF AZIMUTHS, INVERSE-DISTANCE FIELDS,
AND CONDUCTIVITIES USED IN THE STUDIES

RADIO STATION KTOP
TOPEKA, KANSAS
1490 KC 1.0 KW-ND

<u>Azimuth-Degrees</u>	<u>Eo-MV/M</u>	<u>Conductivity</u>
All	203	M-3

RADIO STATION KLMS
LINCOLN, NEBRASKA
1480 KC 1.0 KW-DA

110	65	M-3
120	95	M-3
130	128	M-3
140	162	M-3
150	200	M-3
160	231	M-3
170	253	M-3
180	264	M-3
190	272	M-3
200	281	M-3
210	295	M-3
220	306	M-3
230	312	M-3
240	312	M-3
250	308	M-3
260	298	M-3

RADIO STATION KANS
LARNED, KANSAS
1510 KC 1.0 KW-ND

All	226	M-3
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RADIO STATION KCRB
CHANUTE, KANSAS
1460 KC 1.0 KW-ND

All	190	M-3
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TABULATION OF AZIMUTHS, INVERSE-DISTANCE FIELDS,
AND CONDUCTIVITIES USED IN THE STUDIES

RADIO STATION KBEA
MISSION, KANSAS
1480 KC 1.0 KW-DA

<u>Azimuth-Degrees</u>	<u>Eo-MV/M</u>	<u>Conductivity</u>
356	15	M-3
20	60	M-3
40	186	M-3
60	266	M-3
80	320	M-3
100	347	M-3
120	344	M-3
140	315	M-3
160	242	M-3
180	155	M-3
200	80	M-3
210	48	M-3
220	23	M-3
225	13.5	M-3
242	18.2	M-3
265	15	M-3
290	19.5	M-3
315	23	M-3
340	18.5	M-3

RADIO STATION KVIN
VINITA, OKLAHOMA
1470 KC 0.5 KW-ND

A11	138	M-3
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RADIO STATION KRAN
PHILLIPSBURG, KANSAS
1490 KC 1.0 KW-ND

A11	199	M-3
-----	-----	-----

RADIO STATION KRW
GUTHRIE, OKLAHOMA
1490 KC 0.1 KW-ND

A11	49.5	M-3
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TABULATION OF AZIMUTHS, INVERSE-DISTANCE FIELDS,
AND CONDUCTIVITIES USED IN THE STUDIES

RADIO STATION KTHS
BERRYVILLE, ARKANSAS
1480 KC 1.0 KW-ND

<u>Azimuth-Degrees</u>	<u>Eo-MV/M</u>	<u>Conductivity</u>
A11	176	M-3

RADIO STATION KBIX
MUSKOGEE, OKLAHOMA
1490 KC 1.0 KW-ND

A11	150	M-3
-----	-----	-----

RADIO STATION KWBW
HUTCHINSON, KANSAS
1450 KC 1.0 KW-ND

A11	196	M-3
-----	-----	-----

RADIO STATION KLIB
LIBERAL, KANSAS
1470 KC

	<u>0.5 KW-ND</u>	<u>1.0 KW-ND</u>	
<u>Present Operation</u>	<u>Proposed Operation</u>		
A11	Eo = 130	Eo = 184	M-3

PART III

PROPOSED NIGHTTIME OPERATION

Part III contains the following in connection with the proposed nighttime operation:

1. Conditions for proposed nighttime operation
2. Directional antenna design formula
3. Directional antenna calculations
- 4A. Nighttime directional antenna radiation data
- 4B. Nighttime horizontal radiation pattern
- 4C. Nighttime conical radiation patterns
- 4D. Nighttime vertical radiation patterns
- 5A. Map showing the nighttime 1-v/m contour
- 5B. Map showing the nighttime 25- and 5-mv/m contours
- 5C. Map showing the nighttime 2.5 mv/m contour and the contour free of interference
6. Tabulation of area and population analyses
- 7A. Nighttime allocation map showing pertinent co-channel stations
- 7B. Studies of nighttime limitations

RADIO STATION KLEO
WICHITA, KANSAS

CONDITIONS FOR PROPOSED NIGHTTIME OPERATION

Frequency	1480 kilocycles
Power	1 kw directional
Number of Towers	4 towers of 5 towers
Type of Towers	Triangular, uniform cross-section, guyed, vertical, steel towers
Excitation of Towers	Series Feed
Height of Elements Without Beacon	166 feet above insulator
Without Beacon	169 feet above ground
Without Beacon	1549 feet above sea level
With Beacon	1552 feet above sea level
Spacing and Orientation	Five towers arranged to form two parallelograms. The four towers used for nighttime operation (Towers 1, 2, 4, and 5) form a parallelogram with long sides 394.8 feet (214°) long and bearing N 185° E and short sides 166 feet (90°) long and bearing N 205° E. Tower 3 used for daytime operation only is located 166 feet (90°) from tower 4 on a bearing N 25° E.
Ground System	120 copper radials 166 feet long buried 2 to 4 inches out to 30 feet and 6 to 8 inches beyond 30 feet plus 120 copper radials 30 feet long buried 2 to 4 inches equally spaced about each tower. Intersecting radials are shortened and bonded to transverse copper busses midway between adjacent towers.
Geographic Coordinates	North Latitude 37° 43' 28" West Longitude 97° 12' 57"

RADIO STATION KLEO
WICHITA, KANSAS

DIRECTIONAL ANTENNA DESIGN FORMULA

$$F(E) = 1.000 F_{\theta} \frac{/0.0}{+ 0.800 F_{\theta} \frac{/ -111 + 90 \cos (\theta - 205) \cos \theta}{+ 0.500 F_{\theta} \frac{/ -4 + 214 \cos (\theta - 185) \cos \theta}{+ 0.400 F_{\theta} \frac{/ -115 + 300.2 \cos (\theta - 190.9) \cos \theta}}$$

$$K = 1 - \cos G$$

$$P = \sum_{n=1}^{n=4} (R_n \times I_n^2)$$

$$E = 37.25 \times I \times K \times F(E) F(\theta)$$

Where:

ϕ is the azimuthal bearing from true north

θ is the vertical angle above the horizon

F_{θ} is the vertical radiation factor of the tower

G is the electrical height of the towers

R_n is the base resistance of the nth tower operating directionally

I_n is the base current of the nth tower operating directionally

K is the form factor for the towers

I is the unit vector current for the antenna system

E is the computed inverse-distance field at one mile at any azimuth ϕ and vertical angle θ

P is the total power into the array

RADIO STATION KLEO
WICHITA, KANSAS

DIRECTIONAL ANTENNA CALCULATIONS

GIVEN:

Rated Power	1 kilowatt
Tower Height	166 feet

ASSUMED:

Current distribution in elements	sinusoidal
Electrical height of elements	90 degrees
Surface of earth	plane
Conductivity of earth	infinite
Coupling equipment losses	5.0 percent
Antenna and power losses	1.0 ohm at base of towers

EXPECTED RESULTS:

Tower Number	1	2	3	4	5
Tower Location	N	W	E	S	SW
Relative Phase, Degrees	0	-111	-	-4	-115
Relative Field	1.00	0.80	-	0.50	0.40
Base Current, Amperes	4.79	3.83	-	2.40	1.92
Base Resistance, Ohms	19.4	48.4	-	-31.5	13.9
Base Power, Watts	445	710	-	-181	51
Vector Current	I is 4.79 amperes				
Form Factor	K is 1.0				
Inverse-Distance Field	E = 178.4 x F(E) x F(θ) mv/m				

RADIO STATION KLEO
WICHITA, KANSAS

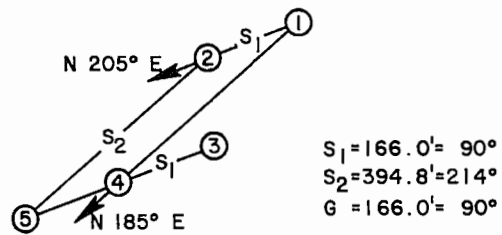
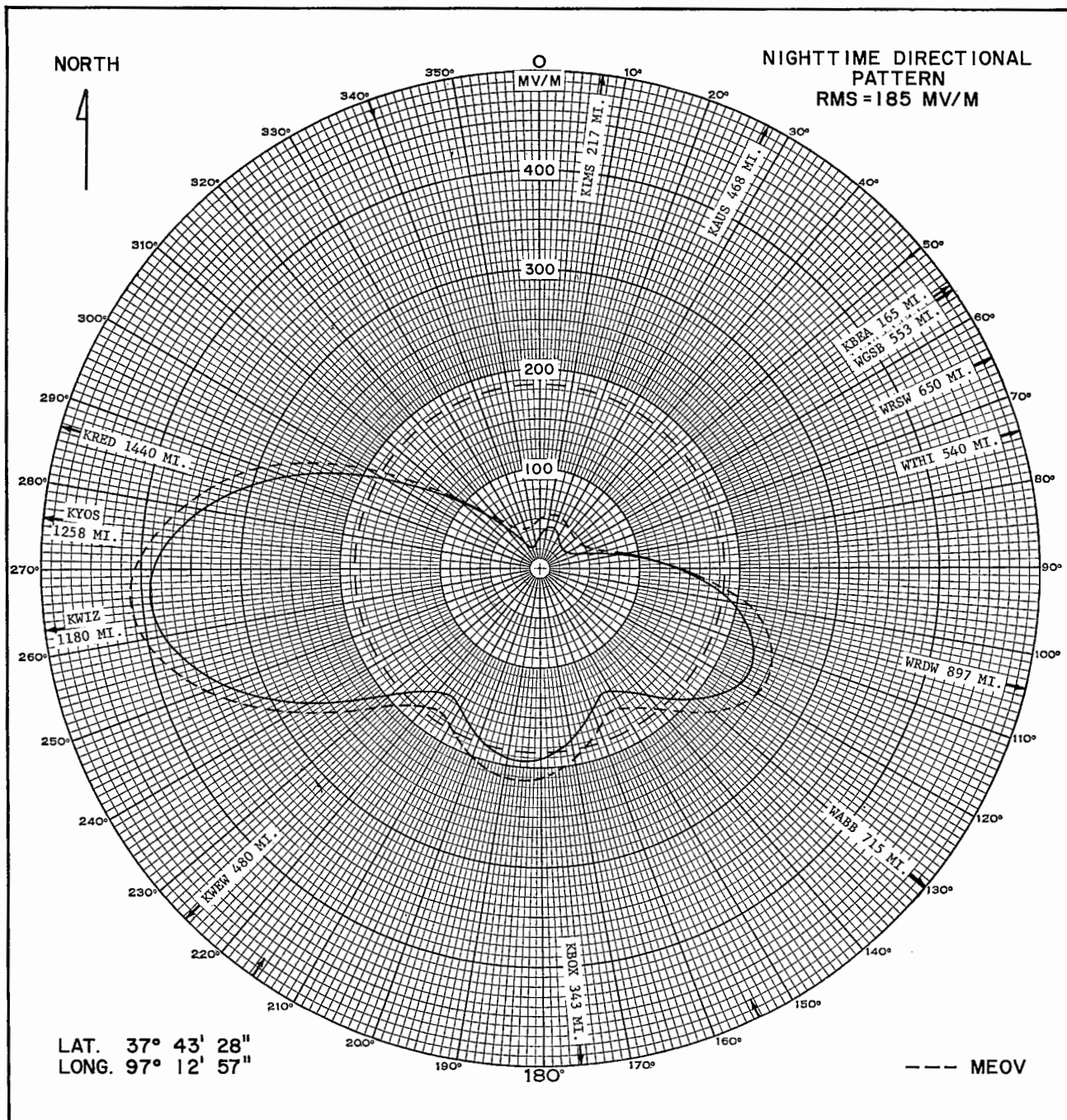
PROPOSED NIGHTTIME DIRECTIONAL ANTENNA RADIATION DATA - MV/M

AZIMUTH	VERTICAL ANGLE θ - DEGREES												
	0	5	10	15	20	25	30	35	40	45	50	55	60
000	33.5	32.7	30.1	26.4	22.1	18.0	15.0	13.7	14.6	17.6	22.4	28.2	33.9
010	41.2	40.1	36.9	32.2	26.6	21.1	16.6	13.7	13.2	15.3	19.6	25.4	31.3
020	40.1	41.0	37.8	33.2	27.7	22.2	17.6	14.5	13.5	15.2	19.2	24.9	30.9
030	36.8	35.9	33.4	29.8	25.5	21.4	17.9	15.5	15.0	16.8	21.1	26.8	32.6
040	30.5	30.0	28.5	26.3	23.8	21.1	18.9	17.5	17.9	20.7	25.5	31.2	36.5
050	29.2	28.8	27.9	26.4	24.6	22.8	21.7	21.9	24.1	28.2	33.4	38.6	42.7
060	30.8	30.6	29.9	29.1	28.5	28.6	29.9	32.6	36.5	41.1	45.6	49.3	51.4
070	42.0	42.1	42.6	43.6	45.2	47.5	50.5	53.4	57.2	60.3	62.4	63.2	62.1
080	79.5	79.7	80.3	81.2	82.4	83.6	84.8	85.5	85.7	84.9	82.9	79.5	74.3
090	136	136	135	134	132	130	127	123	118	112	105	96.5	86.8
100	192	191	189	185	180	174	166	158	148	137	125	112	98.4
110	228	226	224	219	212	203	193	182	169	155	140	124	108
120	231	230	227	223	217	210	200	190	177	163	148	132	114
130	204	204	203	201	198	194	189	182	172	162	149	134	117
140	166	166	166	166	166	166	164	162	158	152	144	132	117
150	143	142	141	140	139	139	140	141	141	140	135	127	116
160	152	150	146	139	133	127	125	125	126	128	127	122	114
170	174	172	165	154	142	130	121	117	117	119	121	119	112
180	191	188	179	167	151	136	123	116	114	116	118	117	112
190	193	190	182	169	153	138	125	118	116	118	120	119	114
200	181	178	171	160	147	135	126	122	123	125	127	125	118
210	162	161	156	150	143	138	135	135	137	139	138	133	123
220	161	160	159	158	157	157	159	160	160	159	154	144	130
230	198	198	199	199	199	199	198	196	191	183	171	156	138
240	267	266	265	262	258	253	245	235	222	206	188	167	144
250	337	336	332	324	314	302	286	268	247	224	200	174	147

RADIO STATION KLEO
WICHITA, KANSAS

PROPOSED NIGHTTIME DIRECTIONAL ANTENNA RADIATION DATA - MV/M

AZIMUTH	VERTICAL ANGLE θ - DEGREES												
	0	5	10	15	20	25	30	35	40	45	50	55	60
260	383	380	374	363	348	330	309	285	259	232	203	175	146
270	386	383	376	364	348	328	305	280	253	225	197	168	141
280	343	341	335	325	311	294	274	252	229	205	180	155	130
290	267	266	262	256	246	235	222	207	191	174	155	136	117
300	180	180	178	176	172	168	162	155	147	137	126	114	101
310	104	104	105	105	106	106	106	106	104	102	97.8	92.2	84.8
320	53.9	54.2	54.9	56.2	58.0	60.4	63.1	66.1	68.9	71.2	72.4	72.0	69.7
330	30.0	30.0	30.3	30.8	31.8	33.5	36.1	39.5	43.7	48.1	52.2	55.3	56.7
340	21.1	21.0	20.7	20.4	20.3	20.7	21.9	24.2	27.8	32.5	37.7	42.6	46.4
350	23.7	23.2	21.8	19.9	17.9	16.3	15.7	16.5	18.9	22.9	28.1	33.8	38.8



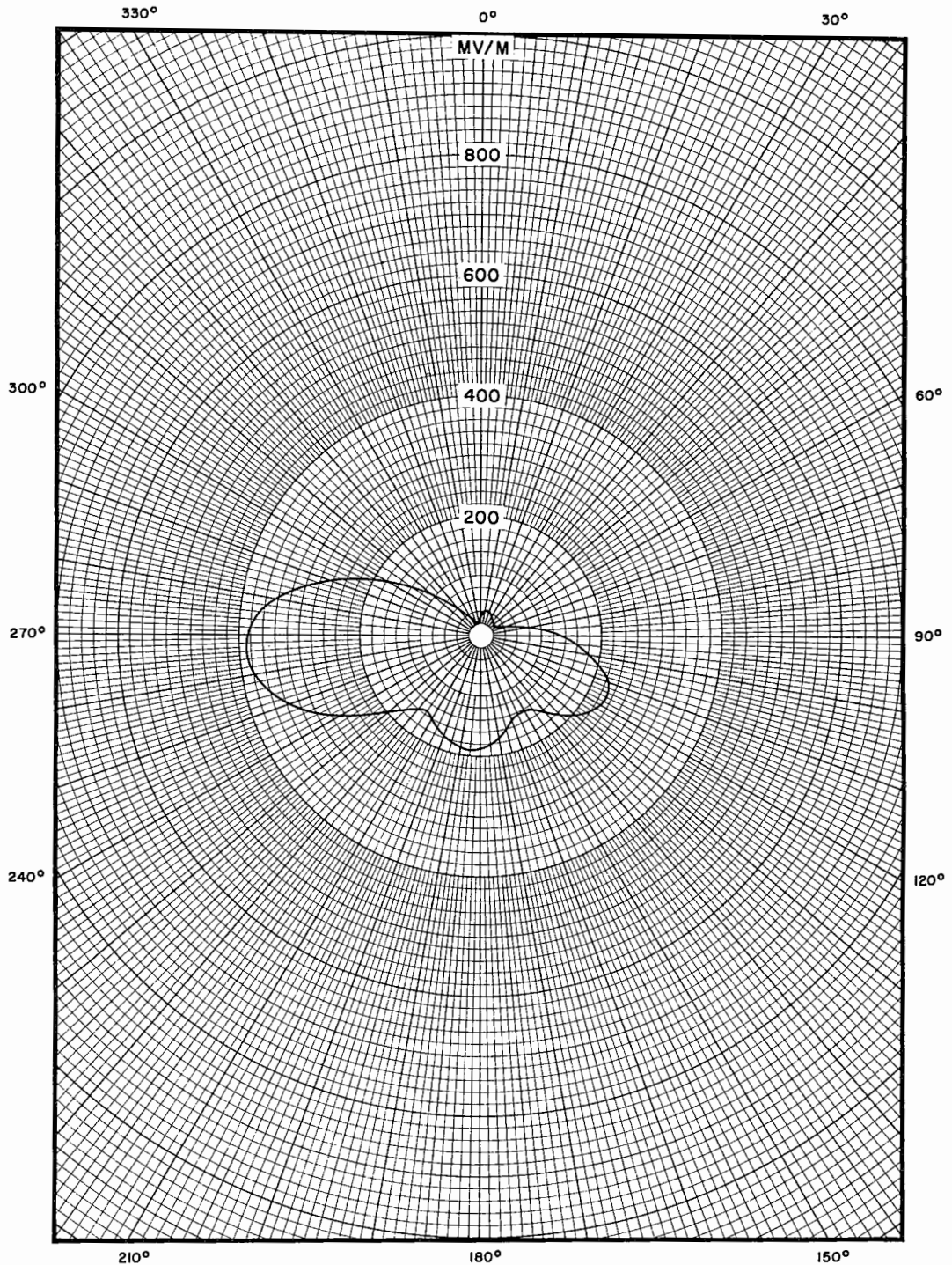
THEORETICAL PARAMETERS

<u>TOWER</u>	<u>FIELD</u>	<u>PHASE</u>
1	1.000	0.00°
2	0.800	-111.00°
3	-	-
4	0.500	-4.00°
5	0.400	-115.00°

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CONSULTING ENGINEERS

RADIO STATION KLEO
1480 KC 1 KW 5 KW-LS DA-2
660420.3 FIGURE 4B

CONICAL SECTION

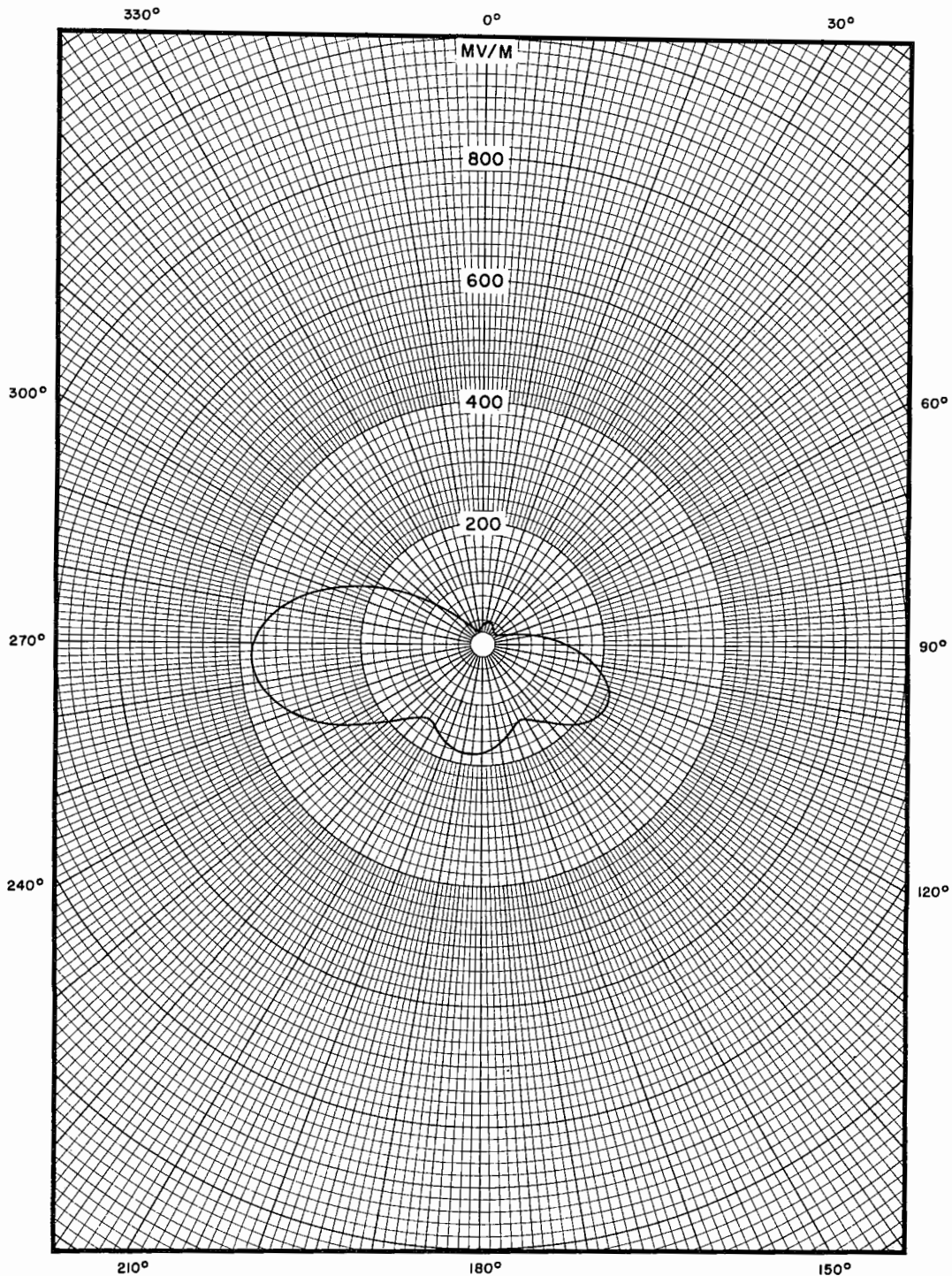


VERTICAL ANGLE $\theta = 5^\circ$

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RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-1

