1510-1540

Station	Main Studio	Freq	Power	Date
CJRS	Sherbrooke, QU	1510	50/10 kW/DA-2	3/15/77
CKOT	Tillsonburg, ON	1510	1 kW/DA-D	5/25/56
XEOF	Cortazer, ON	1510	5 kW/DA-D	7/1/72
NEW	Troy, OH	1510	0.25 kW/DA-D	11/2/79
KAAR	Mountlake Terrace, WA	1510	0.25 kW/DA-D	11/29/68
KURB	Mountlake Terrace, WA	1510	0.25 kW/DA-D	11/29/68
KDKO	Littleton, CO	1510	5/1 kW/DA-2	4/30/75
KEAM	Port Arthur, TX	1510	5 kW/DA-D	3/29/78
KGA	Spokane, WA	1510	50 kW/DA-N	4/12/47
KIRV	Fresno, CA	1510	10 kW/DA-D	11/2/79
KMOR	Littleton, CO	1510	1 kW/DA-1	9/7/56
KSOM	Ontario, CA	1510	1/10 kW/DA-2	3/28/69
WAHT	Annville-Cleona, PA	1510	5 kW/DA-D	9/26/68
WAUK	Waukesha, WI	1510	10 kW/DA-D	7/28/66
WINU	Highland, IL	1510	1 kW/DA-D	6/28/68
WINU	Highland, IL	1510	0.25 kW/DA-D	9/27/60
WITS	Boston, MA	1510	5/50 kW/DA-2	9/12/80
WMEX	Boston, MA	1510	5/50 kW/DA-2	1/28/69
WJCO	Jackson, MI	1510	5 kW/DA-D	8/24/62
WJIC	Salem, NJ	1510	2.5 kW/DA-D	5/16/80
WLAC	Nashville, TN	1510	50 kW/DA	2/20/45
WLKR	Norwalk, OH	1510	0.5 kW/DA-D	10/28/66
WMBA	Ambridge-Aliquippa, PA	1510	10 kW/DA-D	1/28/66
WNLC	New London, CT	1510	5/10 kW/DA-2	12/24/75
WPUT	Brewster, NY	1510	1 kW/DA-D	4/21/71

1510-1540

Station	Main Studio	Freq	Power	Date
WRAN	Dover, NJ	1510	0.5/10 kW/DA-2	5/27/69
WRGI	Marco Island, FL	1510	1 kW/DA-D	9/17/75
NEW	Naples, FL	1510	0.25 kW/DA-D	4/29/70
NEW	Monticello, IN	1510	0.25 kW/DA-D	11/29/66
NEW	Wabash, IN	1510	0.25 kW/DA-D	1/30/67
NEW	Pulaski, VA	1510	0.25 kW/DA-D	7/28/69
NEW	Roanoke, VA	1510	50 kW/DA-D	11/29/69
XERB	Cozumel, QR	1510	5 kW/DA-D	9/1/77
NEW	Langley, BC	1520	10 kW	7/26/83
KACY	Port Hueneme, CA	1520	1/50 kW/DA-2	6/29/70
KACY	Port Hueneme, CA	1520	1/10 kW/DA-2	12/22/64
KACY	Port Hueneme, CA	1520	1/5 kW/DA-2	2/26/60
KMPL	Sikeston, MO	1520	0.5/5 kW/DA-3	2/28/66
KOMA	Oklahoma City, OK	1520	50 kW/DA-N	10/14/71
KXKW	Lafayette, LA	1520	0.5/10 kW/DA-D	8/29/60
KYXI	Oregon City, OR	1520	10 kW/DA-1	8/3/55
KYXI	Oregon City, OR	1520	50 kW/DA-2	8/23/63
WANR	Toledo, OH	1520	1 kW/DA-2	3/27/70
WAOA	Auburn-Opelika, AL	1520	5 kW/DA-D	7/28/66
WEXM	Jamesville, VA	1520	0.5 kW/DA-D	2/20/75
WGNB	Indian Rocks Beach, FL	1520	1 kW/DA-D	4/30/63
WINW	Canton, OH	1520	1 kW/DA-D	12/15/60
WKBW	Buffalo, NY	1520	50 kW/DA-1	1/30/67
WKJR	Muskegon Heights, MI	1520	0.5 kW	8/28/79
WKJR	Muskegon Heights, MI	1520	10 kW/DA-D	5/27/70
WKNT	Kent, OH	1520	1 kW/DA-D	7/27/65

1510-1540

Station	Main Studio	Freq	Power	Date
WPOE	Greenfield, MA	1520	10 kW/DA-D	11/16/79
WRAI	San Juan, PR	1520	10 kW/DA-1	10/26/70
WSLT	Ocean City-Sommers Point, NJ	1520	1 kW/DA-D	6/14/61
WSVL	Shelbyville, IN	1520	0.25/1 kW/DA-2	4/10/61
WTGR	Myrtle Beach, SC	1520	5 kW/DA-D	10/73
WTLN	Apopka, FL	1520	5 kW/DA-D	12/15/60
XEEG	Panzacola, Tlax.	1520	0.5 kW/DA-D	7/29/70
NEW	Greenfield, MA	1520	5 kW/DA-D	5/27/69
NEW	Yorktown, TX	1520	0.5 kW/DA-D	9/28/66
NEW	Moncton, NB	1530	10/5 kW	7/26/83
NEW	Morden, MB	1530	10/1 kW/DA-2	3/28/79
KECK	Lincoln, NE	1530	5 kW/DA-D	1/28/66
KFBK	Sacramento, CA	1530	50 kW/DA-1	12/30/48
KGBT	Harlingen, TX	1530	50/10 kW/DA-1	1/21/52
KNBE	Lincoln, NE	1530	5 kW/DA-D	12/30/63
KNIE	Cheyenne, WY	1530	1/10 kW/DA-N	2/28/69
WCKY	Cincinnati, OH	1530	50 kW/DA-N	11/2/79
WDJZ	Bridgeport, CT	1530	5 kW/DA-D	11/9/79
WDJZ	Bridgeport, CT	1530	10 kW/DA-D	4/13/77
WFIC	Collinsville, VA	1530	1/0.25 kW/DA-D	5/27/70
WKDC	Elmhurst, IL	1530	0.25 kW/DA-D	9/28/67
WQLW	Flora, IL	1530	1 kW/DA-D	4/29/69
WKDC	Elmhurst, IL	1530	0.25 kW/DA-D	10/17/74
WPNO	Auburn, ME	1530	10 kW/DA-D	12/4/74
WRBX	Chapel Hill, NC	1530	5 kW/DA-D	4/27/77
WRBX	Chapel Hill, NC	1530	10 kW/DA-D	2/8/78

1510-1540

Station	Main Studio	Freq	Power	Date
WTHM	Lapeer, MI	1530	5 kW/DA-D	9/13/60
WTTI	Dalton, GA	1530	10 kW/DA-D	6/5/74
WTTI	Dalton, GA	1530	10 kW/DA-2	9/28/65
WYAZ	Yazoo City, MS	1530	0.25 kW/DA-D	8/22/69
NEW	Jacksonville, FL	1530	50 kW/DA-D	5/27/69
NEW	Wheaton, IL	1530	0.5 kW/DA-D	4/29/70
NEW	Flora, IL	1530	0.25 kW/DA-D	4/29/68
NEW	Lincoln, NE	1530	5 kW/DA-D	11/30/61
NEW	Matawan, NJ	1530	0.5 kW/DA-D	8/26/66
NEW	Somerville, NJ	1530	1 kW/DA-D	4/28/67
XEUR	Texcoco, Edo de MX	1530	5 kW/DA-1	3/22/71
CHFI	Toronto, ON	1540	50 kW/DA-D	7/27/62
CHIN	Toronto, ON	1540	50 kW/DA-D	8/24/83
KASA	Phoenix, AZ	1540	10 kW/DA-D	9/20/61
KBUY	Fort Worth, TX	1540	1/50 kW/DA-2	9/28/66
KBUY	Fort Worth, TX	1540	1/5 kW/DA-1	9/16/49
KBVU	Bellevue, WA	1540	1 kW/DA-1	4/24/64
KEDA	San Antonio, TX	1540	1/5 kW/DA-2	11/2/79
KFKF	Bellevue, WA	1540	25 kW/DA-2	12/27/68
KFKF	Bellevue, WA	1540	1 kW/DA-1	2/28/66
KGBC	Dallas, TX	1540	0.25/1 kW/DA-N	4/22/60
KKAP	Aptos-Capitols, CA	1540	10 kW/DA-D	11/9/79
KMFO	Aptos, CA	1540	10 kW/DA-D	12/12/80
KMPG	Hollister, CA	1540	5 kW/DA-D	9/26/68
KXEL	Waterloo, IA	1540	50 kW/DA	1/31/45
KZAM	Bellevue, WA	1540	5 kW/DA-N	6/18/75
KZLA	Los Angeles, CA	1540	10/50 kW/DA-2	3/19/76

1510-1540

Station	Main Studio	Freq	Power	Date
WBCO	Bucyrus, OH	1540	0.5 kW/DA-D	6/27/69
WNIO	Niles, OH	1540	0.5 kW/DA-D	4/22/60
WNRE	Circleville, OH	1540	1 kW/DA-D	12/4/74
WPTR	Albany, NY	1540	50 kW/DA-1	12/20/48
WRCP	Philadelphia, PA	1540	50 kW/DA-D	7/8/59
WRGM	Richmond, VA	1540	10 kW/DA-D	10/25/61
NEW	Santa Cruz, CA	1540	5 kW/DA-D	3/28/68
NEW	Napoleon, OH	1540	0.5 kW/DA-D	8/29/60
WRPL	Charlotte, NC	1540	10 kW/DA-D	9/27/78

CJRS

DESCRIPTION

ANTENNE DIRECTIONNELLE

STATION : CJRS, Sherbrooke, Qué.

STUDIO PRINCIPAL: Sherbrooke, Qué.

PUISSANCE: 50 kw jour
10 kw nuit

FREQUENCE : 1510 KHz

CLASSE : II

TEMPS : U

NOTIFICATION NO: 362

DATE le 15 mars 1977

COORDONNEES GEOGRAPHIQUES: 45°21'05" latitude nord
71°57'30" longitude ouest

CARACTERISTIQUES D'ANTENNE

MODE D'OPERATION : AD-2

NOMBRE D'ELEMENTS : 4

DESCRIPTION DES ELEMENTS : Quatre mats d'acier de coupe uniforme haubanés, isolés à la base pour une alimentation en série. Aucune charge de tête

TOURS		No. 1	No. 2	No. 3	No. 4
Hauteur au-dessus des isolateurs		163'(90°)	163'	163'	163'
Hauteur hors-tout		170'	170'	170'	170
Rapport de champ	- jour		1.0	0.55	
	- nuit	1.000	2.846	2.846	1.000
Phasage	- jour		0°	-130°	
	- nuit	-177°	+61°	-61°	+177°
Espacement		Ref.	163'(90°)	326'(180°)	489'(270°)
Orientation		Ref.	42°	42°	42°

SYSTEME DE MISE A TERRE : Pour chaque mât, 120 rayons espacés également en fils de cuivre mou No. 10 B&S de 261' (0.4) reliés au point de jonction commun et joints à un ruban de cuivre mou à la base de la tour

CHAMP PREVU : Jour: 1343 mV/m @ 1 mi. pour 50 kw
190 mV/m @ 1 mi. pour 1 kw

Nuit: 585 mV/m @ 1 mi. pour 10 kw
185 mV/m @ 1 mi. pour 1 kw

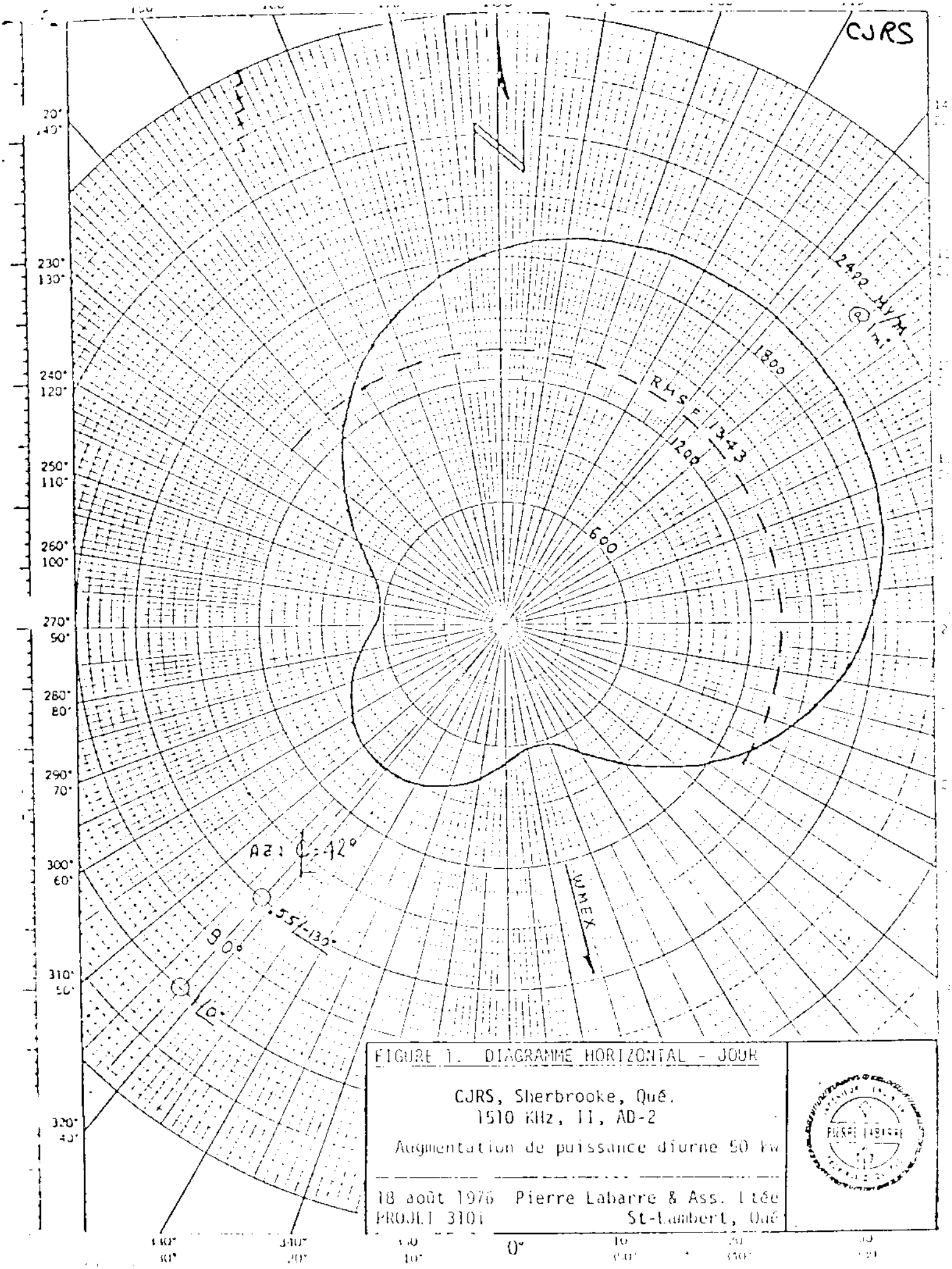


FIGURE 1. DIAGRAMME HORIZONTAL - JOUR

CJRS, Sherbrooke, Qué.
1510 KHz, II, AD-2

Augmentation de puissance diurne 50 Kw

18 août 1976 Pierre Labarre & Ass. Ltée
PROJET 3101 St-Lambert, Qué

CJRS

Description Sheet
(4-28-67ct)

New Station
Sherbrooke, Quebec

10kw, DA-2, U, Class II
1510 kc

ANTENNA DESCRIPTION SHEET

DIRECTIONAL DA-2

STATION CALL:	.....
MAIN STUDIO	Sherbrooke, Quebec.
FREQUENCY	1510 kc/s
POWER	10,000 watts
CLASS	II
TIME	Unlimited
NOTIFICATION REFERENCE	List 223 March 3, 1967
GEOGRAPHICAL LOCATION	Lat 45° 21' 05", Lon 71° 57' 30"
ARRAY CHARACTERISTICS	Four elements, guyed, uniform cross section, base insulated, series feed. Height 163 feet or 90 degrees. No top loading.

ELEMENT	ONE	TWO	THREE	FOUR
spacing	ref	163' 90°	326' 180°	489' 270°
bearing	ref	042°	042°	042°
Day R		1.00	0.55	
Ø		00°	-130°	
Night R	1.000	2.846	2.846	1.000
Ø	-177°	+61°	-61°	+177°

Ground System: 120 radials per tower, #10 AWG bare, soft copper wire, spaced uniformly, depth 8 inches approximately. Radials bonded on a line between towers and bonded to soft copper strap at tower base. Maximum radial length 261 feet.

R M S Day: 601 mv/m at 1 mile for 10 kw
190 mv/m at 1 mile for 1 kw

Night: 585 mv/m at 1 mile for 10 kw
185 mv/m at 1 mile for 1 kw

Dec 1966

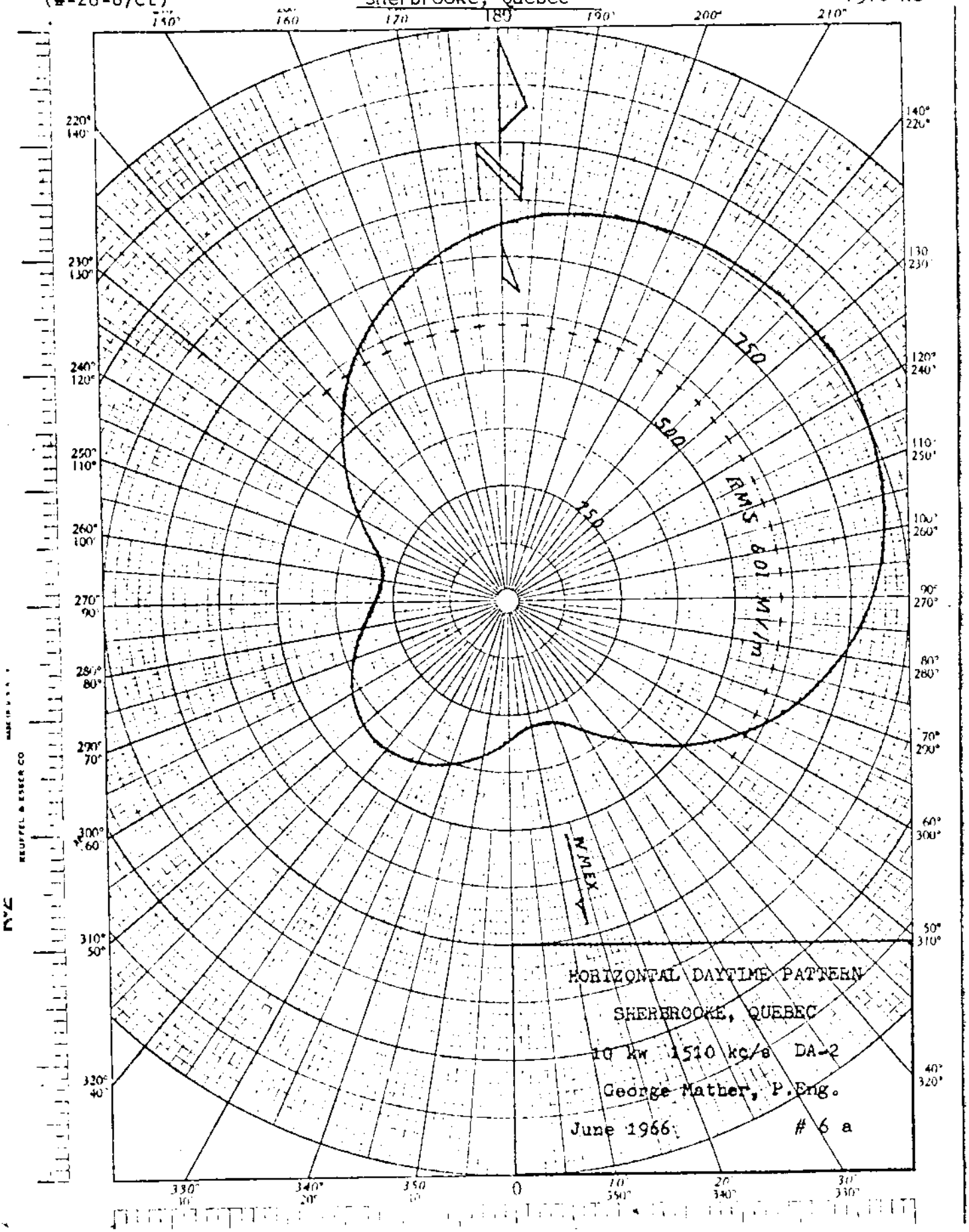
#5

CJRS

Proposed Day
(4-28-67ct)

New Station
Sherbrooke, Quebec

10kw,DA-2,U,Class II
1510 kc

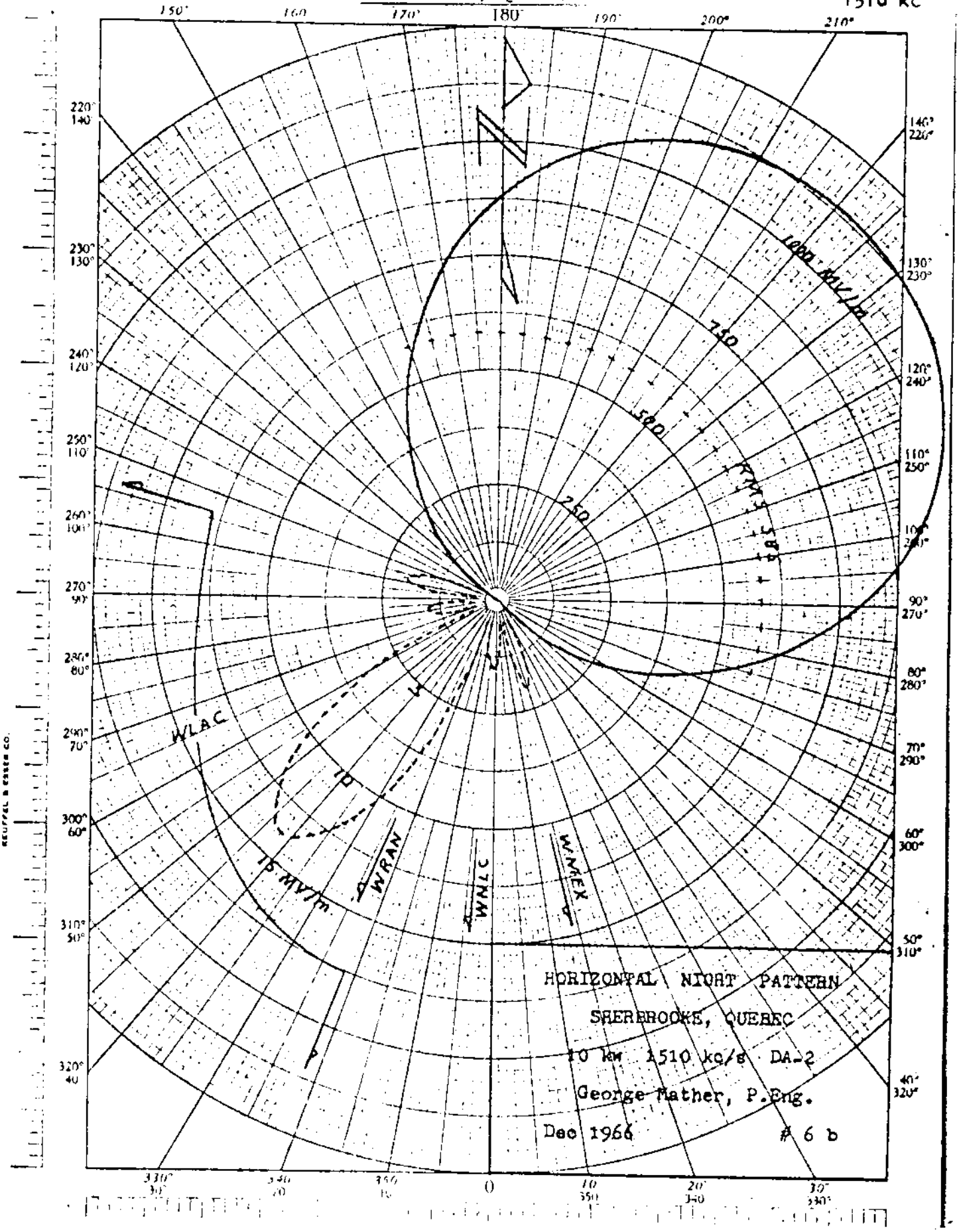


CJRS

Proposed Night
(4-28-67ct)

New Station
Sherbrooke, Quebec

10kw,DA-2,U,Class II
1510 kc



215

CJRS

Description Sheet
(8-26-66ct)

Station CALL
Sherbrook, Quebec

10kw,DA-2,U,Class II
1510 kc

ANTENNA DESCRIPTION SHEET

DIRECTIONAL DA-2

STATION CALL	.....
MAIN STUDIO	Sherbrooke, Quebec
FREQUENCY	1510 kc/s
POWER	10,000 watts
CLASS	II
TIME	Unlimited
NOTIFICATION REFERENCE	.215....Date: July 6, 1966.
GEOGRAPHICAL LOCATION	Lat 45°21'05", Lon 71°57'30"
ARRAY CHARACTERISTICS	Three elements, guyed, uniform cross section, base insulated, series feed. Height 163 feet on 90 degrees. No top loading.

ELEMENT	ONE	TWO	THREE
spacing	ref	163' 90°	326' 180°
bearing	ref	042½°	042½°
Day R	1.00	0.55	
∅	00°	-130°	
Night R	1.000	1.928	1.000
∅	00°	-114.5°	+131.0°

Ground System	120 radials per tower, #10 AWG bare soft copper wire, spaced uniformly, depth approximately 8 inches. Radials bonded on a line between towers and bonded to soft copper strap at tower base. Average length 261 feet.
R M S Day	601 mv/m at 1 mile for 10 kw 190 mv/m at 1 mile for 1 kw
R M S Night	585 mv/m at 1 mile for 10 kw 185 mv/m at 1 mile for 1 kw

June 1966

5

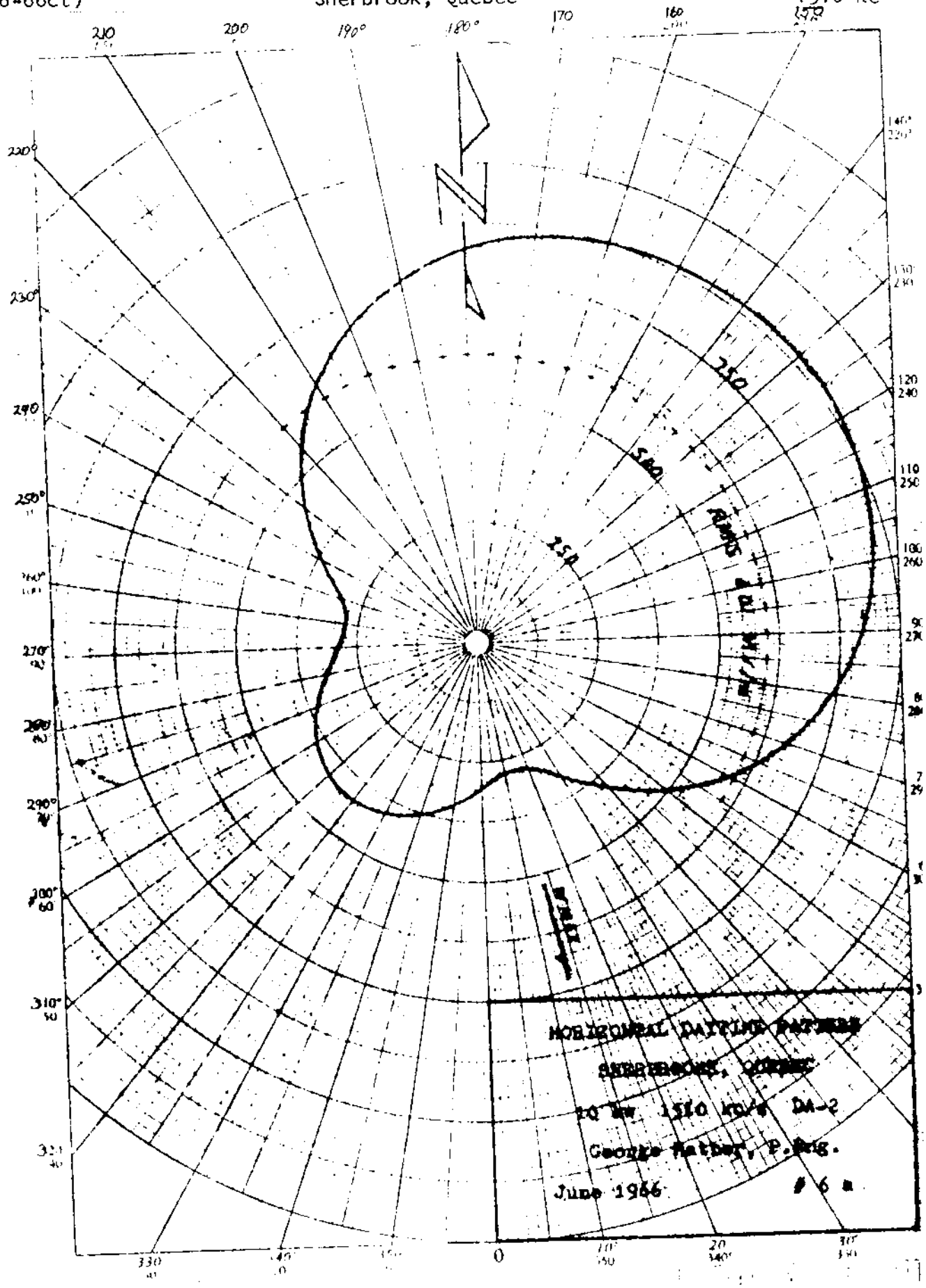
215

CJRS

Proposed Day
(8-26-66ct)

Station CALL
Sherbrook, Quebec

10kw,DA-2,U,Class II,
1510 kc



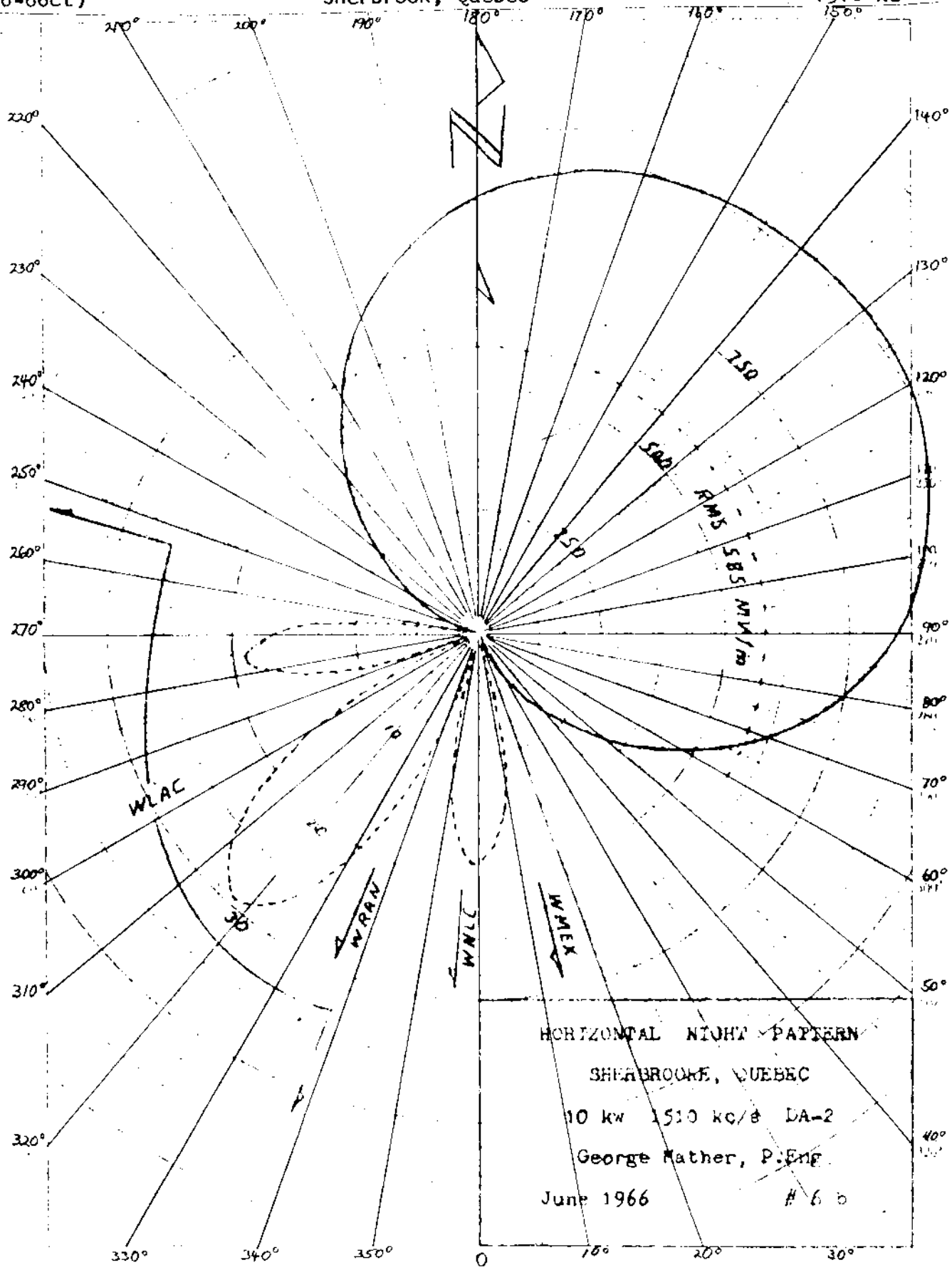
215

CJRS

Proposed Night
(8-26-66ct)

Station CALL
Sherbrook, Quebec

10kw,DA-2,U,Class II
1510 kc



#103

CKOT.

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: CKOT

Main Studio: Tillsonburg, Ont.

Frequency: 1510 Kc.

Power: 1 Kw. Class: II

Notification List No. 103

Date: May 25, 1956.

Geographical Location of the Centre of the Antenna System

North Latitude: 42° 52' 42"
West Longitude: 80° 44' 30"

Antenna: Mode of Operation - DA-D (day only) elements: two, vertical, triangular, guyed, radiators of uniform cross-section. No top loading.

Tower:	(1) West	(2) East
Height above insulators:	160' (93°)	160'
Spacing:	163' (90°)	
Phasing:	0°	155°
Field Ratio:	0	0.55

Orientation: Towers on a bearing 093° true.

Predicted Effective Efficiency: 178 mv/m at 1 mile for 1 Kw.

Ground System: 120 radials #10 copper per tower, buried 10" below grade, bonded to #6 copper at perimeter. Radials are not of equal length but area of the ground system is equivalent to circular type ground system with diameters 0.4 wavelength. Radials are bonded to a 24' x 24' ground screen of expanded copper at base of tower.

#103

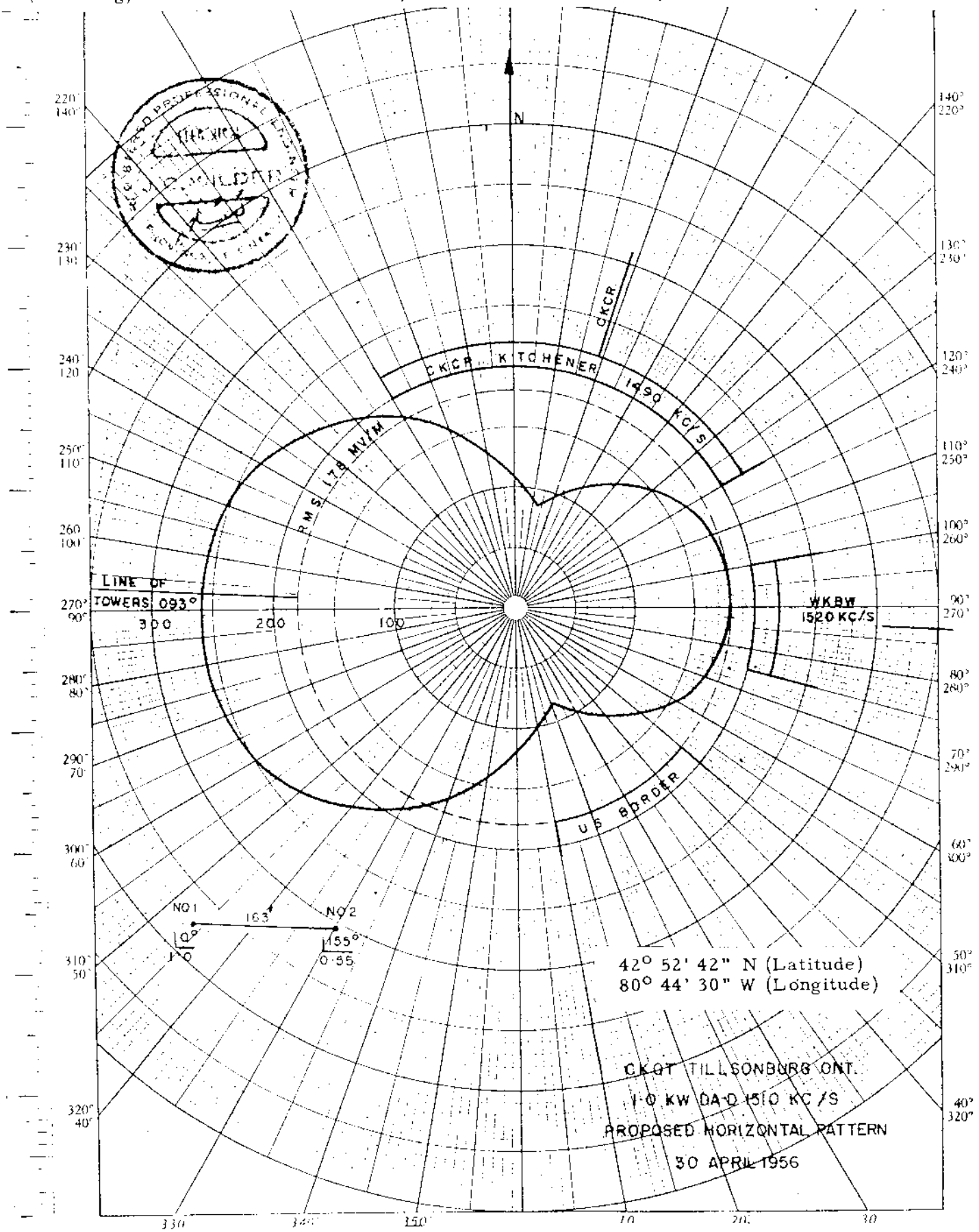
CKOT

PROPOSED
DAY (7-27-56g)

STATION CKOT
TILLSONBURG, ONT.

1 KW CLASS II
DA-D , D

1510 KC



Notification List No. 103 Date: May 25, 1956 CKOT, Tillsonburg, Ont. 1510 KC

XEOF

DIRECTIONAL ANTENNA DESCRIPTION SHEET
(Issued January 23, 1973)

Station: XEOF

Main Studio: Cortazar, Gto.

Frequency: 1510 kHz

Power: 5kW

Notification List No. 266

Date: July 1, 1972

Class: III

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 20° 30' 48"
West Longitude: 100° 59' 55"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 2
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	SW(#1)	NE(#2)
HEIGHT ABOVE INSULATORS:	162.97'	162.97' (90°)
PHASING:	0°	+170°
FIELD RATIO:	1	1

SPACING AND ORIENTATION: Adjacent elements are spaced 108.63' (60°) on a line bearing 55° true.

GROUND SYSTEM: 120-162.97' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

Predicted effective Field: 475.4 mv/m at rated power.

XEOF

DESCRIPCION DEL SISTEMA DIRECCIONAL DE RADIACION

OPERACION DIURNA

ESTACION XEOF — UBICACION: CORTAZAR, GTO.

FRECUENCIA: 1010 KHz. — POTENCIA: 5000 W-D

NOTIFICACION N° _____ — CLASE: AD-D D II

LOCALIZACION GEOGRAFICA DEL SISTEMA RADIADOR — LONGITUD O: 100° 55'55" LATITUD N: 20° 30'48"

CARACTERISTICAS DEL SISTEMA

AUTORIZADO PARA OPERACION: AD-D

NUMERO DE ELEMENTOS: DOS

TIPO DE ELEMENTOS: TORRES VERTICALES

TORRES: DOS CON RETENIDAS

	OESTE	ESTE
ALTURA SOBRE LOS AISLADORES	90° (49.67M)	90° (49.67M)
SEPARACION ENTRE TORRES	60° (33.11M)	
MAGNITUDES RELATIVAS DE CORRIENTE	1	1
DEFASAMIENTO	0°	170
AZIMUT DEL EJE DE LAS TORRES	55° 00'	

RAIZ CUADRATICA MEDIA TEORICA 471.4 mV/M.

[illegible] ATENUADO A [illegible] DE POTENCIA RADIADA 198 mV/M.

0 0 0

XEOF

PATRON DE RADIACION HORIZONTAL TABULADO
OPERACION DIURNA

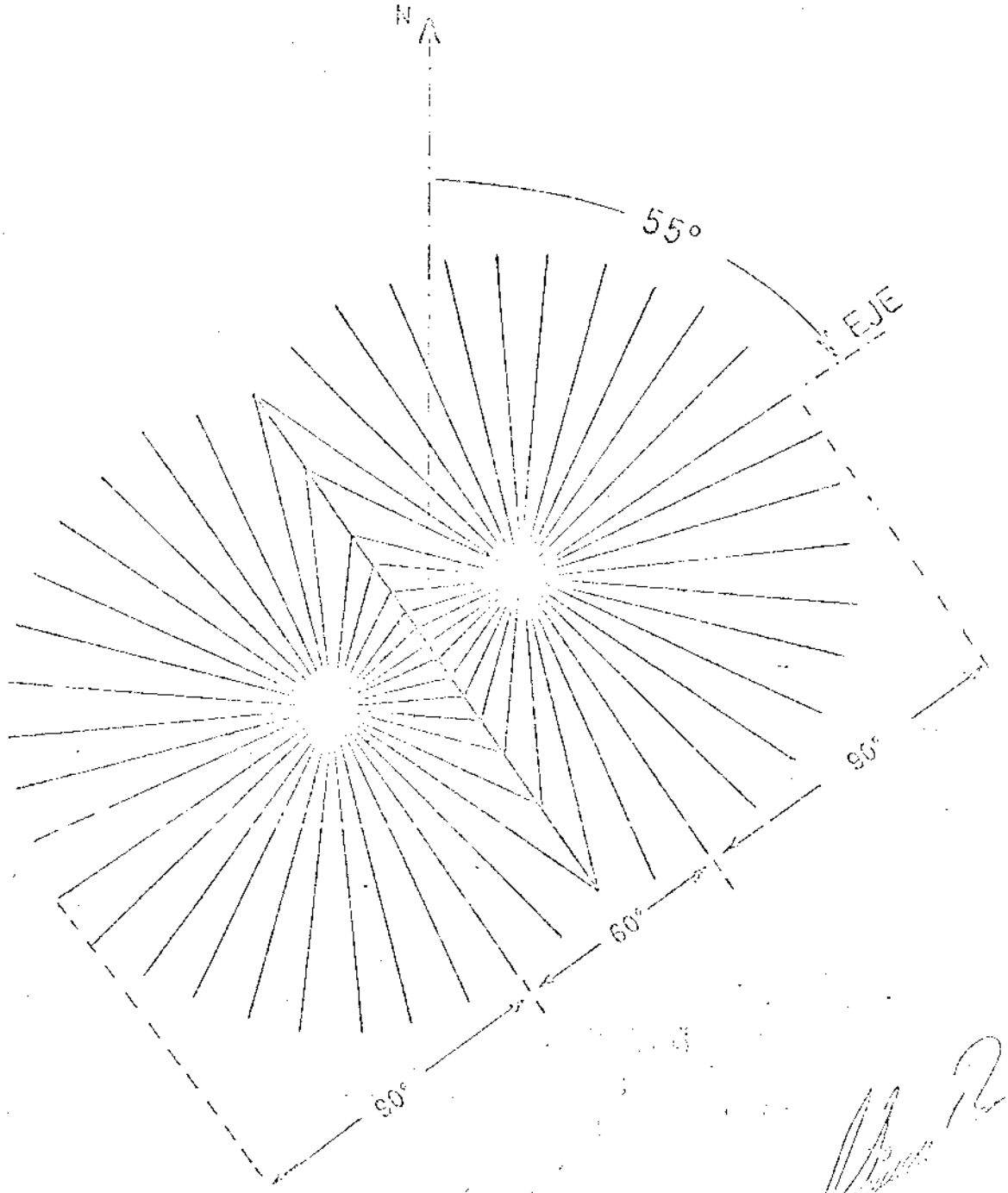
XEOF — 5000 W-AD-D

1510 KHZ — CORTAZAR, GTO.

$E_{\varphi} = 198.24 \cos(30^\circ \cos\varphi + 60^\circ)$

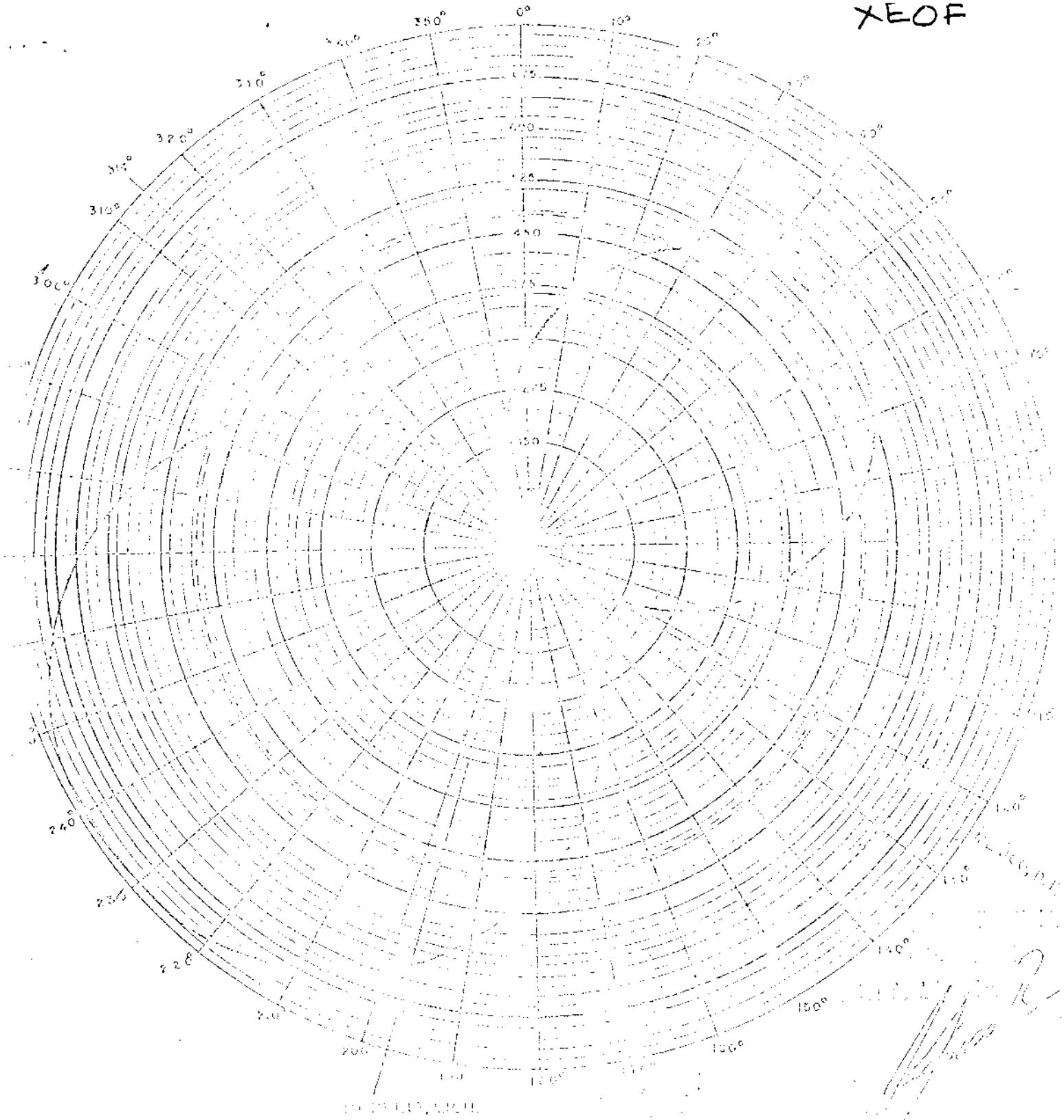
AZIMUTS		φ°	A	B	C	D	E mV/m
			cos	30° A	B + 85	cos C	
55	55	0	1.0000	30.00	115.00	-0.4226	[illegible]
45	65	10	0.9848	29.54	114.54	-0.415	[illegible]
35	75	20	0.9397	28.19	113.19	-0.3939	[illegible]
25	85	30	0.8660	25.98	110.98	-0.3584	[illegible]
15	95	40	0.7660	22.98	107.98	-0.3090	[illegible]
5	105	50	0.6428	19.28	104.28	-0.2470	[illegible]
355	115	60	0.5000	15.00	100.00	-0.1736	[illegible]
345	125	70	0.3420	10.26	95.26	-0.0914	[illegible]
335	135	80	0.1736	5.21	90.21	-0.0034	[illegible]
325	145	90	0.0000	0.00	85.00	0.0872	113.210
315	155	100	-.1736	-5.21	79.79	0.1773	[illegible]
305	165	110	-0.3420	-10.26	74.74	0.2632	341.737
295	175	120	-0.5000	-15.00	70.00	0.3420	[illegible]
285	185	130	-0.6428	-19.28	65.72	0.4112	[illegible]
275	195	140	-0.7660	-22.98	62.02	0.4663	[illegible]
265	205	150	-0.8660	-25.98	59.02	0.5147	[illegible]
255	215	160	-0.9397	-28.19	56.81	0.5474	710.[illegible]
245	225	170	-0.9848	-29.54	55.46	0.5670	[illegible]
235	235	180	-1.0000	-30.00	55.00	0.5736	[illegible]

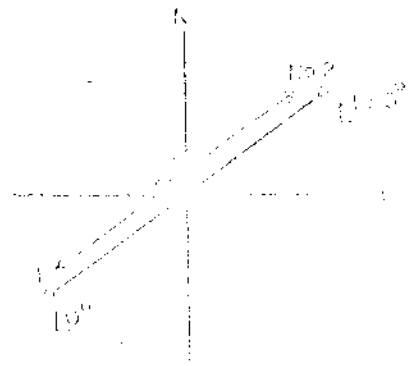
XEOF



[illegible]	XEOF	REPRESENTACIONES TECNICAS
[illegible]	1510 KHZ.	REPRESENTACIONES TECNICAS
	CORTAZAR, GTO.	DICIEMBRE 1991

XEOF


0°
10°
20°
30°
40°
50°
60°
70°
80°
90°
100°
110°
120°
130°
140°
150°
160°
170°
180°
190°
200°
210°
220°
230°
240°
250°
260°
270°
280°
290°
300°
310°
320°
330°
340°
350°
400
450
500
550
600
650
700
750
800
850
900
950
1000


N
10°
10°
10°

NEW
1510kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: (NEW)

Main Studio: Troy, Ohio

Frequency: 1510 kHz

Power: 0.25kw Day

Notification List No. 1783

Date: November 2, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 40° 01' 08"
West Longitude: 84° 14' 29"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 6
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	NE(#1)	EC(#2)	SE(#3)	NW(#4)	WC(#5)	SW(#6)
HEIGHT ABOVE INSULATORS:	162.9'	162.9'	162.9'	162.9'	162.9'	162.9' (90.0°)
DAY PHASING:	0°	143°	-74.5°	76.5°	-140.5°	2°
DAY FIELD RATIO:	1.000	1.870	1.000	1.052	1.970	1.050

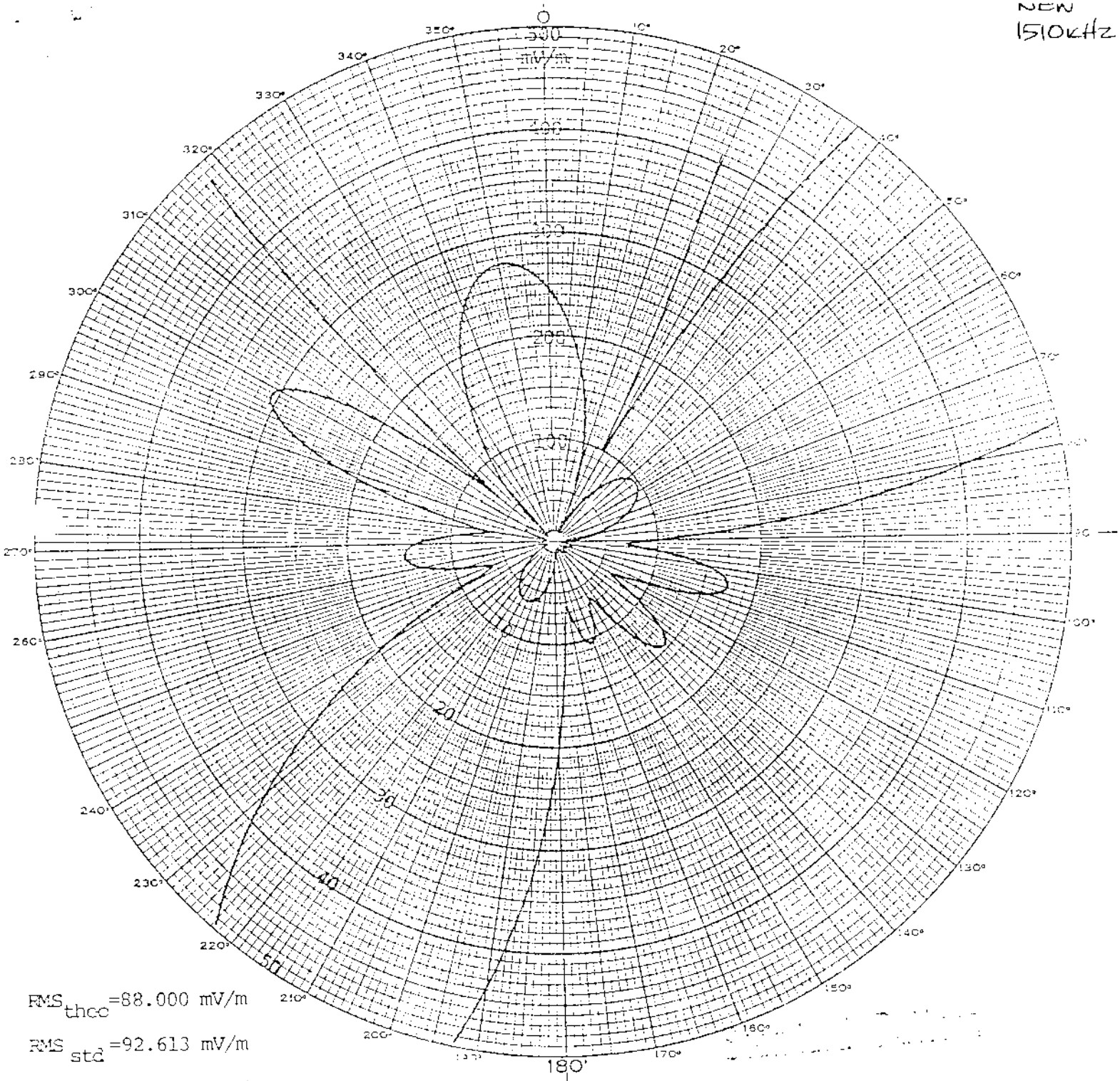
SPACING AND ORIENTATION: The towers are located in two parallel rows with 3 towers per row. Adjacent towers in a row are spaced 162.8' (90.0°) on a line bearing 200° true. End towers forming a side of the parallelogram are spaced 544.6' (301°) on a line bearing 241° true.

GROUND SYSTEM: 120 - 162.9' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	88.000 mv/m	104.403 mv/m	92.613 mv/m

NEW
1510kHz



RMS_{theo}=88.000 mV/m

RMS_{std}=92.613 mV/m

RSS_{theo}=104.403 mV/m

10X EXPANSION

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 6	STATION DATA
All G's = 90° #1 90° 301° #2 90° 301° #3 200° 301° #6 90° #5 90° 301° #4		PROPOSED DAYTIME STANDARD PATTERN TROY, OHIO	CALL NEW FREQ 1510 kHz POWER 0.25 kW TYPE DA-D TIME DAYTIME ONLY LAT. N 40-01-08 LONG. W 84-14-29

TOWER No.	ELECTRICAL HEIGHT °	SPACING °	PHASING °	FIELD RATIO
1			0	1.000
2			143	1.870
3			-74.5	1.000
4			76.5	1.052
			-140.5	1.970
6			2	1.050

θ° = 0

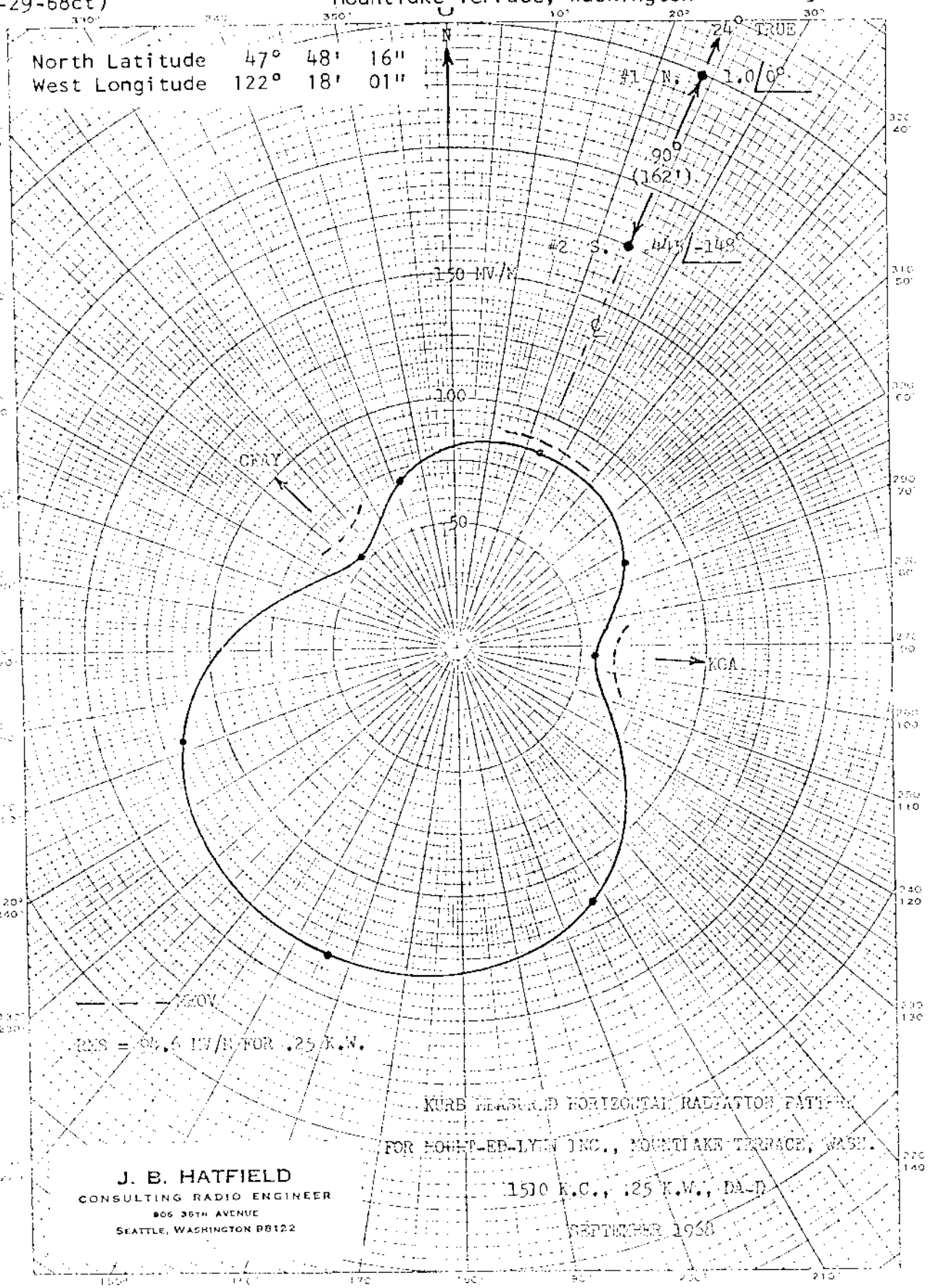
S. HAROLD MINN, JR. & ASSOCIATES, INC.
COLDWATER, MICH.

KAAR

Measured Day
(11-29-68ct)

Station KURB
Mountlake Terrace, Washington

250w, DA-D, D
1510 kc



FCC File No.BL-12146
Accepted 10-30-68

Station KURB
Mountlake Terrace, Washington

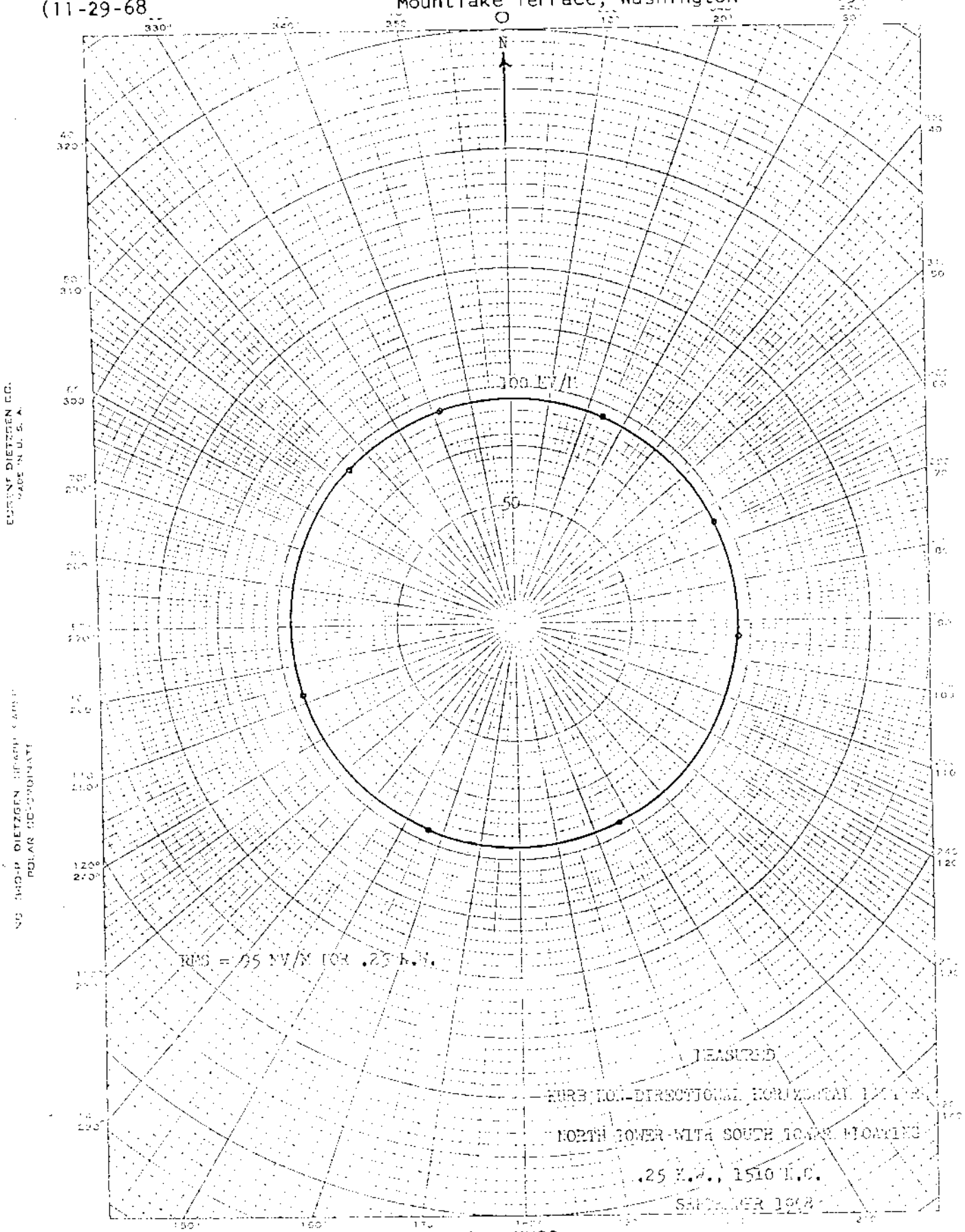
1510 kc

KURB

Measured Non-DA
(11-29-68

Station KURB
Mountlake Terrace, Washington

250w, DA-D, D
1510 kc



FCC File No.BL-12146
Accepted 10-30-68

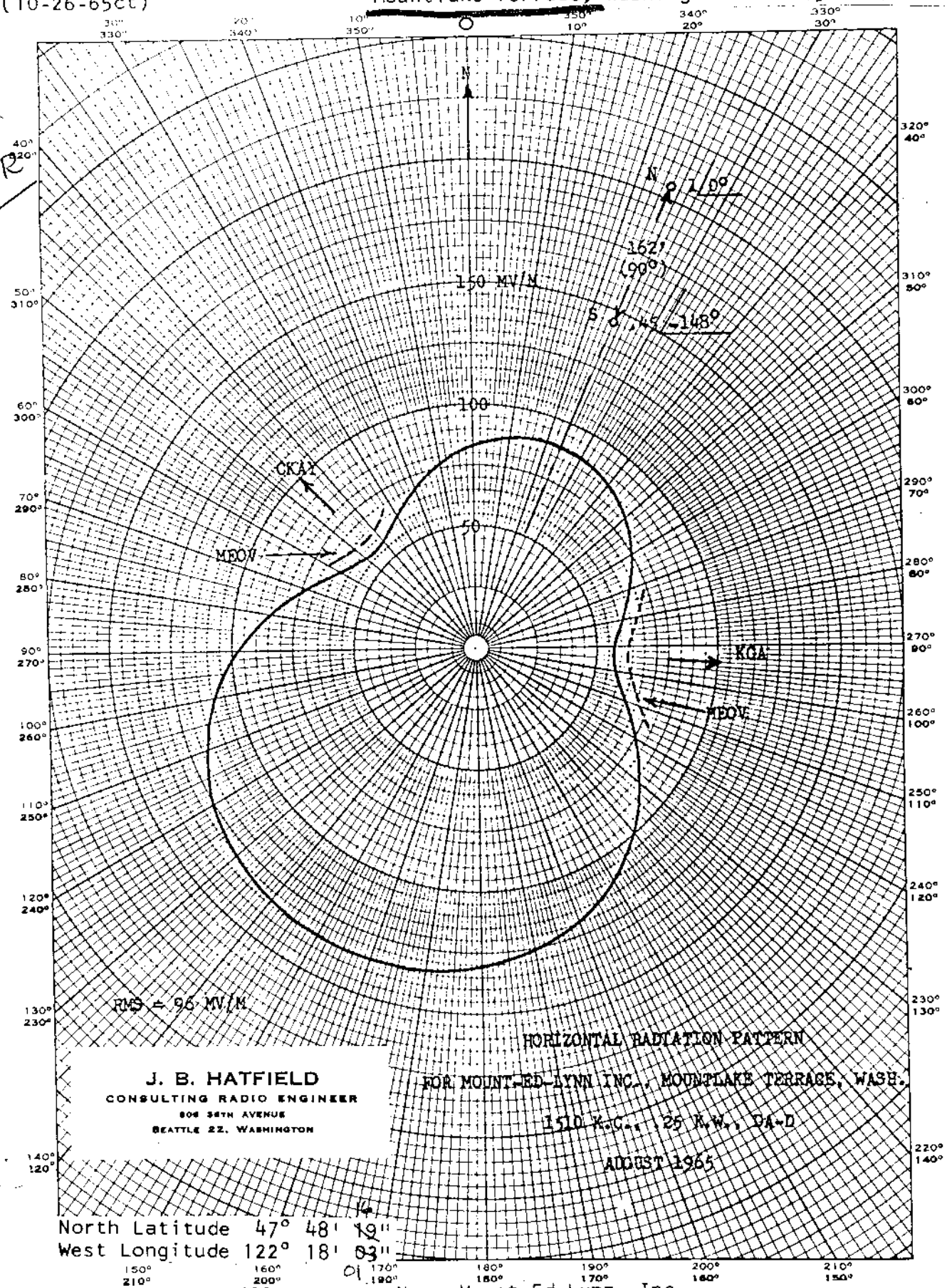
Station KURB
Mountlake Terrace, Washington

1510 kc

KAAR

Proposed Day
(10-26-65ct)

New; Mount-Ed-Lynn, Inc. 250w,DA-D,D
Mountlake Terrace, Washington 1510 kc



OVER

North Latitude 47° 48' 19"
West Longitude 122° 18' 03"

FCC File No. BP-16882
Accepted 10-21-65

New; Mount-Ed-Lynn, Inc.
Mountlake Terrace, Washington 1510 kc

KDKO

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KDKO

Main Studio: Littleton, Colorado

Frequency: 1510 kHz

Power: 5 kW Night 1 kW Day

Notification List No. 1630

Date: April 30, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 39° 33' 15"
West Longitude: 105° 02' 01"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 4
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	NW(#1)	WC(#2)	EC(#3)	SE(#4)
HEIGHT ABOVE INSULATORS:	200'	200'	200'	200' (110.5°)
NIGHT PHASING:	0°	+7.16°	+14.24°	+21.4°
NIGHT FIELD RATIO:	1	2.83	2.83	1
DAY PHASING:	-5.8°	+11.2°	+5.8°	---
DAY FIELD RATIO:	0.23	0.52	0.23	---

SPACING AND ORIENTATION: Adjacent elements are spaced 370.6' (205°) on a line bearing 106° true.

GROUND SYSTEM: 120-108' to 248' equally spaced copper radials plus a 48' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

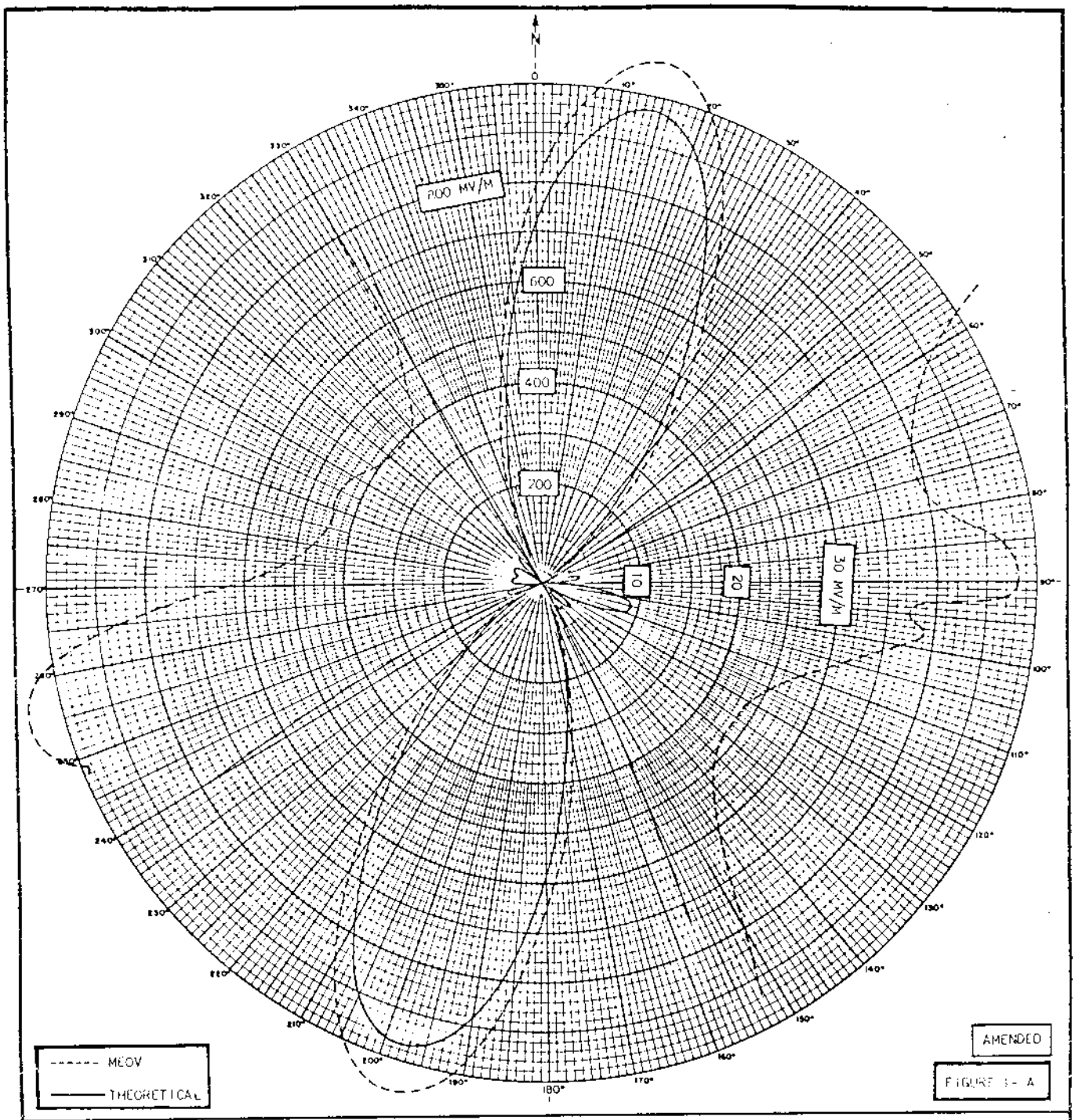
Predicted effective Night Field: 406.9 mv/m at rated power.

Predicted effective Day Field: 182.6 mv/m at rated power.

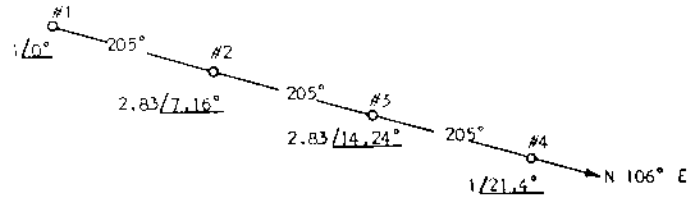
Note: Please retain the Daytime and Nighttime vertical directional antenna radiation patterns from 25° through 60° inclusive notified for Station KDKO in United States Change List Number 1296, dated November 26, 1968, and attach to this Revised Description Sheet and Nighttime horizontal and vertical angle patterns from 0° through 20° inclusive. This notification concerns only changes in meov's of radiation in the nighttime pattern with no changes in the daytime operation of the station.

CTR NO 30607A3

KDKO



HORIZONTAL RADIATION PATTERN



$G_1 - G_2 - G_3 = G_4 = 110.5°$

APPLICANT :	KDKO
LOCATION :	LITTLETON, COLORADO
FREQUENCY :	1510 KC/S
POWER :	5000 WATTS
LATITUDE :	39 DEG 33 MIN 15 SEC
LONGITUDE :	105 DEG 02 MIN 01 SEC.
WHEN USED :	NIGHTTIME
R.M.S. FIELD :	406.9 MV/M
DATE :	DECEMBER 1974

SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
711 FOURTEENTH STREET, N. W.
WASHINGTON D. C. 20005

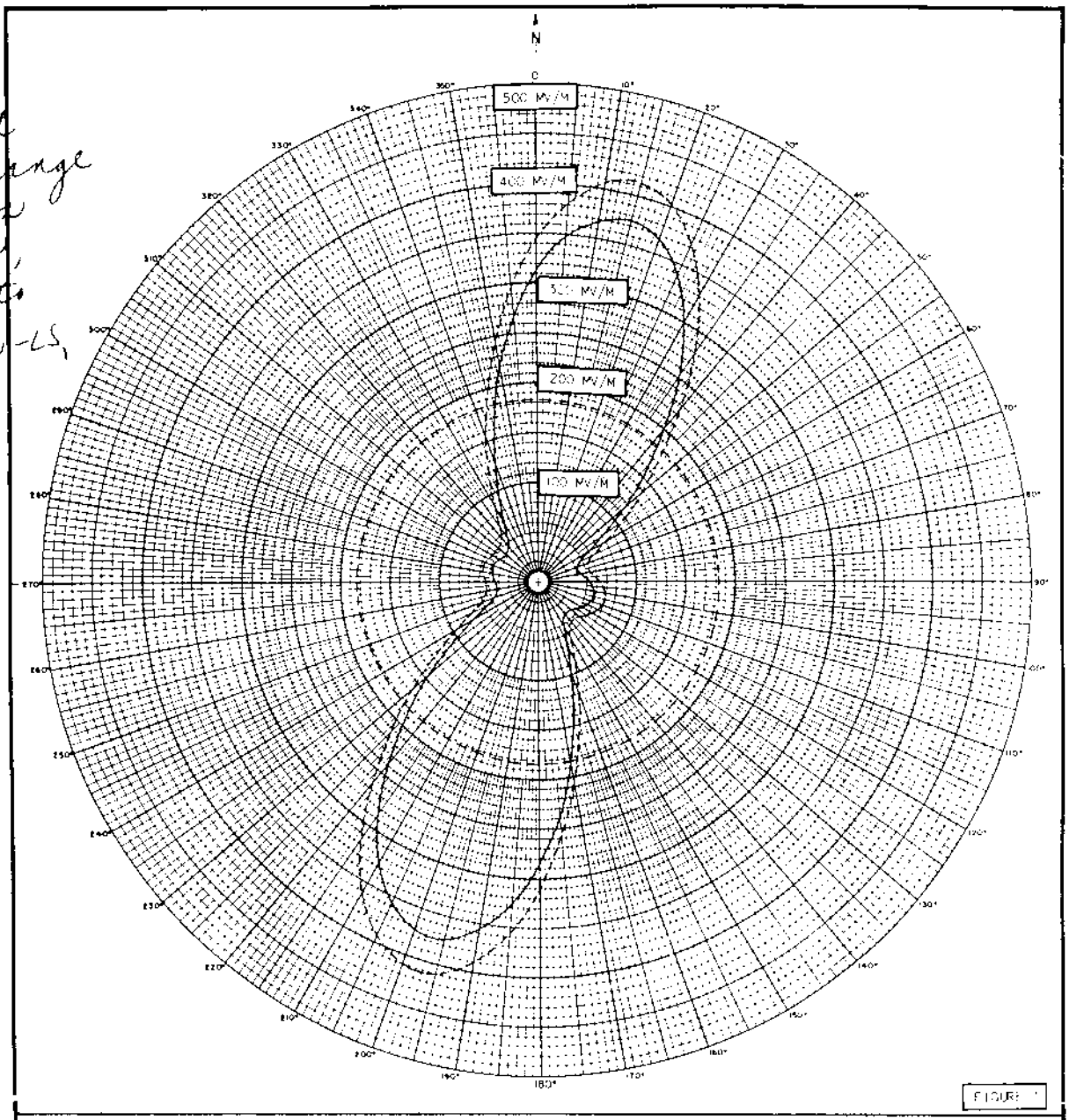
KDKO

Proposed Day
(9-26-68ct)

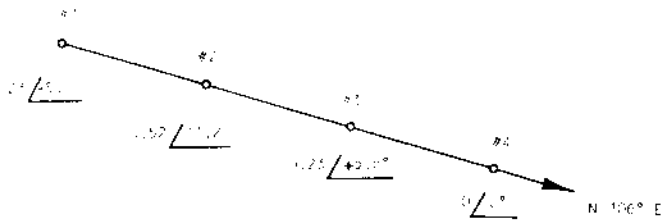
Station KDKO
Littleton, Colorado

5kw, 1kw-LS, DA-N, U
1510 kc

BP 18235
11-25-68
Granted
CP to change
operation
from 1 kw,
DA-1, U, to
5 kw, 1 kw-LS,
DA-2, U.



HORIZONTAL RADIATION PATTERN



APPLICANT	KDKO
LOCATION	LITTLETON, COLORADO
FREQUENCY	1510 KC/S
POWER	1,000 WATTS
LATITUDE	39 DEG 33 MIN 15 SEC
LONGITUDE	105 DEG 02 MIN 21 SEC
WHEN USED	DAYTIME
R.M.S. FIELD	182.6 MV/M
DATE	JUNE 1964

SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No. BP-18235
Accepted 9-9-68

Station KDKO
Littleton, Colorado

1510 kc

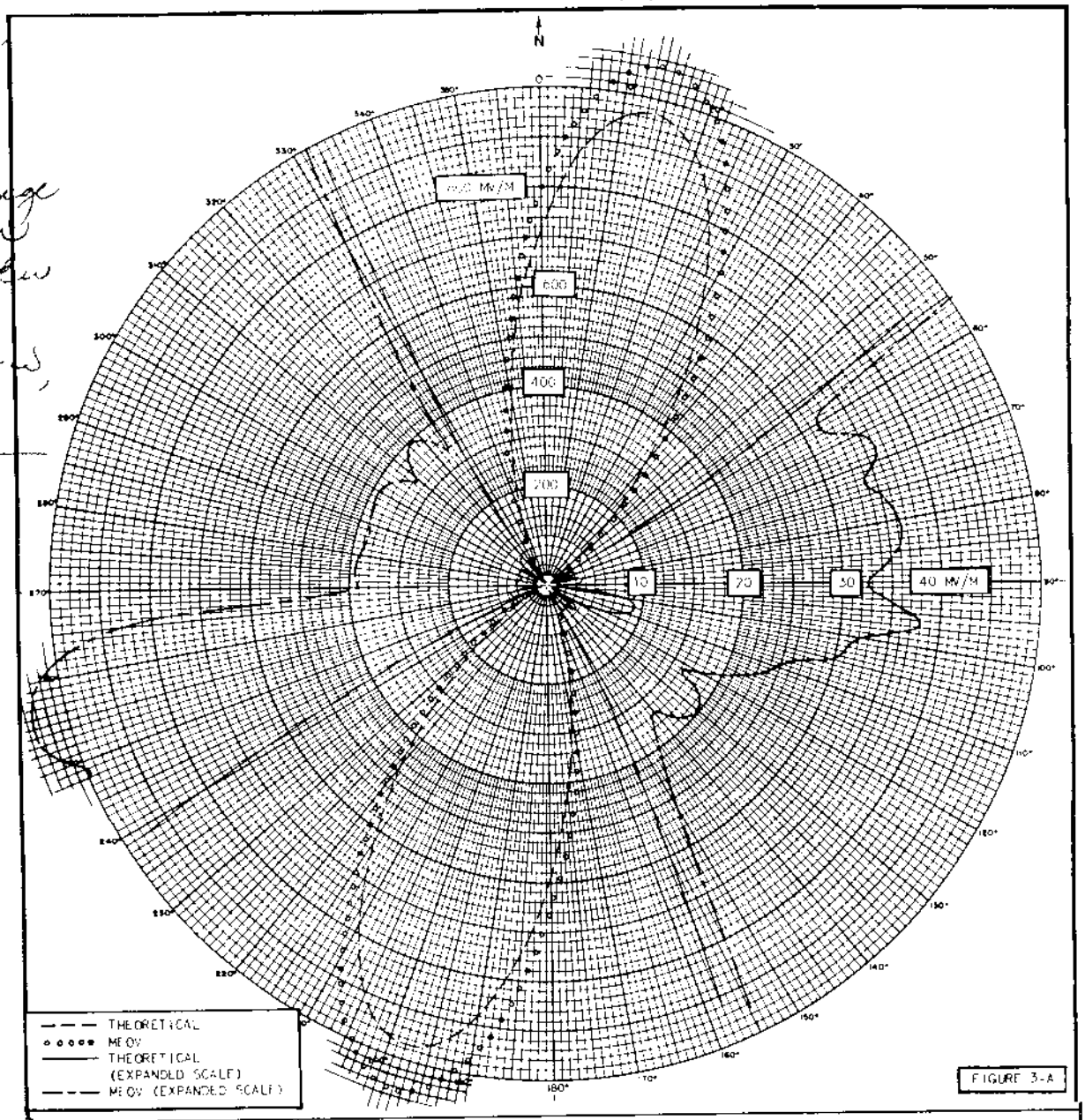
KDKO

Proposed Night
(9-26-68ct)

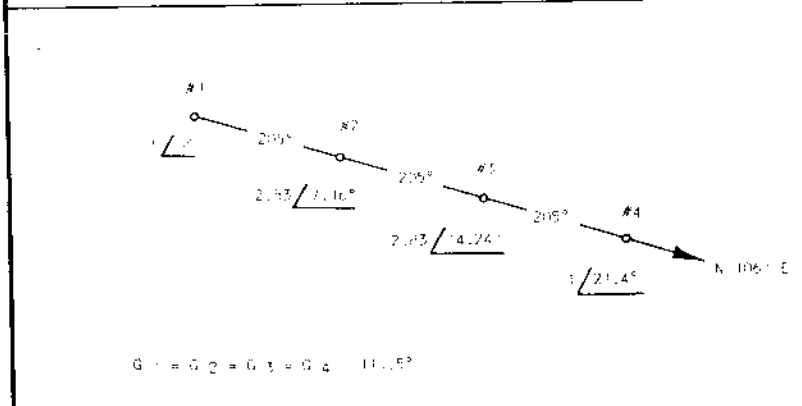
Station KDKO
Littleton, Colorado

5kw,1kw-LS,DA-N,U
1510 kc

BP-18235
Granted
11-25-68
IP to change
operation
from 1kw
DA-1,U to
5kw,1kw-LS,
DA-2,U



HORIZONTAL RADIATION PATTERN



APPLICANT	KDKO
LOCATION	LITTLETON, COLORADO
FREQUENCY	1510 KC/S
POWER	5,000 WATTS
LATITUDE	39 DEG 33 MIN 15 SEC
LONGITUDE	105 DEG 02 MIN 01 SEC
WHEN USED	NIGHTTIME
RMS FIELD	406.9 MV/M
DATE	JUNE 1968

SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No.BP-18235
Accepted 9-9-68

Station KDKO
Littleton, Colorado

1510 kc

KEAM

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KYKR

Main Studio: Port Arthur, Texas

Frequency: 1510 kHz

Power 5kw Day

Notification List No. 1773

Date: March 29, 1978 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 30° 03' 35"
West Longitude: 93° 58' 49"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 2
Type of elements: Series excited, Self supporting, tapered, vertical steel towers.

TOWER:	SW (#1)	NE (#2)
HEIGHT ABOVE INSULATORS:	170.1	170.1 (94°)
PHASING:	0°	+18°
FIELD RATIO:	1	0.65

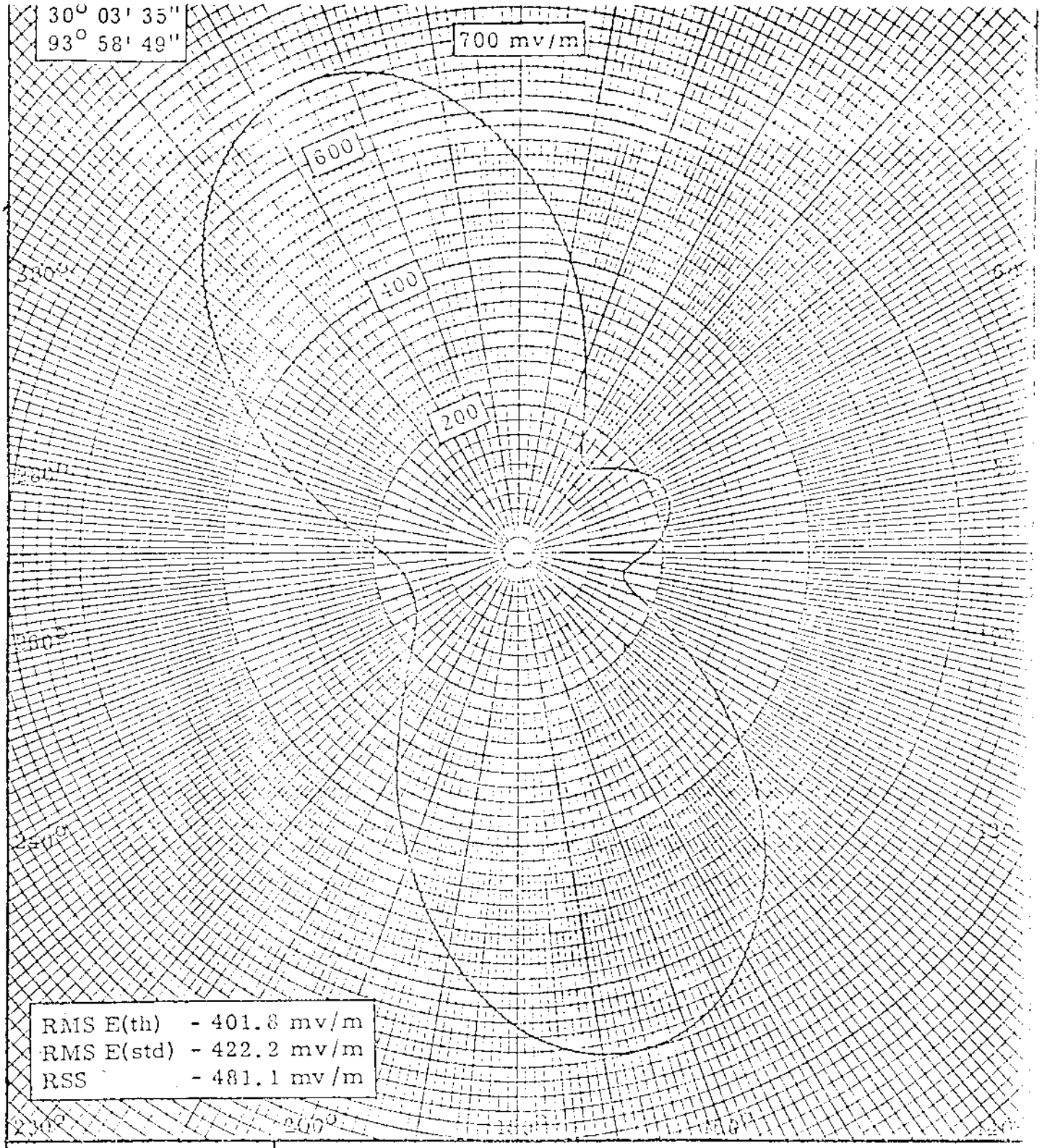
SPACING AND ORIENTATION: With SW(#1) tower as reference the NE (#2)tower is spaced 344.3' (190°) on a line bearing 70° true.

GROUND SYSTEM: 120 - 163' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	401.8 mv/m	481.1 mv/m	422.2 mv/m

(This notification concerns a change in transmitter location, antenna system and an increase in power.)



70° T

② 0.65/18°

S

① 1/0°

G - 170.1' - 93.89°
S - 344.3' - 190°

STANDARD HORIZONTAL PLANE PATTERN

KEAM

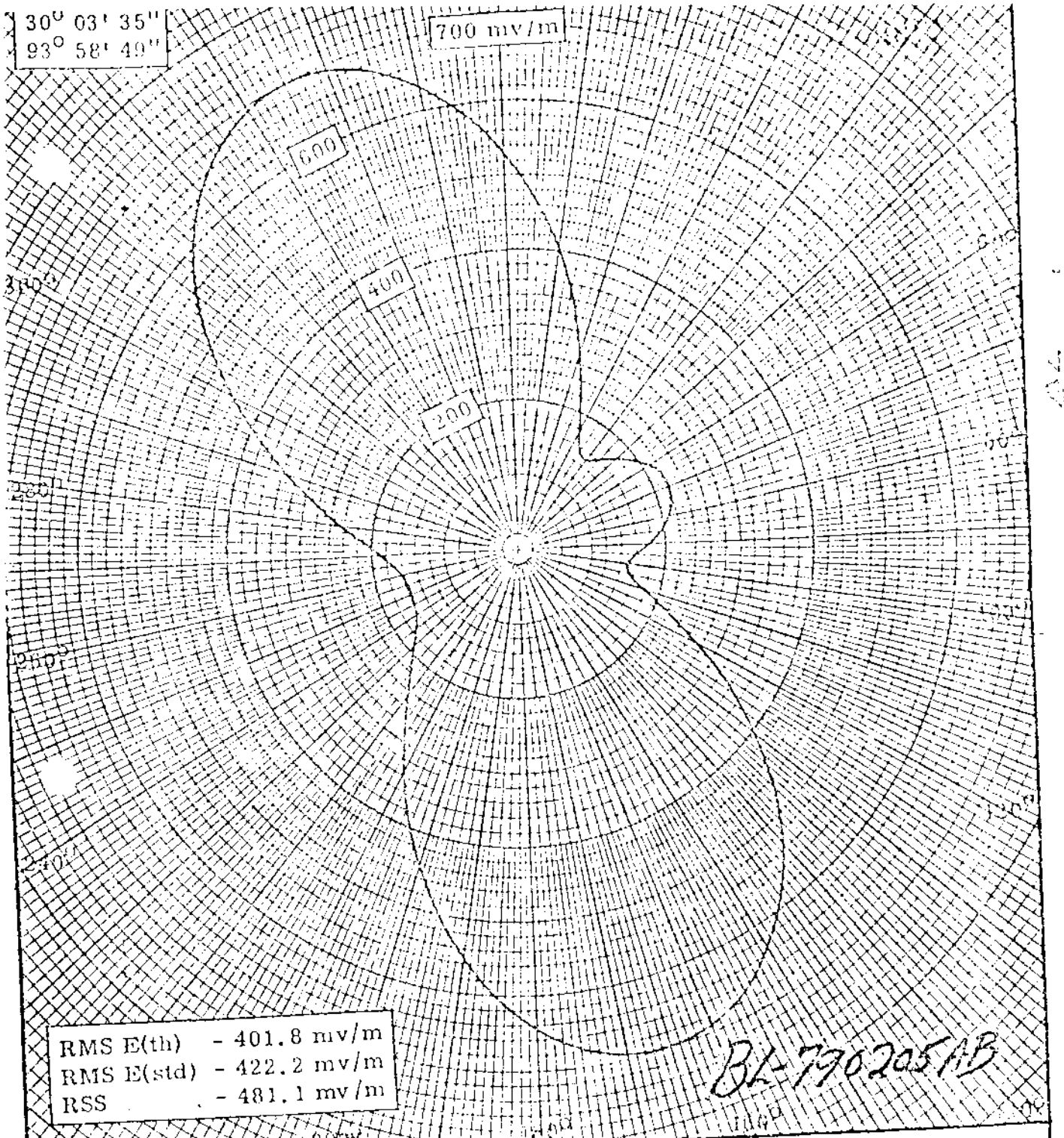
RADIO STATION ~~KYKR~~
PROPOSED OPERATION
PORT ARTHUR, TEXAS

1510 KHZ 5 KW DA-D

051176

FIGURE C

Earl Saxon
CONSULTING RADIO ENGINEER



70° T

② 0.65 /18°

S

① 1 /0°

G - 170.1' - 93.89°
S - 344.3' - 190°

STANDARD HORIZONTAL PLANE PATTERN

RADIO STATION ~~KYKR~~ KEAM
PROPOSED OPERATION
PORT ARTHUR, TEXAS
1510 KHZ 5 KW

DA-D

30-03-35N 93-58-49

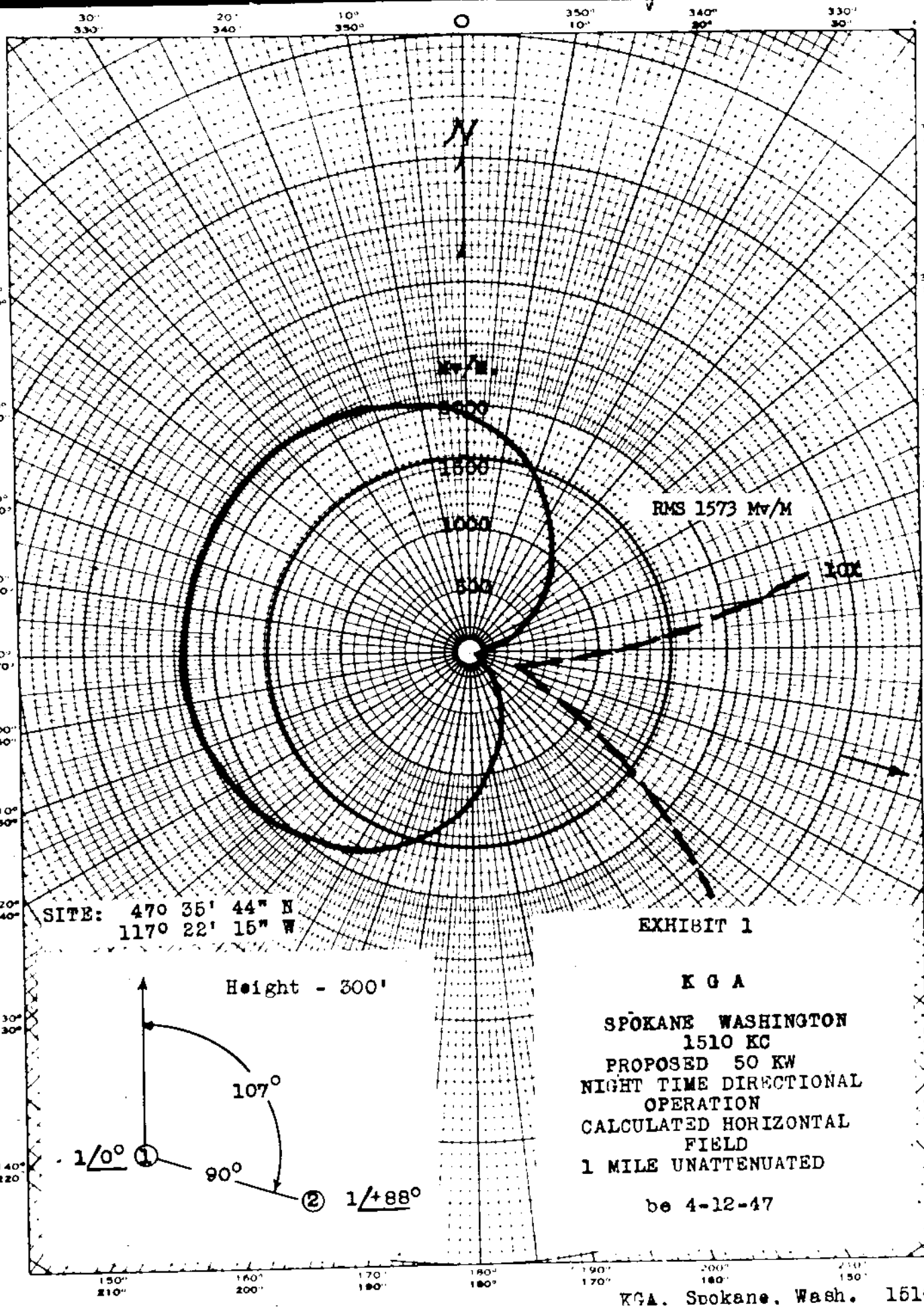
051176

FIGURE C

Merl Saxon
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

KGA

PROPOSED NIGHT | Station KGA Spokane, Washington | 50kw, DA-N,U 1510 KC

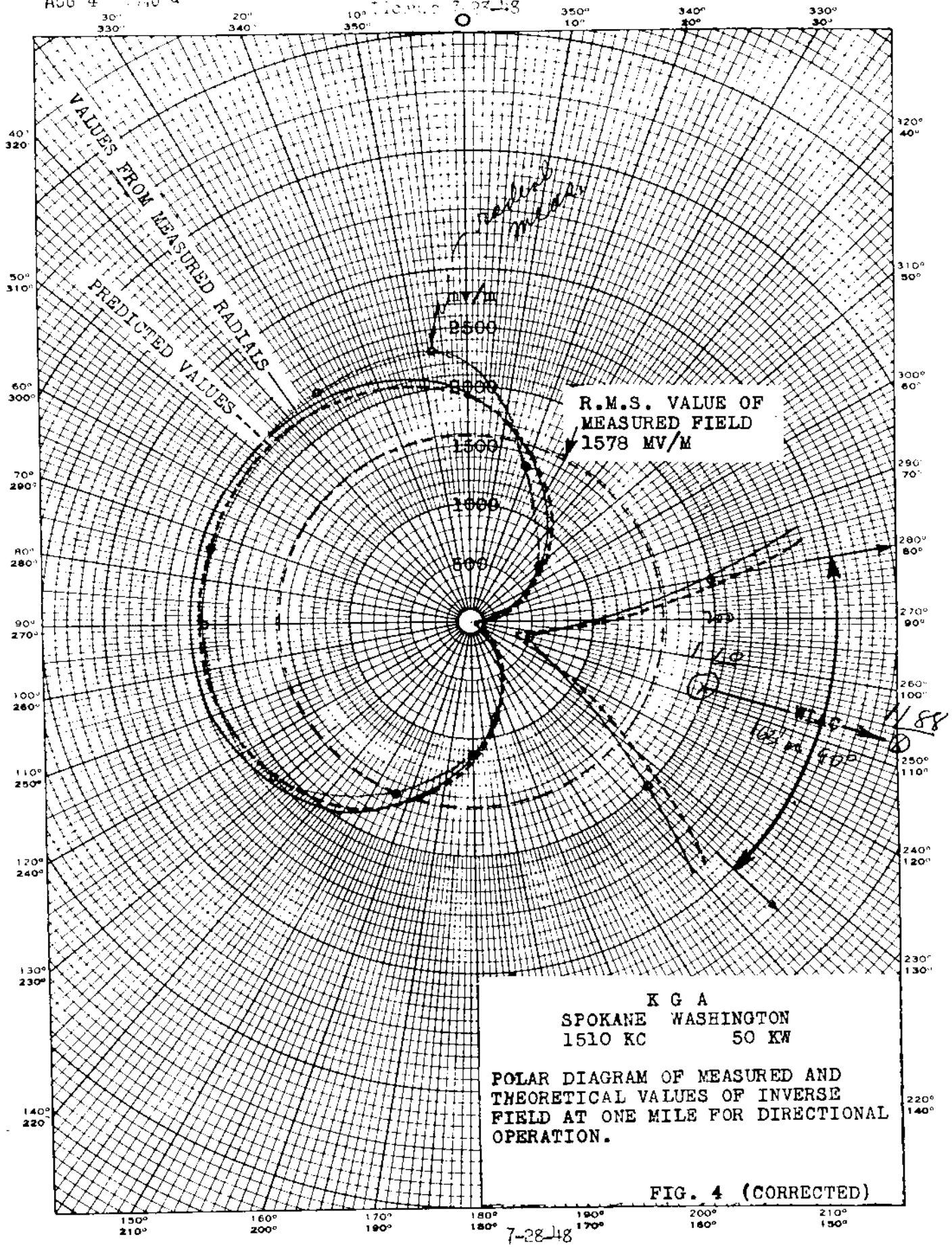


KGA. Spokane. Wash. 1510 k

H = 300' = 166°

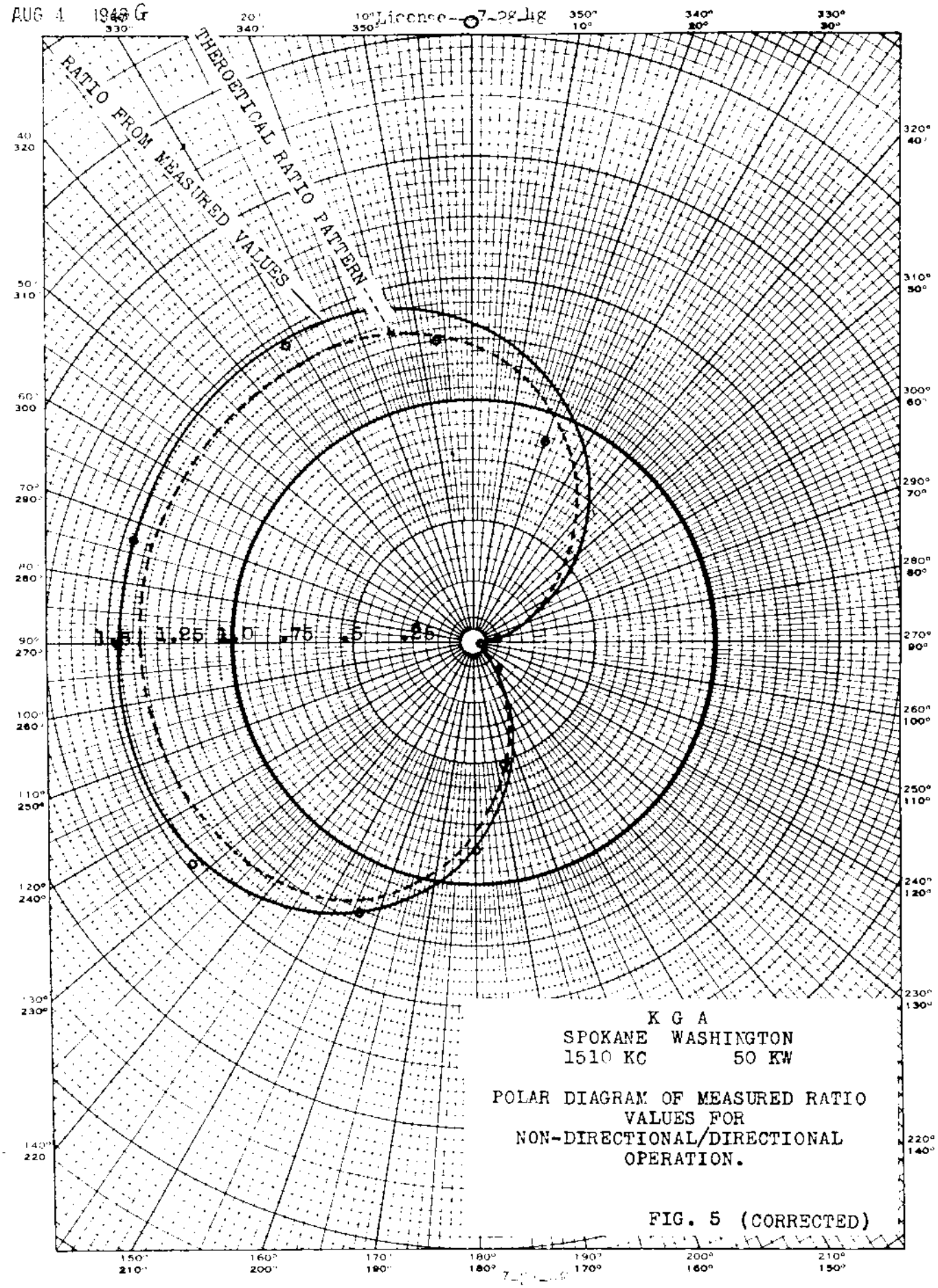
KGA
1510

AUG 4 1948 G

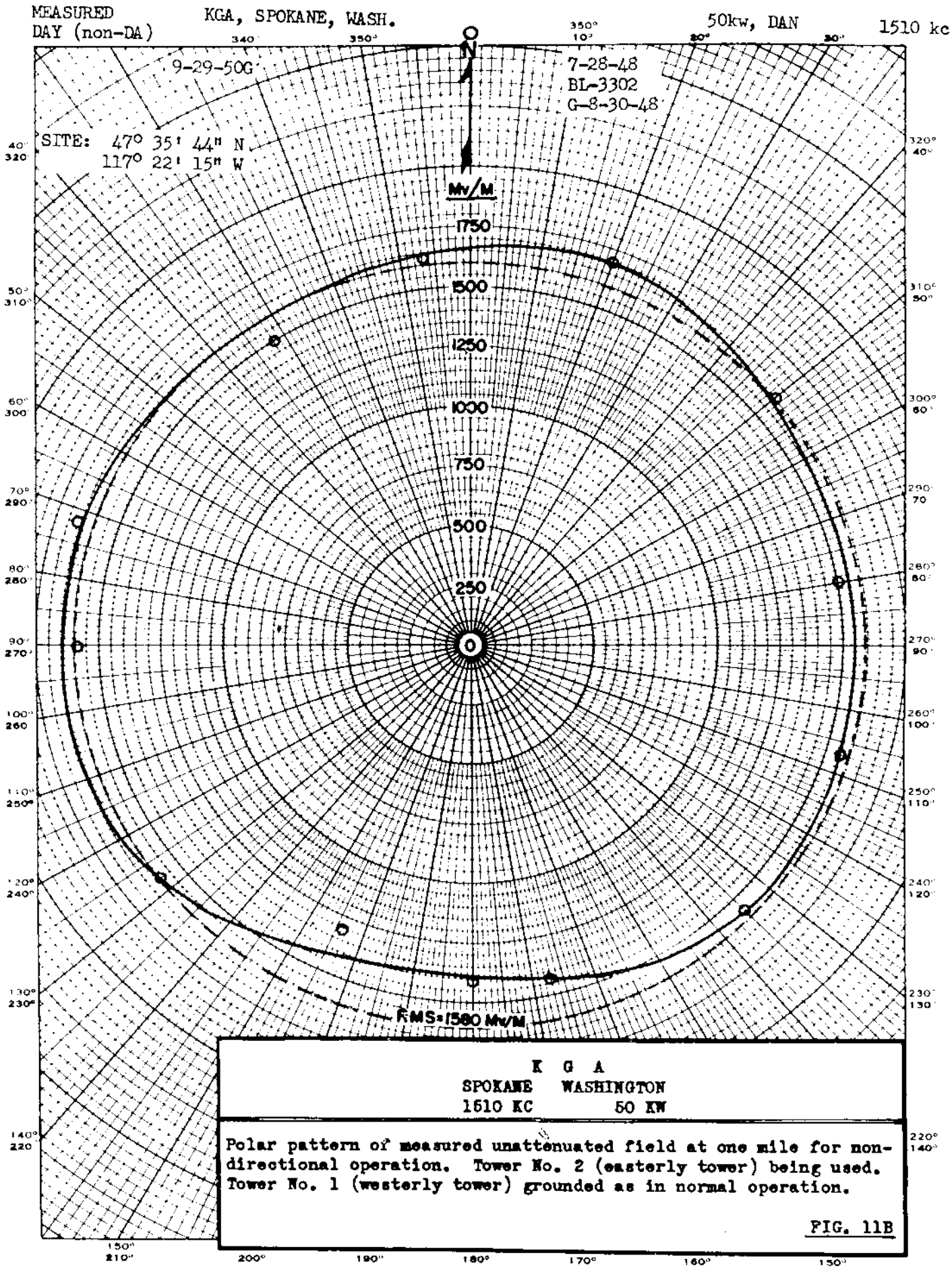


7-28-48

KGA
1510


AUG 4 1948 G
License 7-28-48
THEORETICAL RATIO PATTERN
RATIO FROM MEASURED VALUES
1.5
1.25
1.0
.75
.5
.25
K G A
SPOKANE WASHINGTON
1510 KC 50 KW
POLAR DIAGRAM OF MEASURED RATIO VALUES FOR NON-DIRECTIONAL/DIRECTIONAL OPERATION.
FIG. 5 (CORRECTED)

KGA



K G A
SPOKANE WASHINGTON
1510 KC 50 KW

Polar pattern of measured unattenuated field at one mile for non-directional operation. Tower No. 2 (easterly tower) being used. Tower No. 1 (westerly tower) grounded as in normal operation.

FIG. 11B

KGA, Spokane, Wash. 1510 kc

KIRV
1510kHz

SUPPLEMENTAL AND CORRECTED
DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KIRV

Main Studio: Fresno, California

Frequency: 1510 kHz

Power 10kw Day

Notification List No. 1785

Date November 16, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE
CENTER OF THE ANTENNA SYSTEM:

North Latitude: 36° 42' 42"
West Longitude: 119° 49' 59"

Note: Please retain the description sheet and directional antenna radiation patterns notified for station KIRV in United States Change List Number 1783 dated November 2, 1979 and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only a change or correction in the geographical coordinates of the center of the antenna system.

KIRV
1510 kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KIRV

Main Studio: Fresno, California

Frequency: 1510

Power: 10kw Day

Notification List No. 1783

Date: November 2, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 36° 42' 42"
West Longitude: 119° 49' 59"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 2
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	NW(#1)	SE(#2)
HEIGHT ABOVE INSULATORS:	185'	185' (105.2°)
DAY PHASING:	0°	-94.5°
DAY FIELD RATIO:	1.00	0.77

SPACING AND ORIENTATION: The towers are spaced 162.6' (90°) on a line bearing 140° true.

GROUND SYSTEM: 120 - 162' equally spaced copper radials plus 120-50' interspaced radials about each tower.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	623.9 mv/m	635.4 mv/m	655.4 mv/m

KIRV

Exhibit E1 Page 31

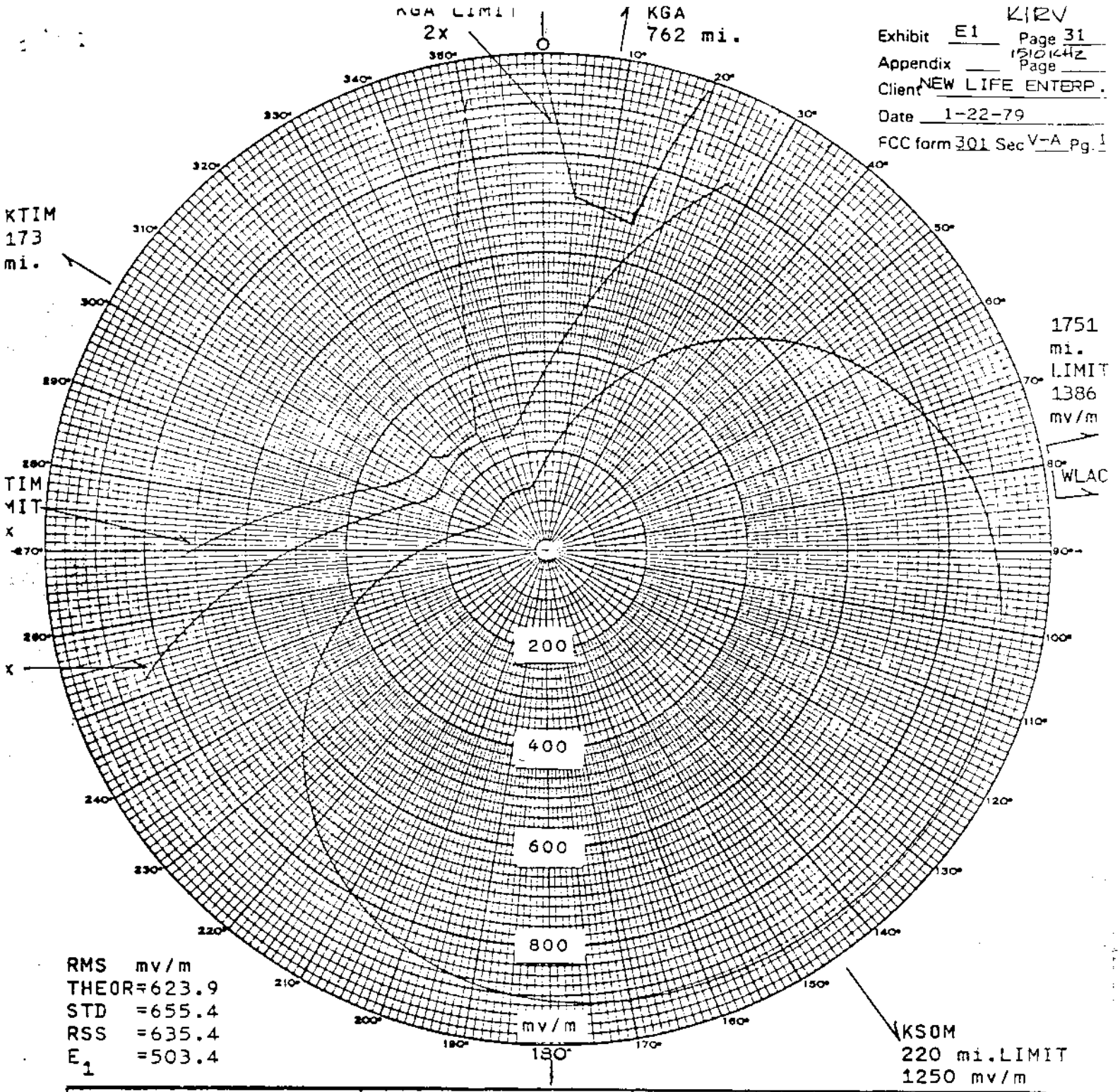
Appendix ___ Page ___

1510 kHz

Client NEW LIFE ENTERP.

Date 1-22-79

FCC form 301 Sec V-A Pg. 1



RMS mv/m
THEOR=623.9
STD =655.4
RSS =635.4
E_1 =503.4

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA	
N #1 1/0° 90° 162.6' .77/-94.5° #2 140° $G_1 = G_2$ G_1 = 105.2°190'	TOWER No.	ELECTRICAL HEIGHT G°	TRUE TOWER ORIENTATION A°	SPACING S°	PHASING φ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ	CALL	KIRV
	1	105.2	0	0	0	503.4	1.00	0	655.4	FREQUENCY	1510 kc
	2	105.2	140	90	-94.5	378.6	.77	10		POWER	10 kw
	3							20		TIME OF OPERATION	DAY
	4							30		TYPE OF OPERATION	DA-D
	5							40		DAYTIME TOWERS	2
	6							50		NIGHTTIME TOWERS	–
	7							60		No RADIALS PER TOWER	120
	8							70		LENGTH OF RADIALS	90 · 162 ft
	9							80		GROUND SCREEN DIMENSION	–
	10							E_1 =	mv/m	LAT.	36° 42' 42"
	DAYTIME OPERATION ☒			NIGHTTIME OPERATION ☐				P_1 =	10 kw	LONG.	119° 57' 59"
										SUPERSEDES	
										PATTERN No	

Radio Engineering Co.
Consultants
Box 4399 RR-1
Santa Ynez, Ca. 93460
(805) 688-2323

FCC STANDARD HORIZONTAL PATTERN

K I R V FRESNO, CA.

LITTLETON, COLO

PROPOSED SKYLINE B/C INC. DA-1, U 1510 KC
NIGHT & DAY (DA-1) LITTLETON, COLORADO 1 KW
(9-7-56g)

KMOR

Granted CP 2/20/57

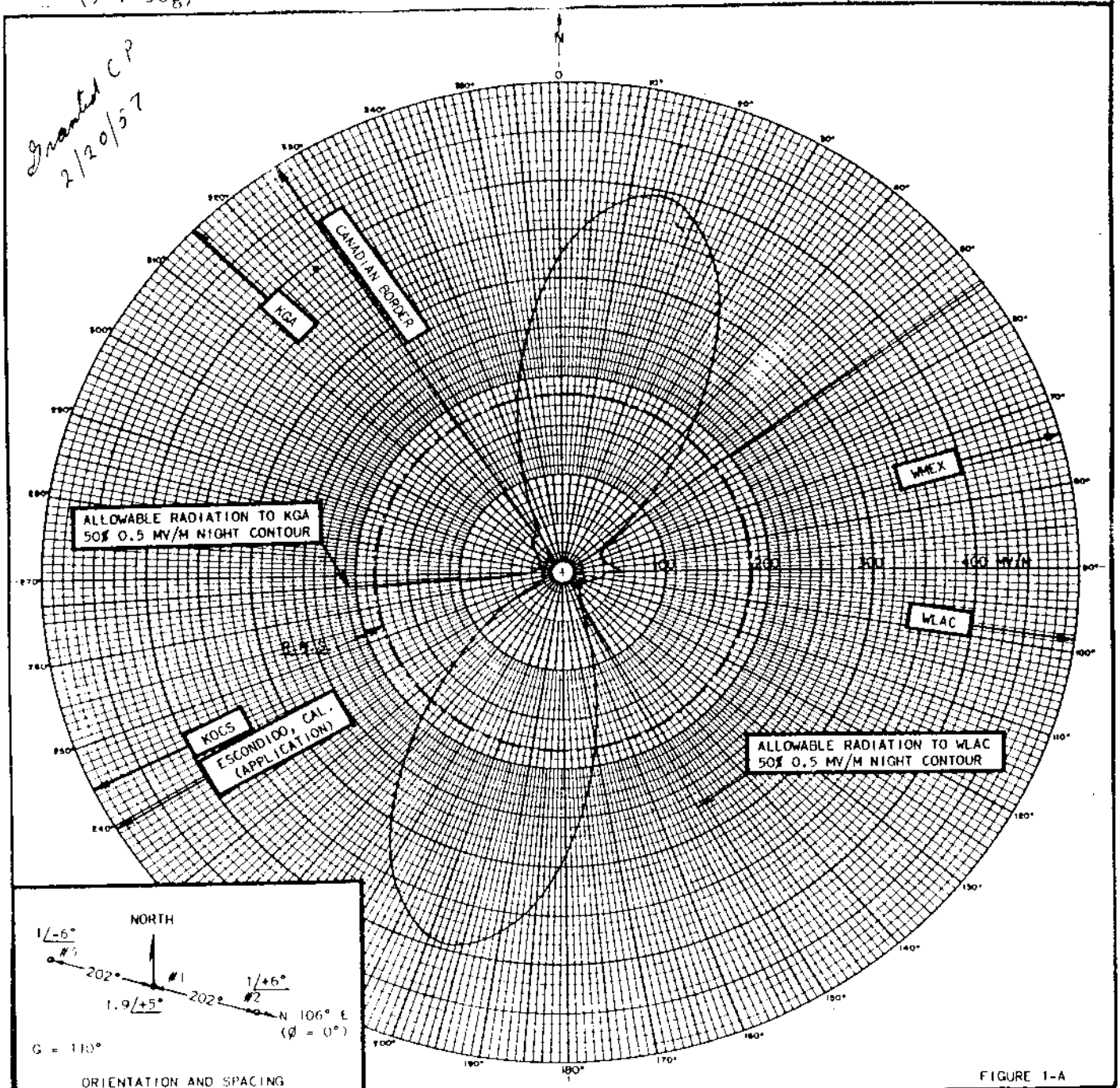


FIGURE 1-A

HORIZONTAL RADIATION PATTERN

ANTENNA	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6
PHASE DEG	+5	+6	-6			
HEIGHT DEG	110	110	110			
FIELD RATIO	1.9	1.0	1.0			
NON DA ANT.						

FREQUENCY:	1510 KC.
ASSIGNMENT:	REQ. 1KW - U - DA-1
LONGITUDE:	105 DEG. 03 MIN. 35 SEC.
LATITUDE:	39 DEG. 33 MIN. 12 SEC.
WHEN USED:	DAY AND NIGHT
R.M.S. FIELD	182.2 MV/M
DATE:	JULY 1956

ROBERT M. SILLIMAN
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

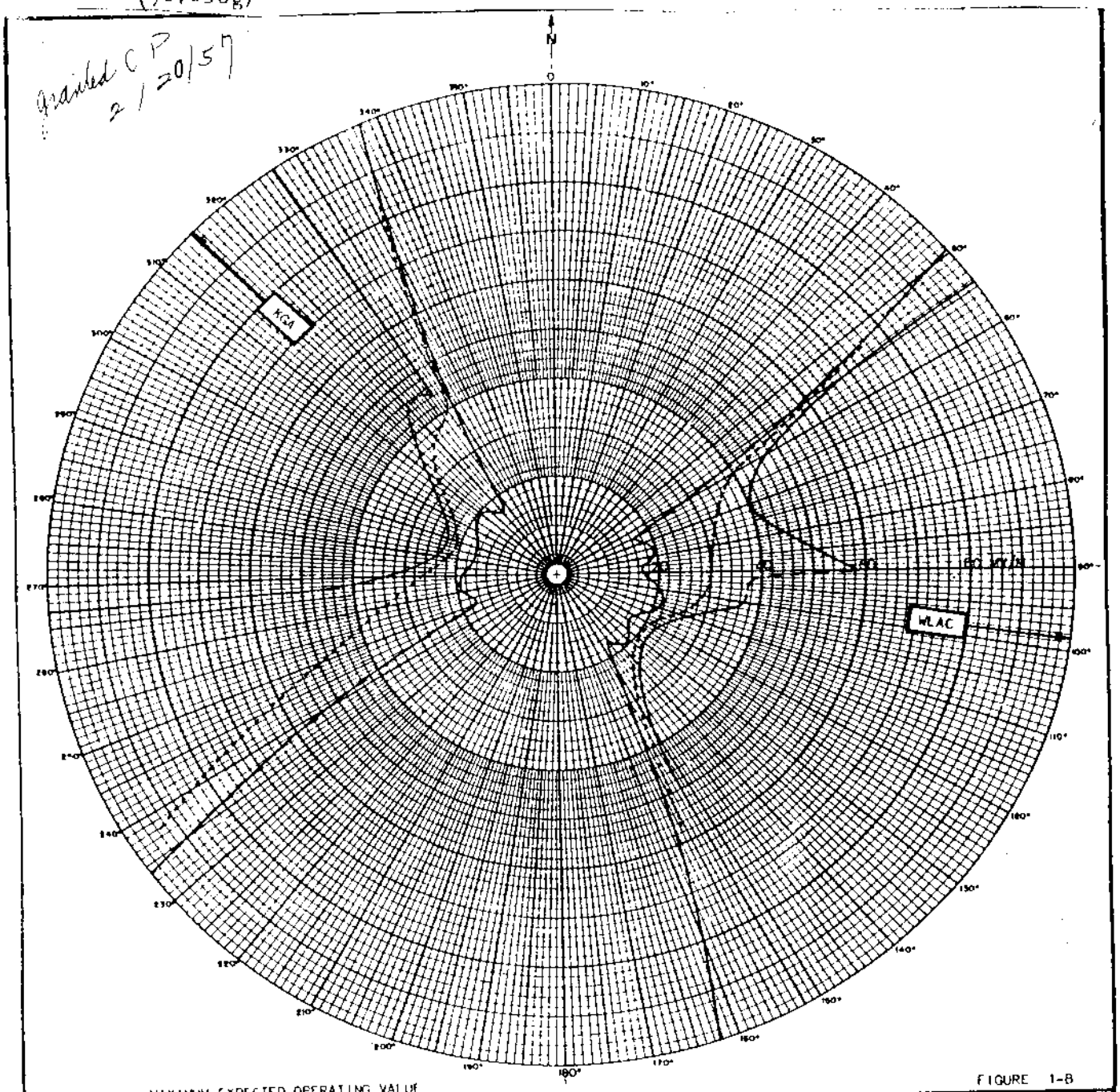
FCC FILE NO. BP-10,751 Accepted 8-30-56 SKYLINE B/C INC. 1510 KC
LITTLETON, COLORADO

Littleton, Col

PROPOSED NIGHT & DAY (DA-1) (9-7-56g) | Skyline B/C, Inc. Littleton, Colorado | DA-1, U 1 KW | 1510 KC

KMOR

Granted CP 2/20/57



------- MAXIMUM EXPECTED OPERATING VALUE

FIGURE 1-8

HORIZONTAL RADIATION PATTERN

(EXPANDED)

ANTENNA	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6
PHASE DEG	+5	+6	-6			
HEIGHT DEG	110	110	110			
FIELD RATIO	1.9	1.0	1.0			
NON-DA ANT						

FREQUENCY: 1510 KC

ASSIGNMENT: REG. 1KW - U - DA-1

LONGITUDE: 105 DEG. 03 MIN. 35 SEC.

LATITUDE: 39 DEG. 33 MIN. 12 SEC.

WHEN USED: DAY AND NIGHT

R.M.S. FIELD: 182.2 MV/M

DATE: JULY 1956

ROBERT M. SILLIMAN

CONSULTING RADIO ENGINEERS

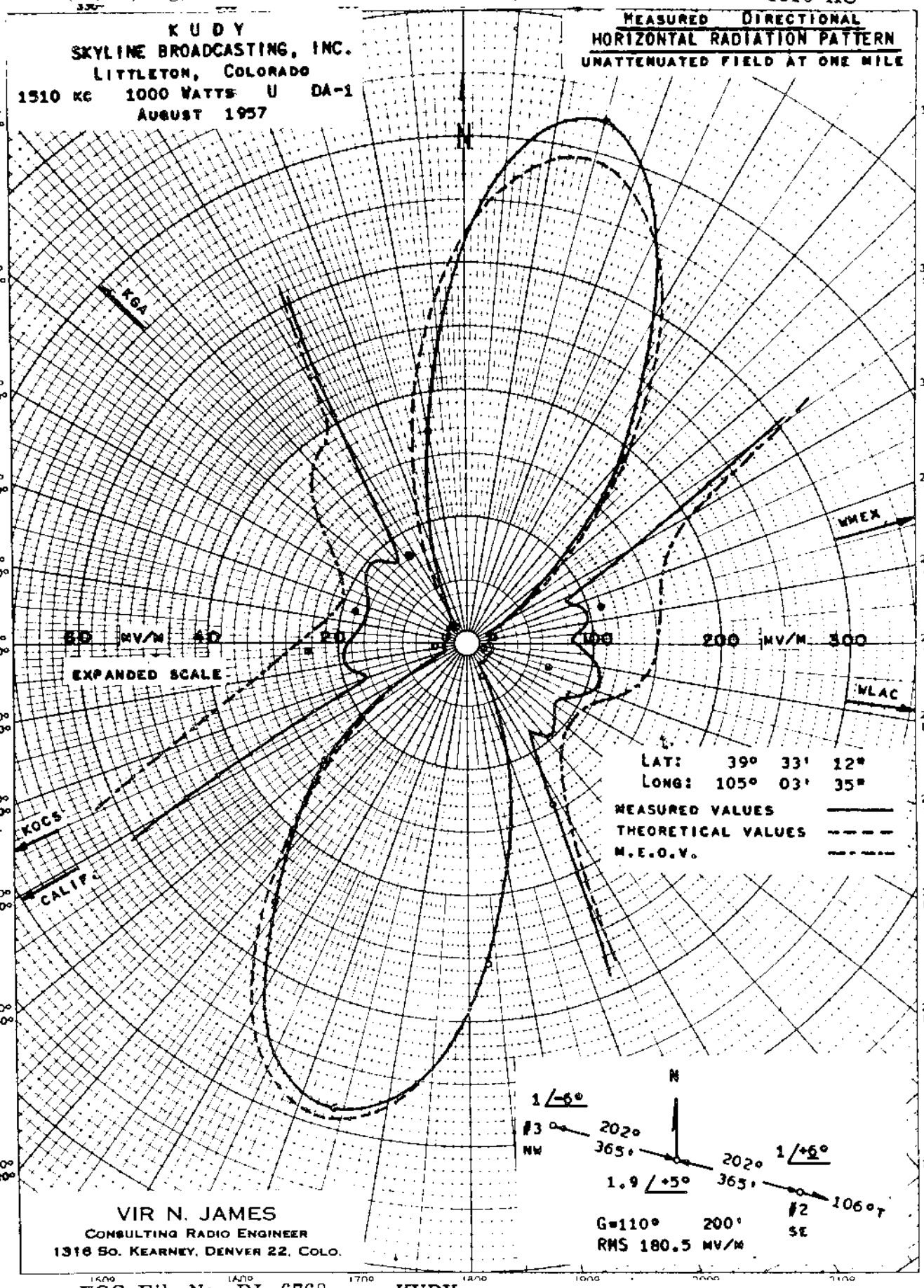
WASHINGTON, D. C.

FCC File No. BP-10,751 Accepted 8-30-56 Skyline B/C Inc. Littleton, Colorado 1510 K

KMOR

MEASURED DAY & NIGHT (10/11/57g) — Station KUDY, Littleton, Colorado — 1kw, DA-1,U — 1510 KC

Granted license 10/21/57



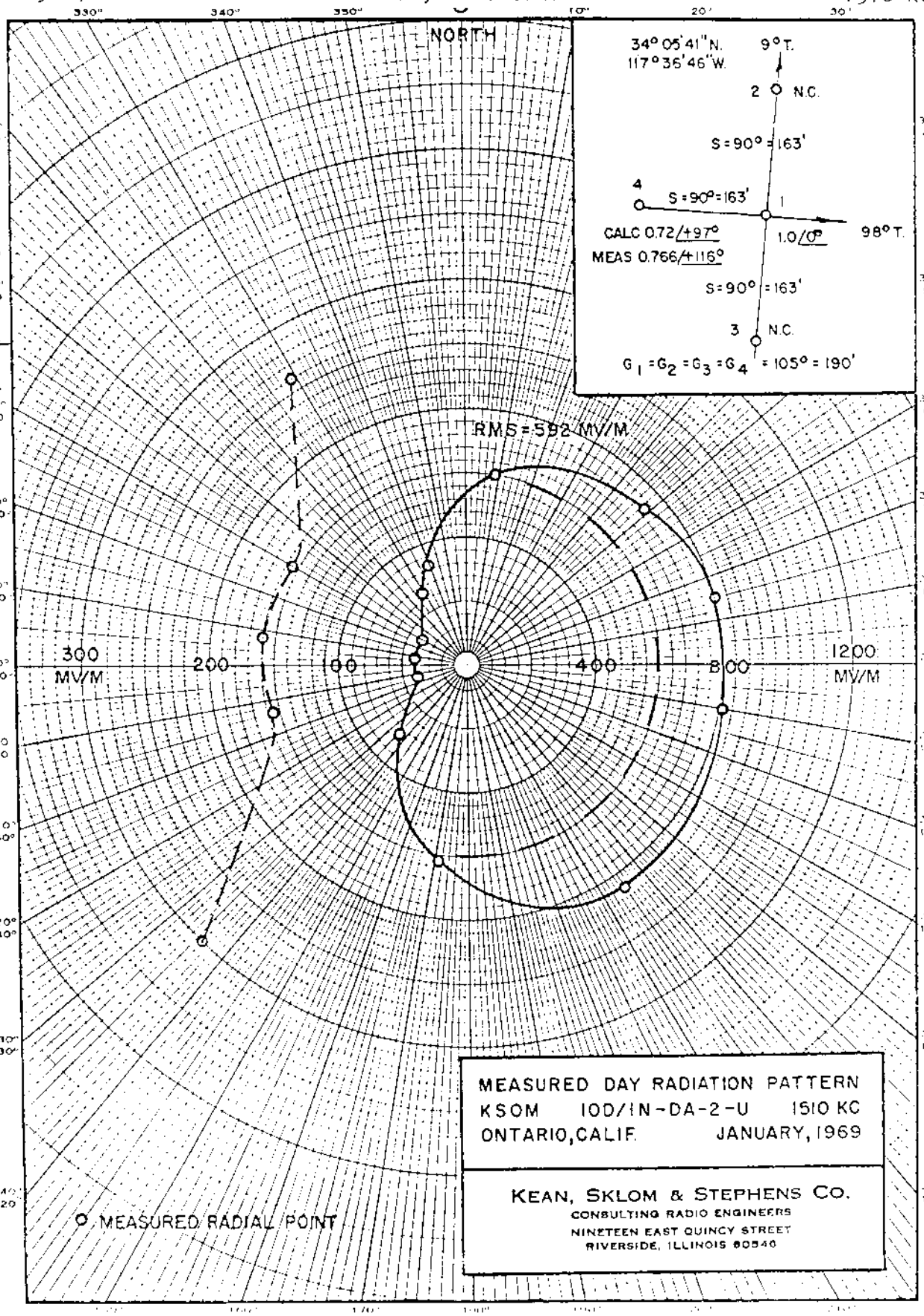
FCC File No. BL-6768 — KUDY
Accepted 9/27/57 — Littleton, Colorado — 1510 KC

KSOM

Measured Day
(3-28-69ct)

Station KSOM
Ontario, California

1kw,10kw-LS,DA-2,U
1510 kc



FCC File No. BL-12281
Accepted 3-25-69

Station KSOM
Ontario, California

1510 kc

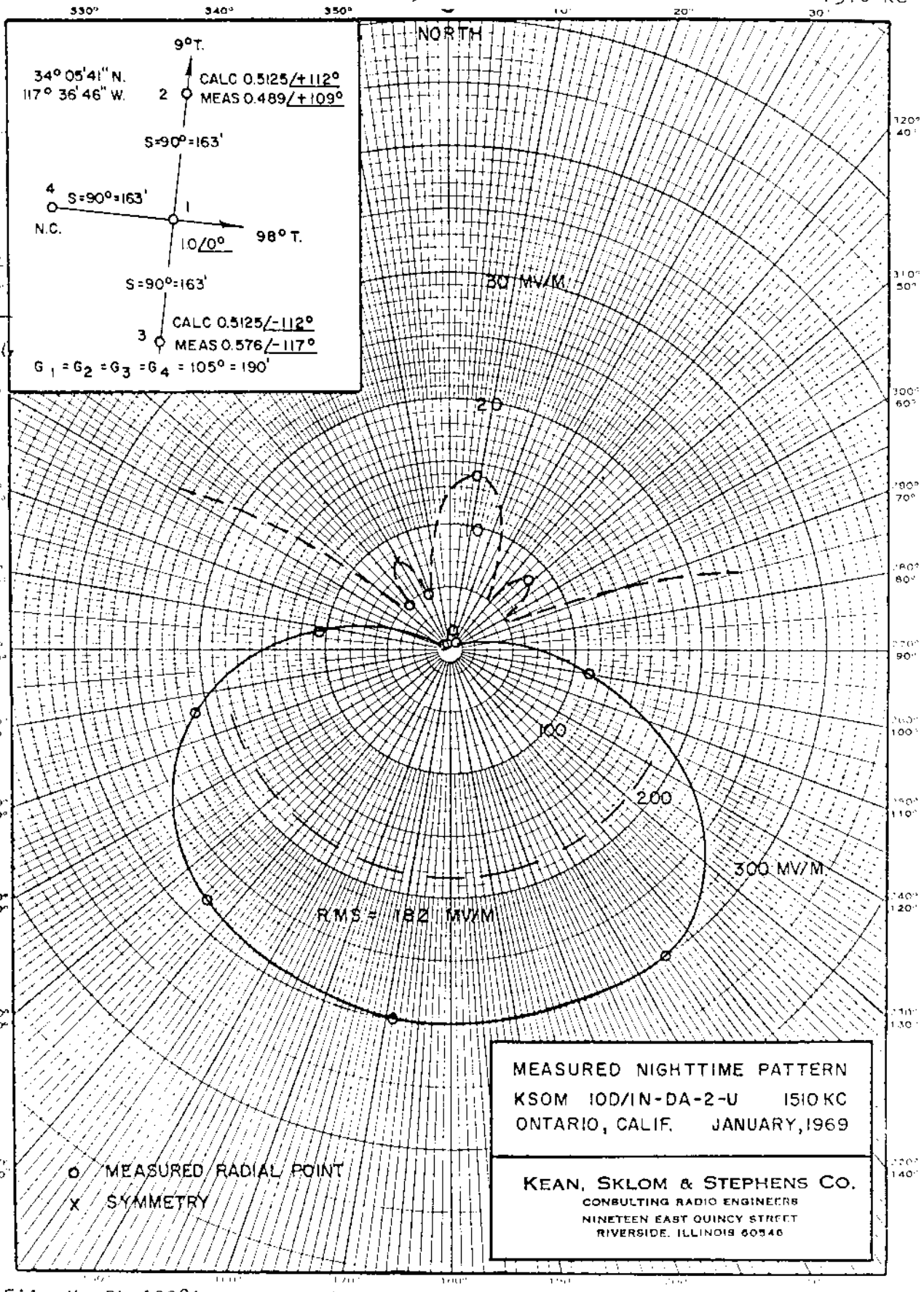
KSOM

Measured Night
(3-28-69ct)

Station KSOM
Ontario, California

1kw,10kw-LS,DA-2,U
1510 kc

granted 1/12/69 license covering use of DA-2 in daytime 10kw, 1kw, 1kw, 10kw-LS, DA-2, U



FCC File No.BL-12281
Accepted 3-25-69

Station KSOM
Ontario, California

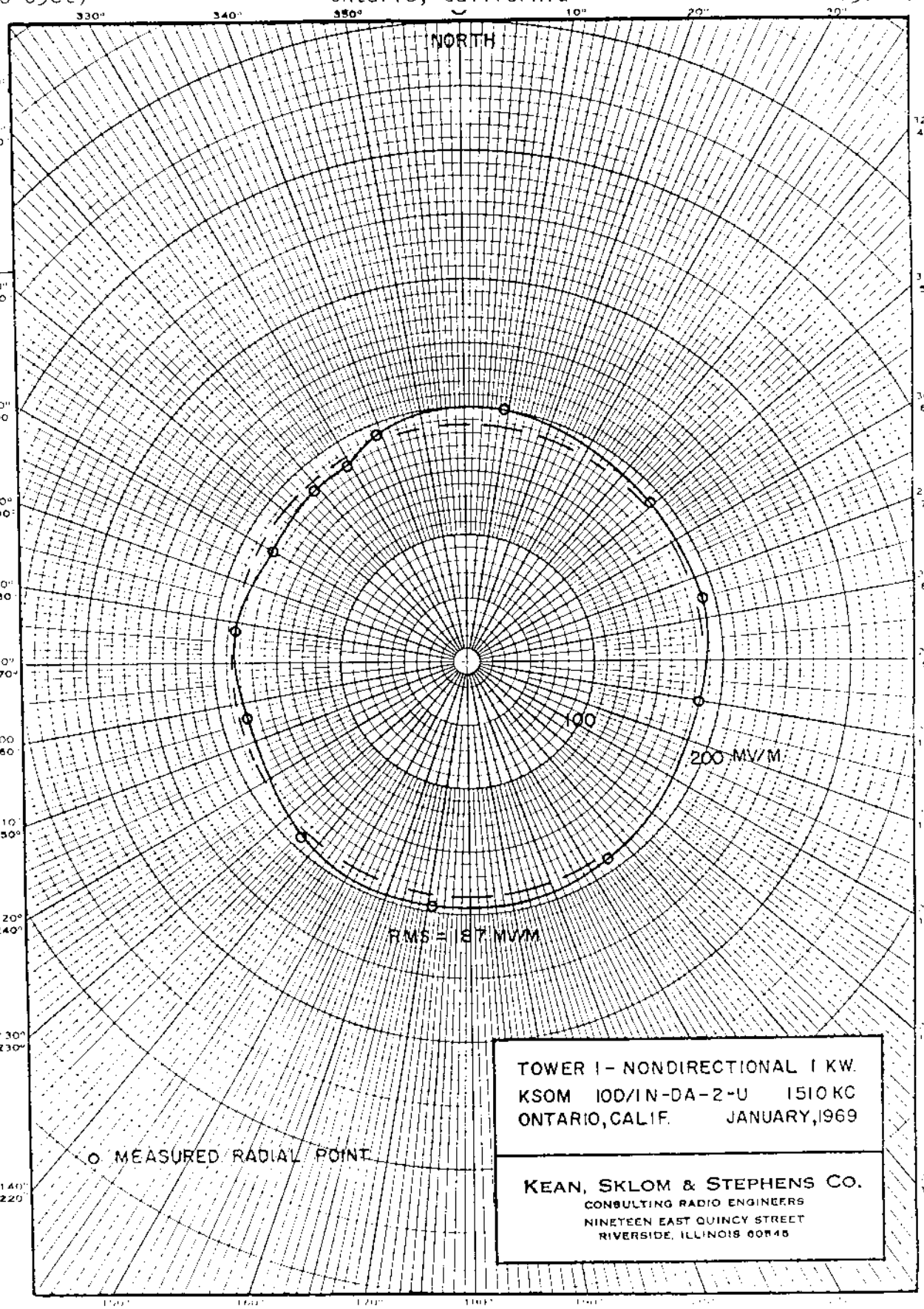
1510 kc

KSOM

Measured Non-DA
(3-28-69ct)

Station KSOM
Ontario, California

1kw,10kw-LS,DA-2,U
1510 kc



FCC File No.BL-12281
Accepted 3-25-69

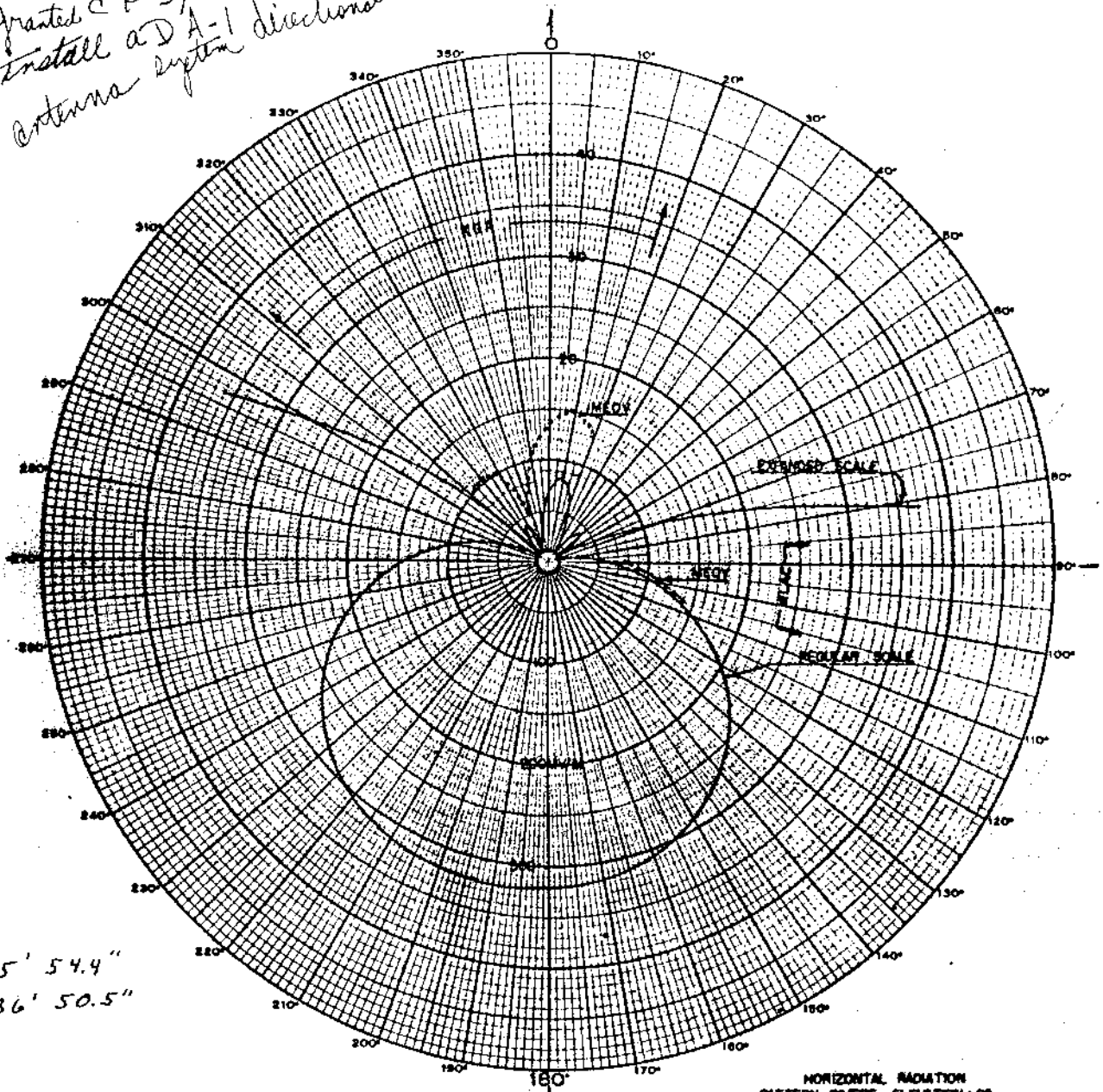
Station KSOM
Ontario, California

1510 kc

KSOM

PROPOSED KOCS 1 KW, N-1 KW, D 1510 KC
NIGHT & DAY (DA-1) Ontario, California DA-1, U
(9-21-56g)

Granted CP 3/6/57 to install a DA-1 directional antenna system



NL 34° 05' 54.4"
WL 117° 36' 50.5"

HORIZONTAL RADIATION PATTERN WHERE ELEVATION = 0°

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA
	TOWER No.	ELECTRICAL HEIGHT °	TRUE TOWER ORIENTATION °	SPACING °	PHASING °	HORIZONTAL FIELD	FIELD RATIO	ELEV. ANGLE °	ELEVATION PWR FIELD	CALL KOCS
NO. 2	1	110	0	0	0	165.2	1.0	0	194	FREQUENCY 1510 kc
90°	2	110	9	90	112		0.525	10		POWER 1 kw
NO. 1	3	110	189	90	-112		0.525	20		TIME OF OPERATION FULLTIME
90°	4							30		TYPE OF OPERATION DA-1
NO. 3	5							40		DAYTIME TOWERS 3
	6							50		NIGHTTIME TOWERS 3
	7							60		No. RADIALS PER TOWER 120
	8							70		LENGTH OF RADIALS 90 ' 163 "
	9							80		GROUND SCREEN DIMENSION
	10							E_1 =	mv/m	LAT. 34 ° 04 ' 42.5 "
		DAYTIME OPERATION ☒			NIGHTTIME OPERATION ☒			P_1 =	kw	LONG. 117 ° 39 ' 42.5 "
										SUPERSEDES
										PATTERN No.

EXHIBIT NO. 1-A (AMENDED)

RADIO STATION KOCS ONTARIO, CALIFORNIA
PROPOSED DA-1 — 1KW 1510 KC

AUGUST — 1956

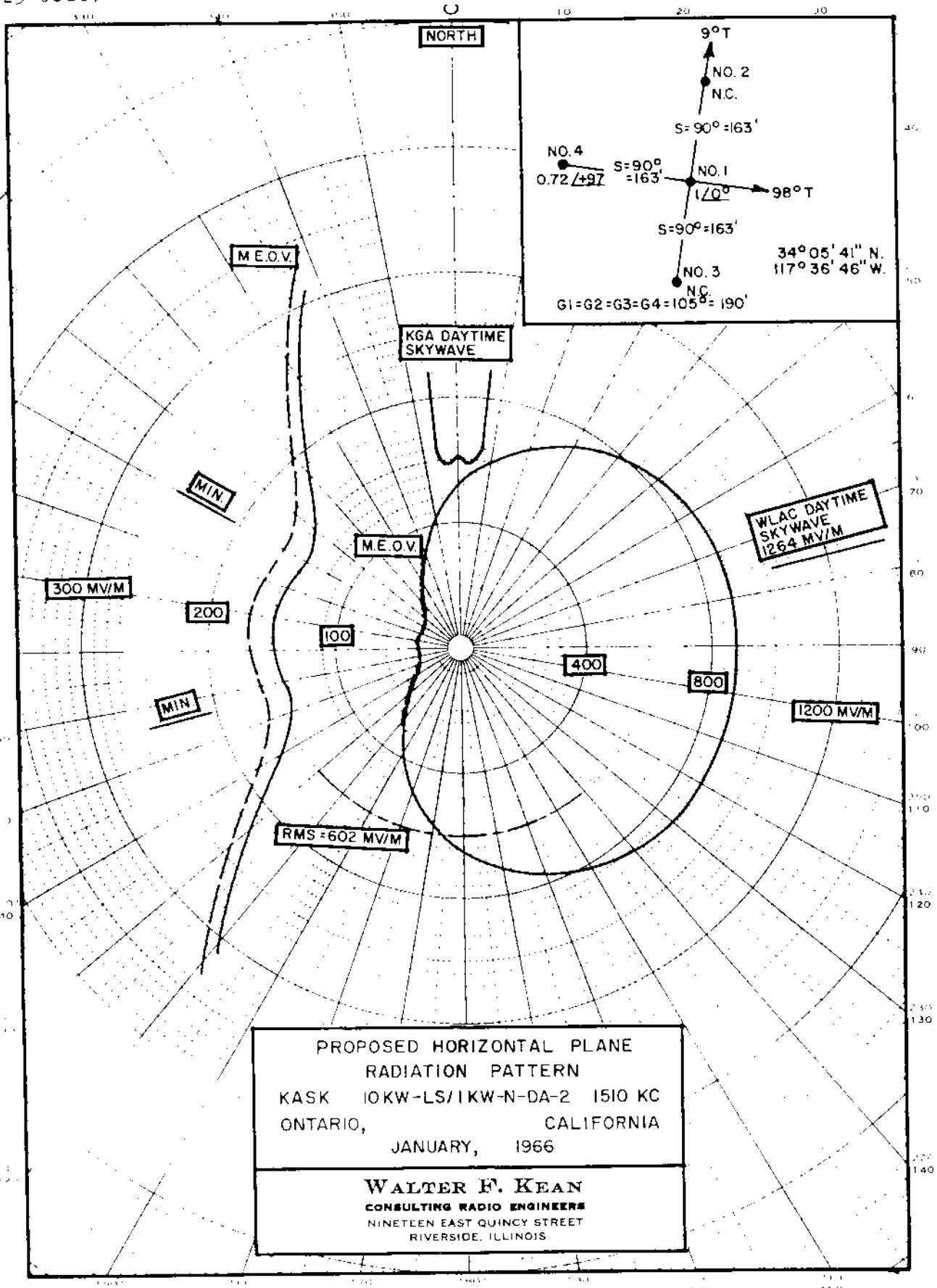
FCC File No. BP-10,097 Accepted 9-12-56 KOCS Ontario, California 1510 KC

KSOM ~~KASK~~

Proposed Day
(11-29-66ct)

Station KASK
Ontario, California

1kw,10kw-LS,DA-2,U
1510 kc



12-15-67
GRANTED
CP 1KW
FULL 10KW
TO 10KW

FCC File No.BP-17325
Accepted 11-14-66

Station KASK
Ontario, California

1510 kc

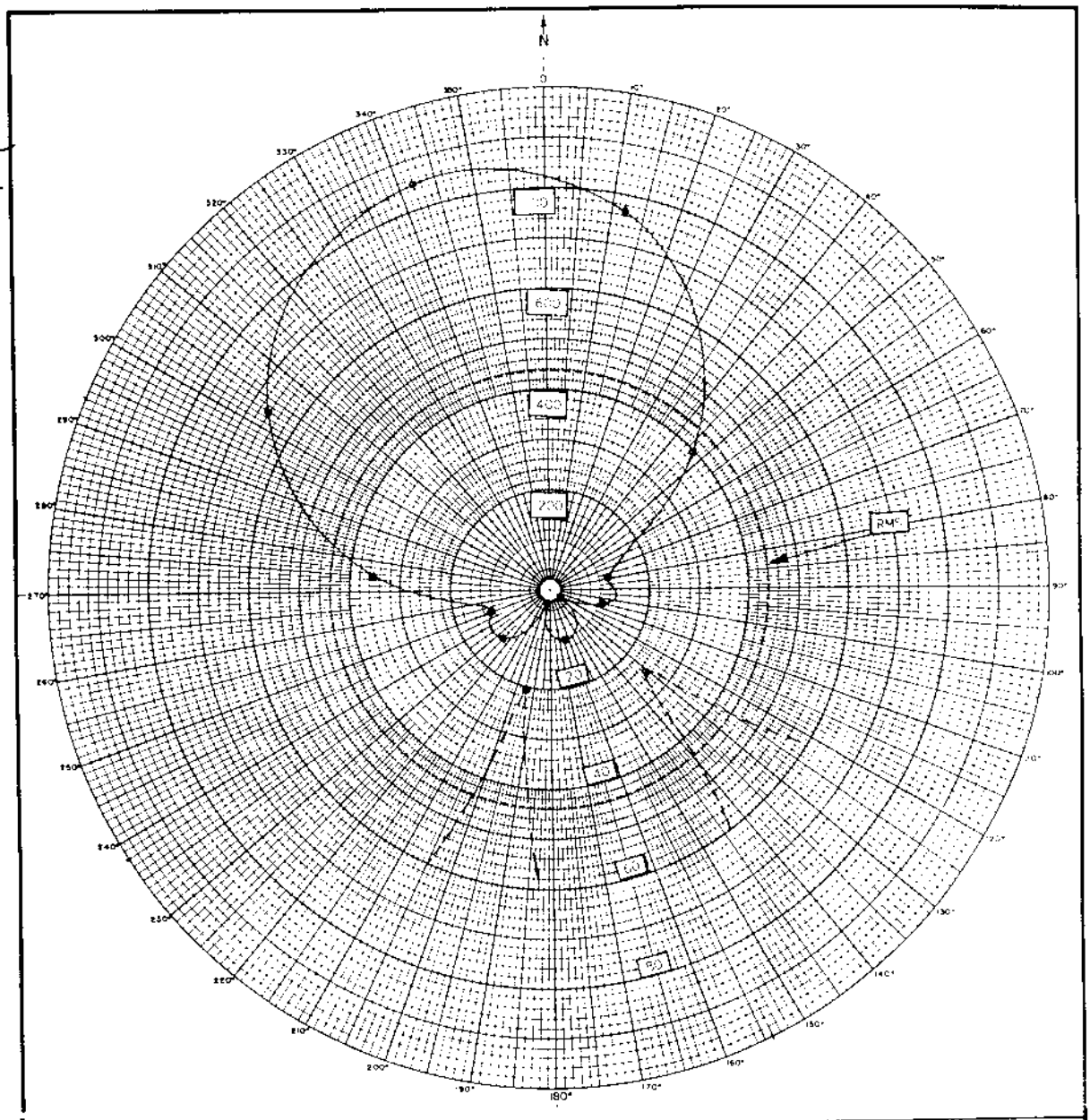
WAHT

Measured Day
(9-26-68ct)

Station WAHT
Annville-Cleona, Pennsylvania

5kw,DA-D,D
1510 kc

10-2-68
Granted
license



HORIZONTAL RADIATION PATTERN

APPLICANT
LOCATION
FREQUENCY KC/S
POWER 5 KW
LATITUDE DEG MIN SEC
LONGITUDE DEG MIN SEC
WHEN USED DAY
R.M.S. FIELD
DATE

SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No.BL-12092
Accepted 9-13-68

Station WAHT
Annville-Cleona, Pennsylvania

1510 kc

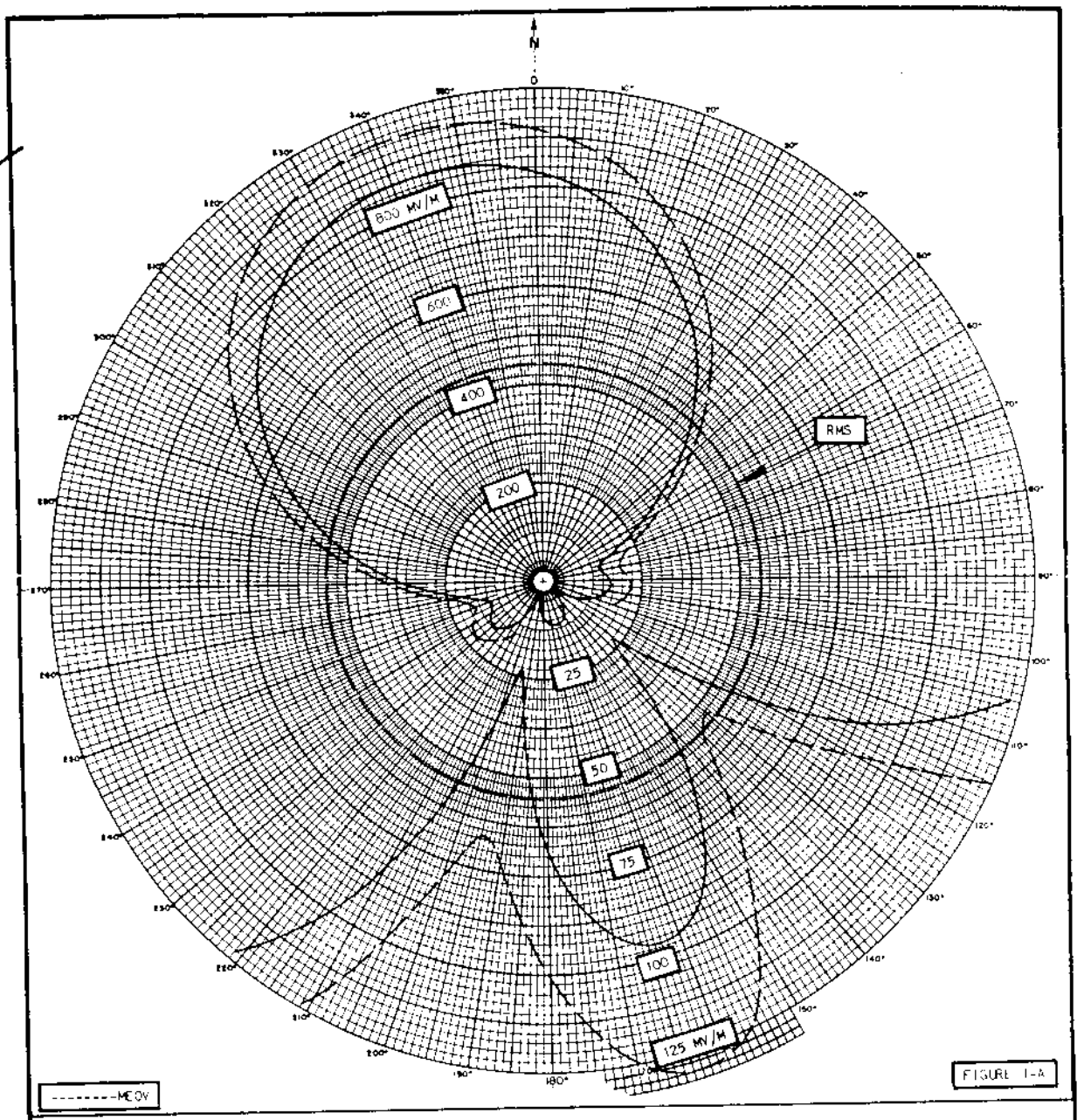
WAHT

Proposed Day
(6-28-67ct)

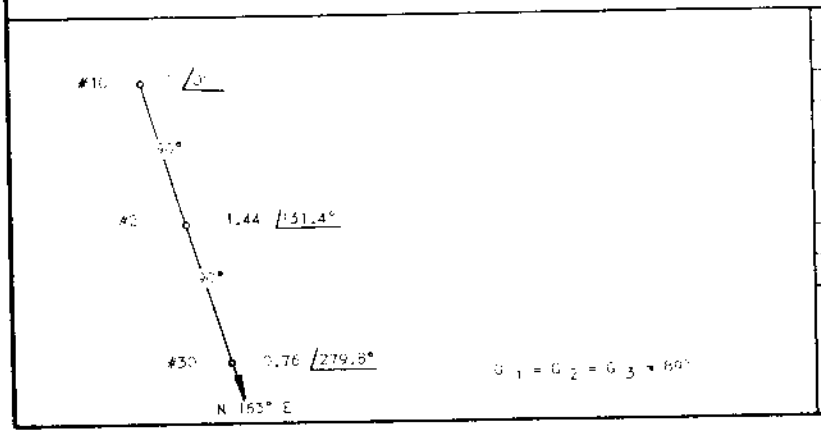
Station WAHT
Annville-Cleona, Pennsylvania

5kw,DA-D,D
1510 kc

2-6-68
GRANTED
CP



HORIZONTAL RADIATION PATTERN



APPLICANT : WAHT
LOCATION : ANNVILLE-CLEONA, PA.
FREQUENCY : 1510 KC/S
POWER 5,000 WATTS
LATITUDE 40 DEG 17 MIN 44 SEC
LONGITUDE 76 DEG 27 MIN 46 SEC.
WHEN USED DAYTIME
R M S FIELD. 440
DATE JANUARY 1967

SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No. BMP-12078
Accepted 6-14-67

Station WAHT
Annville-Cleona, Pennsylvania

1510 kc

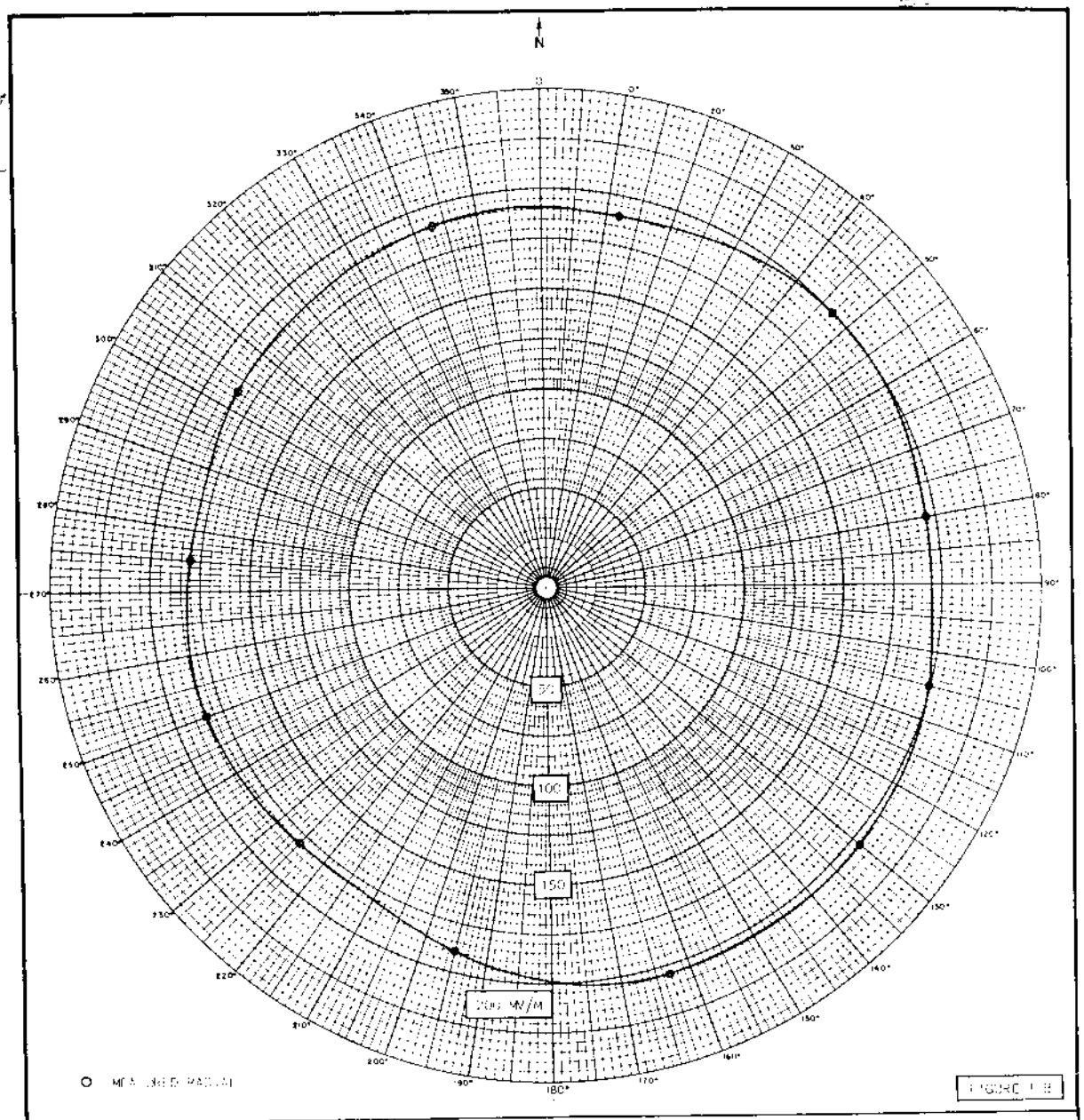
WAHT

Measured Non-DA
(9-26-68ct)

Station WAHT
Annville-Cleona, Pennsylvania

5kw,DA-D,D
1510 kc

10-2-68
Granted
license



HORIZONTAL RADIATION PATTERN

NON-DIRECTIONAL SURVEY

APPLICANT
LOCATION
FREQUENCY KC/S
POWER
LATITUDE DEG MIN SEC
LONGITUDE DEG MIN SEC
WHEN USED
RMS FIELD MV/M
DATE

SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No.BL-12092
Accepted 9-13-68

Station WAHT
Annville-Cleona, Pennsylvania

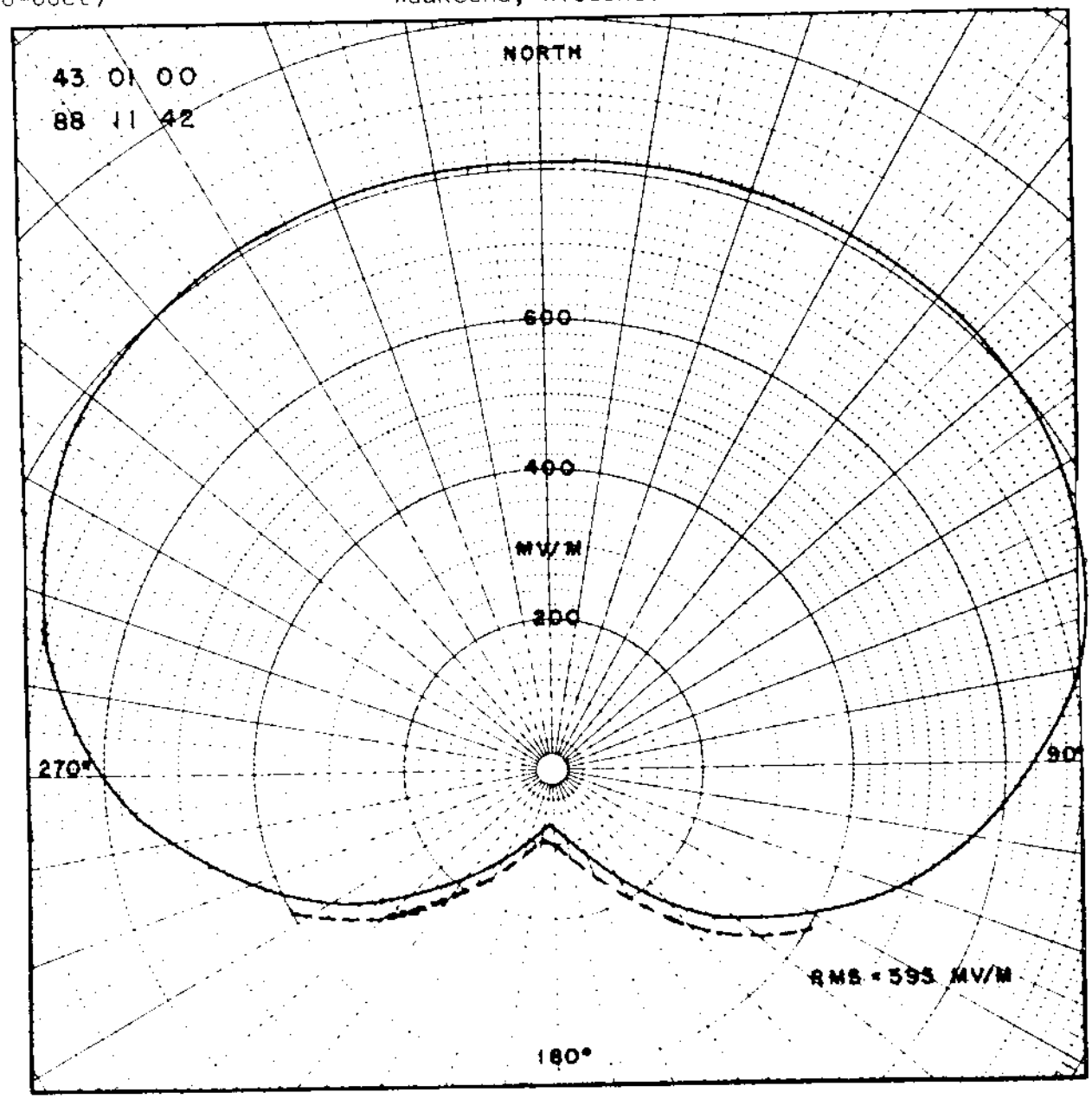
1510 kc

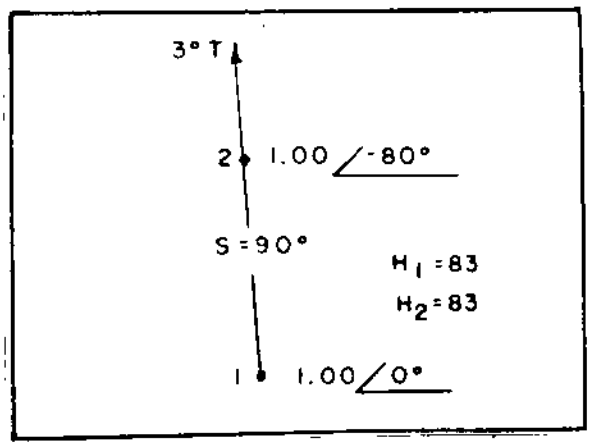
WAUK

Proposed Day
(7-28-66ct)