CONICAL SECTION

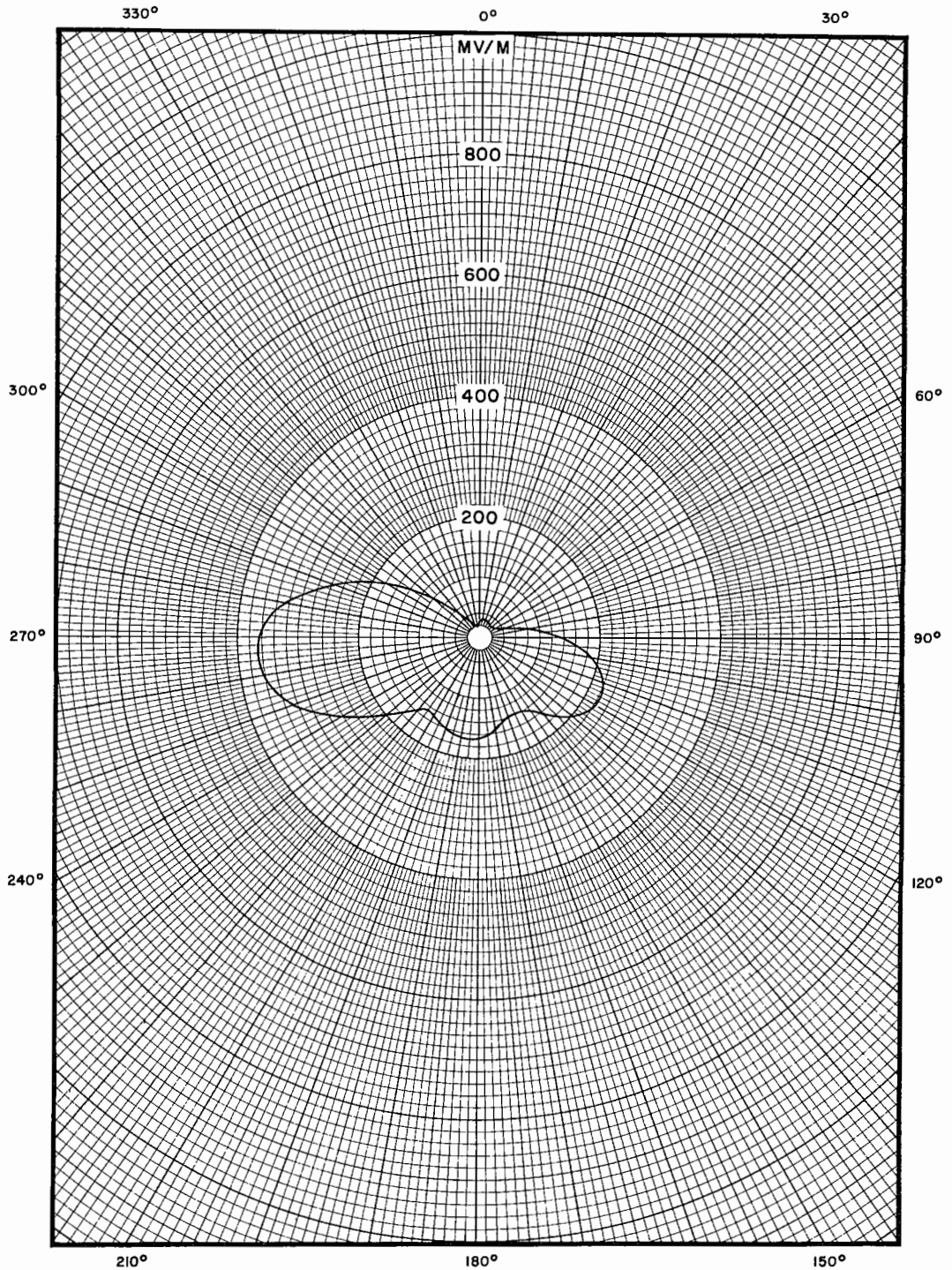


VERTICAL ANGLE $\theta = 10^\circ$

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RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-2

CONICAL SECTION

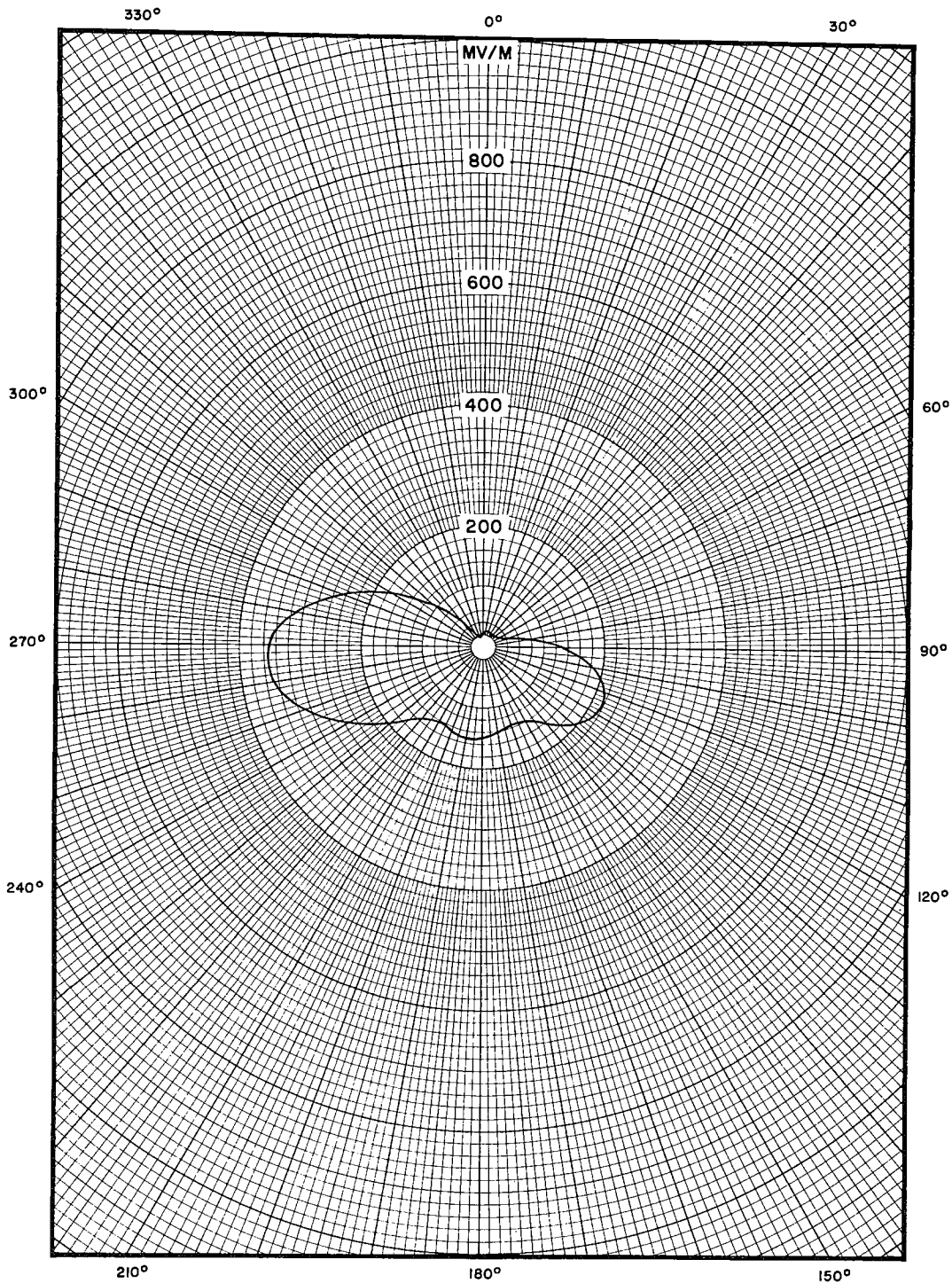


VERTICAL ANGLE $\theta = 15^\circ$

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RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-3

CONICAL SECTION

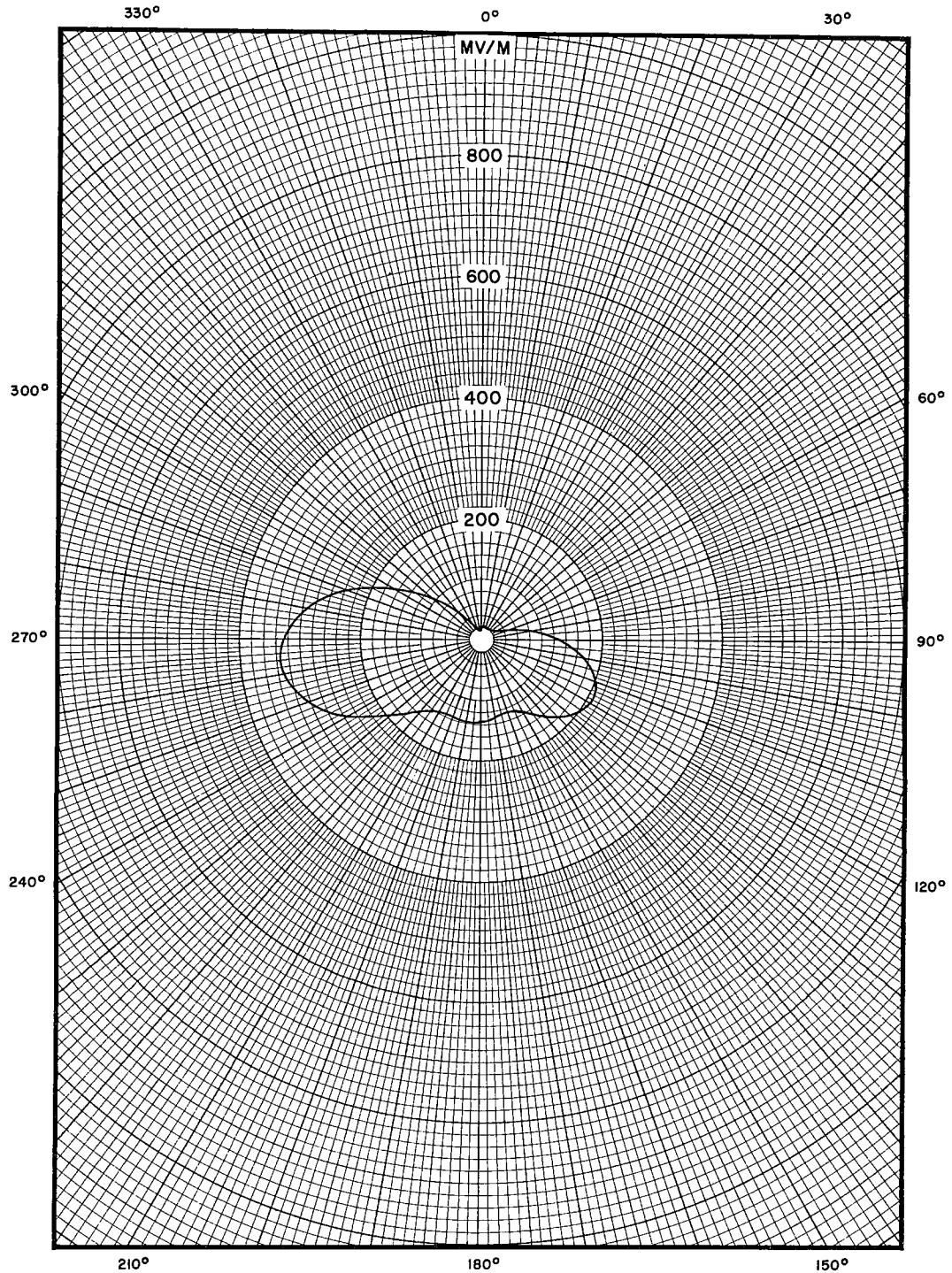


VERTICAL ANGLE $\theta = 20^\circ$

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RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-4

CONICAL SECTION

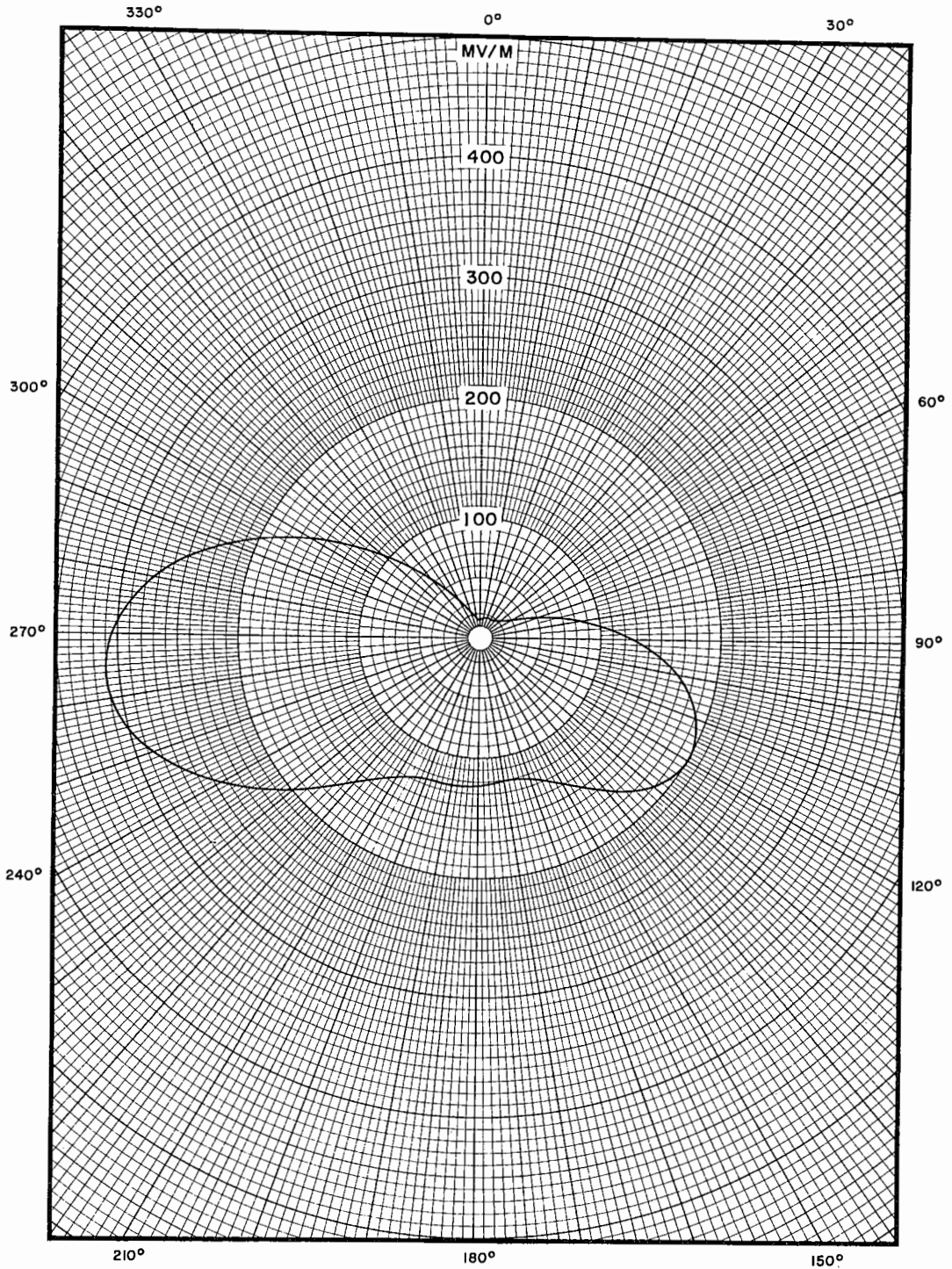


VERTICAL ANGLE $\theta = 25^\circ$

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RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-5

CONICAL SECTION

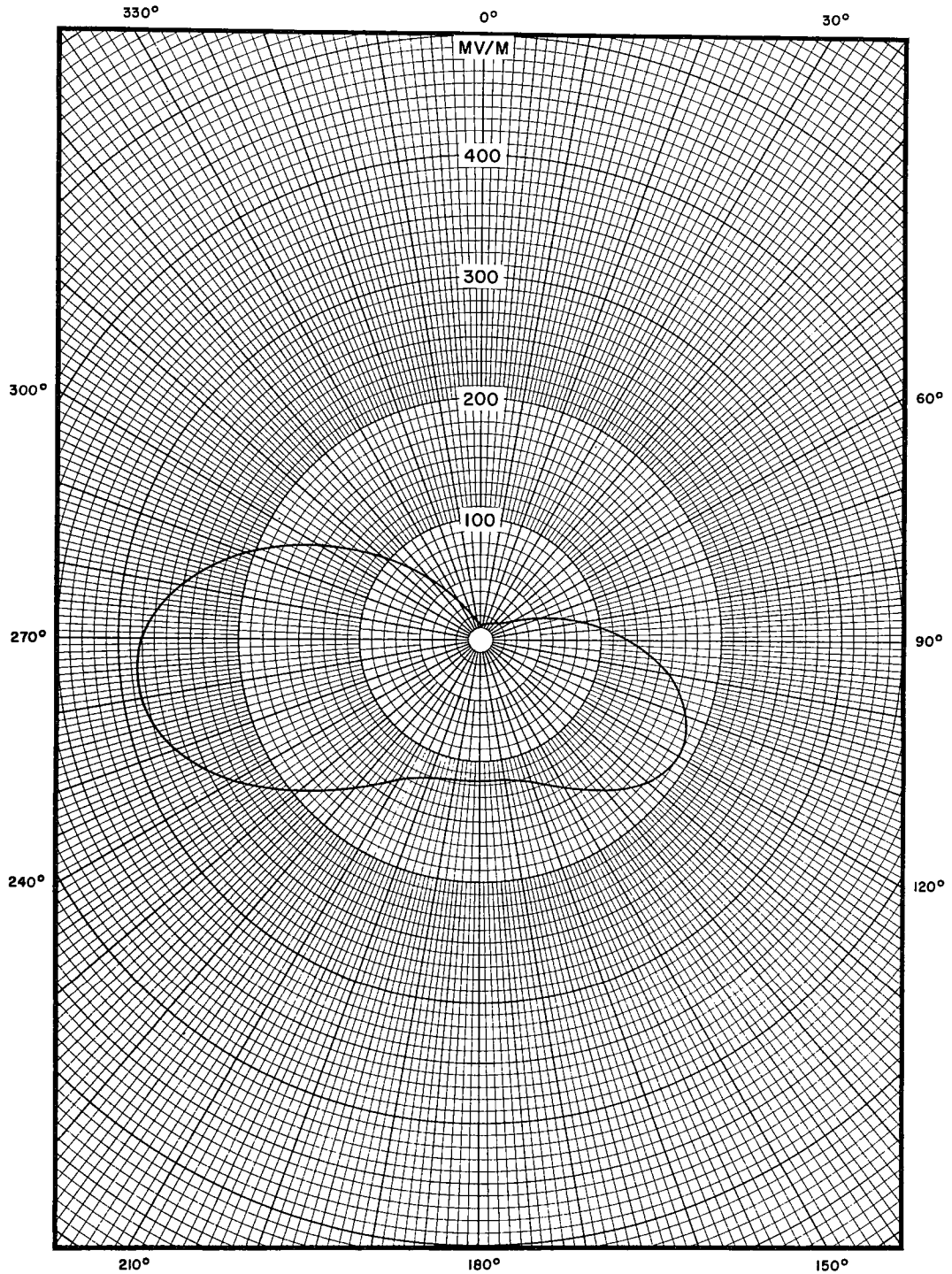


VERTICAL ANGLE $\theta = 30^\circ$

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RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-6

CONICAL SECTION

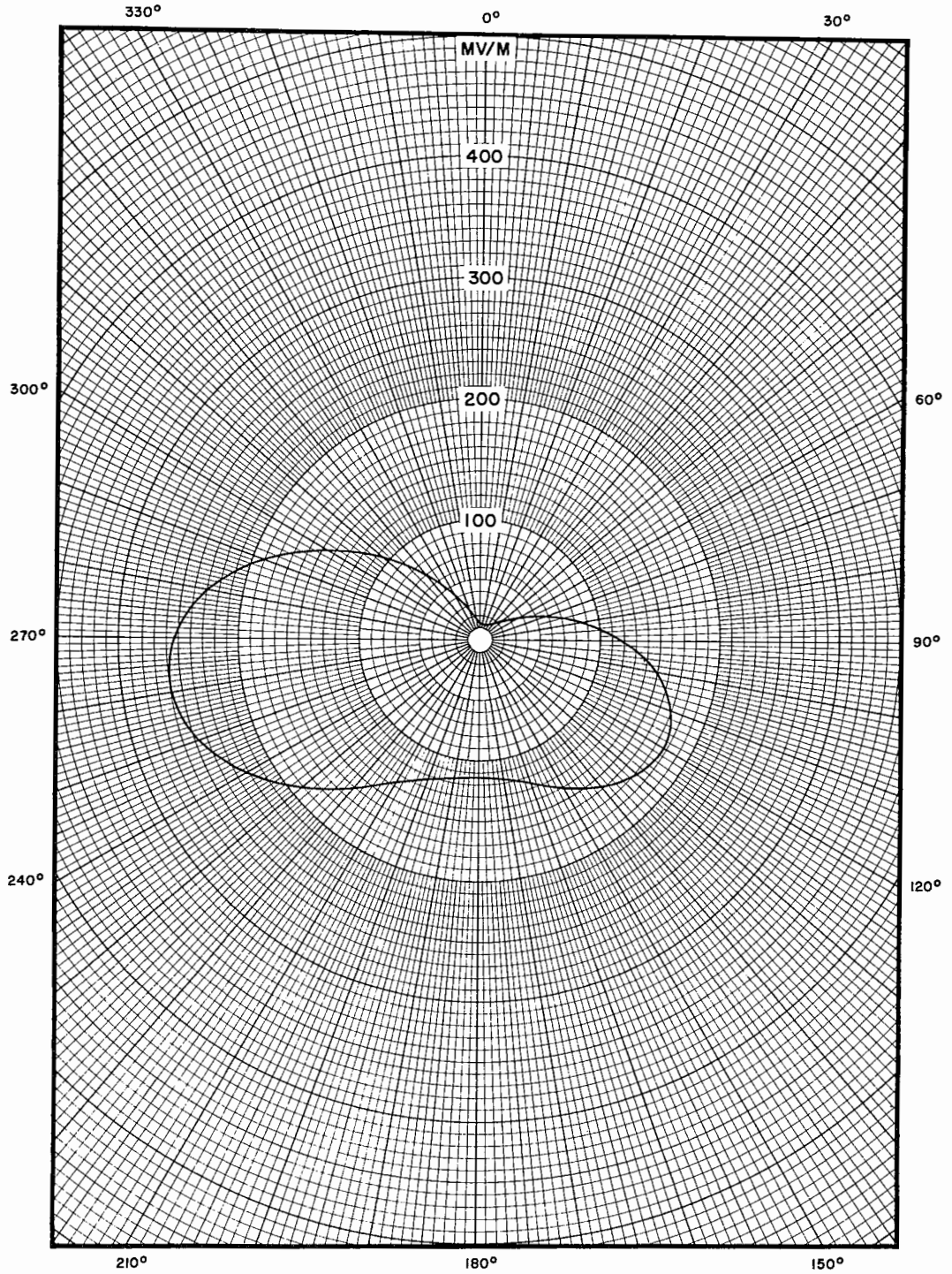


VERTICAL ANGLE $\theta = 35^\circ$

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RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-7