Station WAUK
Waukesha, Wisconsin

10kw,DA-D,D
1510 kc





WAUK RADIATION PATTERN
1510KC 10 KW DA-D
WAUKESHA, WISCONSIN
MAY, 1966

ROBERT A. JONES
CONSULTING ENGINEERS
LA GRANGE, ILLINOIS

FCC File No. BP-17231
Accepted 6-30-66

Station WAUK
Waukesha, Wisconsin

1510 kc

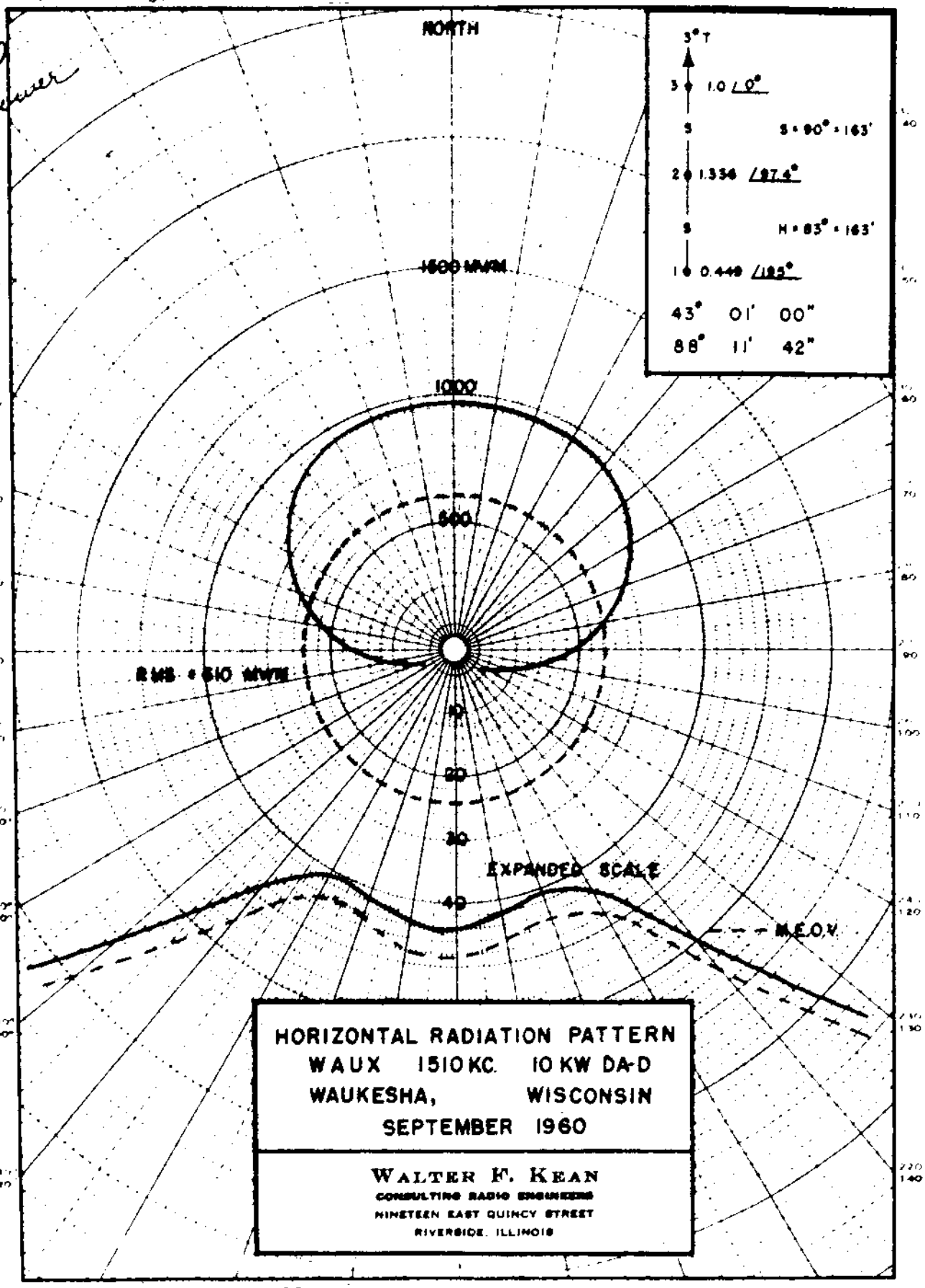
WAUK

PROPOSED DAY
(10-18-60g)

Station WAUX
Waukesha, Wisconsin

10kw, DA-D,U
1510 KC

2-1-61 granted CP to increase power and install DA-D



FCC File No. BP-12885
Accepted 10-4-60 (Amended)

WAUX
Waukesha, Wisconsin

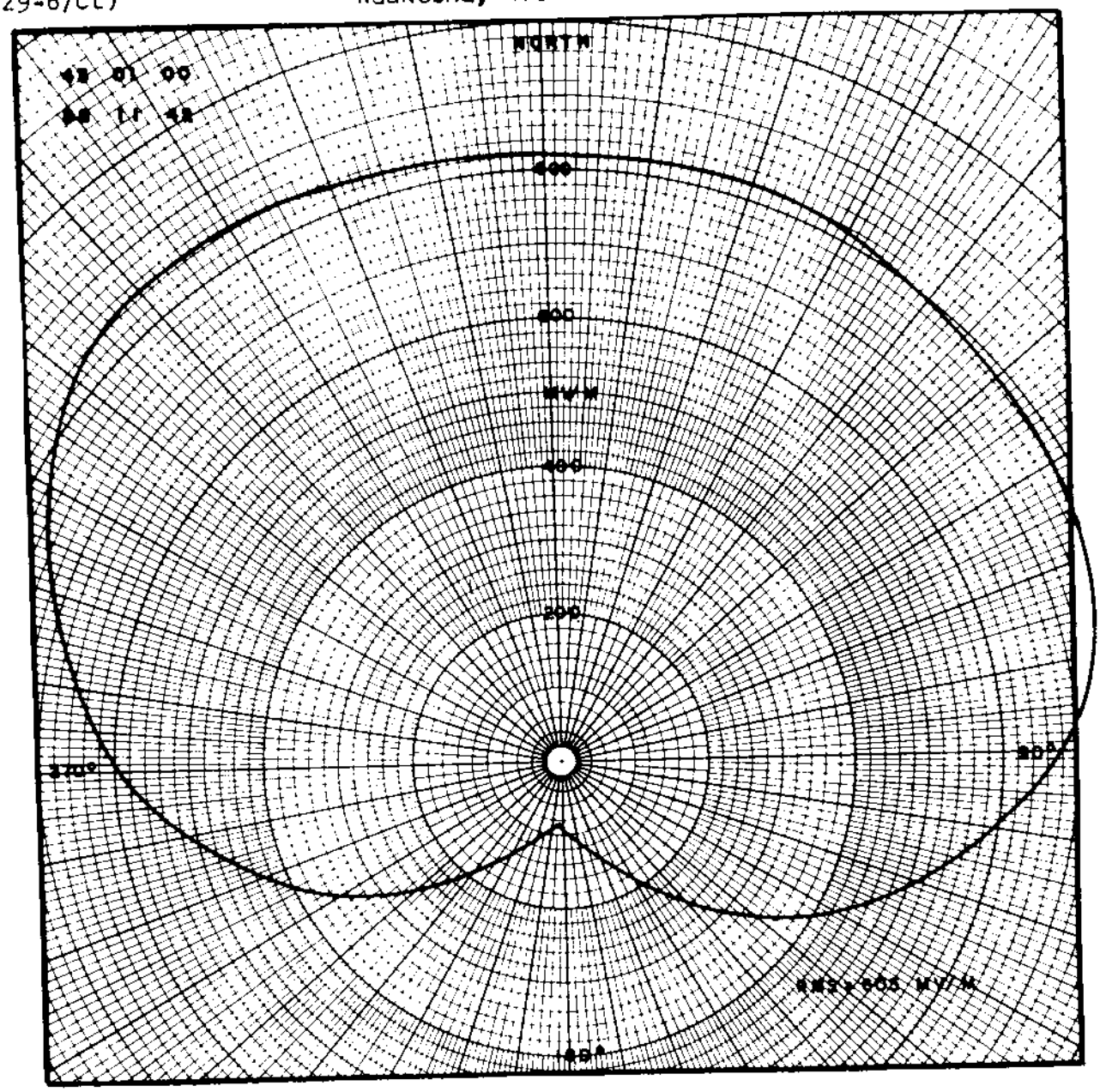
1510 KC

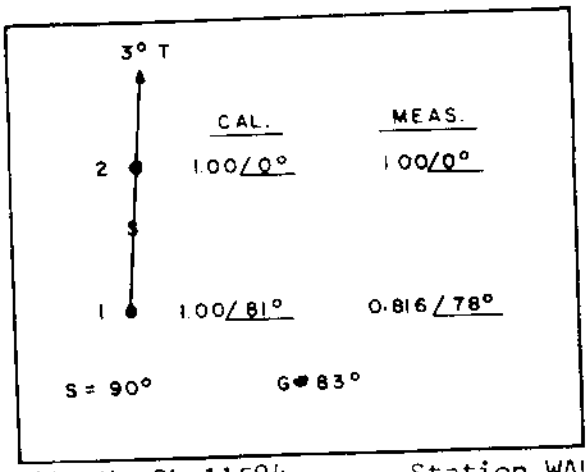
WAUK

Measured Day
(3-29-67ct)

Station WAUK
Waukesha, Wisconsin

10kw,DA-D,D
1510 kc





WAUK
MEASURED RADIATION PATTERN
1510 KHZ 10 KW DA-D
WAUKESHA, WISCONSIN
AUGUST, 1966

ROBERT A. JONES
CONSULTING ENGINEERS
LA GRANGE, ILLINOIS

FCC File No.BL-11584
Accepted 3-15-67

Station WAUK
Waukesha, Wisconsin

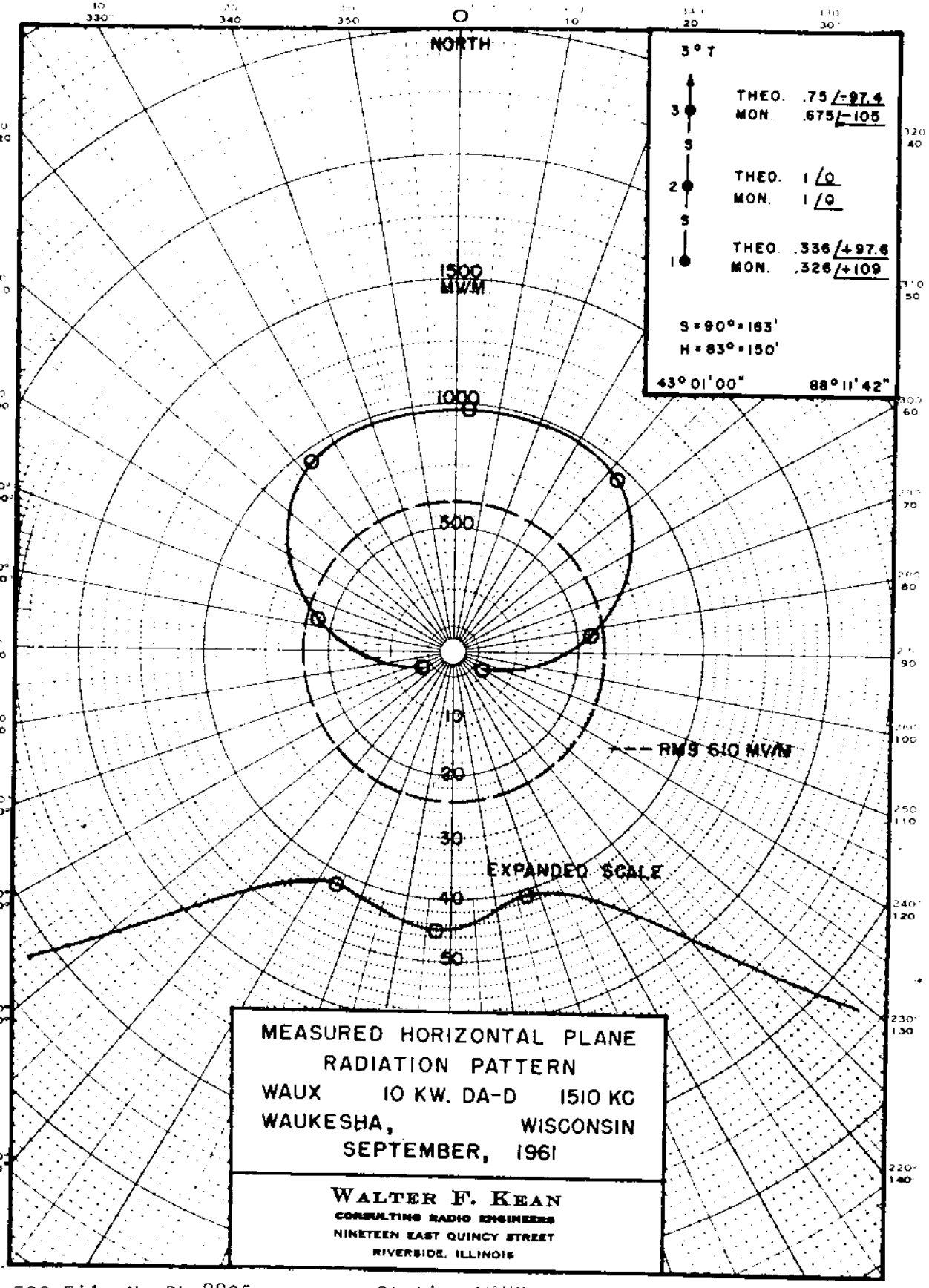
1510 kc

WAUK

Measured Day
(11-30-61ct)

Station WAUX
Waukesha, Wisconsin

10kw,DA-D,D
1510 kc



FCC File No.BL-8805
Accepted 11-17-61

Station WAUX
Waukesha, Wisconsin

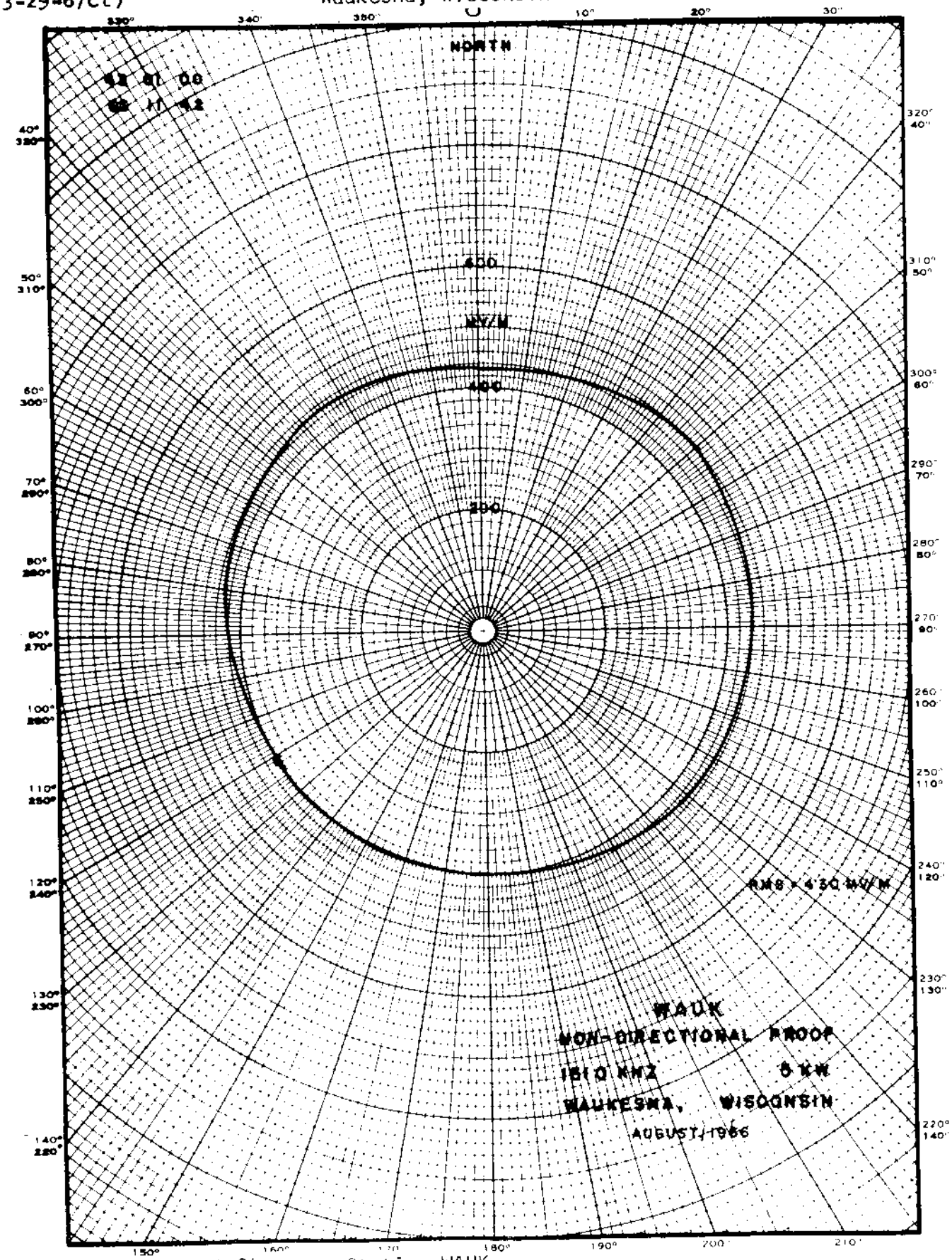
1510 kc

WAUK

Measured Non-DA
(3-29-67ct)

Station WAUK
Waukesha, Wisconsin

10kw,DA-D,D
1510 kc



FCC File No.BL-11584
Accepted 3-15-67

Station WAUK
Waukesha, Wisconsin

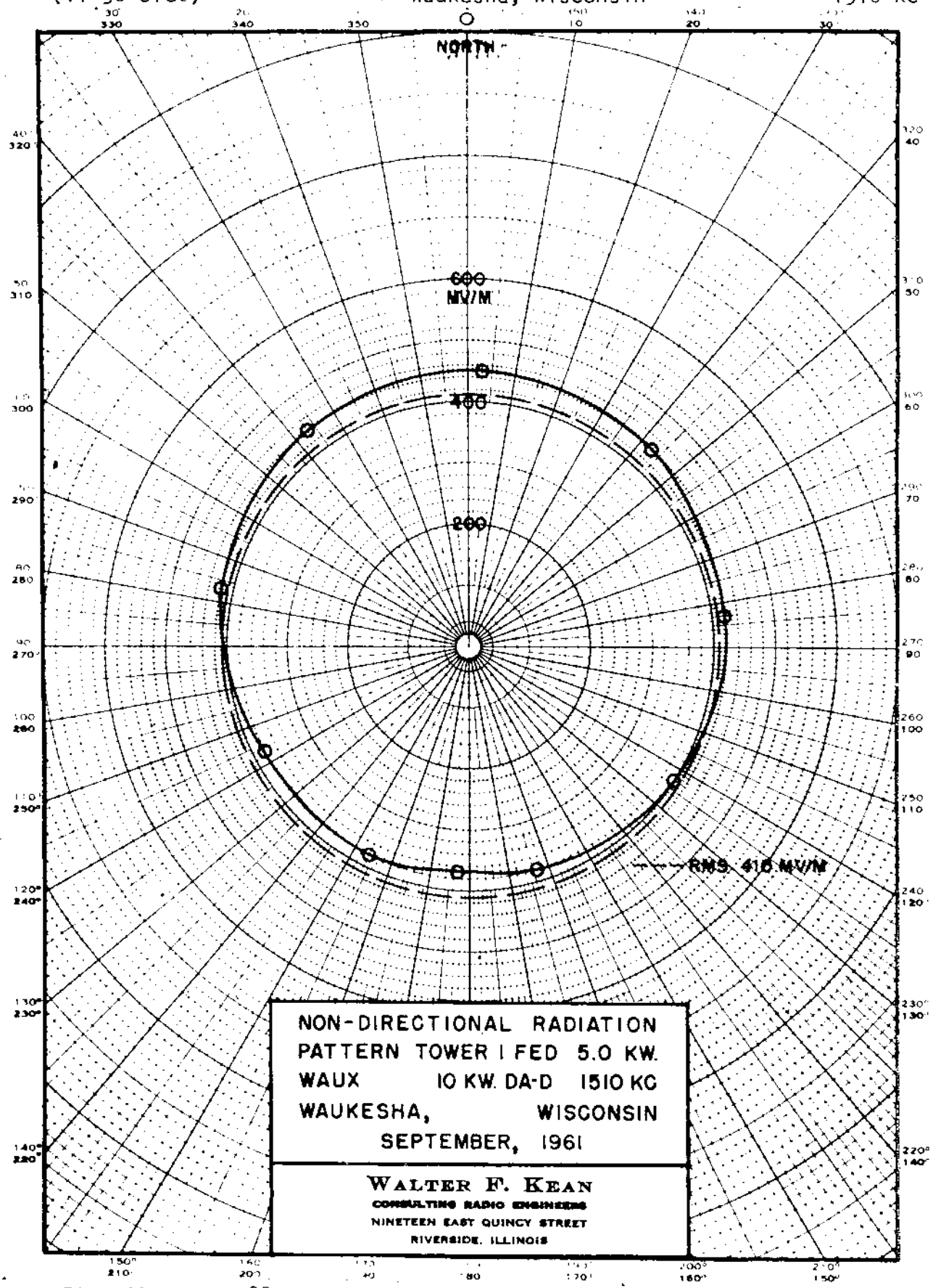
1510 kc

WAUK

Measured Non-DA
(11-30-61ct)

Station WAUX
Waukesha, Wisconsin

10kw,DA-D,D
1510 kc



FCC File No.BL-8805
Accepted 11-17-61

Station WAUX
Waukesha, Wisconsin

1510 kc

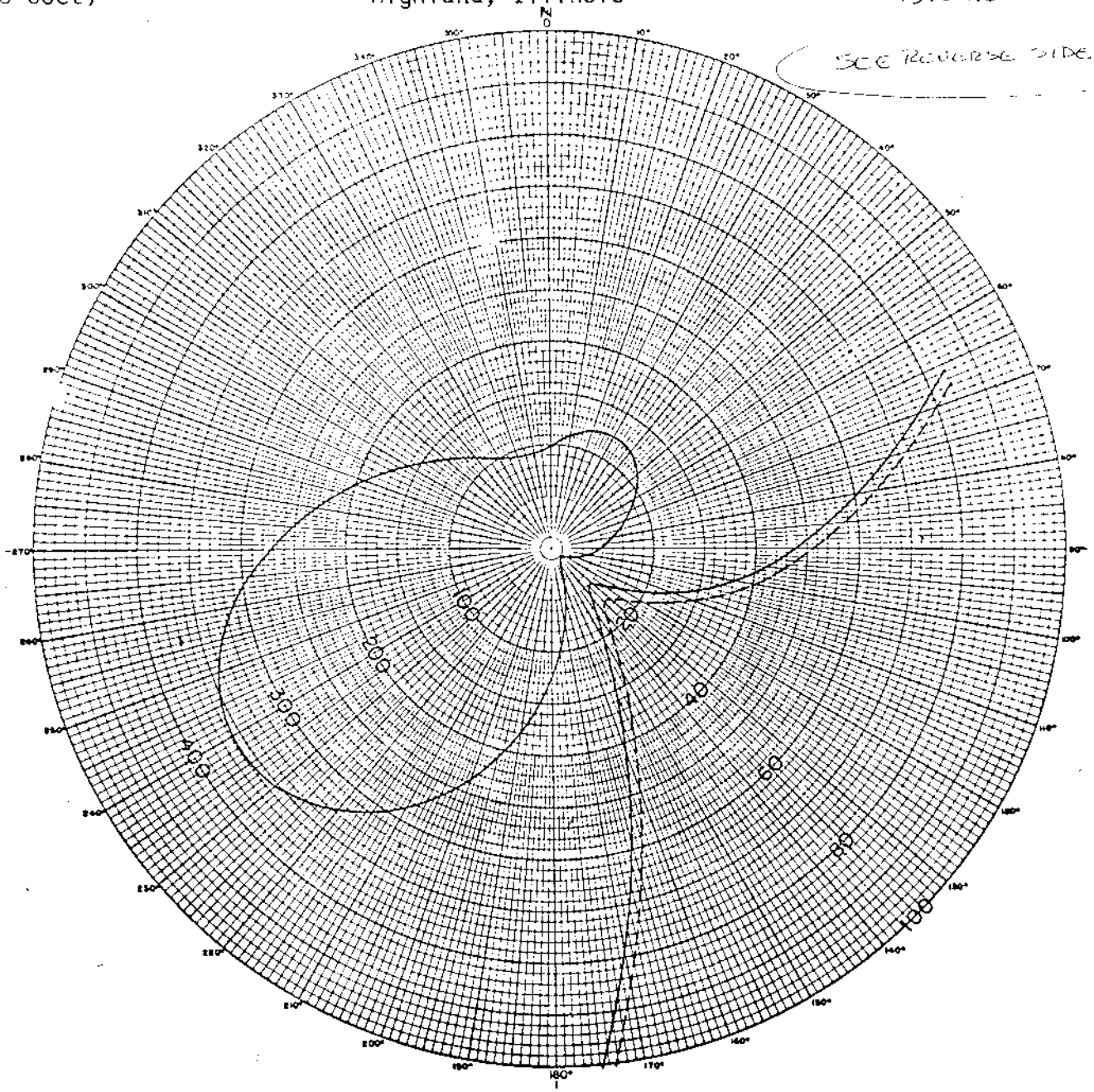
WINU

Proposed Day
(6-28-68ct)

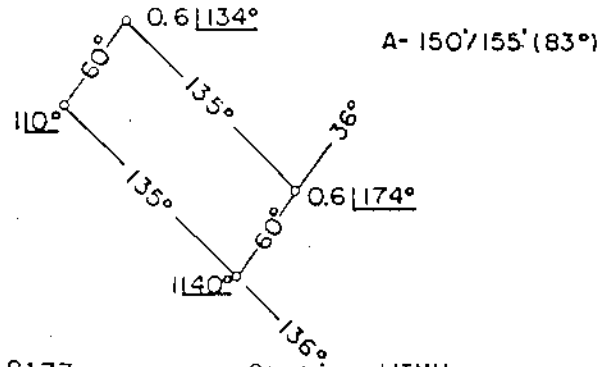
Station WINU
Highland, Illinois

1kw,DA-D,D
1510 kc

SEE REVERSE SIDE



HORIZONTAL RADIATION PATTERN



APPLICANT	Radio Station WINU
LOCATION	Highland, Illinois
FREQUENCY	1510 KC/S
POWER	1000 Watts
LATITUDE	38 DEG. 45 MIN. 23 SEC.
LONGITUDE	89 DEG. 39 MIN. 18 SEC.
WHEN USED	Daytime
R.M.S. FIELD	176 MV/M
DATE	March 30th, 1968

RALPH J. BITZER
CONSULTING RADIO ENGINEERS
ST. LOUIS, MISSOURI

FCC File No.BP-18177
Accepted 6-20-68

Station WINU
Highland, Illinois

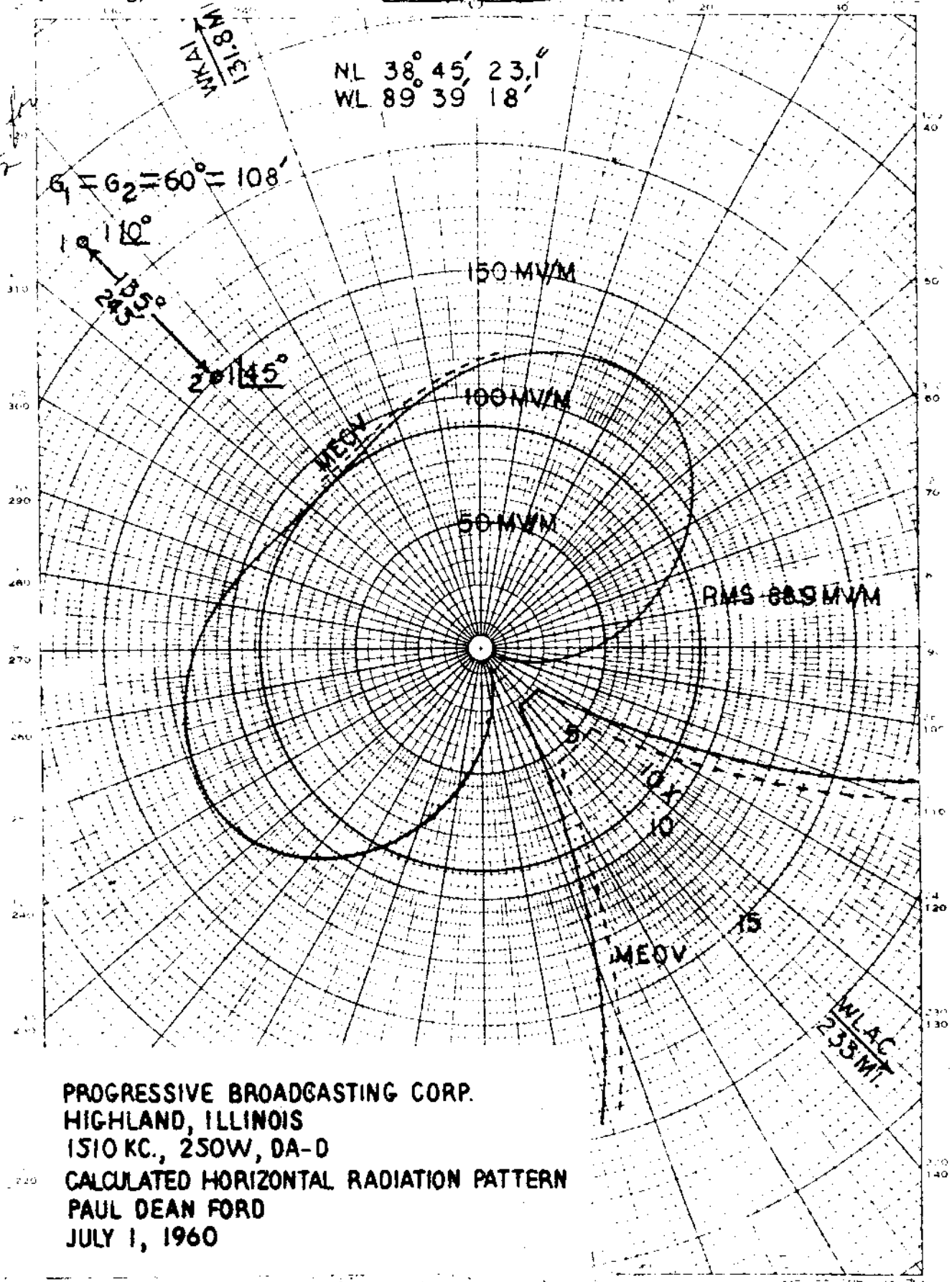
1510 kc

WINU

PROPOSED DAY
(9-27-60g)

New; Progressive Bcstng. Co.
Highland, Illinois

250w, DA-D,D
1510 KC



PROGRESSIVE BROADCASTING CORP.
HIGHLAND, ILLINOIS
1510 KC., 250W, DA-D
CALCULATED HORIZONTAL RADIATION PATTERN
PAUL DEAN FORD
JULY 1, 1960

FCC File No. BP-14329
Accepted 9-14-60

Progressive Broadcasting Company
Highland, Illinois

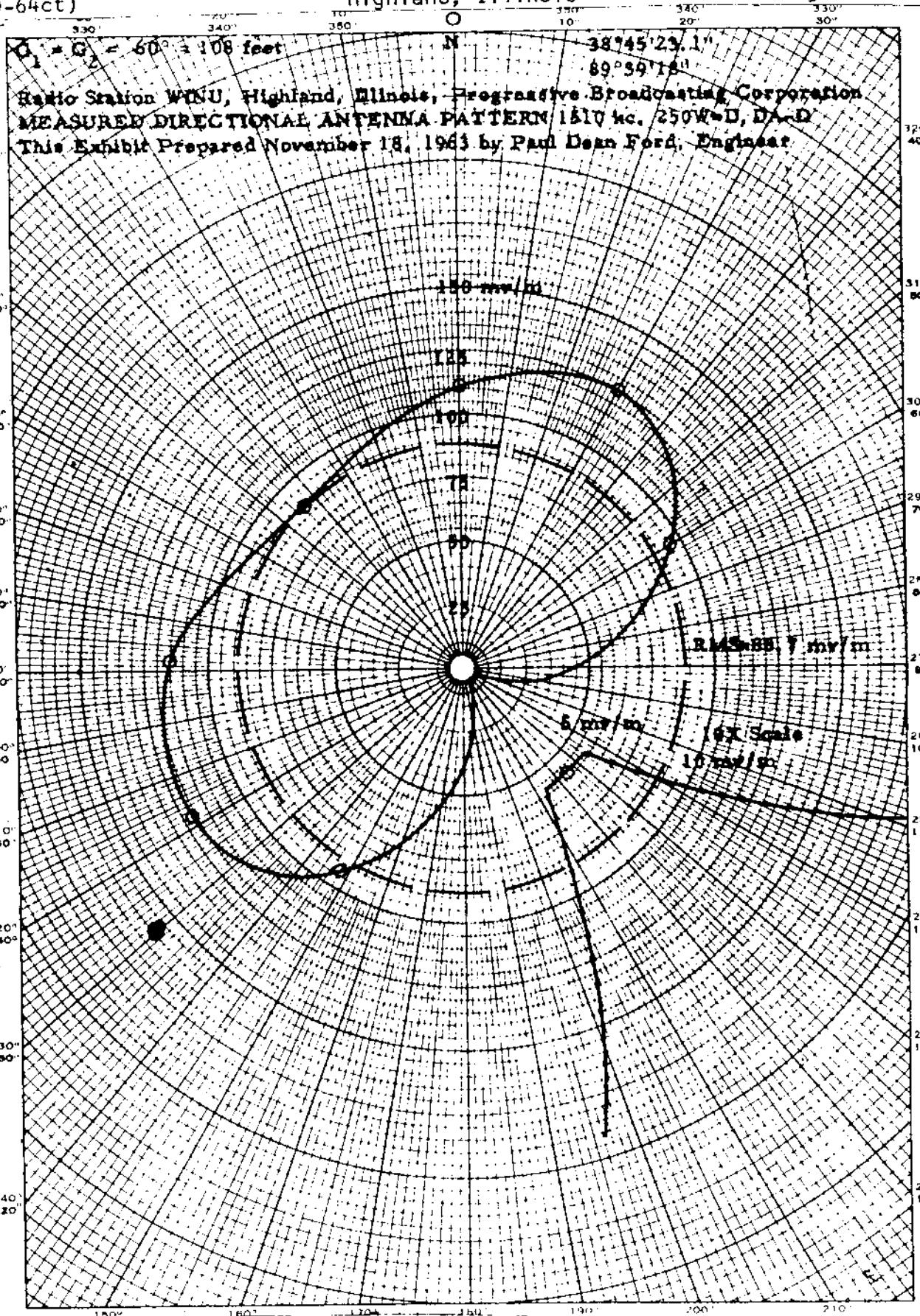
1510 KC

WINU

Measured Day
(3-30-64ct)

Station WINU
Highland, Illinois

250w, DA-D, D
1510kc



FCC File No. BP-10414
Accepted 3-5-64

Station WINU
Highland, Illinois

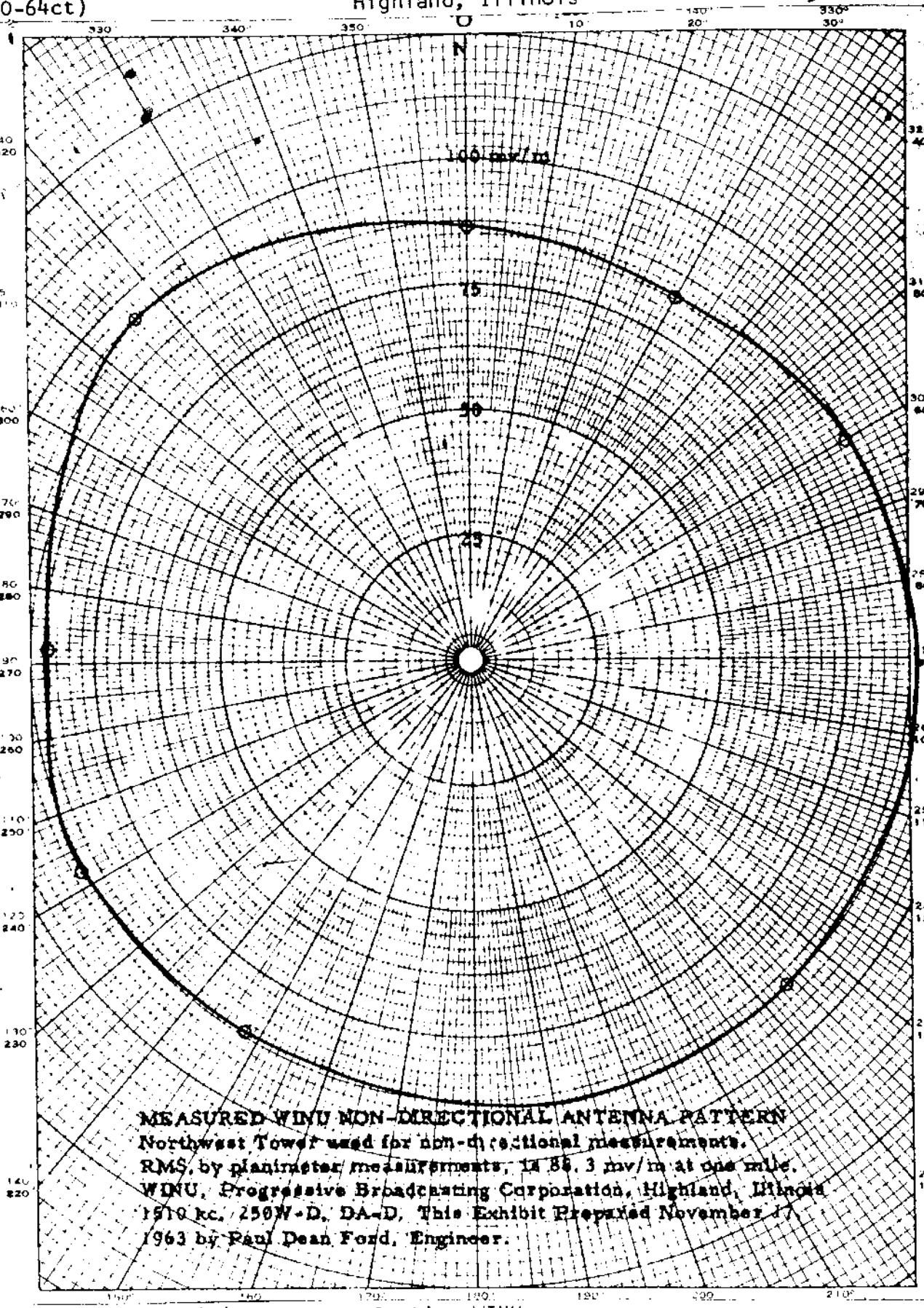
1510kc

WINU

Measured Non-DA
(3-30-64ct)

Station WINU
Highland, Illinois

250w,DA-D,D
1510kc



MEASURED WINU NON-DIRECTIONAL ANTENNA PATTERN
Northwest Tower used for non-directional measurements.
RMS, by planimeter measurements, is 88.3 mv/m at one mile.
WINU, Progressive Broadcasting Corporation, Highland, Illinois
1510 kc, 250W-D, DA-D, This Exhibit Prepared November 17,
1963 by Paul Dean Ford, Engineer.

FCC File No. BP-10414
Accepted 3-5-64

Station WINU
Highland, Illinois

1510kc

WITS
1510 kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WITS

Main Studio: Boston, Massachusetts

Frequency: 1510 kHz

Power: 50kw Night 50kw Day

Notification List No. 1789

Date: September 12, 1980 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 42° 23' 10"
West Longitude: 71° 12' 01"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 4
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	E(#1)	N(#2)	W(#3)	S(#4)
HEIGHT ABOVE INSULATORS:	360'	360'	360'	360' (199°)
NIGHT PHASING:	0°	+125.1°	-137.1°	+100.9°
NIGHT FIELD RATIO:	1.0	1.57	1.56	0.9
DAY PHASING:	—	0°	+92.1°	—
DAY FIELD RATIO:	—	1.0	1.16	—

SPACING AND ORIENTATION: The towers are located at the vertices of Rhombus the sides of which are 90° in length on lines bearing 240° and 302° true.

GROUND SYSTEM: 120 - 162.8' equally spaced copper radials plus a 48' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS+	THEORETICAL RSS	STANDARD RMS
Day	1786.5 mv/m	1801.99 mv/m	1876.4 mv/m
Night	1808 mv/m	1874.93 mv/m	1899 mv/m

WITS
1510 kHz

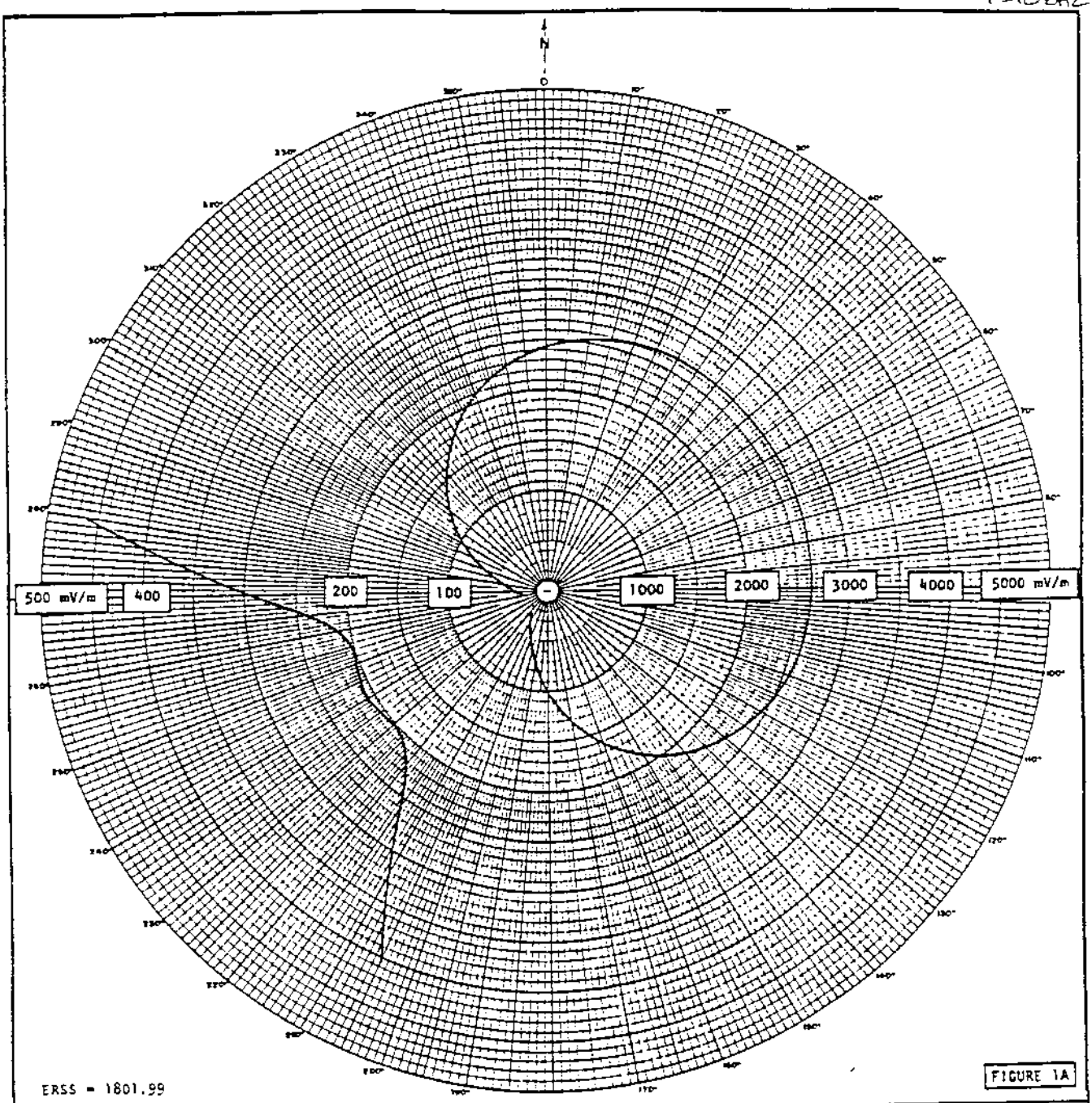
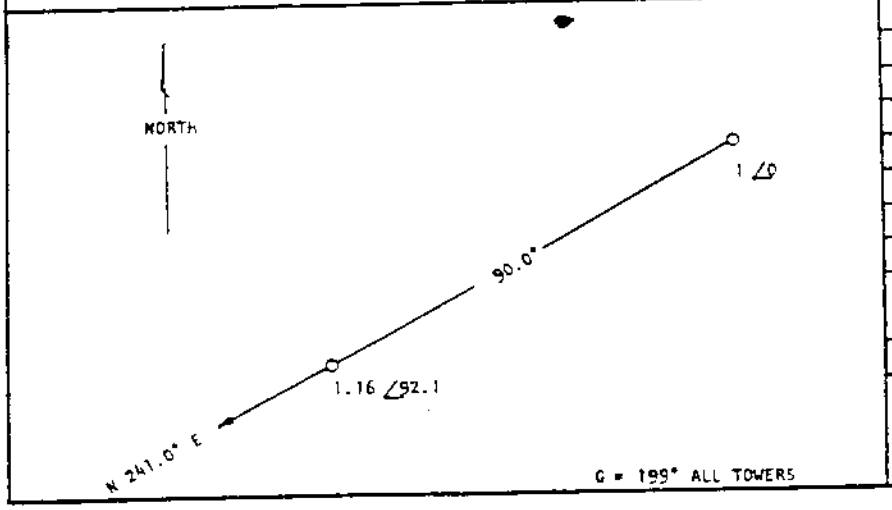


FIGURE 1A

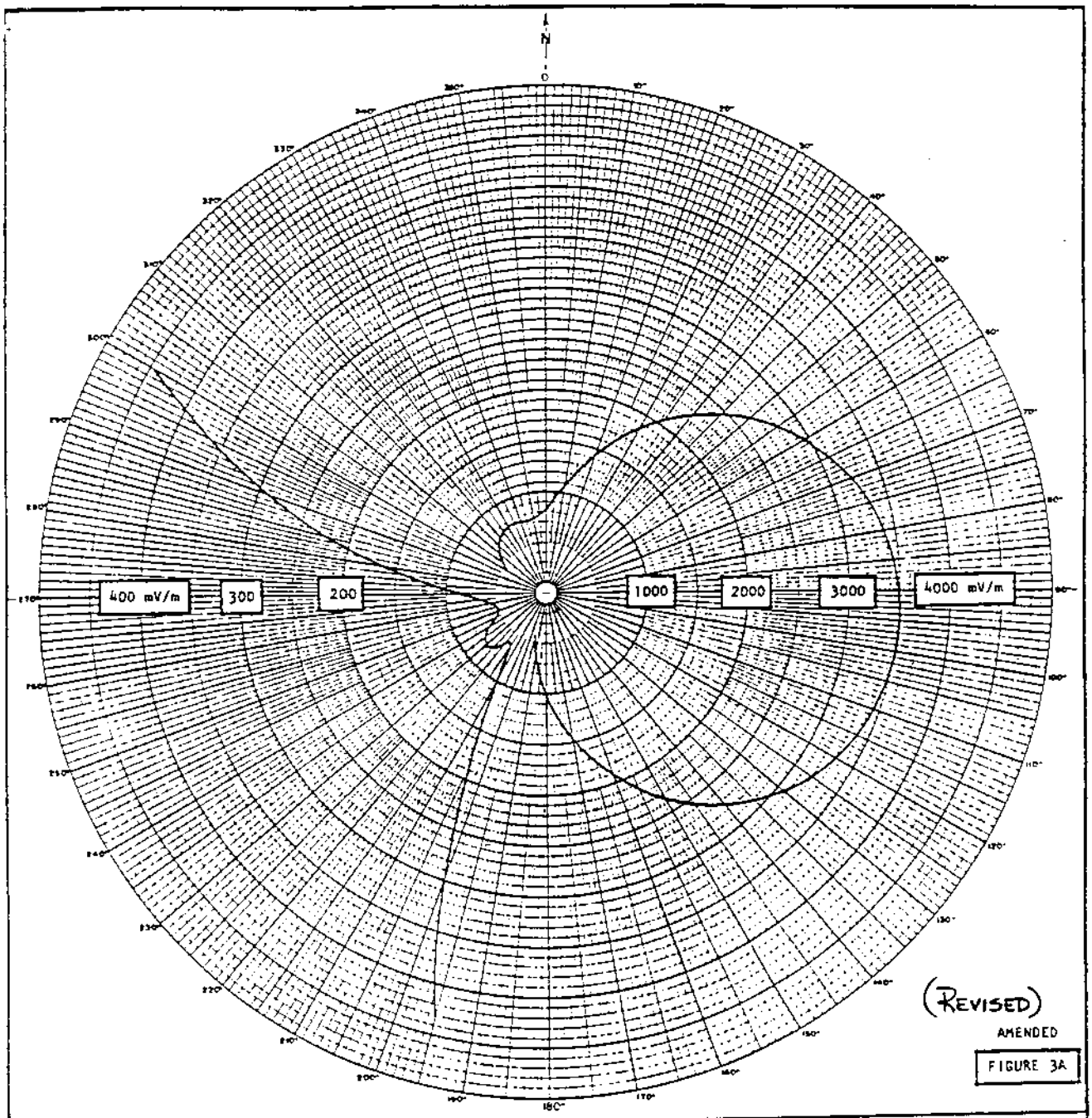
STANDARD HORIZONTAL PLANE PATTERN



CALL	: WITS
APPLICANT	: MARINER COMMUNICATIONS INC.
LOCATION	: BOSTON, MASSACHUSETTS
FREQUENCY	: 1510 kHz
POWER	: 50 kW
LATITUDE	: 42 DEG 23 MIN 10 SEC
LONGITUDE	: 71 DEG 12 MIN 1 SEC
WHEN USED	: DAY
R.M.S. FIELD	: THEO: 1786.5 mV/m STD : 1876.4 mV/m
DATE	: FEBRUARY 1979

SILLIMAN, MOFFET & KOWALSKI, P.C.
CONSULTING RADIO ENGINEERS

WITS
1510 kHz



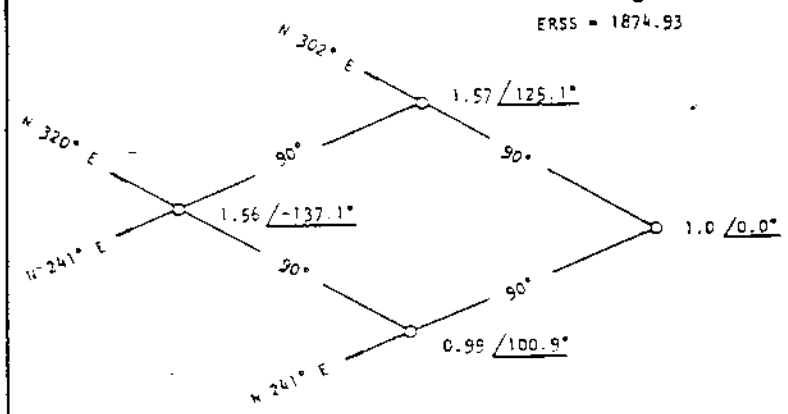
(REVISED)
AMENDED

FIGURE 3A

STANDARD HORIZONTAL PLANE PATTERN

G = 199° [redacted] TOWERS

ERSS = 1874.93



CALL	: WITS
APPLICANT	: MARINER COMMUNICATIONS, INC.
LOCATION	: BOSTON, MASSACHUSETTS
FREQUENCY	: 1510 kHz
POWER	: 50 kW
LATITUDE	: 42 DEG 23 MIN. 10 SEC.
LONGITUDE	: 71 DEG. 12 MIN 1 SEC.
WHEN USED	: NIGHT
R.M.S FIELD	: THEO: 1808.0 mV/m STD : 1899.0 mV/m
DATE	: OCTOBER 1979

SILLIMAN, MOFFET & KOWALSKI, P.C.
CONSULTING RADIO ENGINEERS
[redacted]

WITS

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WITS

Main Studio: Boston, Massachusetts

Frequency: 1510 kHz

Power 5kw Night 50kw Day

Notification List No. 1773

Date: March 29, 1978 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 42° 16' 30"
West Longitude: 71° 01' 53"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 3
Type of elements: The N(#1) and S(#2) towers are series excited, uniform cross-section, guyed: The E(#3) tower is self supporting, series excited tapered; vertical steel towers.

TOWER:	S (#2)	N (#1)	E (#3)
HEIGHT ABOVE INSULATORS:	200	200	200 (110.5°)
NIGHT PHASING	135°	0°	---
NIGHT FIELD RATIO:	1.0	0.854	---
DAY PHASING:	0°	---	-45°
DAY FIELD RATIO:	1.0	---	1.27

SPACING AND ORIENTATION: The towers are located at the vertices of a triangle. With the South (#2) tower as reference, the North Tower is spaced 251' (138.7°) on a line bearing 358° true. The East tower is spaced 244.3' (135°) on a line bearing 70° true.

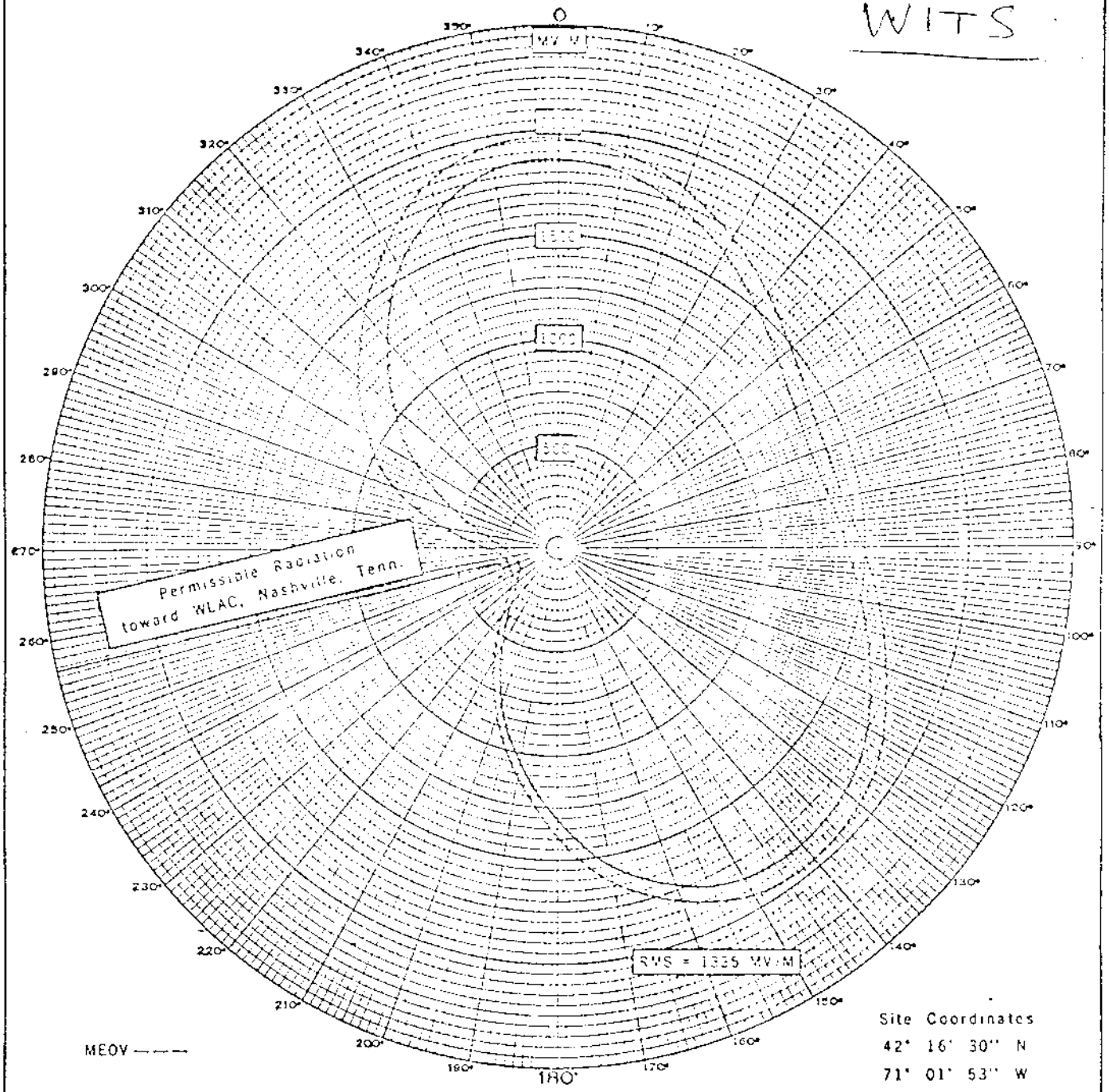
GROUND SYSTEM: 120 - 170' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS
Day	1335 mv/m
Night	436 mv/m

Note: Please retain the Nighttime directional antenna radiation pattern notified for Station WMEX in the original 1941 Notification and attache to this Revised Description Sheet and Daytime pattern. This notification concerns only a change in daytime MEOV of radiation and also a change in call letters from WMEX with Nighttime operation continued as previously notified.

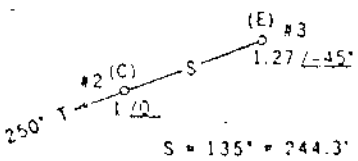
WITS



PROPOSED DAYTIME HORIZONTAL PLANE RADIATION PATTERN

G = 110.5'

Not used daytime
(N)
#1



S = 135° = 244.3'

RICHMOND BROTHERS, INC.

BOSTON, MASSACHUSETTS

Jules Cohen & Associates

Consulting Electronics Engineers

STATION WMEX

1510 KHZ

5 KW, 50 KW-LS U DA-2

FEBRUARY 1977

DIRECTIONAL ANTENNA DESCRIPTION SHEET

~~WMEX~~
WITS

Station: WMEX

Main Studio: Boston, Massachusetts

Frequency: 1510 kHz

Power: 5 kW Night 50 kW Day

Notification List No. 1624

Date: March 18, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 42° 16' 30"
West Longitude: 71° 01' 53"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 3
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	N(#1)	S(#2)	E(#3)
HEIGHT ABOVE INSULATORS:	200'	200'	200' (110.5°)
NIGHT PHASING:	0°	+135°	---
NIGHT FIELD RATIO:	0.854	1.0	---
DAY PHASING:	---	0°	-45°
DAY FIELD RATIO:	---	1	1.27

SPACING AND ORIENTATION: Nighttime elements are spaced 251' (139°) on a line bearing 178° true. Daytime elements are spaced 244.3' (135°) on a line bearing 250° true.

GROUND SYSTEM: 120-170' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

Predicted effective Night Field: 436 mv/m at rated power.

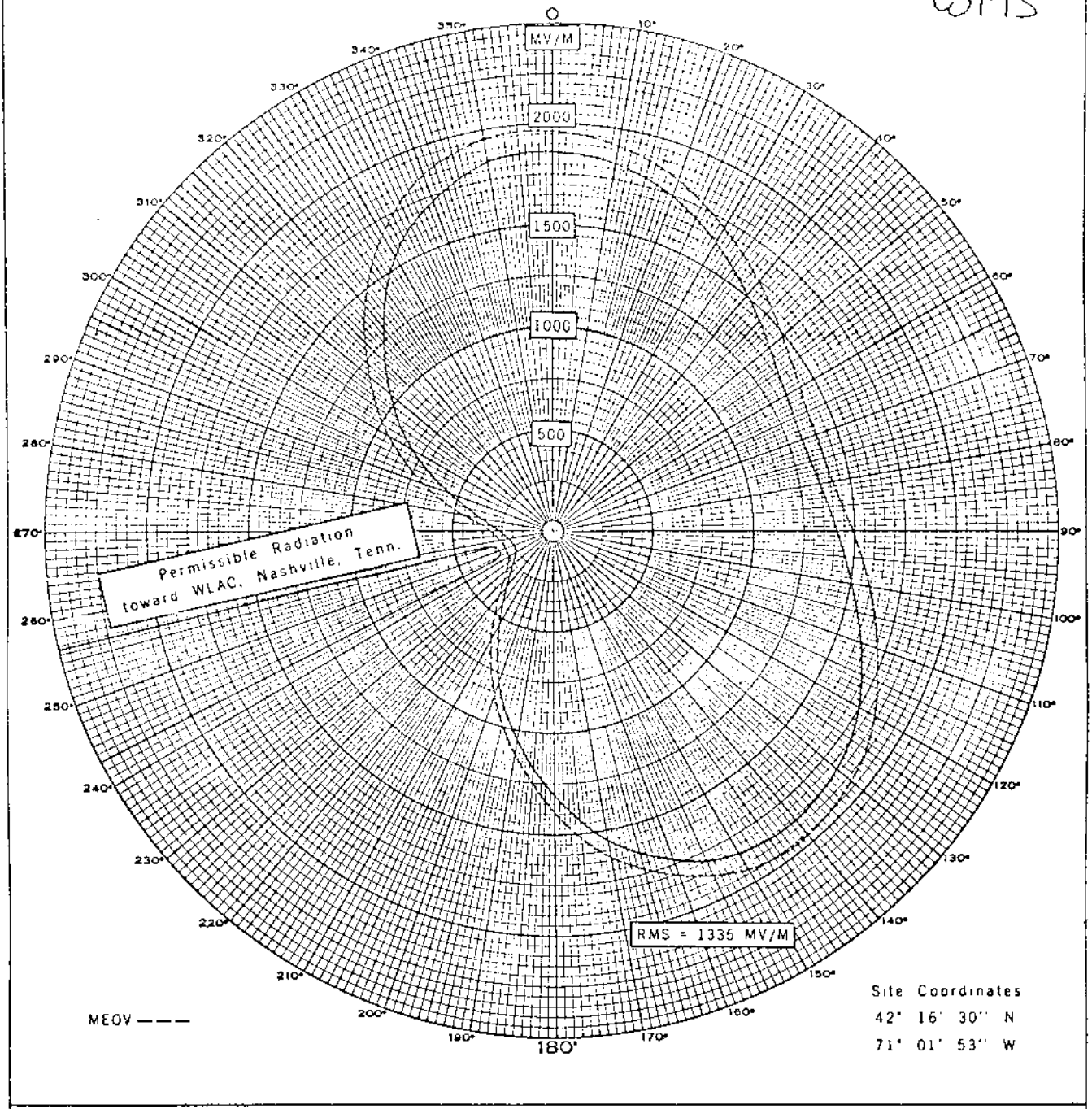
Predicted effective Day Field: 1335 mv/m at rated power.

Note: Please retain the Nighttime directional antenna radiation pattern notified for Station WMEX in the original 1941 notification and attach to this Revised Description Sheet and Daytime pattern. This notification concerns only a change in the Daytime operation of the station with Nighttime operation continued as previously notified.

CTR NO 31204A3

~~WMEX~~ Figure 1

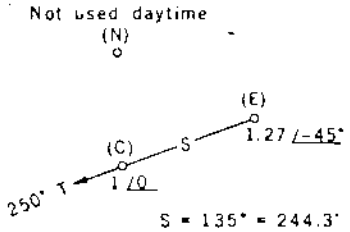
WITS



PROPOSED DAYTIME HORIZONTAL PLANE RADIATION PATTERN

G = 110.5°

Not used daytime



RICHMOND BROTHERS, INC.

BOSTON, MASSACHUSETTS

Jules Cohen & Associates

Consulting Electronics Engineers

STATION WMEX

1510 KHZ

5 KW, 50 KW-LS U DA-2

DECEMBER 1974

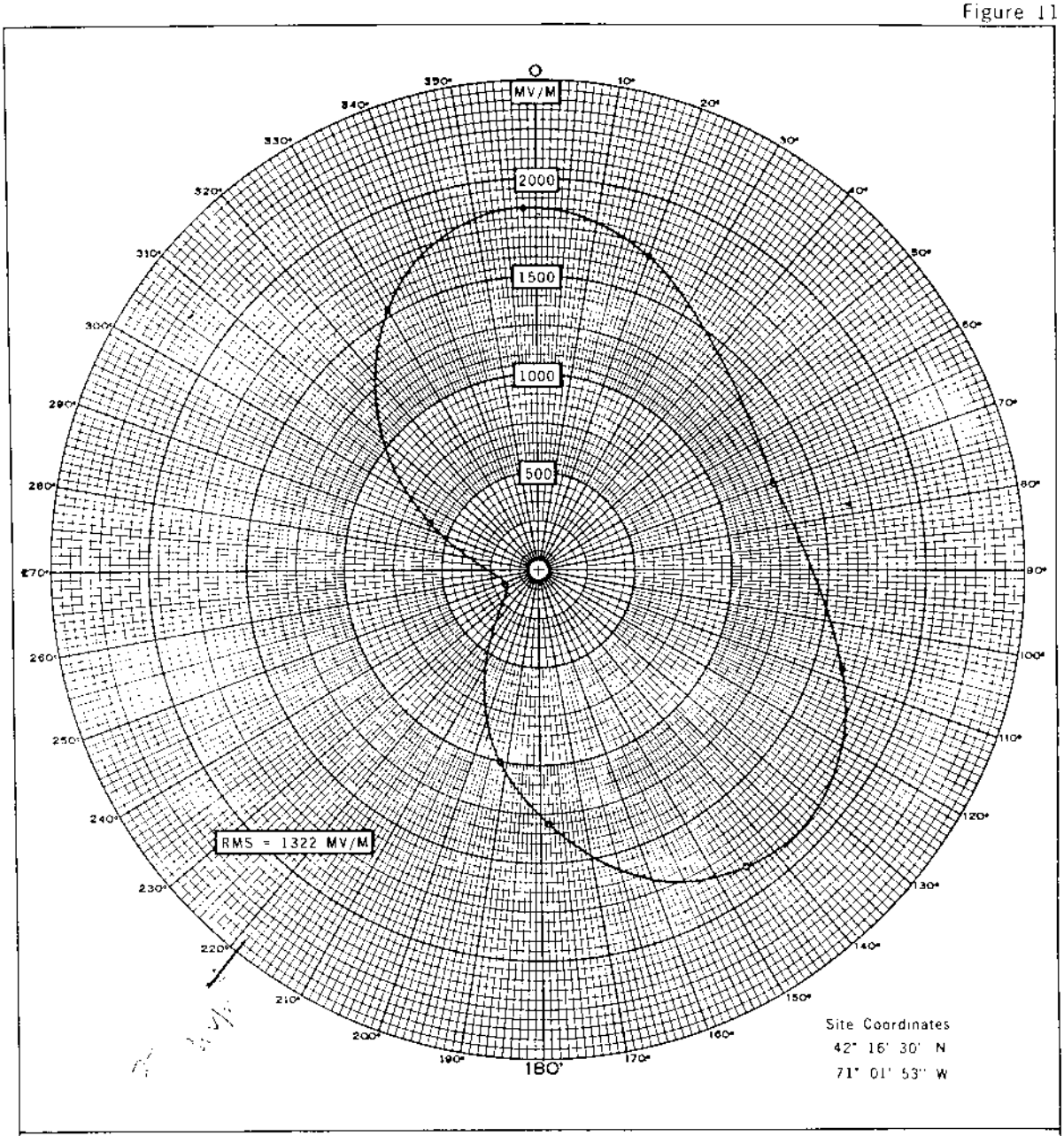
BL 12231
Gil. (2-13-70) Lic. Covering increase in DAYTIME POWER

Measured Day
(1-28-69ct)

Station WMEX
Boston, Massachusetts

~~WMEX~~ X
WITS
5kw, 50kw-LS, DA-2, U
1510 kc

Figure 11



MEASURED DAYTIME HORIZONTAL PLANE RADIATION PATTERN

G = 110.5' Not used daytime #1 138.7'(251') #3 1.0(2') 139' 1.27/-45° 250° T #2 (244.3') 178° T	RICHMOND BROTHERS, INC. BOSTON, MASSACHUSETTS Jules Cohen & Associates Consulting Electronics Engineers	STATION WMEX 1510 KHZ 5 KW 50 KW LS U DA 2 NOVEMBER 1968

FCC File No. BL-12231
Accepted 1-16-69

Station WMEX
Boston, Massachusetts

1510 kc

BL 12231
GRC (2-13-70) Lic increase in DAYTIME POWER

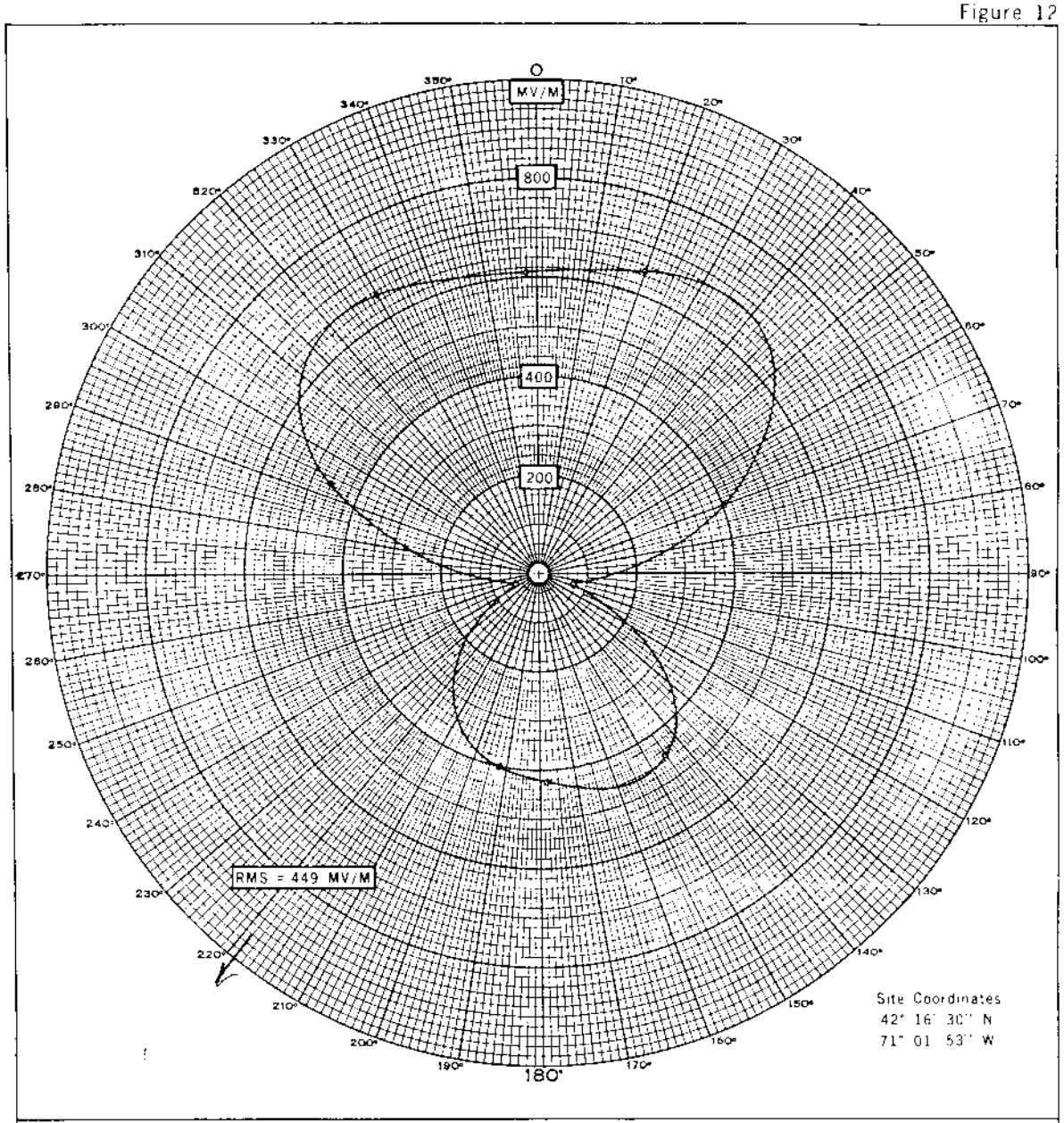
WITS ~~WMEX~~

Measured Night
(1-28-69ct)

Station WMEX
Boston, Massachusetts

5kw, 50kw-LS, DA-2, U
1510 kc

Figure 12



MEASURED NIGHTTIME HORIZONTAL PLANE RADIATION PATTERN

G = 110.5°

0.83/ 135° #4
138 /(251°) #3
1.0/0° #2 135° (244.3) Not used nighttime
250° T
178° T

RICHMOND BROTHERS, INC.

BOSTON, MASSACHUSETTS

Jules Cohen & Associates

Consulting Electronics Engineers

STATION WMEX

1510 KHZ

5 KW, 50 KW-LS U DA-2

NOVEMBER 1968

at V = 57°
fv = 1405
2 mV/m at TV

FCC File No. BL-12231
Accepted 1-16-69

Station WMEX
Boston, Massachusetts

1510 kc

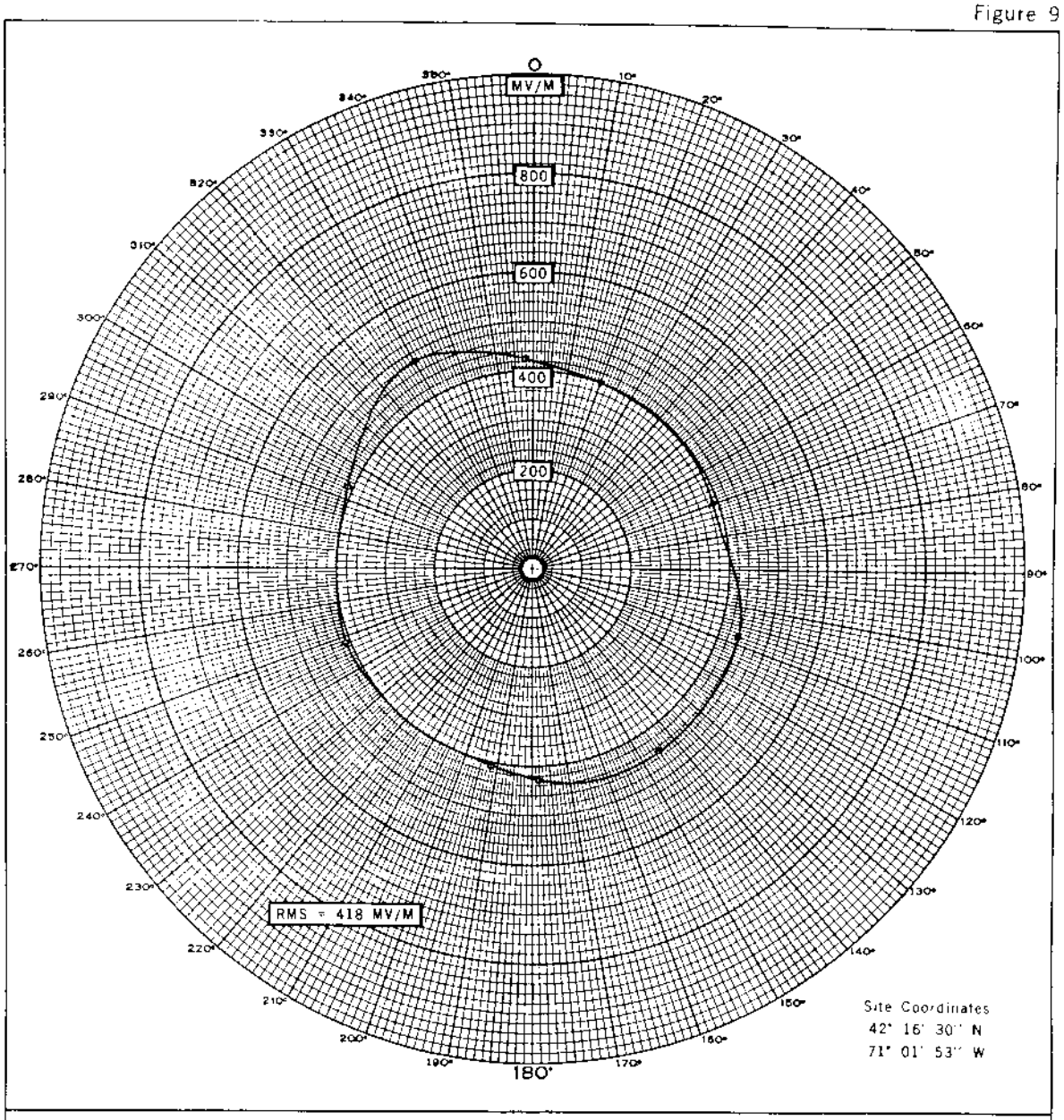
BL 12231
CIR (2-13-70) Lic increase DAYTIME POWER

Measured Non-DA
(1-28-69ct)

Station WMEX
Boston, Massachusetts

WMEX
5kw, 50kw-LS, DA-2, U
1510 kc

Figure 9



MEASURED NONDIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN

G = 110.5°

Not used
#1
138.7°(251°)
#3
Not used
#2
250° T
178° T

RICHMOND BROTHERS, INC.

BOSTON, MASSACHUSETTS

Jules Cohen & Associates

Consulting Electronics Engineers

STATION WMEX

1510 KHZ

5 KW. 50 KW-LS U DA-2

NOVEMBER 1968

FCC File No.BL-12231
Accepted 1-16-69

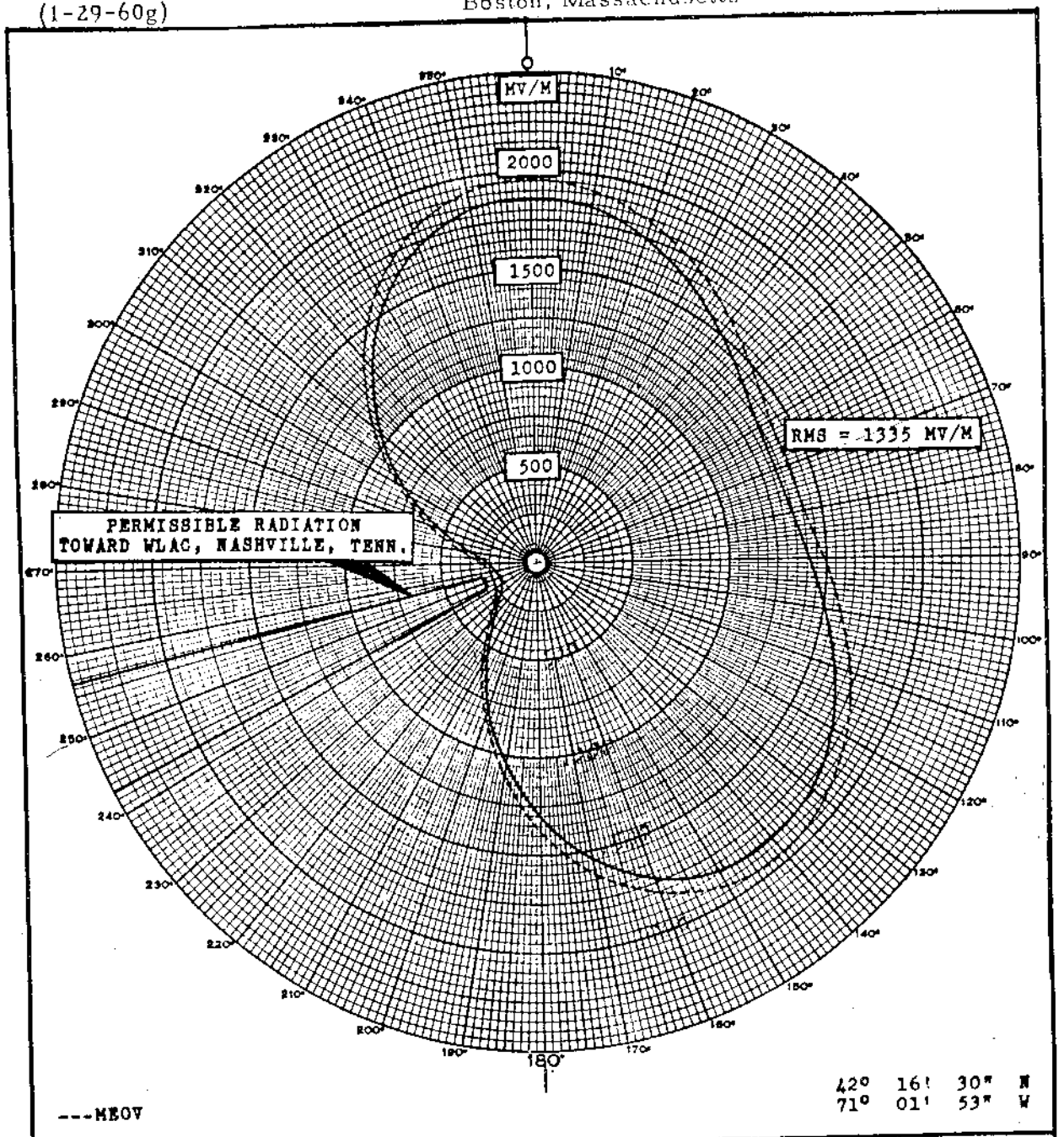
Station WMEX
Boston, Massachusetts

1510 kc

WMTS

PROPOSED DAY
(1-29-60g)

Station WMEX 5kw, 50kw-LS, DA-2,U
Boston, Massachusetts 1510 KC



PROPOSED DAYTIME HORIZONTAL PLANE RADIATION PATTERN

G=110°
(N) 1.0/0°
(W) s
0.79/45°
250°T
(S) Not used daytime
s = 135° = 244.3'

RICHMOND BROTHERS, INC.
BOSTON MASSACHUSETTS

Jules Cohen
Consulting Electronic Engineer

STATION WMEX
1510 KC
5 KW, 50 KW-LS U DA-2
DECEMBER, 1959

FCC File No. BP-13760 WMEX
Accepted 1-14-60 (formerly BP-8771) Boston, Massachusetts 1510 KC

53

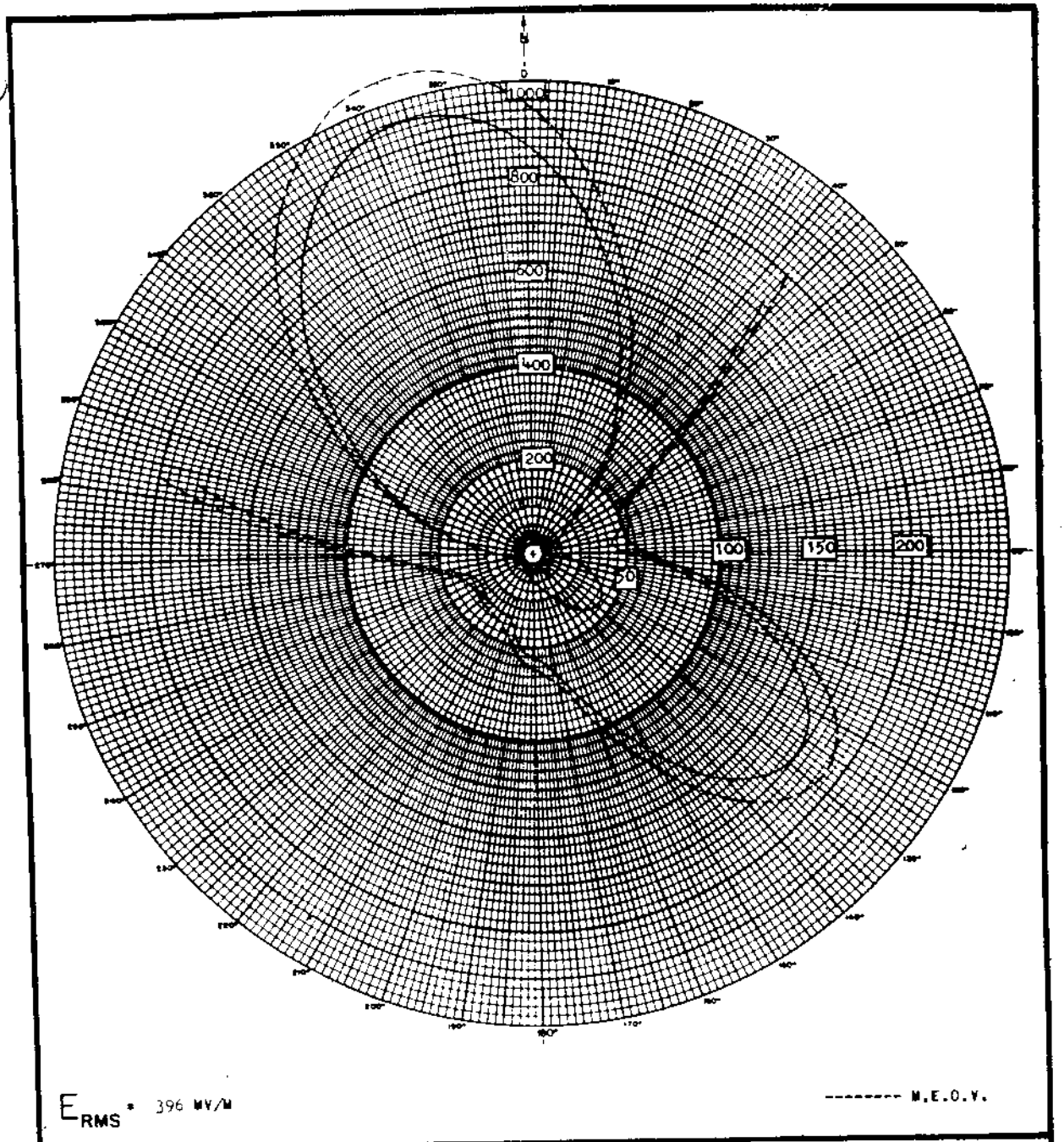
WJCO

Proposed Day
(8-24-62ct)

Station WRST
Jackson, Michigan

5kw,DA-D,D
1510 kc

8-17-62 granted MCP to change ant. location



LATITUDE: N 42° 11' 9.6"
LONGITUDE: W 84° 22' 39"

JOHN H. MULLANEY
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

ANTENNA PARAMETERS

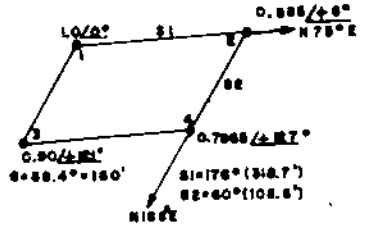


FIGURE 1

(AMENDED)
DAYTIME DIRECTIONAL HORIZONTAL
POLAR PATTERN

T.V.
CORPORATION OF MICHIGAN, INC.