CONICAL SECTION

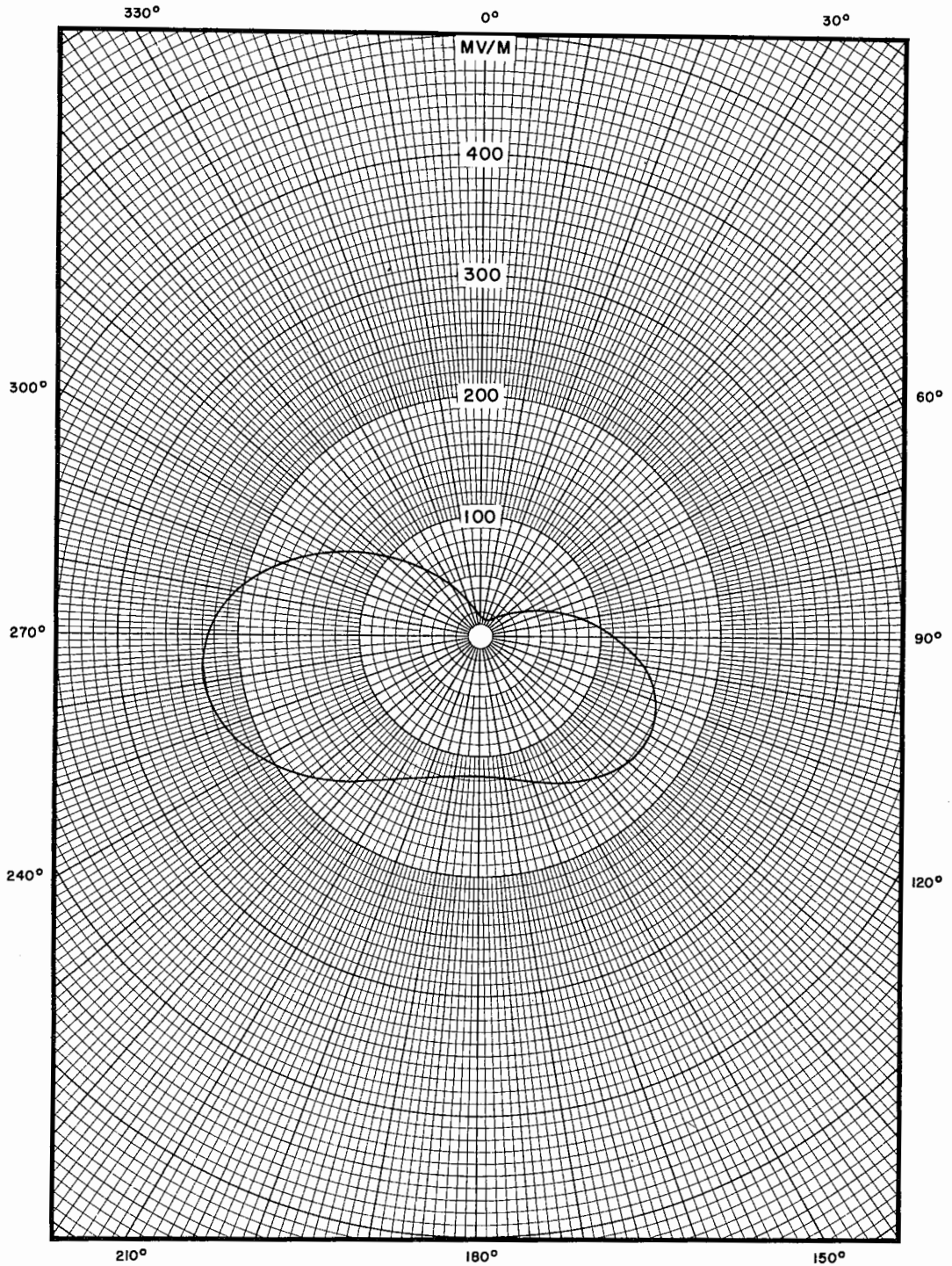


VERTICAL ANGLE $\theta = 40^\circ$

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RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-8

CONICAL SECTION

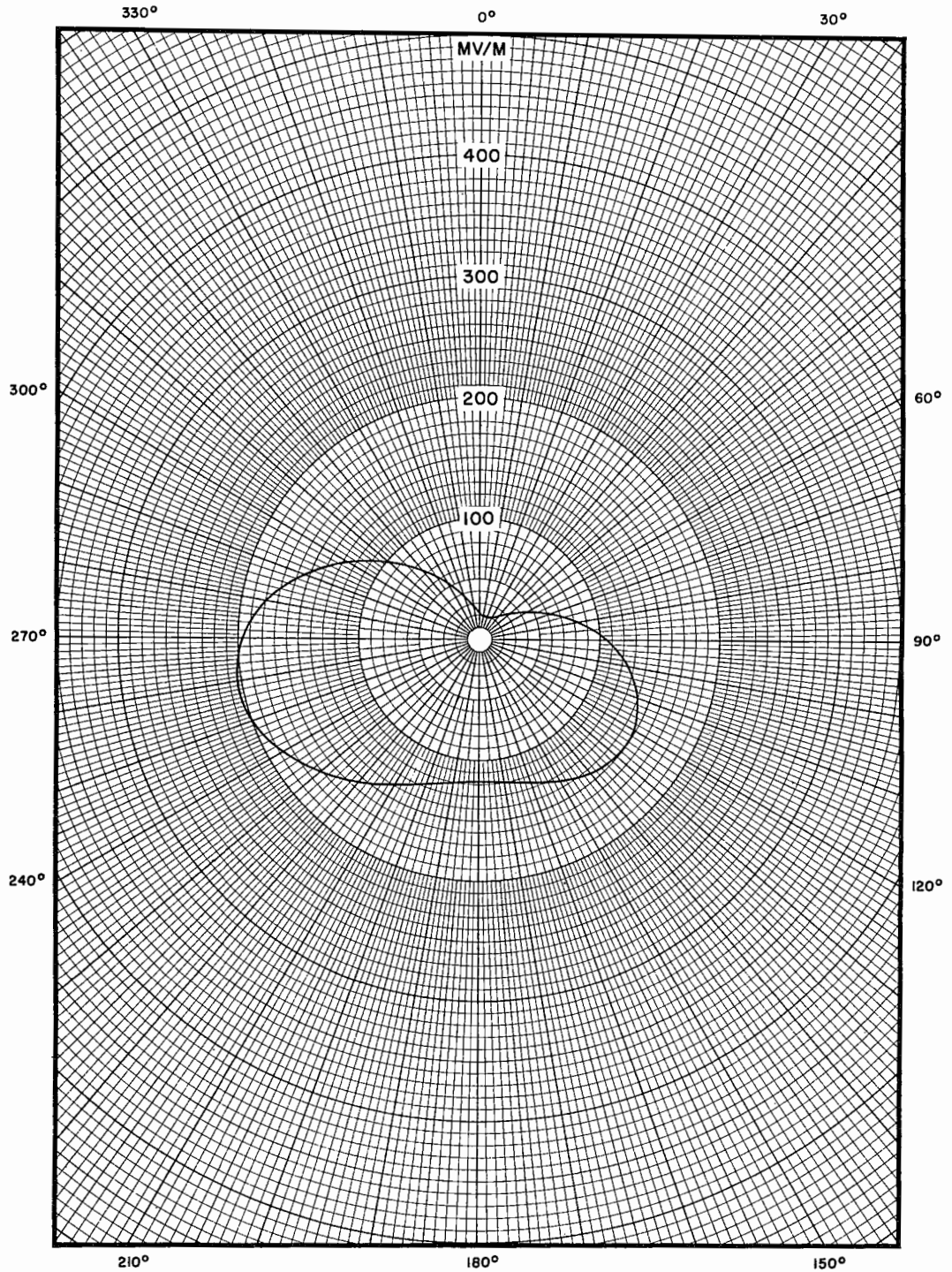


VERTICAL ANGLE $\theta = 45^\circ$

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RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-9

CONICAL SECTION

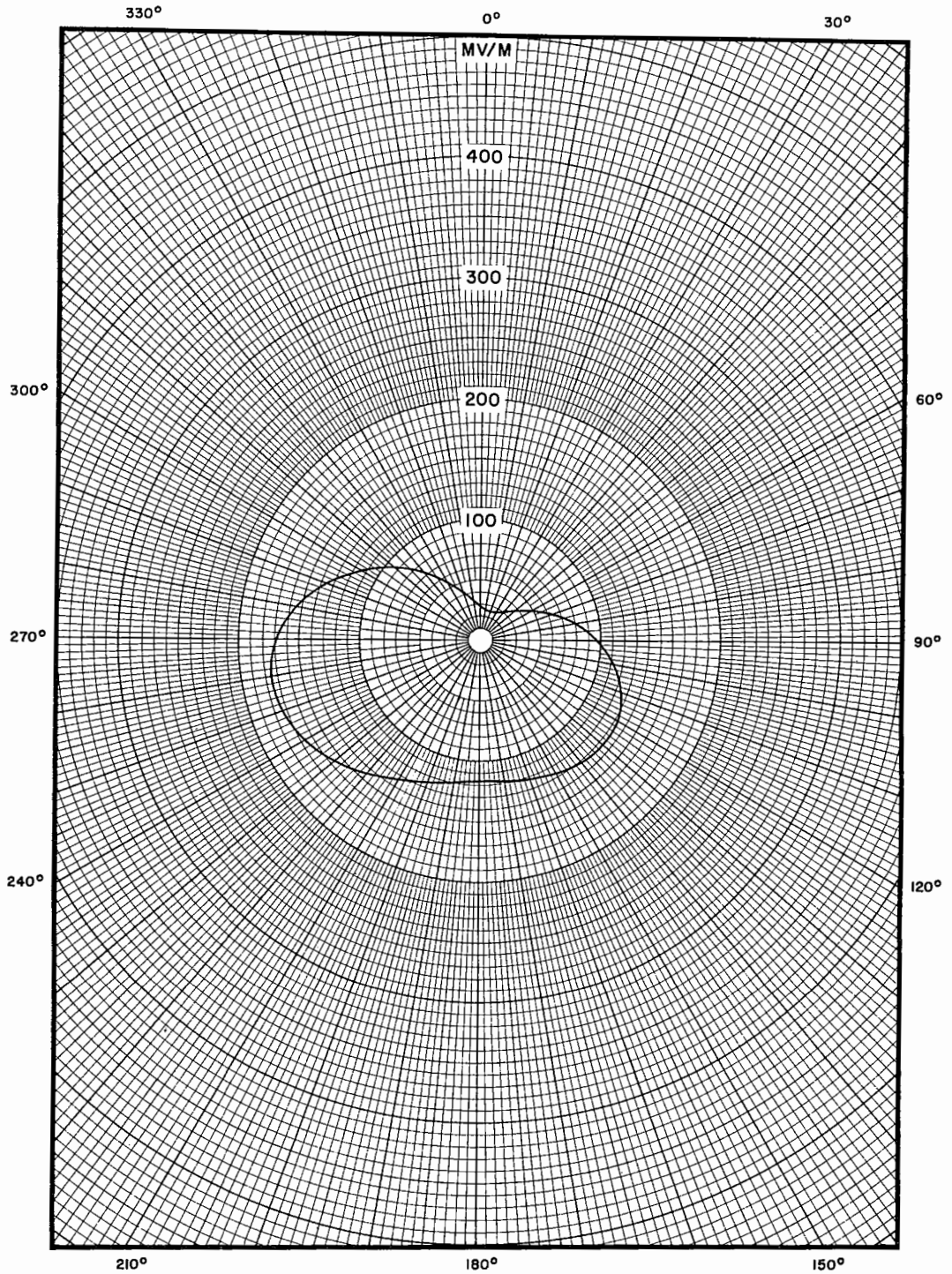


VERTICAL ANGLE $\theta = 50^\circ$

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RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-10

CONICAL SECTION

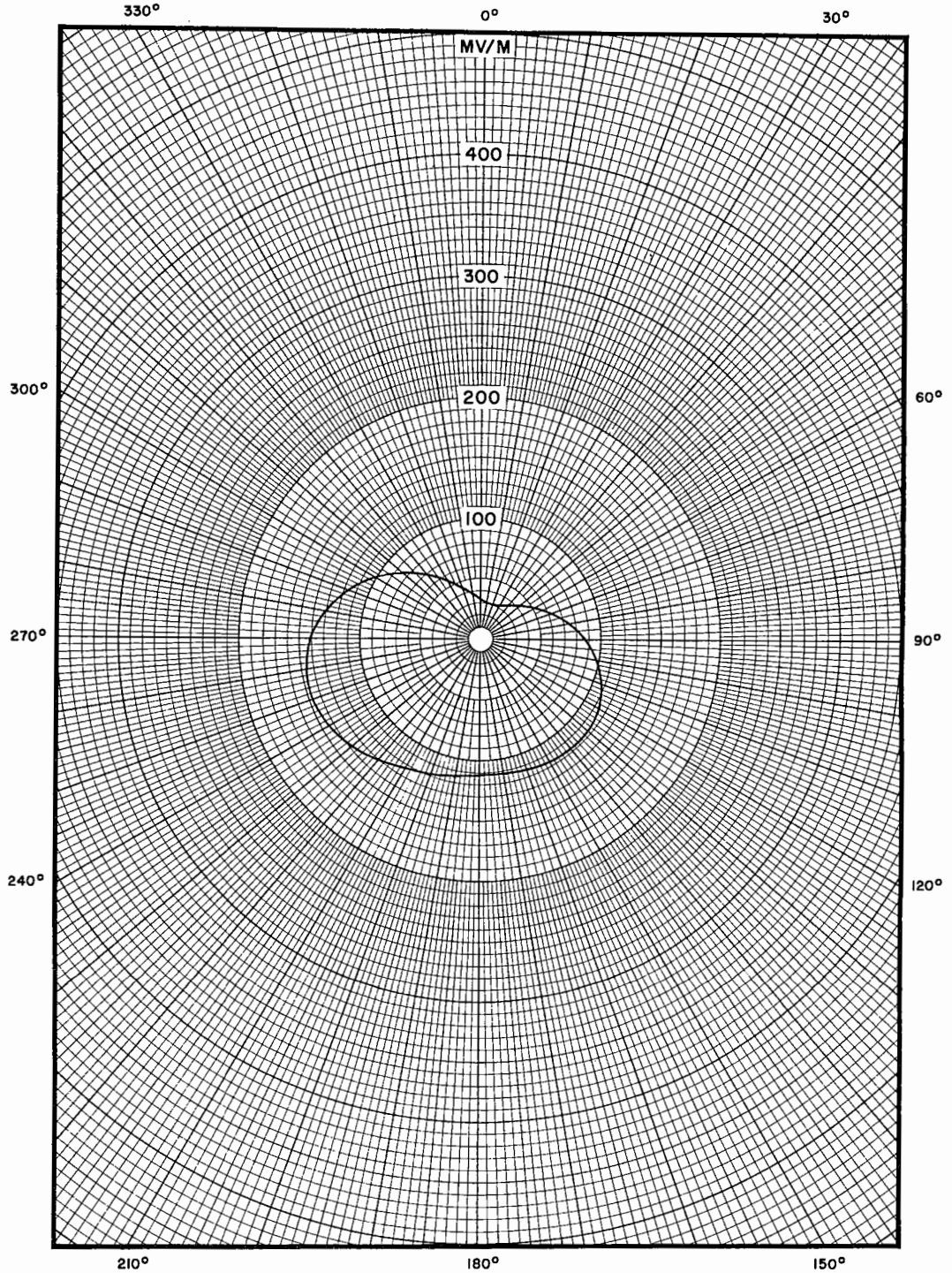


VERTICAL ANGLE $\theta = 55^\circ$

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RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-11

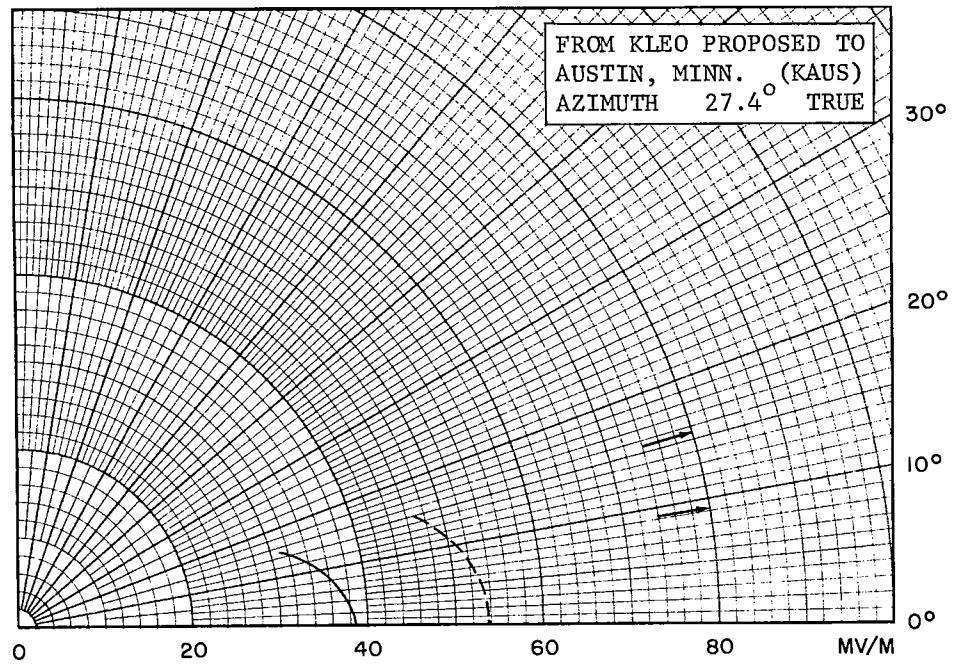
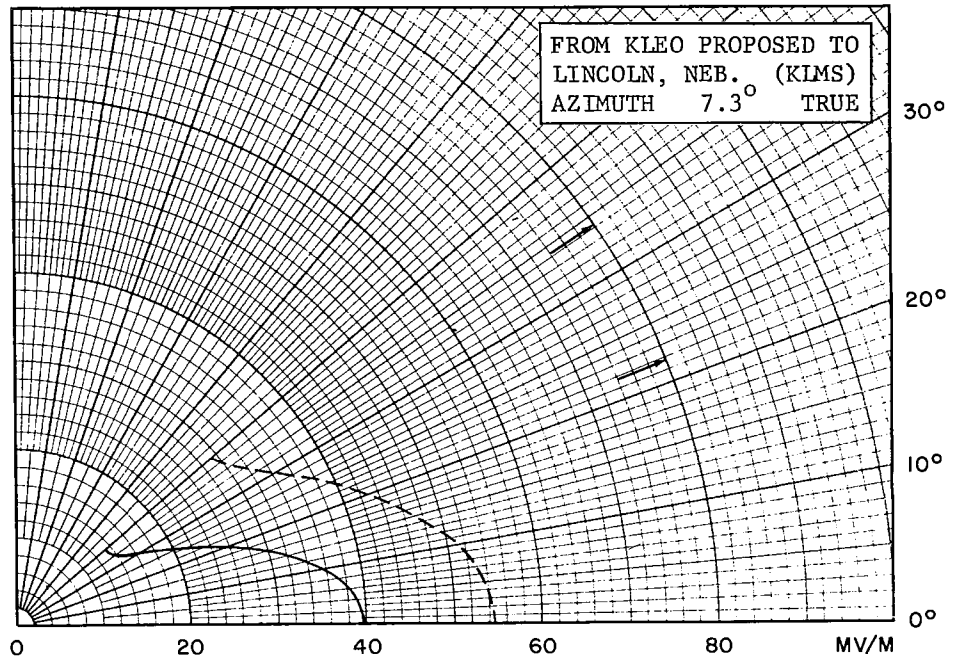
CONICAL SECTION

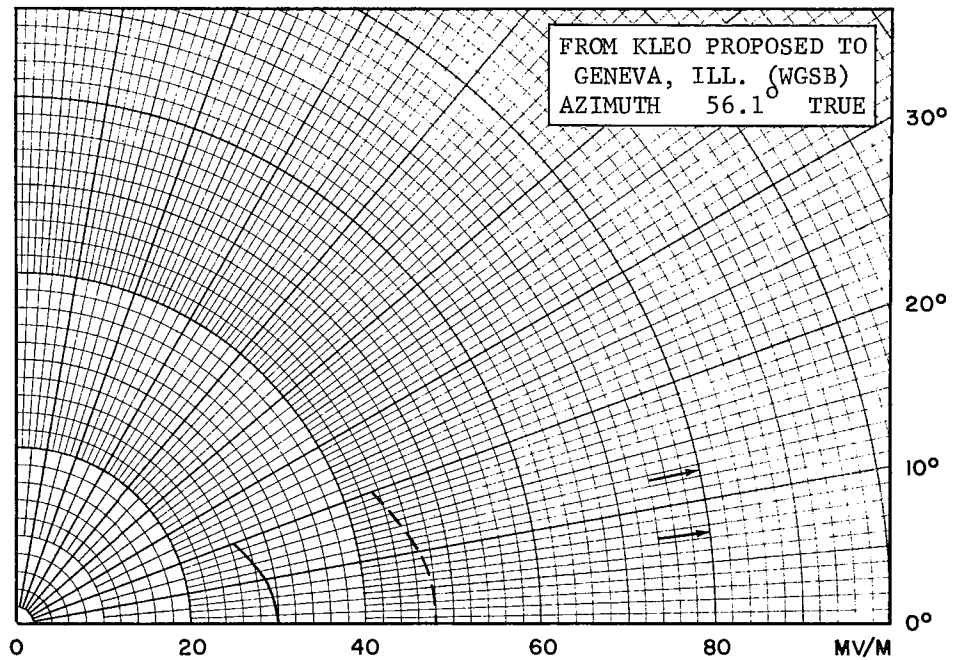
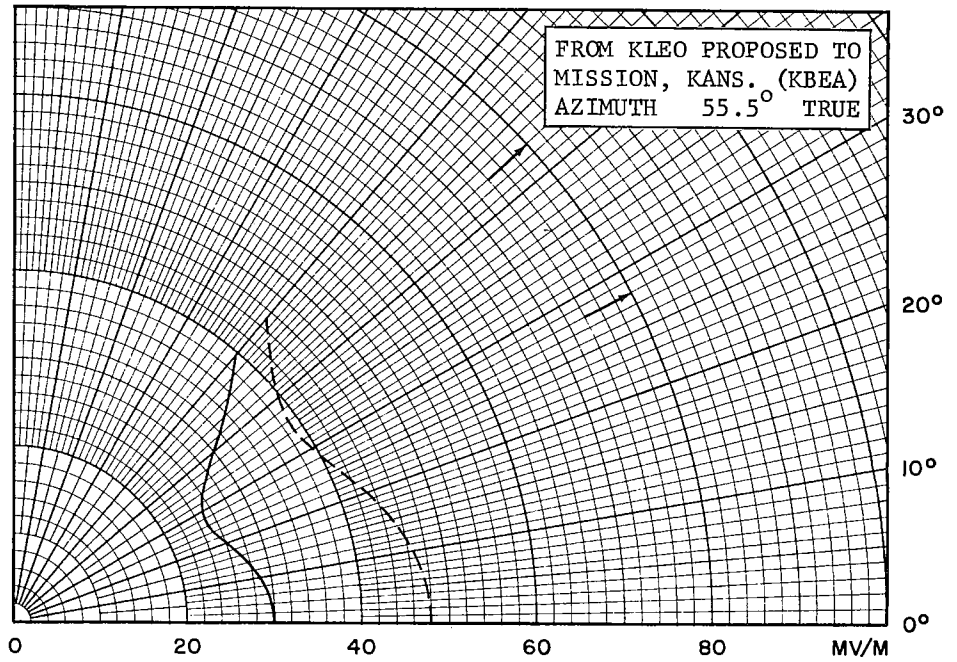


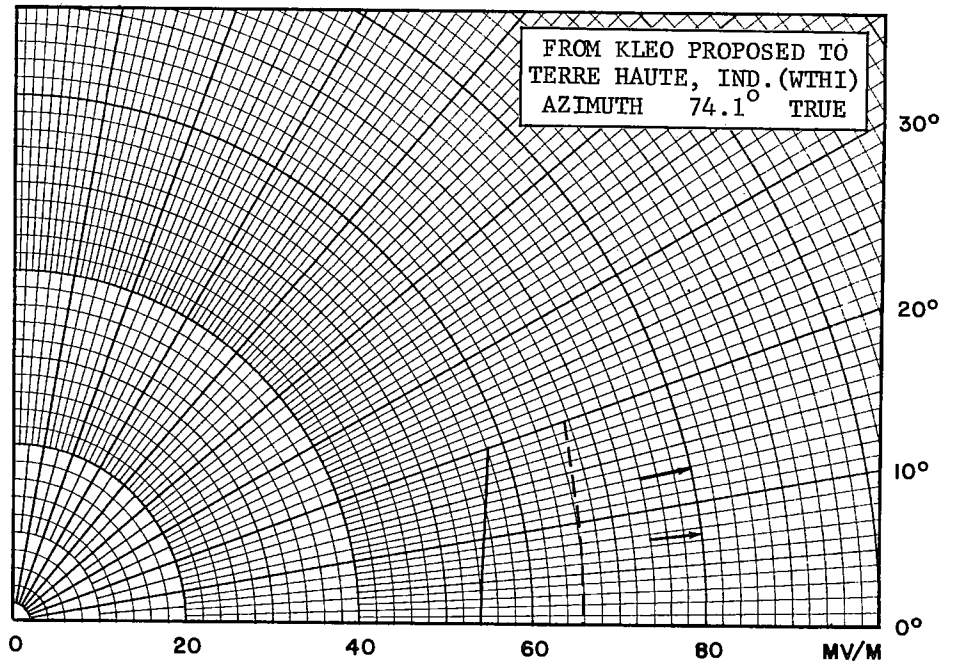
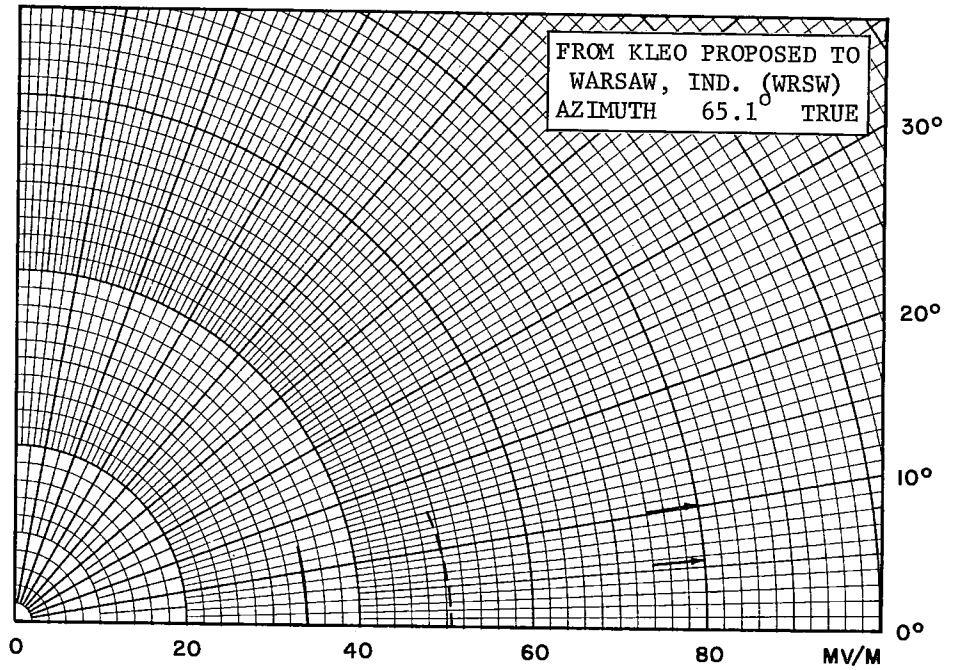
VERTICAL ANGLE $\theta = 60^\circ$

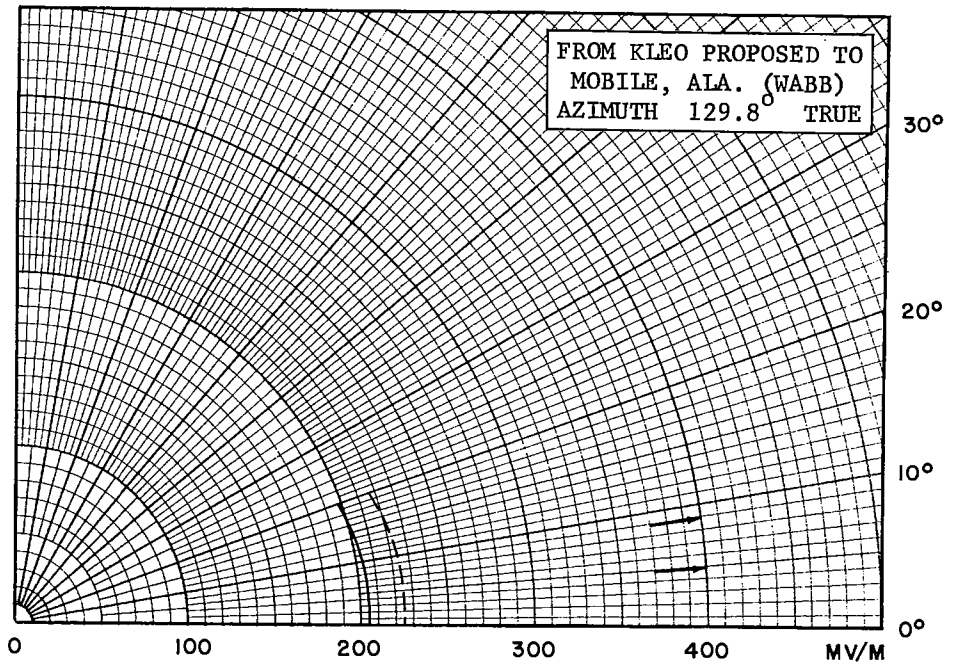
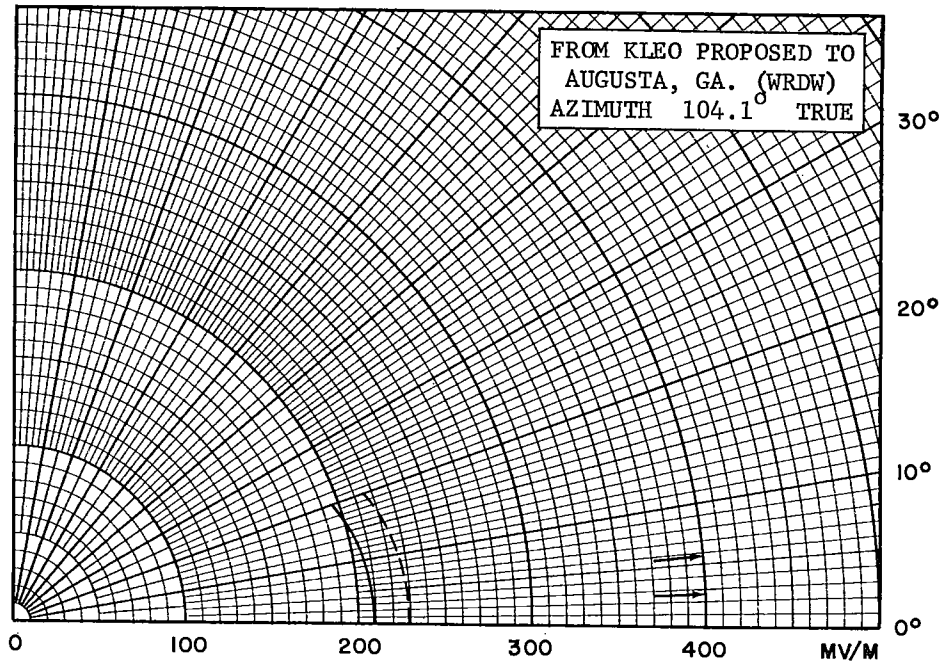
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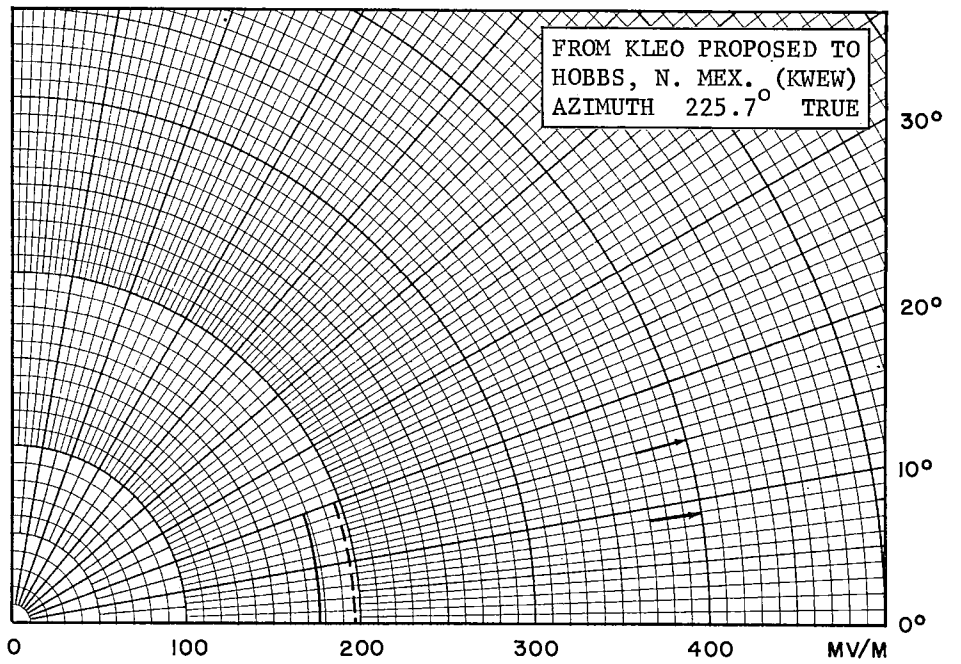
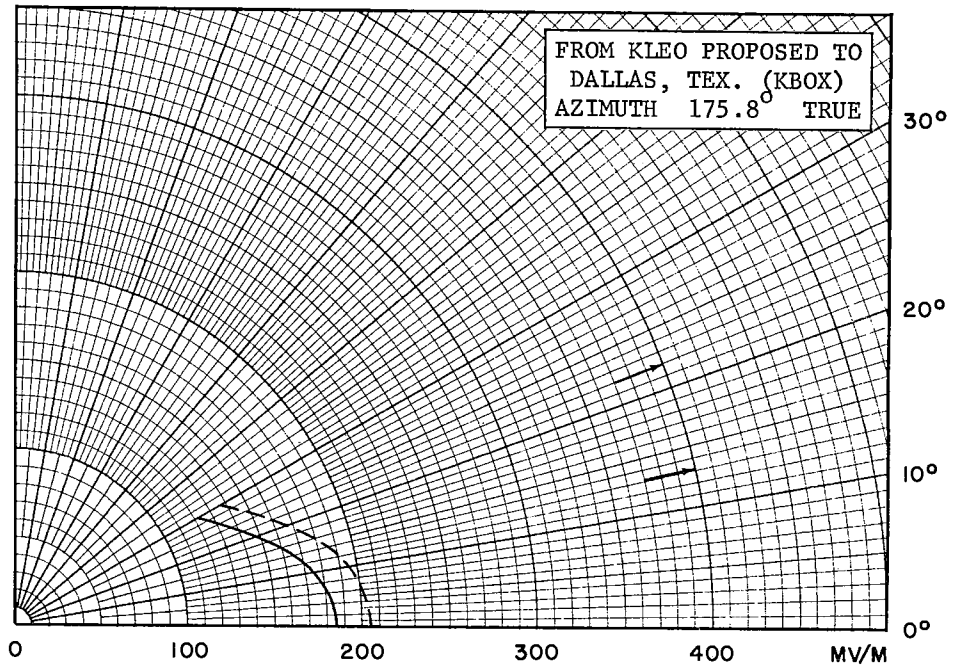
RADIO STATION KLEO
WICHITA, KANSAS
660420.3 FIGURE 4C-12

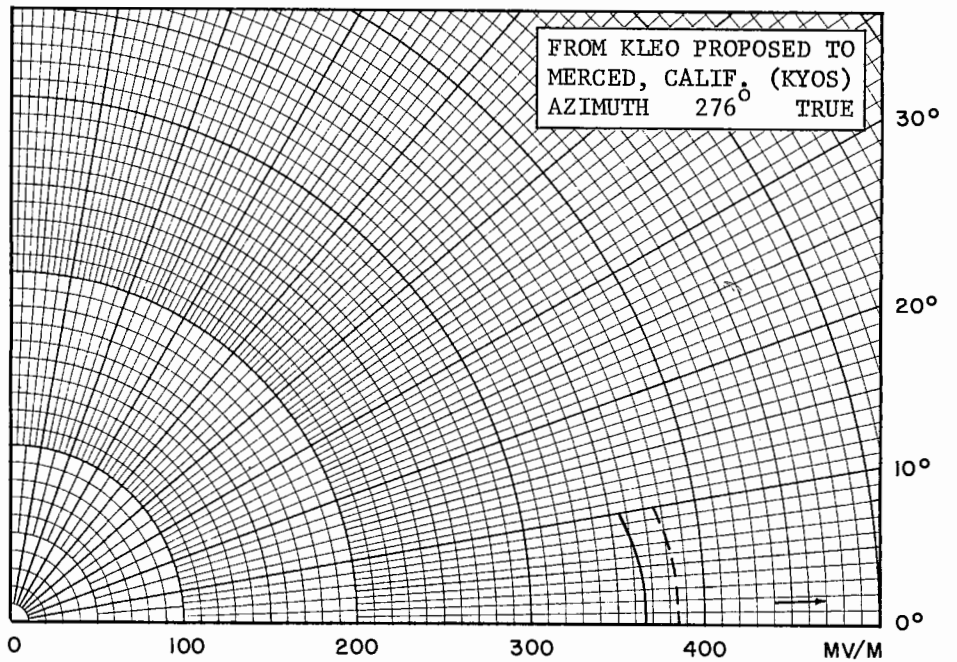
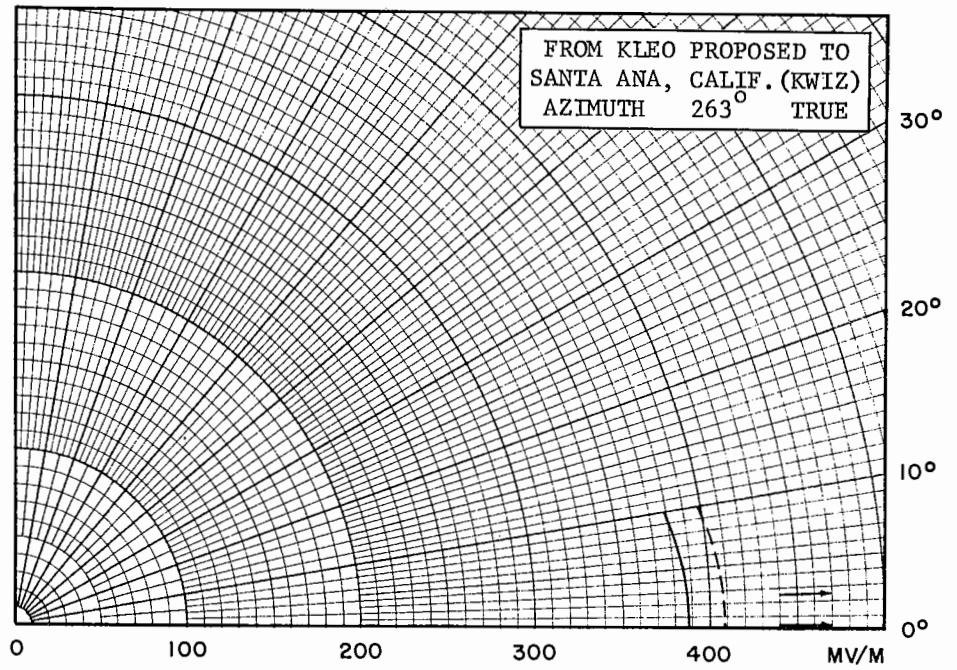