JACKSON, MICHIGAN

1510 KC 5 KW, DA-D

FCC File No. BMP-10381
Accepted

Station WRST
Jackson, Michigan

1510 kc

WJIC
1510kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WJIC

Main Studio: Salem, New Jersey

Frequency: 1510 kHz

Power: 2.5kw Day

Notification List No. 1786

Date: May 16, 1980 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 39° 34' 58"
West Longitude: 75° 27' 39"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D_
Number of elements: 4
Type of elements: Uniform cross-section, guyed, shunt excited, vertical steel towers.

TOWER	N(#1)	NE(#2)	SE(#3)	S(#4)
HEIGHT ABOVE INSULATORS:	160' (88.39°)	145'	145'	145' (80.2°)
DAY PHASING:	0°	-80.29°	+175.46°	-82.99°
DAY FIELD RATIO:	1.0	0.642	0.542	0.775

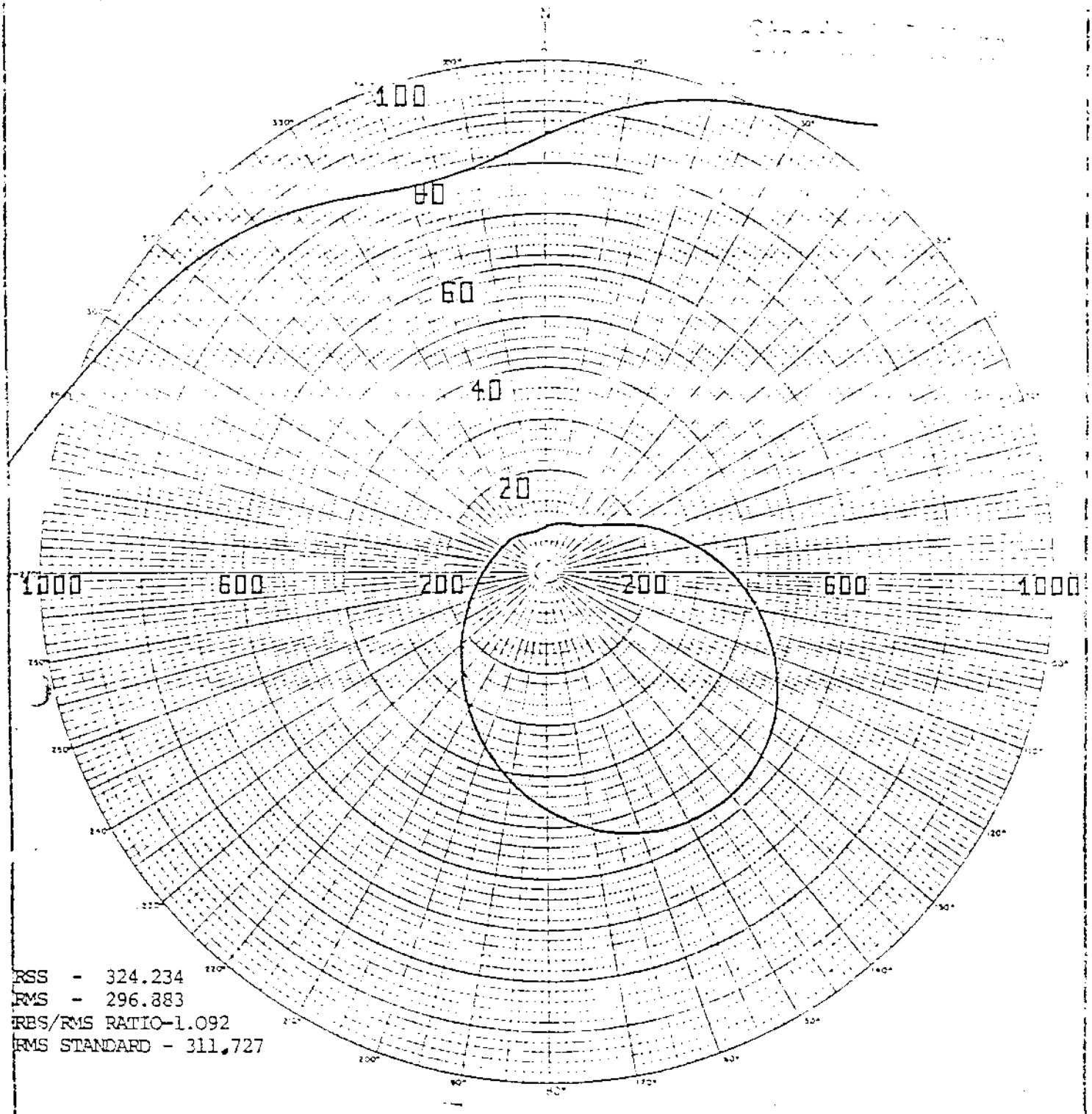
SPACING AND ORIENTATION: With the North (#1) tower as the reference, Tower #2(NE) spaced 86.71° (156.89') on a line bearing 91.52° true; Tower #3(SE) spaced 95.97° (173.65') on a line bearing 148.10° true; Tower #4(S) spaced 86.61° (156.71') on a line bearing 188.46° true.

GROUND SYSTEM: 240 - 32' to 232' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	296.88 mv/m	324.234 mv/m	311.73 mv/m

WJIC
1510 kHz



N.Lat. 39° 34' 58"
M.Long. 75° 27' 39"

G_1 = 88.39°
G_2, G_3 & G_4 = 80.20°

PETER V. GUSECKIS & ASSOC.
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

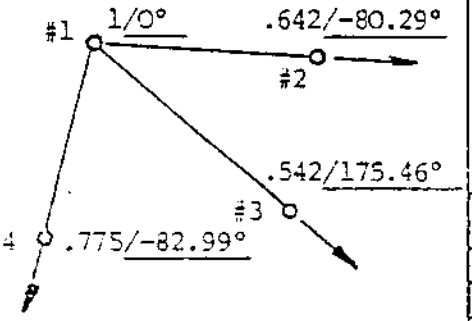


FIGURE 4
PLOT of DAYTIME DIRECTIONAL PATTERN
RADIO STATION WJIC
SALEM, NEW JERSEY
1510 KHz 2.5 KW-DA-D

TOWER	SPACING	BEARING
1 to 2	86.71°	91.52°
1 to 3	95.97°	148.10°
1 to 4	86.61°	188.46°

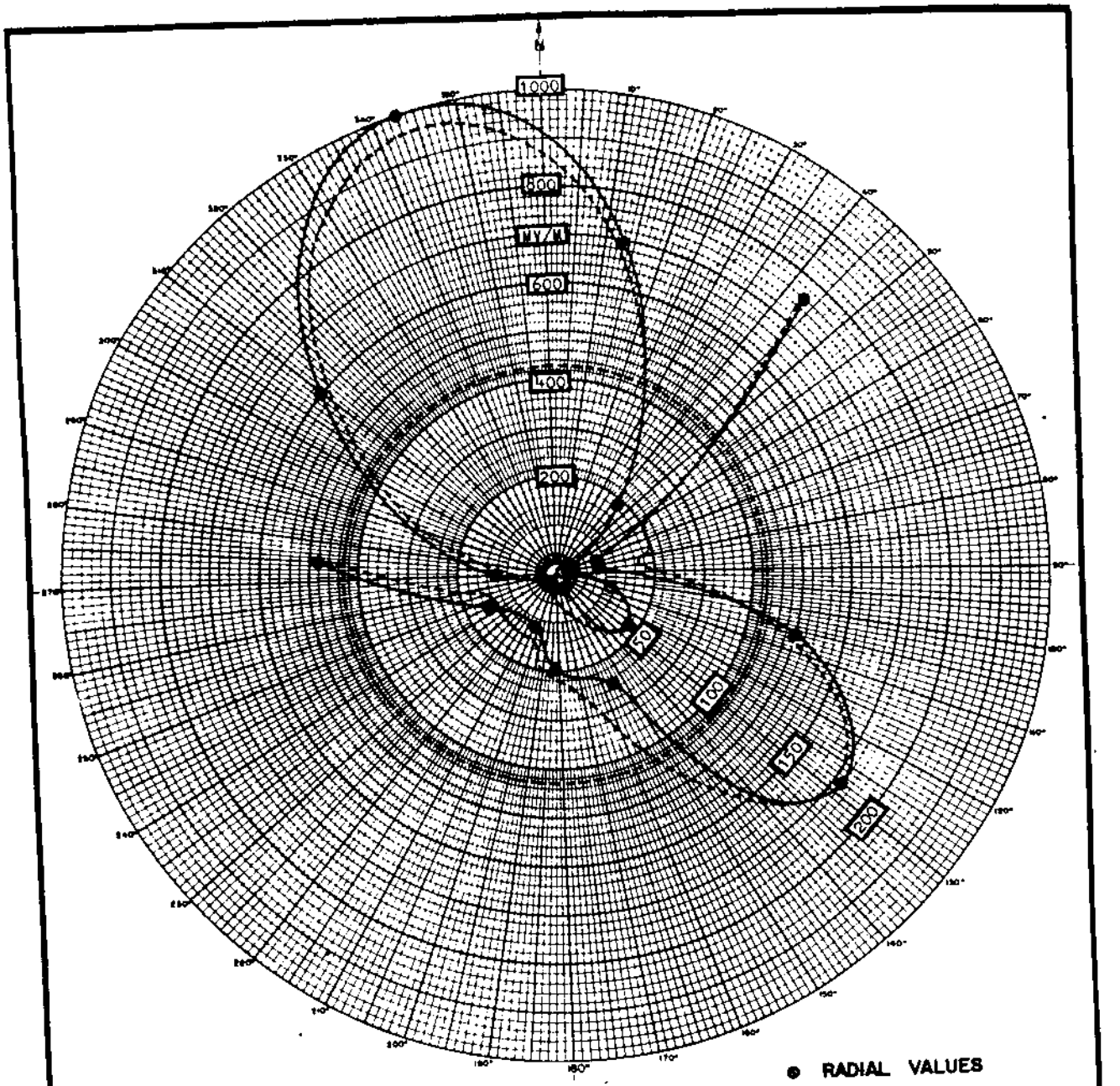
WJCO

Measured Day
(4-30-63ct)

Station WJCO
Jackson, Michigan

5kw,DA-D,D
1510 kc

:-14-63
rated
ceive for
new AM
station.



E_{RMS} = 428 MV/M (MEASURED)

LATITUDE: N 42° 11' 9.6"
LONGITUDE: W 84° 22' 39"

JOHN H. MULLANEY
AND
ASSOCIATES
WASHINGTON, D. C.

ANTENNA PARAMETERS

	1	2	3	4
THEOR.	1|0	0.89|6	0.9|121	0.8|127
MEAS.	1|0	0.99|6	1.09|121	1.00|127

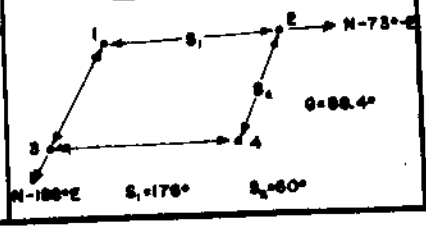


FIGURE 16

MEASURED
DAYTIME DIRECTIONAL
HORIZONTAL PLANE PATTERN

STATION
WJCO

JACKSON, MICHIGAN

1510 KC

5KW, DA-D

FCC File No.BL-9925
Accepted 4-22-63

Station WJCO
Jackson, Michigan

1510 kc

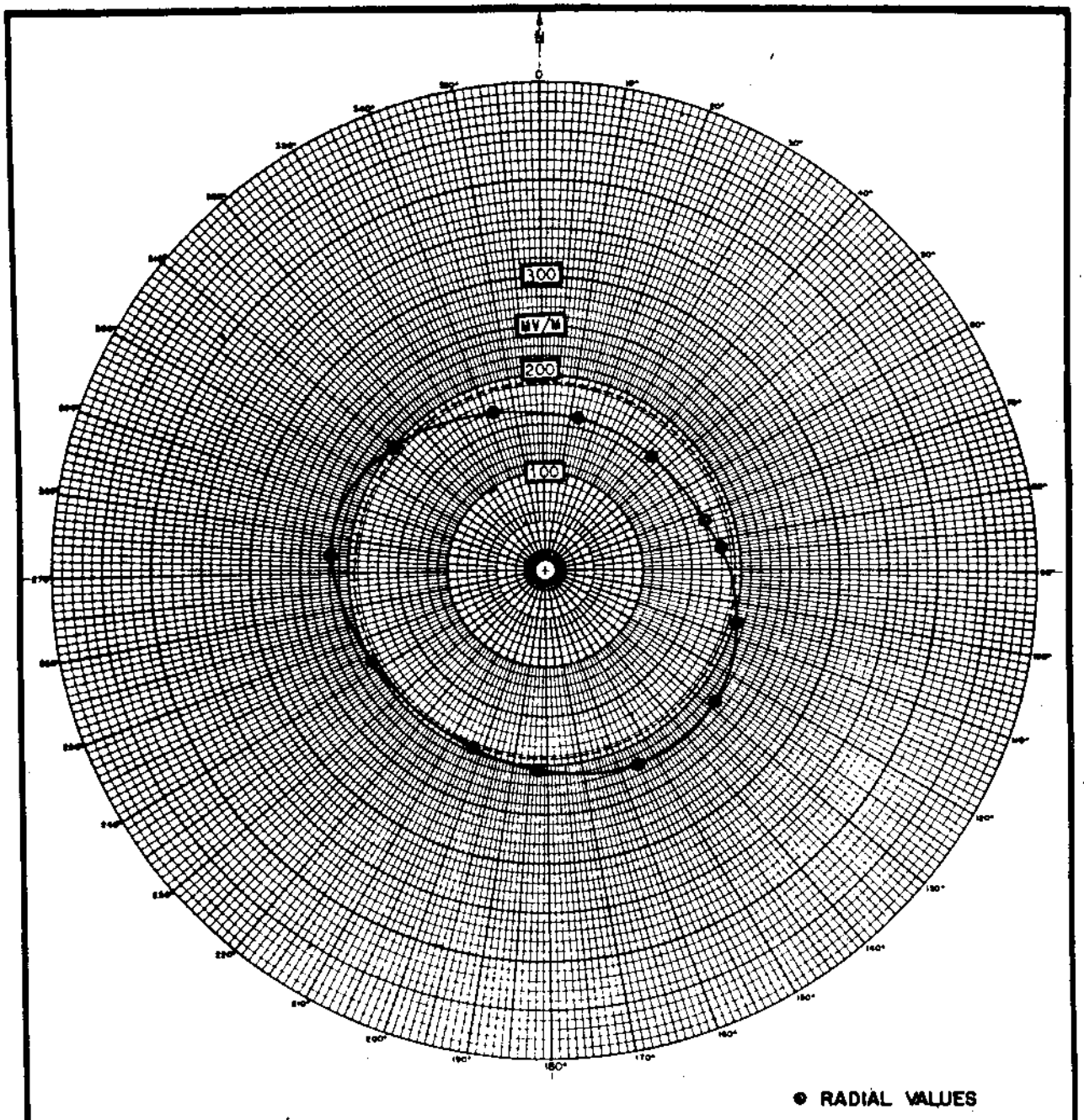
WJCO

Measured Non-DA
(4-30-63ct)

Station WJCO
Jackson, Michigan

5kw,DA-D,D
1510 kc

8-14-63
granted license for new AM station.



E_{RMS} = 195 MV/M (MEASURED)

LATITUDE: N 42° 11' 9.6" LONGITUDE: W 84° 22' 39"	ANTENNA PARAMETERS	**FIGURE 15** MEASURED NON-DIRECTIONAL HORIZONTAL PLANE PATTERN
JOHN H. MULLANEY AND ASSOCIATES WASHINGTON, D. C.	*1 TOWER G=88.4° 1 KW	**STATION WJCO** JACKSON, MICHIGAN 1510 KC 5 KW, DA-D

FCC File No.BL-9925
Accepted 4-22-63

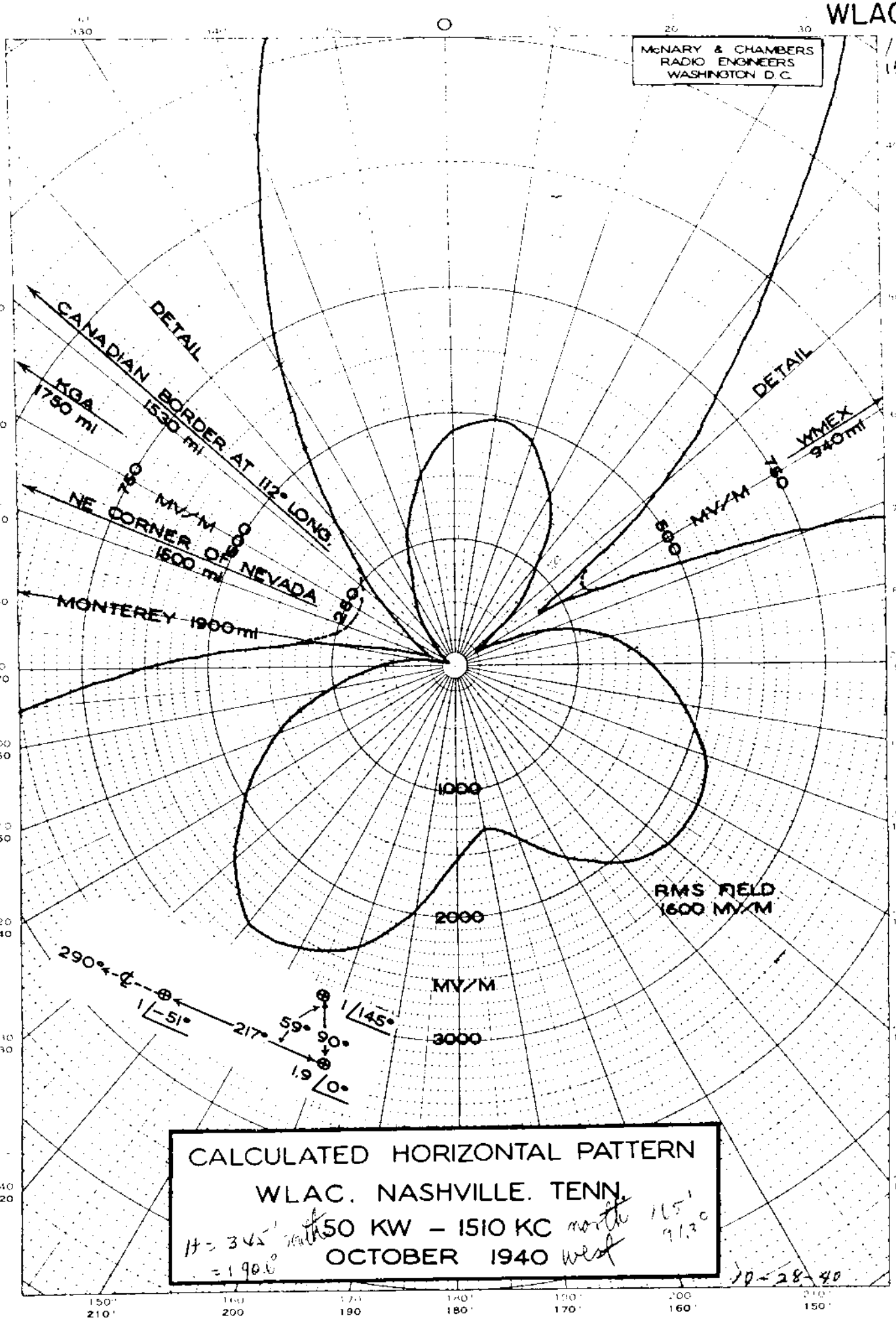
Station WJCO
Jackson, Michigan

1510 kc

WLAC

1510

McNARY & CHAMBERS
RADIO ENGINEERS
WASHINGTON D.C.

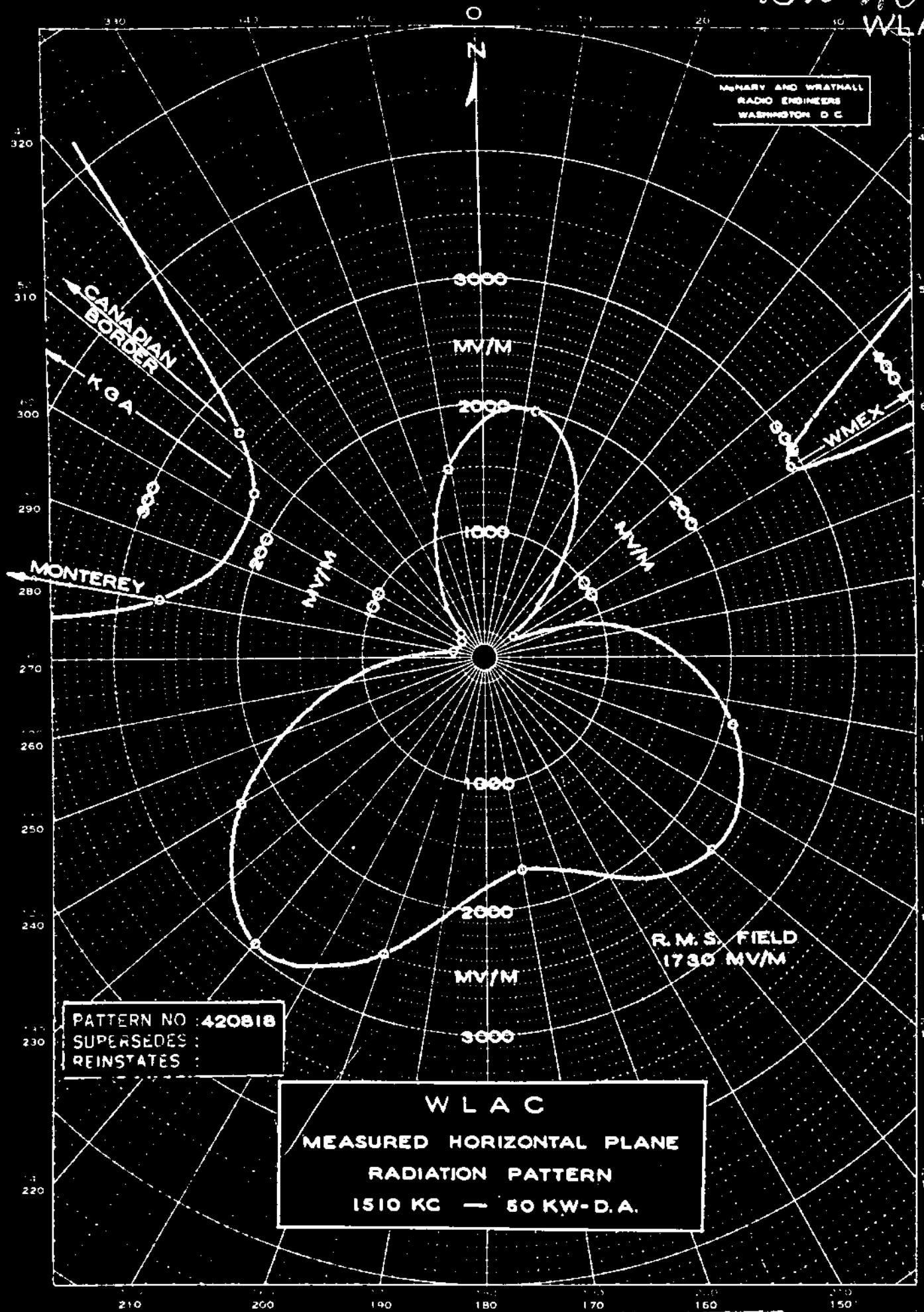


CALCULATED HORIZONTAL PATTERN
WLAC. NASHVILLE. TENN.
50 KW – 1510 KC
OCTOBER 1940

H = 345' north = 190°
north 165' 91.3° west

10-28-40

0510 KC
WLAC

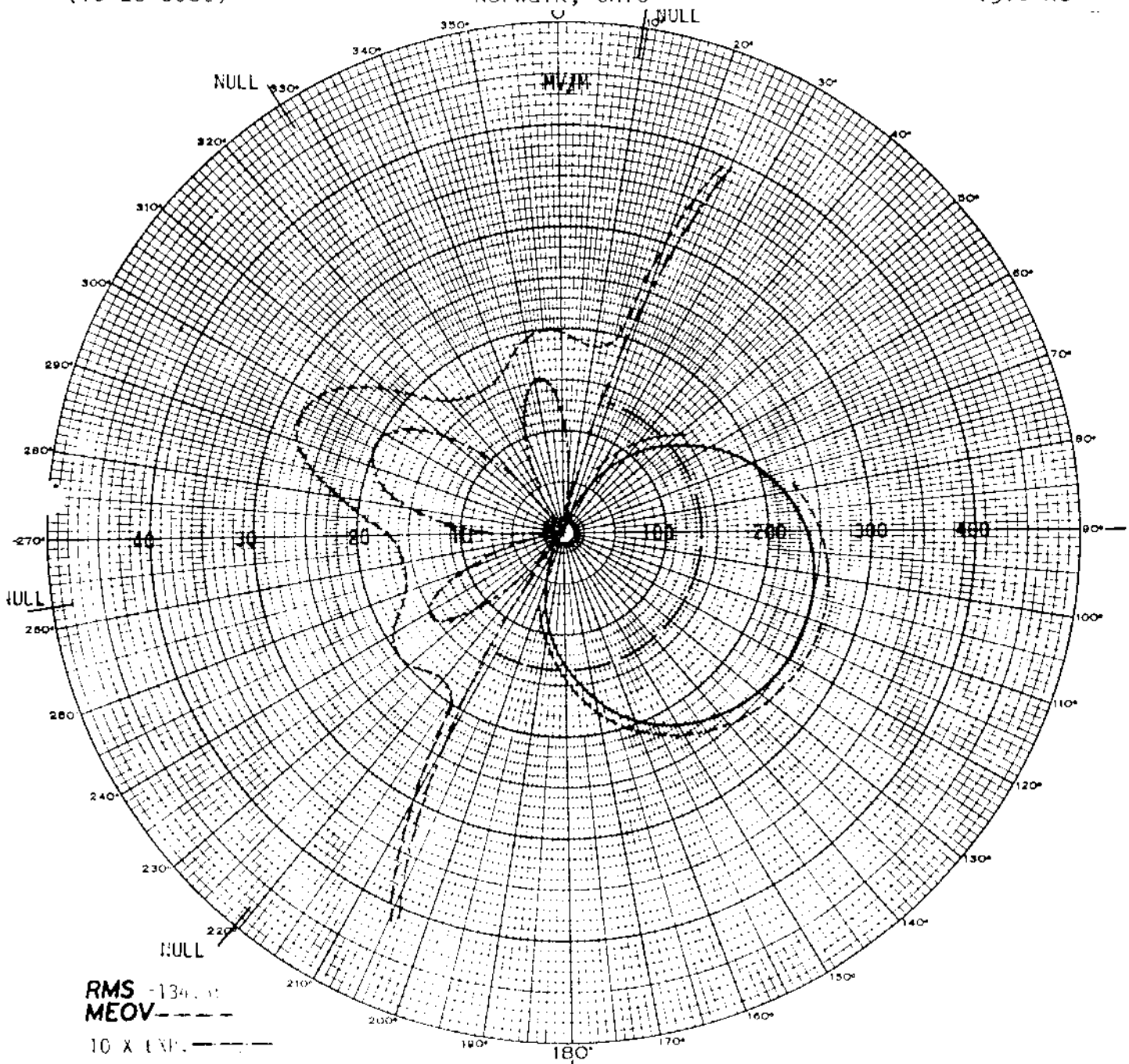

McNARY AND WRATHALL
RADIO ENGINEERS
WASHINGTON D.C.
N
CANADIAN BORDER
KGA
MONTEREY
WMEX
3000
MV/M
2000
1000
200
R.M.S. FIELD
1730 MV/M
PATTERN NO : 420818
SUPERSEDES :
REINSTATES :
WLAC
MEASURED HORIZONTAL PLANE
RADIATION PATTERN
1510 KC — 50 KW-D.A.

WLKR

Proposed Day
(10-28-66ct)

New; Ohio Radio, Inc.
Norwalk, Ohio

500w,DA-D,D
1510 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 3	STATION DATA
G's = 90° S 50° 1/+130° #1 S N 1.8/0° #2 S1/-130° #3 115°	TOWER No. / ELECTRICAL HEIGHT G° / SPACING S° / PHASING ψ° / FIELD RATIO F 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐	PROPOSED DAYTIME DIRECTIONAL PATTERN θ° = 0	CALL NEW FREQ 1510 Khz POWER 0.5 Kw TYPE DA-D TIME Day LAT. N-41-16-45.3 LONG W-82-39-22.8 E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BP-16659
Accepted 9-30-66 Amended

New; Ohio Radio, Inc.
Norwalk, Ohio

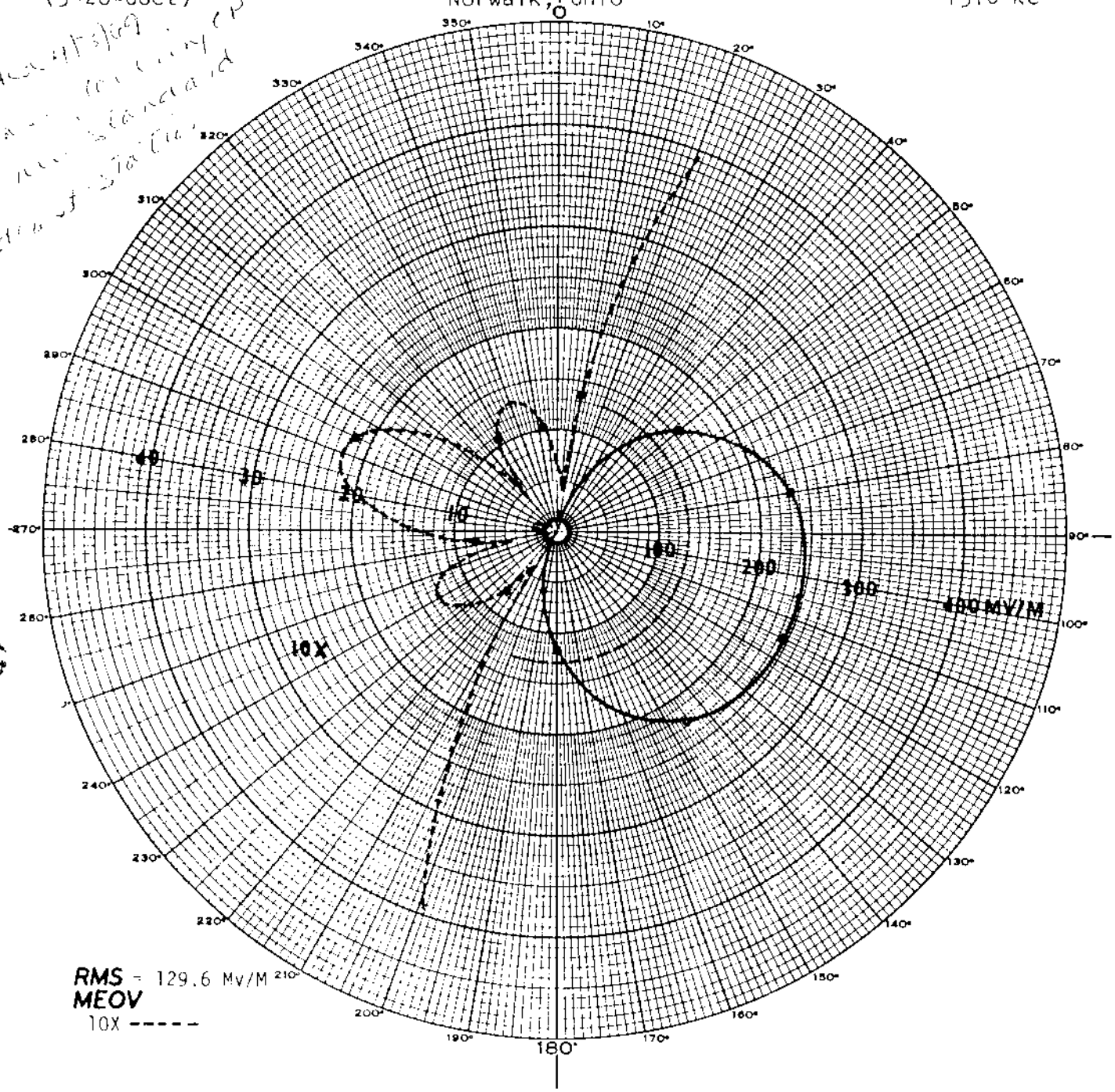
1510 kc

WLKR

Measured Day
(3-28-68ct)

Station WLKR
Norwalk, Ohio

500w, DA-D, D
1510 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 6	STATION DATA
G's = 90° S = 90°	TOWER No	ELECTRICAL HEIGHT θ°	SPACING S°	PHASING ψ°	FIELD RATIO F	WLKR MEASURED DAYTIME DIRECTIONAL PATTERN	CALL WLKR
#1 S #2 S #3	1	90°	90°	+119°	0.590		FREQ 1510 KHz.
	2	90°	90°	0°	1.000		POWER 0.5 Kw
	3	90°	90°	-120°	0.486		TYPE DA-D
	4						TIME DAYTIME
	5						LAT. 41-16-45.3
	6						LONG. 82-39-22.8
	7					DECEMBER - 1967	E.H.MUNN, JR.
	8						RADIO ENGINEER
	9						COLDWATER, MICH.
110' 1.	10					θ° - 0°	

DAYTIME OPERATION KX NIGHTTIME OPERATION ☐

FCC File No. BL-11915
Accepted 3-26-68

Station WLKR
Norwalk, Ohio

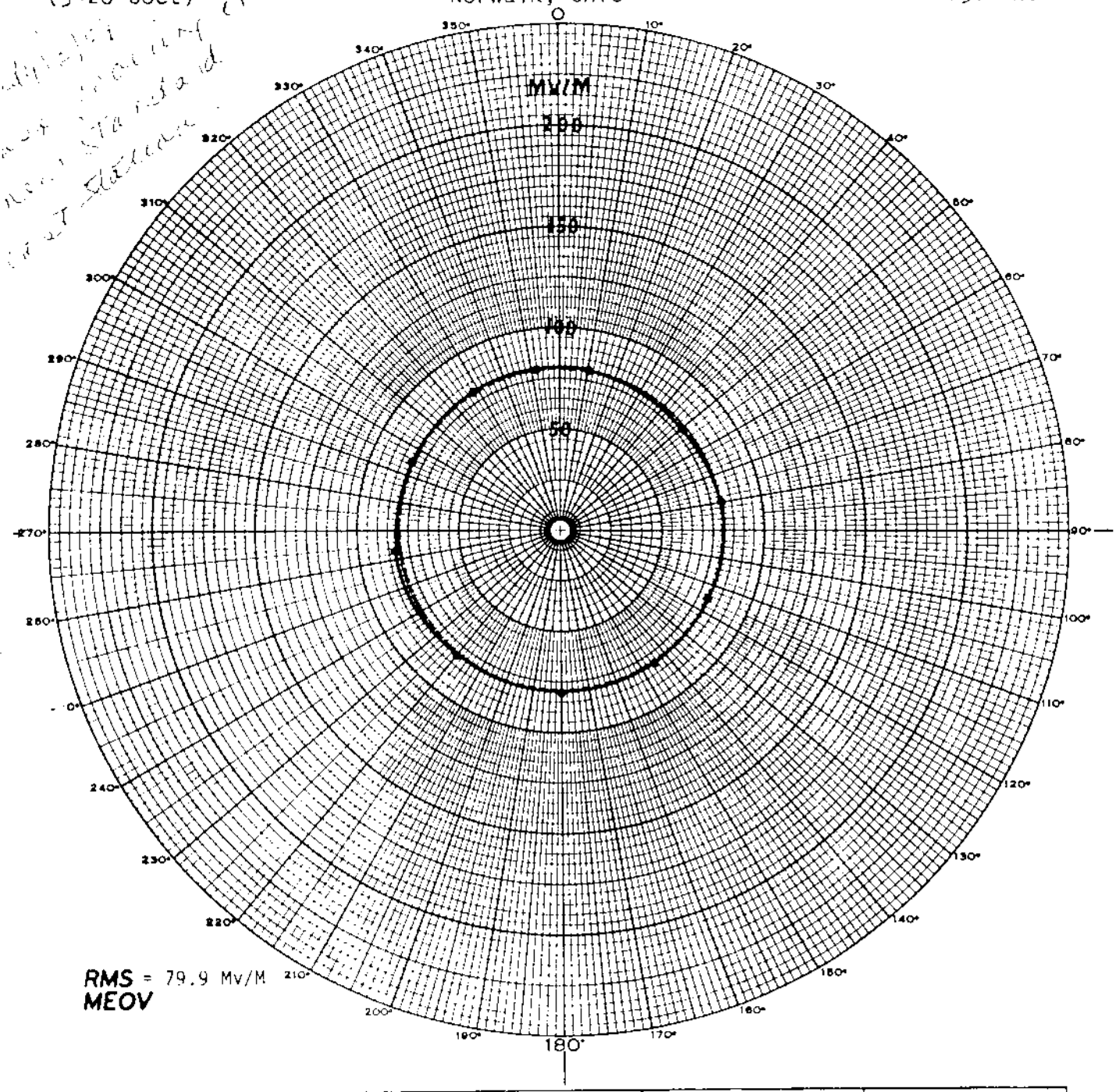
1510 kc

WLKR

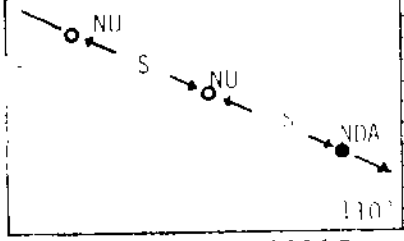
Measured Non-DA
(3-28-68ct)

Station WLKR
Norwalk, Ohio

500w,DA-D,D
1510 kc



RMS = 79.9 Mv/M
MEOV

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 5	STATION DATA
G's = 90° S = 90° 	TOWER No. / ELECTRICAL HEIGHT θ° / SPACING S° / PHASING ψ° / FIELD RATIO F DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐	WLKR MEASURED NON-DIRECTIONAL PATTERN USING SOUTHEAST TOWER DECEMBER - 1967 θ° = 0°	CALL WLKR FREQ 1510 KHz. POWER 0.187 Kw TYPE NDA TIME *** LAT. 41-16-45.3 LONG. 82-39-22.8 E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BL-11915
Accepted 3-26-68

Statio WLKR
Norwalk, Ohio

1510 kc

WMBA

Proposed Day
(1-28-66ct)

Station WMBA
Ambridge-Aliquippa, Pennsylvania

10kw,DA-D,D
1510 kc

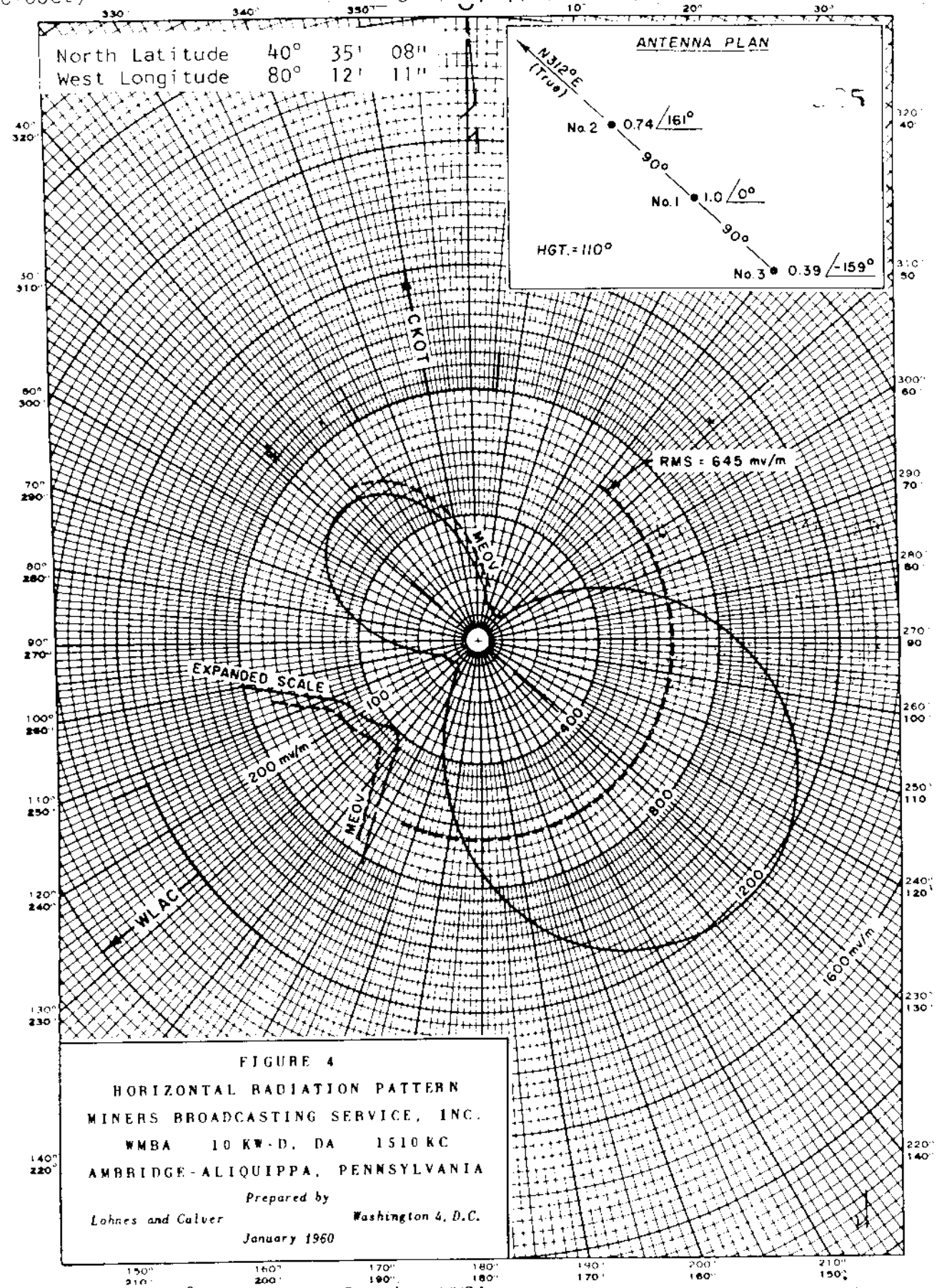


FIGURE 4
HORIZONTAL RADIATION PATTERN
MINERS BROADCASTING SERVICE, INC.
WMBA 10 KW-D, DA 1510 KC
AMBRIDGE-ALIQUIPPA, PENNSYLVANIA
Prepared by
Lohnes and Culver *Washington 4, D.C.*
January 1960

FCC File No.BP-13855
Record reopened 12-27-65

Station WMBA
Ambridge-Aliquippa, Pennsylvania

1510 kc

WNLC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WNLC

Main Studio: New London, Connecticut

Frequency: 1510 kHz

Power: 5 kW Night 10 kW Day

Notification List No. 1664

Date: December 24, 1975 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 41° 22' 38"

West Longitude: 72° 10' 02"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 8
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	NW(#1)	(#2)	(#3)	(#4)	(#5)	SE(#6)	W(#7)	S(#8)
HEIGHT ABOVE INSULATORS:	All towers 220' (121.8°)							
NIGHT PHASING:	+151°	+18.29°	-113.83°	+113.83°	-18.29°	-151°	-	-
NIGHT FIELD RATIO:	1.0	3.279	5.294	5.062	2.857	0.7996	-	-
DAY PHASING:	-	-	0°	-	-	-	+33°	+150
DAY FIELD RATIO:	-	-	1	-	-	-	1.2	0.0[illegible]

SPACING AND ORIENTATION: Nighttime, adjacent elements #1 through #6 are spaced 217' (120°) on a line bearing 309° true.

Daytime, tower #7 is spaced 275' (152°) on a line bearing 230° true from tower #3 and tower #8 is spaced 272.3' (150.51°) on a line bearing 193.77° true from tower #3.

GROUND SYSTEM: 120-163' equally spaced copper radials plus 120-50' interspaced radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

Predicted effective Night Field: 454 mv/m at rated power.

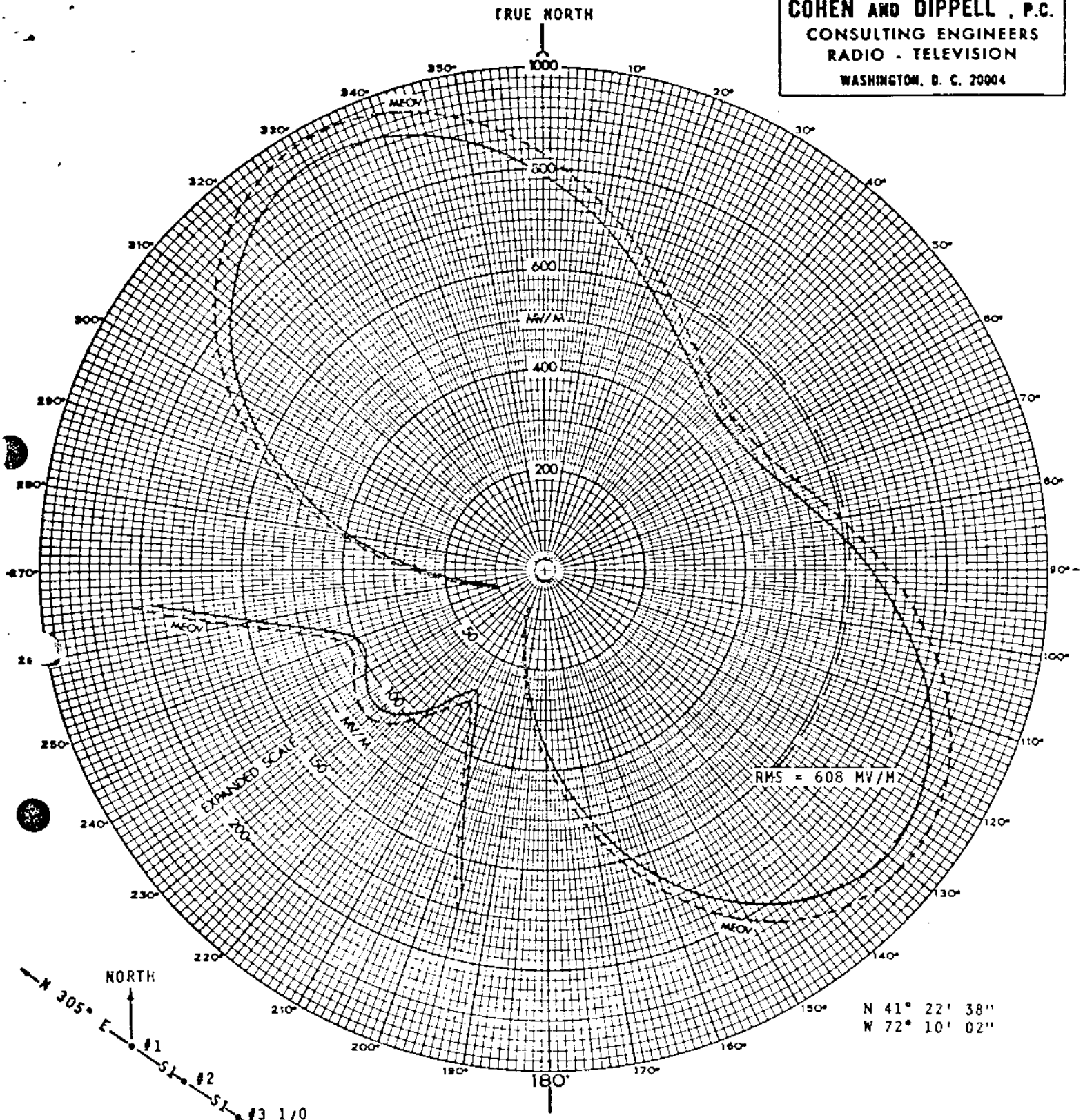
Predicted effective Day Field: 608 mv/m at rated power.

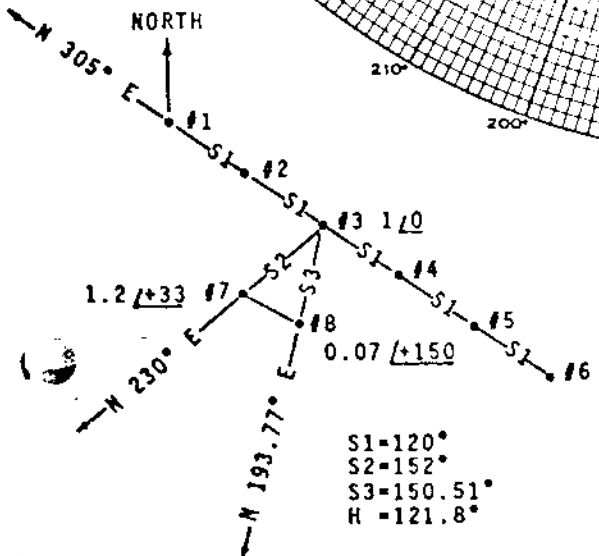
Note: Please retain the Nighttime directional antenna radiation pattern notified for station WNLC in United States Change List Number 887 dated November 22, 1968 and attach to this Revised Description Sheet and Daytime pattern. This notification concerns only a change in the Daytime operation of the station since Nighttime operation continued as previously notified.

CTR NO 31203A3

WNLC

COHEN AND DIPPELL, P.C.
CONSULTING ENGINEERS
RADIO - TELEVISION
WASHINGTON, D. C. 20004





HORIZONTAL PLANE RADIATION PATTERN
FOR THE DAYTIME OPERATION OF
WNLC, NEW LONDON, CONNECTICUT
1510 KHz - 5/10 KW - DA-2
JUNE 1975

TOWERS #1,2,4,5, and 6 will be detuned for daytime operation

WNLC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WNLC

Main Studio: New London, Connecticut

Frequency: 1510 kHz

Power: 5 kW Night 10 kW Day

Notification List No. 1593

Date: August 14, 1974 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 41° 22' 38"
West Longitude: 72° 10' 02"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 8
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	NW(#1)	(#2)	(#3)	(#4)	(#5)	SE(#6)	W(#7)	S(#8)
HEIGHT ABOVE INSULATORS:	All towers 220' (121.8°)							
NIGHT PHASING:	+151°	+18.29°	-113.83°	+113.83°	-18.29°	-151°	-	-
NIGHT FIELD RATIO:	1.0	3.279	5.294	5.062	2.867	0.7996	-	-
DAY PHASING:	-	-30°	0°	+150°	+180°	-	+35°	+183°
DAY FIELD RATIO:	-	0.125	1	0.6	0.105	-	0.905	0.65

SPACING AND ORIENTATION: Nighttime: Adjacent elements #1 through #6 are spaced 217'(120°) on a line bearing 305° true.

Daytime: Adjacent elements #2 through #5 are spaced 217'(120°) on a line bearing 305° true. Tower #7 is spaced 280'(155°) from tower #3 on a line bearing 240° true. Tower #8 is spaced 280'(155°) from tower #4 on a line bearing 240° true.

GROUND SYSTEM: 120-163' equally spaced copper radials plus a 120-50' interspaced radials about each tower. Raidals are shortened and bonded to tranvers. straps along intersections between towers.

Predicted effective Night Field: 454 mv/m at rated power.

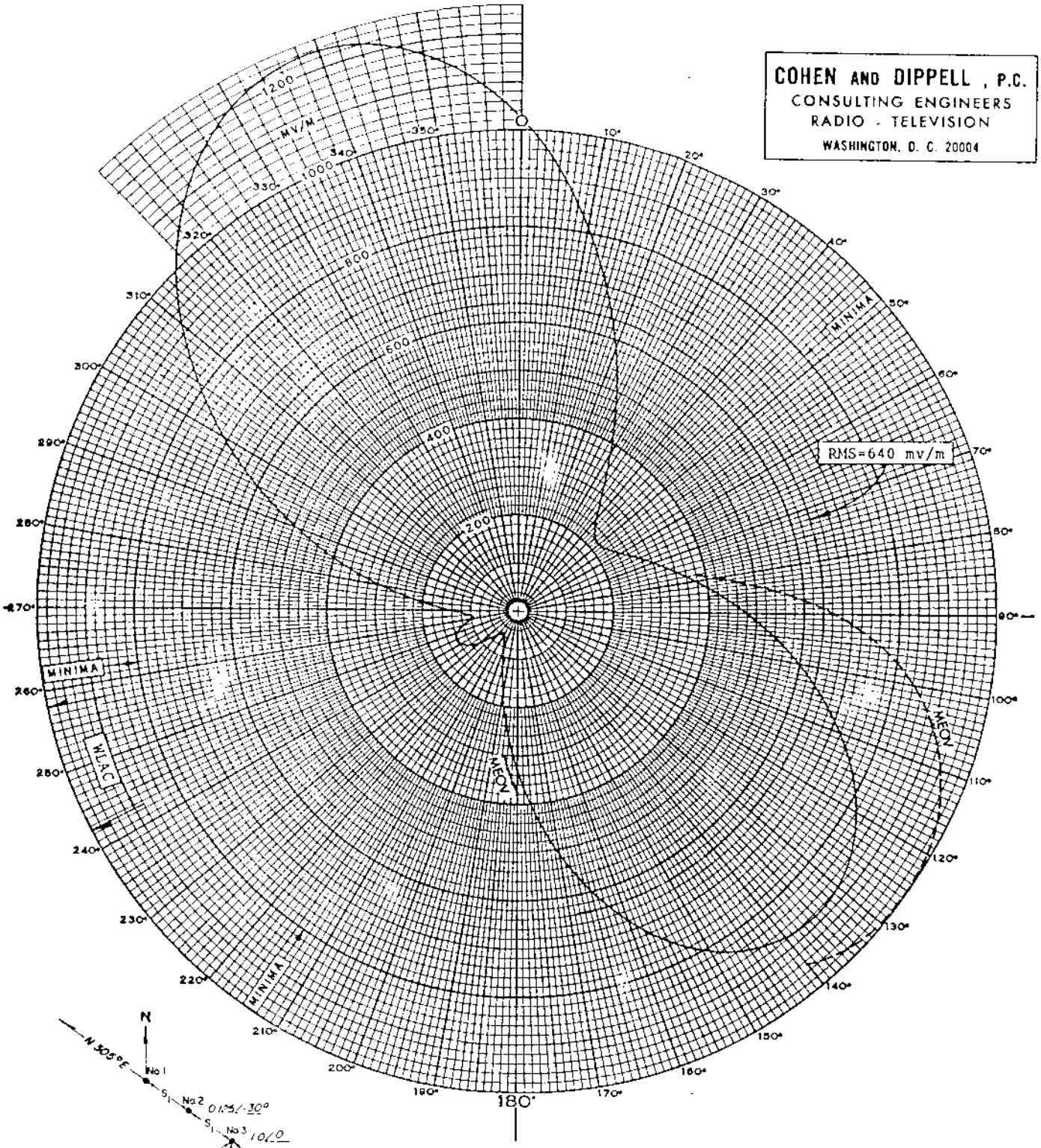
Predicted effective Day Field: 640 mv/m at rated power.

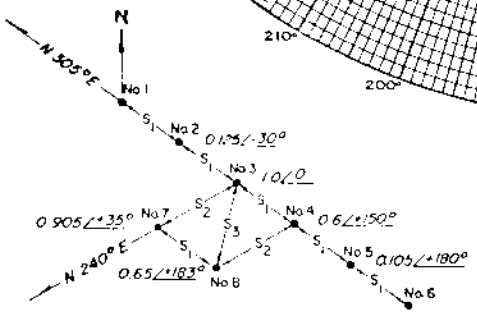
Note: Please retain the Nighttime directional antenna radiation pattern notified for station WNLC in United States Change List Number 887 dated November 22, 1960, and attach to this Revised Description Sheet and Daytime pattern. This notification concerns only a change in the Daytime operation of the station with Nighttime operation continued as previously notified.

CTR NO 31203A3

WNLC

COHEN AND DIPPELL, P.C.
CONSULTING ENGINEERS
RADIO - TELEVISION
WASHINGTON, D. C. 20004





$S_1 = 120°$
$S_2 = 155°$
$S_3 = 150.51°$
$H = 121.8°$

Towers No 1 & No 6 are detuned for Day use

Site Coordinates:
North Latitude 41° 22' 38"
West Longitude 72° 10' 02"

COMPUTED HORIZONTAL
PLANE RADIATION PATTERN
FOR THE PROPOSED DAYTIME OPERATION OF
WNLC, NEW LONDON, CONNECTICUT
1510 KHz - 5/10 KW - DA-2 U
MARCH 1974

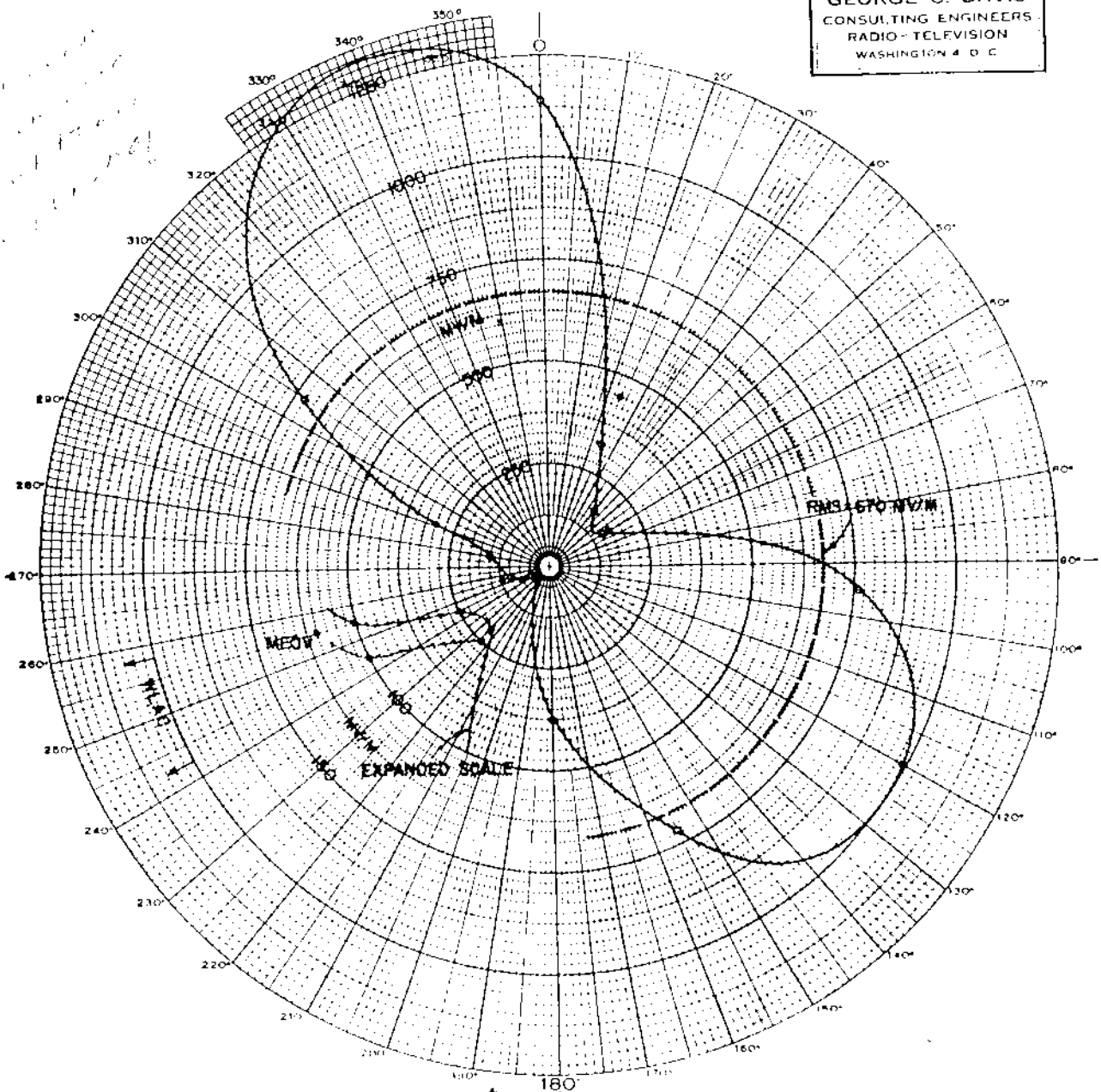
WNLC

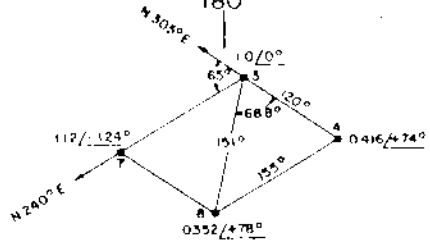
Measured Day
(12-30-63ct)-

Station WNLC
New London, Connecticut

5kw,10kw-LS,DA-2,U
1510 kc

GEORGE C. DAVIS
CONSULTING ENGINEERS
RADIO - TELEVISION
WASHINGTON 4 D C





● CP VALUES
O MEASURED VALUES

LATITUDE 41° 22' 38"
LONGITUDE 72° 10' 02"

S-120° : 217'
S-151° : 273'
S-155° : 280'
H: 121.8° : 220'

ACTUAL BASE PARAMETERS

MEASURED HORIZONTAL
PLANE RADIATION PATTERN
FOR PROPOSED DAYTIME OPERATION
OF WNLC, NEW LONDON, CONNECTICUT
1510 KC - 5/10 KW - DA-2
JULY 1963

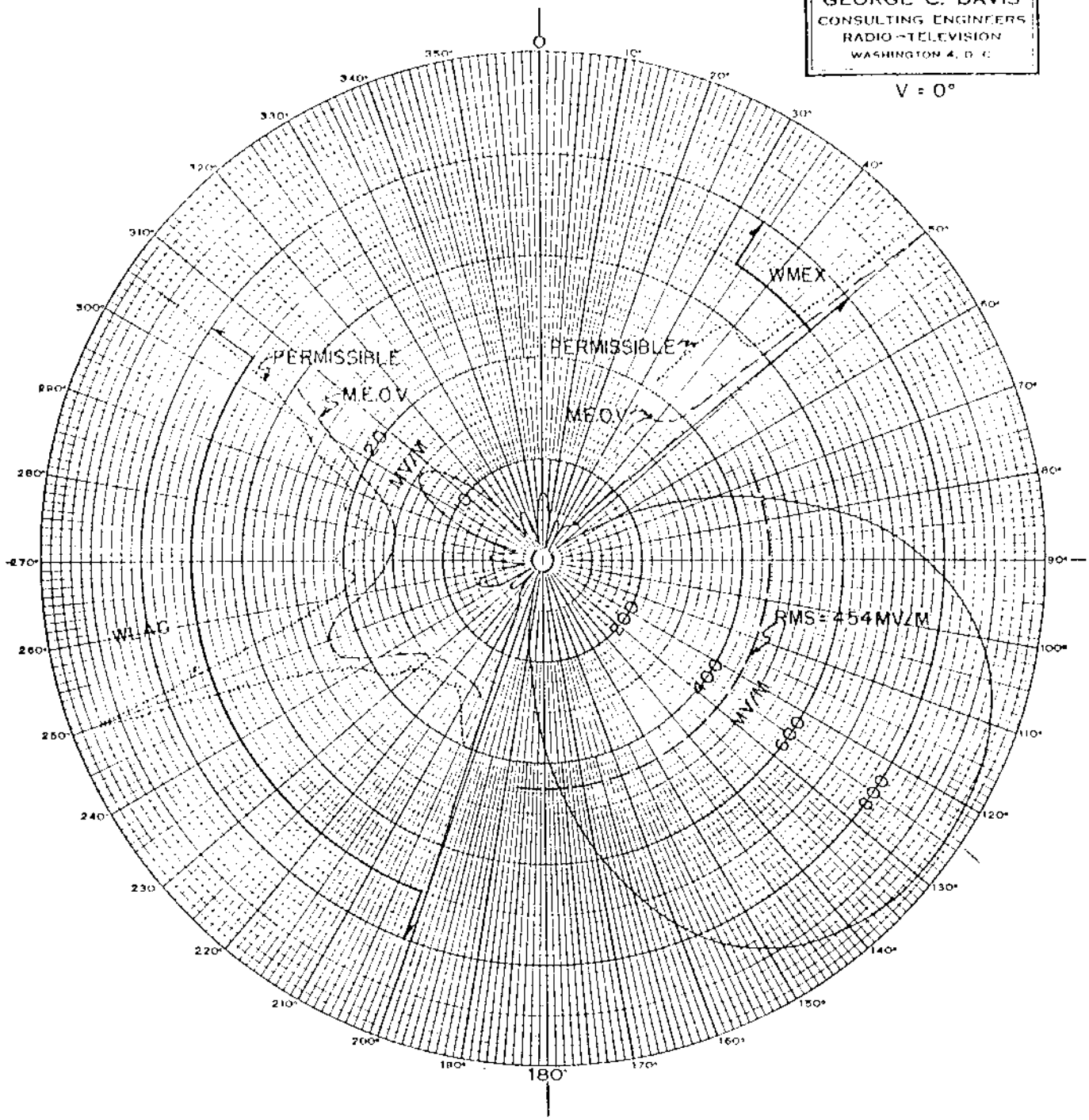
FCC File No.BL-9116
Accepted 12-12-63 Amended

Station WNLC
New London, Connecticut

1510 kc

GEORGE C. DAVIS
CONSULTING ENGINEERS
RADIO-TELEVISION
WASHINGTON 4, D. C.

V = 0°



H = 220' = 121.8°

NIGHTTIME PATTERN

1/+151°	3.279/+18.29°	5.294/-113.83°	5.062/+113.83°	2.867/-18.29°	0.7996/-151°
N305°E ←●1	●2	●3	●4	●5	●6

S = 217' = 120°

COMPUTED
HORIZONTAL PLANE RADIATION PATTERN
FOR PROPOSED OPERATION OF
WNLC, NEW LONDON, CONN.
1510 KC, 5 KW, DA-2
JUNE 1960

NORTH LAT. 41° 22' 38"
WEST LONG 72° 10' 02"

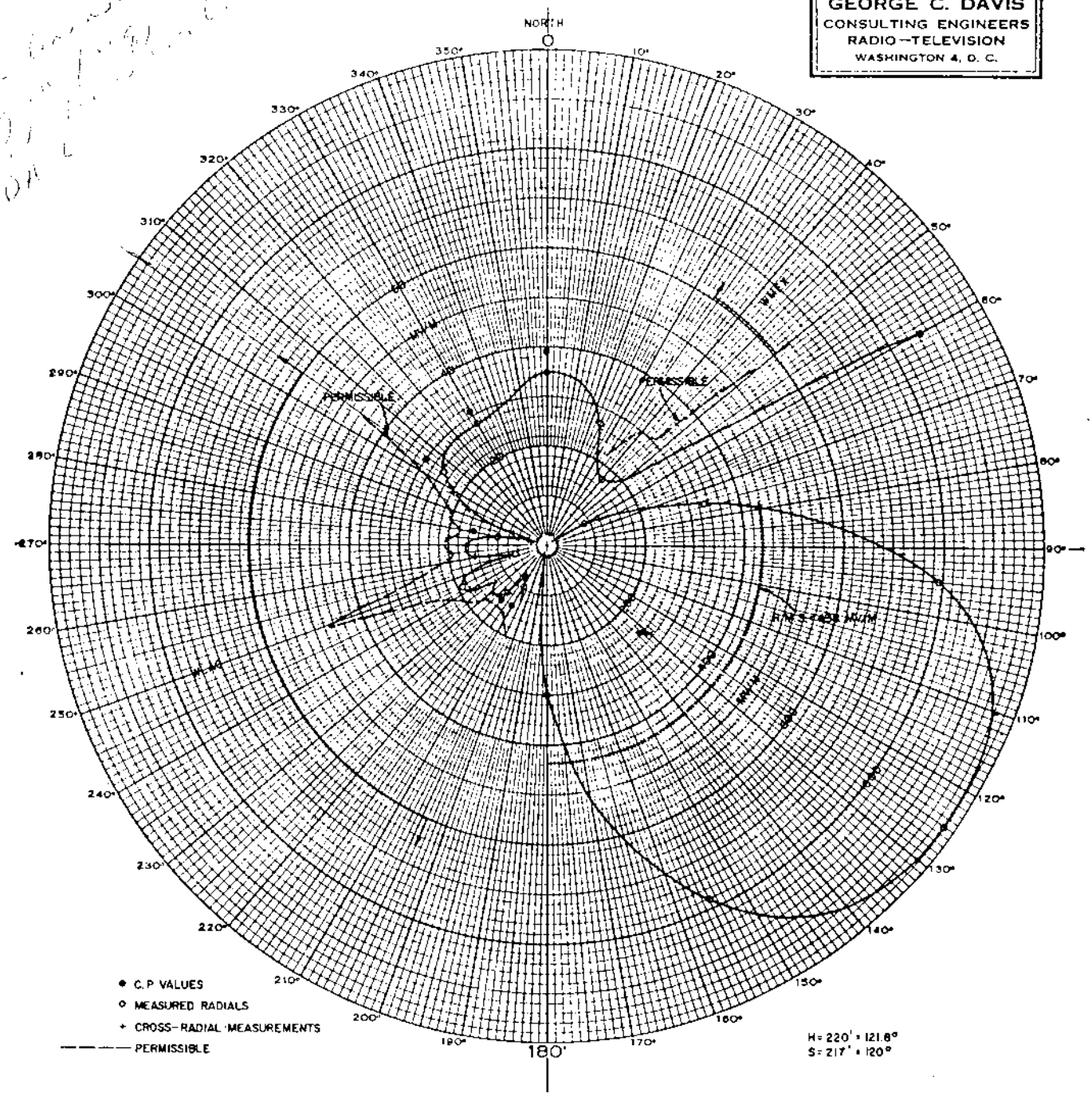
WNLC

Measured Night
(4-27-62ct)

Station WNLC
New London, Connecticut

5kw,DA-2,U
1510 kc

GEORGE C. DAVIS
CONSULTING ENGINEERS
RADIO—TELEVISION
WASHINGTON 4, D. C.



NIGHTTIME THEORETICAL PARAMETERS

1/+151°	3.279/+18.29°	5.294/-113.83°	5.062/+113.83°	2.867/-18.29°	0.7996/-151°
N 305° E ●1	●2	●3	●4	●5	●6
0.1595/-31.5°	0.524/+150°	1.00/0°	1.00/-149°	0.715/+67.5°	0.162/+59.5°

ACTUAL BASE CURRENT PARAMETERS

NORTH LAT. 41° 22' 38"
WEST LONG. 72° 10' 02"

MEASURED
HORIZONTAL PLANE RADIATION PATTERN
WNLC, NEW LONDON, CONNECTICUT
1500 KC 5 KW DA-2
JANUARY 1962

FCC File No.BL-9116
Accepted 4-13-62

Station WNLC
New London, Connecticut

1510 kc

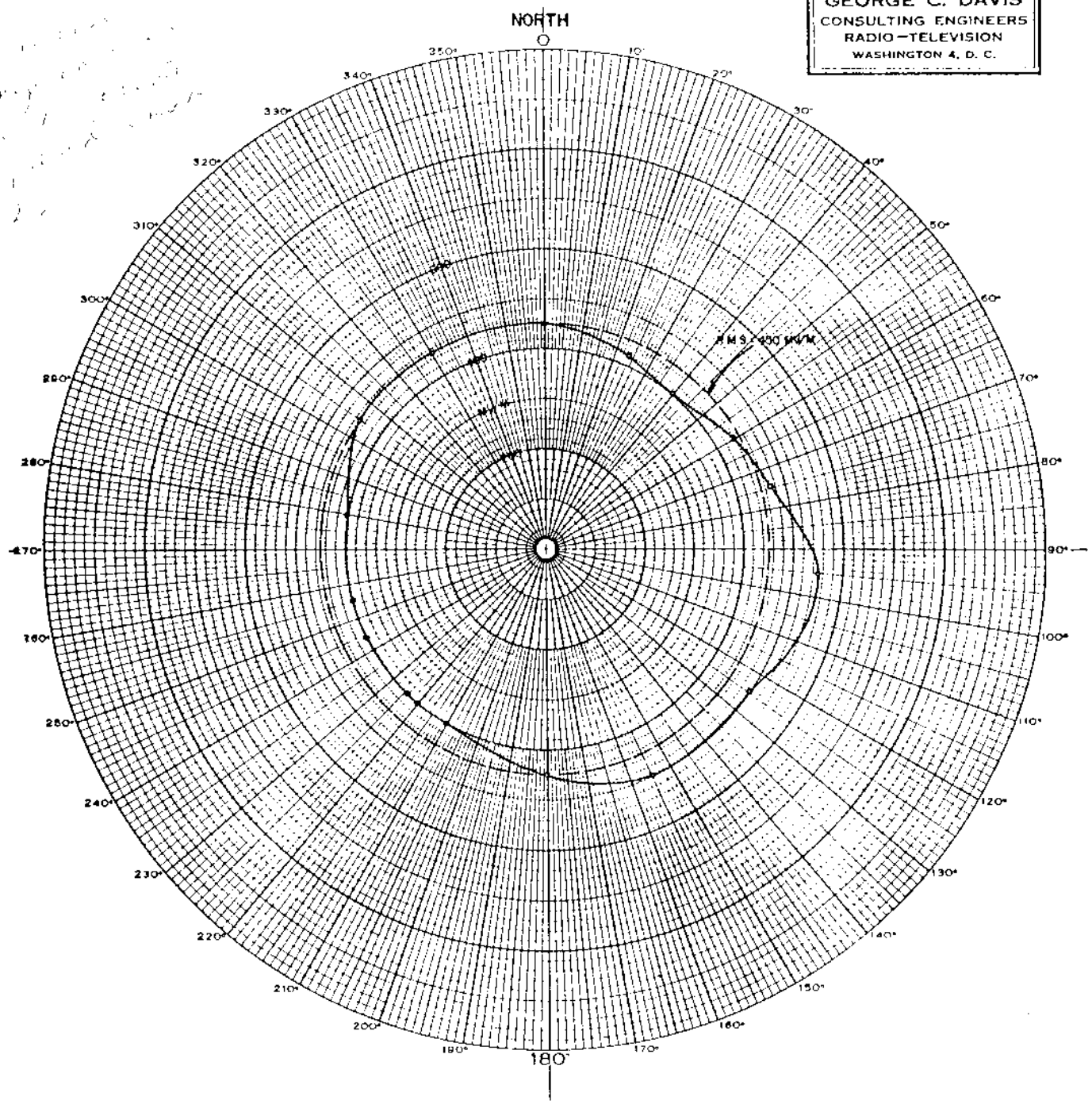
WNLC

Measured Non-DA
(4-27-62ct)

Station WNLC
New London, Connecticut

5kw,DA-2,U
1510 kc

GEORGE C. DAVIS
CONSULTING ENGINEERS
RADIO—TELEVISION
WASHINGTON 4, D. C.



NON-DIRECTIONAL UNATTENUATED
FIELD INTENSITY AT ONE MILE FOR
WNLC - 5 KW - 1510 KC
NEW LONDON, CONNECTICUT
JANUARY 1962

FCC File No.BL-9116
Accepted 4-13-62

Station WNLC
New London, Connecticut

1510 kc

FCC File Number BP-18997
August 10, 1971 K & E

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WPUT

Main Studio: Brewster, New York

Frequency: 1510 kHz

Power: 1kw

Notification List No. 1421

Date: April 21, 1971

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 41° 24' 34"
West Longitude: 73° 37' 29"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 2
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	N(#2)	S(#1)
HEIGHT ABOVE INSULATORS:	140'	140' (77.4°)
PHASING:	0°	+171°
FIELD RATIO:	1	0.51

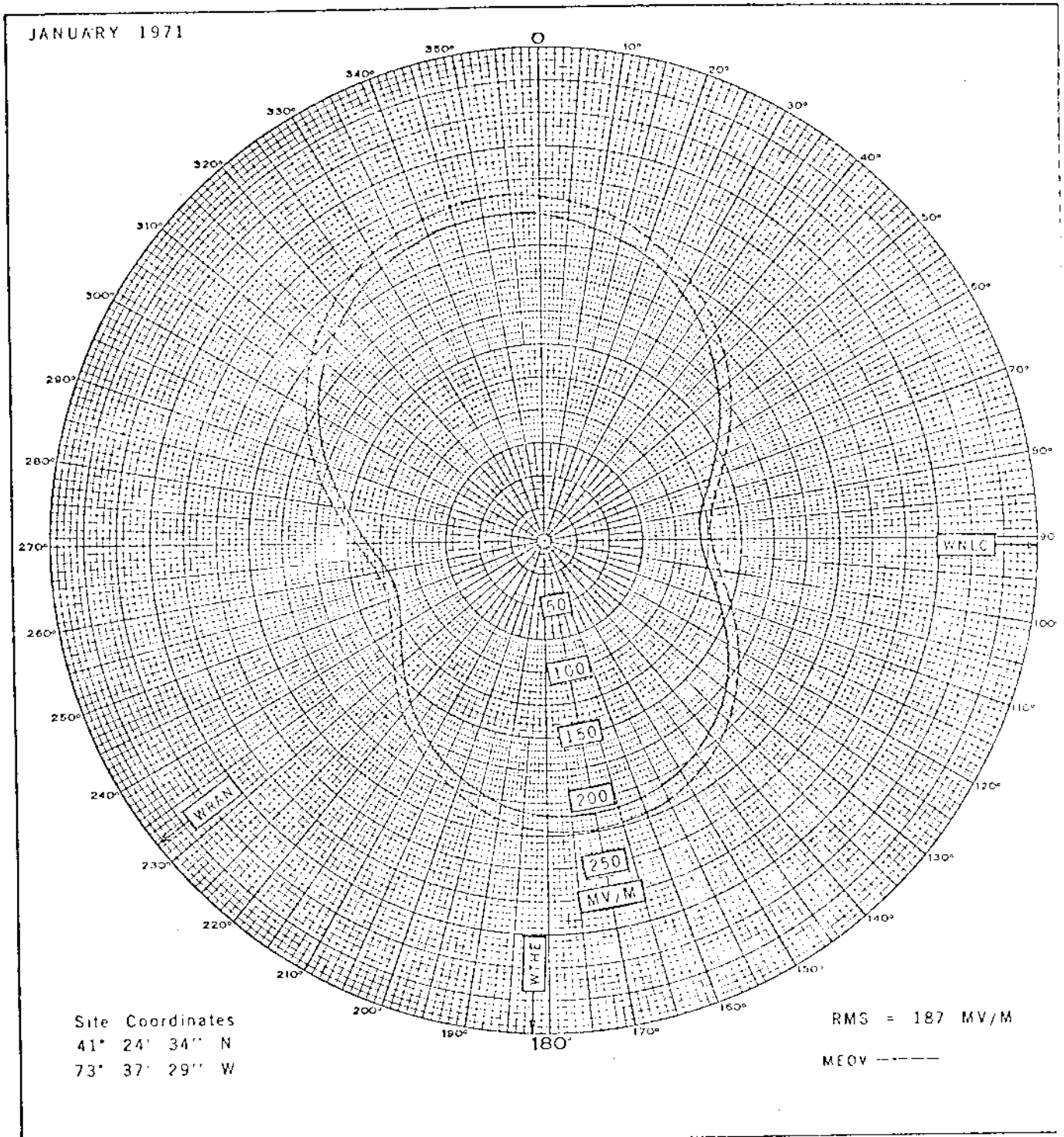
SPACING AND ORIENTATION: Elements are spaced 126.7'(70°) on a line bearing 170° true.

GROUND SYSTEM: 120 - 163' equally spaced copper radials plus a 24'square ground screen about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

Predicted effective Field: 187 mv/m at rated power.