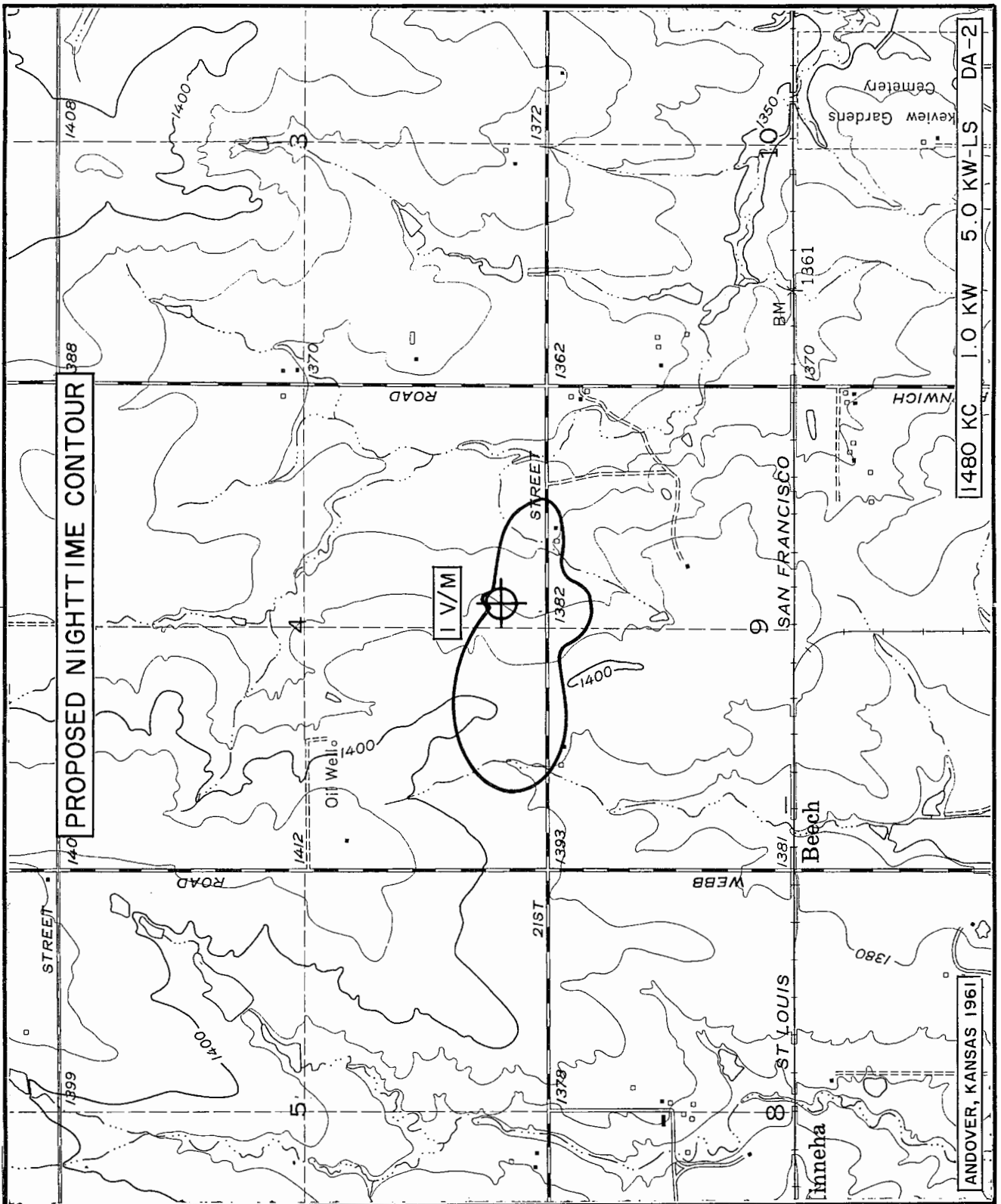






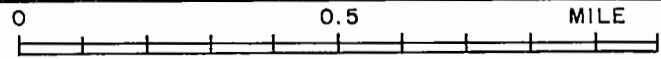


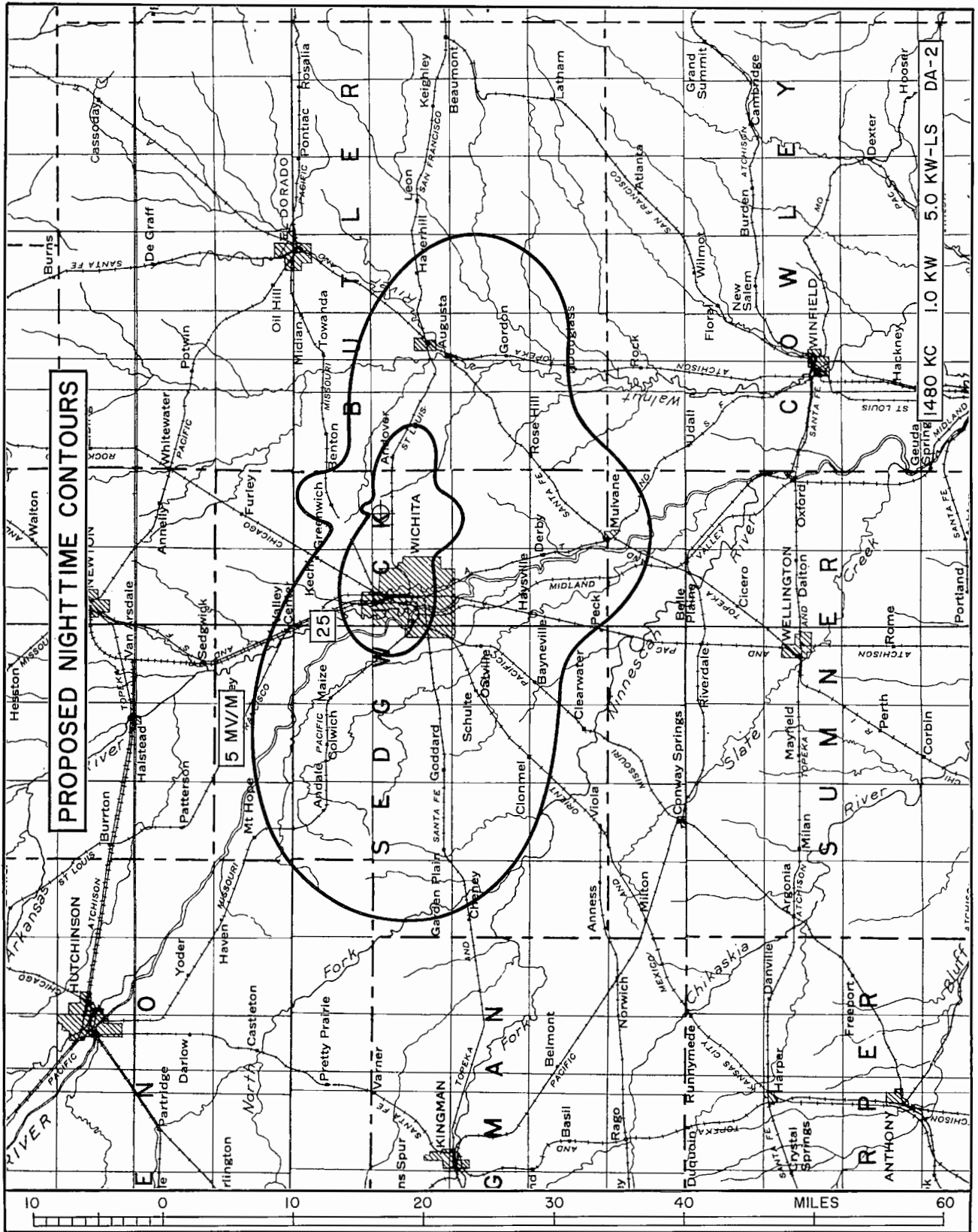




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RADIO STATION KLEO
 WICHITA, KANSAS
 660420.3 FIGURE 5A

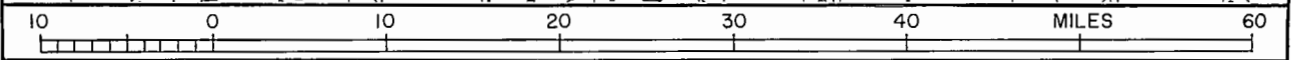




PROPOSED NIGHTTIME CONTOURS

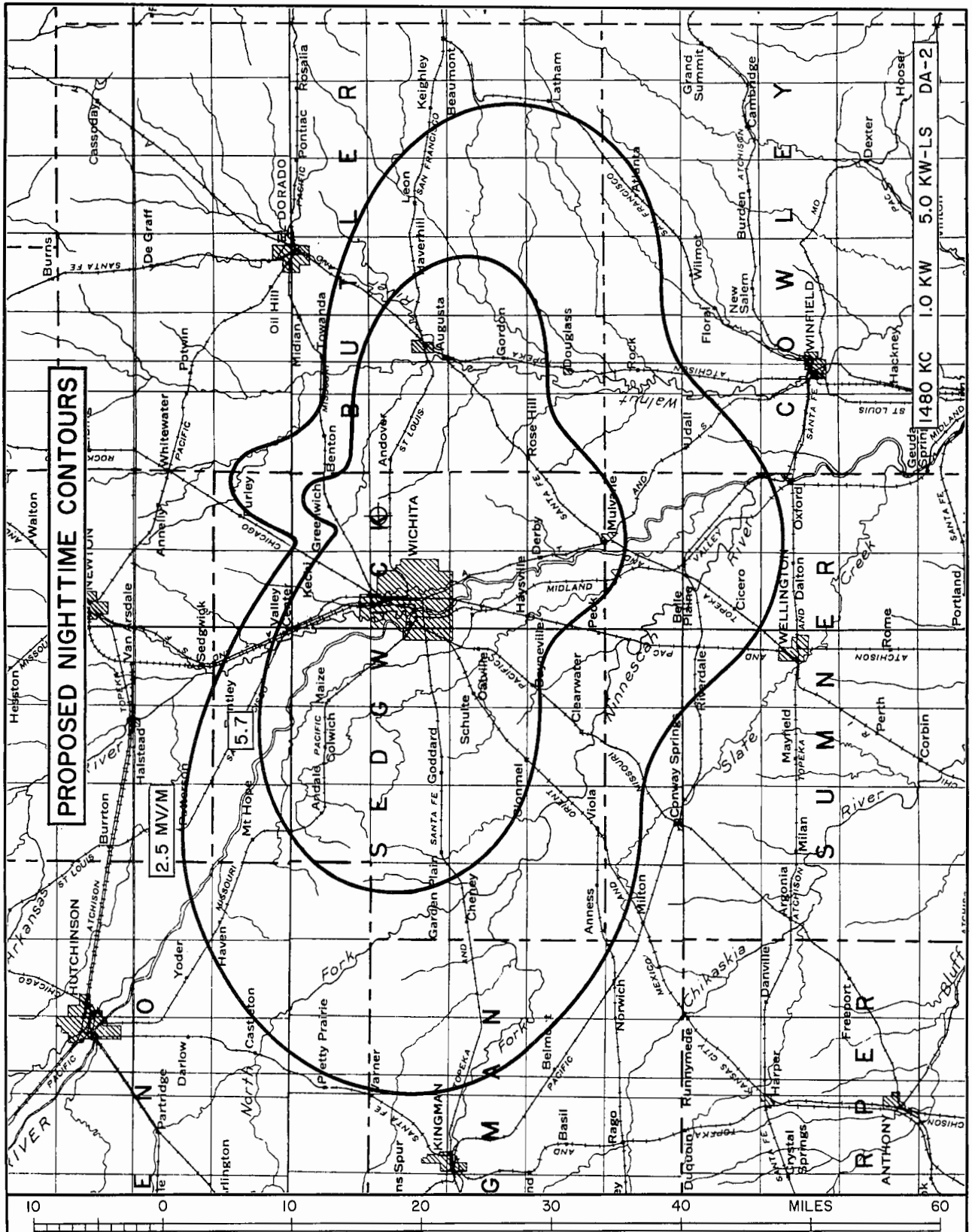
25

5 MV/M



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RADIO STATION KLEO
 WICHITA, KANSAS
 660420.3 FIGURE 5B



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RADIO STATION KLEO
 WICHITA, KANSAS
 660420.3 FIGURE 5C

RADIO STATION KLEO
WICHITA, KANSAS

AREA AND POPULATION ANALYSES
PROPOSED NIGHTTIME CONTOURS

<u>CONTOUR</u>	<u>AREA - SQ. MI.</u>	<u>POPULATION</u>
Within 1 v/m	0.11	3
25 mv/m	105	213,253
5.7 (1)	879	347,301
5	1,037	352,450
2.5 (1)	2,289	370,681

(1) Limited by interference

(2) Normally protected

1480 KC NIGHTTIME ALLOCATION MAP

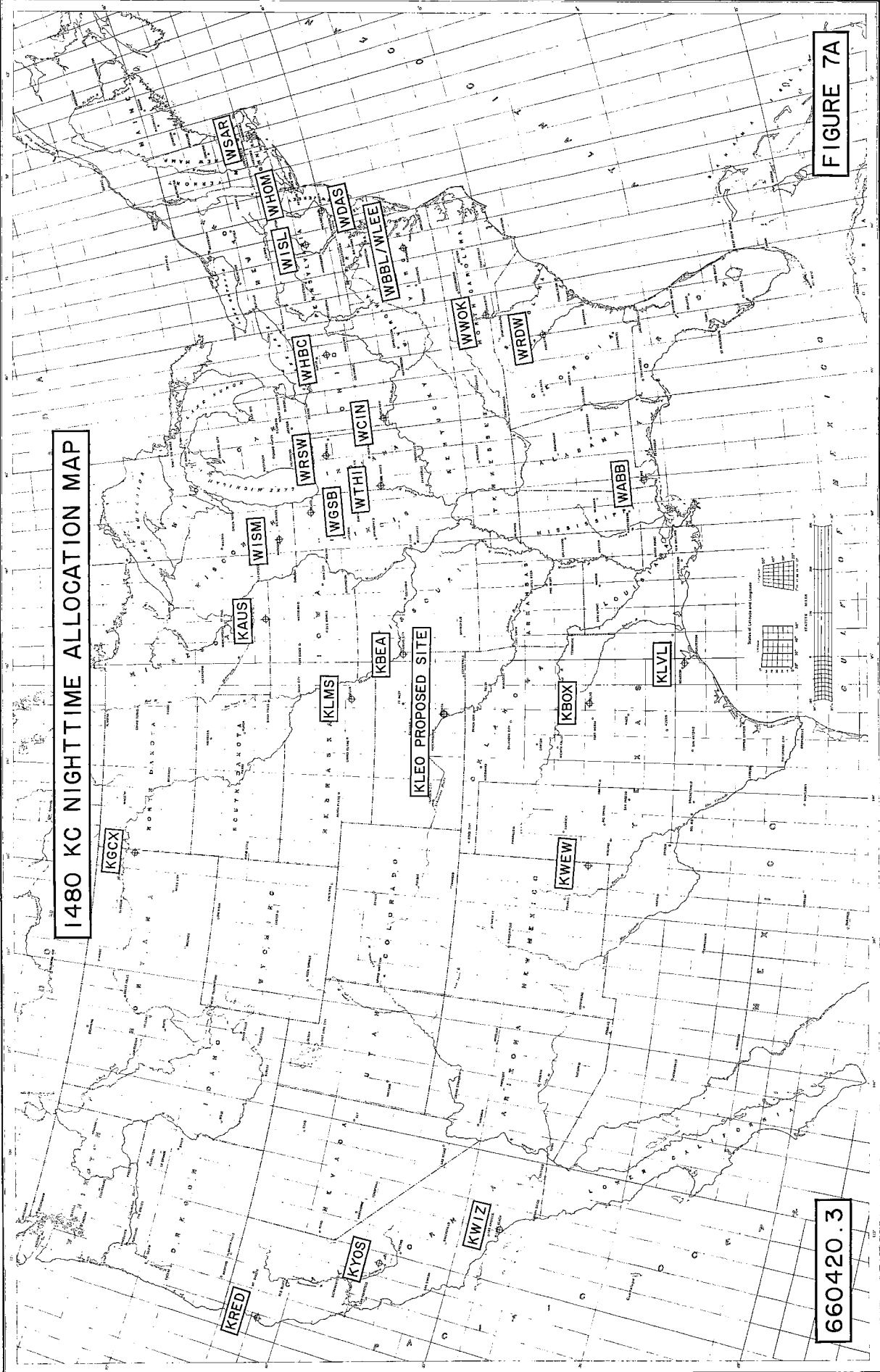


FIGURE 7A

660420.3

NIGHTTIME LIMITATIONS FROM KLEO PATTERN AUTHORIZED BY BP-5159

TO	KLMS	KAUS	KBEA	WGSB	WRSW	WTHI	WRDW	WABB	KBOX	KWEW	KWIZ	KYOS	KRED
Miles	219	473	175	562	660	550	907	723	344	472	1170	1248	1430
Mid-Point Lat.	39.2	41.6	38.4	39.9	39.6	38.7	35.8	34.3	35.3	35.2	36.1	38.1	40.0
Azimuth Angle	10.0	28.3	57.1	56.4	65.4	74.2	103.8	129.1	173.7	224.5	262.8	276.0	286.5
Radiation on Gnd.	70	68	41	41	41	65	250	228	241	218	243	338	420
Min.-Max. Angle θ	21.5-33.7	9.1-15.5	26.4-40.6	7.2-12.3	5.6-9.8	7.4-12.6	2.6-5.7	4.8-8.7	13.1-22.0	9.1-15.3	0.3-2.6	0.0-1.8	0.0
Max. Rad. at θ	54	64	41	36	47	69	247	224	213	206	243	338	420
Skywave Field	.227	.123	.251	.101	.0785	.104	.0388	.0670	.166	.123	.0198	.0166	.0114
Limitation	2.45	1.57	2.06	0.72	0.74	1.43	1.92	3.00	7.07	5.07	0.96	1.12	0.96

NIGHTTIME LIMITATIONS FROM KLEO PATTERN PROPOSED HEREIN

TO	KLMS	KAUS	KBEA	WGSB	WRSW	WTHI	WRDW	WABB	KBOX	KWEW	KWIZ	KYOS	KRED
Miles	217	468	165	553	650	540	897	715	343	480	1180	1258	1440
Mid-Point Lat.	39.2	41.6	38.4	39.9	39.6	38.7	35.8	34.3	35.3	35.2	36.1	38.1	40.0
Azimuth Angle	7.3	27.4	55.5	56.1	65.1	74.1	104.1	129.8	175.8	225.7	263.0	276.0	286.6
Radiation on Gnd.	54.6	53.7	47.9	48	50	65.8	230	225	205	197	408	385	316
Min.-Max. Angle θ	21.8-34.2	9.2-15.6	28.0-43.0	7.4-12.6	5.7-10.1	7.6-12.9	2.7-5.8	4.9-8.9	13.1-22.0	8.9-15.0	0.2-2.5	0.0-1.7	0.0
Max. Rad. at θ	41	51	41	47	50	66.5	228	224	188	197	408	385	316
Skywave Field	.229	.125	.268	.103	.0805	.106	.0404	.0684	.167	.121	.0193	.0162	.0112
Limitation	1.88	1.28	2.20*	0.97*	0.80*	1.41	1.84	3.07*	6.27	4.76	1.57*	1.25*	0.71

NIGHTTIME LIMITATIONS TO KLEO

FROM	WTHI	WCIN	RSS
Miles	550	700	
Mid-Point Lat.	38.7	38.5	
Azimuth Angle	260.0	265.7	
Radiation on Gnd.	250	200	
Min.-Max. Angle θ	7.4-12.6	5.1-9.0	
Max. Rad. at θ	243	184	
Skywave Field	.104	.0710	
Limitation	5.05	2.61	5.68

*Although this proposal increases the radiation toward these stations, it does not increase their RSS as shown on page 2.

NIGHTTIME RSS OF CERTAIN 1480 KC STATIONS

LIMITATION TO FROM	<u>WGSB</u>	<u>WRSW</u>	<u>KWIZ</u>	<u>KYOS</u>
	WTHI	WTHI	KRED	KRED
Miles	172	143	598	310
Mid-Point Lat.	40.7	40.4	37.3	39.1
Azimuth Angle	344.4	35.0	142.9	139.0
Radiation on Gnd.	58	160	215	200
Min.-Max. Angle θ	27.-41.	3.2-4.7	6.5-11.3	14.8-24.5
Max. Rad. at θ	62	97	220	199
Skywave Field	.262	.288	.0915	.181
Limitation	3.25	5.59	4.02	7.20

LIMITATION TO FROM	<u>KBEA</u>		<u>WABB</u>	
	WTHI	WCIN	WRDW	WTHI
Miles	390	544	405	606
Mid-Point Lat.	39.4	39.2	32.1	35.0
Azimuth Angle	267.7	272.5	243.2	183.6
Radiation on Gnd.	212	165	280	420
Min.-Max. Angle θ	11.4-19.3	7.5-12.8	10.9-18.4	6.4-11.1
Max. Rad. at θ	200	149	274	415
Skywave Field	.149	.105	.145	.0897
Limitation	5.96	3.13	7.95	7.45
RSS Limitation		6.73		10.9

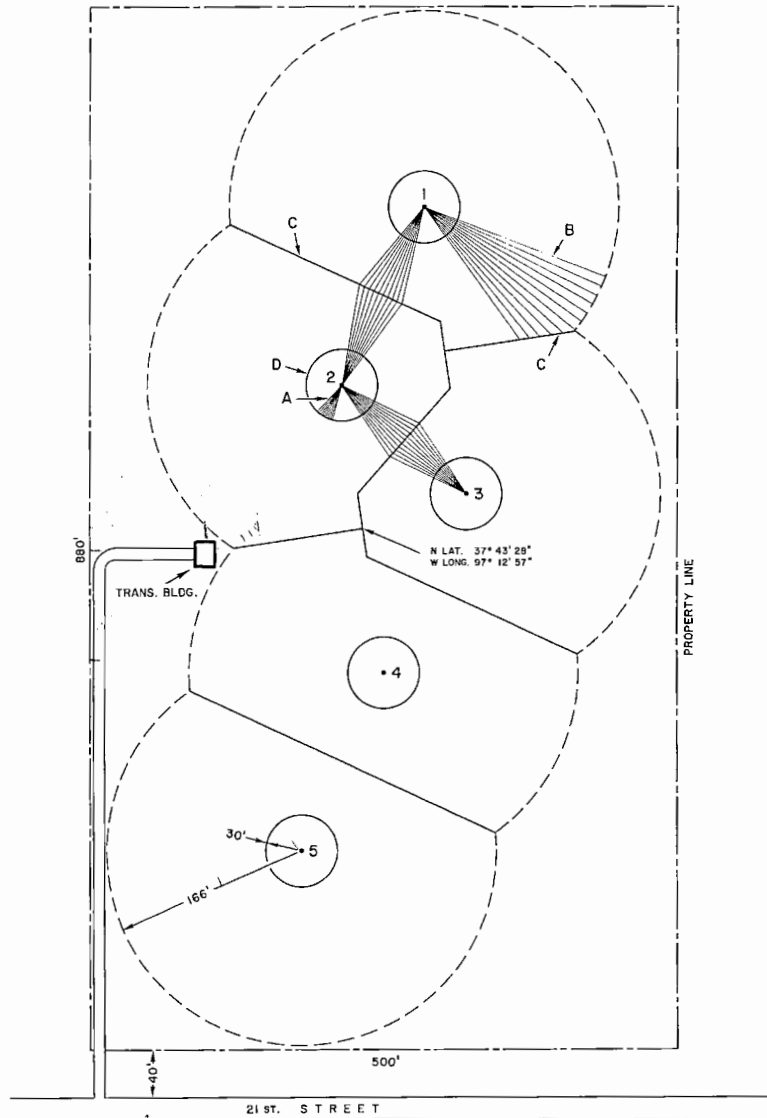
PART IV

PROPOSED SITE INFORMATION

Part IV contains the following in connection with the proposed site:

1. Plat of the property showing the location of towers and ground system for the proposed operation
2. Vertical plan sketch of the antenna system
3. Aerial photographs of the proposed site showing the proposed daytime and nighttime 1-v/m contours
4. Map showing the location of other radio stations within two and five miles of the proposed site
5. Map of Wichita, Kansas and environs showing the main business district of Wichita
- 6A. Sectional Aeronautical Chart showing the proposed site and surrounding structures
- 6B. Statement regarding F.A.A. determination of no hazard in connection with the proposed antenna structure

PLAT OF PROPERTY



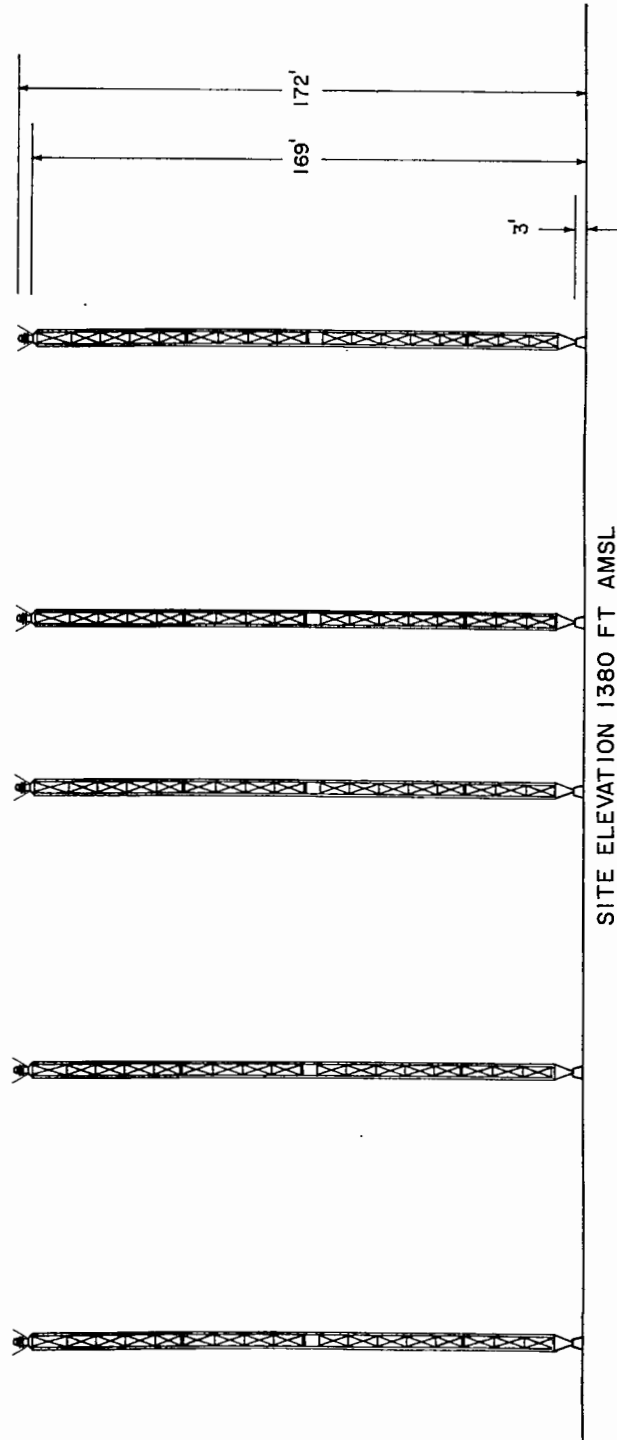
GROUND SYSTEM

- A. 120 EQUALLY SPACED COPPER RADIALS ABOUT EACH TOWER, 30 FEET LONG, AND BURIED 2 TO 4 INCHES
- B. 120 EQUALLY SPACED COPPER RADIALS ABOUT EACH TOWER, 166 FEET LONG, AND BURIED 2 TO 4 INCHES OUT TO 30 FEET AND 6 TO 8 INCHES BEYOND 30 FEET
- C. INTERSECTING RADIALS SHORTENED AND BONDED TO TRANSVERSE COPPER BUSES MIDWAY BETWEEN ADJACENT TOWERS
- D. BONDING BUSS AT 30 FOOT RADIALS ABOUT EACH TOWER