FCC File Number BP-18997
August 10, 1971 K & E

Figure 1



PROPOSED DAYTIME HORIZONTAL PLANE RADIATION PATTERN

#2 ○ 1/0

70° (126.7')

#1 ○ 0.51/171°

170° True

G = 77.4° (140')

BREWSTER BROADCASTING CORPORATION

BREWSTER, NEW YORK

Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION WPUT

1510 KHZ

1 KW D. DA

Pattern 701230

8-1-63 granted been for on am station

WPUT ~~WBRW~~

Measured Day
(5-28-63ct)

Station WBRW
Brewster, New York

1kw,DA-D,D
1510 kc

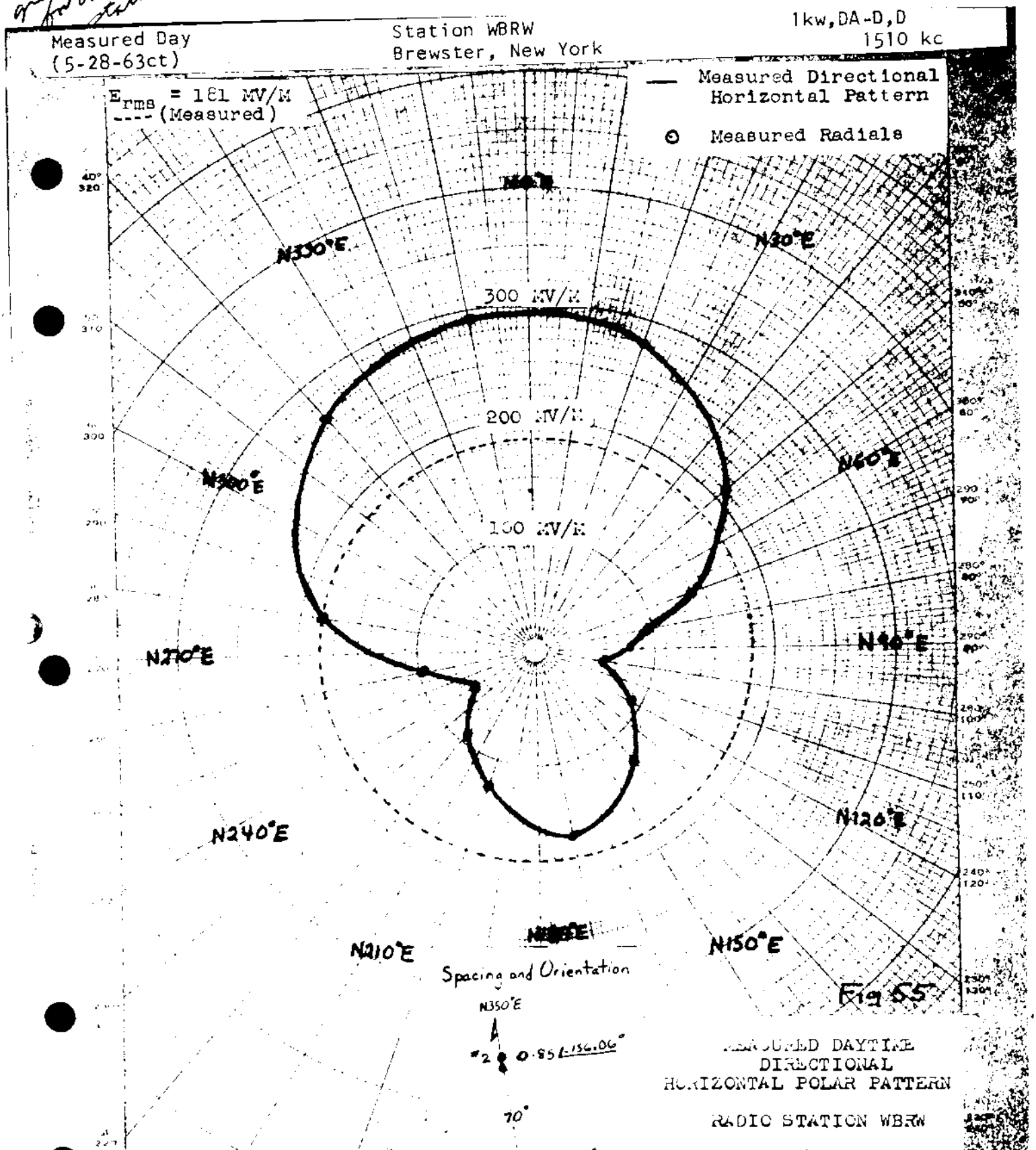


Fig 55

MEASURED DAYTIME
DIRECTIONAL
HORIZONTAL POLAR PATTERN

RADIO STATION WBRW

1510 Kc/s 1 KW-DA-D

BREWSTER, NEW YORK

Latitude: 41° 24' 34"

Longitude: 73° 37' 29"

FCC File No.BL-9989
Accepted 5-21-63

Station WBRW
Brewster, New York

1510 kc

Brewster, N.Y.

~~WBRW~~
WPUT

PROPOSED DAY
(5-27-60g)

New; Taconic Bcstrs.
Brewster, New York

1kw, DA-D,D
1510 KC

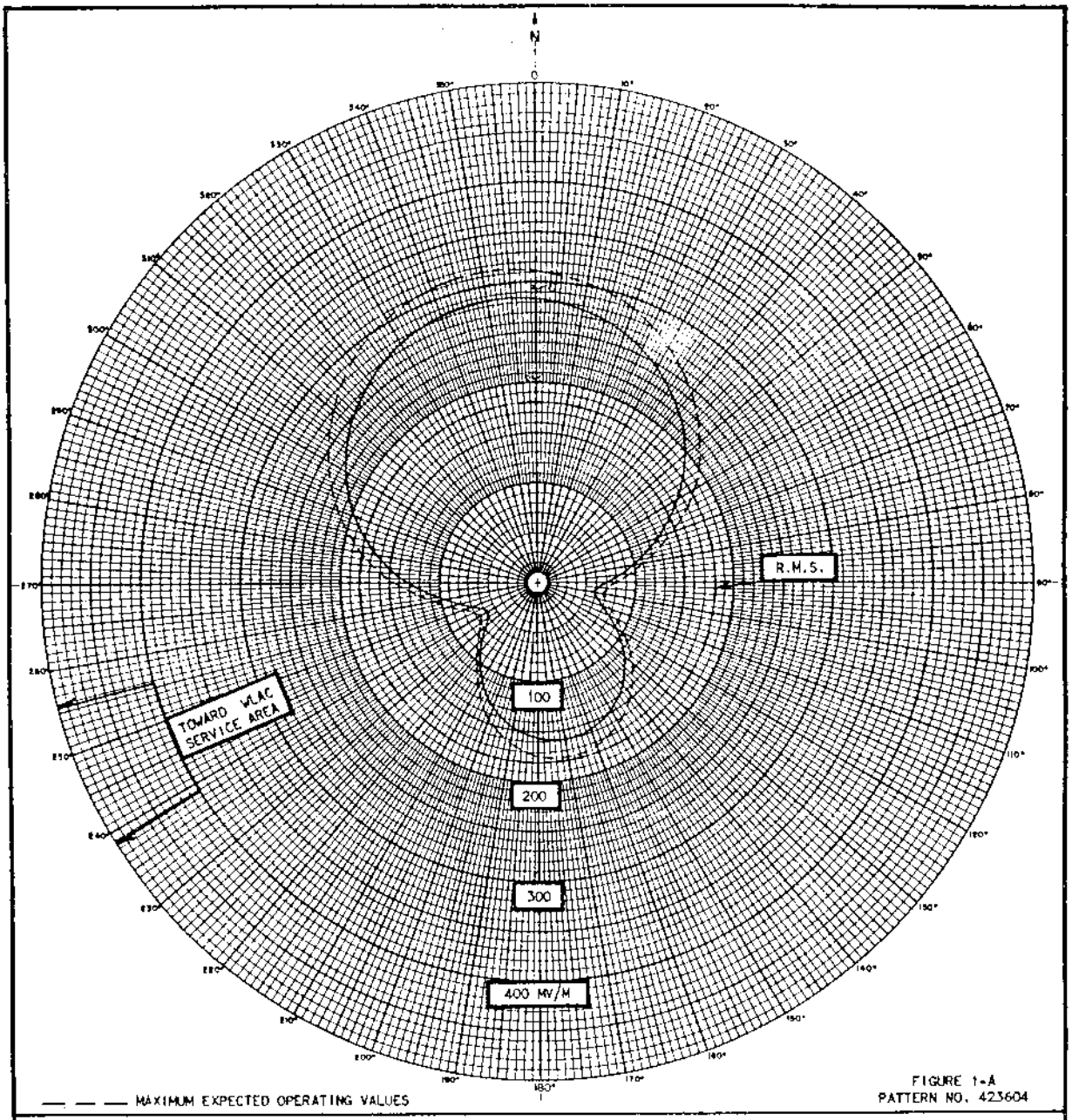


FIGURE 1-A
PATTERN NO. 423604

HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION

N 350° E

#2 0.85/-156.06°

70°

G = 140 FEET = 77.36°

#1 1.15/0°

APPLICANT	TACONIC BROADCASTERS
LOCATION	BREWSTER, N. Y.
FREQUENCY	1510 KC/S
POWER	1 KW
LATITUDE	41 DEG. 22 MIN. 12 SEC.
LONGITUDE	73 DEG. 36 MIN. 26 SEC.
WHEN USED	DAYTIME
R.M.S. FIELD	180 MV/M
DATE	APRIL 1960

SILLIMAN, MOFFET & ROHRER
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No. BP-14105
Accepted 5-16-60

Taconic Broadcasters Corporation
Brewster, New York

1510 KC

WPUT ~~WBRW~~

Measured Non-DA
(5-28-63ct)

Station WBRW
Brewster, New York

1kw,DA-D,D
1510 kc

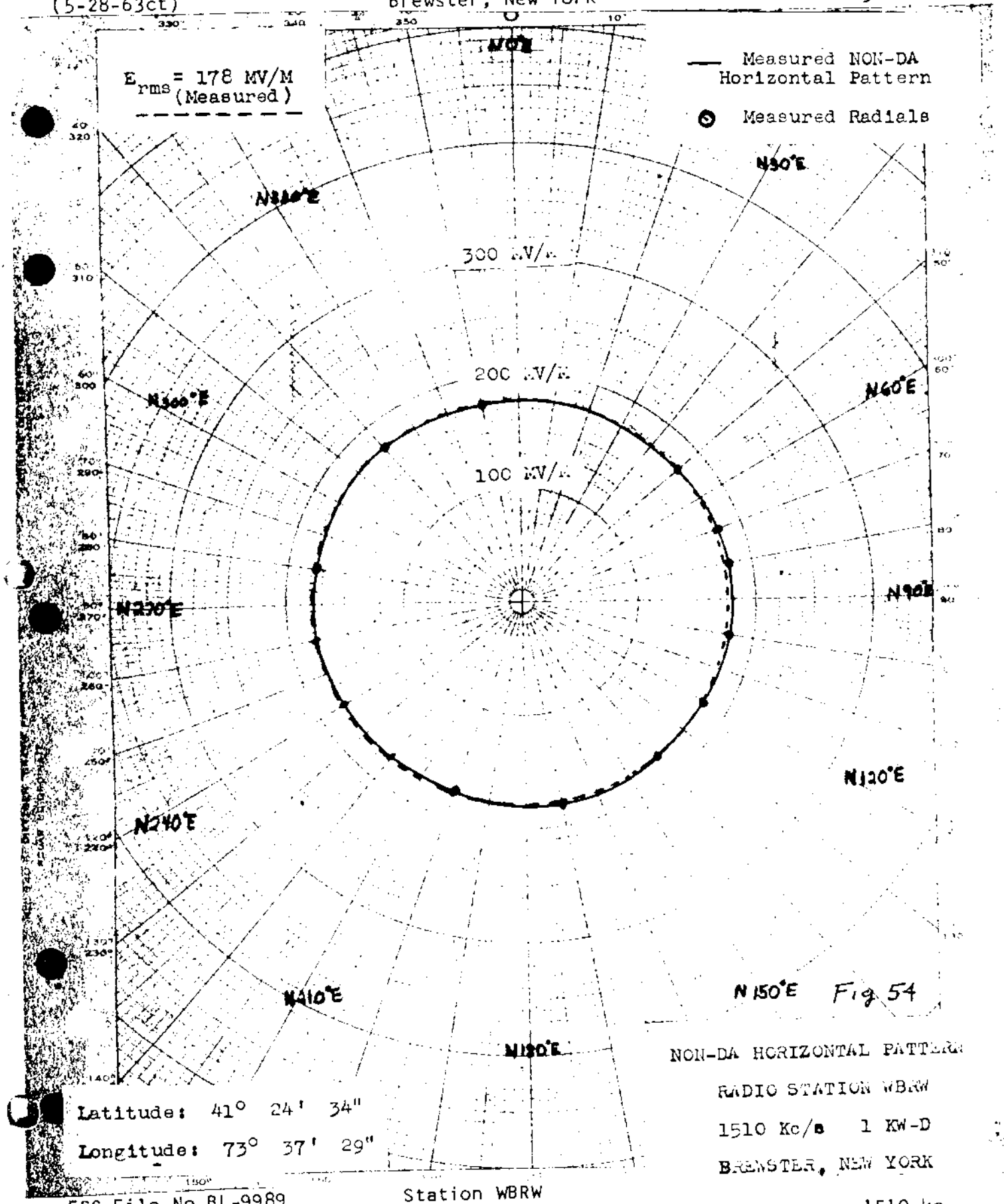


Fig 54

NON-DA HORIZONTAL PATTERN
RADIO STATION WBRW
1510 Kc/s 1 KW-D
BREWSTER, NEW YORK

Latitude: 41° 24' 34"

Longitude: 73° 37' 29"

FCC File No.BL-9989
Accepted 5-21-63

Station WBRW
Brewster, New York

1510 kc

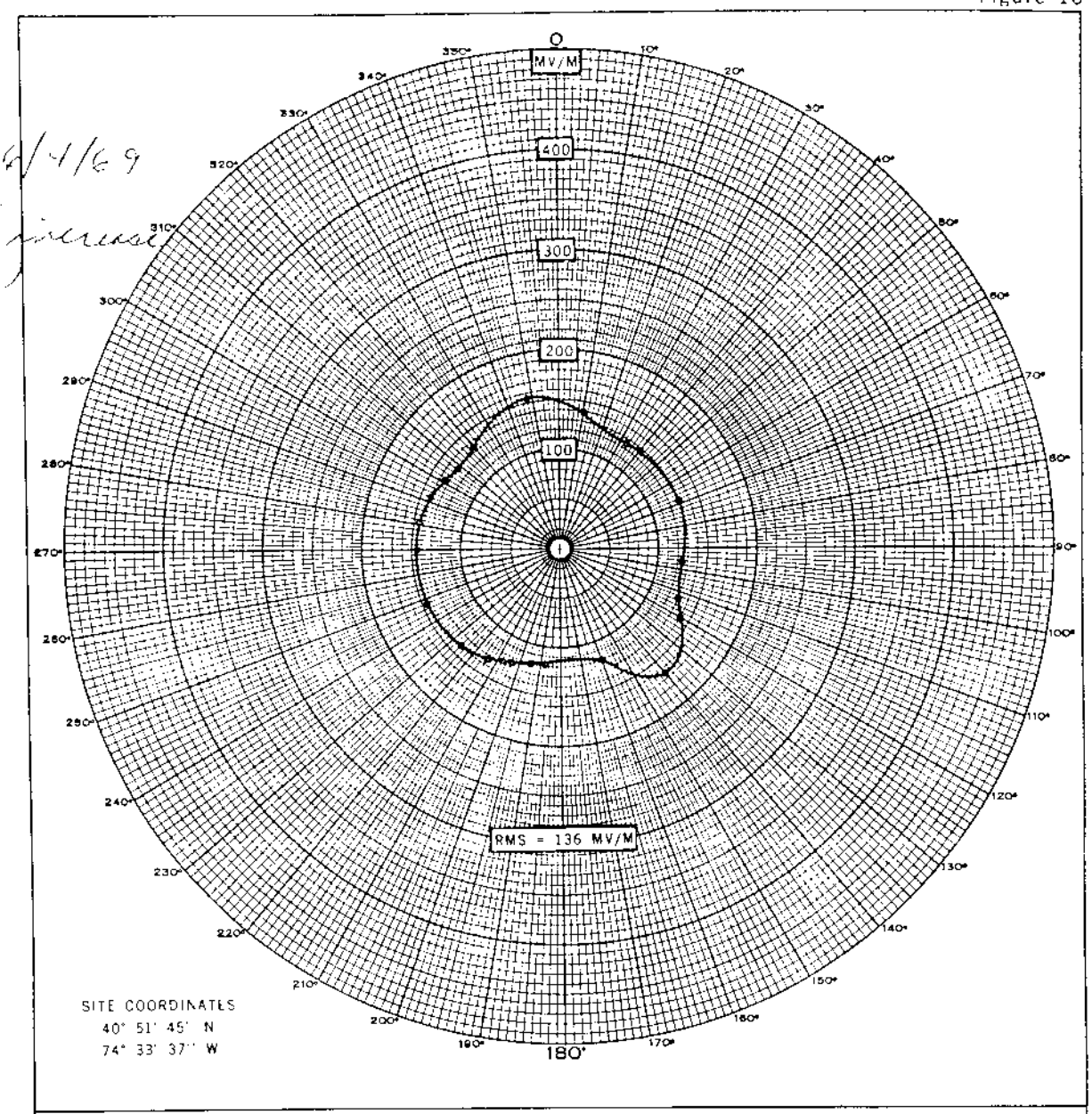
WRAN

Measured Non-DA
(5-27-69ct)

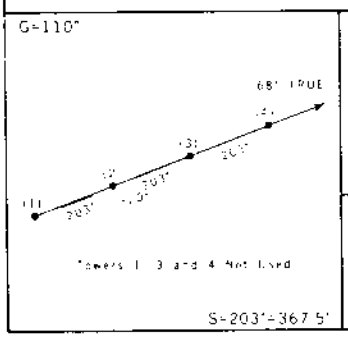
Station WRAN
Dover, New Jersey

500w,10kw-LS,DA-2,U
1510 kc
Figure 10

BL-12328
Granted 6/4/69
license covering increase in power



MEASURED NONDIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN



LION BROADCASTING CO., INC.

DOVER, NEW JERSEY

Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION WRAN

1510 KHZ

0.5 KW, 10 KW-LS U DA-2

FEBRUARY 1969

FCC File No.BL-12328
Accepted 5-2-69

Station WRAN
Dover, New Jersey

1510 kc

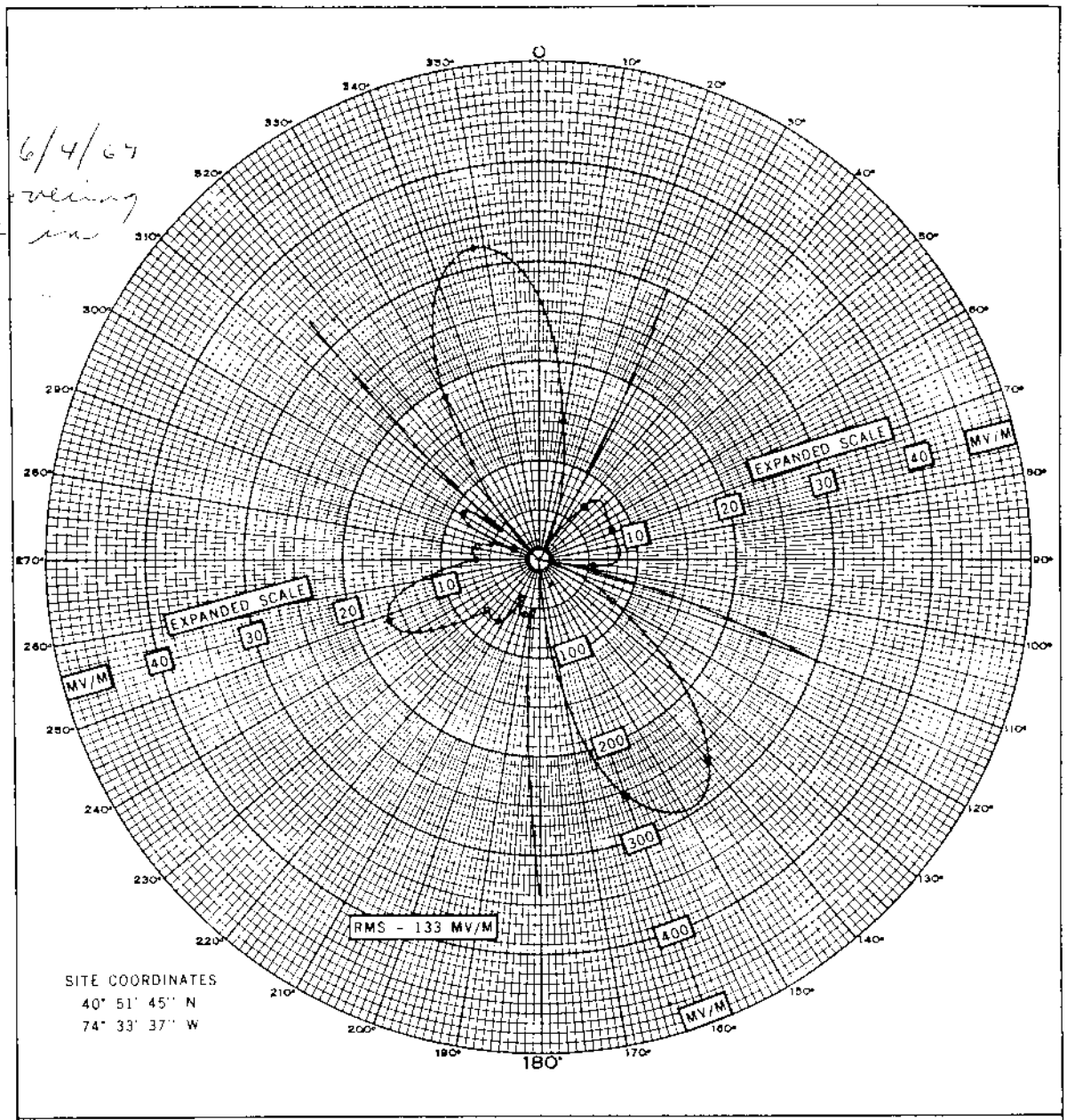
WRAN

Measured Night
(5-27-69ct)

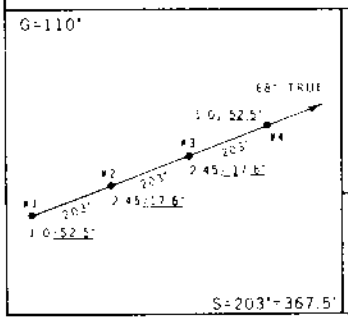
Station WRAN
Dover, New Jersey

500w,10kw-LS,DA-2,U
1510 kc
Figure 12

BL-12328
Granted 6/4/69
license covering
increase in
power



MEASURED NIGHTTIME HORIZONTAL PLANE RADIATION PATTERN



LION BROADCASTING CO., INC.

DOVER, NEW JERSEY

Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION WRAN
1510 KHZ
0.5 KW, 10 KW LS U DA 2
FEBRUARY 1969

FCC File No.BL-12328
Accepted 5-2-69

Station WRAN
Dover, New Jersey

1510 kc

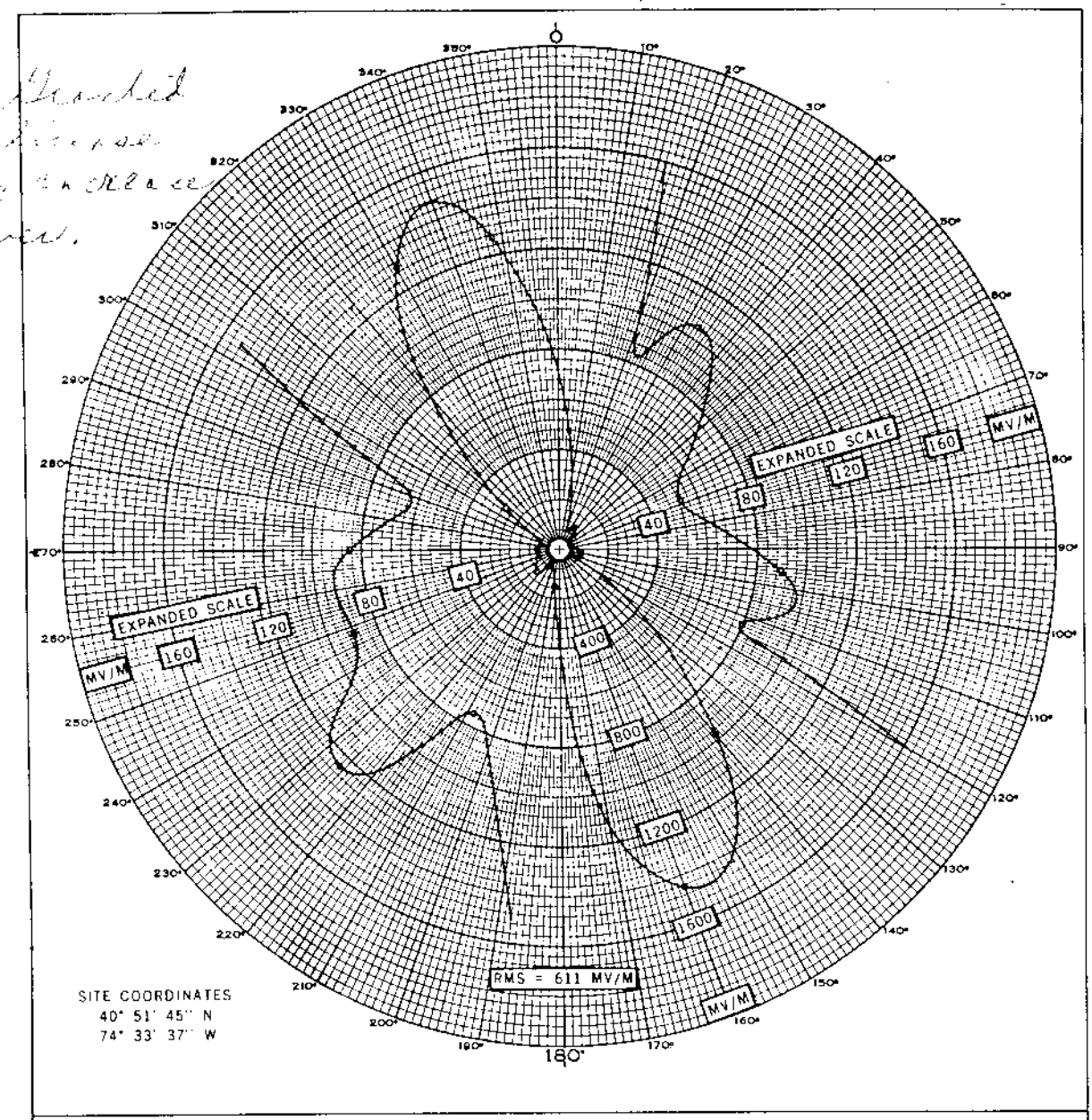
WRAN

Measured Day
(5-27-69ct)

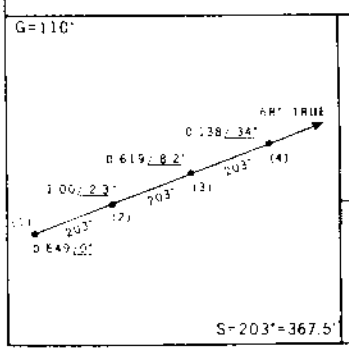
Station WRAN
Dover, New Jersey

500w,10kw-LS,DA-2,U
1510 kc

Power, thanked
[illegible]
Coming [illegible]
in power.



MEASURED DAYTIME HORIZONTAL PLANE RADIATION PATTERN



LION BROADCASTING CO., INC.

DOVER, NEW JERSEY

Jules Cohen & Associates

Consulting Electronics Engineers

RADIO STATION WRAN

1510 KHZ

0.5 KW 10 KW-LS U DA-2

FEBRUARY 1969

FCC File No.BL-12328
Accepted 5-2-69

Station WRAN
Dover, New Jersey

1510 kc

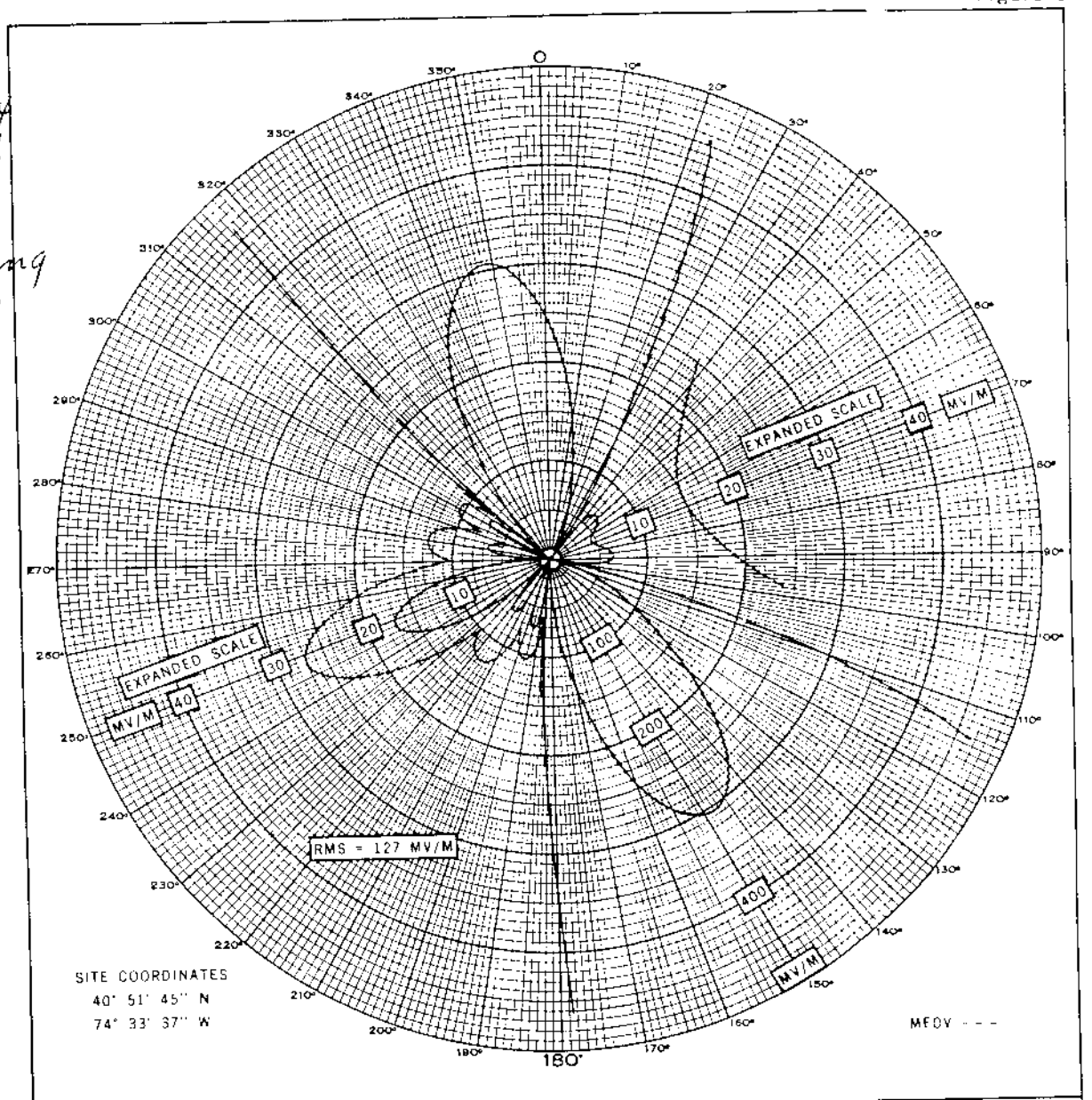
WRAN

Proposed Night
(3-28-69ct)

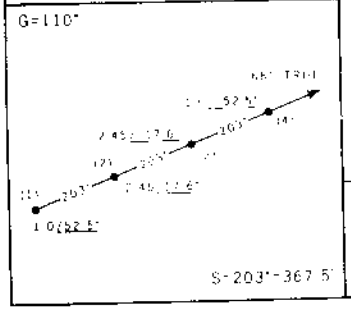
Station WRAN
Dover, New Jersey

500w,10kw-LS,DA-2,U
1510 kc
Figure 1

MP-12654
Granted
3-21-69
red. of
p covering
changes



PROPOSED NIGHTTIME HORIZONTAL PLANE RADIATION PATTERN



LION BROADCASTING CO., INC.

DOVER, NEW JERSEY

Jules Cohen & Associates

Consulting Electronics Engineers

RADIO STATION WRAN

1510 KHZ

0.5 KW, 10 KW-LS, U DA 2

JANUARY 1969

FCC File No.BMP-12654
Accepted 3-19-69

Station WRAN
Dover, New Jersey

1510 kc

WRAN

Proposed Day
(10-28-67ct)

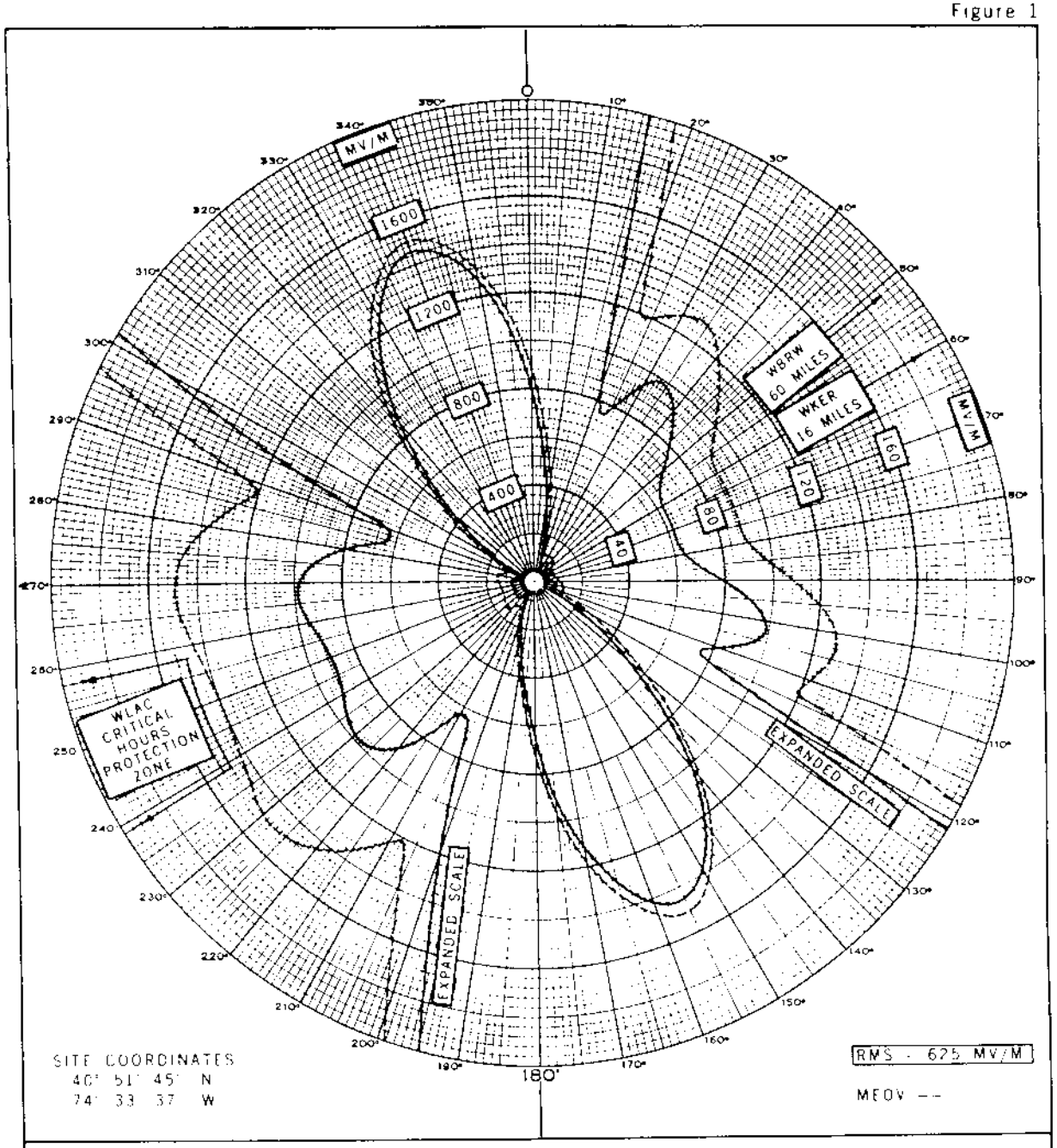
Station WRAN
Dover, New Jersey

500w,10kw-LS,DA-2,U
1510 kc

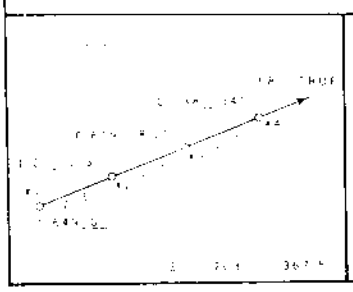
Figure 1

9/11/68
CP FOR .5/10KW DA-2

BMP-12654
Granted
(3-21-69)
Mod. of CP
Correction



PROPOSED DAYTIME HORIZONTAL PLANE RADIATION PATTERN



LION BROADCASTING CO., INC.

DOVER, NEW JERSEY

Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION WRAN
1510 KHZ
0.5 KW, 10 KW-LS U DA 2
APRIL 1967

FCC File No.BP-17757
Accepted 9-28-67

Station WRAN
Dover, New Jersey

1510 kc

WRGI

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WRGI

Main Studio: Marco Island, Florida

Frequency: 1510 kHz

Power: 1 kW

Notification List No. 1650

Date: September 17, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 25° 59' 30"
West Longitude: 81° 37' 30"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 4
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	N(#3)	SW(#1)	NE(#4)	S(#2)
HEIGHT ABOVE INSULATORS:	160'	160'	160'	160' (88.5°)
PHASING:	+70°	0°	+194°	+124°
FIELD RATIO:	0.4	1.0	0.36	0.9

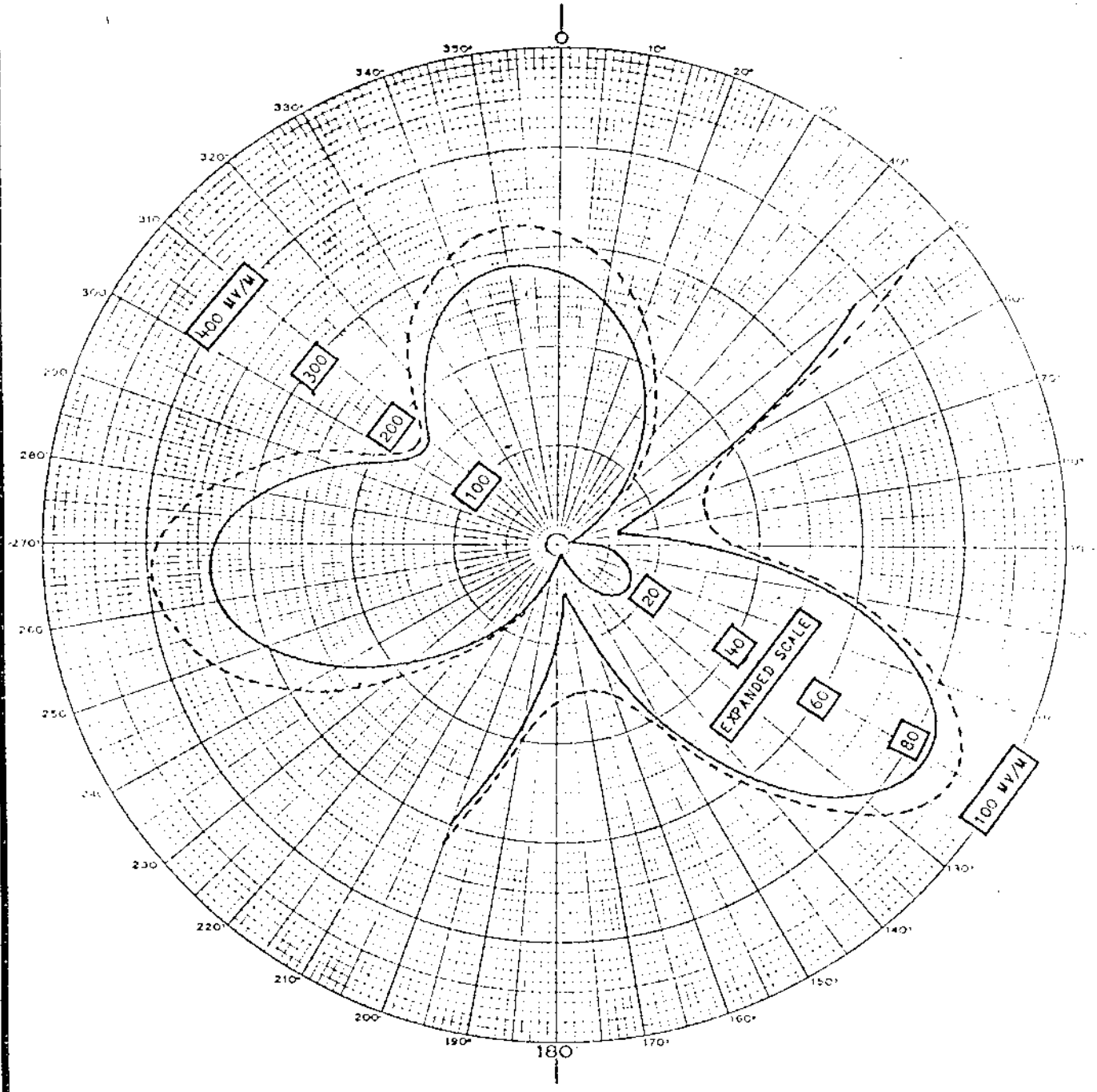
SPACING AND ORIENTATION: The towers are located at the vertices of a parallelogram the long sides of which are 411'(227°) in length on a line bearing 7° true. The short sides are 144.7'(80°) in length on a line bearing 125° true.

GROUND SYSTEM: 120-163' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bon to transverse straps along intersections between towers. Centers of systems are bonded together.

Predicted effective Field: 180 mv/m at rated power by adjustment of input power.

Note: This notification concerns only changes in meovs of radiation in the directional antenna pattern.

WRGI



E_{RMS} = 180 MV/M (BY ADJUSTMENT)

- - - - MEOV

MARCH, 1975

LATITUDE: 25° 59' 30'

LONGITUDE: 81° 37' 30'

PETER V. GORECKIS & ASSOC.
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

ANTENNA PARAMETERS

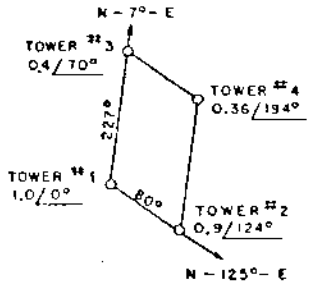


FIGURE 2

PROPOSED DIRECTIONAL

HORIZONTAL PATTERN

RADIO STATION WRGI

COLLIER BROADCASTING COMPANY

MARCO ISLAND, FLORIDA

1510 KHz 1.0 KW, DA-D

WRGI

CORRECTED DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WRGI

Main Studio: Marco Island, Florida

Frequency: 1510 kHz

Power: 1 kW

Notification List No. 1564

Date: June 12, 1974 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 25° 59' 30"

West Longitude: 81° 37' 30"

Authorized for Daytime operation (DA-D).

Predicted effective Field: 180 mv/m at rated power by adjustment of input power.

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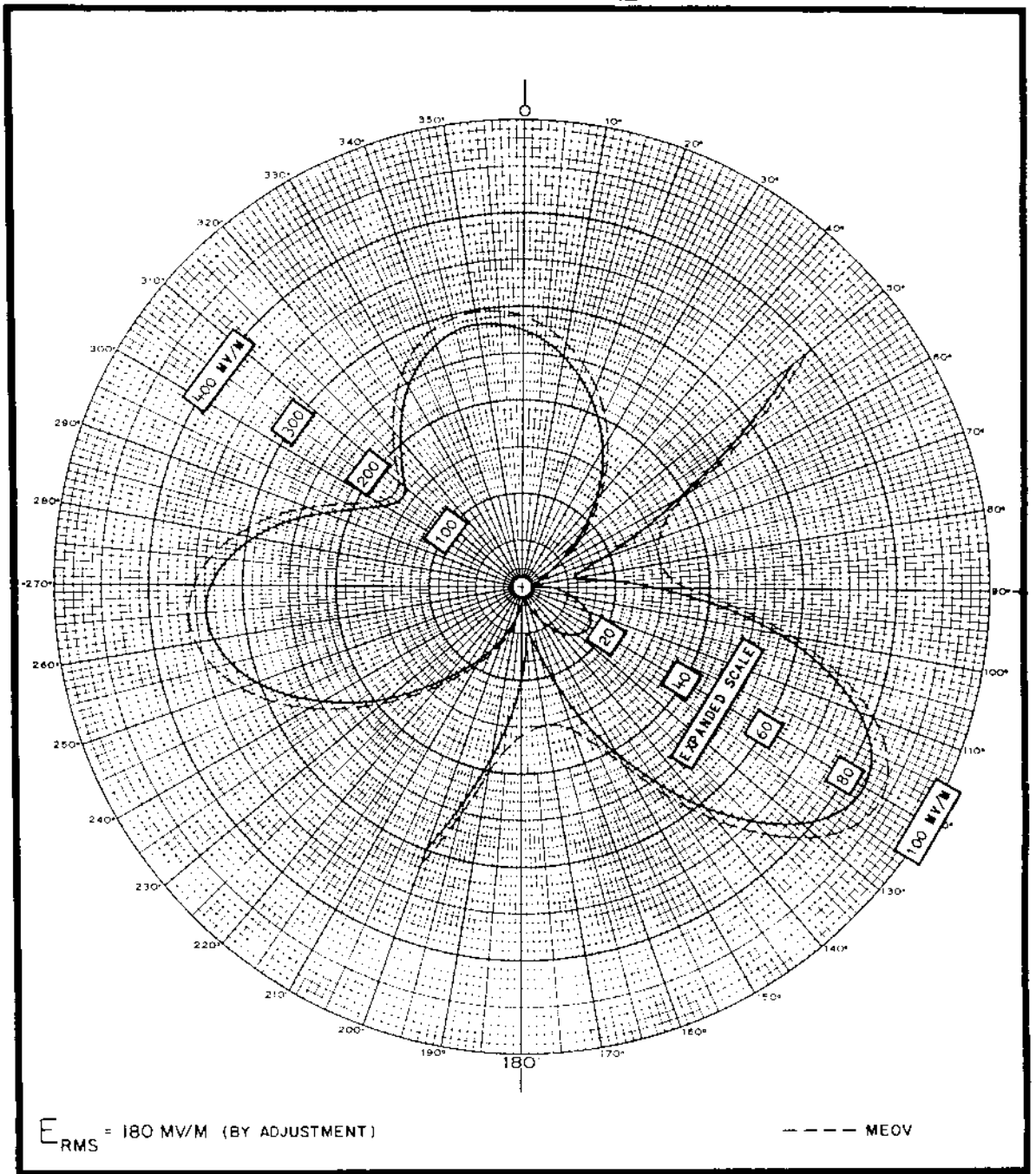
*Note: Please retain the description sheet and directional antenna radiation patterns notified for a new station at Marco Island, Florida in United States Change List Number 1528, dated May 9, 1973 and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only a correction in the geographical coordinates of the center of the antenna system.



LATITUDE	25°	58'	35"
LONGITUDE	81°	38'	07"

JOHN H. MULLANEY
AND
ASSOCIATES

ANTENNA PARAMETERS

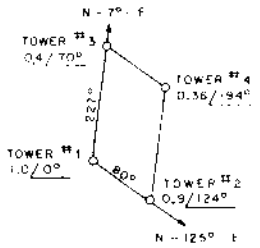


FIGURE 4

PROPOSED DIRECTIONAL
HORIZONTAL PATTERN

COLLIER BROADCASTING COMPANY
MARCO ISLAND, FLORIDA

1510 KHz 1.0 KW, DA-D

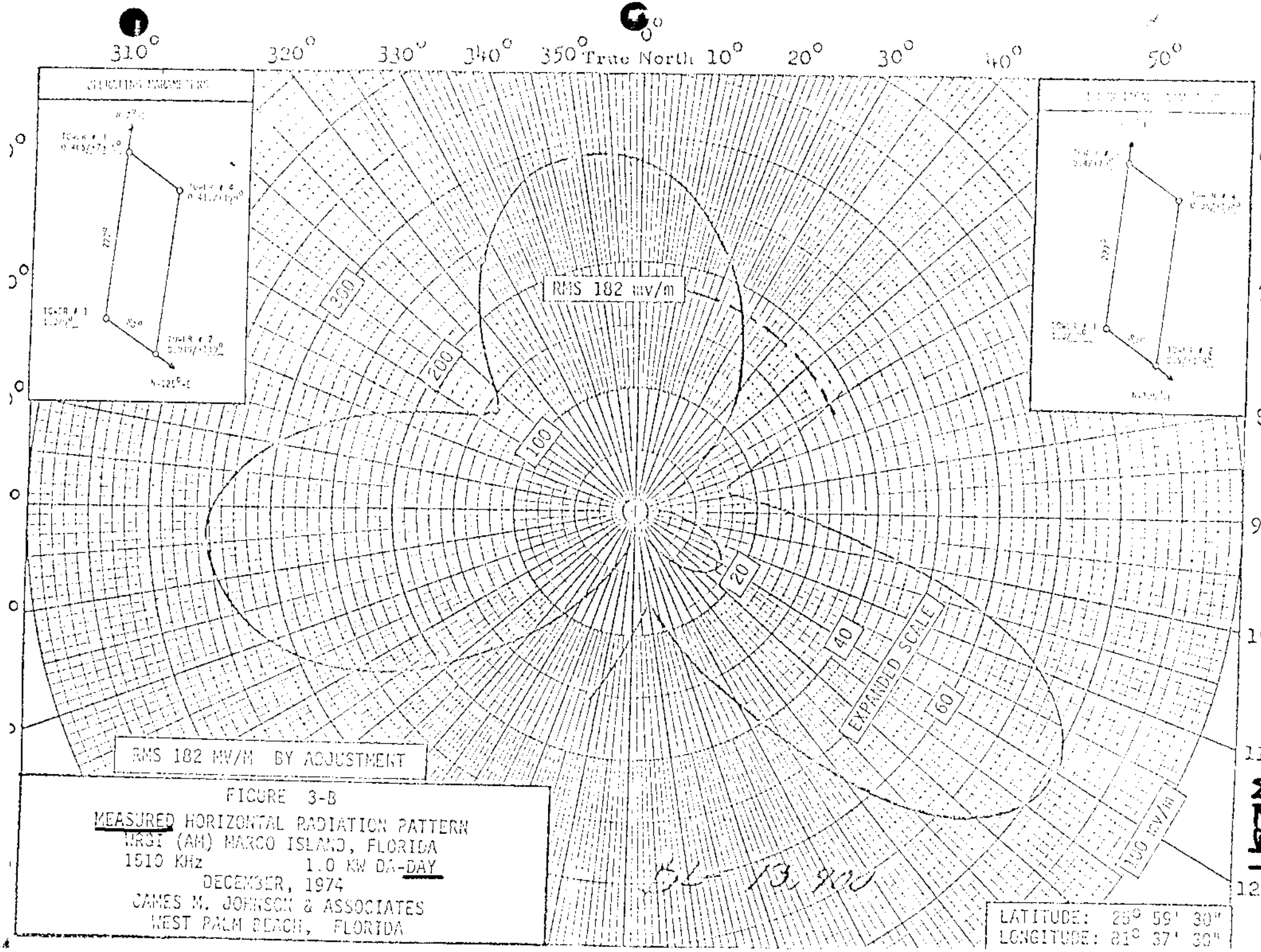


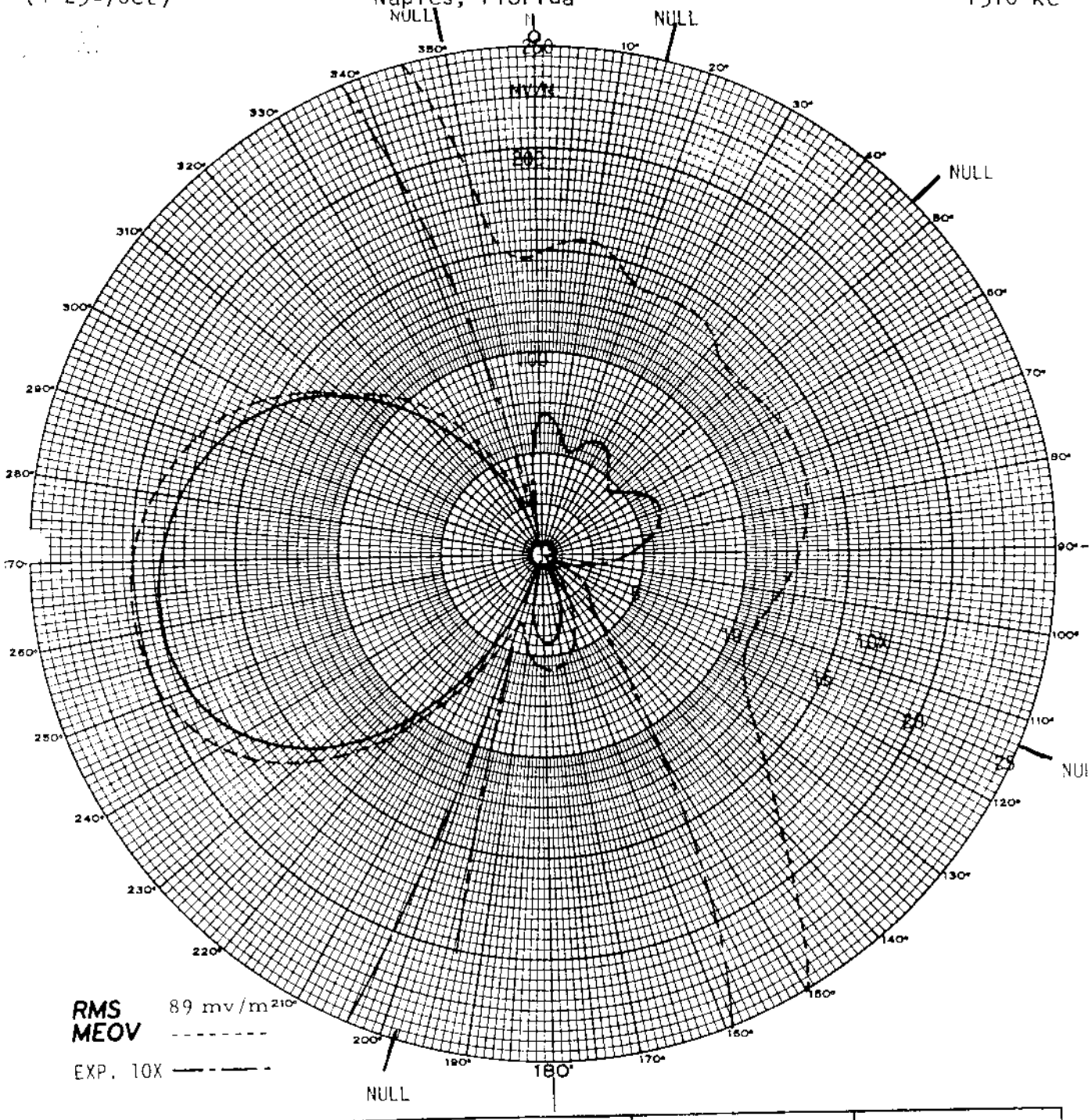
FIGURE 3-B
MEASURED HORIZONTAL RADIATION PATTERN
WRGI (AM) MARCO ISLAND, FLORIDA
1510 KHz 1.0 KW DA-DAY
DECEMBER, 1974
CARES M. JOHNSON & ASSOCIATES
WEST PALM BEACH, FLORIDA

WRGI

Proposed Day
(4-29-70ct)

New; Radio Voice of Naples
Naples, Florida

250w,DA-D,D
1510 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS					FIGURE 3	STATION DATA
G's 100° S_{12} 137.6' S_{13} 272.4' S_{15} 311.4' S_{14} 439.9' S_{16} 192.8' 297° 76° 282° #6 #2 274° #4 #5 #1 #3 78°	TOWER No.	ELECTRICAL HEIGHT θ°	SPACING S°	PHASING V°	FIELD RATIO F.	PROPOSED DAY DIRECTIONAL - - - - - RADIO VOICE OF NAPLES AMENDED 9/69 Naples, Florida	CALL NEW FREQ 1510 kHz POWER 0.25 Kw TYPE DA TIME DAY LAT. N26-07-11.5 LONG. W81-46-16.5
	1	100	—	0	1.0		
	2	100	76	130	1.96		
	3	100	150.5	-100	1.0		
	4	100	243	120	0.91		
	5	100	172	-110	1.79		
	6	100	106.5	19.5	0.91		
	7						
	8						
	9						
	10						
	DAYTIME OPERATION ☐			NIGHTTIME OPERATION ☐		θ° 0°	E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BP-17991
Accepted 1-8-70 Amended

New; Radio Voice of Naples
Naples, Florida

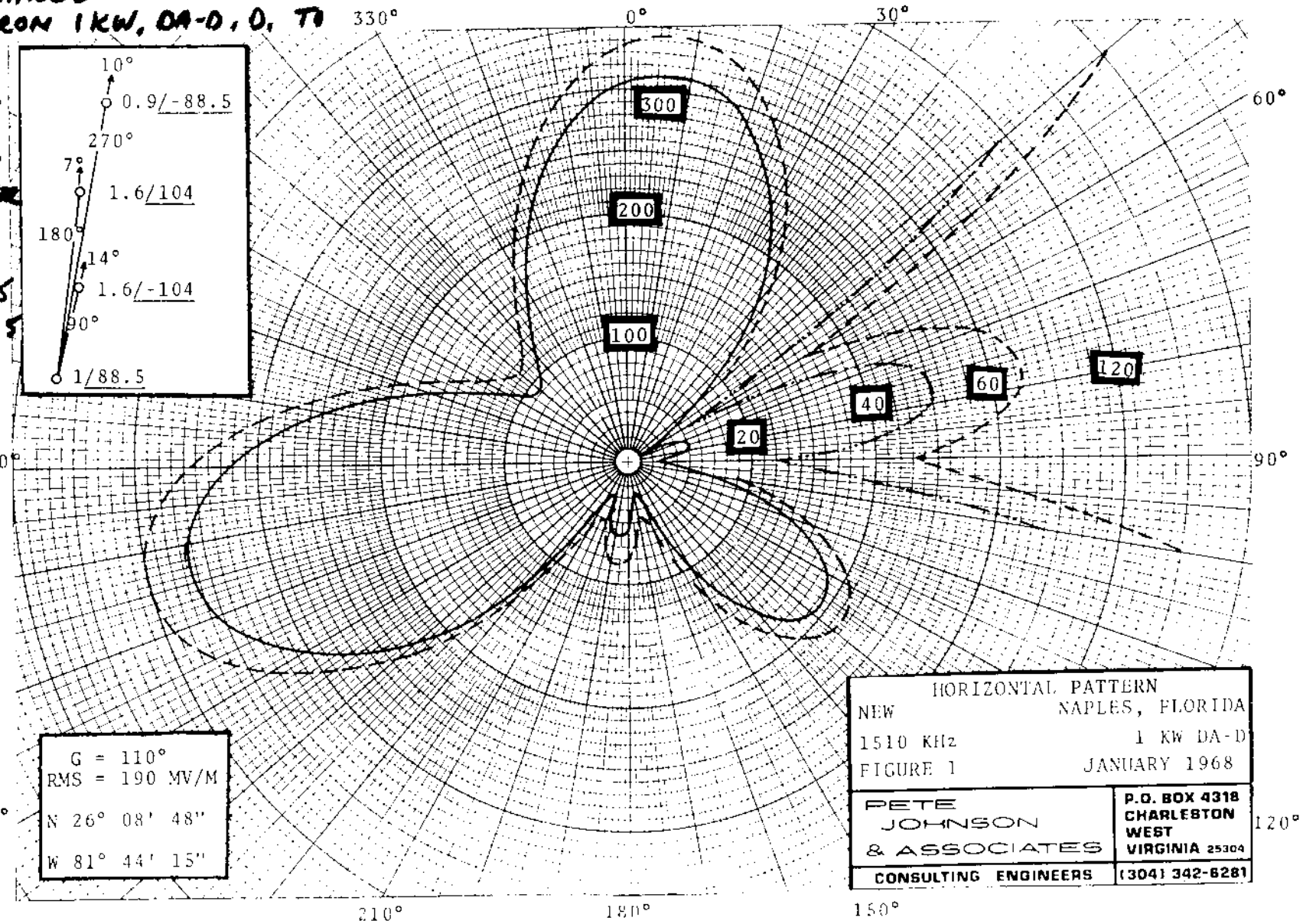
1510 kc

BP-17991
AMENDED (11-24-68)
APPLICATION FOR
CP TO CHANGE
POWER FROM 1KW, DA-D, D, TO
250 W,
DA-D, D;
CHAGE
ANTENNA -
TRANSMITTER
LOCATION
TO:
26-07-11.5
81-46-16.5

Proposed Day
(9-26-68ct)

New; Radio Voice of Naples
Naples, Florida

1kw, DA-D, D
1510 kc



FCC File No. BP-17991
Accepted 9-12-68

New; Radio Voice of Naples
Naples, Florida

1510 kc

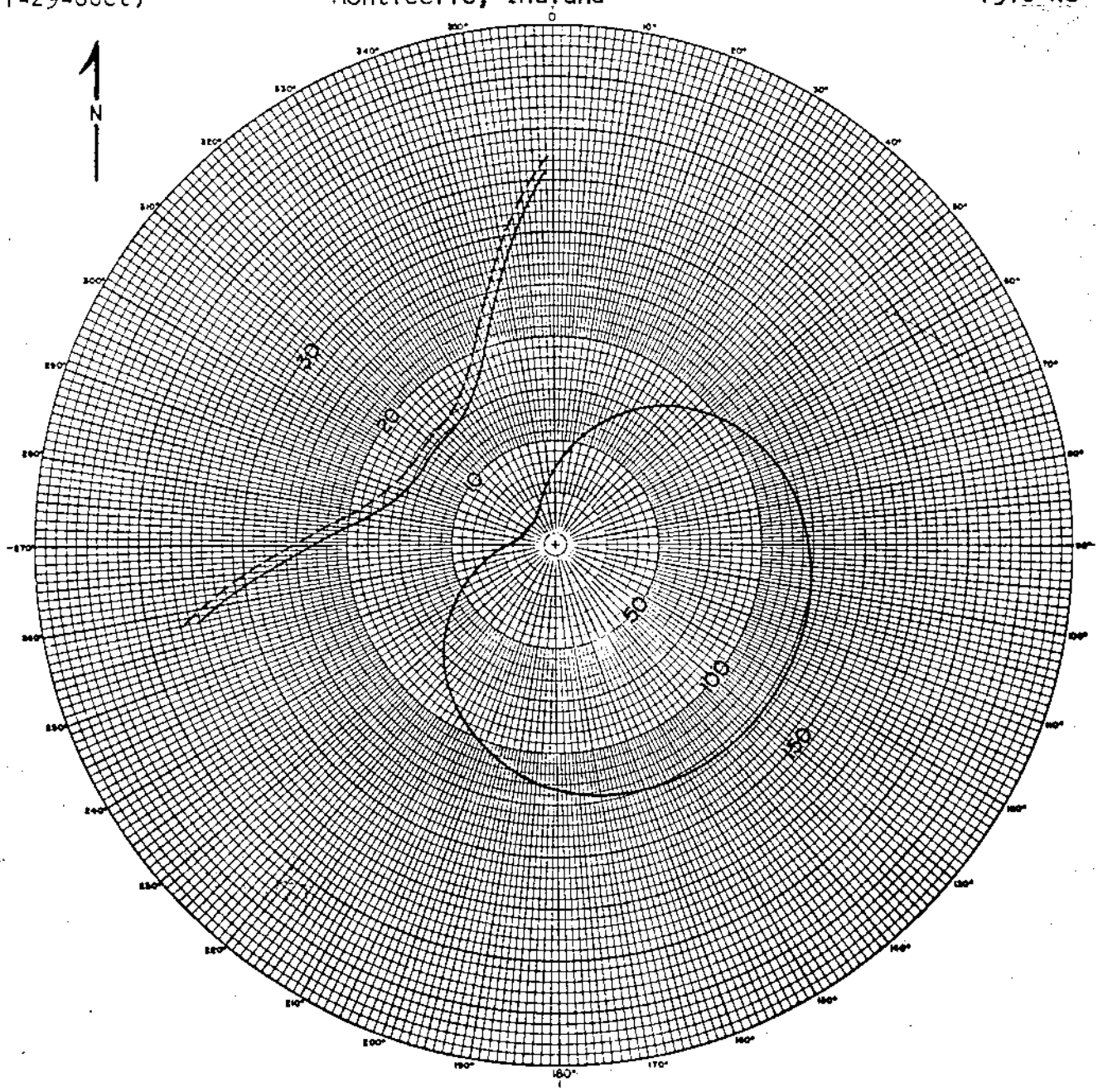
PAGE 22

18313-1

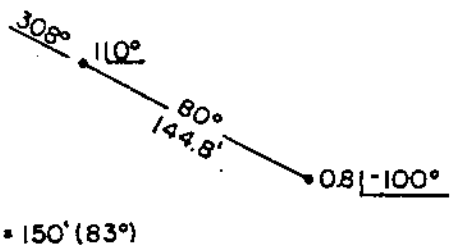
Proposed Day
(11-29-66ct)

New; Iroquois County Bcstg. Co.
Monticello, Indiana

250w,DA-D,D
1510 kc



HORIZONTAL RADIATION PATTERN



APPLICANT	Iroquois County Broadcasting Co
LOCATION	Monticello, Indiana
FREQUENCY	1510 KC/S
POWER	0.25 KW
LATITUDE	40 DEG. 45 MIN. 35 SEC.
LONGITUDE	86 DEG. 46 MIN. 34 SEC.
WHEN USED	Daytime
R.M.S. FIELD	88 MV/M
DATE	8/8/66

RALPH J. BITZER
CONSULTING RADIO ENGINEERS

FCC File No. BP-17397
Accepted 11-22-66

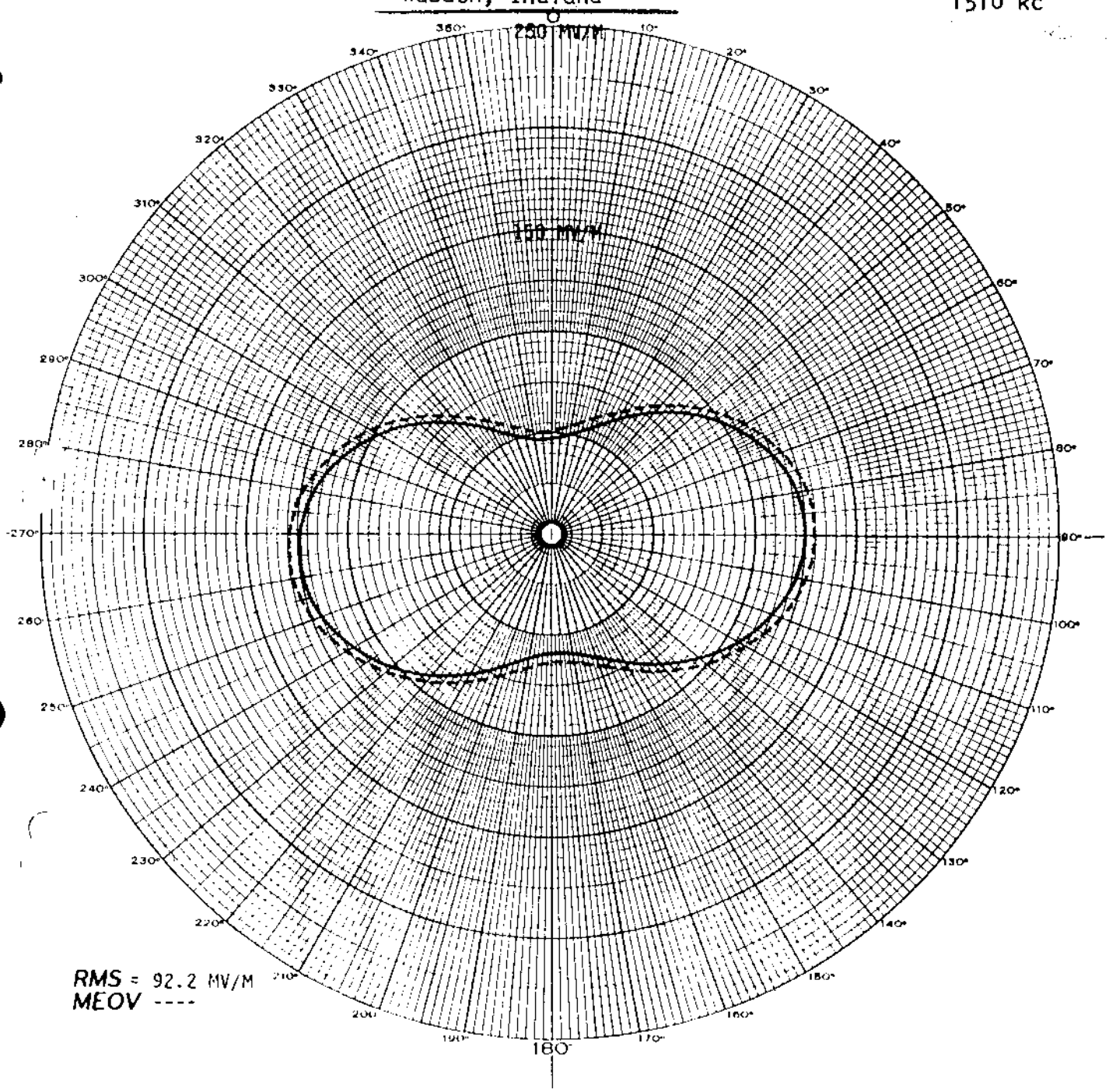
New; Iroquois County Bcstg. Co.
Monticello, Indiana

1510 kc

Proposed Day
(1-30-67ct)

New; Wabash Radio Company
Wabash, Indiana

250w,DA-D,D
1510 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 3	STATION DATA
357°T. ↑ No. 1 ○ 1/+7° 130° No. 2 ○ 1/0° G's=107.3°	TOWER No. / ELECTRICAL HEIGHT G° / SPACING S° / PHASING ψ° / FIELD RATIO F 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION XX NIGHTTIME OPERATION ☐	PROPOSED DAYTIME DIRECTIONAL PATTERN WABASH RADIO CO., WABASH - INDIANA θ° = 0°	CALL NEW FREQ 1510 KHz. POWER 0.25 Kw. TYPE DA-D TIME DAYTIME LAT. 40-47-19.8 LONG. 85-49-35.3 E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BP-17506
Accepted 1-3-67

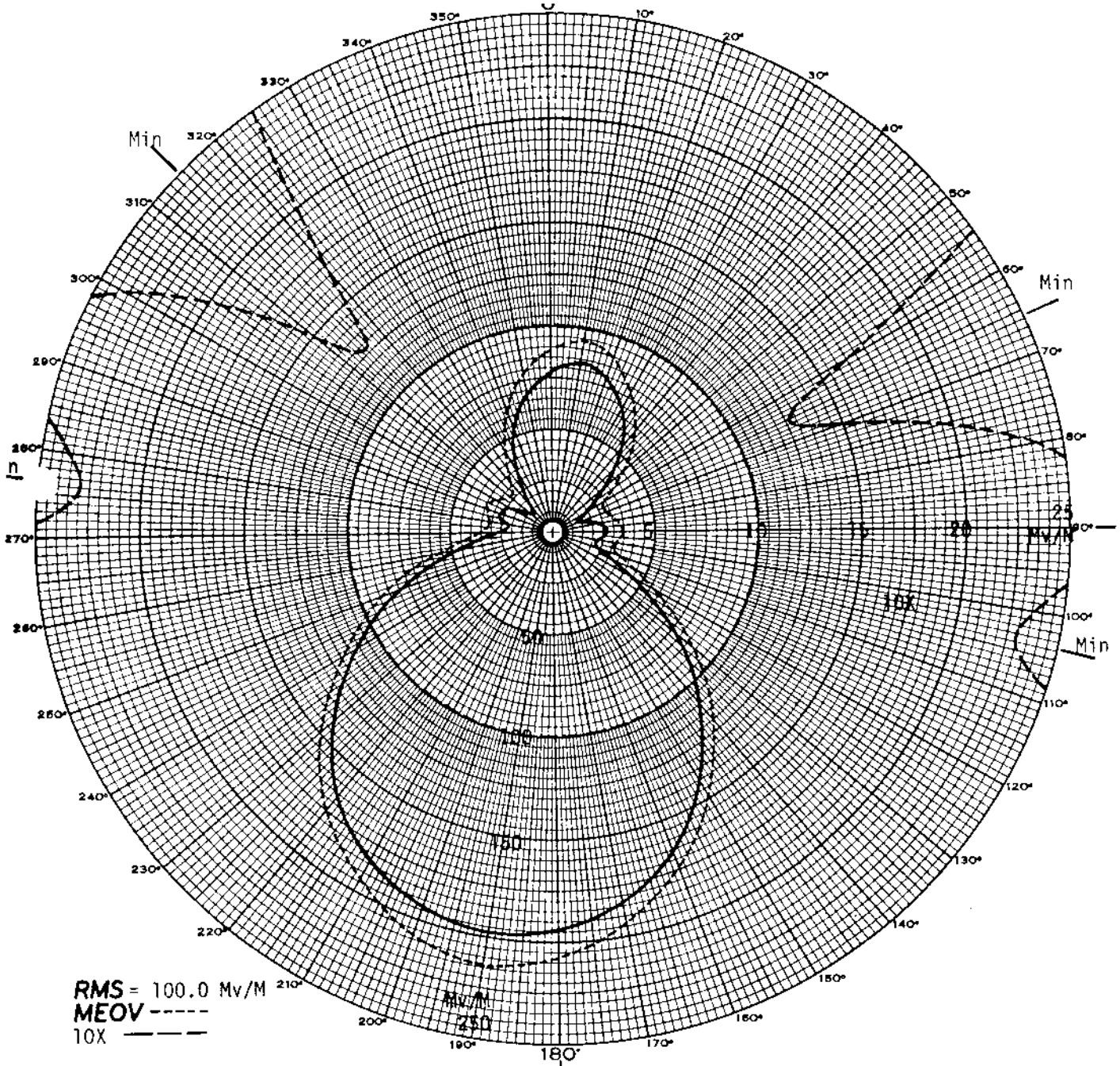
New; Wabash Radio Company
Wabash, Indiana

1510 kc

Proposed Day
(7-28-69ct)

New; The ~~Great American~~ Bcstg Corp.
Pulaski, Virginia

250w,DA-D,D
1510 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 3	STATION DATA
s=90° G's=120° #1 1.000/0° S #2 1.381/-156.65° S #3 0.645/42° 190° T.	TOWER No. / ELECTRICAL HEIGHT θ° / SPACING S° / PHASING ψ° / FIELD RATIO F 1 2 3 4 5 6 7 8 9 10 DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐	PROPOSED DAYTIME DIRECTIONAL ANTENNA SYSTEM ********** PULASKI, VIRGINIA ********** February - 1969 θ° = 0°	CALL NEW FREQ 1510 KHz. POWER 0.25 Kw TYPE DA-D TIME DAYTIME LAT. 37-03-55 LONG. 80-46-11 E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

FCC File No.BP-18500
Accepted 7-15-69

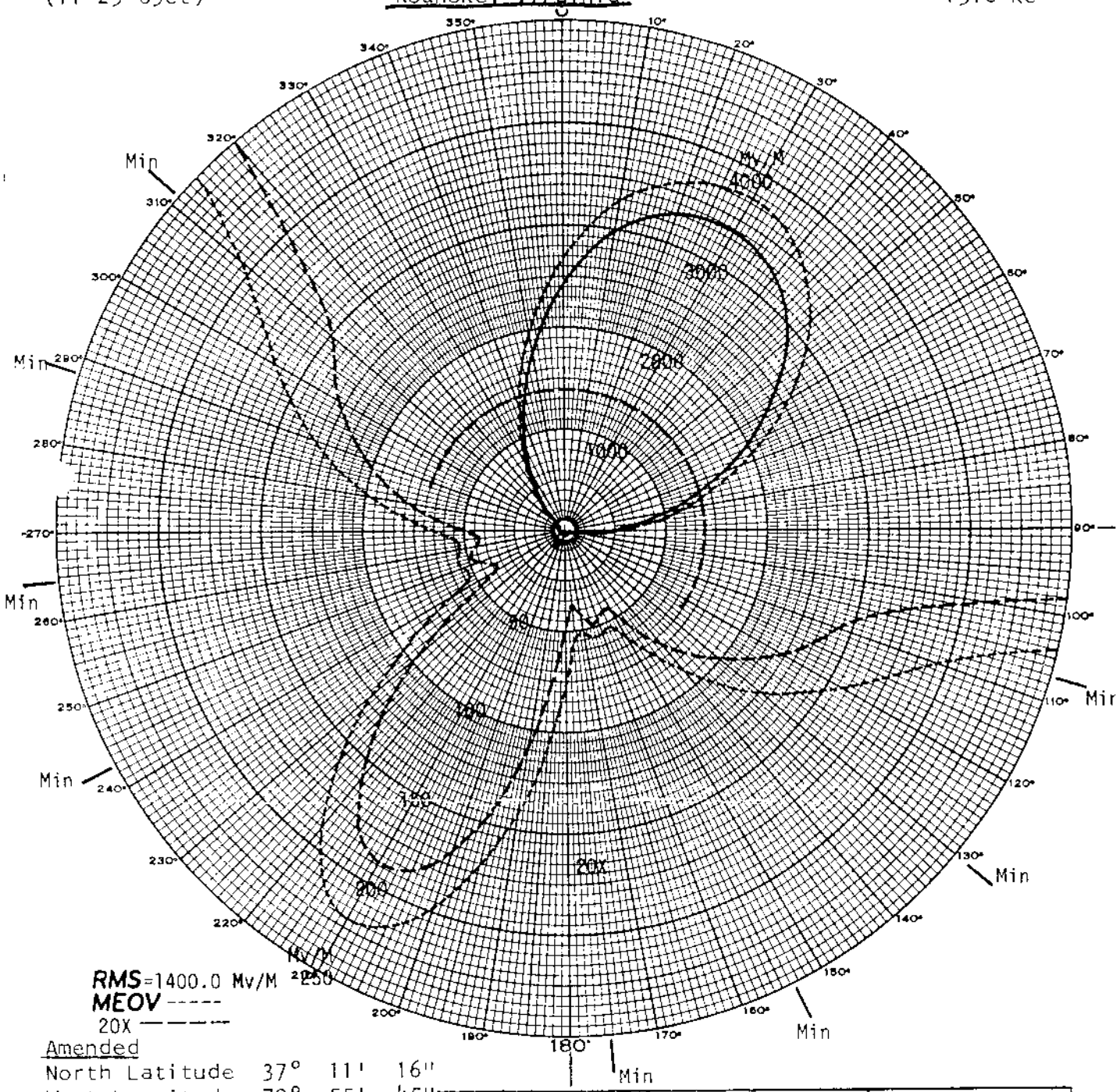
New; The Great American Bcstg Corp.
Pulaski, Virginia

1510 kc

Proposed Day
(11-29-69ct)

New; Great American Bcstg. Corp.
Roanoke, Virginia

50kw,DA-D,D
1510 kc



RMS=1400.0 Mv/M
MEOV -----
20X — — — —

Amended
North Latitude 37° 11' 16"
West Longitude 79° 55' 45"

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	FIGURE 3	STATION DATA
#1 1.000/0° #2 2.619/151.62° #3 2.955/-53.54° #4 1.664/102.39° #5 0.386/-100.00° 209° T.		PROPOSED DAYTIME DIRECTIONAL ANTENNA SYSTEM ********** ROANOKE, VIRGINIA ********** February - 1969 θ° = 0°	CALL NEW FREQ 1510 KHz. POWER 50 Kw TYPE DA-D TIME DAYTIME LAT. 37-13-39 LONG. 79-57-40 E.H.MUNN,JR. RADIO ENGINEER COLDWATER, MICH.

TOWER No.	ELECTRICAL HEIGHT θ°	SPACING S°	PHASING ψ°	FIELD RATIO F
1	125°	Ref.		
2	125°	80°		
3	125°	160°		
4	125°	240°		
5	125°	320°		
6				
7				
8				
9				
10				

DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐

FCC File No.BP-18499
Accepted 10-10-69

New; Great American Bcstg. Corp.
Roanoke, Virginia

1510 kc

DCC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: XERB | Main Studio: Cozumel, Q.R.

Frequency: 1510 kHz | Power: 5kw

Notification List No. 282 | Date: September 1, 1977 | Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 20° 29' 02"
West Longitude: 86° 54' 19"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 3
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	S(#1)	C(#2)	N(#3)
HEIGHT ABOVE INSULATORS:	108.6'	108.6'	108.6' (60°)
PHASING:	-108°	0°	+108°
FIELD RATIO:	1	1.955	1

SPACING AND ORIENTATION: Adjacent towers are spaced 162.9' (90°) on a line bearing 12° true.

GROUND SYSTEM: 120 - 162.9' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL

RMS

451.51 mv/m

HOJA DESCRIPTIVA DEL SISTEMA RADIADOR DIRECCIONAL DE LA ESTACION XE 12

1. LISTA DE CAMBIOS : [illegible]
2. FECHA : [illegible]
3. FRECUENCIA : 1510 KHz.
4. DISTINTIVO : X E R B
5. POBLACION : COZUMEL, Q.R.
6. UBICACION : LW 86° 54' 19" LN 20° 29' 02"
7. POTENCIA : 5 kW
8. CLASE : II

CARACTERISTICAS TECNICAS DEL RADIADOR.

9. TIEMPO DE OPERACION : DIURNO.
10. SISTEMA RADIADOR : AD-D
11. NUMERO DE ELEMENTOS : 3

TIPO DE ELEMENTOS RADIADORES.

12. TIPO DE ALIMENTACION : SERIE EN LA BASE.
13. SECCION TRANSVERSAL : TRIANGULAR DE 0.4 m/LADO.
14. TIPO DE ELEMENTO RADIADOR : VERTICAL
15. TIPO DE SOPORTES : RETENIDAS DE CABLE ACERO 1/4"
16. LONGITUD DEL COPETE CAPACITIVO : NO HAY.
17. SEPARACION ENTRE TORRES : 90° (49.66 m) ENTRE TORRES.
18. NUMERO DE ELEMENTOS : 3
19. ALTURA SOBRE EL AISLADOR : 60° (33.11 m CADA UNA)
20. DEFASAMIENTO : - 108° 0° + 108°
21. RELACION DE CORRIENTES : 1:1 1:1.95 1:1
22. DESCRIPCION DE LA ORIENTACION DEL SISTEMA RADIADOR : 12° DE AZIMUT (ver patrón horizontal)

SISTEMA DE TIERRA.

23. NUMERO DE RADIALES POR ELEMENTO. : 120
24. LONGITUD DE LOS RADIALES : 49.66 m.
25. TIPO DE RADIAL : ALAMBRE DE COBRE # 10

RADIACION DEL SISTEMA.

26. INTENSIDAD DE CAMPO TEORICO -- (OMNIDIRECCIONAL) DE LA POTENCIA RADIADA (RCM) : 451.51 mV/m
27. INTENSIDAD DE CAMPO EFECTIVO - TEORICO A 1609 m. POR KILOWATT - DE POTENCIA RADIADA. : 201 mV/m.

EL PERITO EN TELECOMUNICACIONES.

ING. JOSE LUIS GONZALEZ CORTES.
Registro # 026.

PATRON DE RADIACION HORIZONTAL TABULADO

(OPERACION DIURNA)

XERB

1510 KHZ.

CLASE II

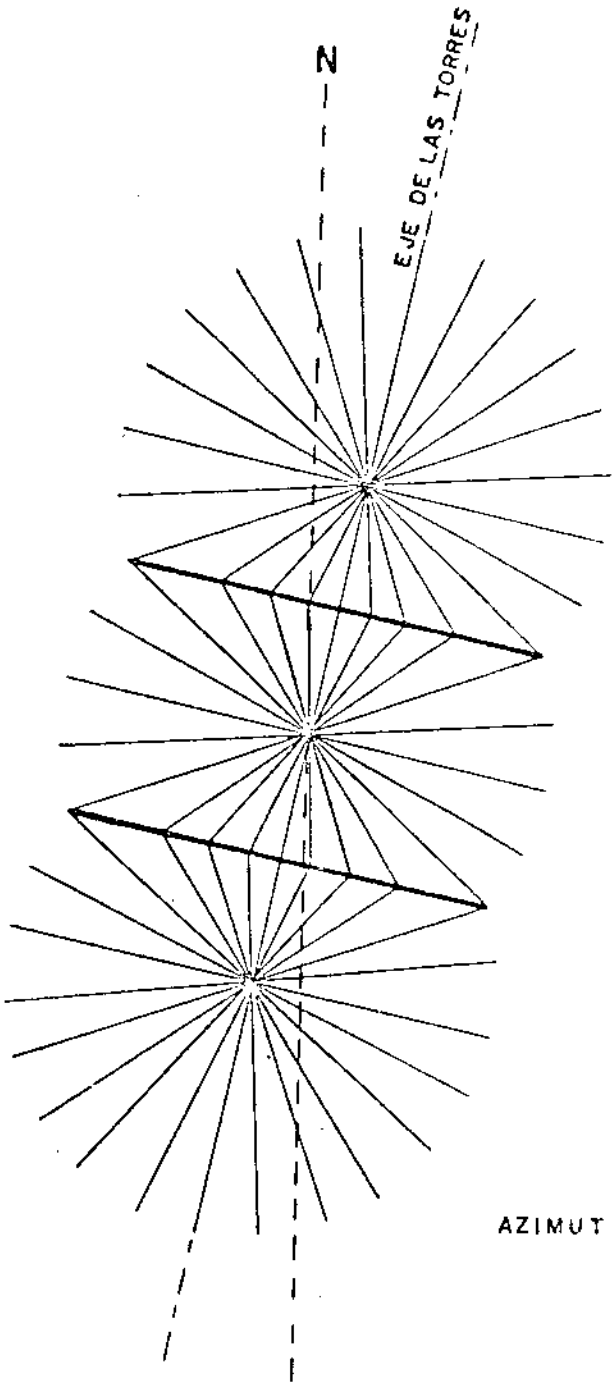
5000 W.

AD-D

COZUMEL, Q.R.

$$E = 388.1168\left[1 + 1.023\cos(90^\circ \cos\varphi_2 + 108^\circ)\right]$$

AZIMUT		A	B	C	D	E mV/m.
φ_1	φ_2	90 COS φ_2	A + 108°	COS B	(1.023 C)+1	388.1168D
12°	0°	90.0000	198.0000	- 0.9510	0.0270	10.5058
22°	10°	88.6327	196.6327	- 0.9581	0.0198	7.6856
32°	20°	84.5723	192.5723	- 0.9760	0.0015	0.5936
42°	30°	77.9423	185.9423	- 0.9946	-0.0175	- 6.7933
52°	40°	68.9440	176.9440	- 0.9985	-0.0215	- 8.3620
62°	50°	57.8509	165.8509	- 0.9696	0.0080	3.1184
72°	60°	45.0000	153.0000	- 0.8910	0.0885	34.3486
82°	70°	30.7818	138.7818	- 0.7522	0.2304	89.4579
92°	80°	15.6283	123.6283	- 0.5538	0.4334	168.2329
102°	90°	0.0000	108.0000	- 0.3090	0.6838	265.4236
112°	100°	-15.6283	92.3716	- 0.0413	0.9576	371.6863
122°	110°	-30.7818	77.2182	0.2212	1.2263	475.9582
132°	120°	-45.0000	63.0000	0.4539	1.4644	568.3709
142°	130°	-57.8509	50.1490	0.6407	1.6555	642.5390
152°	140°	- 68.9439	39.0560	0.7765	1.7943	696.4329
162°	150°	- 77.9423	30.0576	0.8655	1.8854	731.7666
172°	160°	- 84.5723	23.4276	0.9175	1.9386	752.4291
182°	170°	- 88.6327	19.3672	0.9434	1.9651	762.6923
192°	180°	-90.0000	18.0000	0.9510	1.9729	765.7277



AZIMUT: 12°

SISTEMA DE TIERRA

120 RADIALES DE ALAMBRE DE COBRE No. 10 EN CADA TORRE DE 49.66 MTS. DE LONGITUD CADA UNO, UNIDOS AL CRUZARSE, POR ALAMBRE DEL MISMO MATERIAL TIPO OO. TODO EL SISTEMA ESTA ENTERRADO 0.30 MTS.

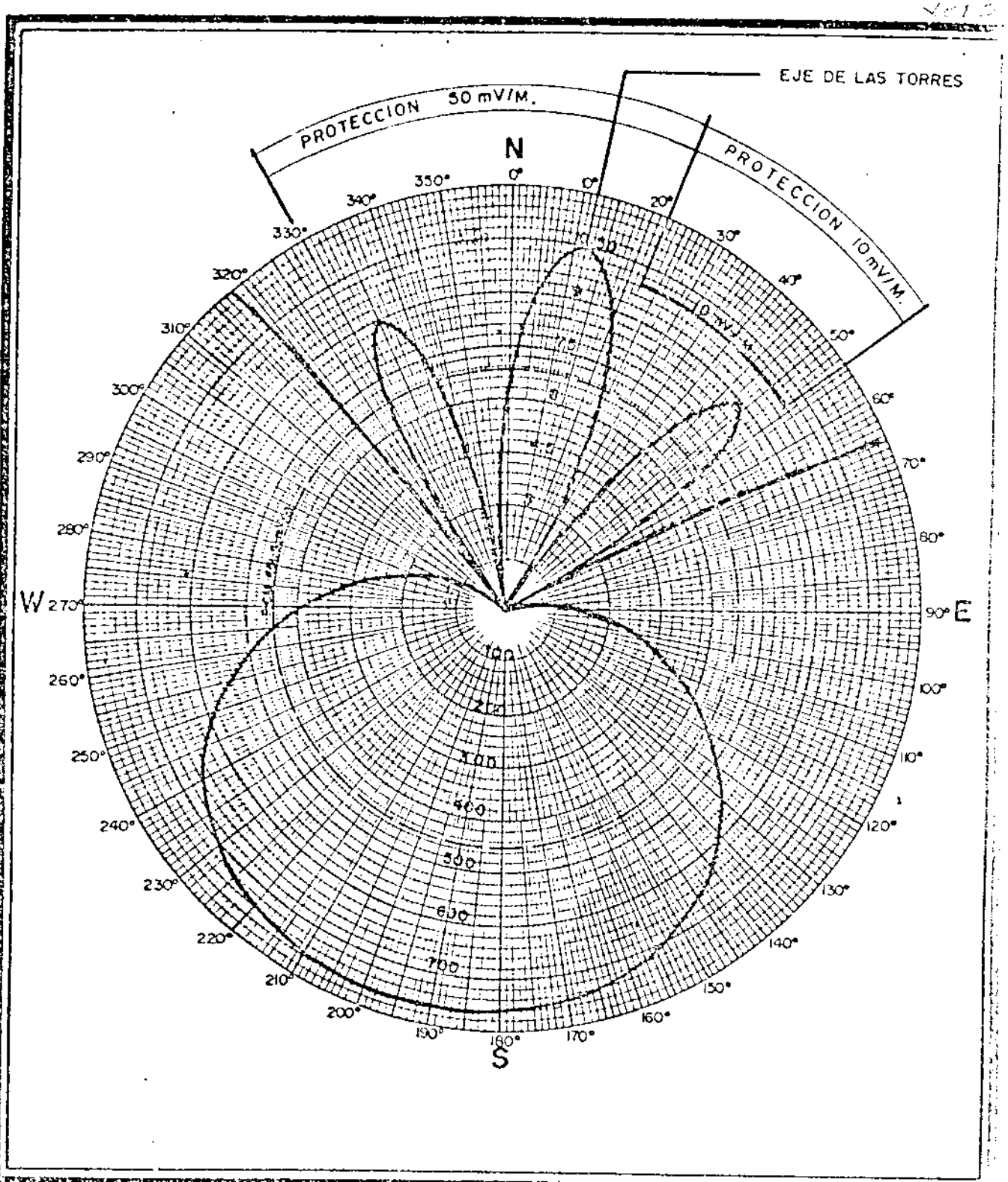
XERB

COZUMEL, Q.R.

FRECUENCIA Y POTENCIA:
1510 KHZ.
5 KW. AD.-D

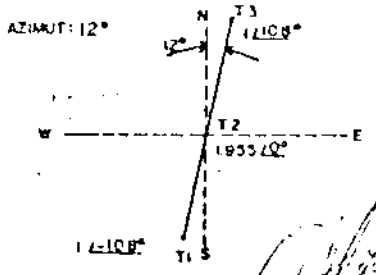
DISEÑO:
PERITO EN TELECOMUNICACIONES:
ING. J. LUIS GONZALEZ CORTES.
REGISTRO No. 026.

DIBUJO:
A. P. L.



PATRON DE RADIACION HORIZONTAL CALCULADO EN mV/m. A 1609M

ESQUEMA DE LAS TORRES Y SU ORIENTACION CON RESPECTO AL NORTE GEOGRAFICO



XERB

COZUMEL, Q. R.

FRECUENCIA: 1510 KHZ

POTENCIA: 5 KW. AD-B

DISEÑO: PERITO EN TELECOMUNICACIONES. ING. J. LUIS GONZALEZ CORTES. REGISTRO No. 026

DIBUJO: A. P. L.

XERB

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: XERB

Main Studio: Cozumel. Q.R.

Frequency: 1510 kHz

Power: 5 kw

Notification List No. 282

Date: September 1, 1977 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 20° 29' 02"
West Longitude: 86° 54' 19"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 3
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	#1(S)	#2(C)	#3(N)
HEIGHT ABOVE INSULATORS:	162.9'	162.9'	162.9' (90°)
DAY PHASING:	-100°	0°	100°
DAY FIELD RATIO:	1	2	1

SPACING AND ORIENTATION: The towers are located in a row. Adjacent towers are spaced 162.9' (90°) on a line bearing 12° true.

GROUND SYSTEM: 120 - 162.9' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS
Day	450.23 mv/m

XERB

HOJA DESCRIPTIVA DEL SISTEMA RADIADOR DIRECCIONAL DE LA ESTACION

1.	LISTA DE CAMBIOS	:
2.	FECHA	:
3.	FRECUENCIA	: 1510 KHz.
4.	DISTINTIVO	: X E R B
5.	POBLACION	: COZUMEL, Q.R.
6.	UBICACION	: LW 86° 54' 19" LN 20° 29' 02"
7.	POTENCIA	: 5 kW
8.	CLASE	: II

CARACTERISTICAS TECNICAS DEL RADIADOR.

9.	TIEMPO DE OPERACION	: DIURNO.
10.	SISTEMA RADIADOR	: AD-D
11.	NUMERO DE ELEMENTOS	: 3

TIPO DE ELEMENTOS RADIADORES.

12.	TIPO DE ALIMENTACION	: SERIE EN LA BASE.
13.	SECCION TRANSVERSAL	: TRIANGULAR DE 0.4 m/LADO.
14.	TIPO DE ELEMENTO RADIADOR	: VERTICAL
15.	TIPO DE SOPORTES	: RETENIDAS DE CABLE ACERO 1/4"
16.	LONGITUD DEL COPETE CAPACITIVO	: NO HAY.
17.	SEPARACION ENTRE TORRES	: 90° (49.66 m) ENTRE TORRES.
18.	NUMERO DE ELEMENTOS	: 3
19.	ALTURA SOBRE EL AISLADOR	: 90° (49.66 m CADA UNA)
20.	DEFASAMIENTO	: -100° 0° +100°
21.	RELACION DE CORRIENTES	: 1 2 1
22.	DESCRIPCION DE LA ORIENTACION DEL SISTEMA RADIADOR	: 12° DE AZIMUT (ver patrón horizontal)

SISTEMA DE TIERRA.

23.	NUMERO DE RADIALES POR ELEMENTO.	: 120
24.	LONGITUD DE LOS RADIALES	: 49.66 m.
25.	TIPO DE RADIAL	: ALAMBRE DE COBRE # 10

RADIACION DEL SISTEMA.

26.	INTENSIDAD DE CAMPO TEORICO -- (OMNIDIRECCIONAL) DE LA POTENCIA RADIADA (RCM)	: 450.23mV/m
27.	INTENSIDAD DE CAMPO EFECTIVO - TEORICO A 1609 m. POR KILOWATT - DE POTENCIA RADIADA.	: 201 mV/m

DIRECC. GRAL. DE TELECOMUNICACIONES
Departamento de Ingeniería
Oficina de Asignaciones

EL PERITO EN TELECOMUNICACIONES.

ING. JOSE LUIS GONZALEZ CORTES.
Registro # 026.

DIRECC. GRAL. DE TELECOMUNICACIONES
Departamento de Ingeniería
Oficina de Asignaciones

XERB

PATRON DE RADIACION HORIZONTAL TABULADO

(OPERACION DIURNA)

XERB

5000 W.

1510 KHZ.

AD – D

CLASE II

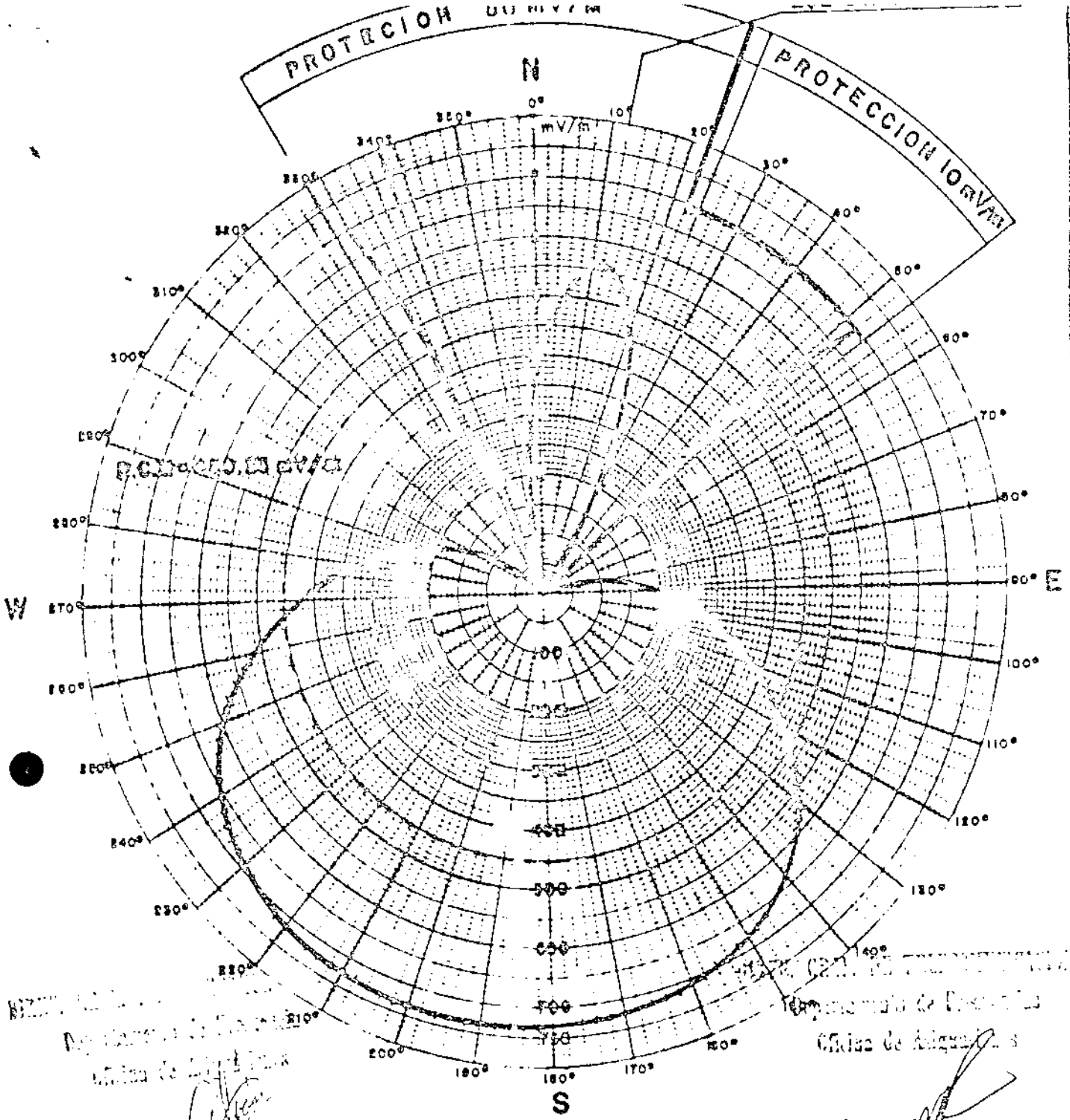
COZUMEL, Q.R.

$$E = 370.2242\,[1 + \cos(90^\circ \cos \varphi_2 + 100^\circ)]$$

AZIMUT		A	B	C	D	EmV/m.
φ_1	φ_2	90 cos φ_2	A + 100	cos B	1 + C	370.2242 D
12°	0°	90.0000	190.0000	- 0.9848	0.0152	5.6274
22°	10°	83.6320	183.6320	- 0.9886	0.0114	4.2205
32°	20°	84.5640	184.5640	- 0.9968	0.0032	1.1847
42°	30°	77.9400	177.9400	- 0.9993	0.0007	0.2591
52°	40°	63.9400	163.9400	- 0.9814	0.0186	6.8861
62°	50°	57.0430	157.0430	- 0.9261	0.0739	27.3595
72°	60°	45.0000	145.0000	- 0.8191	0.1808	66.9543
82°	70°	30.7818	130.7818	- 0.6531	0.3468	128.4007
92°	80°	15.6283	115.6283	- 0.4325	0.5674	210.0907
102°	90°	0.0000	100.0000	- 0.1736	0.8263	305.9355
112°	100°	-15.6283	84.3716	0.0980	1.0980	406.5339
122°	110°	- 30.7818	69.2182	0.3548	1.3548	501.5834
132°	120°	-45.0000	55.0000	0.5735	1.5735	582.5762
142°	130°	- 57.0509	42.1490	0.7414	1.7414	644.7087
152°	140°	- 66.9439	31.0560	0.8566	1.8566	687.3815
162°	150°	- 77.9423	22.0576	0.9268	1.9268	713.3505
172°	160°	- 84.5723	15.4276	0.9639	1.9639	727.1081
182°	170°	- 88.6327	11.3672	0.9803	1.9803	733.1060
192°	180°	+ 90.0000	10.0000	0.9848	1.9848	734.8239

APROBO

XERE



REVISO

APROBO

PATRON DE RADIACION HORIZONTAL CALCULADO EN mV/m A 1609 m

ESQUEMA DE LAS TORRES Y SU ORIENTACION CON RESPECTO DEL NORTE GEOGRAFICO

AZIMUT 12°

T3 1/1000°

T2 2/1000°

T1 1/1000°

XERB

COZUMEL, Q. R.

FRECUENCIA: 1610 KHz

POTENCIA: 5 Kw. AD-D

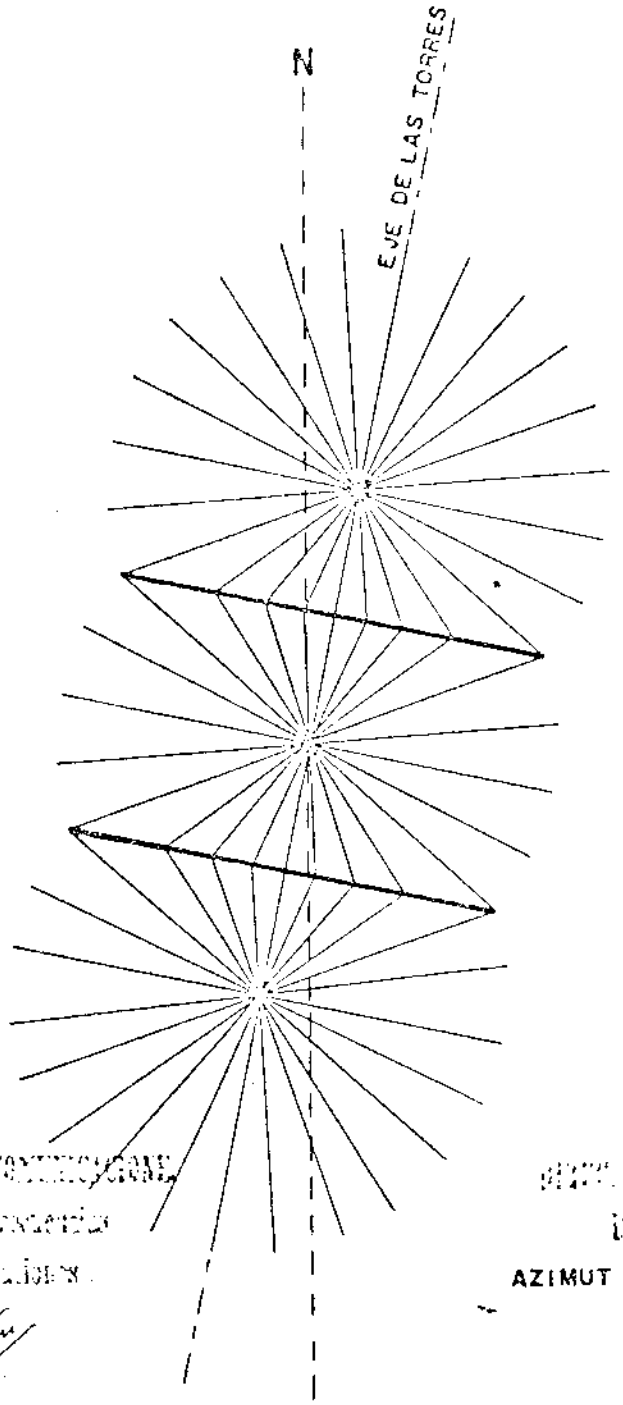
DISEÑO

PERITO EN TELECOMUNICACIONES

ING. J LUIS GONZALEZ CORTES REG. IN 0[illegible]

DIBUJO I. C. [illegible]

XERB



DIRECC. GRAL. DE TELECOMUNICACIONES
Departamento de Frecuencias
Oficina de Asignaciones

REVISO

AZIMUT : 02°

SISTEMA DE TIERRA

120 RADIALES DE ALAMBRE DE COBRE No. 10 EN CADA TORRE DE 49.66 MTS. DE LONGITUD CADA UNO, UNIDOS AL CRUCE, POR ALAMBRE DEL MISMO MATERIAL TIPO OO. TODO EL SISTEMA ESTA ENTERRADO 0.30 MTS.

XERB

COZUMEL, Q.R.

FRECUENCIA Y POTENCIA:
1510 KHZ.
5 KW. AD-D

DISEÑO:
PERITO EN TELECOMUNICACIONES:
ING. J. LUIS GONZALEZ CORTES.
REGISTRO No. 026

DIBUJO:
A. P. L.

DELETE 1520 KC

IFRB Serial No. 6356

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 - 1605 kHz

PART I GENERAL INFORMATION

(01) Administration: CANADA Sheet No. 421 Date 830726

Assigned frequency (kHz)		(02)	1520
Transmitting station	Name of the station	(03)	LANGLEY BC
	Call sign	(04)	
	Additional identification	(05)	
	Station class	(06)	B
	Operational Status	(07)	P
Country		(08)	CAN
Geographical coordinates of the transmitting station		(09)	122W40'00" 49N05'00"

(11) a) New assignment [ ] b) Modification of characteristic of an assignment recorded in the plan [ ] c) Cancellation of an assignment [X]

(12) Modification under Section 4.2.14 Yes [ ] No [ ]

(13) Date of bringing into service or cessation of operation [ ] [ ] [ ] Year Month Day

STATION PARAMETERS	DAYTIME OPERATION	NIGHT-TIME OPERATION
Station power (kW)	(21) 10.	(31) 10.
r.m.s. value of radiation for station power (mV/m at 1 km)	(25)	(35)
Antenna type	(26) B	(36) B
Simple vertical antenna electrical height (degrees)	(27)	(37)

(44) Remarks

COORDINATION UNDER ARTICLE 4:								
COUNTRY	USA							
IN PROGRESS								
ACCEPTANCE OBTAINED	No							

IFRB Serial No. 6356

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 - 1605 kHz

NEW 1520

PART I GENERAL INFORMATION

(01) Administration: CANADA Sheet No.: 417 Date: 830321

Assigned frequency (kHz)	(02)	1520
Transmitting station: Name of the station	(03)	LANGLEY BC
Transmitting station: Call sign	(04)	
Transmitting station: Additional identification	(05)	
Transmitting station: Station class	(06)	B
Transmitting station: Operational Status	(07)	P
Country	(08)	CAN
Geographical coordinates of the transmitting station	(09)	122W4000 49N0500

(11) a) New assignment [ ] b) Modification of characteristic of an assignment recorded in the plan [X] c) Cancellation of an assignment [ ]

(12) Modification under Section 4.2.14 Yes [ ] No [X]

(13) Date of bringing into service or cessation of operation [ ] [ ] [ ] Year Month Day

STATION PARAMETERS		DAYTIME OPERATION		NIGHT-TIME OPERATION
Station power (kW)	(21)	10	(31)	10
r.m.s. value of radiation for station power (mV/m at 1 km)	(25)		(35)	
Antenna type	(26)	B	(36)	B
Simple vertical antenna electrical height (degrees)	(27)		(37)	

(44) Remarks

COORDINATION UNDER ARTICLE 4:

COUNTRY	USA							
IN PROGRESS	X							
ACCEPTANCE OBTAINED								

FORM FOR THE APPLICATION OF ..ICLE 4 OF THE AGREEMENT
CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 - 1605 kHz

IFRL arial No. 6356

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No. 417

Date 830321

(01) LANGLEY BC
Name of transmitting station

(02) CAN
Country

(03) HJ
Hours of operation

(04) 4
Total number of towers

(05) Tower No.	(06) Tower field ratio	(07) Phase difference of the field (± degrees)	(08) Electrical tower spacing (degrees)	(09) Angular tower orientation (degrees)	(10) Reference tower indicator	(11) Electrical height of tower (degrees)	(12) Tower structure
1	1.	0.	0.	0.	0	90.	0
2	2.7276	-119.73	100.	354.	0	90.	0
3	2.7276	120.77	200.	354.	0	90.	0
4	1.	22.55	310.27	350.3601	0	90.	0
	.	.	.	.		.	
	.	.	.	.		.	
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	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	
	.	.	.	.		.	

(14) r.m.s value of radiation	(15) Type of pattern	(16) Special quadrature factor
981.49 mV/m at 1 km	E	. mV/m at 1 km

(17) SUPPLEMENTARY INFORMATION

NEW 0251

IFR Serial No. 6356

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT
CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 - 1605 kHz

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No. 417

Date 830321

(01) Name of transmitting station: LANGLEY BC

(02) Country: CAN

(03) Hours of operation: HN

(04) Total number of towers: 4

(05) Tower No.	(06) Tower field ratio	(07) Phase difference of the field (± degrees)	(08) Electrical tower spacing (degrees)	(09) Angular tower orientation (degrees)	(10) Reference tower indicator	(11) Electrical height of tower (degrees)	(12) Tower structure
1	1.	0.	0.	0.	0	90.	0
2	2.7276	-119.73	100.	354.	0	90.	0
3	2.7276	120.77	200.	354.	0	90.	0
4	1.	22.55	310.27	350.3601	0	90.	0

(14) r.m.s value of radiation: 981.49 mV/m at 1 km

(15) Type of pattern: E

(16) Special quadrature factor: . mV/m at 1 km

(17) SUPPLEMENTARY INFORMATION

NEW 1520

KACY

Measured Day
(6-29-70ct)

Station KACY
Port Hueneme, California

1kw,50kw-LS,DA-2,U
1520 kc

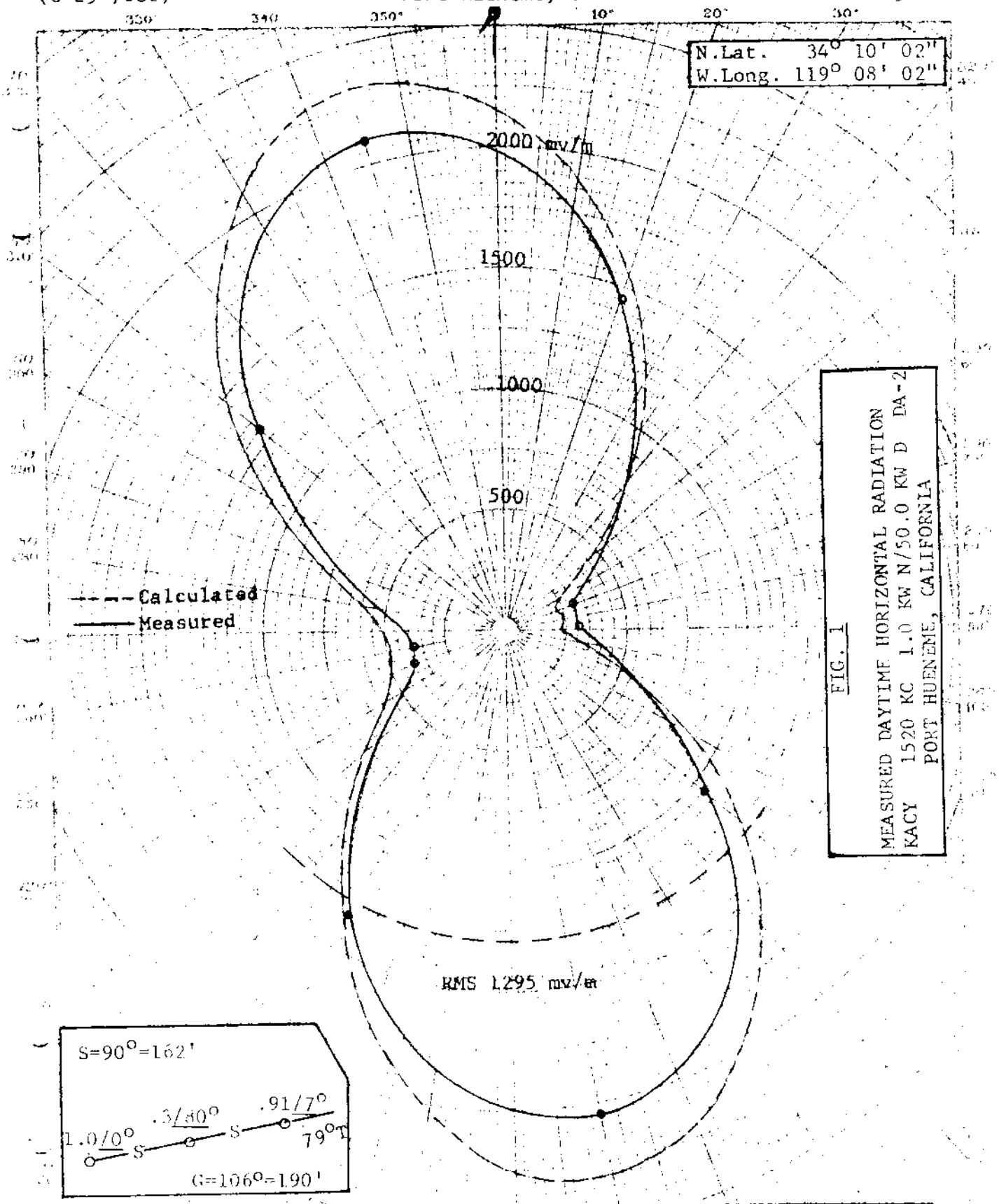


FIG. 1

MEASURED DAYTIME HORIZONTAL RADIATION
KACY 1520 KC 1.0 KW N/50.0 KW D DA-2
PORT HUENEME, CALIFORNIA

A.E.Towne Associates Inc., Consulting Engineers, San Carlos, California

FCC File No.BL-12623
Accepted 6-2-70

Station KACY
Port Hueneme, California

1520 kc

KACY

Measured Non-DA
(6-29-70ct)

Station KACY
Port Hueneme, California

1kw,50kw-LS,DA-2,U
1520 kc

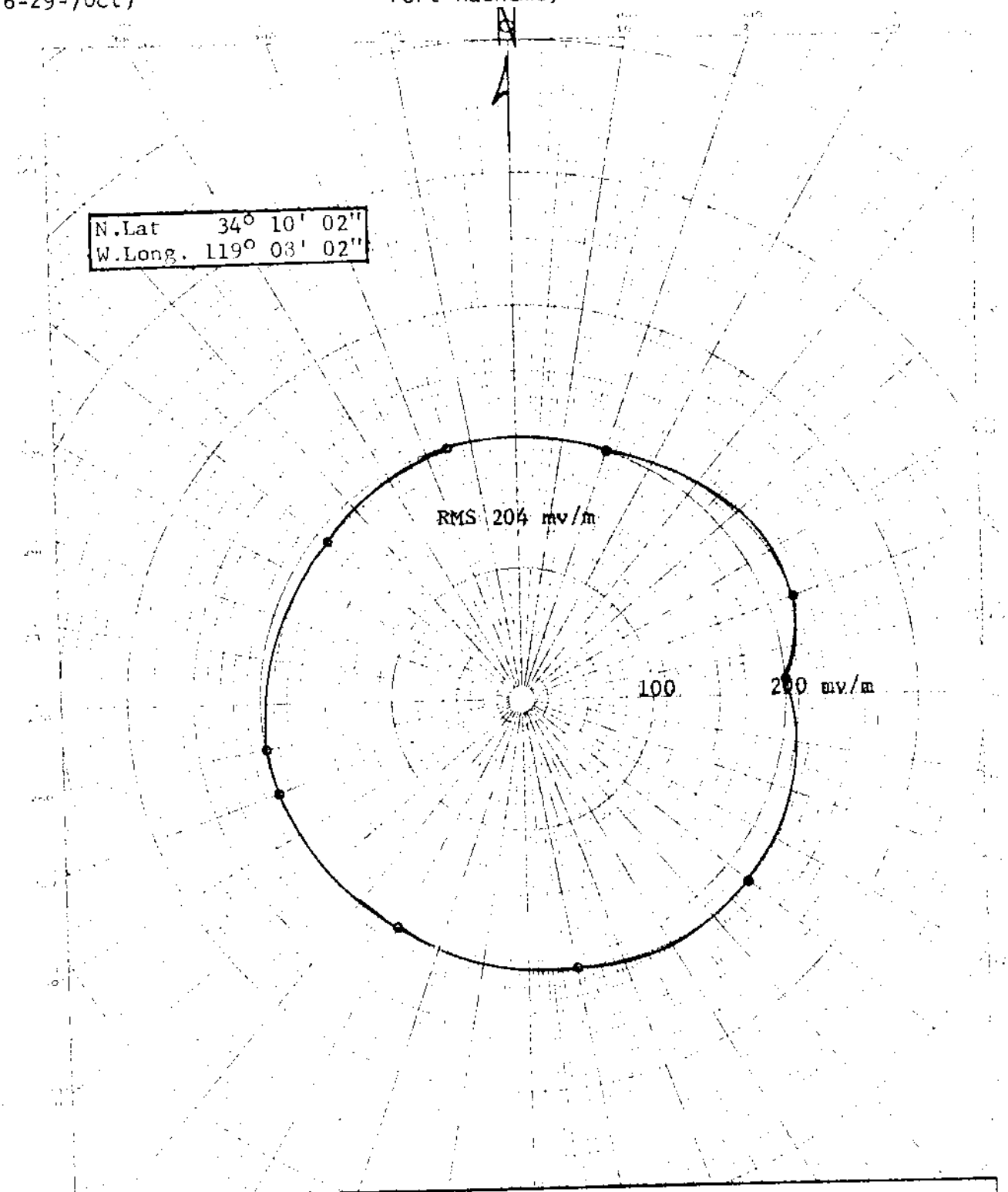


FIG. 2

MEASURED NON-DIRECTIONAL HORIZONTAL RADIATION
KACY 1520 KC PORT HUENEME, CALIF.

A.E.Towne Associates Inc., Consulting Engineers, San Carlos,California

FCC File No.BL-12623
Accepted 6-2-70

Station KACY
Port Hueneme, California

1520 kc

17304

SUPPLEMENTAL AND CORRECTED
DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KACY

Main Studio: Port Hueneme, California

Frequency: 1520 kc.

Power: 1kw Night 10kw Day

Notification List No. 948

Date: February 28, 1962 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 34° 10' 02"

West Longitude: 119° 08' 02"

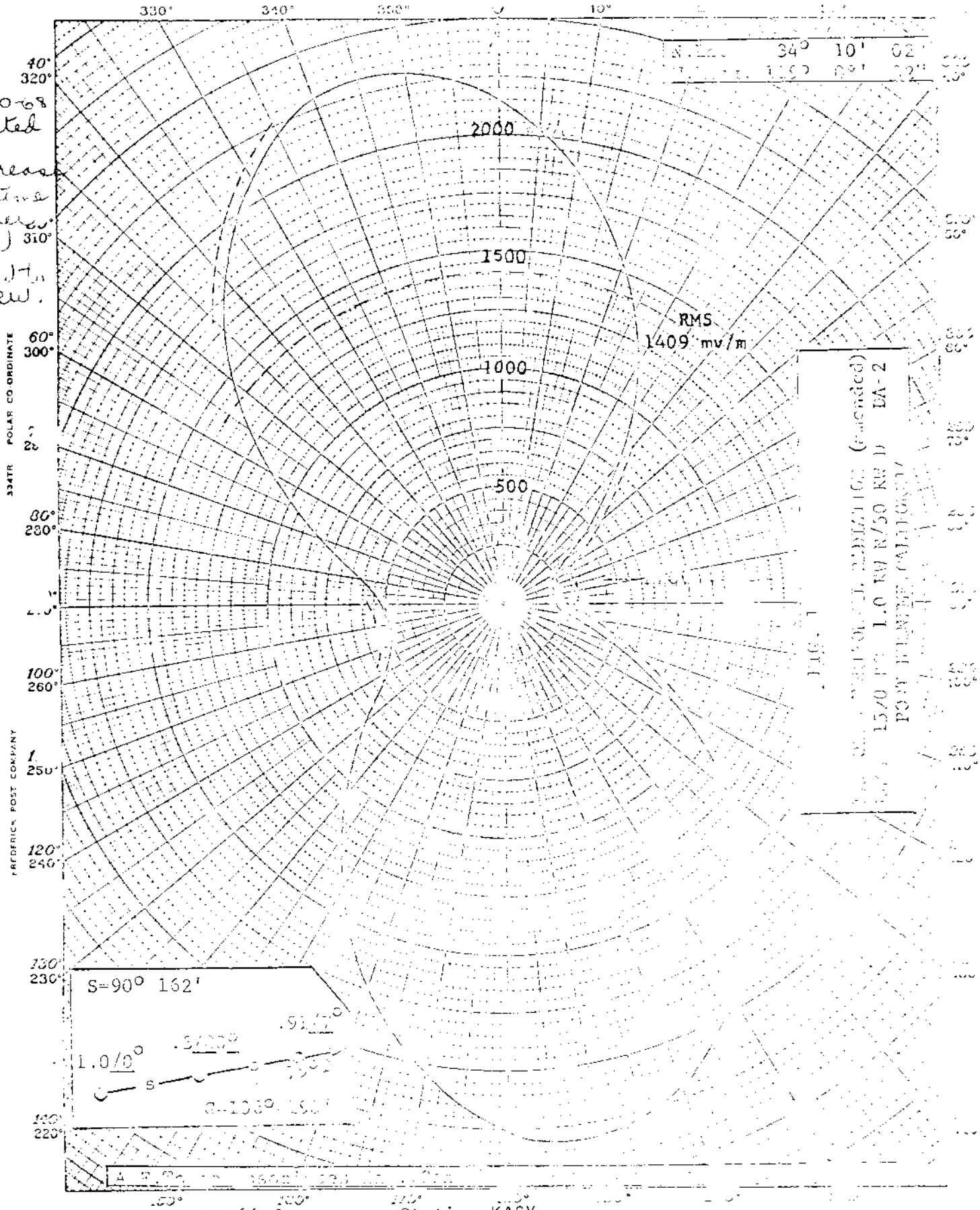
Note: Please retain the description sheet and directional antenna radiation patterns notified for Station KACY in U.S. Change List No. 934, dated November 21, 1961 and attach to this supplemental Description Sheet. This notification is for the purpose of indicating only a change in the geographical coordinates of the center of the antenna system.

KACY

Proposed Day
(10-28-67ct)

Station KACY
Port Hueneme, California

1kw,50kw-LS,DA-2,U
1520 kc



FCC File No.BP-16677
Accepted 10-25-67 Amended

Station KACY
Port Hueneme, California

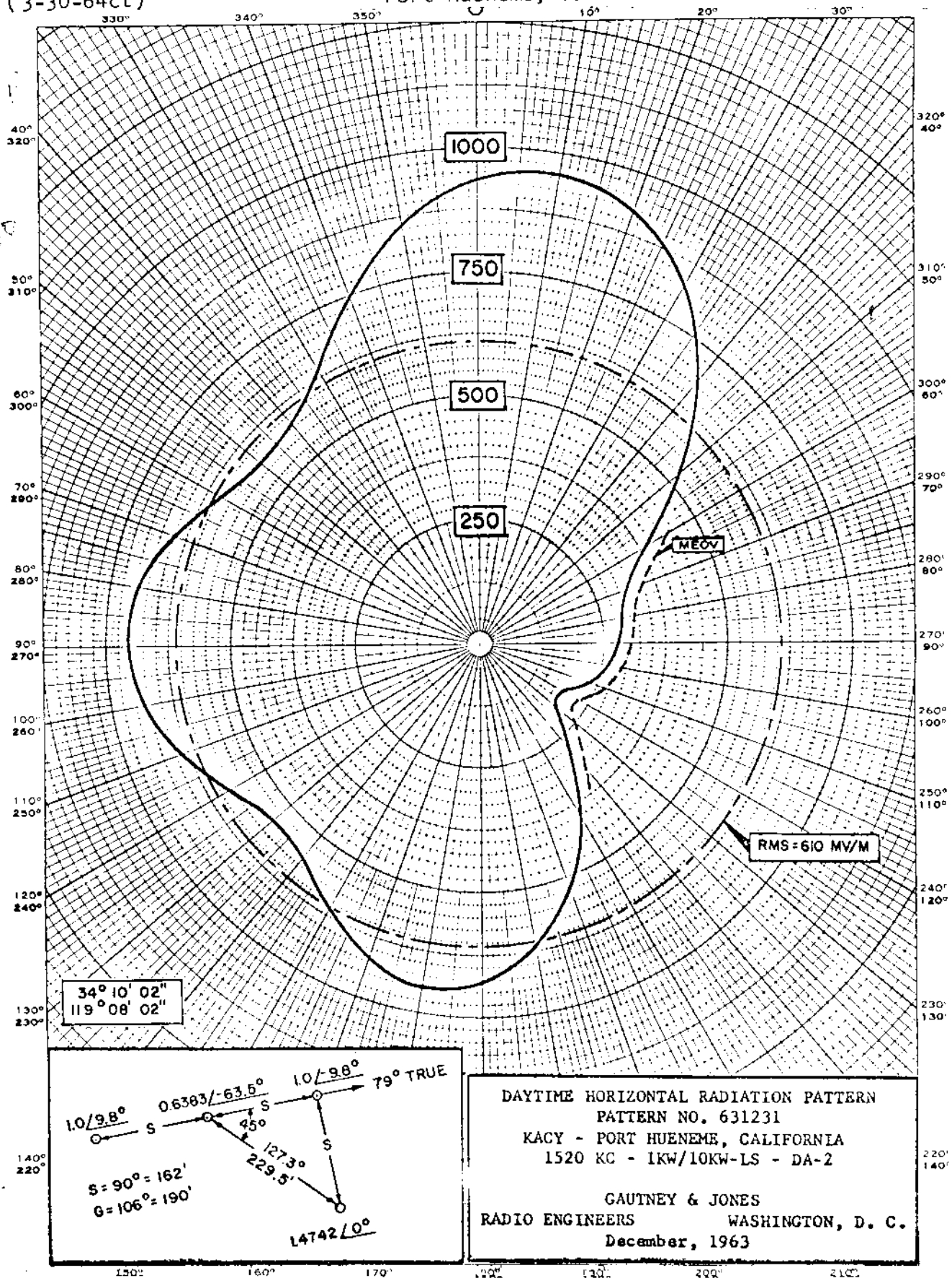
1520 kc

KACY

Proposed Day
(3-30-64ct)

Station KACY
Port Hueneme, California

1kw,10kw-LS,DA-2,U
1520kc



FCC File No. BP-16112
Accepted 3-10-64

Station KACY
Port Hueneme, California

1520

KACY

Measured Day
(12-22-64ct)

Station KACY
Port Hueneme, California

1kw,10kw-LS,DA-2,U
1520 kc

BL-10680
GRANTED
12-31-64
CHG DAY DA

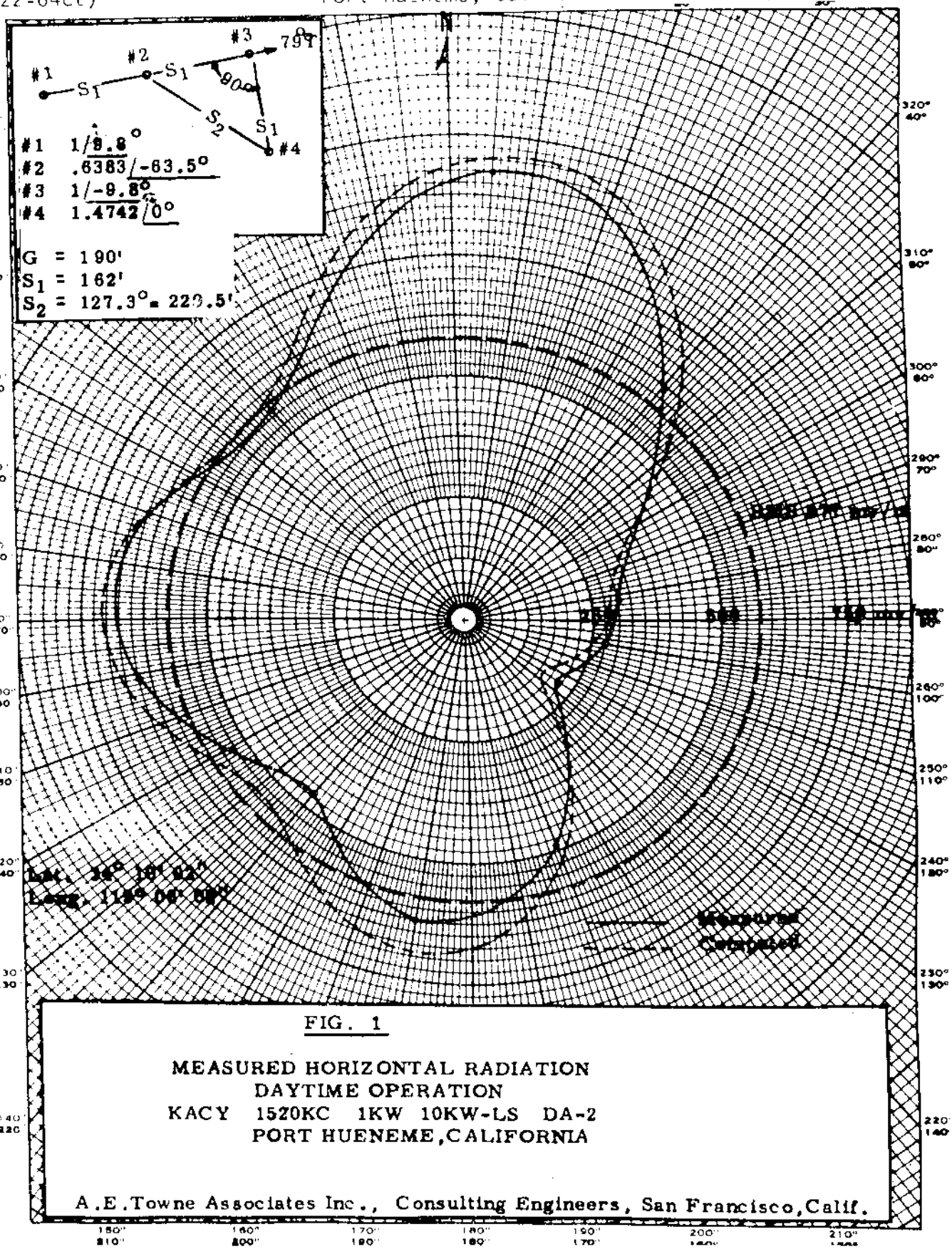


FIG. 1

MEASURED HORIZONTAL RADIATION
DAYTIME OPERATION
KACY 1520KC 1KW 10KW-LS DA-2
PORT HUENEME, CALIFORNIA

A.E.Towne Associates Inc., Consulting Engineers, San Francisco, Calif.

FCC File No. BL-10680
Accepted 11-25-64

Station KACY
Port Hueneme, California

1520 kc

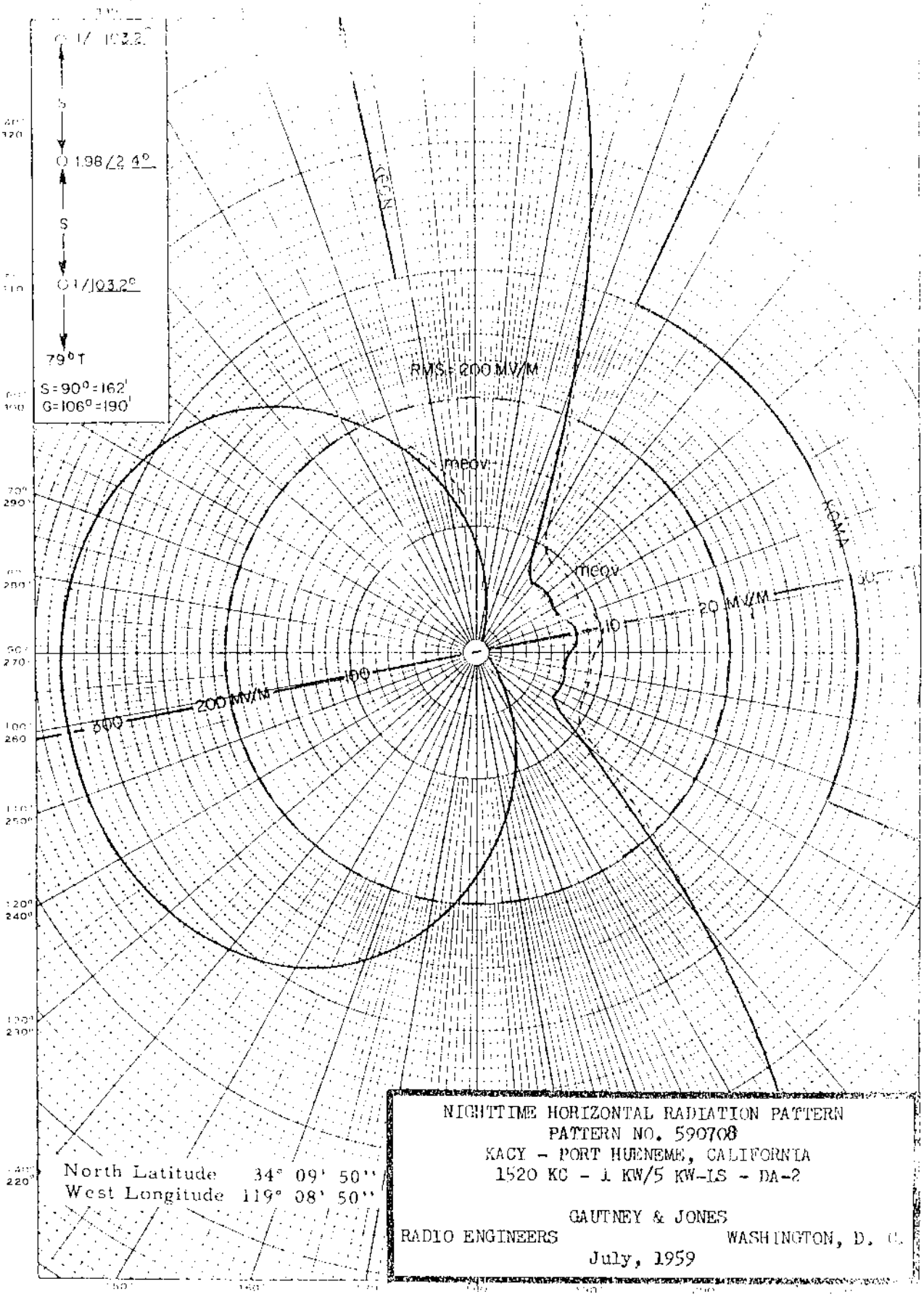
KACY

PROPOSED NIGHT
(2-26-60g)

Station KACY
Port Hueneme, California

1kw, 5kw-LS, DA-2,U
1520 KC

11-21-61 granted cp for DA-2



BP 13824, Mod Lic No Illegal to change DA patterns 4-18-60

FCC File No. BP-13824
Accepted 2-2-60 (BP-13378 Amended)

KACY
Port Hueneme, California

1520 KC

KACY

Measured Night
(2-26-63ct)

Station KACY
Port Hueneme, California

1kw,10kw-LS,DA-2,U
1520 kc

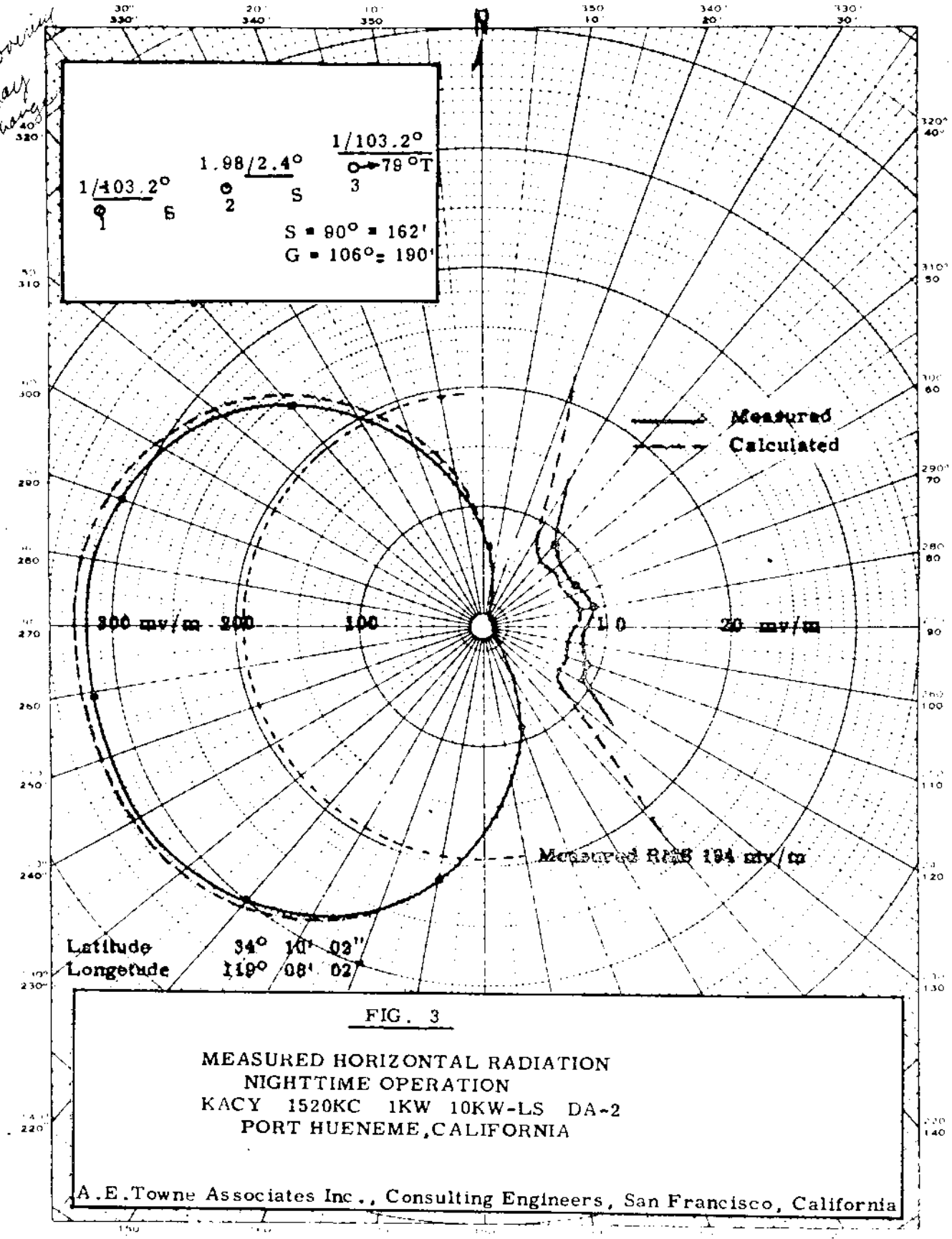


FIG. 3

MEASURED HORIZONTAL RADIATION
NIGHTTIME OPERATION
KACY 1520KC 1KW 10KW-LS DA-2
PORT HUENEME, CALIFORNIA

A.E.Towne Associates Inc., Consulting Engineers, San Francisco, California

FCC File No.BL-9717
Accepted 1-30-63

Station KACY
Port Hueneme, California

1520 kc

KMPL

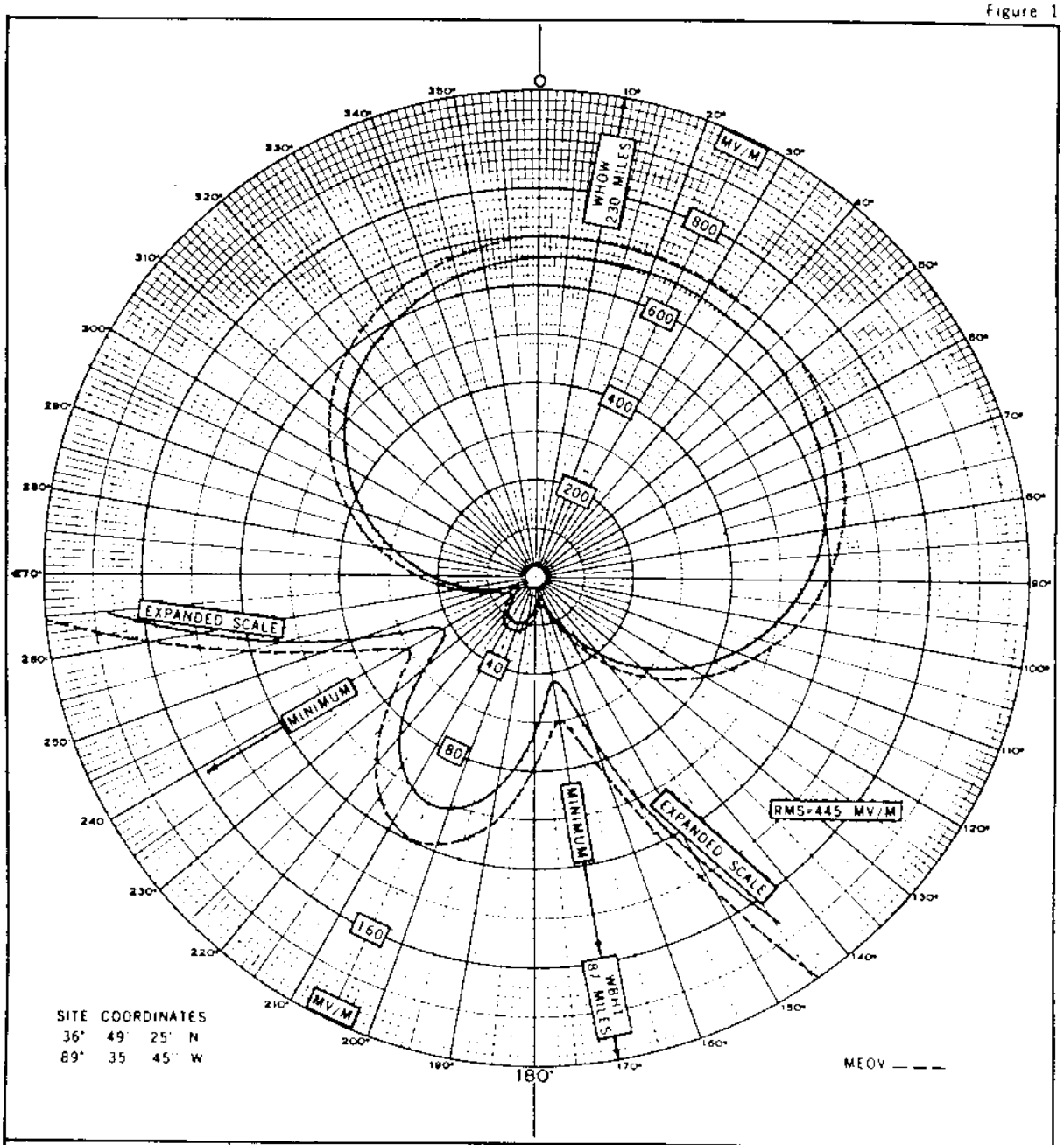
Proposed Day (Non-CH)
(2-28-66ct)

Station KMPL
Sikeston, Missouri

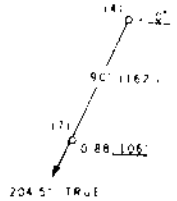
500w,5kw-LS,DA-3,U
1520 kc

Figure 1

ICP 2-9-66



PROPOSED DAYTIME HORIZONTAL PLANE RADIATION PATTERN

G=111' 	SEMO BROADCASTING CORPORATION SIKESTON, MISSOURI	RADIO STATION KMPL 1520 KC/S
	Jules Cohen & Associates Consulting Electronics Engineers	0.5 KW-N 5 KW-CH 5 KW-D U DA 3 OCTOBER 1965

FCC File No.BMP-11693
Accepted 2-8-66

Station KMPL
Sikeston, Missouri

1520 kc

KMPL

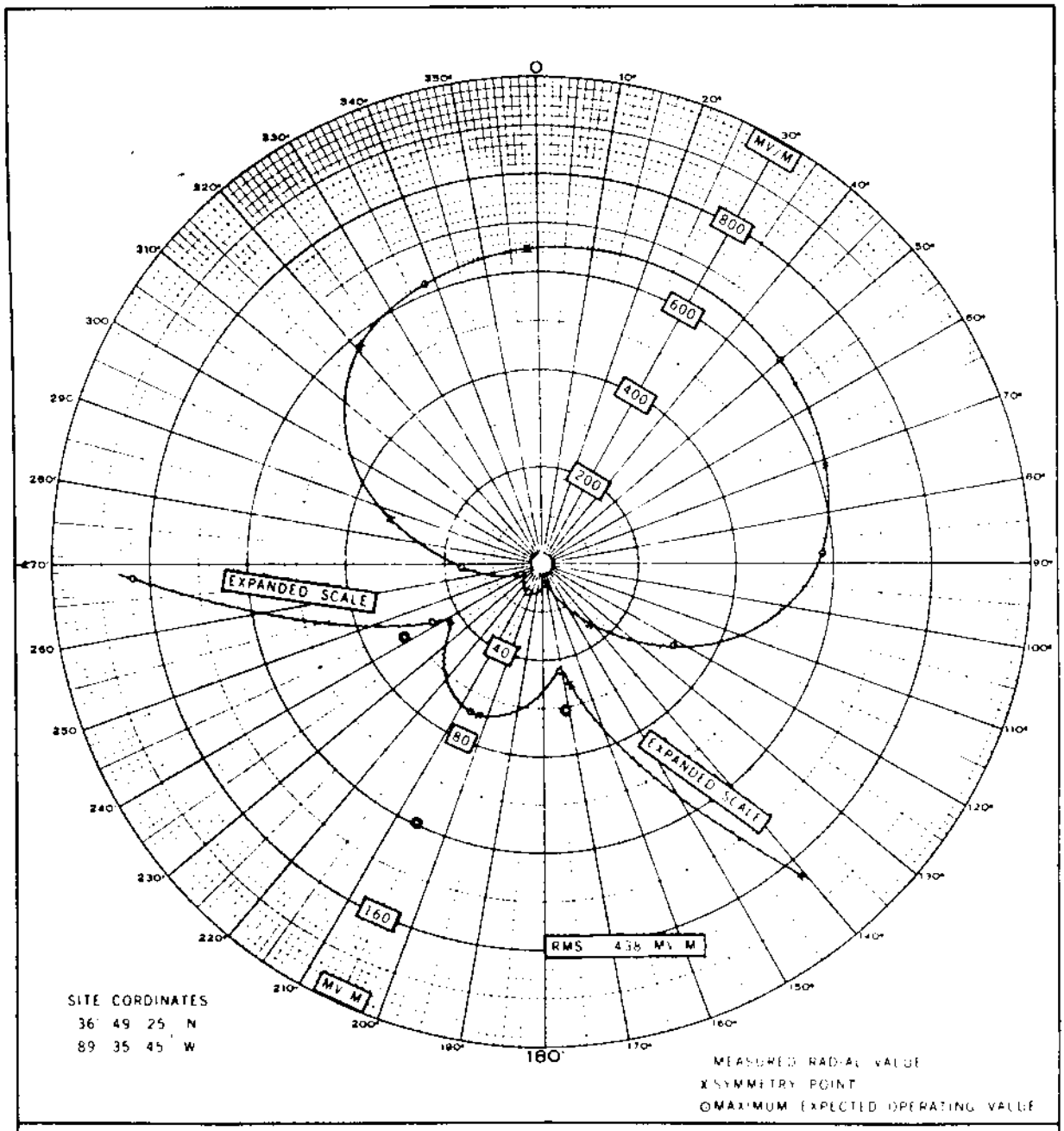
Measured Day
(5-27-66ct)

Station KMPL
Sikeston, Missouri

500w,5kw-LS,DA-3,U
1520 kc

Figure 10

LIC 10-4-66



MEASURED DAYTIME HORIZONTAL PLANE RADIATION PATTERN

G=111° (200)	SEMO BROADCASTING CORPORATION SIKESTON MISSOURI	RADIO STATION KMPL 1520 KC/S
	Jules Cohen & Associates Consulting Electronics Engineers	0.5 KW N 5 KW CH 5 KW D U DA 3 660228 D

FCC File No. BL-11259
Accepted 4-26-66

Station KMPL
Sikeston, Missouri

1520 kc

KMPL

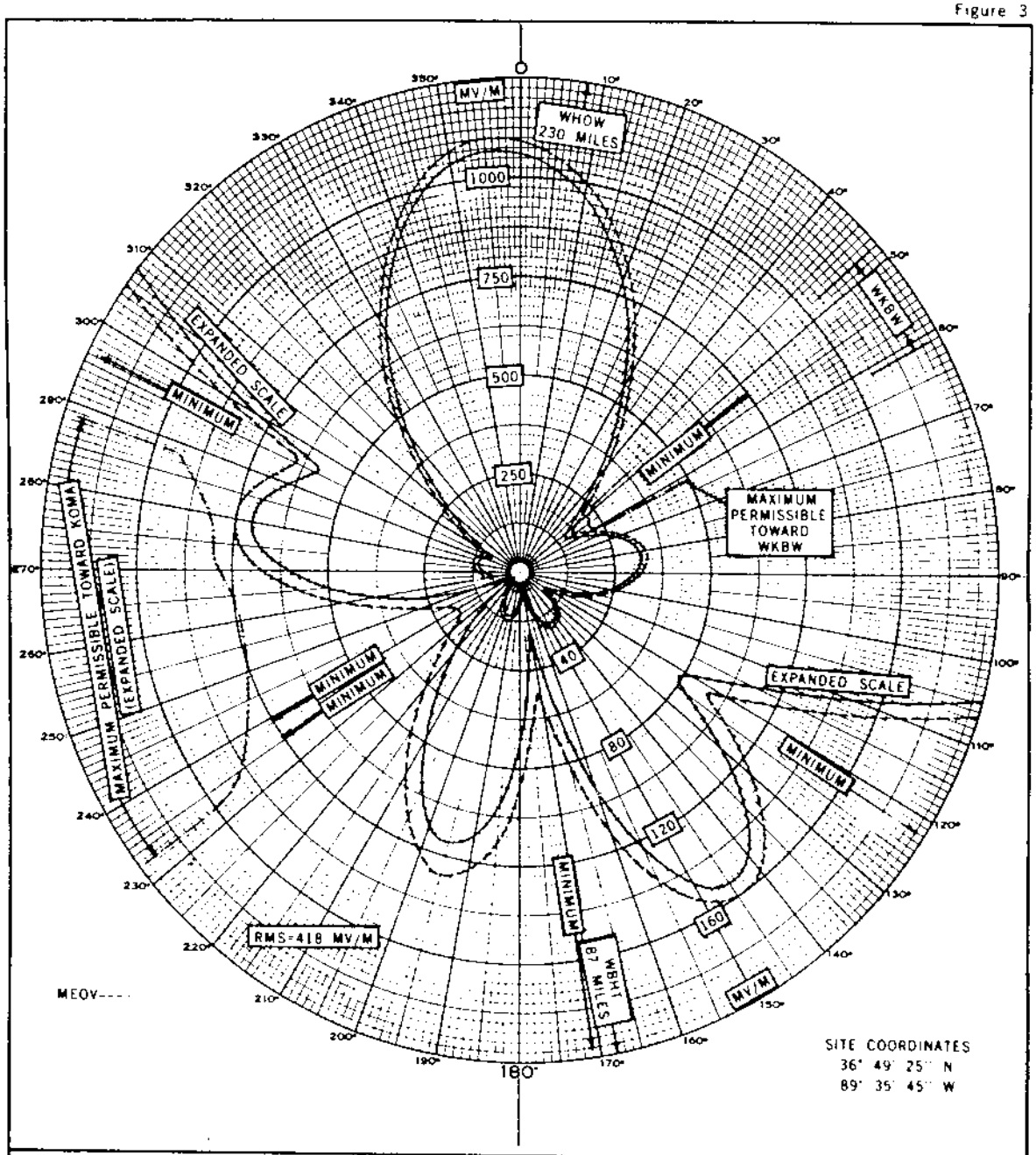
Proposed Day (CH)
(2-28-66ct)

Station KMPL
Sikeston, Missouri

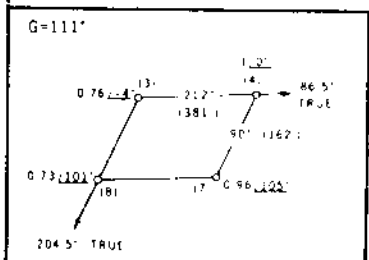
500w,5kw-LS,DA-3,U
1520 kc

MCP-2-9-66

Figure 3



PROPOSED CRITICAL HOURS HORIZONTAL PLANE RADIATION PATTERN



SEMO BROADCASTING CORPORATION
SIKESTON, MISSOURI

Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION KMPL
1520 KC/S
0.5 KW N 5 KW CH
5 KW-D U DA-3
OCTOBER 1965

FCC File No.BMP-11693
Accepted 2-8-66

Station KMPL
Sikeston, Missouri

1520 kc

KMPL

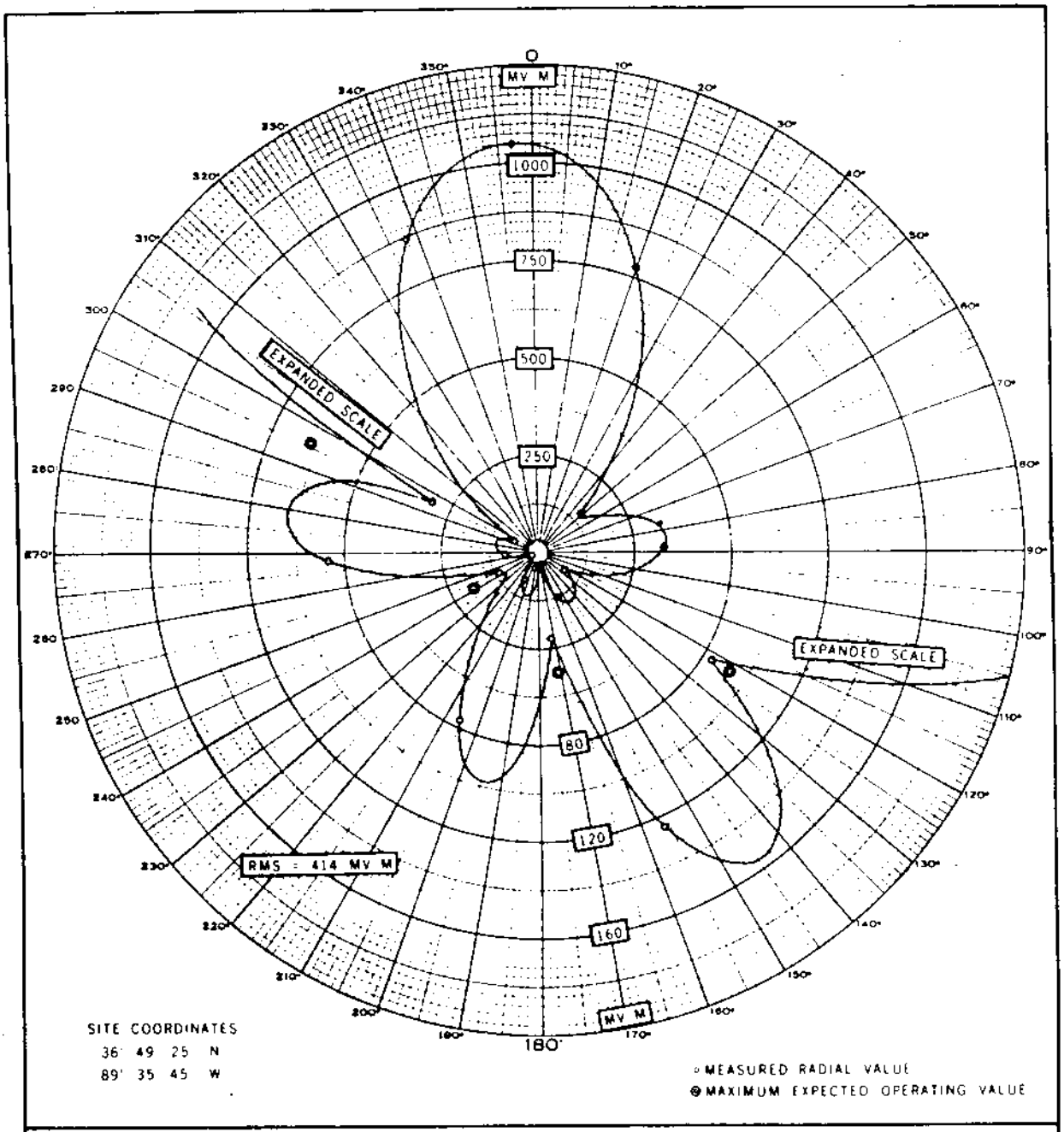
Measured Day (CH)
(5-27-66ct)

Station KMPL
Sikeston, Missouri

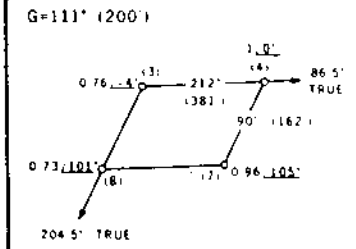
500w,5kw-LS,DA-3,U
1520 kc

Figure 12

LIC 10-4-66



MEASURED CRITICAL HOURS HORIZONTAL PLANE RADIATION PATTERN



SEMO BROADCASTING CORPORATION
SIKESTON, MISSOURI

Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION KMPL
1520 KC/S
0.5 KW-N 5 KW-CH
5 KW-D U DA 3
660228 CH

FCC File No. BL-11259
Accepted 4-26-66

Station KMPL
Sikeston, Missouri

1520 kc

KMPL

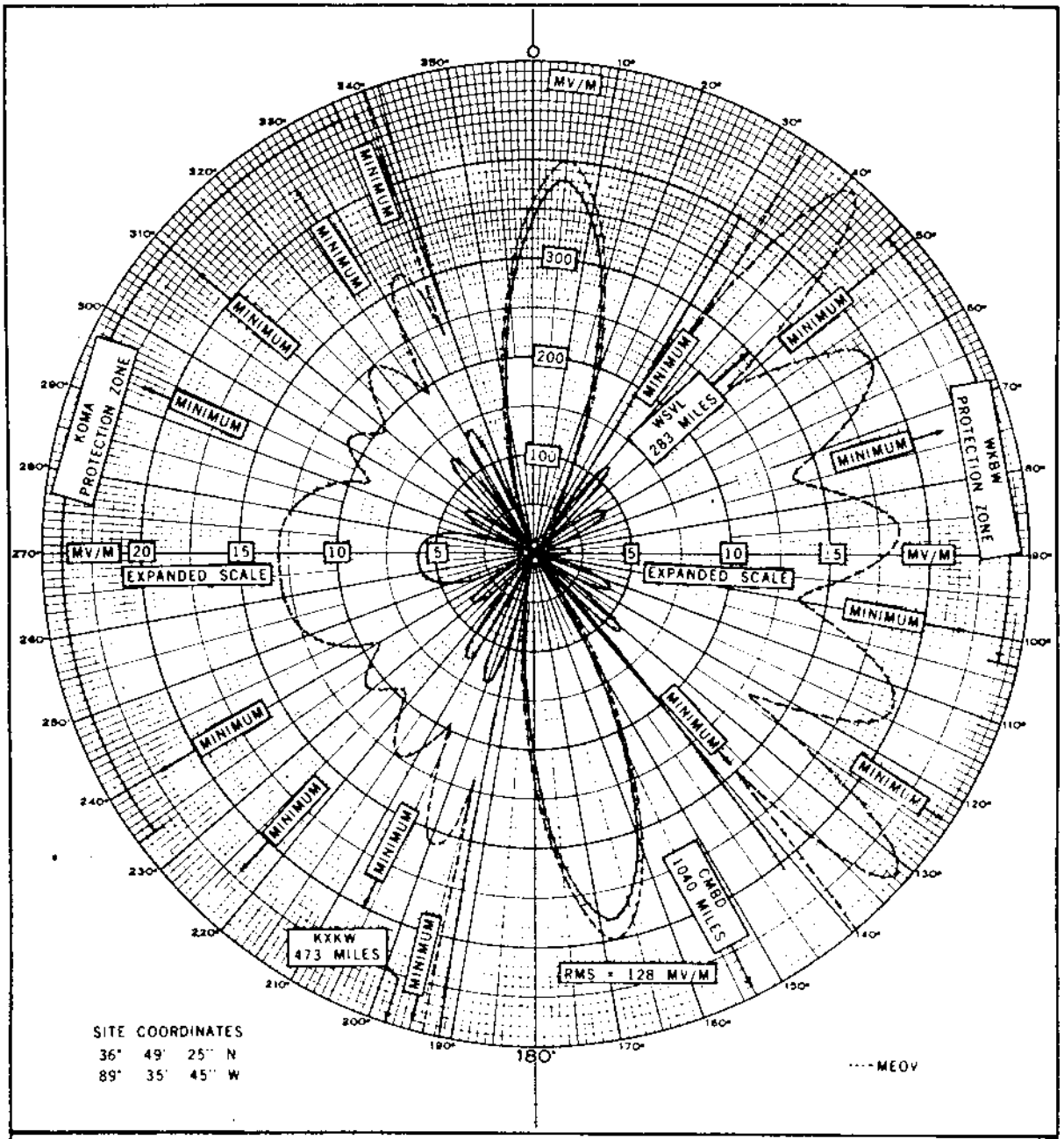
Proposed Night
(2-28-66ct)

Station KMPL
Sikeston, Missouri

500w,5kw-LS,DA-3,U
1520 kc

Figure 5
Sheet 1 of 14

MCP 2-9-66



PROPOSED NIGHTTIME HORIZONTAL PLANE RADIATION PATTERN

(1) (2) (3) (4) (5) (6) 86.5' Tiue

	Field Ratio	Phase
(1)	1.00	+78.7°
(2)	2.84	+48.3°
(3)	4.40	+16.0°
(4)	4.40	-16.0°
(5)	2.84	-48.3°
(6)	1.00	-78.7°

G=111° (200')
S=212° (381')

SEMO BROADCASTING CORPORATION
SIKESTON, MISSOURI

Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION KMPL
1520 KC/S
0.5 KW N 5 KW CH
5 KW D U DA 3
OCTOBER 1965

FCC File No.BMP-11693
Accepted 2-8-66

Station KMPL
Sikeston, Missouri

1520 kc

KMPL

Proposed Night Nulls
(2-28-66ct)

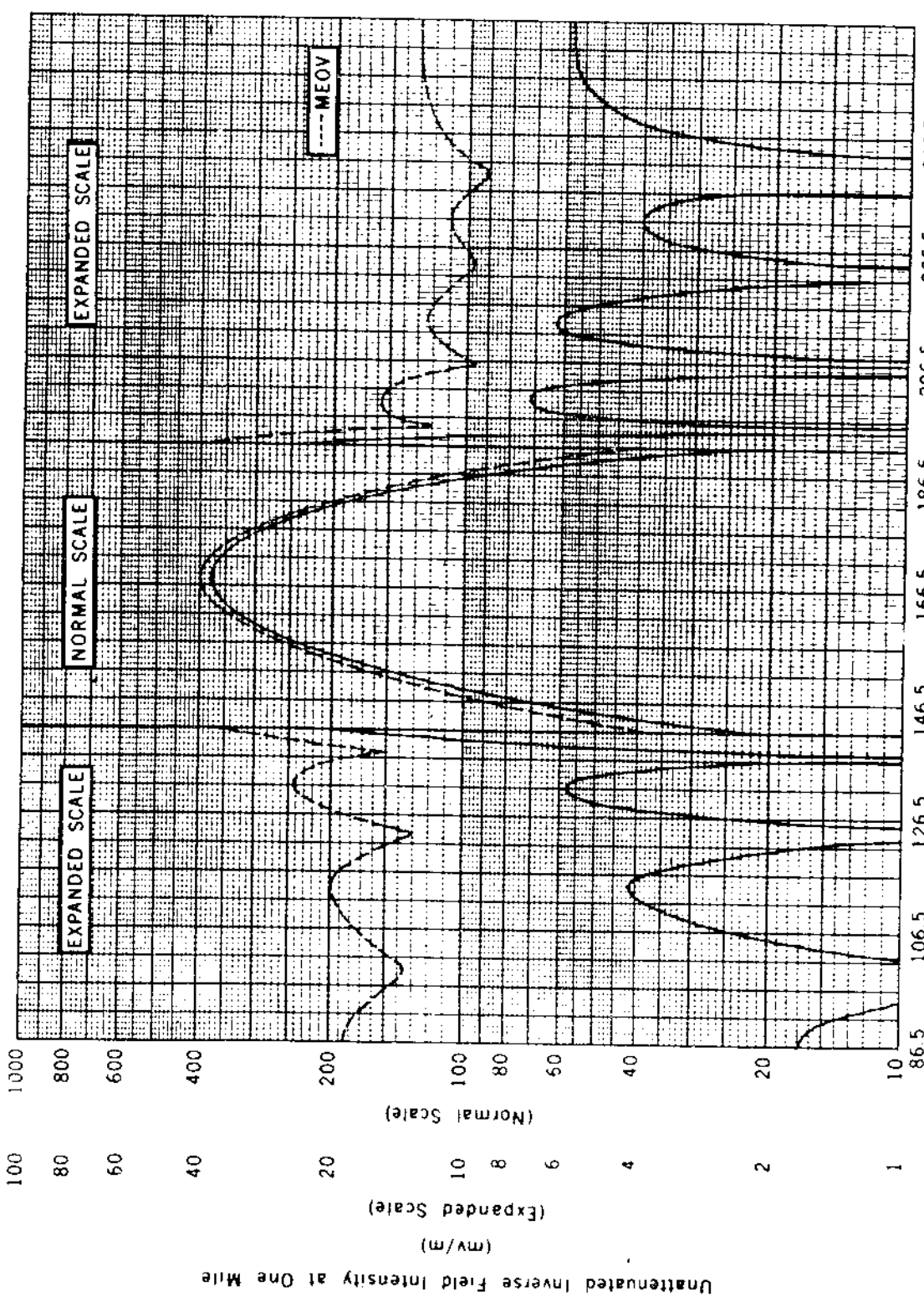
Station KMPL
Sikeston, Missouri

500w,5kw-LS,DA-3,U
1520 kc

Figure 5

Sheet 2 of 14

MCP 2-9-66



FCC File No.BMP-11693
Accepted 2-8-66

Station KMPL
Sikeston, Mossouri

1520 kc

KMPL

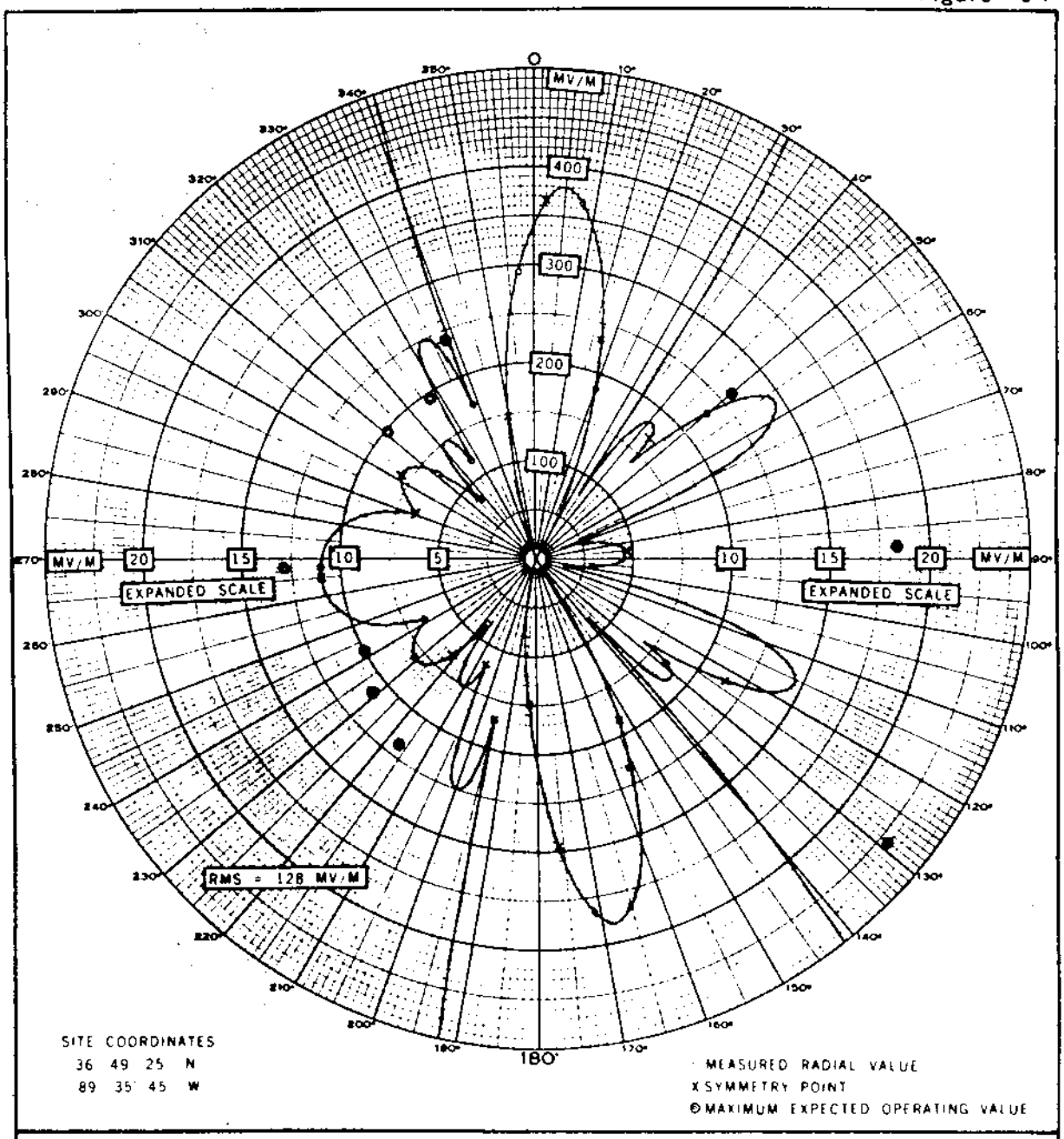
Measured Night
(5-27-66ct)

Station KMPL
Sikeston, Missouri

500w,5kw-LS,DA-3,U
1520 kc

Figure 14

LIC 10-4-66



MEASURED NIGHTTIME HORIZONTAL PLANE RADIATION PATTERN

(1) (2) (3) (4) (5) (6) 86.5° True

	Field Ratio	Phase
(1)	1.00	+78.7
(2)	2.84	-48.3°
(3)	4.40	-16.0°
(4)	4.40	-16.0°
(5)	2.84	-48.3°
(6)	1.00	78.7°

G=111° (200)
S=212° (381)

SEMO BROADCASTING CORPORATION
SIKESTON MISSOURI

Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION KMPL
1520 KC/S
0.5 KW N 5 KW CH
5 KW D U DA 3
660228 N

FCC File No. BL-11259
Accepted 4-26-66

Station KMPL
Sikeston, Missouri

1520 kc

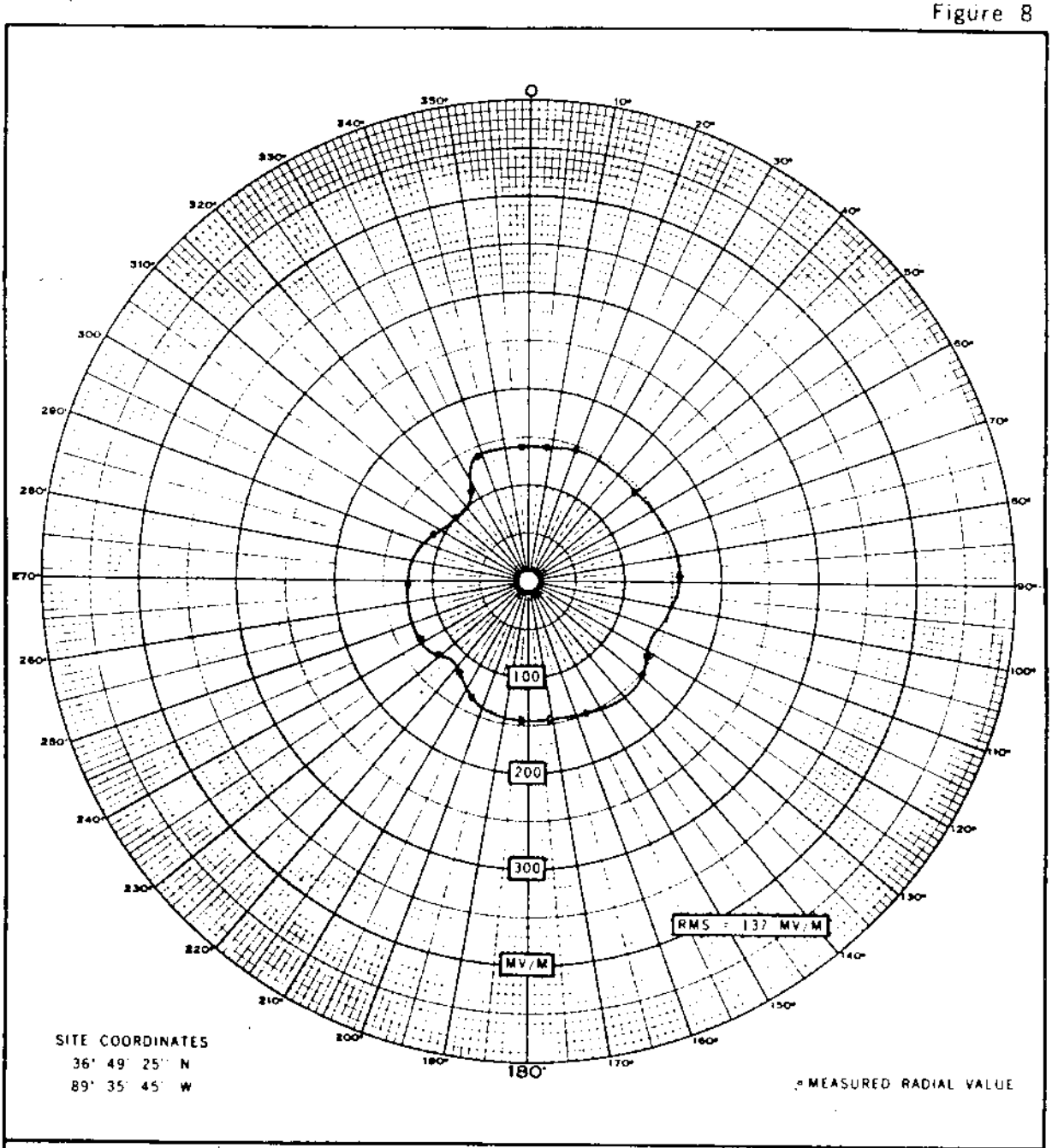
KMPL

Measured Non-DA
(5-27-66ct)

Station KMPL
Sikeston, Missouri

500w,5kw-LS,DA-3,U
1520 kc
Figure 8

LIC 10-4-66



MEASURED NONDIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN
(0.5 KW)

(4) 1/0	SEMO BROADCASTING CORPORATION SIKESTON, MISSOURI	RADIO STATION KMPL 1520 KC/S 0.5 KW N 5 KW CH 5 KW D U DA 3 Pattern 660228 ND
G = 111 (200')	[illegible]	

FCC File No.BL-11259
Accepted 4-26-66

Station KMPL
Sikeston, Missouri

1520 kc

OKLAHOMA CITY, OKLAHOMA KOMA

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KOMA

Main Studio: Oklahoma City, Oklahoma

Frequency: 1520 kHz

Power: 50 kw

Notification List No. 1446

Date: October 14, 1971

Class: 1-B

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 35° 20' 00"
West Longitude: 97° 30' 16"

ANTENNA CHARACTERISTICS

Authorized for Nighttime operation. (DA-N)
Number of elements: 3
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	NW(#1)	C(#2)	SE(#3)	
HEIGHT ABOVE INSULATORS:	325'	325'	325'	(181°)
PHASING:	-119.5°	0°	+114.5°	
FIELD RATIO:	0.510	1	0.510	

SPACING AND ORIENTATION: Adjacent elements are spaced 162' (90°) on a line bearing 114.3° true.