PREPARED BY
THE FIRM OF A. EARL CULLUM, JR.
CONSULTING ENGINEERS

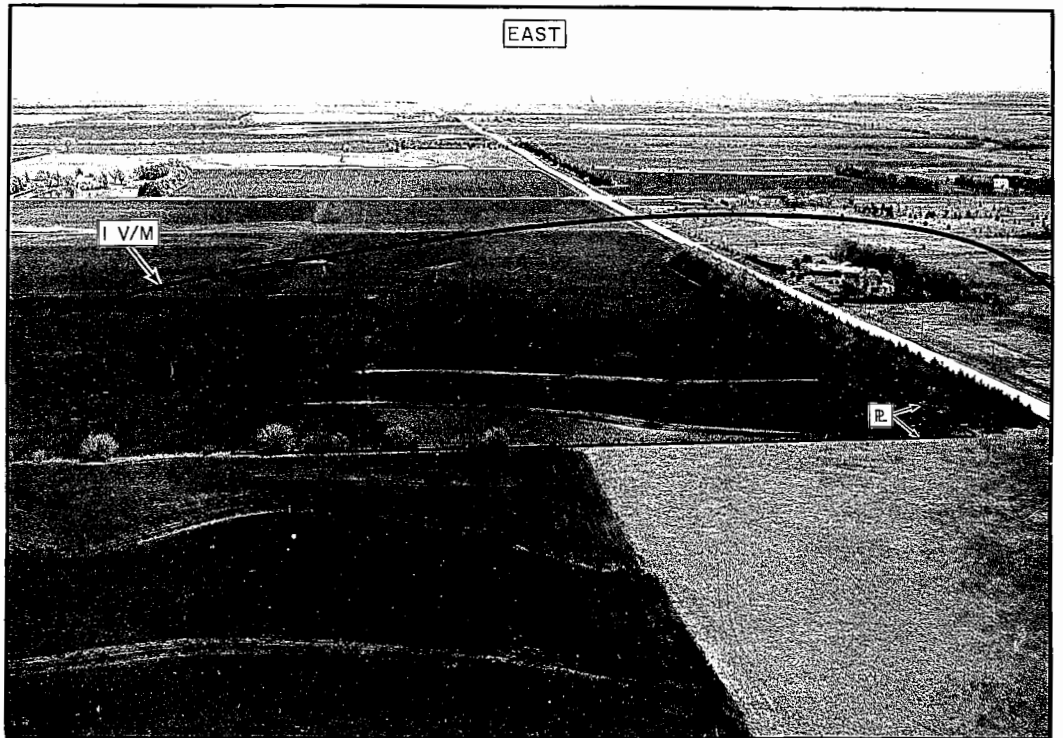
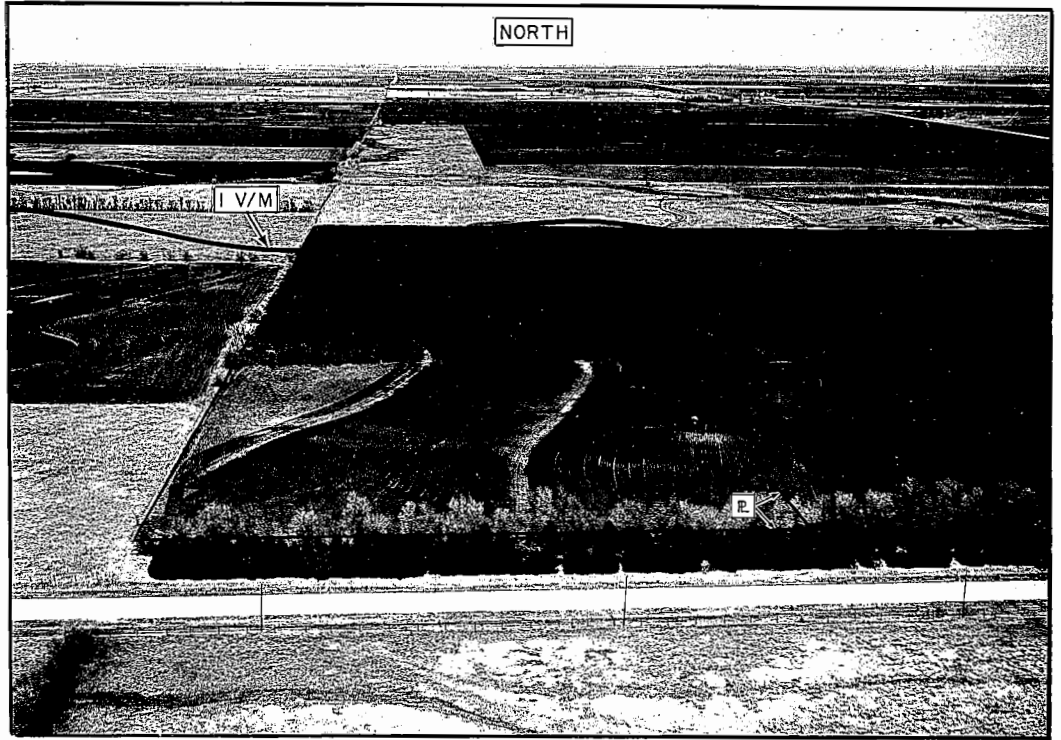
RADIO STATION KLEO
WICHITA, KANSAS
660420.4 FIGURE 1

ELEVATION VIEW OF TOWERS LOOKING EAST



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CONSULTING ENGINEERS

RADIO STATION KLEO
WICHITA, KANSAS
660420.4 FIGURE 2



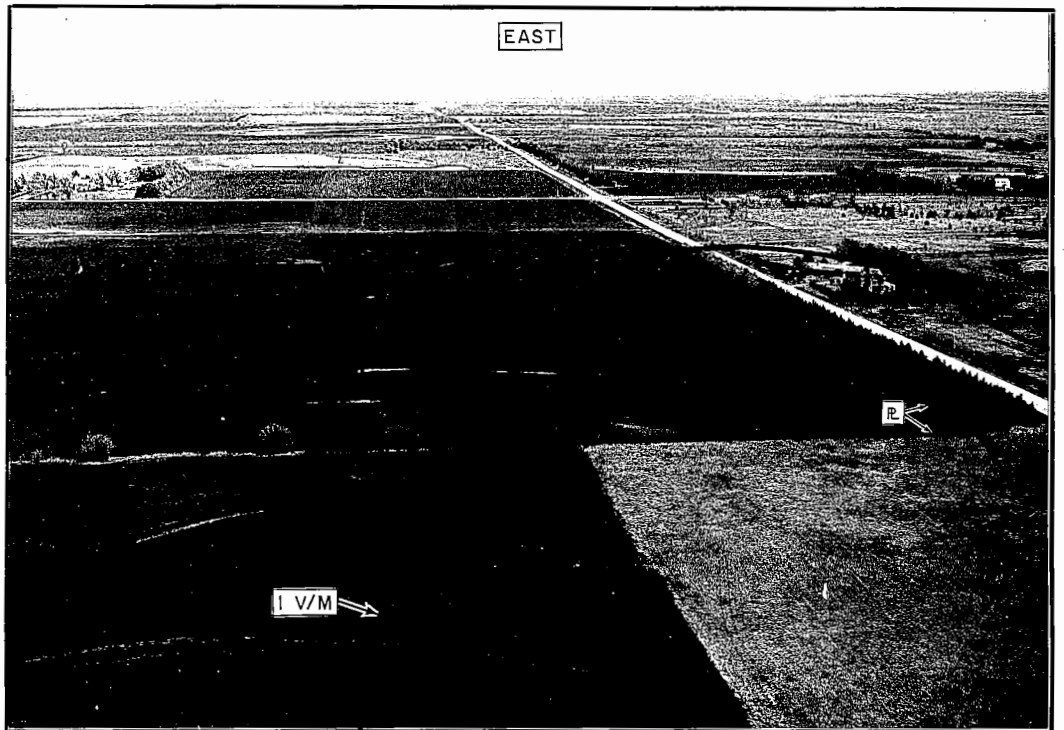
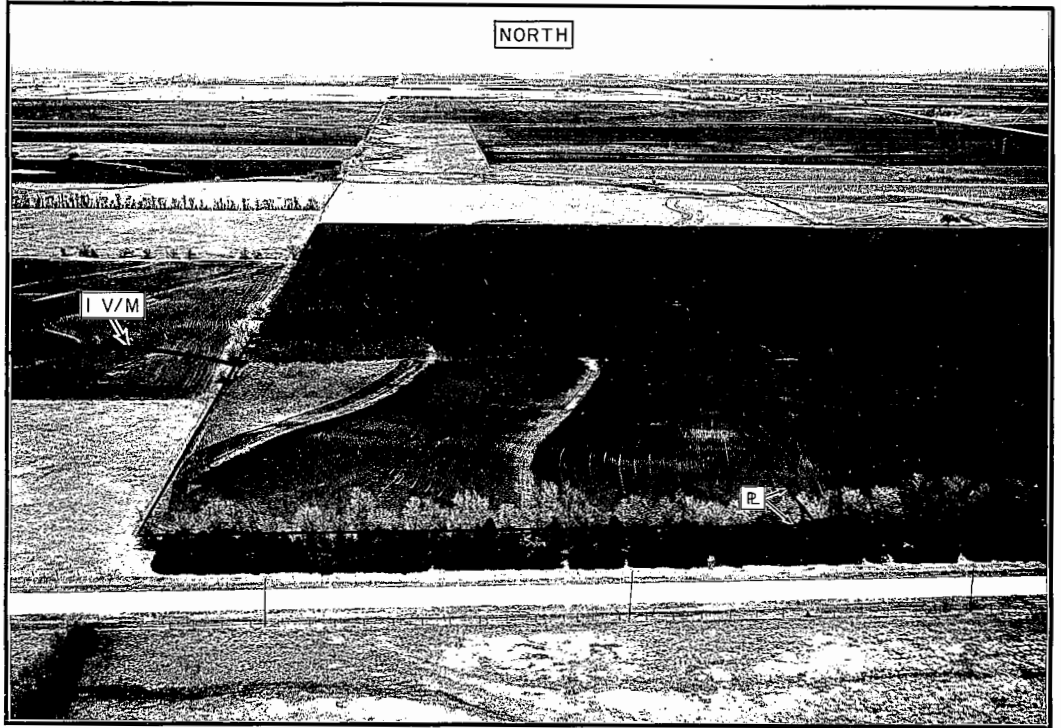
PROPOSED DAYTIME

MAY 1966



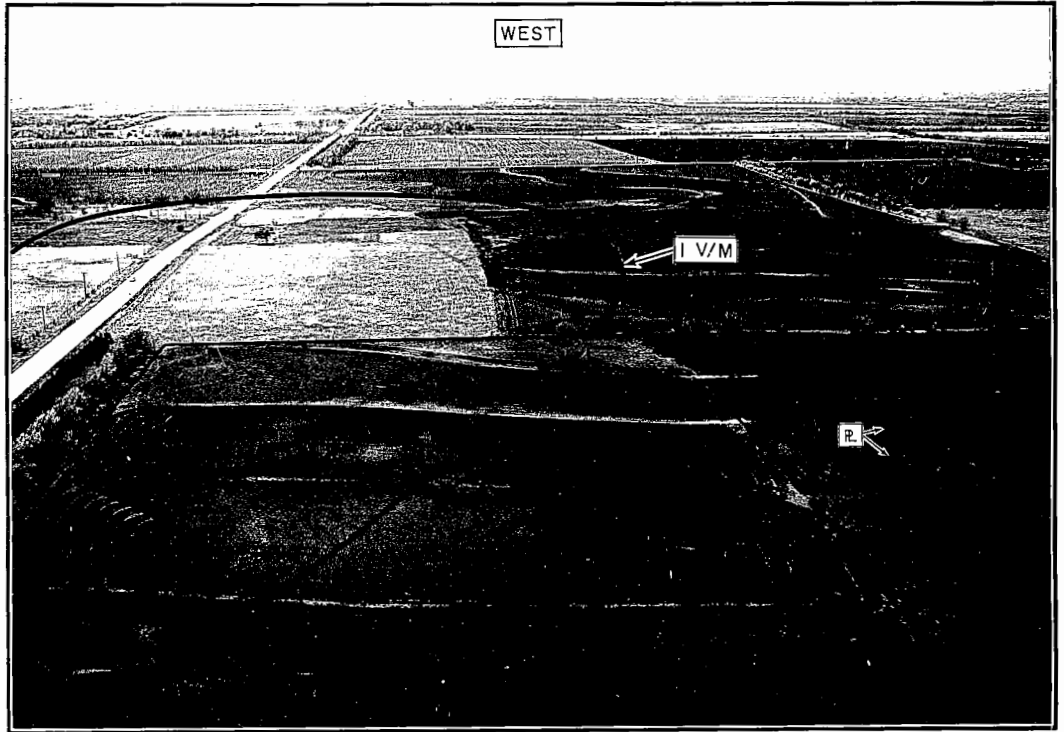
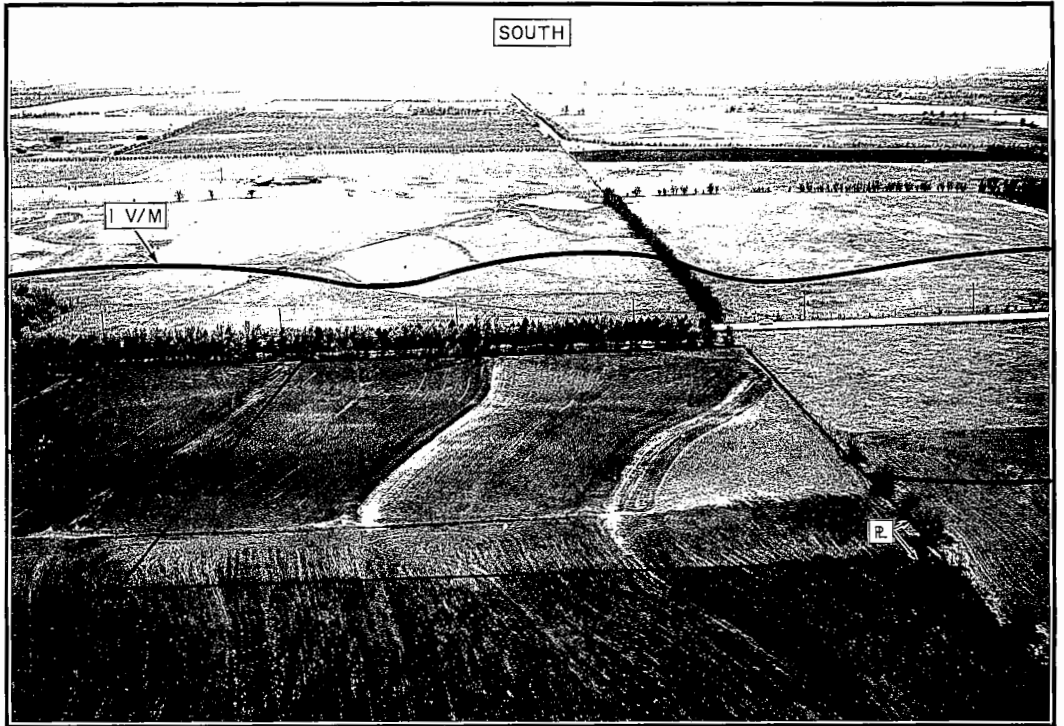
PROPOSED DAYTIME

MAY 1966



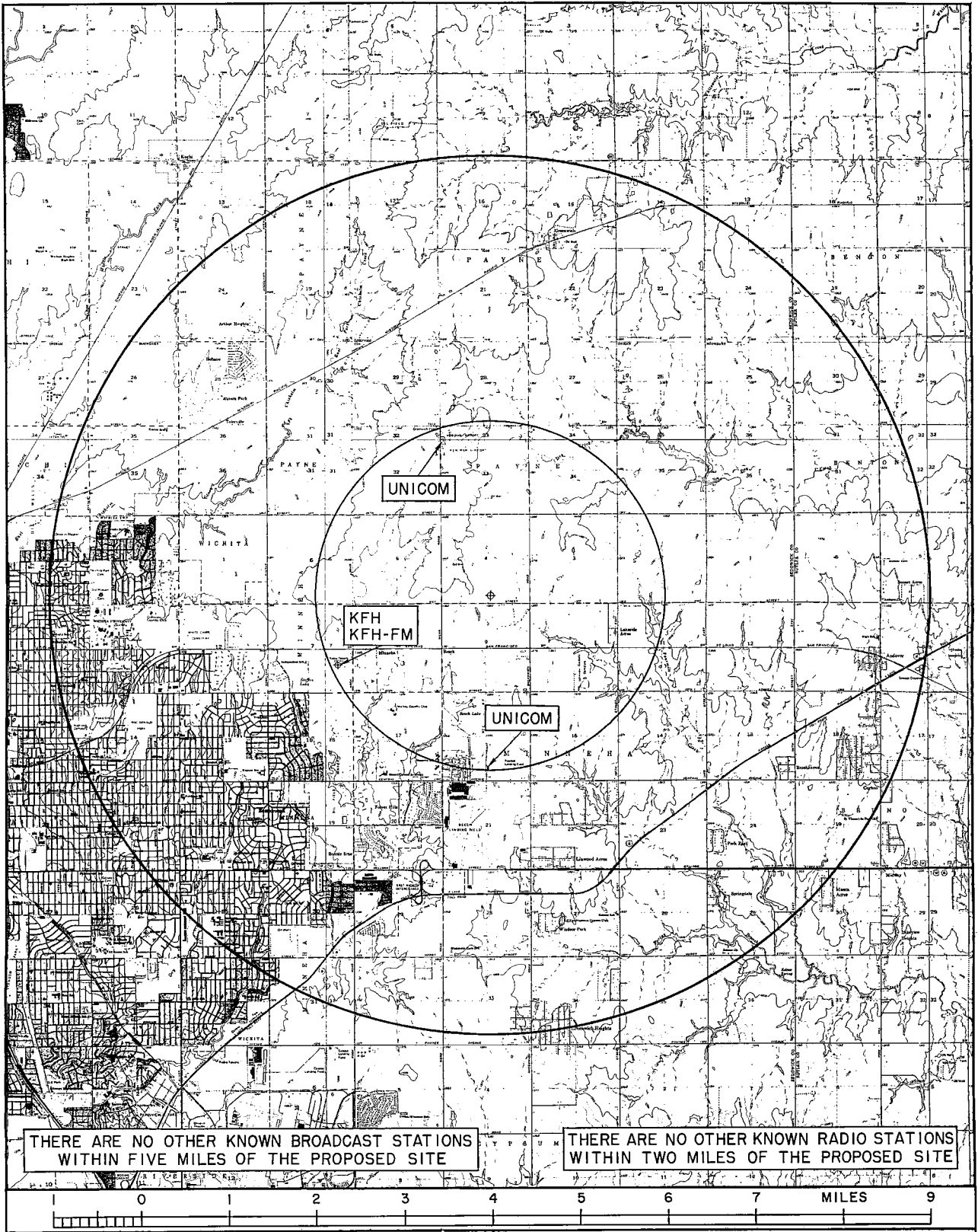
PROPOSED NIGHTTIME

MAY 1966



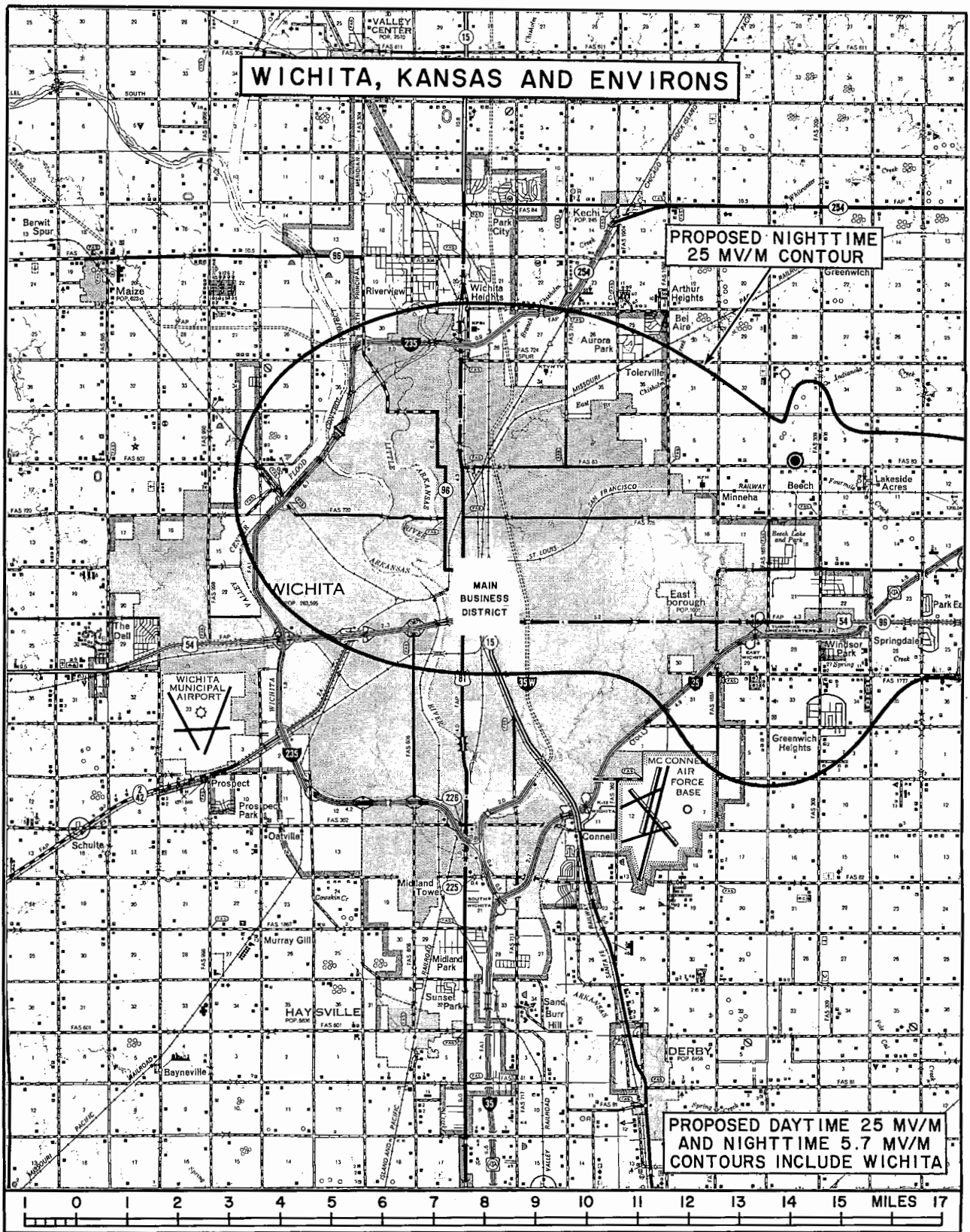
PROPOSED NIGHTTIME

MAY 1966



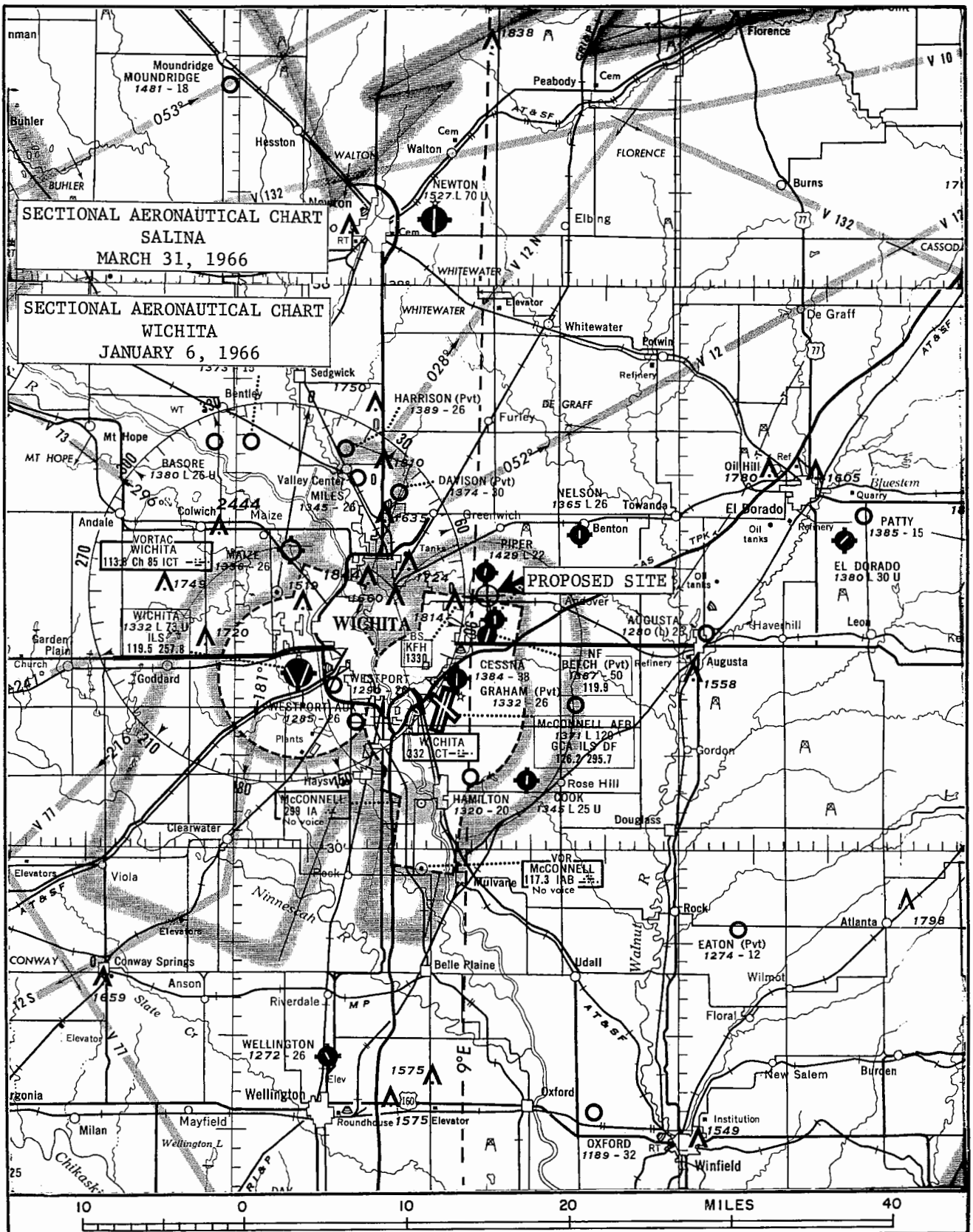
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THE FIRM OF A. EARL CULLUM, JR.
CONSULTING ENGINEERS

RADIO STATION KLEO
WICHITA, KANSAS
660420.4 FIGURE 4



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 CONSULTING ENGINEERS

RADIO STATION KLEO
 WICHITA, KANSAS
 660420.4 FIGURE 5



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 CONSULTING ENGINEERS

RADIO STATION KLEO
 WICHITA, KANSAS
 660420.4 FIGURE 6A



FEDERAL AVIATION AGENCY

KANSAS CITY AREA OFFICE
4747 Troost Avenue
Kansas City, Missouri 64110

IN REPLY
REFER TO: CE-OE-66-290
MKC-560

Mr. C. M. Daniell
A. Earl Cullum, Jr. & Associates
P. O. Box 7004
Dallas, Texas 75209

Dear Mr. Daniell:

This will acknowledge receipt of Notice or Proposed Construction or Alteration, Form FAA-117, or the equivalent, dated 2/14/66 describing the following proposal:

Structure:	Tower (radio)	Height :	1552'AMSL 172'AGL
Location:	Wichita, Kansas	Latitude :	37° 43' 28"
		Longitude:	97° 12' 57"

As a result of a review of this proposal in accordance with administrative procedures of Part 77, Federal Aviation Regulations, the following item/s have been marked for your attention and action if required. The construction or alteration:

- (x) Would not exceed any standard of Subpart C and would not be a hazard to air navigation.
- (x) The Federal Communications Commission has been advised of this determination.
- (x) Should be obstruction marked and lighted in accordance with FAA standards.
- () Requires supplemental notice to this office at least 48 hours before the start of construction or alteration. Notice form is enclosed.
- () Requires supplemental notice to this office within five days after the construction or alteration reaches its greatest height. Notice form is enclosed.

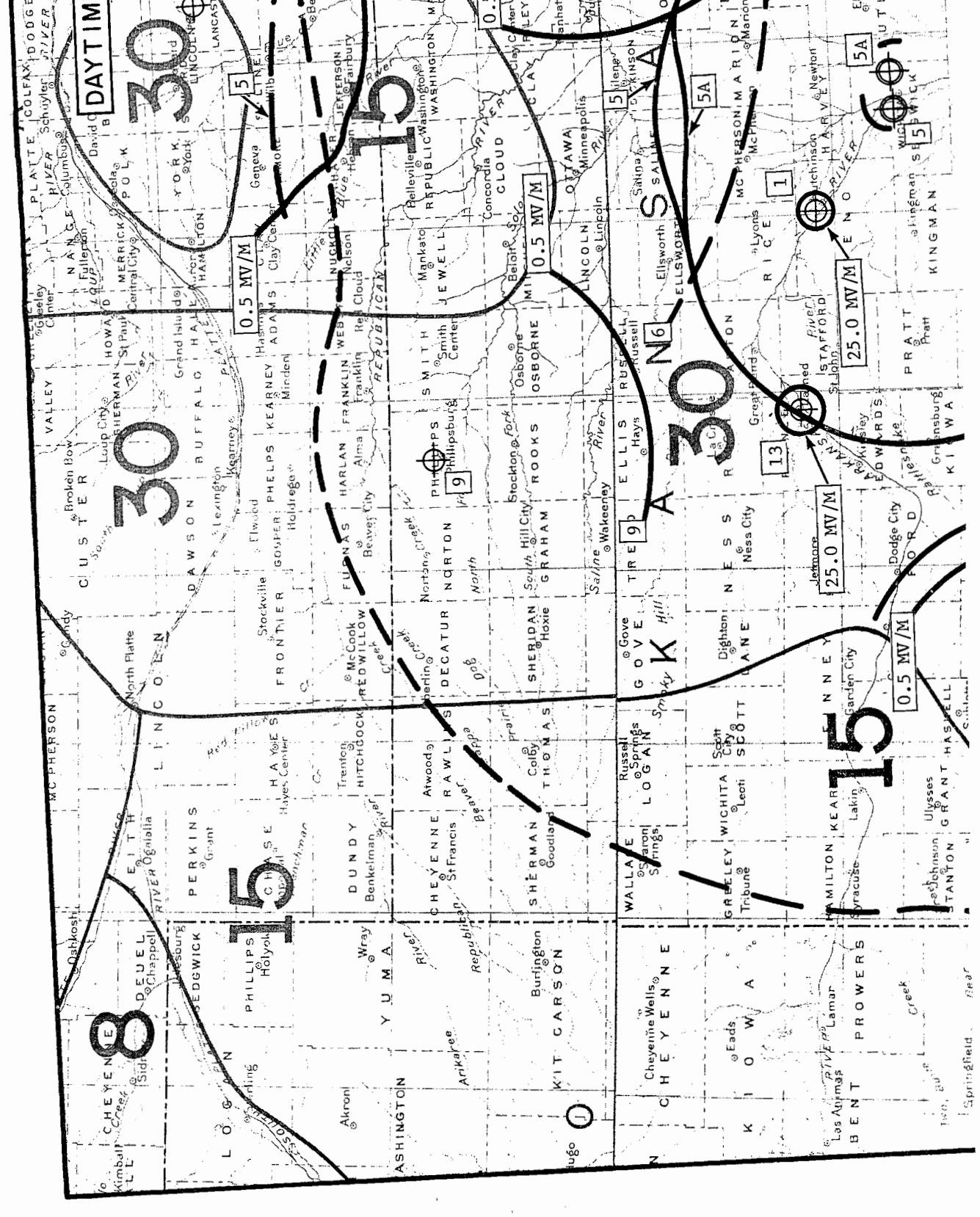
The above determination does not preempt or waive the regulations of any other governmental agency.

Sincerely yours,

for *R. E. Underwood*
E. W. Underwood
Chief, Air Traffic Branch

MKC FORM 7002

DAYTIME ALLOC



8

15

30

15

30

30

15

25.0 MV/M

0.5 MV/M

0.5 MV/M

2.0 MV/M

0.5 MV/M

8

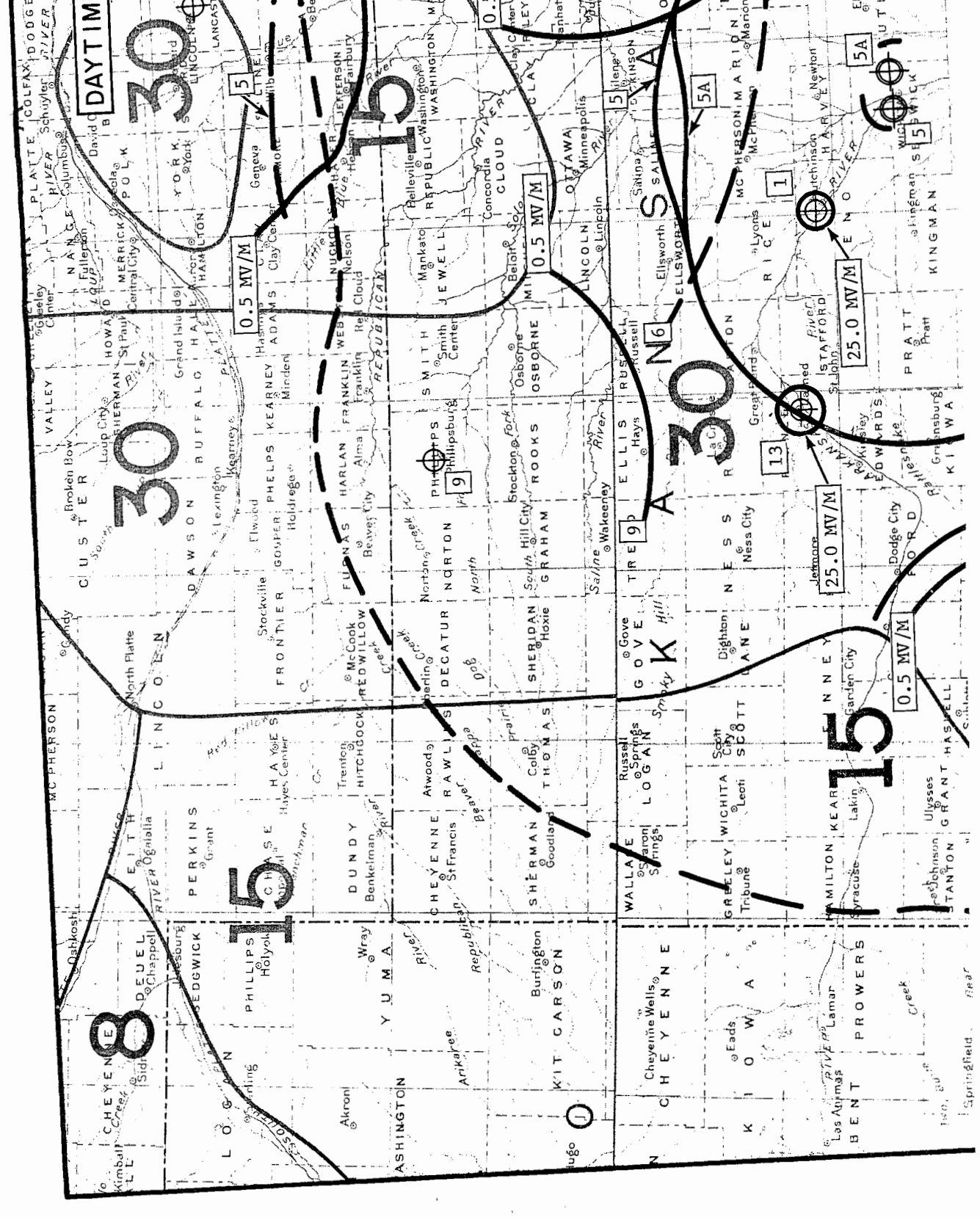
15

15

30

15

DAYTIME ALLOC



8

15

30

15

30

30

15

25.0 MV/M

0.5 MV/M

0.5 MV/M

2.0 MV/M

0.5 MV/M

8

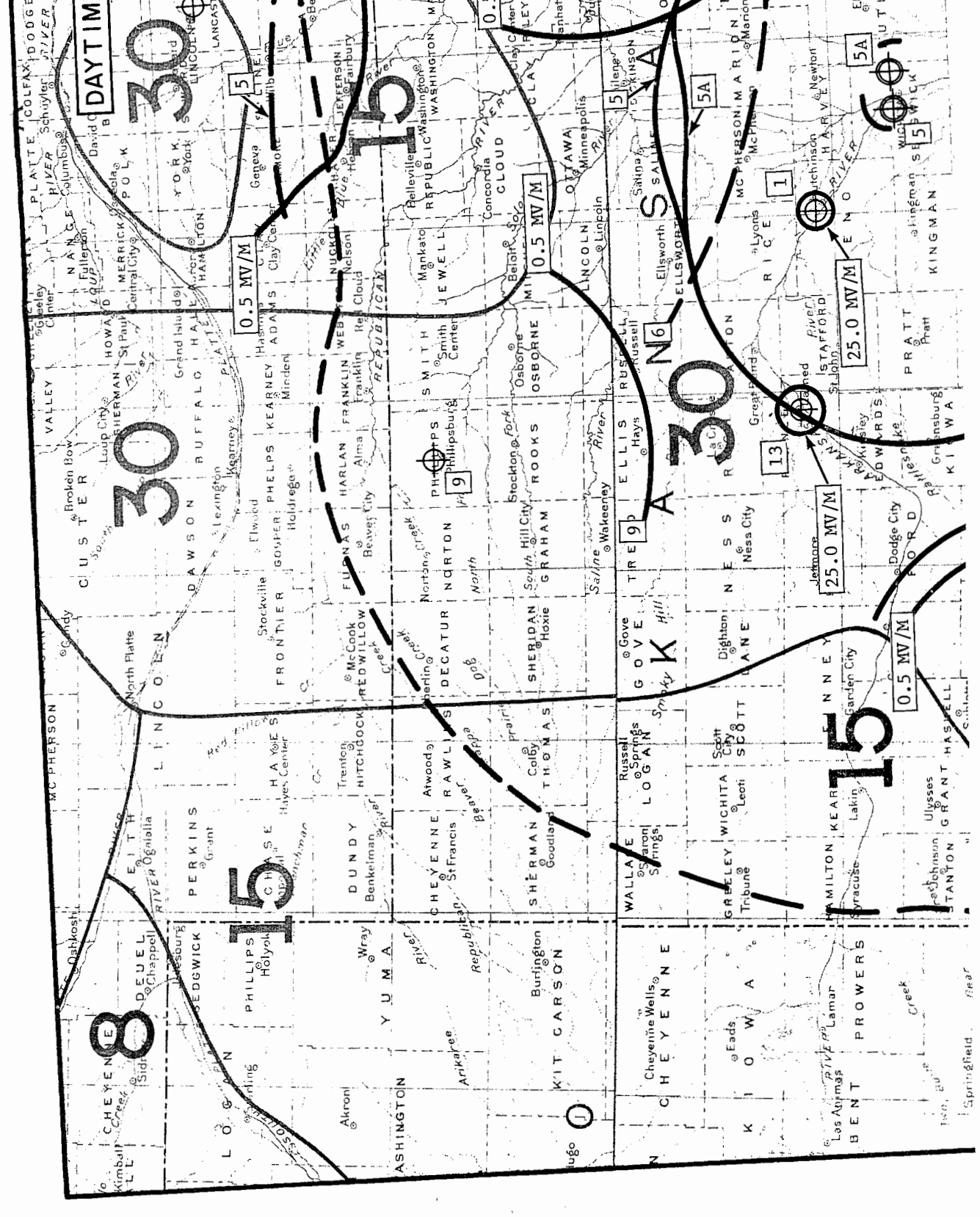
15

15

30

15

DAYTIME ALLOC



8

15

30

15

30

30

15

25.0 MV/M

0.5 MV/M

0.5 MV/M

2.0 MV/M

0.5 MV/M

8

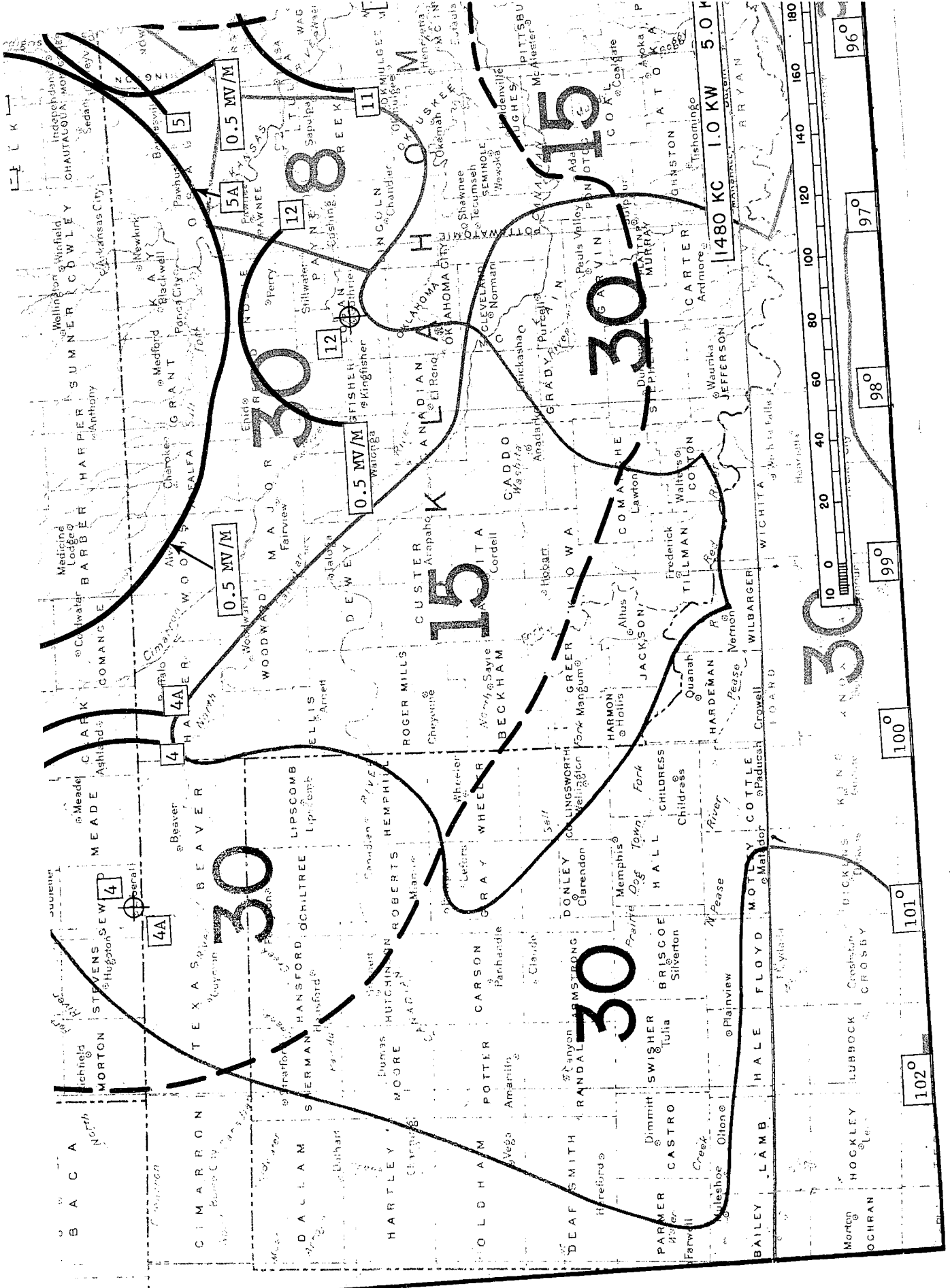
15

15

30

15

DAYTIME ALLOC



30

15

30

30

15

30

0.5 MV/M

0.5 MV/M

0.5 MV/M

1480 KC 1.0 KW 5.0 K

102°

101°

100°

99°

98°

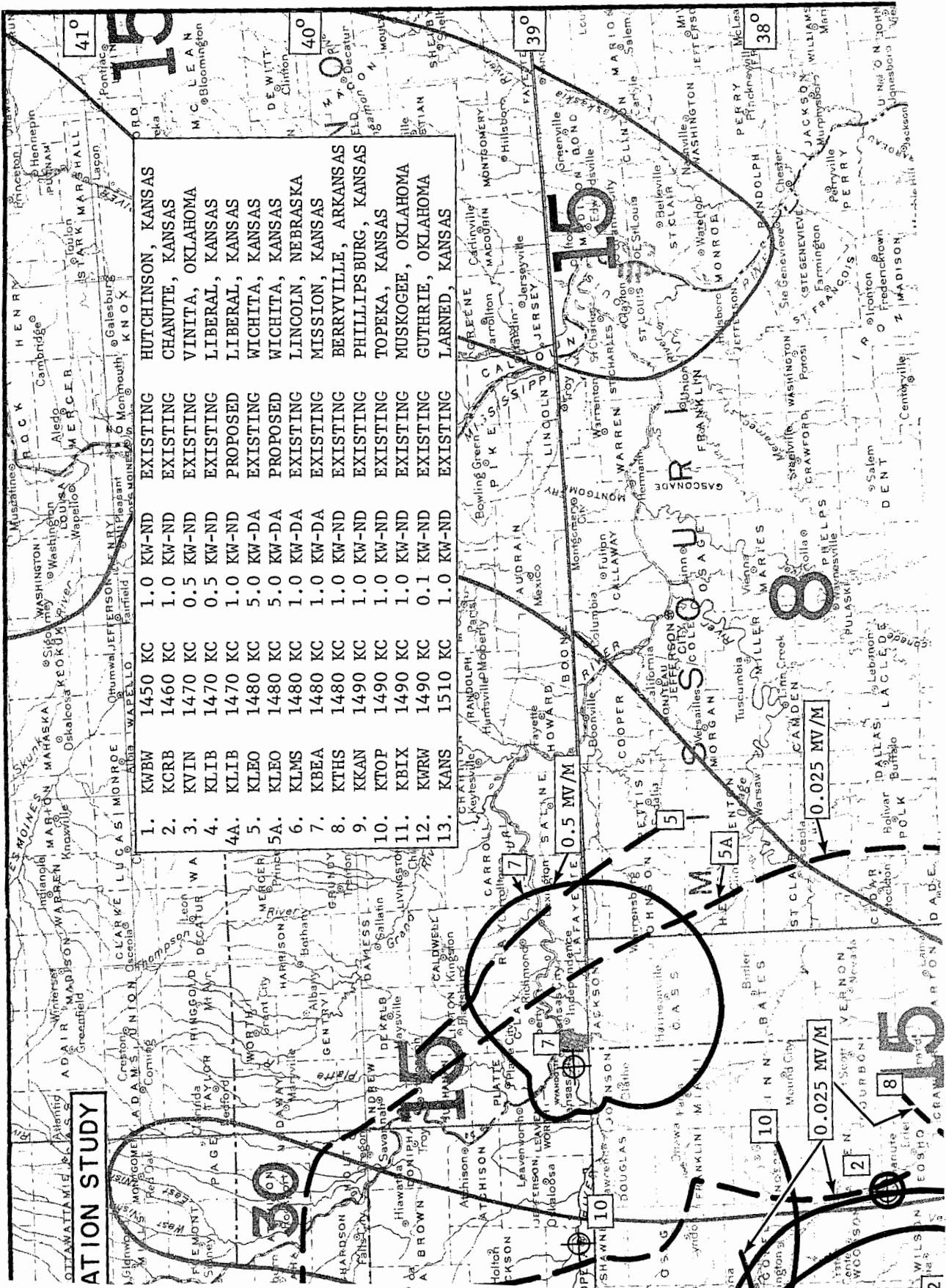
97°

96°

0 20 40 60 80 100 120 140 160 180

ATION STUDY

1.	KWBW	1450 KC	1.0 KW-ND	EXISTING	HUTCHINSON, KANSAS
2.	KCRB	1460 KC	1.0 KW-ND	EXISTING	CHANUTE, KANSAS
3.	KVIN	1470 KC	0.5 KW-ND	EXISTING	VINITA, OKLAHOMA
4.	KLIB	1470 KC	0.5 KW-ND	EXISTING	LIBERAL, KANSAS
4A.	KLIB	1470 KC	1.0 KW-ND	PROPOSED	LIBERAL, KANSAS
5.	KLEO	1480 KC	5.0 KW-DA	EXISTING	WICHITA, KANSAS
5A.	KLEO	1480 KC	5.0 KW-DA	PROPOSED	WICHITA, KANSAS
6.	KLMS	1480 KC	1.0 KW-DA	EXISTING	LINCOLN, NEBRASKA
7.	KBEA	1480 KC	1.0 KW-DA	EXISTING	MISSION, KANSAS
8.	KTHS	1480 KC	1.0 KW-ND	EXISTING	BERRYVILLE, ARKANSAS
9.	KKAN	1490 KC	1.0 KW-ND	EXISTING	PHILLIPSBURG, KANSAS
10.	KTOP	1490 KC	1.0 KW-ND	EXISTING	TOPEKA, KANSAS
11.	KBLX	1490 KC	1.0 KW-ND	EXISTING	MUSKOGEE, OKLAHOMA
12.	KWRW	1490 KC	0.1 KW-ND	EXISTING	GUTHRIE, OKLAHOMA
13.	KANS	1510 KC	1.0 KW-ND	EXISTING	LARNED, KANSAS