GROUND SYSTEM: 120 - 259' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

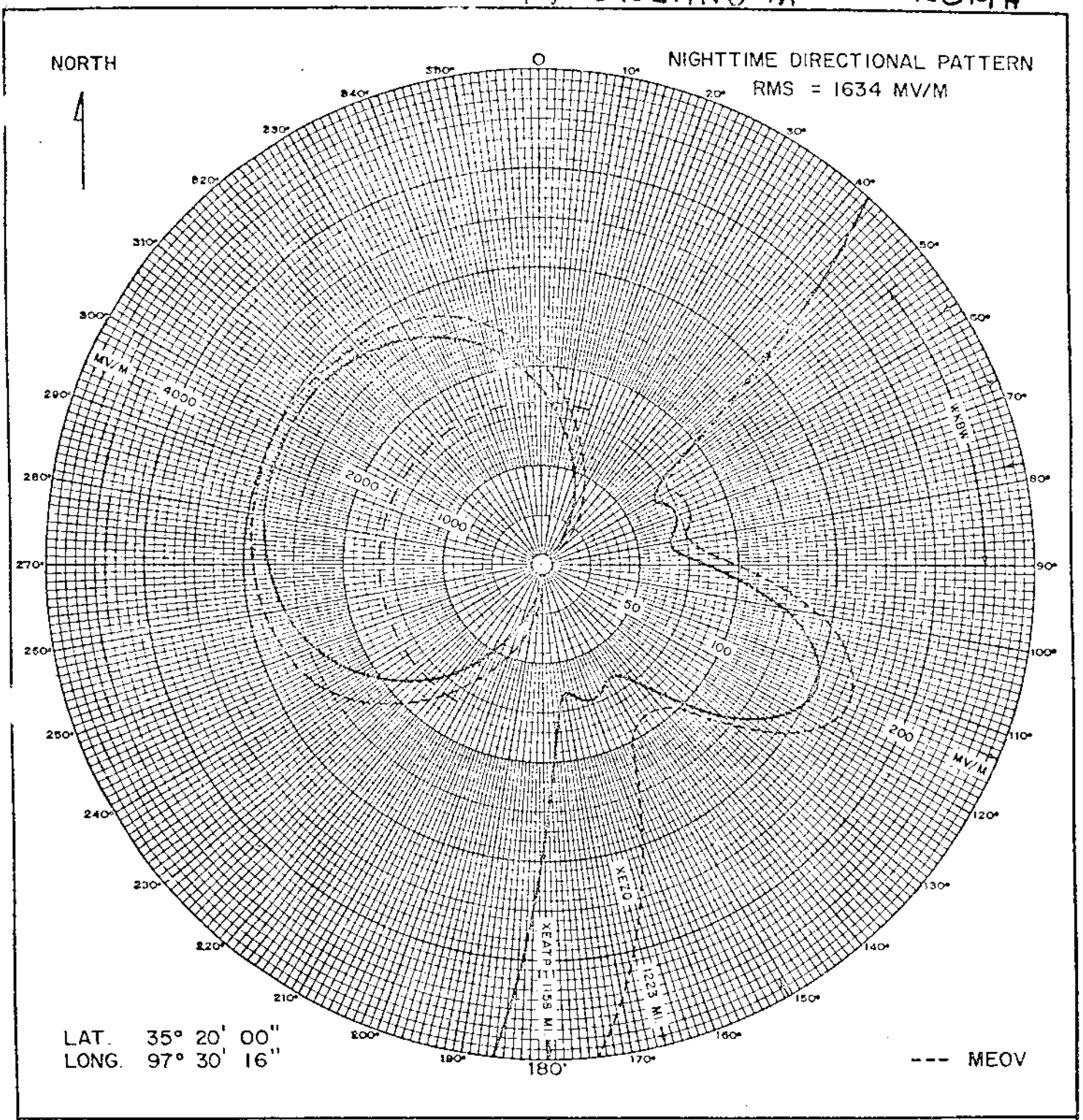
Predicted effective Night Field: 1634 mv/m at rated power.

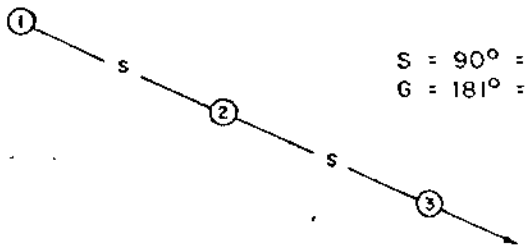
Predicted effective Day Field: (omnidirectional) 1682 mv/m at rated power.

Note: This notification concerns only a change in meovs of radiation in the directional antenna radiation pattern.

CTR NO 31208A4

OKLAHOMA CITY, OKLAHOMA KOMA





S = 90° = 162'
G = 181° = 325'

THEORETICAL PARAMETERS

TOWER	FIELD	PHASE
1	.510	-119.5°
2	1.000	0.0°
3	.510	+114.5°

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

RADIO STATION KOMA
1520 KC 50 KW DA-N

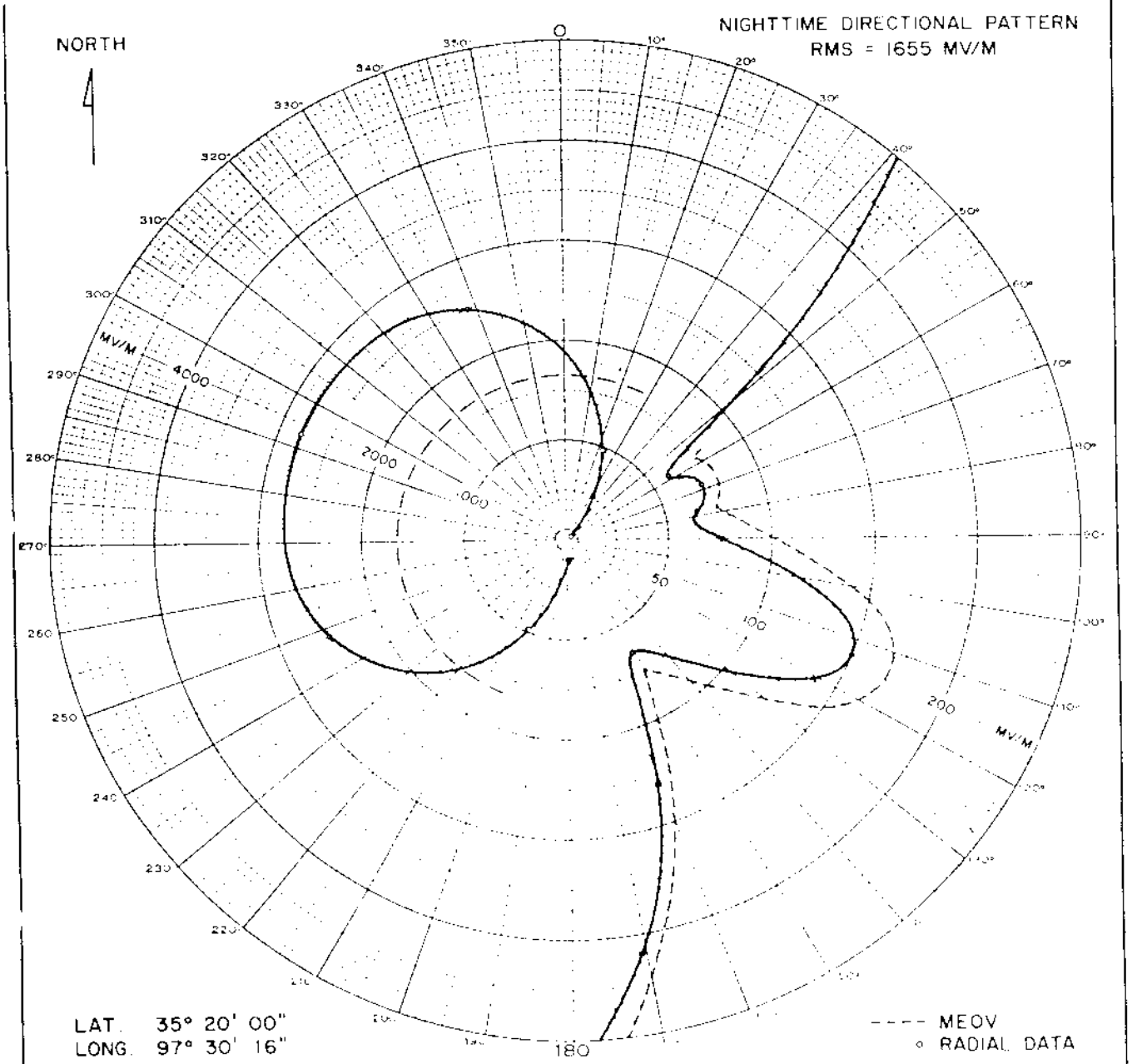
KOMA

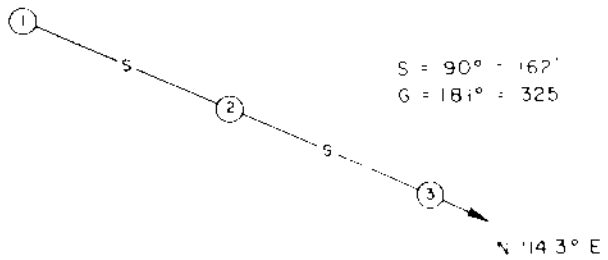
Measured Night
(6-28-66ct)

Station KOMA
Oklahoma City, Oklahoma

50kw, DA-N, U
1520 kc

BL 11315
ICB-2-66





ANTENNA PARAMETERS

TOWER	THEORETICAL FIELD RATIO	THEORETICAL PHASE	OBSERVED FIELD RATIO	OBSERVED PHASE
1	5.0	-119.5°	483	-115.5°
2	1.000	0.0°	1.000	0.0°
3	510	+114.5°	483	+108.5°

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

RADIO STATION KOMA
1520 KC 50 KW DA-N
651120 FIGURE 2B

FCC File No. BL-11315
Accepted 6-16-66

Station KOMA
Oklahoma City, Oklahoma

1520 kc

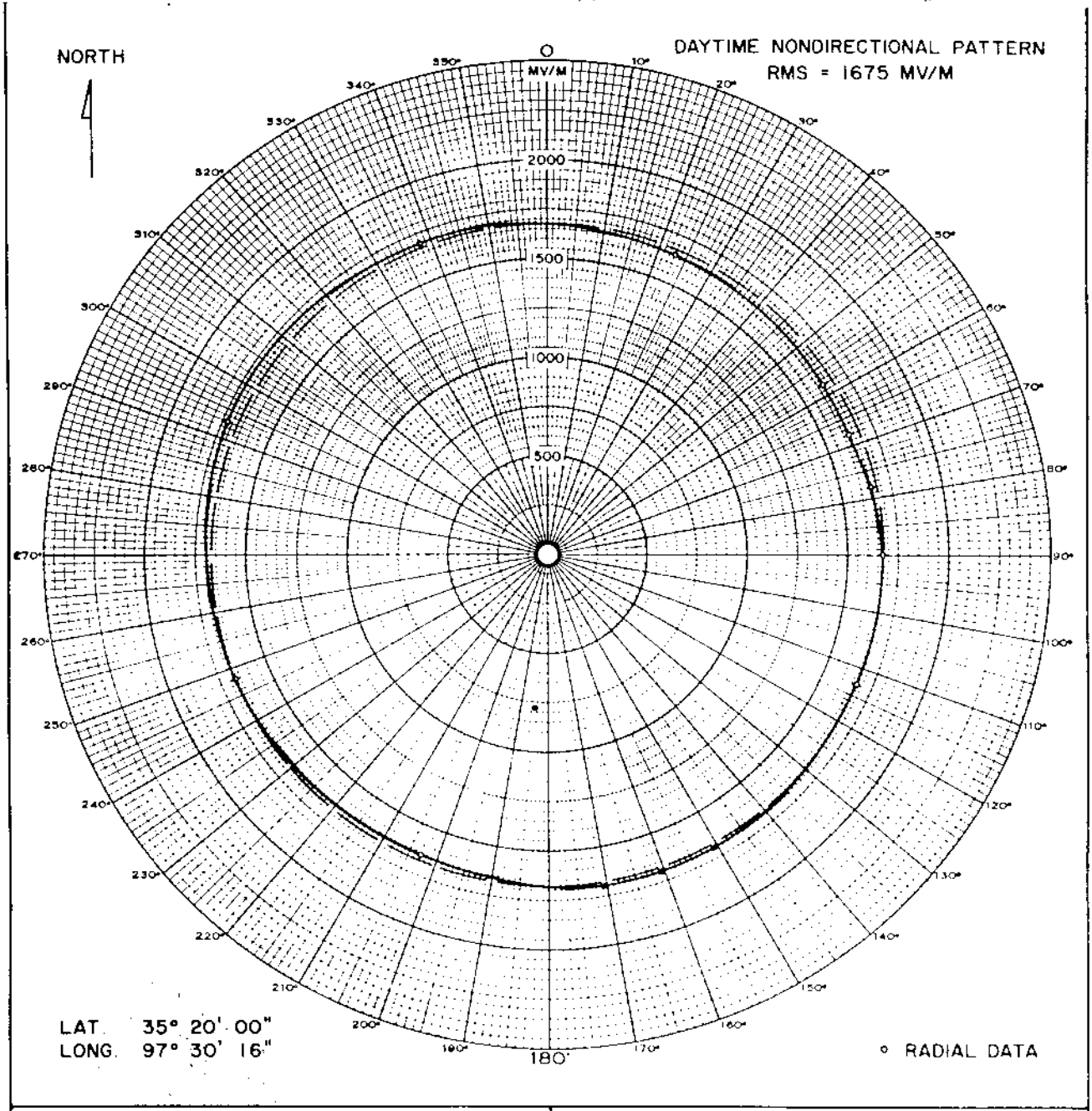
KOMA

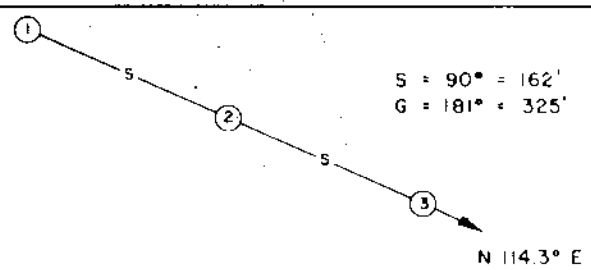
Measured Non-DA
(6-28-66ct)

Station KOMA
Oklahoma City, Oklahoma

50kw, DA-N, U
1520 kc

BL-11315
-1C 8-2-66





ANTENNA PARAMETERS

TOWER	OPERATION
1	DETUNED
2	SERIES FED
3	DETUNED

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

RADIO STATION KOMA
1520 KC 50 KW DA-N
651120.A FIGURE 2A

FCC File No. BL-11315
Accepted 6-16-66

Station KOMA
Oklahoma City, Oklahoma

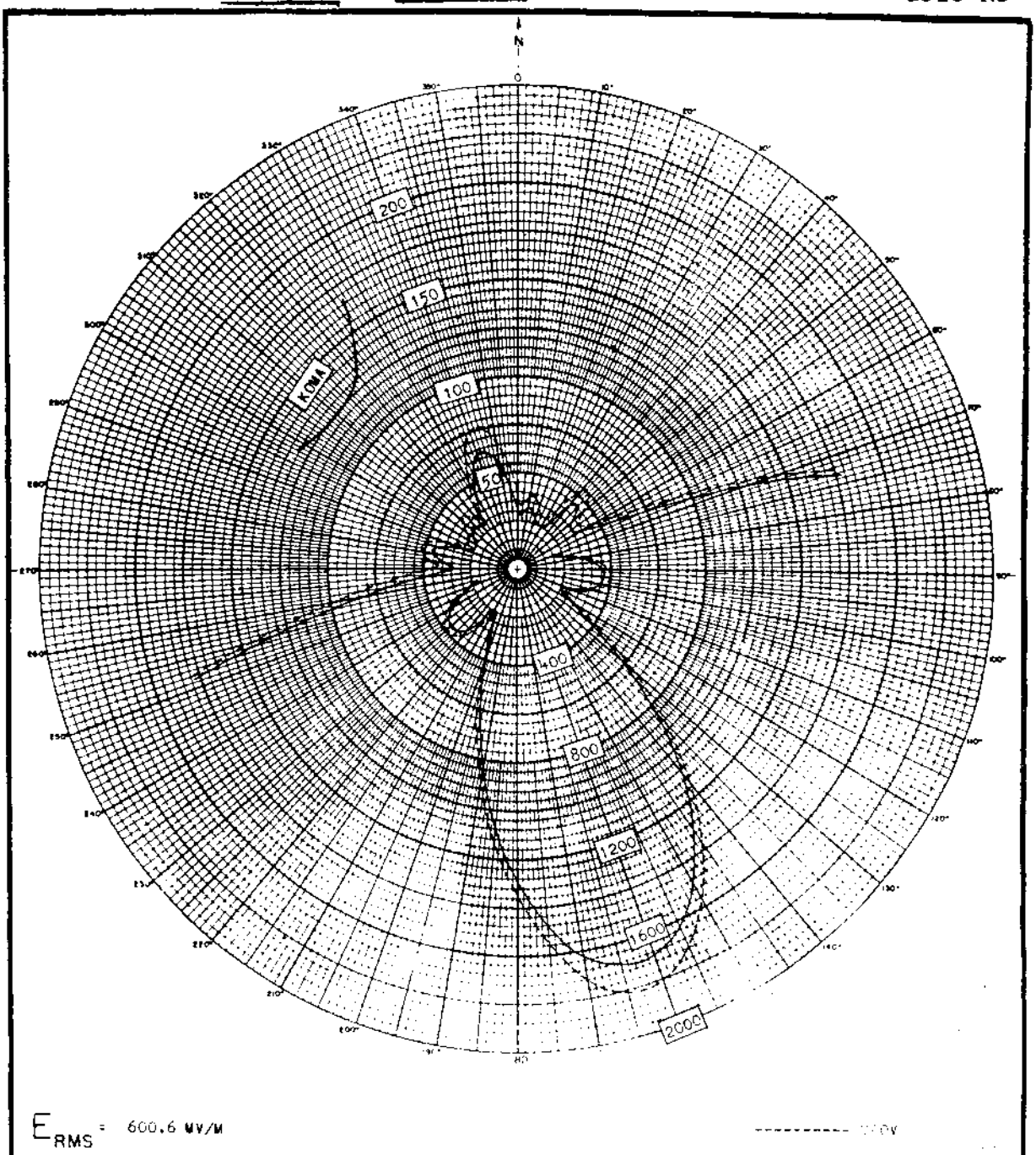
1520 kc

KXKW

PROPOSED DAY (8-29-60g)

New; General Communications, Inc. 500w, 10kw-CR, DA-D, U
Lafayette, Louisiana 1520 KC

12/28/62 granted cp for increase in day power and DA-2 (day DA for CH)

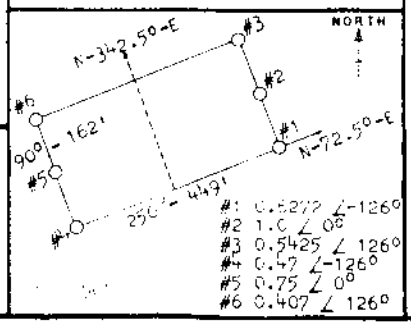


LATITUDE: 30° 16' 51"

LONGITUDE 92° 00' 53"

JOHN H. MULLANEY
CONSULTING RADIO ENGINEER
WASHINGTON, D.C.

ANTENNA PARAMETERS



#1 0.5272 ∠-126°
#2 1.0 ∠ 0°
#3 0.5425 ∠ 126°
#4 0.47 ∠-126°
#5 0.75 ∠ 0°
#6 0.407 ∠ 126°

FIGURE 4

HORIZONTAL POLAR PATTERN
(CRITICAL HOURS)

GENERAL COMMUNICATIONS, INC.

1520 KC

0.5 KW-N, DA
10 KW-CH, DA
10 KW-N-DA, DAY, U

FCC File No. BMP-9060
Accepted 8-8-60

General Communications, Incorporated
Lafayette, Louisiana 1520 KC

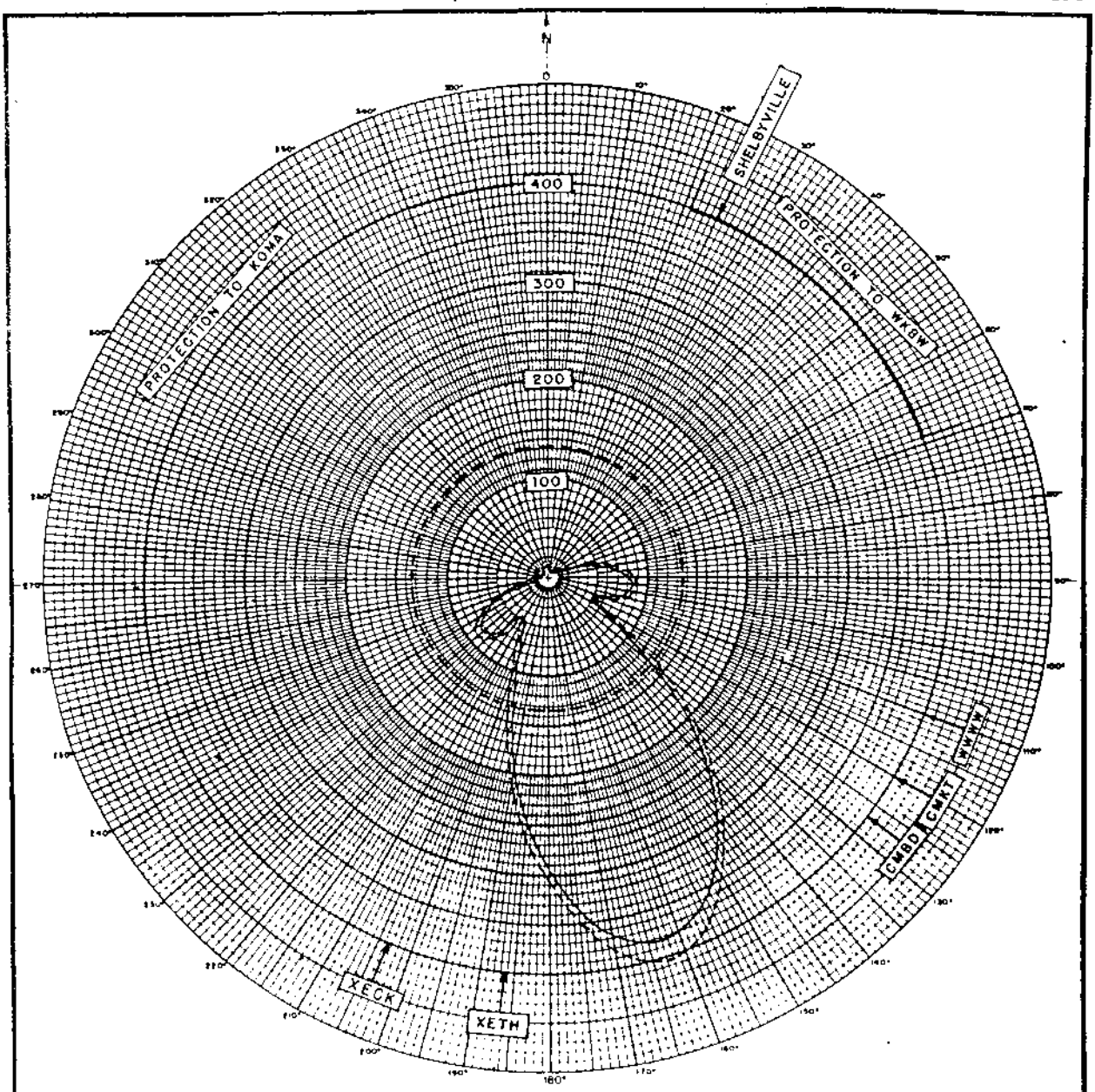
Lafayette, Louisiana

KXKW

PROPOSED DAY & NIGHT (5-28-59g)

New; General Communications, Inc.
Lafayette, Louisiana

500w, DA-1,U
1520 KC



E_{RMS} = 134.3 MV/M

---- MEOV

LATITUDE: 30° 16' 51"

LONGITUDE: 92° 00' 53"

ANTENNA PARAMETERS

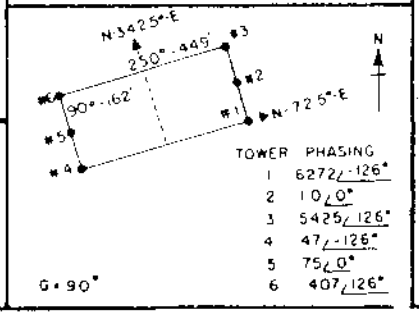


FIGURE 4

PLOT OF HORIZONTAL POLAR PATTERN

GENERAL COMMUNICATIONS INC
LAFAYETTE, LA.

1520KC 0.5 KW-DA-1,U

JOHN H. MULLANEY
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

Finished Pfir and station 0 22 60

FCC File No. BP-12244
Accepted 5-4-59 (Amended)

General Communications, Incorporated
Lafayette, Louisiana

1520 KC

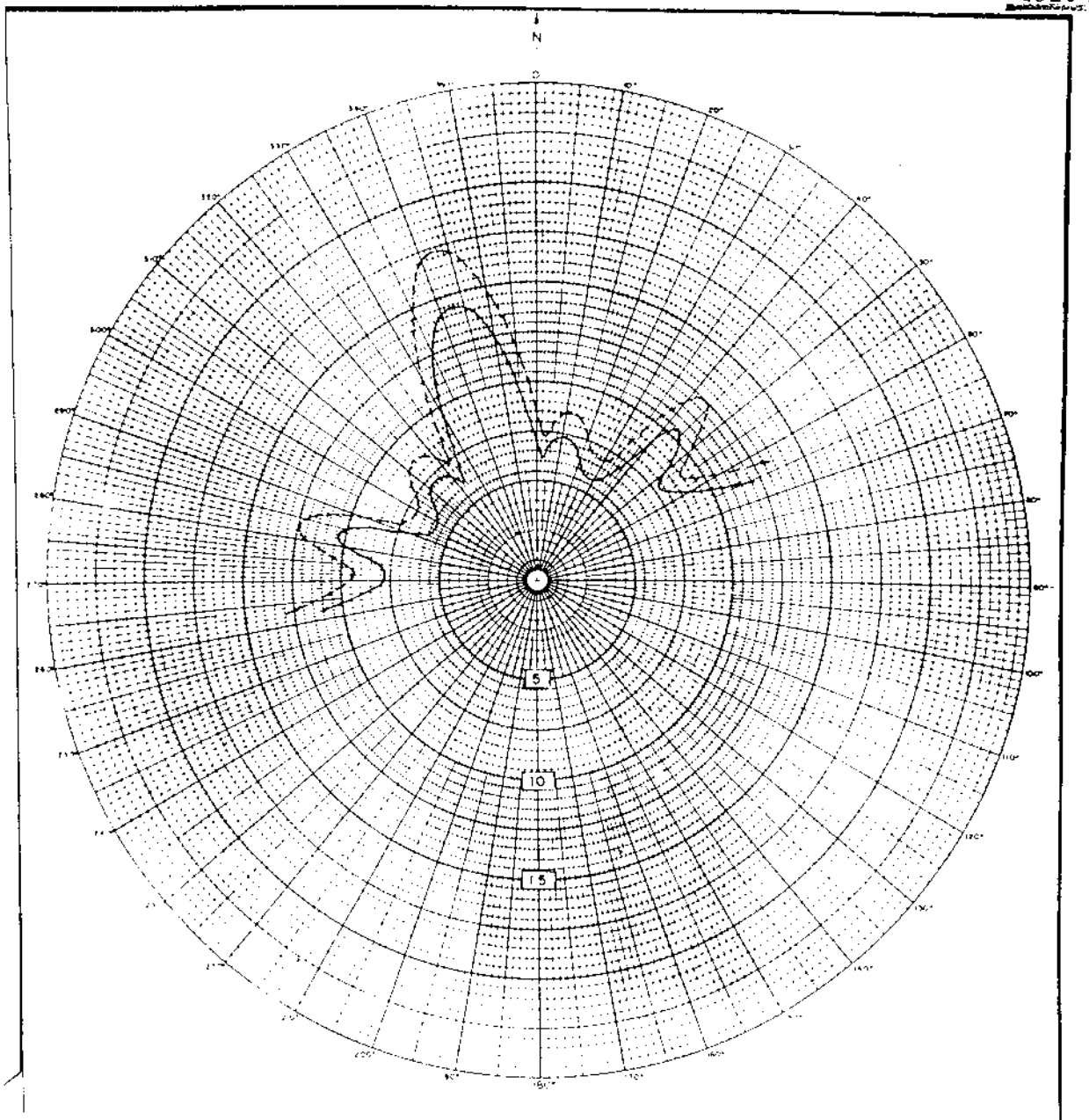
KXKW

LAFAYETTE, LA

PROPOSED DAY & NIGHT NULLS
(6-16-59g)

New; General Communication, Inc.
Lafayette, Louisiana

500w, DA-D, D
1520 K



E_{RMS} = 134.3 MV/M

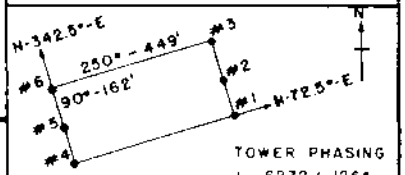
---- MEOV

LATITUDE 30° 16' 51"

LONGITUDE 92° 00' 53"

JOHN H MULLANEY
CONSULTING RADIO ENGINEERS
WASHINGTON D.C.

ANTENNA PARAMETERS



TOWER PHASING
1 .6272 /-126°
2 1.0 /0°
3 .5425 /126°
4 .47 /-126°
5 .75 /0°
6 .407 /126°

θ = 90°

FIGURE 4A

PLOT OF
EXPANDED POLAR PATTERN

GENERAL COMMUNICATION INC.
LAFAYETTE, LA.

1520 KC

0.5 KW-DA-1,U

FCC File No. BP-12244
Accepted 5-18-59 (Amended)

General Communication, Incorporated
Lafayette, Louisiana

1520 KC

Finaled for new station
9-22-60

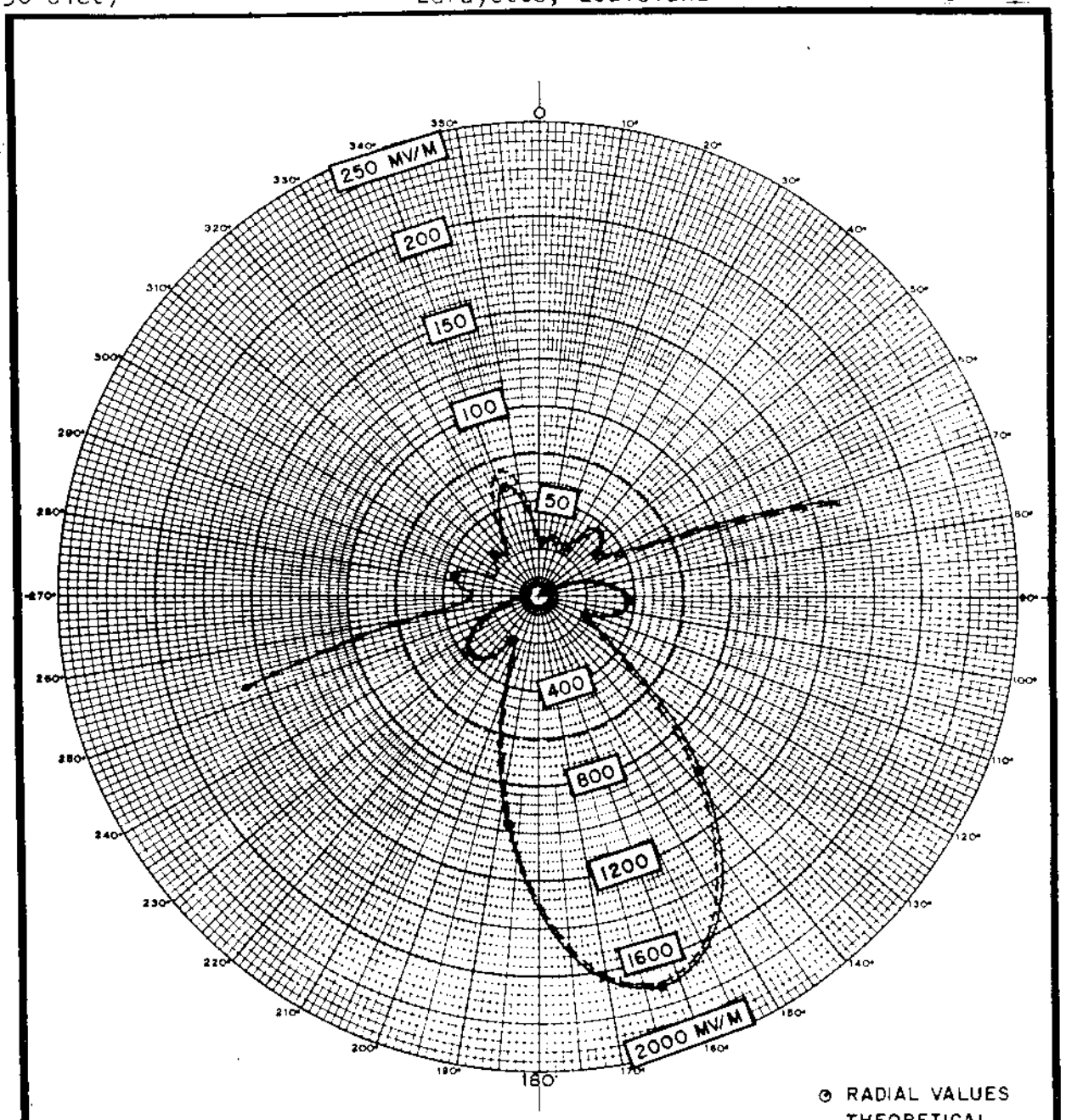
KXKW

Measured Day (CH)
(3-30-64ct)

Station KXKW
Lafayette, Louisiana

500w,10kw-LS,DA-2,U
1520kc

3-25-64
[illegible]



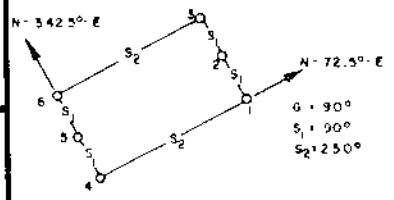
E_{RMS} = 606 MV/M (MEASURED)

LATITUDE: 30° 16' 51"

LONGITUDE: 92° 00' 53"

JOHN H. MULLANEY AND ASSOCIATES
A DIVISION OF MULTRONICS, INC

ANTENNA PARAMETERS



1	0.524 ∠ -122°	4	0.425 ∠ -123.5°
2	1.0 ∠ 0°	5	0.738 ∠ +2°
3	0.510 ∠ +124.5°	6	0.492 ∠ +122°

FIGURE 16

MEASURED DAYTIME
CRITICAL-HOURS PATTERN

RADIO STATION KXKW
LAFAYETTE, LOUISIANA

1520 KC

0.5 KW, DA-N
10 KW, DA-CH
10 KW, NDA, DAY, U

FCC File No. BL-10444
Accepted 3-12-64

Station KXKW
Lafayette, Louisiana

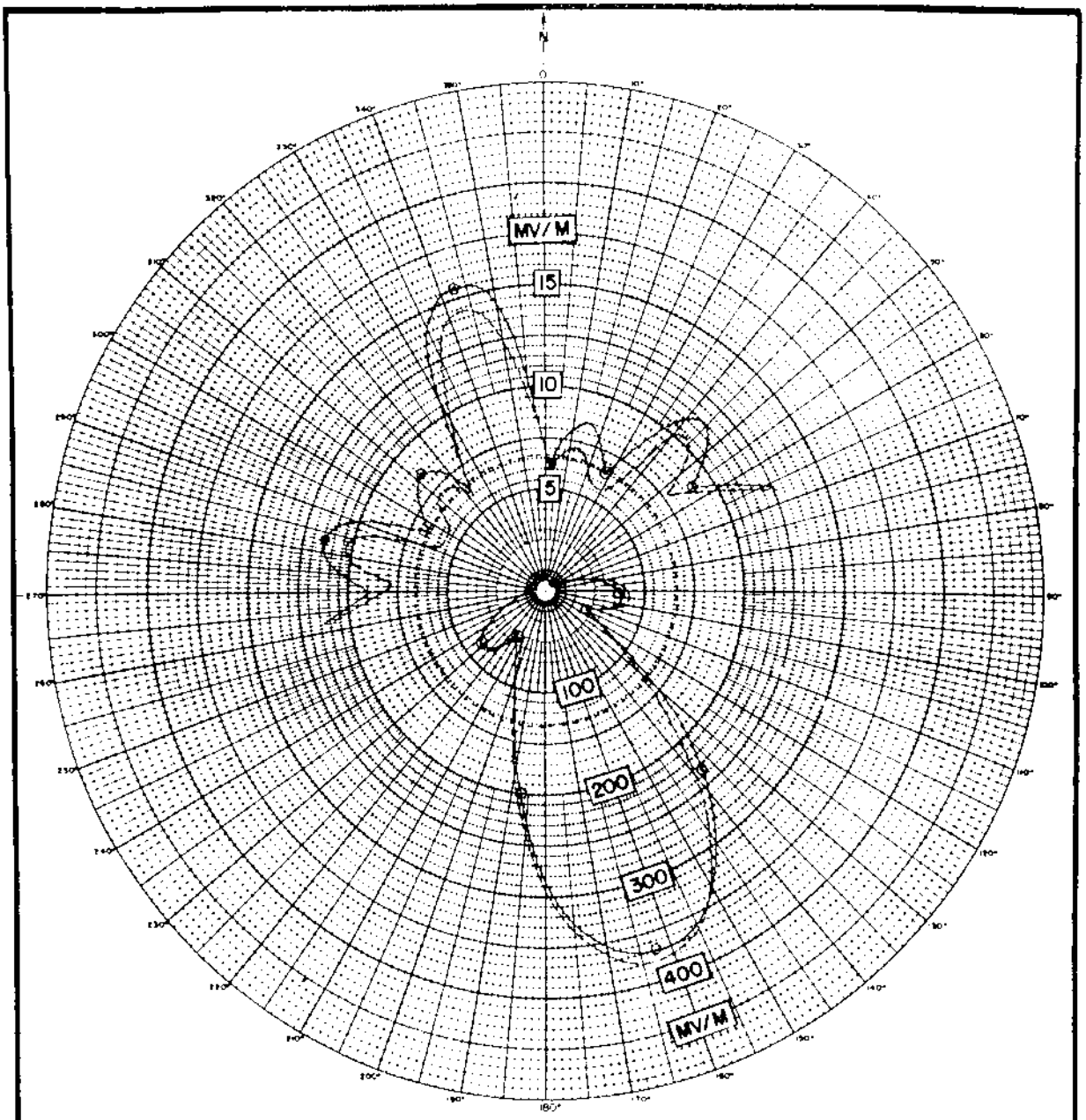
1520kc

KXKW

MEASURED DAY & NIGHT (2-17-61g)

Station KXKW Lafayette, Louisiana

500w, DA-1,U 1520 KC



E_{RMS} = 132 MV/M (MEASURED)

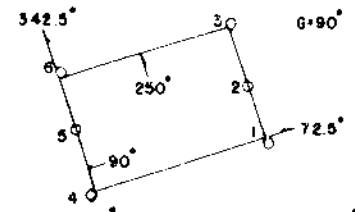
θ RADIAL VALUES
--- THEORETICAL
— MEASURED

LATITUDE: 30° 16' 51"

LONGITUDE 92° 00' 53"

JOHN H. MULLANEY
CONSULTING RADIO ENGINEERS
WASHINGTON D. C.

ANTENNA PARAMETERS



1-0.527/-122°
2-1.0 /0°
3-0.51/+124°
4-0.416/-122°
5-0.75 /3°
6-0.466/+124°

FIGURE 16

MEASURED HORIZONTAL DIRECTIONAL PATTERN

RADIO STATION KXKW
LAFAYETTE, LOUISIANA

1520 KC 0.5 KW-U-DA-1

FCC File No. BL-8211
Accepted 1-19-61

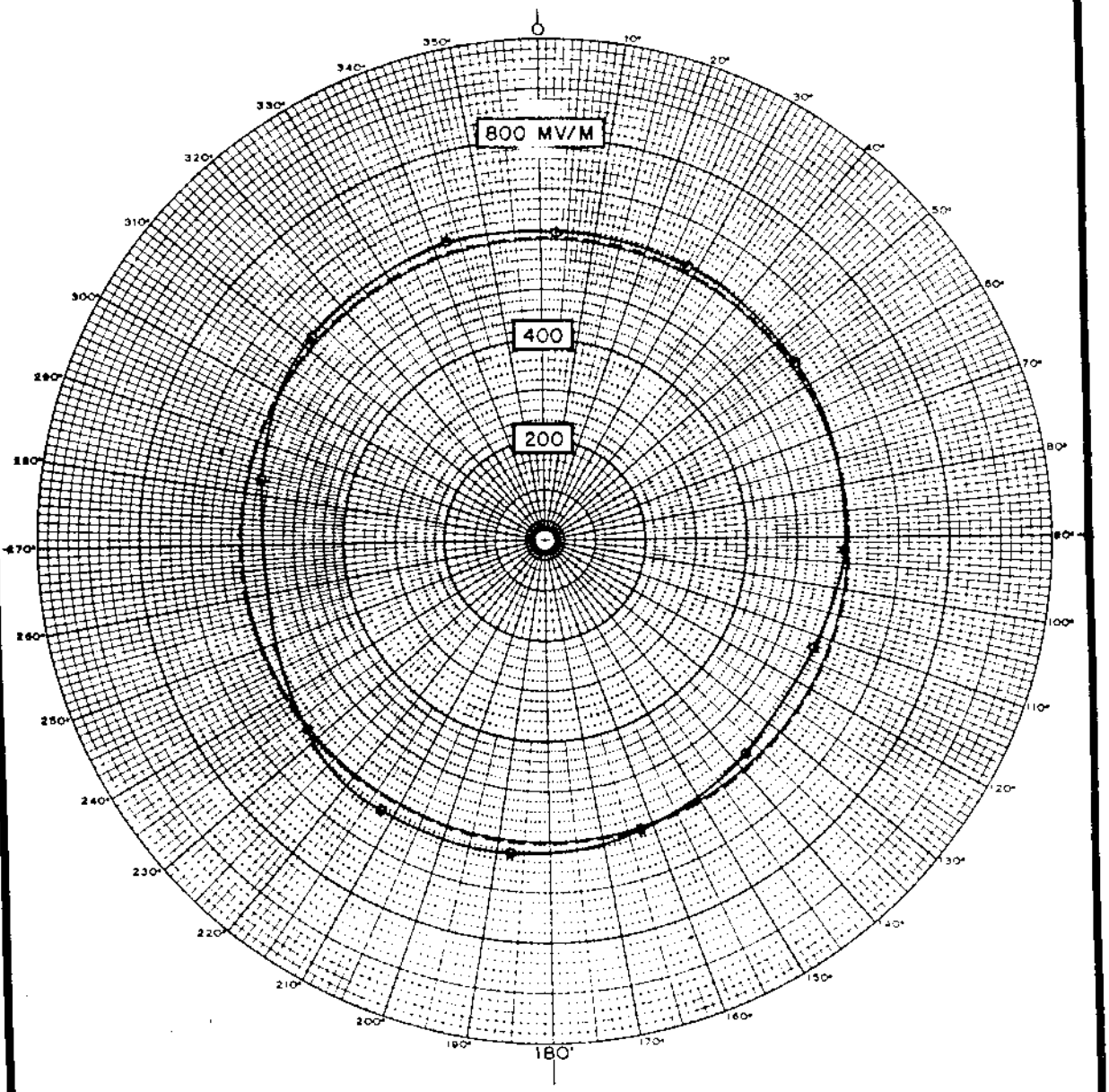
KXKW
Lafayette, Louisiana 1520 KC

KXKU

Measured Non-DA
(3-30-64ct)

Station KXKW
Lafayette, Louisiana

500w,10kw-LS,DA-2,U
1520kc



E_{RMS} = 602 MV/M (MEASURED)

⊙ RADIAL VALUES

LATITUDE: 30° 16' 51"
LONGITUDE: 92° 00' 53"

JOHN H. MULLANEY AND ASSOCIATES
A DIVISION OF MULTRONICS INC.

ANTENNA PARAMETERS

#3 TOWER

G = 90°

FIGURE 15

MEASURED DAYTIME NON-DIRECTIONAL PATTERN

RADIO STATION KXKW
LAFAYETTE, LOUISIANA

1520 KC — 0.5 KW, DA-N
1.0 KW, DA-CH
10 KW, NDA, DAY, U

FCC File No. BL-10444
Accepted 3-12-64

Station KXKW
Lafayette, Louisiana

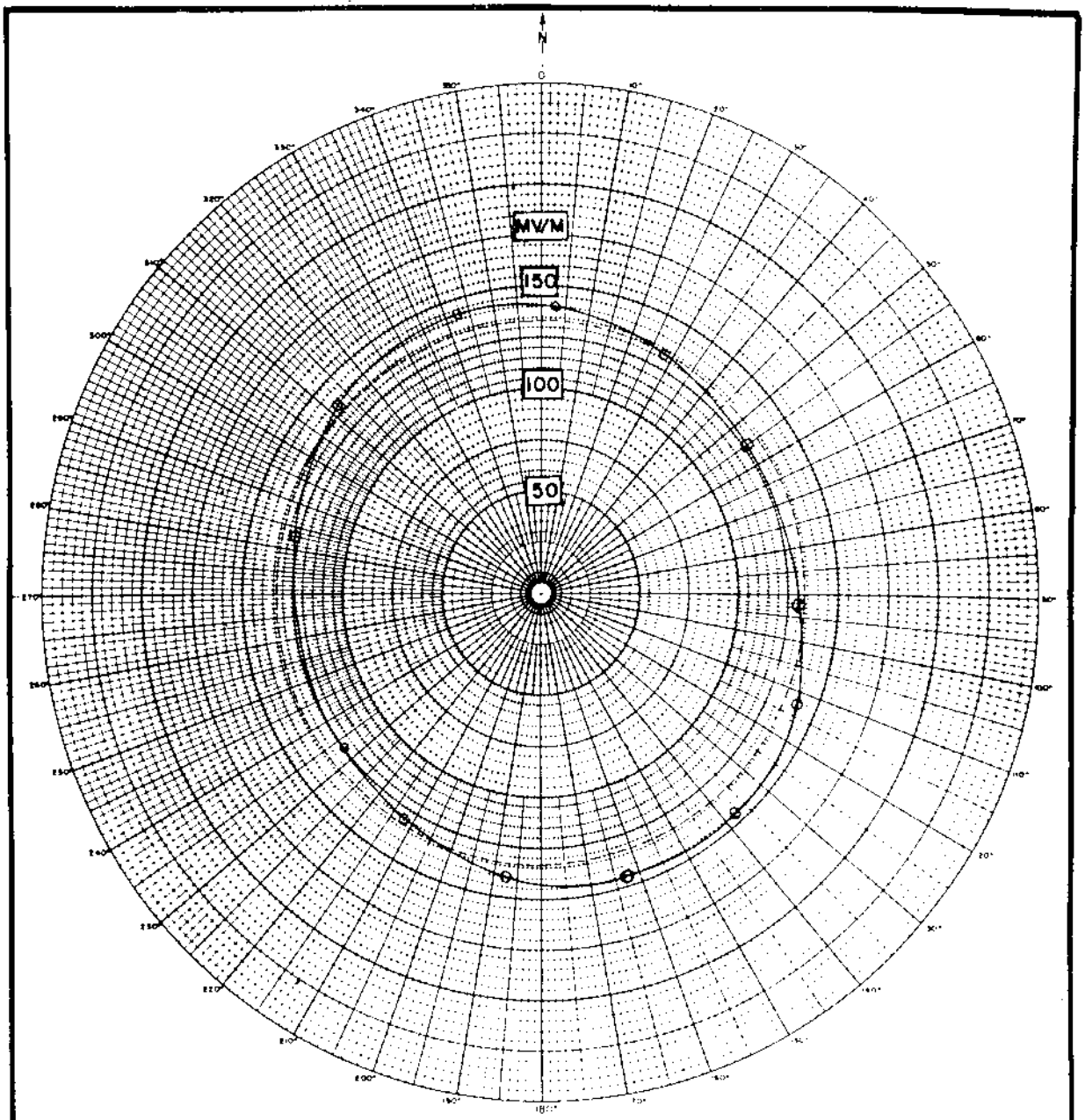
1520kc

KXKW

MEASURED NON-DA
(2-17-61g)

Station KXKW
Lafayette, Louisiana

500w, DA-1,U
1520 KC



E_{RMS} = 134 MVM (MEASURED)

⊙ RADIAL VALUES

LATITUDE 30°16'51"

LONGITUDE 92° 00'53"

ANTENNA PARAMETERS

• 2 TOWER

G=90°

JOHN H. MULLANEY
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

FIGURE 15

MEASURED HORIZONTAL
NON-DIRECTIONAL PATTERN

RADIO STATION KXKW
LAFAYETTE, LOUISIANA

1520 KC 0.5 KW-U-DA-1

FCC File No. BL-8211
Accepted 1-19-61

KXKW
Lafayette, Louisiana

1520 KC

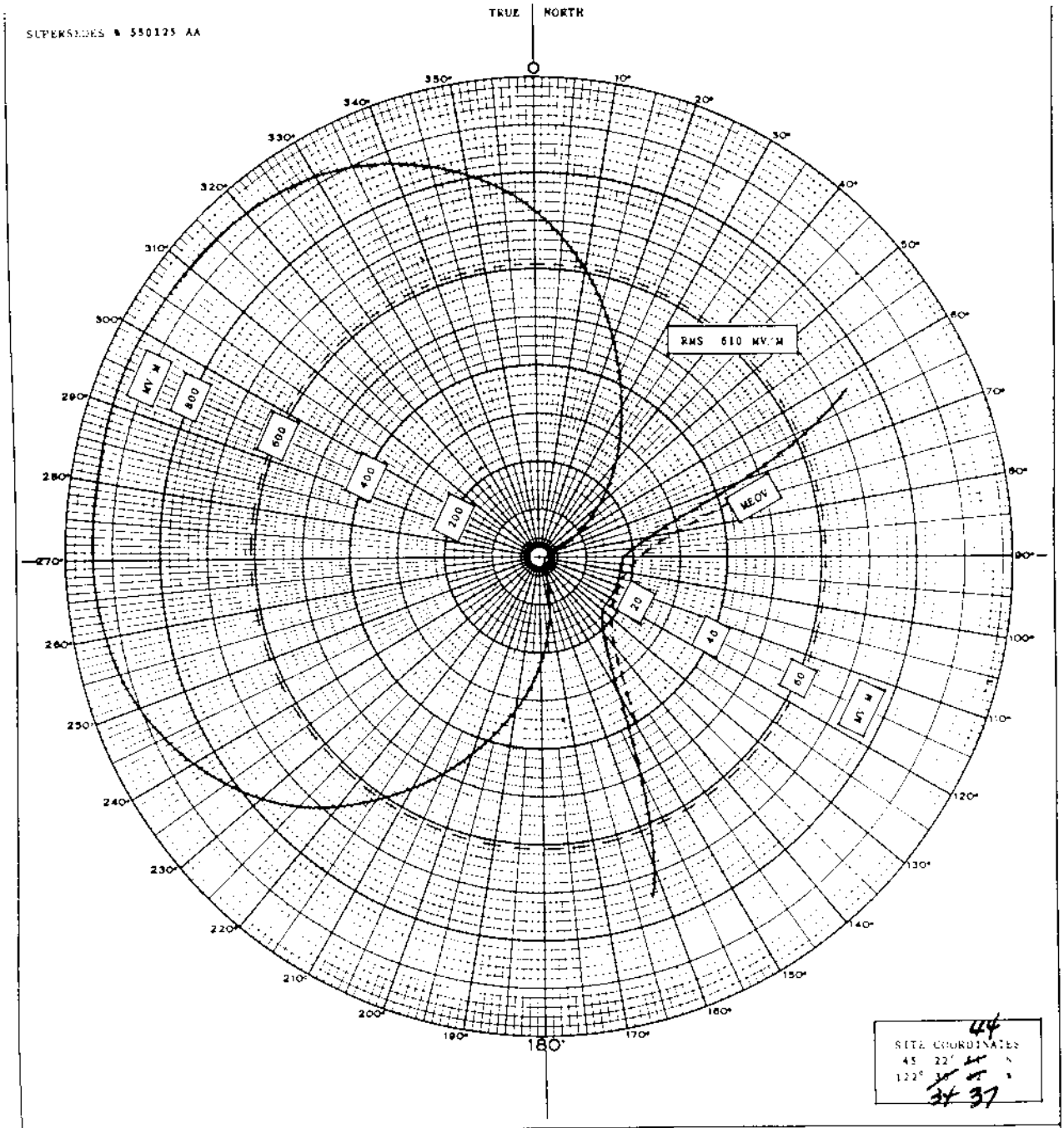
KYXI

PROPOSED DAY & NIGHT
(8/3/55G)

STATION KGON
OREGON CITY, OREGON

10KW
DA-1, U

1520 KC



HORIZONTAL PLANE RADIATION PATTERN

CLACKAMAS BROADCASTERS INC.

KGON
OREGON CITY OREGON
1520 KC 10 KW DA-1

WELDON & CARR
Consulting Radio and Television Engineers
Washington, D.C. Dallas, Texas

FILE NO. BP-9478 ACCEPTED FCC 7/12/55 KGON, Oregon City, Oregon 1520 KC

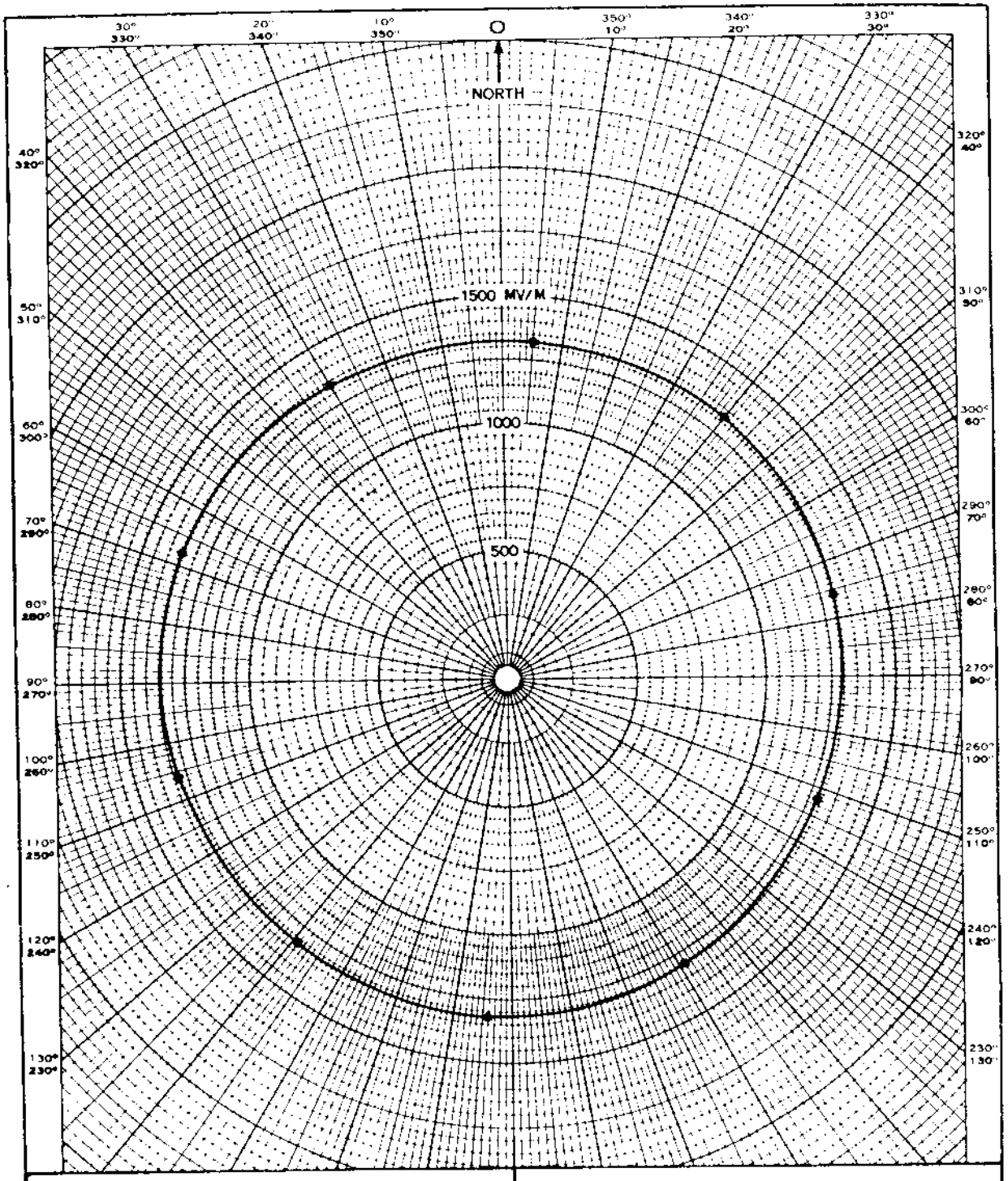
KYXI

; Measured Non-DA
(5-28-63ct)

Station KGON
Oregon City, Oregon

10kw,DA-1,U
1520 kc

8-16-63
Started
licensing
hang in
antenna
monitor
location.



N. LAT. 45°24' 44"
W. LONG. 122°34' 37"

G=90°=162'

RMS = 1315 MV/M

50 KW INTO TOWER 2. TOWERS 1 & 3 FLOATING

HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

RADIO STATION KGON
1520 KC. 10 KW. DA-1
OREGON CITY, OREGON

MEASURED
NON-DIRECTIONAL
HORIZONTAL RADIATION PATTERN

UNATTENUATED FIELD INTENSITY
AT ONE MILE

621123

FIGURE 10A

FCC File No.BL-10007
Accepted 5-17-63

Station KGON
Oregon City, Oregon

1520 kc

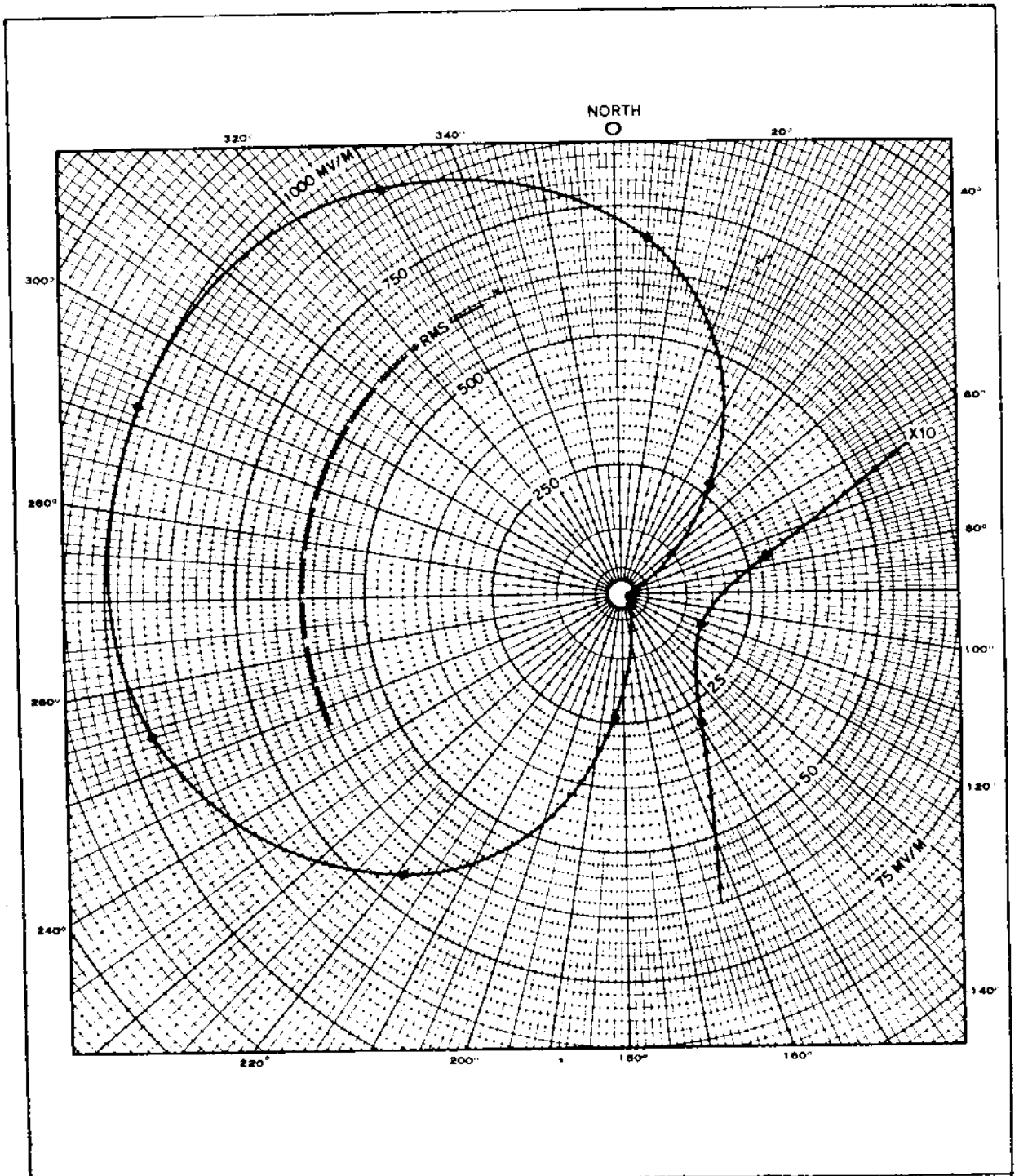
KYXI

Measured Day & Night
(5-28-63ct)

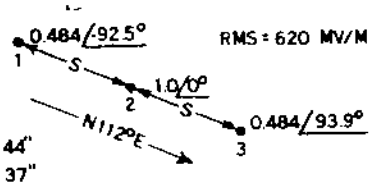
Station KGON
Oregon City, Oregon

10kw,DA-1,U
1520 kc

8-14-63 Antenna system change in transmitter location.



S=90°=162'
G=90°=162'



RMS = 620 MV/M

N. LAT. 45°24' 44"
W. LONG. 122°34' 37"

HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

RADIO STATION KGON
1520 KC. 10 KW. DA-1
OREGON CITY, OREGON

MEASURED DIRECTIONAL HORIZONTAL RADIATION PATTERN

UNATTENUATED FIELD INTENSITY
AT ONE MILE

621123

FIGURE 10B

FCC File No.BL-10007
Accepted 5-17-63

Station KGON
Oregon City, Oregon

1520 kc

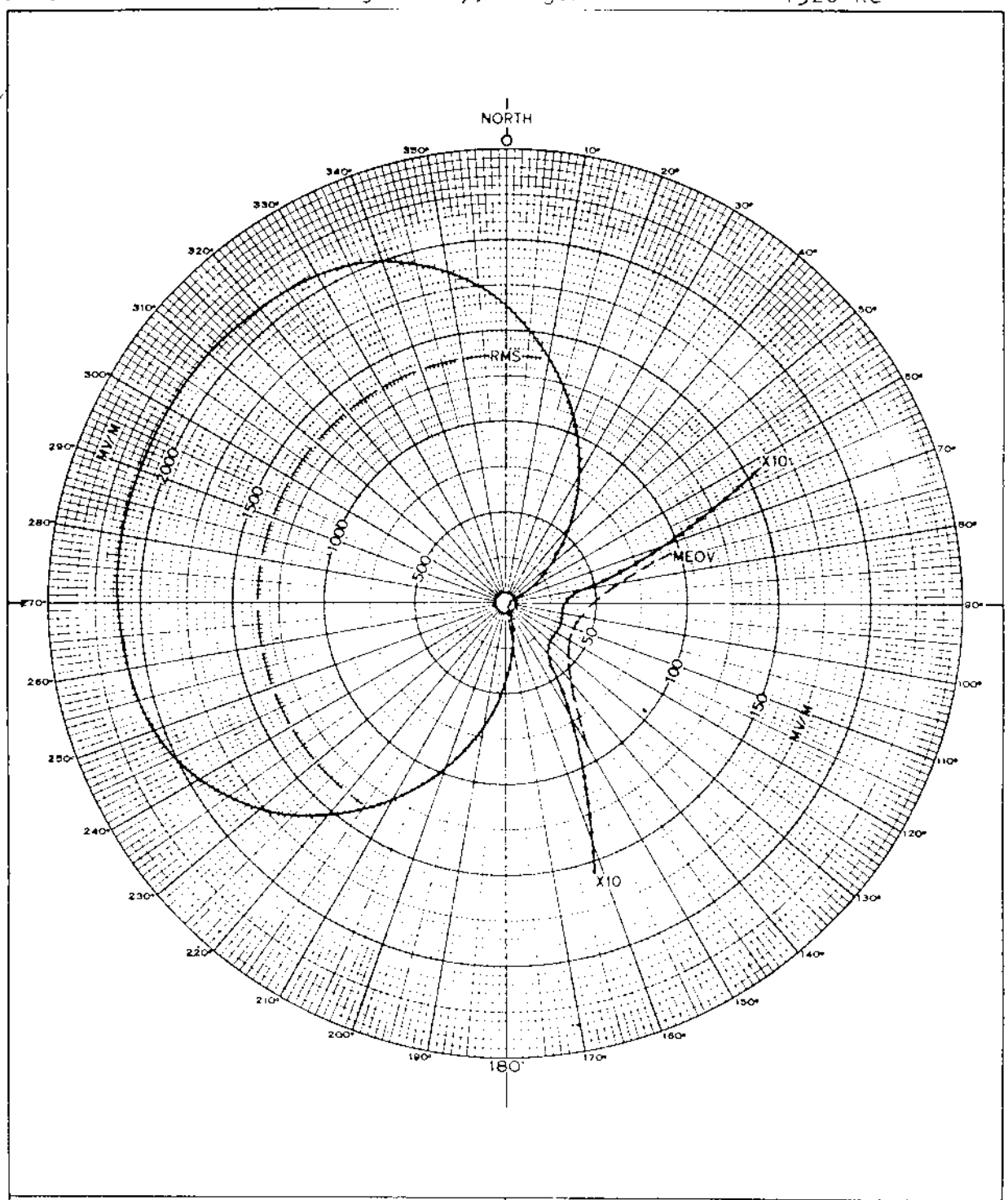
KYXI

Proposed Day
(8-23-63ct)

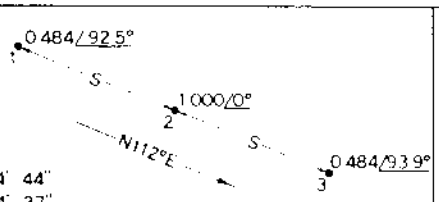
Station KGON
Oregon City, Oregon

50kw,DA-2,U
1520 kc

8-23-63
Granted Mod
of CP to change
from DA-1 to
DA 2



S=90°=162'
G=90°=162'
RMS=1364 MV/M



N. LAT 45° 24' 44"
W. LONG 122° 34' 37"

HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

RADIO STATION KGON
1520 KC 50 KW. DA 2
OREGON CITY OREGON

DAYTIME
HORIZONTAL RADIATION PATTERN

UNATTENUATED FIELD INTENSITY
AT ONE MILE

630709

FIGURE 2

FCC File No.BMP-10969
Accepted 7-29-63

Station KGON
Oregon City, Oregon

1520 kc

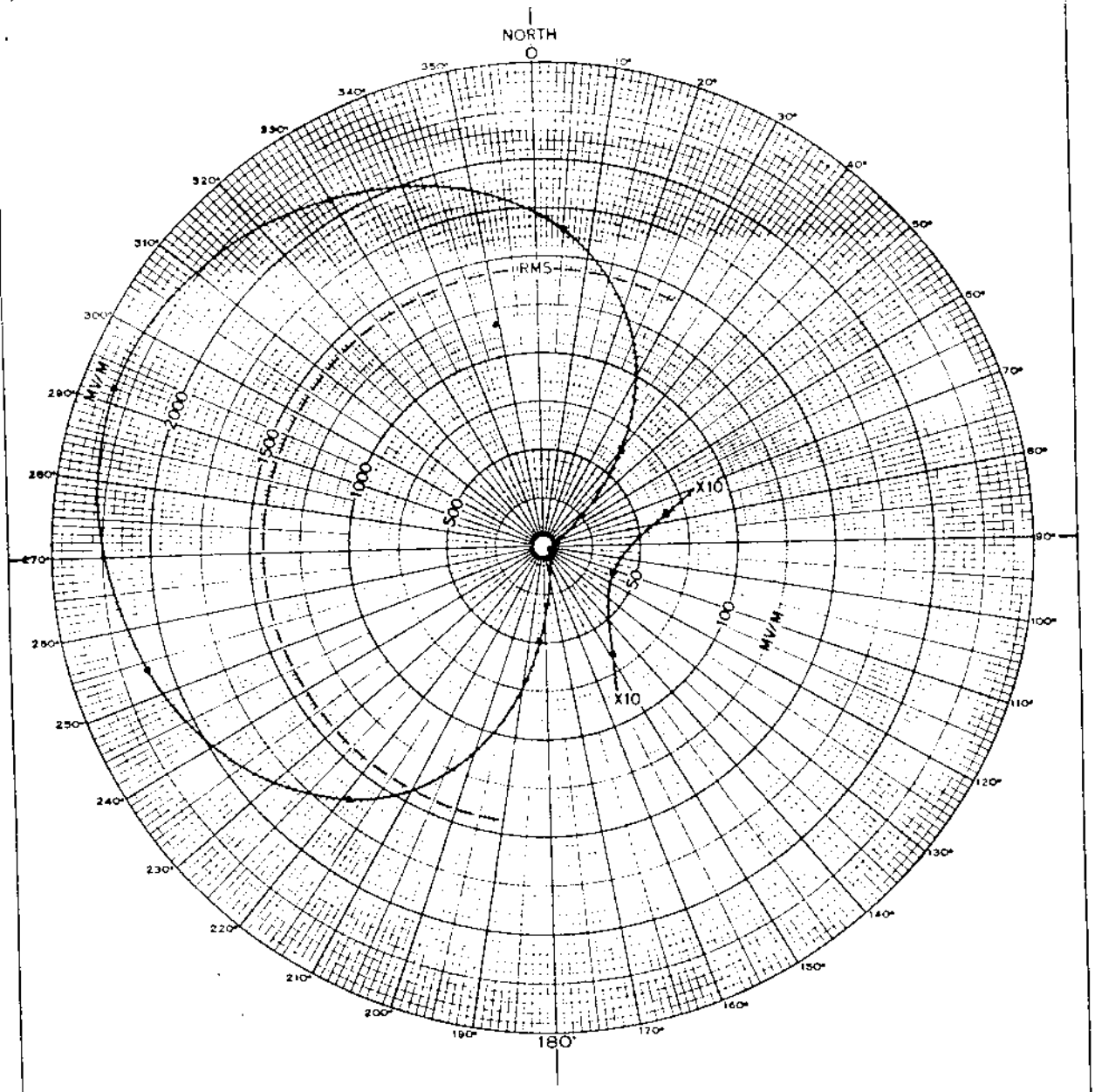
KYXI

Measured Day
(2-28-64ct)

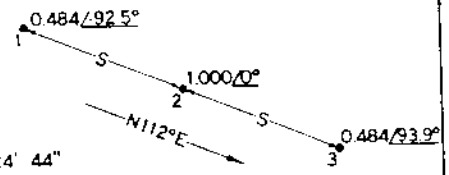
Station KGON
Oregon City, Oregon

10kw, 50kw-LS, DA-2
1520 kc

2-20-64
Lg for 10kw N,
50kw D, DA-2.



S=90°=162'
G=90°=162'
RMS=1435 MV/M



N. LAT. 45° 24' 44"
W. LONG. 122° 34' 37"

HAMMETT & EDISON
CONSULTING RADIO ENGINEERS
SAN FRANCISCO

RADIO STATION KGON
1520 KC. 10.KW. 50 KW-LS. DA-2
OREGON CITY. OREGON

MEASURED DAYTIME HORIZONTAL RADIATION PATTERN

UNATTENUATED FIELD INTENSITY
AT ONE MILE

631016

FIGURE 8

FCC File No.BL-10362
Accepted 1-30-64

Station KGON
Oregon City, Oregon

1520 kc

DESCRIPTION OF WTTO NIGHTTIME DIRECTIONAL ANTENNA SYSTEM

(a) Number of Towers:	Six
(b) Type of Elements:	Uniform cross section, base insulated, guyed
(c) Top Loading:	None
(d) Height of Elements: (90° = 161.7) (180° = 323.4')	All six towers 165' above ground 627' above MSL
(e) Spacing and Orientation: (In-line array)	No. 1 reference No. 2 120° at 180° true No. 3 240° at 180° true No. 4 360° at 180° true No. 5 480° at 180° true No. 6 600° at 180° true
(f) Field Ratios and Phasing:	No. 1 1.0 /-37.5° No. 2 2.87 /121.8° No. 3 4.54 /-79.3° No. 4 4.54 /+79.3° No. 5 2.87 /-121.8° No. 6 1.0 /37.5°
(g) Ground System:	120 equally spaced radials around each tower, a maximum 150 feet of No. 10 bare copper wire buried approximately 6 inches deep in the ground. Intersecting radials are shortened and bonded to a transverse 2 inch copper strap midway between towers.
(h) Location:	N. Latitude 41° 34' 00" W. Longitude 83° 34' 23"
(i) Operation:	1520 kHz, 1 kw, DA-2

WANR

Measured Night
(3-27-70ct)

Station WTTO
Toledo, Ohio

1kw, DA-2, U
1520 kc

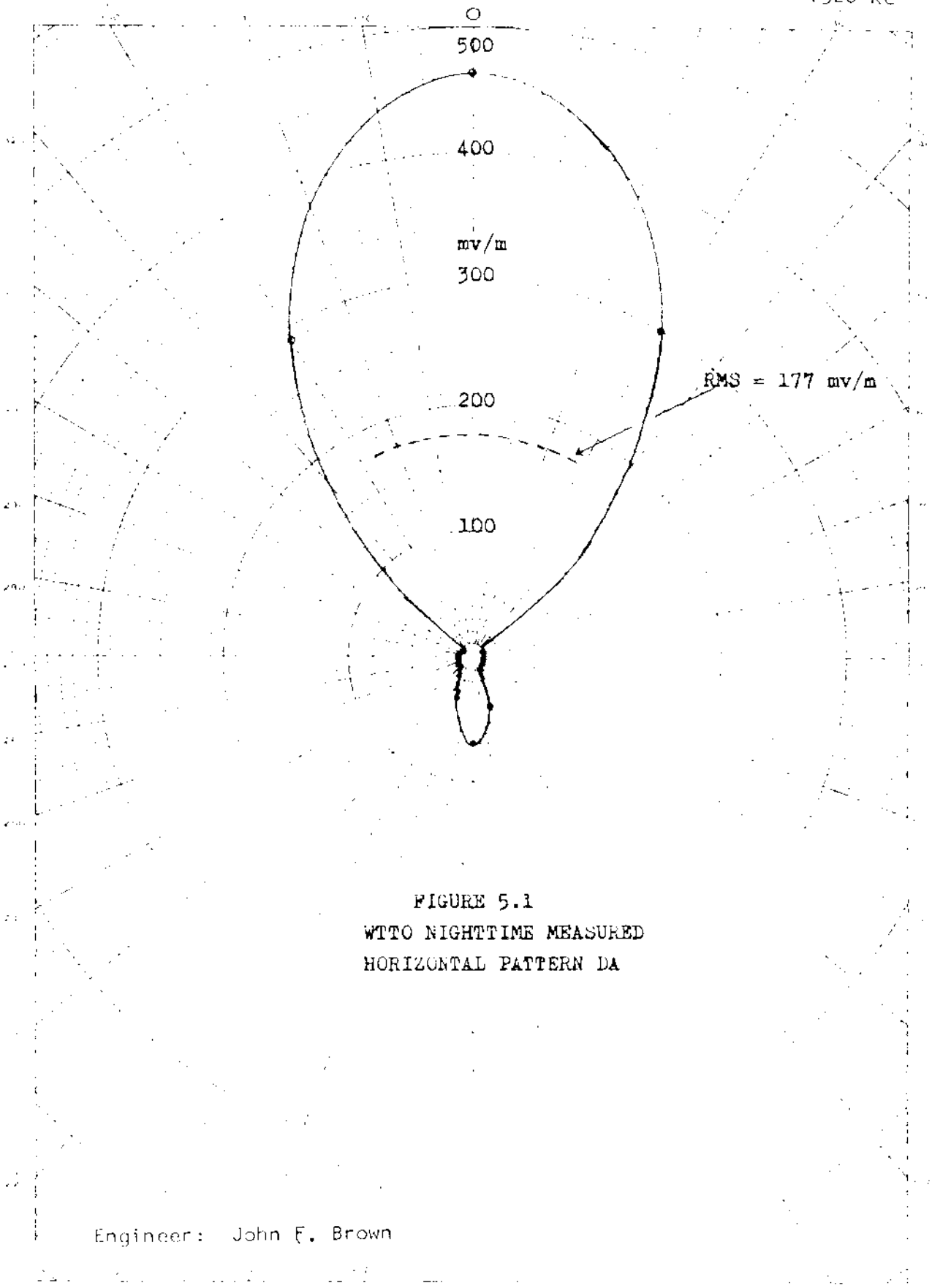


FIGURE 5.1
WTTO NIGHTTIME MEASURED
HORIZONTAL PATTERN DA

FCC File No.BRC-3412
Accepted 3-11-70

Station WTTO
Toledo, Ohio

1520 kc

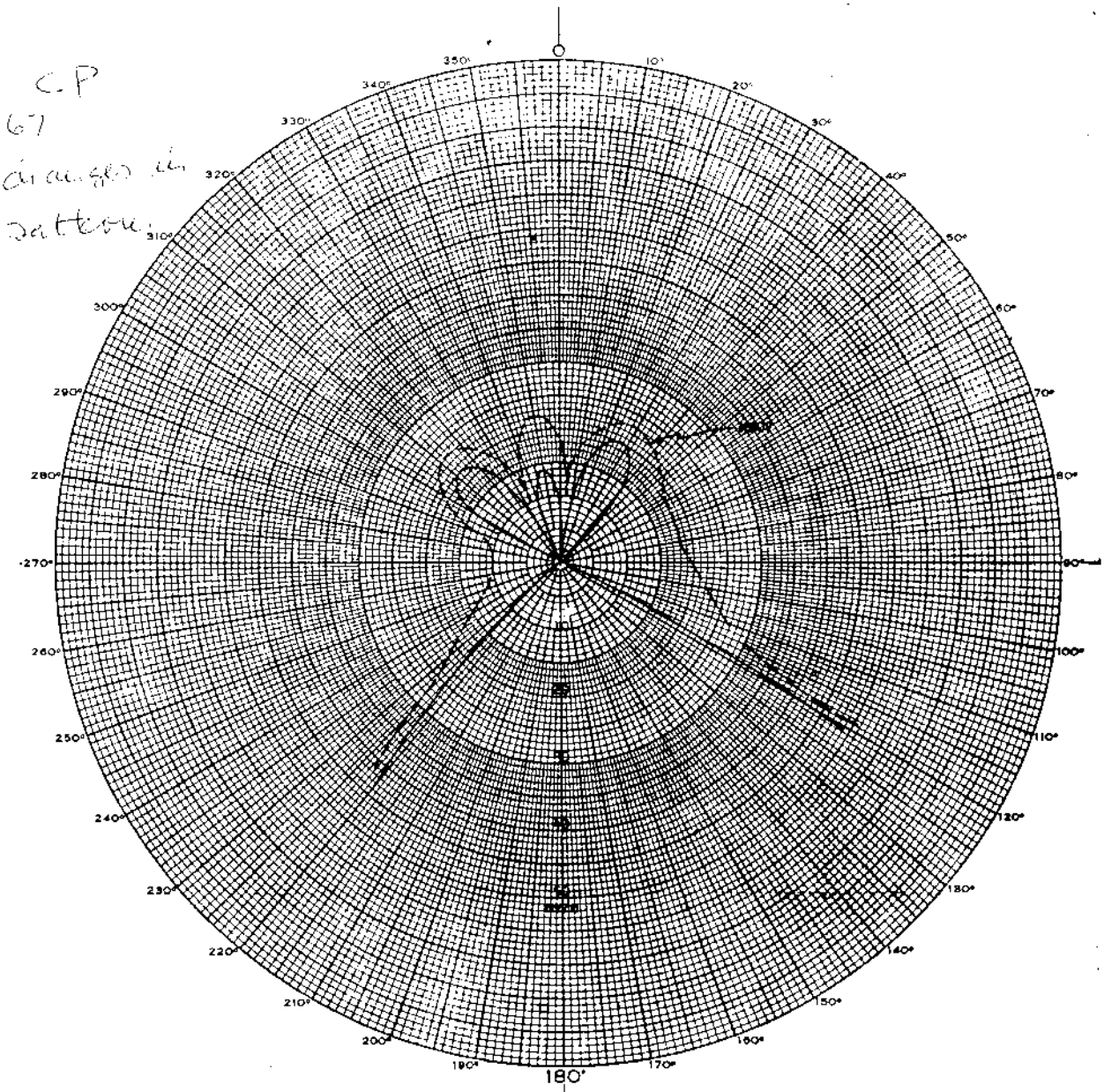
WANR

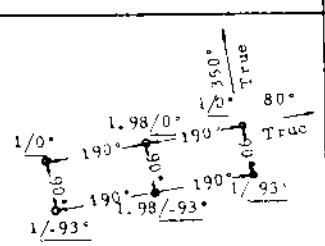
Proposed Day
(3-29-67ct)

Station WTTO
Toledo, Ohio

1kw, DA-2, U
1520 kc

Granted C.P
3-27-67
to make changes in
daytime pattern.