0.025 MV/M

0.025 MV/M

0.5 MV/M

8

5

7

10

15

30

39

40

41

15

38

2

10

2

8

15

30

39

40

41

15

38

2

10

2

8

15

30

39

40

41

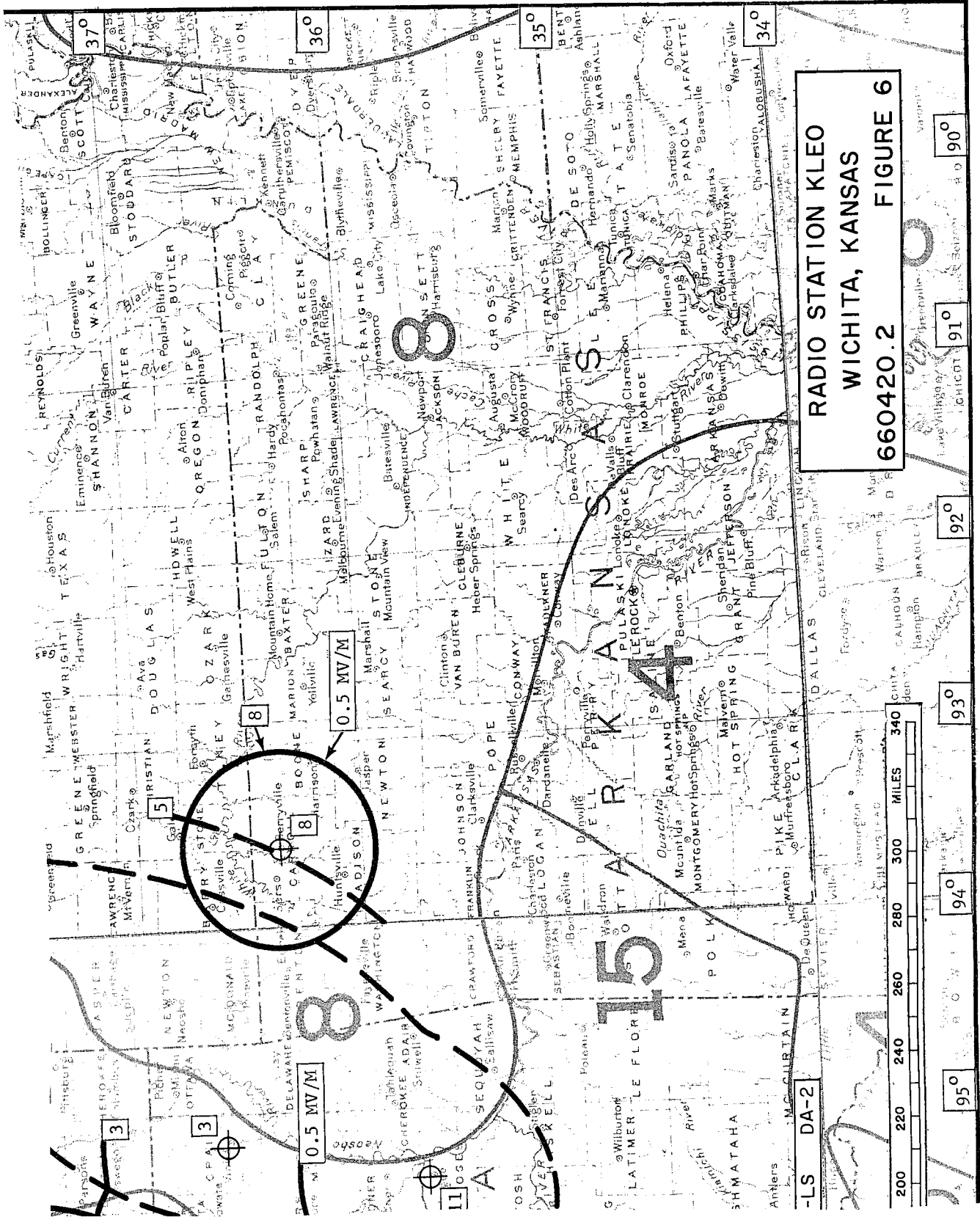
15

38

2

10

2



**RADIO STATION KLEO
WICHITA, KANSAS
660420.2 FIGURE 6**



91°

92°

93°

94°

95°

-LS DA-2

0.5 MV/M

0.5 MV/M

0.5 MV/M

3

3

8

8

8

15

4

8

370

36

35

34

90°

91°

92°

93°

94°

95°

Broadcast Application		FEDERAL COMMUNICATIONS COMMISSION		Section V-A															
STANDARD BROADCAST ENGINEERING DATA		Name of applicant																	
		Swanco Broadcasting of Kansas, Inc.																	
<p>1. Purpose of authorization applied for: (Indicate by check mark) (If application is for a new station or for any of the changes numbered B through F, complete all paragraphs of this form; if change G is of a character which will change coverage or increase the overall height of the antenna structure more than 20 feet, answer all paragraphs, otherwise complete only paragraphs 2 and 10 and the appropriate other paragraphs; for changes H through M, complete only paragraph 2 and the appropriate other paragraphs; for change N complete only paragraphs 2 and 5.)</p> <table border="0"> <tr> <td>A. <input type="checkbox"/> Construct a new station</td> <td>H. <input type="checkbox"/> Change frequency control equipment</td> </tr> <tr> <td>B. <input type="checkbox"/> Change power</td> <td>I. <input type="checkbox"/> Change tubes in last radio stage</td> </tr> <tr> <td>C. <input checked="" type="checkbox"/> Change transmitter location</td> <td>J. <input type="checkbox"/> Change system of modulation</td> </tr> <tr> <td>D. <input type="checkbox"/> Change frequency</td> <td>K. <input type="checkbox"/> Change transmitter</td> </tr> <tr> <td>E. <input type="checkbox"/> Approval of site and antenna</td> <td>L. <input type="checkbox"/> Install auxiliary or alternate main transmitter</td> </tr> <tr> <td>F. <input type="checkbox"/> Special Service Authorization</td> <td>M. <input type="checkbox"/> Other changes (specify)</td> </tr> <tr> <td>G. <input checked="" type="checkbox"/> Change in antenna system (including addition of FM and TV antennas)</td> <td>N. <input type="checkbox"/> Change studio location</td> </tr> </table> <p>If this application is not for a new station, summarize briefly the nature of the changes proposed.</p> <p>Change transmitter location and make changes in the antenna system</p>						A. <input type="checkbox"/> Construct a new station	H. <input type="checkbox"/> Change frequency control equipment	B. <input type="checkbox"/> Change power	I. <input type="checkbox"/> Change tubes in last radio stage	C. <input checked="" type="checkbox"/> Change transmitter location	J. <input type="checkbox"/> Change system of modulation	D. <input type="checkbox"/> Change frequency	K. <input type="checkbox"/> Change transmitter	E. <input type="checkbox"/> Approval of site and antenna	L. <input type="checkbox"/> Install auxiliary or alternate main transmitter	F. <input type="checkbox"/> Special Service Authorization	M. <input type="checkbox"/> Other changes (specify)	G. <input checked="" type="checkbox"/> Change in antenna system (including addition of FM and TV antennas)	N. <input type="checkbox"/> Change studio location
A. <input type="checkbox"/> Construct a new station	H. <input type="checkbox"/> Change frequency control equipment																		
B. <input type="checkbox"/> Change power	I. <input type="checkbox"/> Change tubes in last radio stage																		
C. <input checked="" type="checkbox"/> Change transmitter location	J. <input type="checkbox"/> Change system of modulation																		
D. <input type="checkbox"/> Change frequency	K. <input type="checkbox"/> Change transmitter																		
E. <input type="checkbox"/> Approval of site and antenna	L. <input type="checkbox"/> Install auxiliary or alternate main transmitter																		
F. <input type="checkbox"/> Special Service Authorization	M. <input type="checkbox"/> Other changes (specify)																		
G. <input checked="" type="checkbox"/> Change in antenna system (including addition of FM and TV antennas)	N. <input type="checkbox"/> Change studio location																		
2. Facilities requested			10. Antenna system, including ground or counterpoise																
Frequency	Hours of operation	Power in kilowatts		Non-Directional Antenna:															
1480 kc	Unlimited	Night	Day	Day <input type="checkbox"/>	Night <input type="checkbox"/>														
		1	5	Directional Antenna:															
3. Station location			Day only (DA-D) <input type="checkbox"/>																
State	City or town		Night only (DA-N) <input type="checkbox"/>																
Kansas	Wichita		Same constants and power day and night (DA-1) <input type="checkbox"/>																
4. Transmitter location			Different constants or power day and night (DA-2) <input checked="" type="checkbox"/>																
State	County		(If a directional antenna is proposed submit complete engineering data. Show clearly whether directional operation is for day or night or both. If day and night patterns are different give full information on each pattern. This information is in addition to the information in Paragraph 10 and is submitted as Exhibit No. and signed by the engineer who designed the antenna system.)																
Kansas	Sedgwick		Type radiator																
City or town	Street Address (or other identification)		Five uniform, cross-section guyed, vertical steel towers																
Near Wichita	On 21 Street, midway between Webb & Greenwich		Height in feet of complete radiator above base insulator, or above base if grounded.																
5. Main studio location			Overall height in feet above ground. (Without obstruction lighting)																
State	County		169																
Kansas	Sedgwick		Overall height in feet above mean sea level. (Without obstruction lighting)																
City or town	Street and number, if known		1549																
Wichita	6630 West 13 Street		Overall height in feet above ground. (With obstruction lighting)																
6. Remote control point location <u>Does not apply</u>			172																
State	City or town		If antenna is either top loaded or sectionalized, describe fully as Exhibit No.																
Street Address (or other identification)			Does not apply																
7. Transmitter			Excitation Series <input checked="" type="checkbox"/> Shunt <input type="checkbox"/>																
Make	Type No.	Rated Power		Geographic coordinates to nearest second.															
RCA	BTA-5F	5 kw		For direction antenna give coordinates of center of array. For single vertical radiator give tower location.															
(If the above transmitter has not been accepted for licensing by the F.C.C., attach as Exhibit No. a complete showing of transmitter details. Showing should include schematic diagram and full details of frequency control. If changes are to be made in licensed transmitter include schematic diagram and give full details of change.)			North latitude		West longitude														
			37° 43' 28"		97° 12' 57"														
8. Modulation monitor			If not fully described above, give further details and dimensions including any other antennas mounted on tower and associated isolation circuits as Exhibit No. * (Height figures should not include obstruction lighting.)																
Make	Type No.		Submit as Exhibit No. * a plat of the transmitter site showing boundary lines, and roads, railroads, or other obstructions; and also layout of the ground system or counterpoise. Show number and dimensions of ground radials or if a counterpoise is used, show height and dimensions.																
RCA	BW-66F		11. Attach as Exhibit No. * a sufficient number of aerial photographs taken in clear weather at appropriate altitudes and angles to permit identification of all structures in the vicinity. The photographs must be marked so as to show compass directions, exact boundary lines of the proposed site, and locations of the proposed 1000 mv/m contour for both day and night operation. Photographs taken in eight different directions from an elevated position on the ground will be acceptable in lieu of the aerial photographs if the data referred to can be clearly shown.																
9. Frequency monitor																			
Make	Type No.																		
RCA	BW-11A																		

*See attached engineering statement

12. Allocation Studies:

- A. Attach as Exhibit No. * map or maps, having reasonable scales, showing the 1000, 25, 5, 2, normally protected and interference-free contours in mv/m for both day and night operation both existing and as proposed by the application. (NOTE: The 2 mv/m night contour need not be supplied if service is not rendered thereto.)
- B. (1) For daytime operation, attach as Exhibit No. * an allocation study, utilizing Figure M-3 of the Rules or an accurate full scale reproduction thereof and using pertinent field strength measurement data where available, a full scale exhibit of the entire pertinent area to show the following:
- (a) Normally protected, the interference-free, and the interfering contours for the proposed operation along all azimuths.
 - (b) Complete normally protected and interference-free contours of all other proposals and existing stations to which objectionable interference would be caused.
 - (c) Interfering contours over pertinent arcs of all other proposals and existing stations from which objectionable interference would be received.
 - (d) Normally protected and interfering contours over pertinent arcs of all other proposals and existing stations which require study to show the absence of objectionable interference.
 - (e) Plot of the transmitter location of each station or proposal requiring investigation, with identifying call letters, file numbers, and operating or proposed facilities.
 - (f) Properly labeled longitude and latitude degree lines, shown across entire exhibit.
- (2) For daytime operation, when necessary to show more detail, attach as Exhibit No. * an additional allocation study, utilizing World or Sectional Aeronautical charts to clearly show interference or absence thereof.
- (3) For daytime operation, attach as Exhibit No. * a tabulation of the following:
- (a) Azimuths along which the groundwave contours were calculated for all stations or proposals shown on allocation study exhibits required by Paragraph 12B above.
 - (b) Inverse distance field strength used along each azimuth.
 - (c) Basis for ground conductivity utilized along azimuths specified in (3) (a). If field strength measurements are used, the measurements must be either submitted or be properly identified as to location in Commission files.
- C. For nighttime operation, attach as Exhibit No. * , allocation data to include the following:
- (1) Proposed nighttime limitation to other existing or proposed stations with which objectionable interference would result, as well as those other proposals and existing stations which require study to clearly show absence of objectionable interference.
 - (2) All existing or proposed nighttime limitations which enter into the nighttime R.S.S. limitation of each of the existing or proposed facilities investigated under C (1) above.
 - (3) All existing and proposed limitations which contribute to the R.S.S. nighttime limitation of the proposed operation, together with those limitations which must be studied before being excluded.
 - (4) A detailed interference study plotted upon an appropriate scale map if a question exists with respect to nighttime interference to other existing or proposed facilities along bearings other than on a direct line toward the facility considered.
 - (5) Utilizing an appropriate scale map, clearly show the normally protected and interference-free contours of each of the existing and proposed stations which would receive nighttime interference from the proposed operation.
 - (6) The detailed basis for each nighttime limitation calculated under C (1) (2) (3) and (4) above, including a copy of each pertinent radiation pattern in the vertical plane and basis therefor.

13. Attach as Exhibit No. * tables of the areas and populations within the contours included in Paragraph 12 (A) above, as well as within the normally protected and interference-free contours of each station or proposed operation to which interference would be caused according to the Commission Rules.

(NOTE: See the Standard Broadcast Technical Standards. All towns and cities having populations in excess of those given in Section 3.182(g) are not to be included in the tabulation of populations within the service contours. The 1950 or later Census Minor Civil Division maps are to be used in making population counts, subtracting any towns or cities not receiving adequate service, and where contours cut a minor division assuming a uniform distribution of population within the division, to determine the population included in the contours unless a more accurate count is made.)

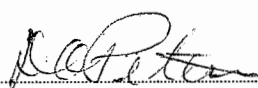
* See attached engineering statement.

14. Attach as Exhibit No. * map or maps having reasonable scales clearly showing the following:
- (a) Proposed antenna location
 - (b) General character of the city or metropolitan district, particularly the retail business, wholesale business, manufacturing, residential, and unpopulated areas (by symbols, cross-hatching, colored crayons, or other means)
 - (c) Heights of buildings or other structures and terrain elevations in the vicinity of the antenna, indicating the location thereof.
 - (d) Transmitter location and call letters of all radio stations (except amateur) and the location of established commercial and government receiving stations within 2 miles of the proposed transmitter location. Call letters and locations of broadcast stations, including FM and television, within 5 miles must be shown.
 - (e) Terrain


15. If this application is for modification of construction permit state briefly as Exhibit No. the present status of construction and indicate when it is expected that construction will be completed. Not Applicable

I certify that I am the Technical Director, Chief Engineer or Consulting Engineer for the applicant of the radio station for which this application is submitted and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief. (This signature may be omitted provided the engineer's original signed report of the data from which the information contained herein has been obtained is attached hereto.)

Date June 17, 1966


.....
Consulting Engineer

* See attached engineering statement.

Broadcast Application		FEDERAL COMMUNICATIONS COMMISSION				Section V-G (Antenna)	
ANTENNA AND SITE INFORMATION (see instruction B Section I)		Name of applicant Swanco Broadcasting of Kansas, Inc.				FOR COMMISSION USE ONLY File No.	
Since this Section is submitted to the Regional Airspace Subcommittee of the Air Coordinating Committee for clearance in connection with obstruction to air navigation, it is necessary that all the data called for be supplied. Previously and separately filed data must not be incorporated by reference.							
Legal Counsel Koteen & Burt		Purpose of application (Check appropriate box)					
Address 1000 Vermont Avenue Washington, D. C.		a. New antenna construction <input checked="" type="checkbox"/>					
Consulting Engineer A. Earl Cullum, Jr.		b. Alteration of existing antenna structure <input type="checkbox"/>					
Address Box 7004 Dallas, Texas		c. Change in location <input type="checkbox"/>					
Class of station Standard Broadcast		2. Features of surrounding terrain					
Facilities requested 1480 kc		List any natural formations or existing man-made structures (hills, trees, water tanks, towers, etc.) which, in the opinion of the applicant, would tend to shield the antenna from aircraft and thereby minimize the aeronautical hazard of the antenna. *					
1. Location of antenna		Submit as Exhibit No. * a chart on which is plotted the exact location of the antenna site, and also the relative location of the natural formations and/or the existing man-made structures listed above.					
State Kansas	County Sedgwick	City or Town Near Wichita				The chart used shall be an Instrument Approach Chart (or the landing chart on reverse side thereof), or a Sectional Aeronautical Chart, choice depending upon proximity of the antenna site to landing areas. 1 In general, the Sectional Aeronautical Chart should be used only when the antenna site is more than 10 miles from a landing area or when an Instrument Approach Chart is unobtainable. 1 These charts may be purchased from the U.S. Coast and Geodetic Survey, Washington 25, D. C.	
Exact antenna location (street address) (if outside city limits, give distance and direction from, and name of nearest town)							
On 21 Street, midway between Webb & Greenwich							
Geographic coordinates (to be determined to nearest second. For directional antenna give coordinates of center of array.) For single vertical radiator give tower location.							
North latitude 97° 43' 28"		West longitude 97° 12' 57"					
3. Designation, distance, and bearing to center line of nearest established airway within 5 miles							
None							
4. List all landing areas within 10 miles of antenna site. Give distance and direction to the nearest boundary of each landing area from the antenna site.							
<u>Landing Area</u>	<u>Distance</u>	<u>Direction</u>	<u>Landing Area</u>	<u>Distance</u>	<u>Direction</u>		
(a) Piper	1.6 mile	North	(e) Graham	8.0 miles	SE		
(b) Nelson	6.1 miles	NE	(f) Cessna	5.5 miles	SSW		
(c) Rawdon	1.6 mile	SSE	(g) McDonnell AFB	6.2 miles	SSW		
(d) Beech	2.1 miles	South	(h) Davison	7.8 miles	NW		
5. Description of antenna system (If directional, giving spacing and orientation of towers)							
*							
Type							
Description of tower(s) triangular, uniform, cross-section, guyed, vertical steel radiators							
Self-supporting		Guyed			Tubular (Pole)		
Tower (height figures should include obstruction lighting)		#1	#2	#3	#4	#5	#6
Height of radiating elements		166 ft	166 ft	166 ft	166 ft	166 ft	
Overall height above ground		172	172	172	172	172	
Overall height above mean sea level		1552	1552	1552	1552	1552	
If a combination of Standard, FM, or TV operation is proposed on the same multi-element array (either existing or proposed) submit as Exhibit No. a horizontal plan for the proposed antenna system, giving heights of the elements above ground and showing their orientation and spacing in feet. Clearly indicate if any towers are existing.							
Submit as Exhibit No. * a vertical plan sketch for the proposed total structure (including supporting building if any) giving heights above ground in feet for all significant features. Clearly indicate existing portions, noting painting and lighting.							
Is the proposed antenna system designed so that obstruction lights may be installed and maintained at the uppermost point(s)?							
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>							
6. Is the proposed site the same or immediately adjoining the transmitter-antenna site of other stations authorized by the Commission or specified in another application pending before the Commission?						Date June 17, 1966	
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>						 Signature of Engineer preparing data	
If the answer is "Yes", give							
Call letters		File numbers					

*See attached figures 1, 2, 6A and 6B