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA	
	TOWER No.	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION φ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ	CALL	WTTO
	1	89	0	0	0		1.0	0		FREQUENCY	1520 kc
	2	89	260	190	0		1.98	10		POWER	1.0 kw
	3	89	260	380	0		1.0	20		TIME OF OPERATION	U
	4	89	246.7	391	-93		1.0	30		TYPE OF OPERATION	DA-2
	5	89	234.7	210	-93		1.98	40		DAYTIME TOWERS	1, 2, 3, 4, 5, 6
	6	89	170	90	-93		1.0	50		NIGHTTIME TOWERS	
	7							60		No. RADIALS PER TOWER	120
	8							70		LENGTH OF RADIALS	280 ft.
	9							80		GROUND SCREEN DIMENSION	
	10							E_t =	mv/m	LAT.	41° 44' 15"
								P_t =	kw	LONG.	83° 35' 19"
	DAYTIME OPERATION ☒			NIGHTTIME OPERATION ☐						SUPERSEDES	660915
										PATTERN No.	670210

WTTO Broadcasting Company
Toledo, Ohio
Carl E. Smith
Consulting Radio Engineers
Cleveland, Ohio

FIG. 1 A
DAYTIME ARRAY
MODIFIED HORIZONTAL PATTERN
EXPANDED SCALE

FCC File No. BMP-12008
Accepted 3-20-67

Station WTTO
Toledo, Ohio

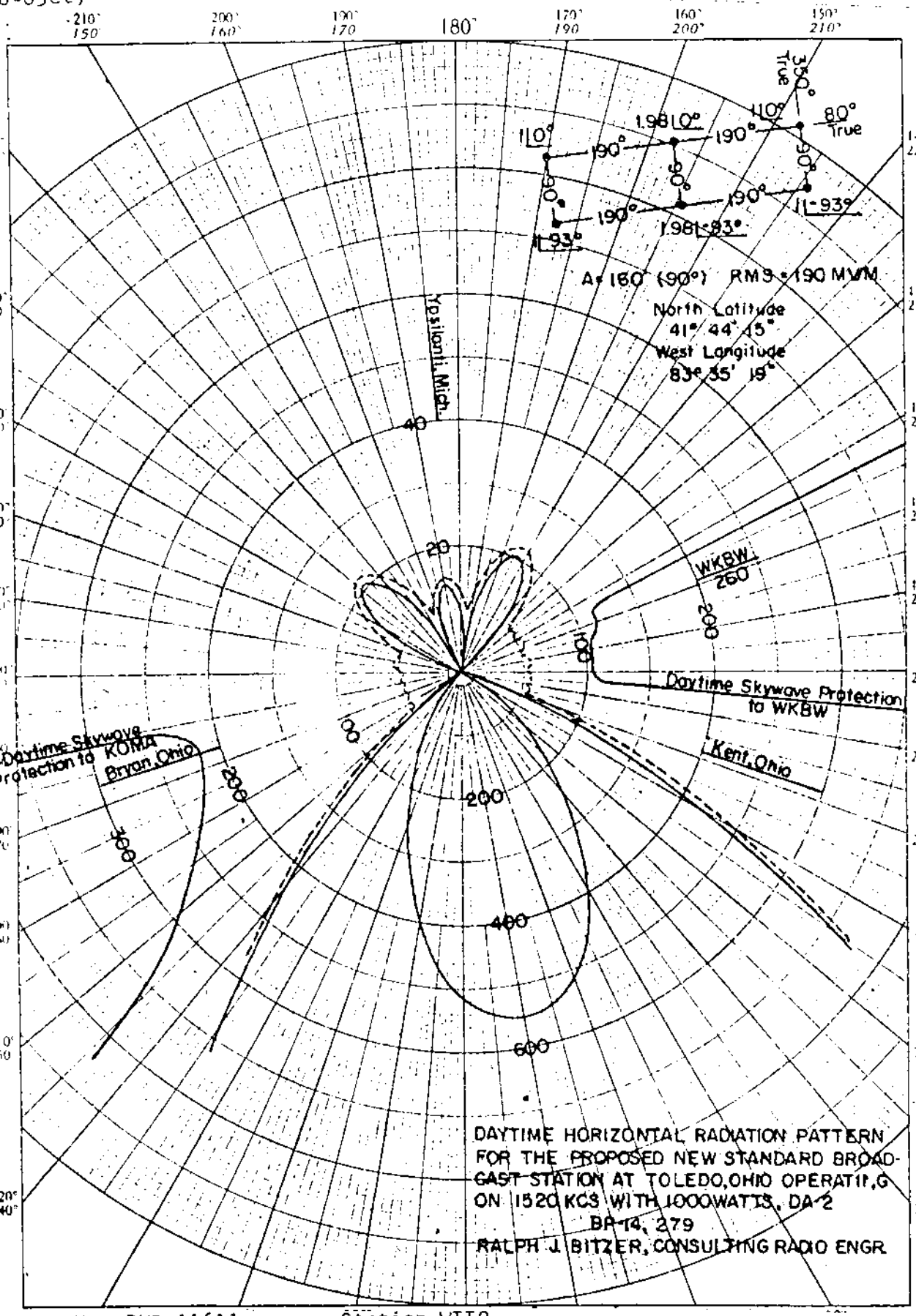
1520 kc

WANR

Proposed Day
(10-26-65ct)

Station WTTO
Toledo, Ohio

1kw,DA-2,U
1520 kc



FCC File No. BMP-11611
Accepted 9-29-65

Station WTTO
Toledo, Ohio

1520 kc

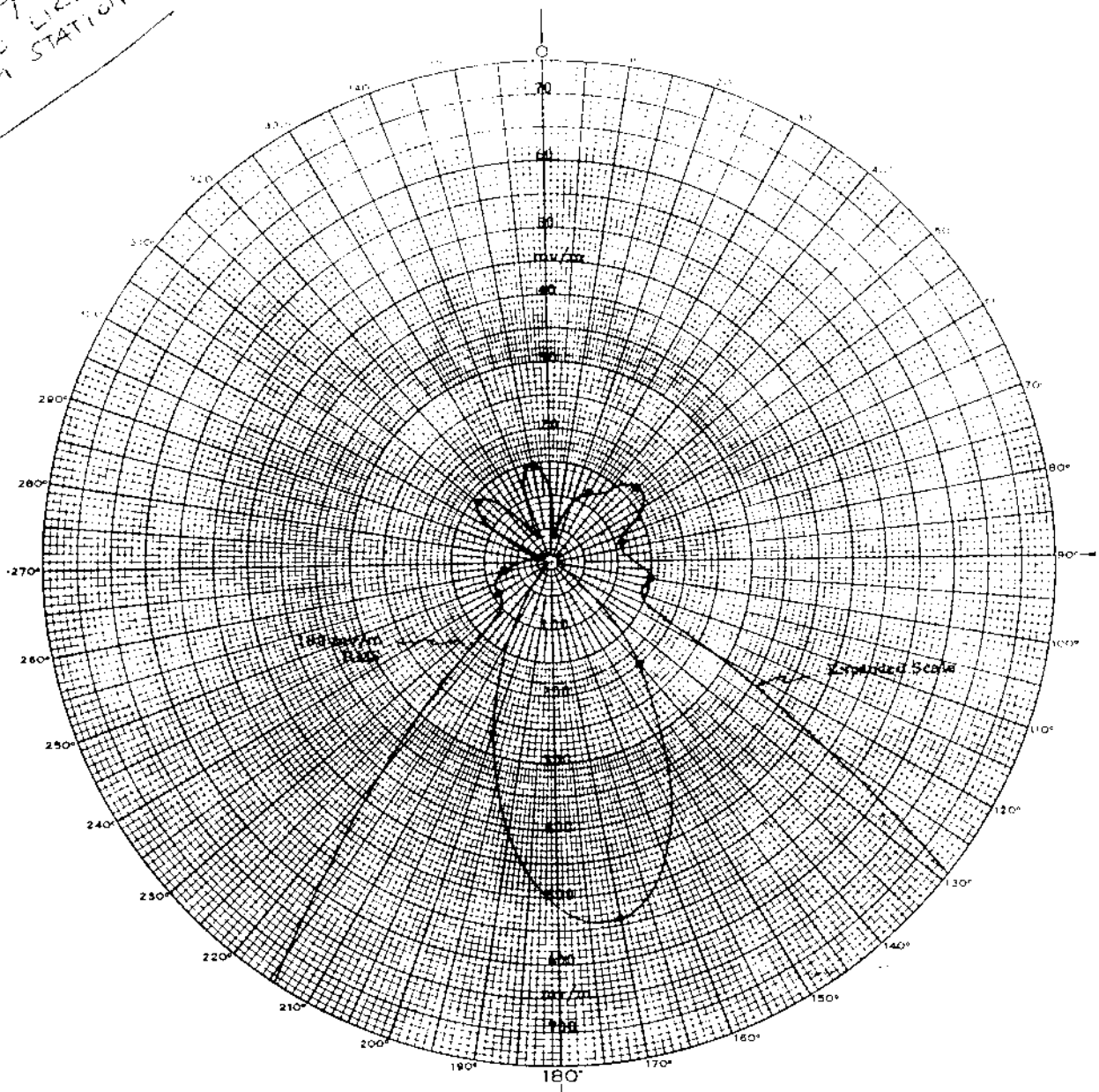
WANR

Measured Day
(3-29-67ct)

Station WTTO
Toledo, Ohio

1kw,DA-2,U
1520 kc

10-6-67
GRANTED LICENSE
NEW AM STATION



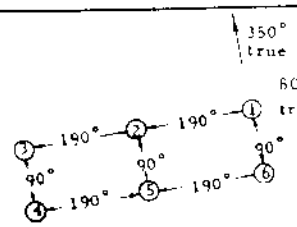
TOWER PLACEMENT SKETCH	THEORETICAL PATTERN PARAMETERS							STATION DATA
	TOWER	ELECTRICAL HEIGHT	TOWER RADIATION	SPACING			ELEC. ANGLE	WTTO 1520 kHz 1.0 DA-2 1,2,3,4,5,6 120 200 41 44 15 83 15 15 660928 661226
	1	89	0	0	0	1.0	0	
	2	89	260	120	0	1.98	0	
	3	89	260	380	0	1.0		
	4	89	246.7	391	-93	1.0		
	5	89	234.7	210	-93	1.98		
	6	89	170	70	-93	1.0		
							180	

FIG. 7.1 WTTO DIRECTIONAL ANTENNA DAYTIME MEASURED HORIZONTAL PATTERN

AMENDED

CARL E. SMITH Consulting Radio Engineers
Cleveland, Ohio

WTTO BROADCASTING COMPANY
Toledo, Ohio

FCC File No.BL-11577
Accepted 3-10-67

Station WTTO
Toledo, Ohio

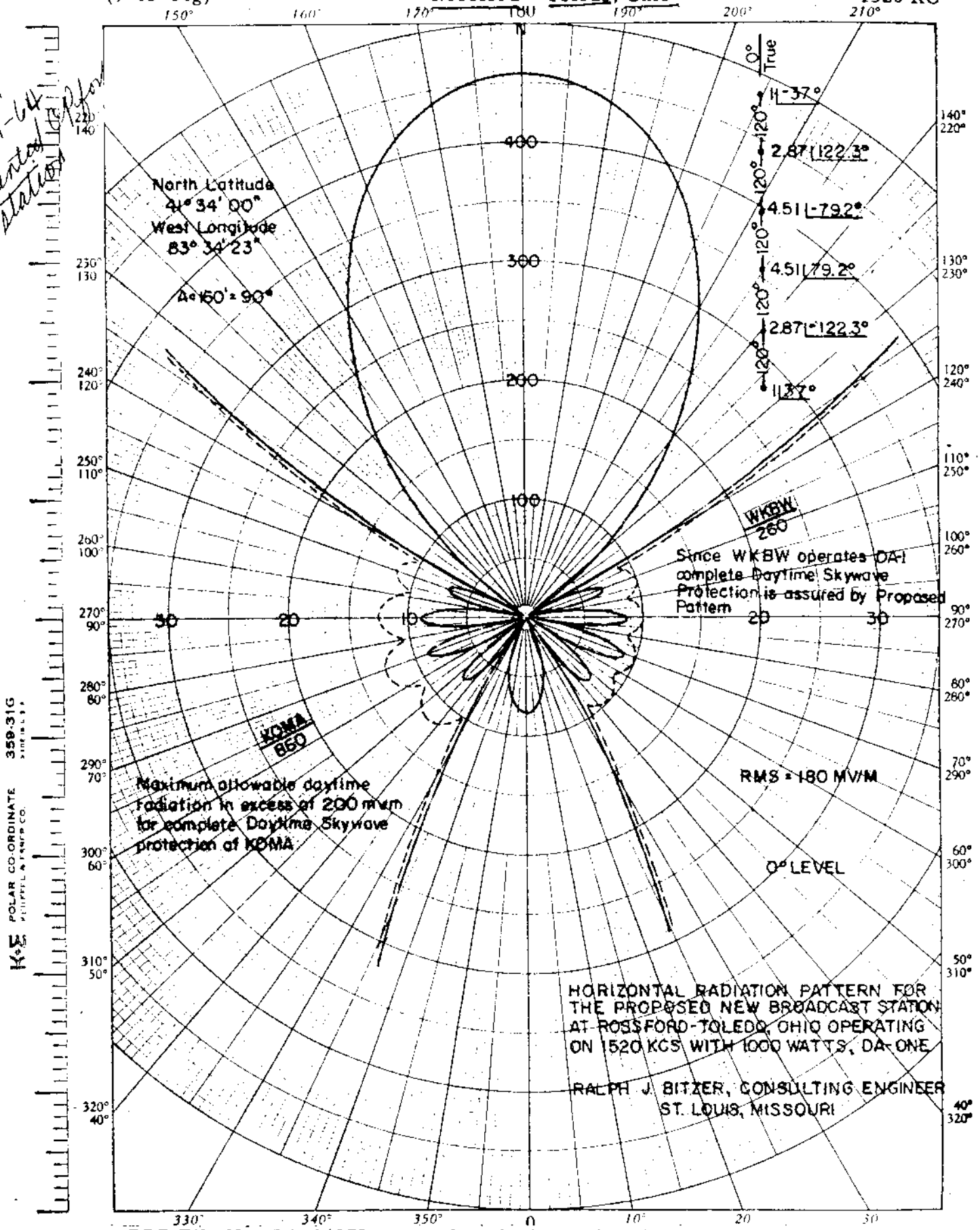
1520 kc

WANR

PROPOSED ~~DAY~~ & NIGHT (9-13-60g)

New; Rossford Bcstng., Inc. Rossford - Toledo, Ohio

1kw, DA-1,U 1520 KC



FCC File No. BP-14279
Accepted 8-30-60

Rossford Broadcasting, Incorporated
Rossford - Toledo, Ohio

1520 KC

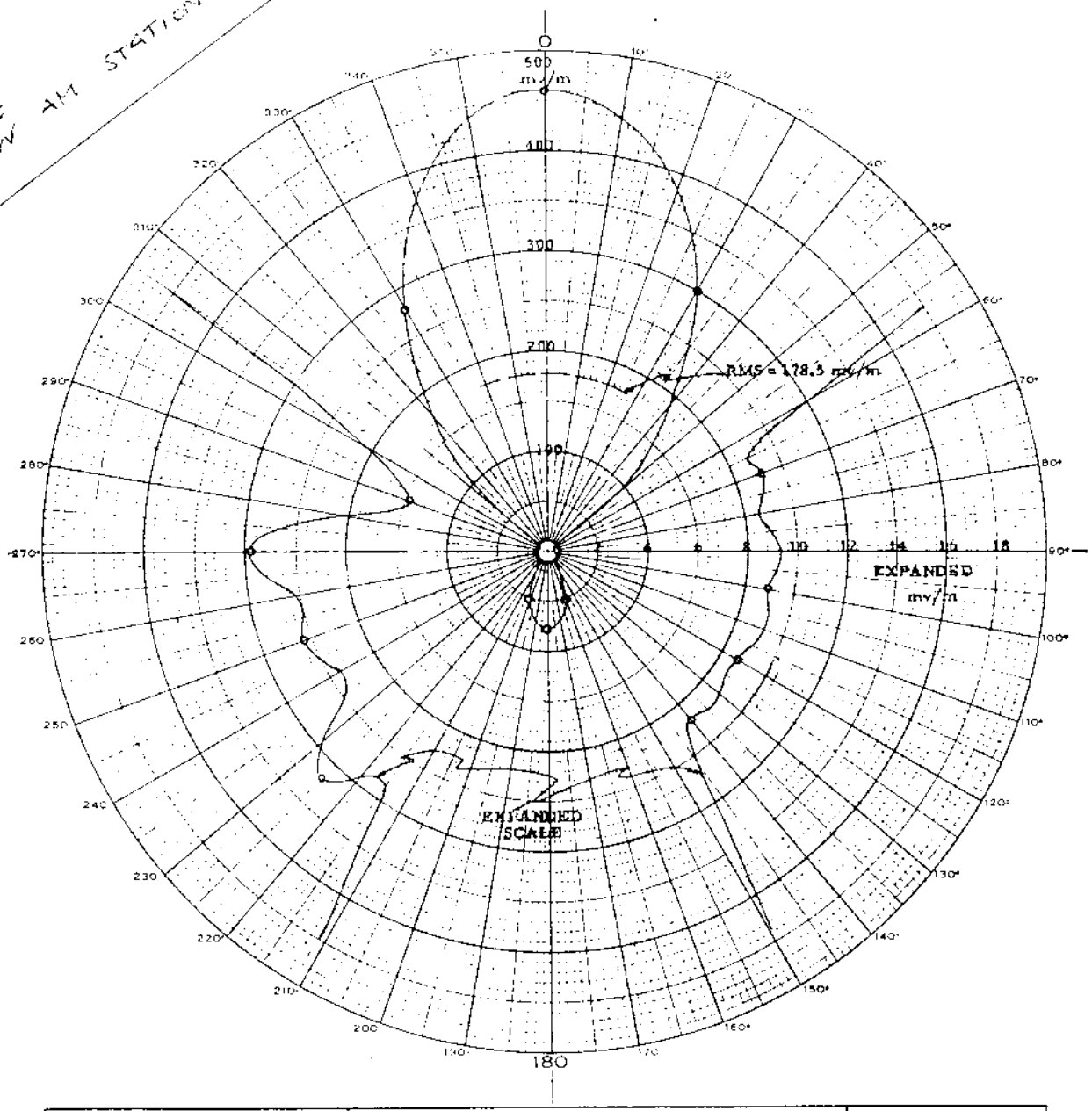
WANR

Measured Night
(3-29-67ct)

Station WTTO
Toledo, Ohio

1kw,DA-2,U
1520 kc

10-6-67
GRANTED
LICENSE
FOR NEW AM STATION



TOWER PLACEMENT SKETCH	THEORETICAL PATTERN PARAMETERS									STATION DATA
	TOWER No.	ELECTRICAL HEIGHT θ°	TOWER ORIENTATION φ°	SPACING ft	I-RATIO ψ°	HORIZONTAL FIELD mv/m	FIELD RATIO F	ELEV. ANGLE θ°	ELEVATION RMS FIELD mv/m	CALL WTTO
	1	89	0		37.5		1.0	0	178.5	FREQUENCY 1520 kHz
	2	89	180	120	121.8		2.87	10		POWER 1.0 kw
	3	89	180	240	-79.3		4.54	20		TIME OF OPERATION U
	4	89	180	360	79.3		4.54	30		TYPE OF OPERATION DA-2
	5	89	180	480	-121.8		2.87	40		LOCAL TIME TOWERS - - - -
	6	89	180	600	37.5		1.0	50		NIGHTTIME TOWERS 1, 2, 3, 4, 5, 6
										NOMINAL DAY POWER 120
										LOCATION OF PRINCIPAL CITY 269° 150 mi
										LOCATION OF STATION VIEWER
										LAT. 41° 34' 00"
										LONG. 83° 34' 23"
										COMMISSION 661031
										PATTERN 661208

1 / -37.5
120°
2 / 2.87 / 121.8
120°
3 / 4.54 / -79.3°
120°
4 / 4.54 / 79.3
120°
5 / 2.87 / -121.3°
120°
6 / 1 / 37.5°

FIG. 6.1
AMENDED
WTTO DIRECTIONAL NIGHTTIME
MEASURED HORIZONTAL PATTERN

CARL E. SMITH
Consulting Radio Engineers

WTTO BROADCASTING CO.
TOLEDO, OHIO

FCC File No.BL-11577
Accepted 3-10-67

Station WTTO
Toledo, Ohio

1520 kc

WANR

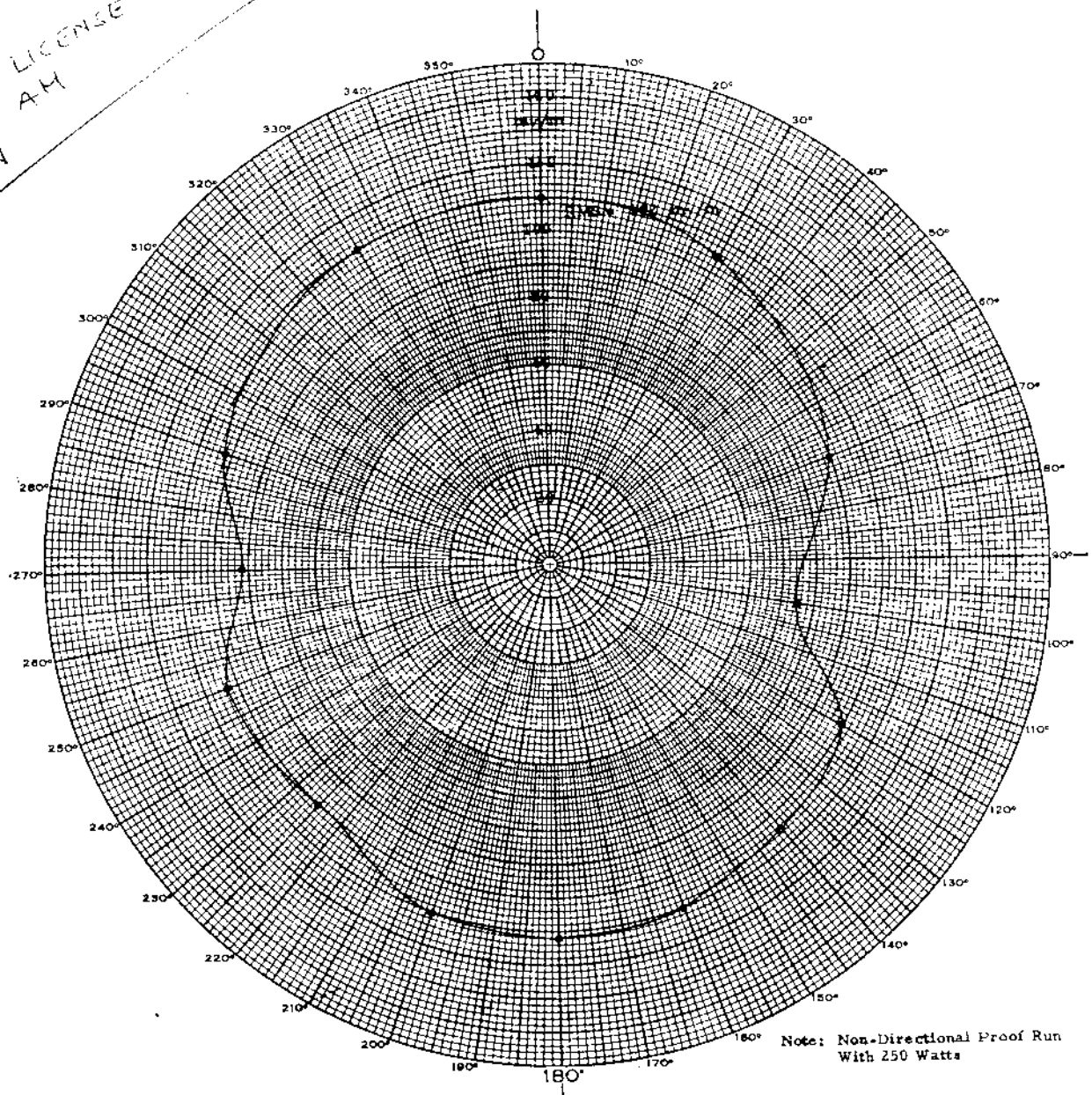
[redacted]

Measured Non-DA
(3-29-67ct)

Station WTTO
Toledo, Ohio

1kw,DA-2,U
1520 kc

10-6-67
GRANTED LICENSE
FOR NEW AM
STATION



Note: Non-Directional Proof Run
With 250 Watts

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA
	TOWER No.	ELECTRICAL HEIGHT ε°	TRUE TOWER ORIENTATION φ°	SPACING s°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV ANGLE φ°	ELEVATION RMS FIELD mv/m E_φ	CALL WTTO
N	1							0		FREQUENCY 1520 kHz
① 120°	2							10		POWER 1.0 kw
② 120°	3							20		TIME OF OPERATION U
③ 120°	4	89						30		TYPE OF OPERATION DA-2
④ 120°	5							40		DAYTIME TOWERS - - - -
⑤ 120°	6							50		NIGHTTIME TOWERS 1, 2, 3, 4, 5, 6
⑥	7							60		No RADIALS PER TOWER 120
	8							70		LENGTH OF RADIALS 269' 150'
	9							80		GROUND SCREEN DIMENSION
	10							E_1 = 102 mv/m		LAT. 41° 34' 00"
	DAYTIME OPERATION ☐			NIGHTTIME OPERATION ☒				P_1 = kw		LONG. 83° 34' 23"
										SUPERSEDES
										PATTERN No. 661029

Tower No. 4 Used
All Others Detuned

FIG. 6.15

WTTO NON-DIRECTIONAL NIGHTTIME
MEASURED HORIZONTAL PATTERN

CARL E. SMITH
Consulting Radio Engineers

WTTO BROADCASTING CO.
TOLEDO, OHIO

FCC File No.BL-11577
Accepted 3-10-67

Station WTTO
Toledo, Ohio

1520 kc

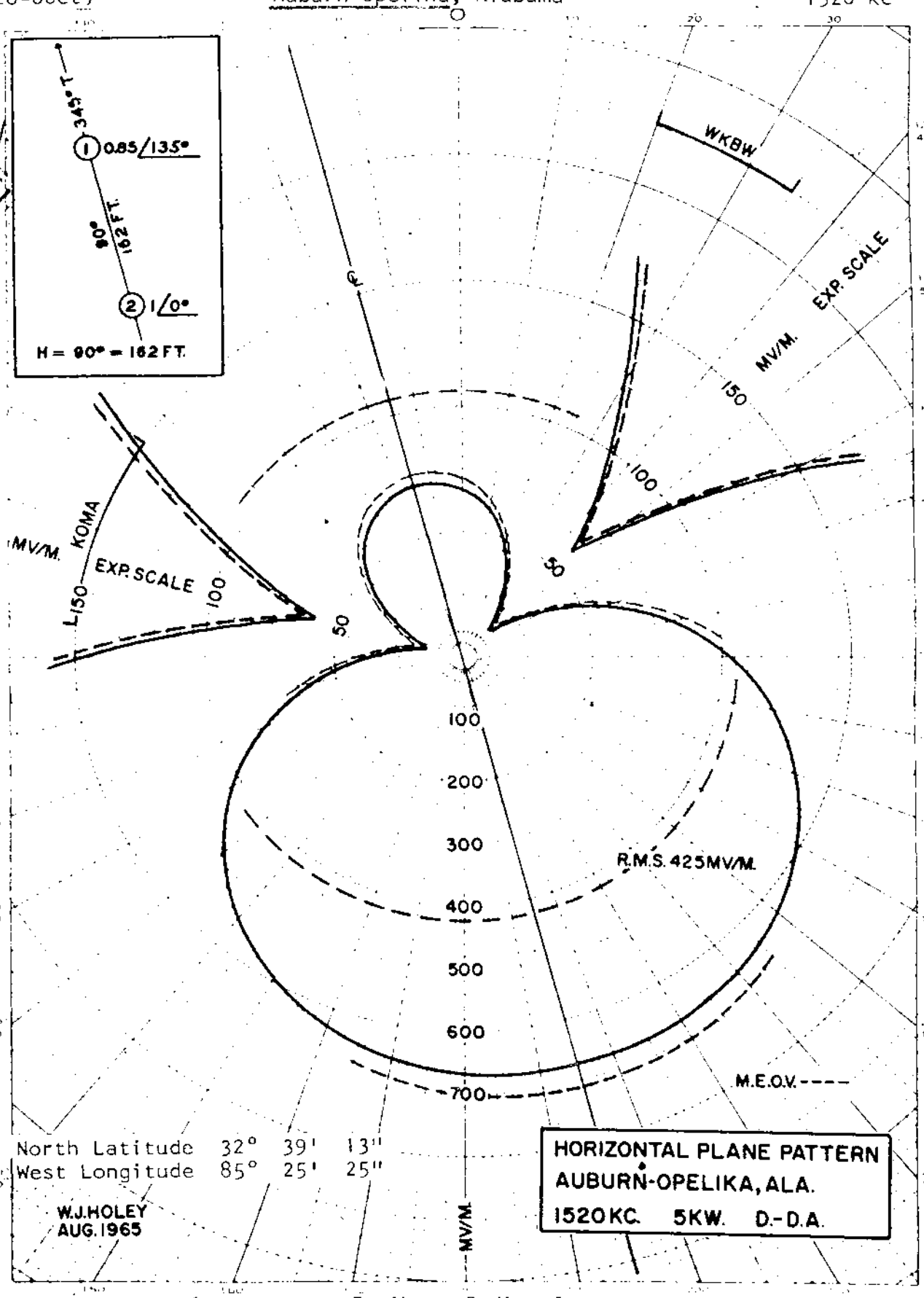
WAOA

Proposed Day
(7-28-66ct)

New; Faulkner Radio, Inc.
Auburn-Opelika, Alabama

5kw,DA-D,D
1520 kc

6-7-67
GRANTED
CP
FOR + NEW
+ 1 STATION



North Latitude 32° 39' 13"
West Longitude 85° 25' 25"

FCC File No. BP-16921
Accepted 6-27-66

New; Faulkner Radio, Inc.
Auburn-Opelika, Alabama

1520 kc

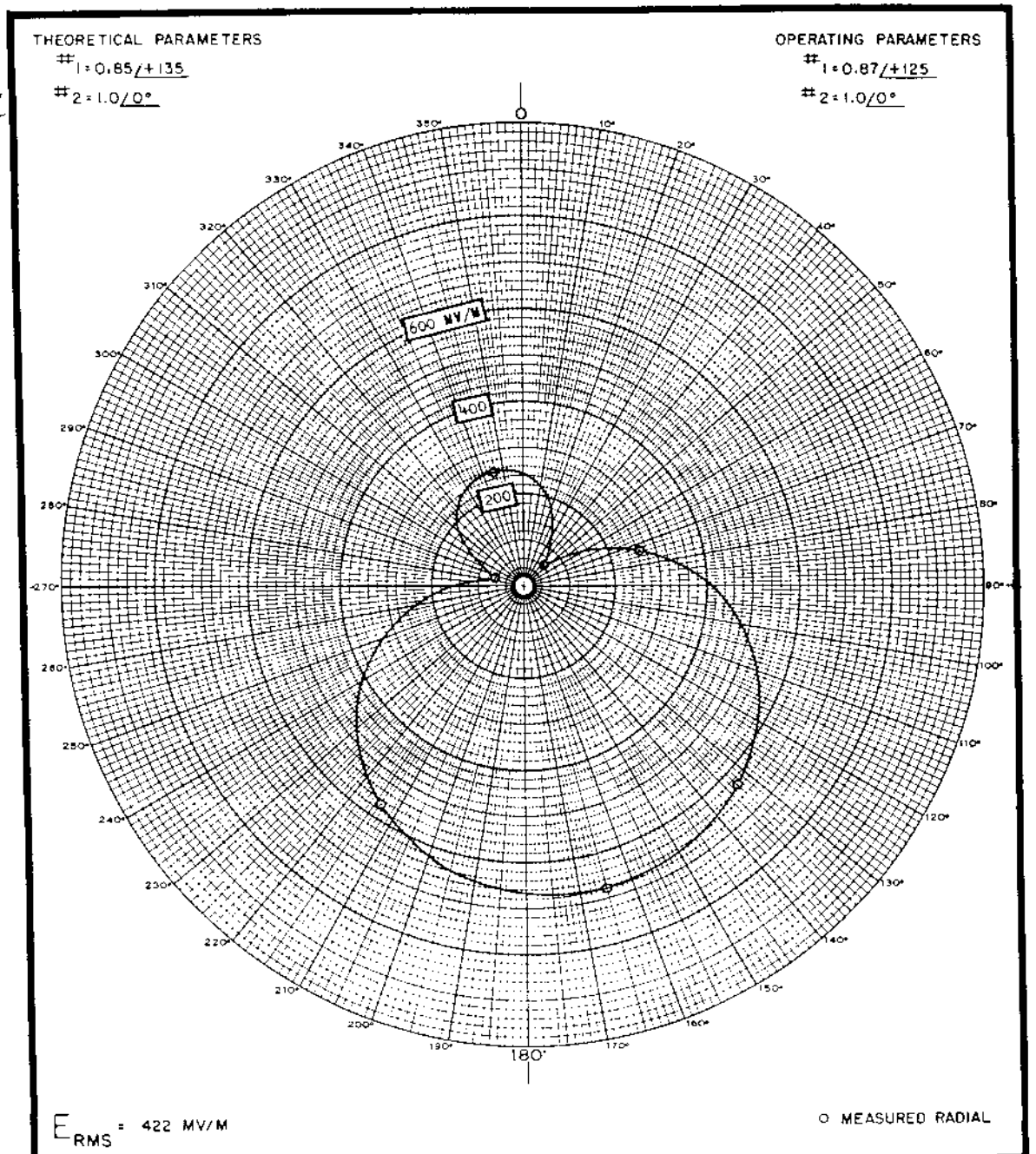
WAOA

Measured Day
(9-26-68ct)

Station WAOA
Auburn-Opelika, Alabama

5kw,DA-D,D
1520 kc

9-26-68
Granted
license

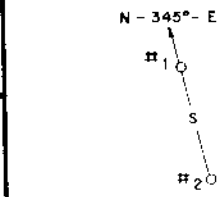


LATITUDE: 32° 39' 21"

LONGITUDE: 85° 25' 25"

JOHN H. MULLANEY
AND
ASSOCIATES

ANTENNA PARAMETERS



G = 90° = 162'
S = 90° = 162'

FIGURE 12

MEASURED DAY DIRECTIONAL

RADIO STATION WAOA
AUBURN-OPELIKA, ALABAMA

1520 KHz

5 KW, DA-D

FCC File No.BL-12090
Accepted 9-10-68

Station WAOA
Auburn-Opelika, Alabama

1520 kc

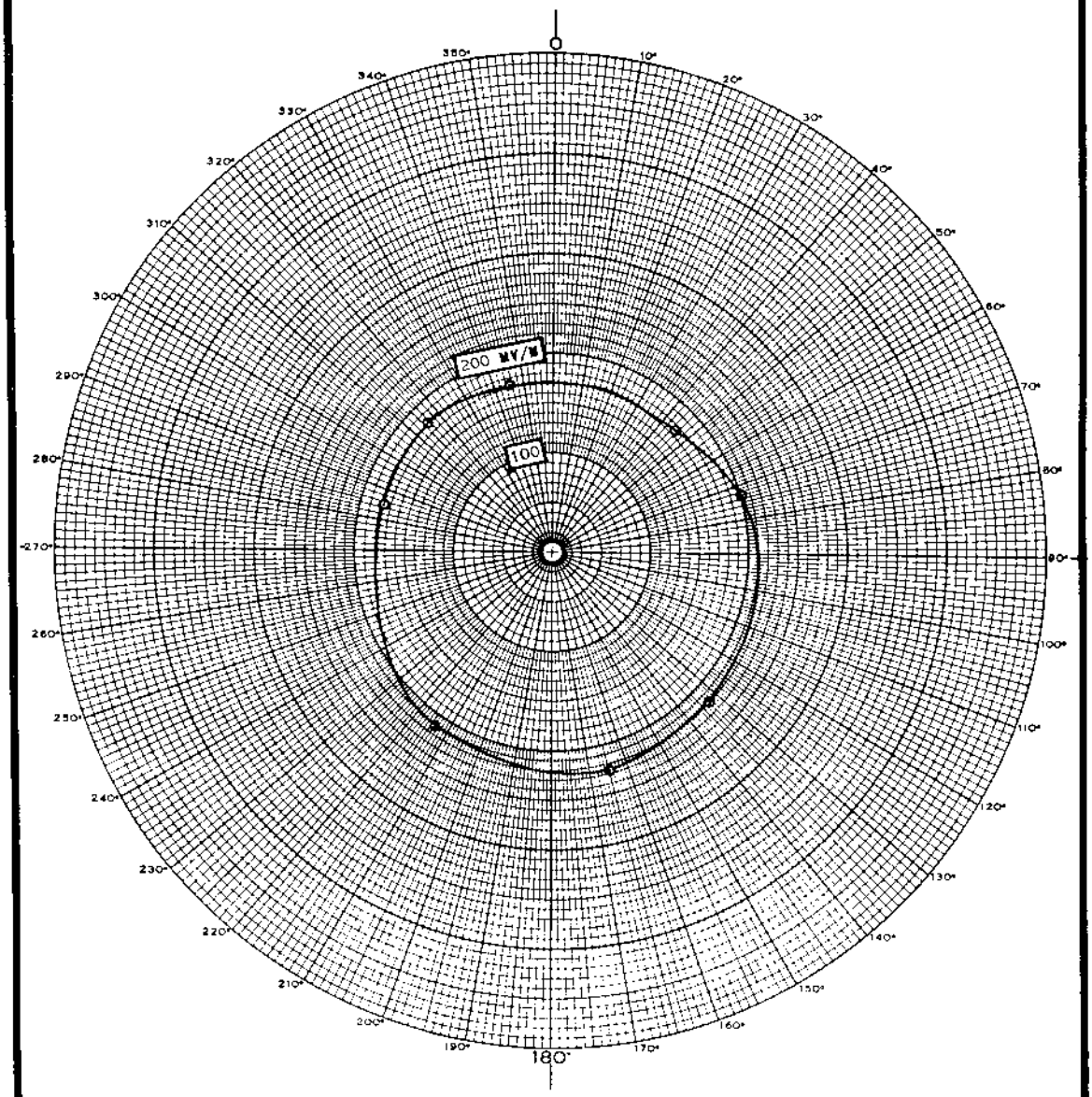
WAOA

Measured Non-DA
(9-26-68ct)

Station WAOA
Auburn-Opelika, Alabama

5kw, DA-D, D
1520 kc

9-26-68
Granted license



E_{RMS} = 194 MV/M

LATITUDE: 32° 39' 21" LONGITUDE: 85° 25' 25"	ANTENNA PARAMETERS	FIGURE II MEASURED 1KW NONDIRECTIONAL RADIO STATION WAOA AUBURN-OPELIKA, ALABAMA
JOHN H. MULLANEY AND ASSOCIATES		1520 KHz 5 KW, DA-D

FCC File No.BL-12090
Accepted 9-10-68

Station WAOA
Auburn-Opelika, Alabama

1520 kc

WEXM

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WEXM

Main Studio: Jamesville, Virginia

Frequency: 1520 kHz

Power: 0.5 kW

Notification List No. 1620

Date: February 20, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 37° 31' 46"
West Longitude: 75° 54' 43"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D) STANDARD PATTERN
Number of elements: 2
Type of elements: Uniform cross-section, guyed, vertical steel towers. Tower #1 is shunt excited, tower #2 is series excited.

TOWER:	NW(#1)		SE(#2)	
HEIGHT ABOVE INSULATORS:	300'	(167°)	160'	(90°)
PHASING:	0°		-98°	
FIELD RATIO:	1.00		0.89	

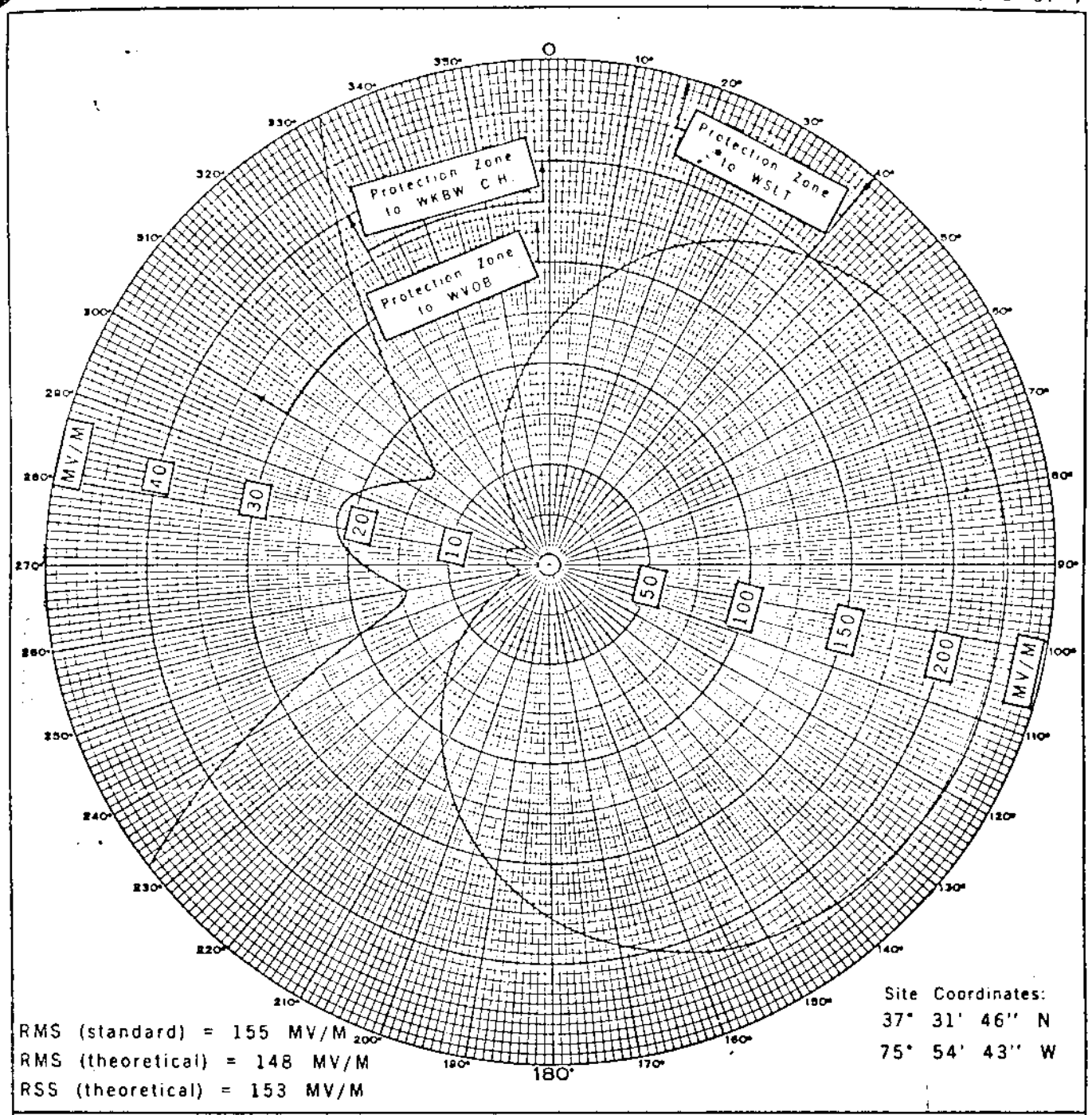
SPACING AND ORIENTATION: Elements are spaced 161.8' (90°) on a line bearing 103° true.

GROUND SYSTEM: 120-160' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

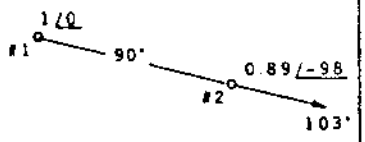
PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
148 mv/m	153 mv/m	155 mv/m

Note: This notification concerns changes in the proposed directional antenn system and radiation pattern.



PROPOSED HORIZONTAL PLANE STANDARD RADIATION PATTERN



G1 = 167°
G2 = 90°

PARKER · REW ENTERPRISES

JAMESVILLE, VIRGINIA

Jules Cohen & Associates
Consulting Electronics Engineers

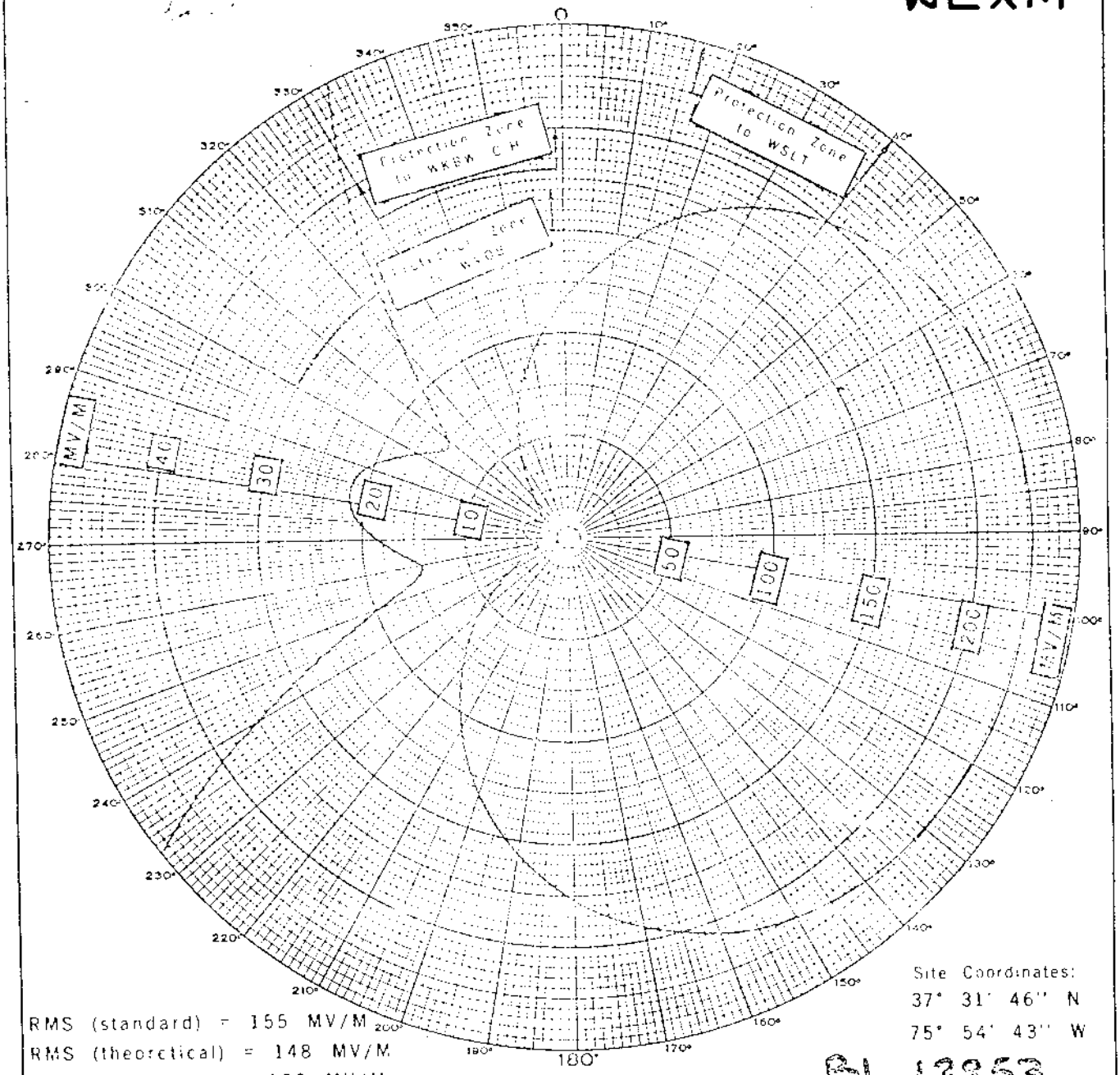
RADIO STATION WEXM

- 1520 KHZ

0.5 KW D DA

PATTERN 741220A

WEXM

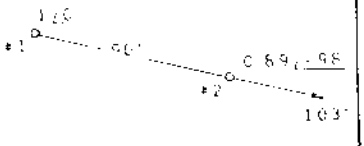


RMS (standard) = 155 MV/M
RMS (theoretical) = 148 MV/M
RSS (theoretical) = 153 MV/M

Site Coordinates:
37° 31' 46" N
75° 54' 43" W

BL 13853

PROPOSED HORIZONTAL PLANE STANDARD RADIATION PATTERN



G1 - 167°
G2 - 90°

PARKER - REW ENTERPRISES

JAMESVILLE, VIRGINIA

Jules Cohen & Associates
Consulting Electronics Engineers

RADIO STATION WEXM

1520 KHZ

0.5 KW D DA

PATTERN 741220A

WGNB

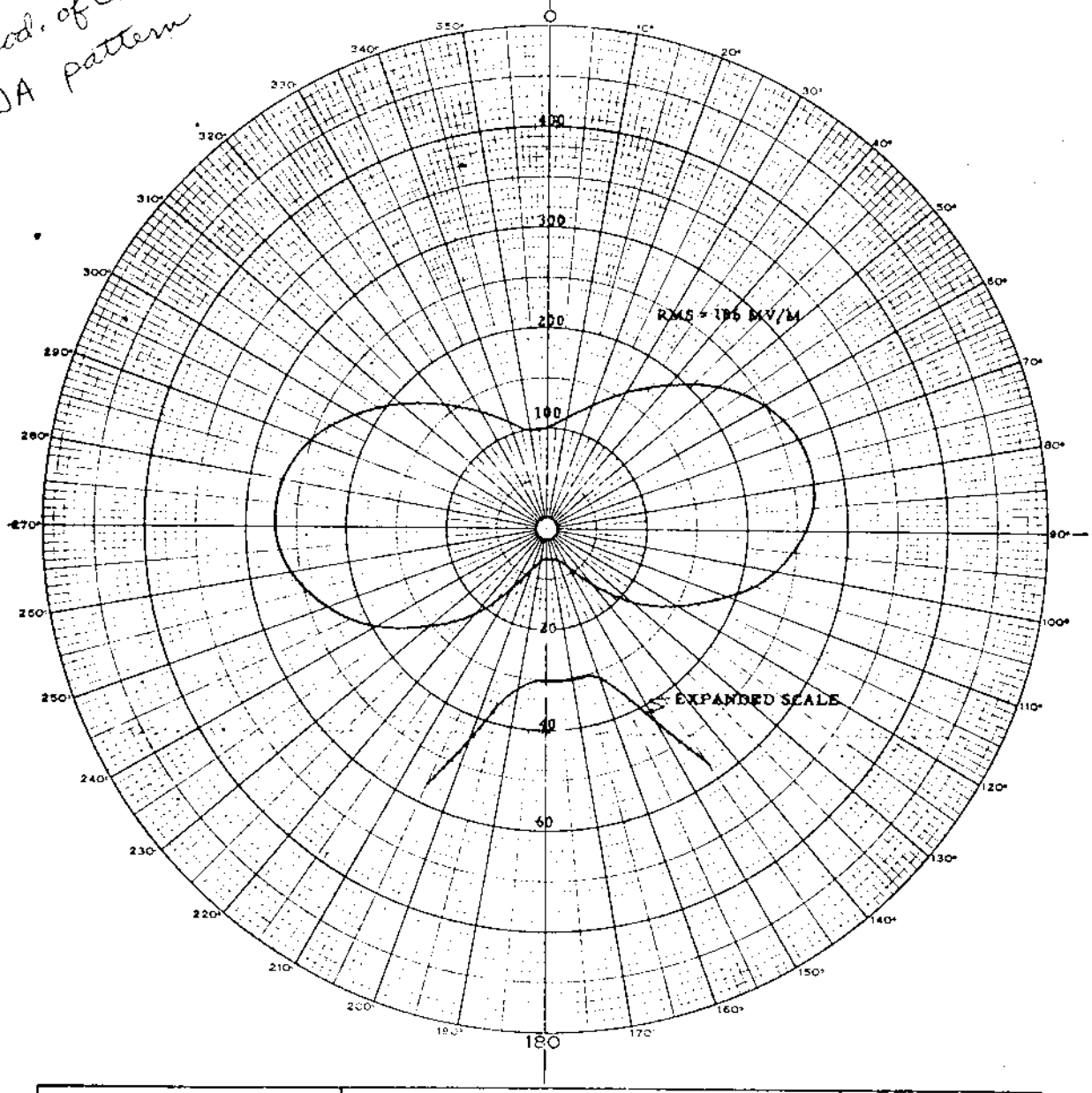
5-9-63
granted mod. of CP
to change DA pattern

POLAR COORDINATE PAPER 10 LP CLEVELAND INSTITUTE OF RADIO ELECTRONICS CLEVELAND OHIO

Proposed Day
(4-30-63ct)

Station WGNP
Indian Rocks Beach, Florida

1kw, DA-D, D
1520 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA
N 1/0° (1) 160° 21.1' -8/21° (2) 175° True	TOWER No.	ELECTRICAL HEIGHT C°	TRUE TOWER ORIENTATION θ°	SPACING S°	PHASING V°	HORIZONTAL FIELD mv/m F	FIELD RATIO F	ELEV. ANGLE θ°	ELEVATION RMS FIELD mv/m F_θ	CALL New
	1	90°	0	0	0	150.5	1.0	0	186	FREQUENCY 1520 kc
	2	90°	175°	160°	21°	120.5	0.8	10		POWER 1 kw
	3							20		TIME OF OPERATION DA-D
	4							30		TYPE OF OPERATION Class II
	5							40		DAYTIME TOWERS 2
	6							50		NIGHTTIME TOWERS --
	7							60		NO. RADIALS PER TOWER 120
	8							70		LENGTH OF RADIALS 90 ' 162 ft
	9							80		GROUND SCREEN DIMENSION 24 x 24
	10									LAT. 27° 49' 28"
	11									LONG. 82° 46' 47"
	12									SUPERSEDES
										PATTERN No. 630325

CARL E. SMITH CONSULTING RADIO ENGINEERS	FIG. 4.1 PROPOSED HORIZONTAL PATTERN	The World Christian Foundation Inc. Indian Rocks Beach, Fla. 1520 kc 1 kw DA-D

FCC File No. BMP-10859
Accepted 4-15-63

Station WGNP
Indian Rocks Beach, Florida 1520 kc

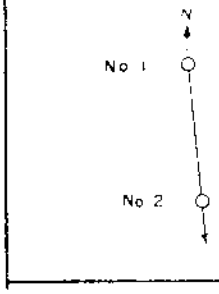
WG-N-B

Measured Day
(9-29-64ct)

Station WGNP
Indian Rocks Beach, Florida

1kw, DA-D, D
1520 kc

TOWER PLACEMENT SKETCH



PATTERN PARAMETERS

TOWER No.	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION φ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD E	FIELD RATIO F	ELEV ANGLE θ°	ELEVATION RM. FIELD E_θ
1	165	0	0	0		1.0	0	187.5
2	90	175	160	21		0.8	10	
3							20	
4							30	
5							40	
6							50	
7							60	
8							70	
9							80	
10							E_1	
							E_2	

STATION DATA

CALL	WGNP
FREQUENCY	1520 kc
POWER	1 kw
TIME OF OPERATION	DA-D
TYPE OF OPERATION	Class II
DAYTIME TOWERS	2
NIGHTTIME TOWERS	--
No. RADIALS PER TOWER	120
LENGTH OF RADIALS	90' 162'
GROUND SCREEN DIMENSION	24 x 24
LAT.	27° 50' 26"
LONG.	82° 46' 10"
SUPERSEDES	630408
PATTERN No.	3

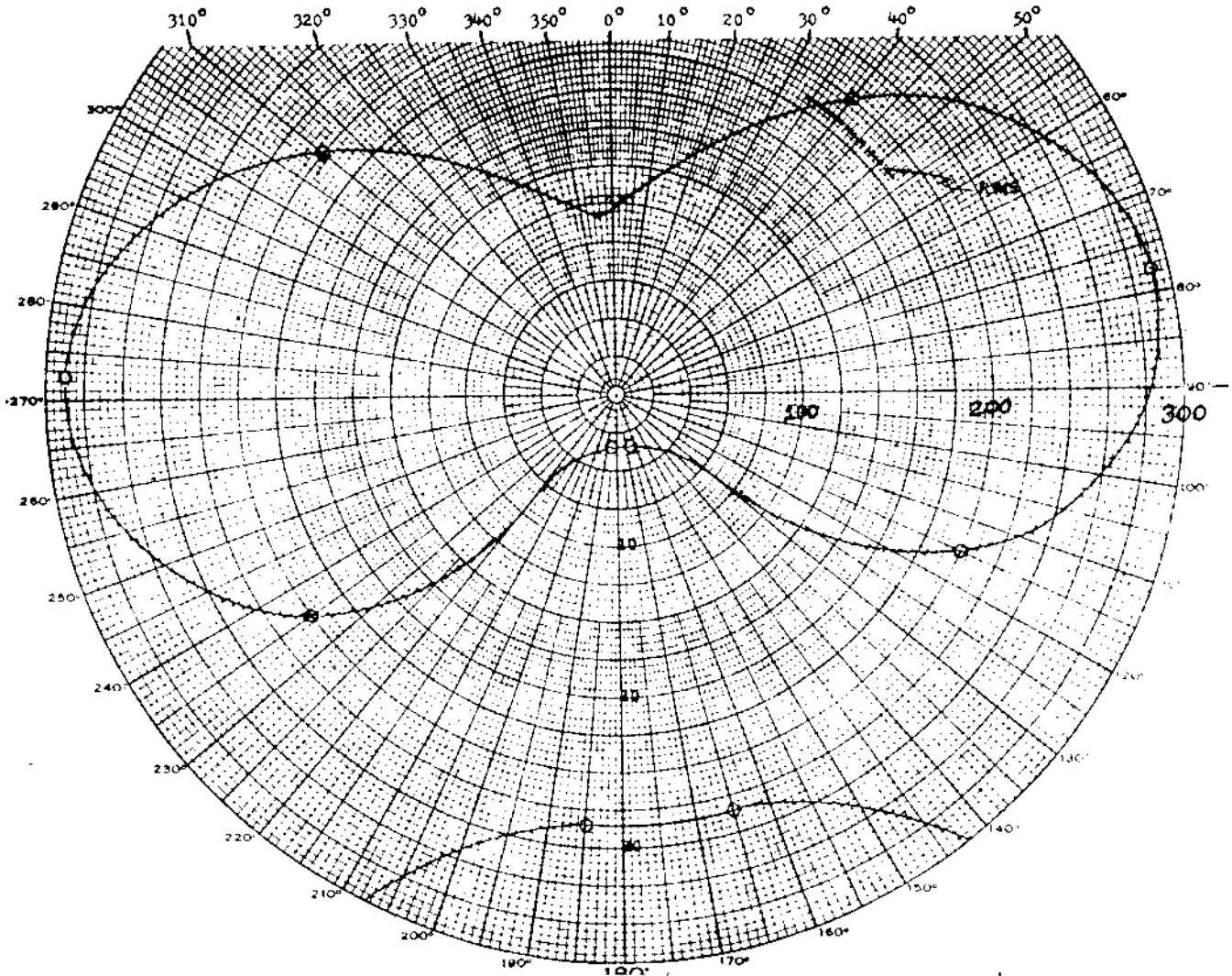
Manly St. Jean
Radio Engineer
8705 Flame Vine Ave.
Largo, Florida

Page 2- (g)

MEASURED DIRECTIONAL HORIZONTAL PATTERN

The World Christian Radio Foundation Inc.
WGNP Indian Rocks Beach, Florida
1520 KC 1 kw DA-D
From original data of March 1963 and from re-run data of June 1964, i.e. 355°.

BRC-2599 7-29-70
GR. (10-21-64) APPL.



FCC File No. BRC-2529
Accepted

Station WGNP
Indian Rocks Beach, Florida

1520 kc

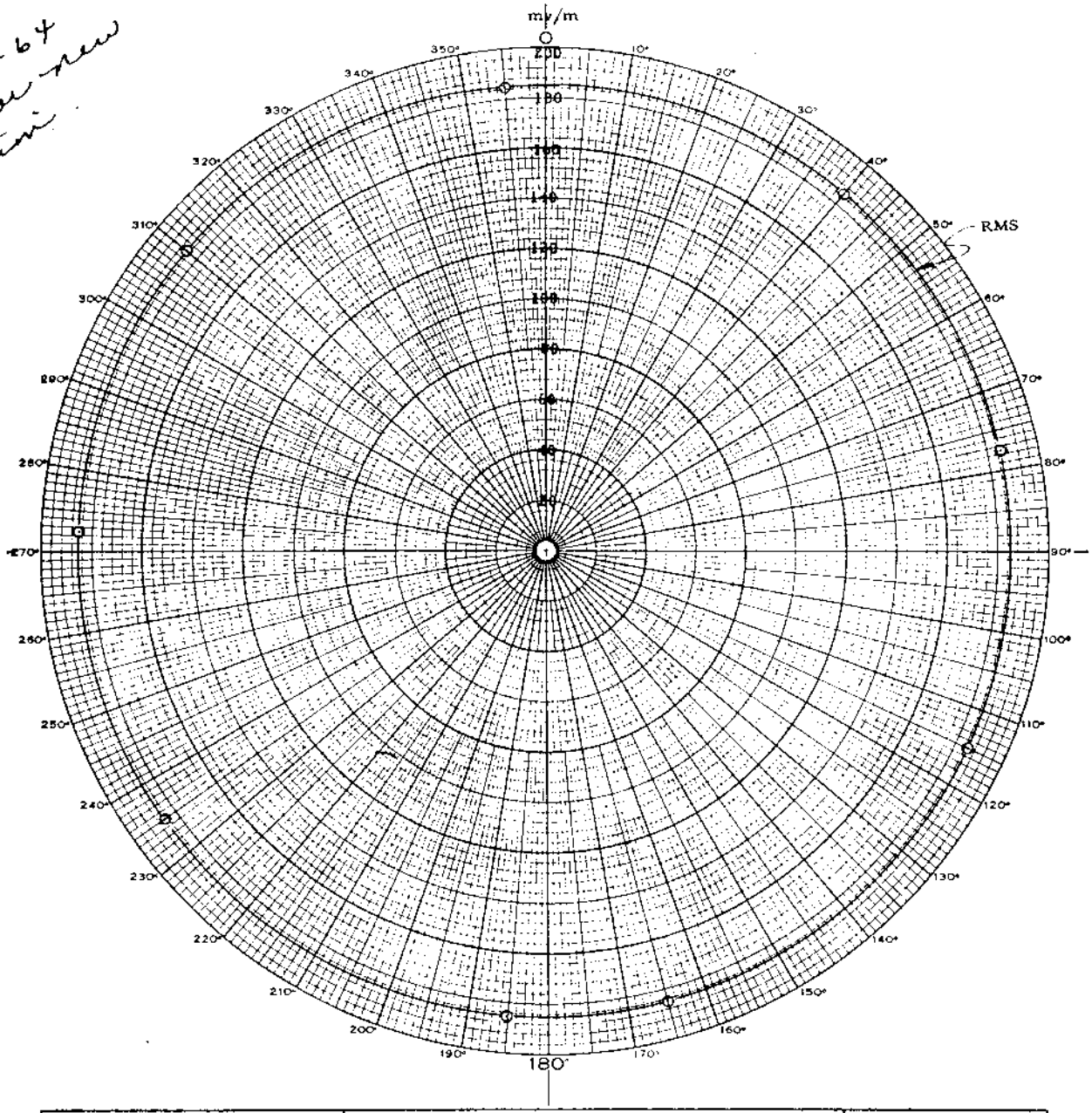
WGNB

Measured Non-DA
(7-24-63ct)

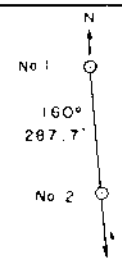
Station WGNP
Indian Rocks Beach, Florida

1kw,DA-D,D
1520 kc

2-13-64
Fig for new station



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS	STATION DATA



TOWER No	ELECTRICAL HEIGHT G°	TRUE TOWER ORIENTATION φ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD E	FIELD RATIO F	ELEV. ANGLE θ°	ELEVATION RMS FIELD E_θ
1	265						0	185
2							10	
3							20	
4							30	
5							40	
6							50	
7							60	
8							70	
9							80	
10							E_0*	mv/m
	DAYTIME OPERATION ☐		NIGHTTIME OPERATION ☐				E_1 =	∠

STATION DATA	
CALL	WGNP
FREQUENCY	1520 kc
POWER	1 kw
TIME OF OPERATION	DA-D
TYPE OF OPERATION	Class II
DAYTIME TOWERS	2
NIGHTTIME TOWERS	- -
No. RADIALS PER TOWER	120
LENGTH OF RADIALS	90 ' 162 ft
GROUND SCREEN DIMENSION	24 x 24
LAT.	27 ° 50 ' 26 "
LONG	82 ° 46 ' 10 "
SUPERSEDES	
PATTERN No	630408

FIG. 6.10

Measured Non-Directional Horizontal Pattern

The World Christian Radio Foundation, Inc
Indian Rocks Beach, Florida
1520 kc 1 kw DA-D

CARL E. SMITH
CONSULTING RADIO ENGINEERS

FCC File No.BL-10123
Accepted 7-8-63

Station WGNP
Indian Rocks Beach, Florida

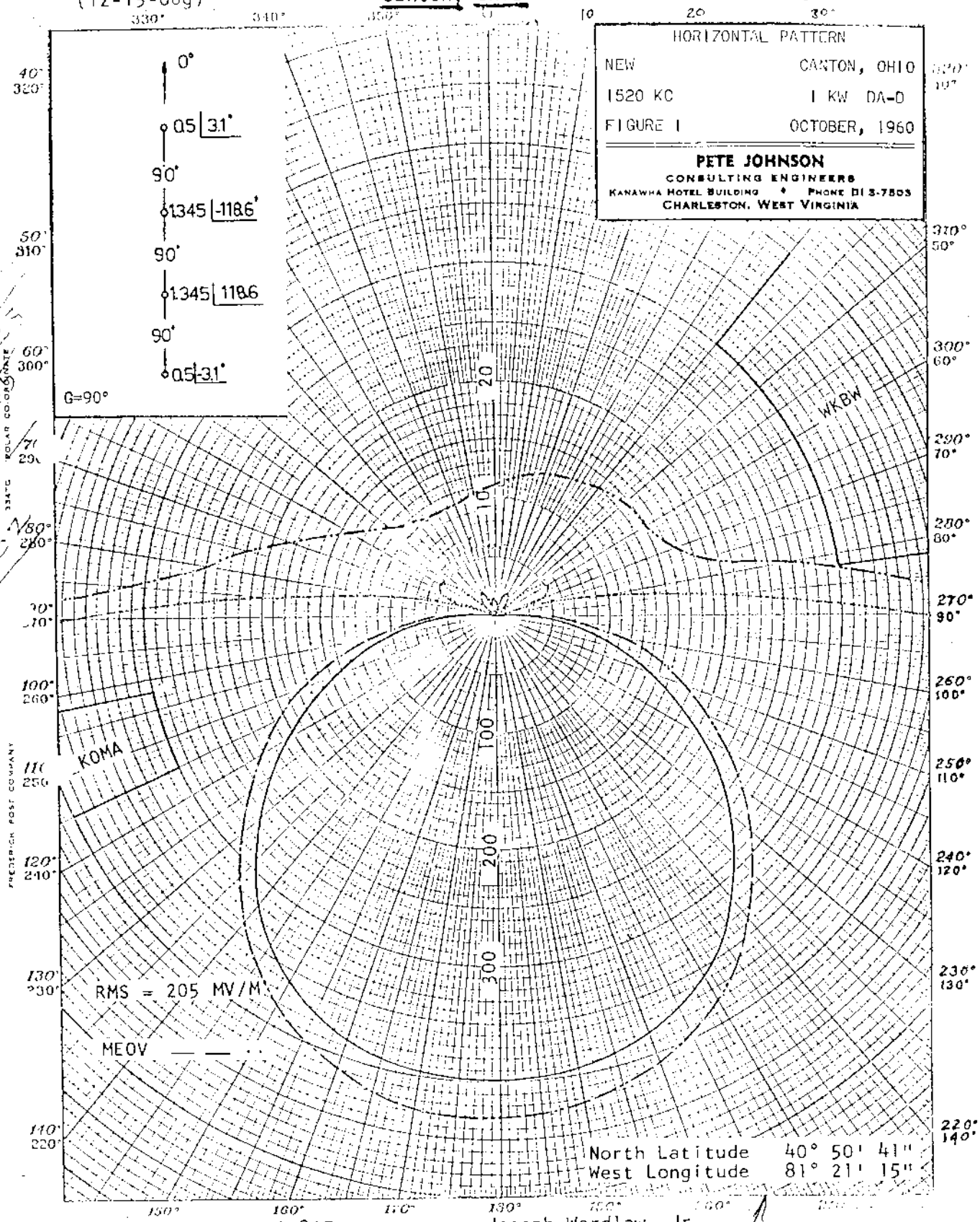
1520 kc

WINW

PROPOSED DAY
(12-15-60g)

New; Joseph Wardlaw, Jr.
Canton, Ohio

1kw, DA-D,D
1520 KC



FCC File No. BP-13835
Accepted 11-10-60 (Amended)

Joseph Wardlaw, Jr.
Canton, Ohio

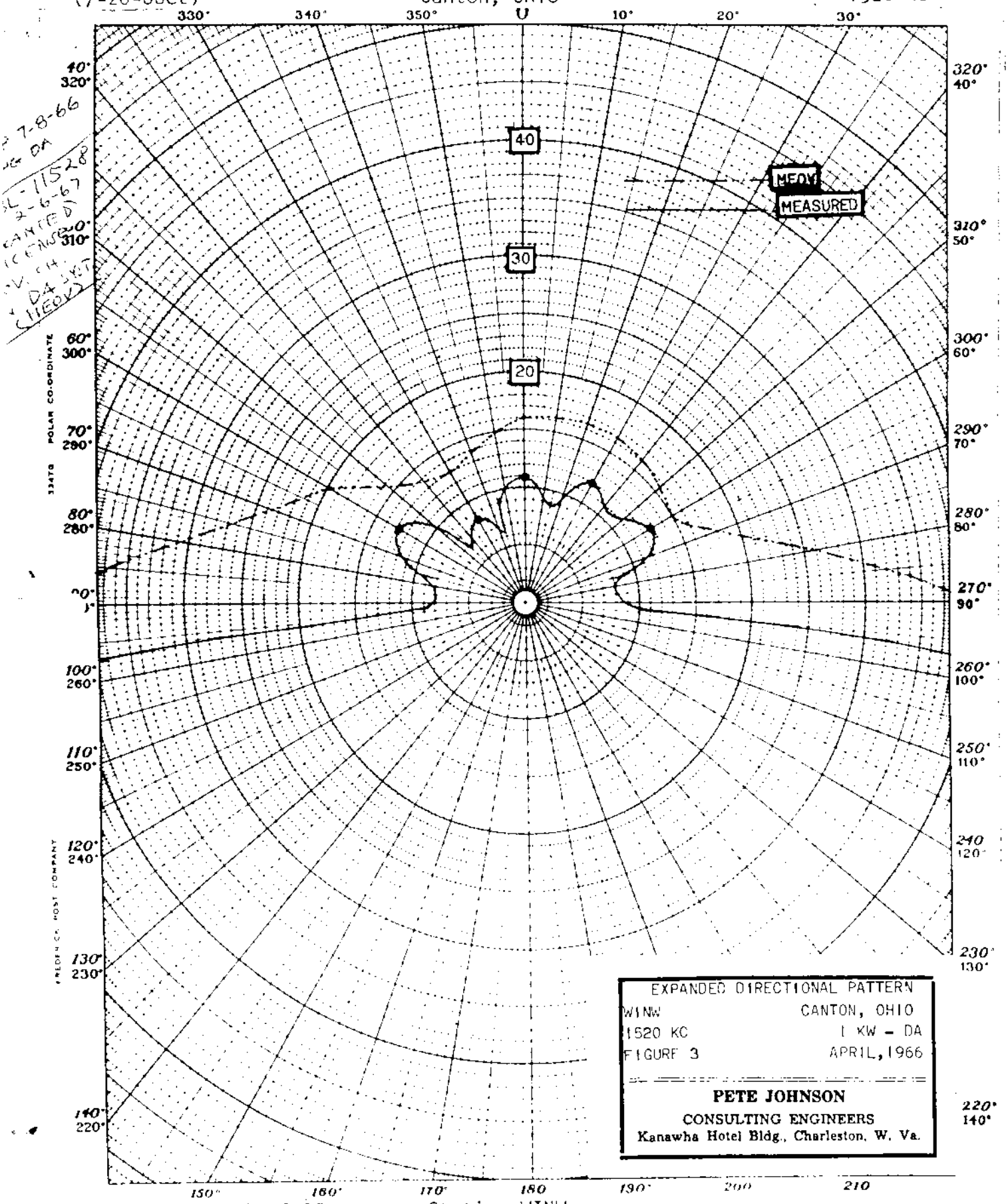
1520 KC

WINW

Proposed Day Nulls (MEOV)
(7-28-66ct)

Station WINW
Canton, Ohio

1kw,DA-D,D
1520 kc



EXPANDED DIRECTIONAL PATTERN
WINW — CANTON, OHIO
1520 KC — 1 KW - DA
FIGURE 3 — APRIL, 1966

PETE JOHNSON
CONSULTING ENGINEERS
Kanawha Hotel Bldg., Charleston, W. Va.

FCC File No. BP-17225
Accepted 6-30-66

Station WINW
Canton, Ohio

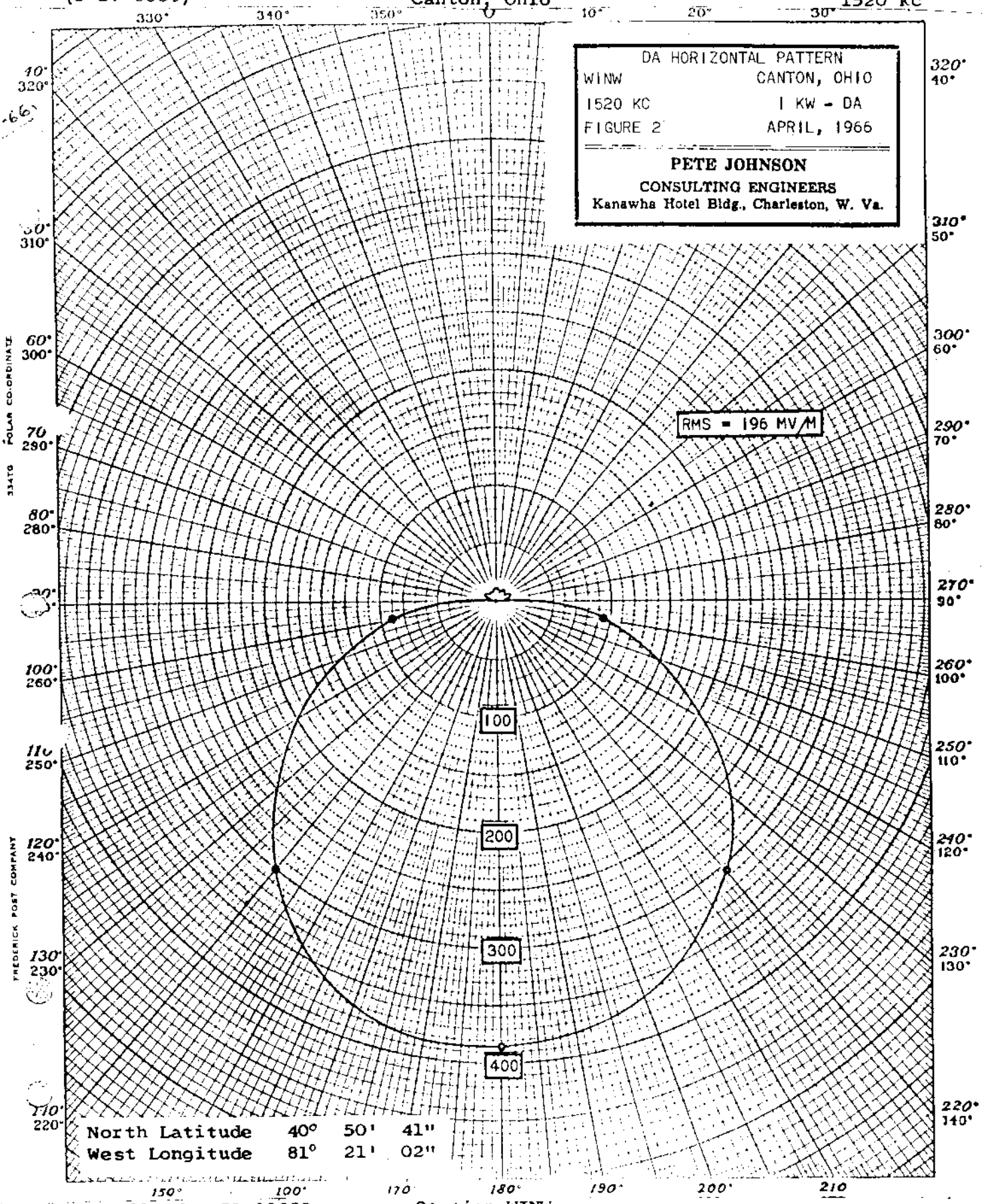
1520 kc

WINW

Measured Day
(5-27-66ct)

Station WINW
Canton, Ohio

1kw,DA-D,D
1520 kc



FCC File No. BL-11288
Accepted 5-13-66

Station WINW
Canton, Ohio

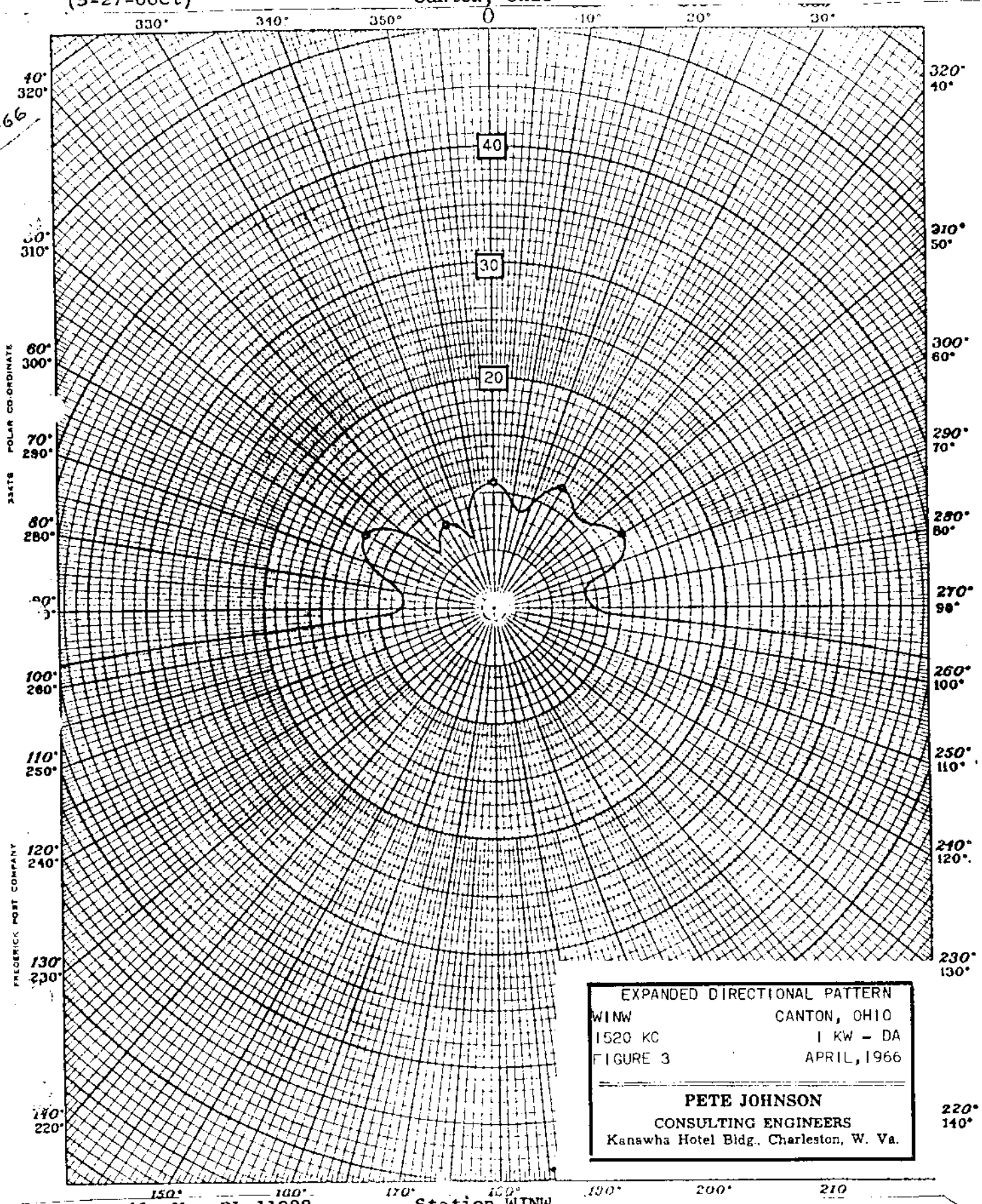
1520 kc

WINW

Measured Day Nulls
(5-27-66ct)

Station WINW
Canton, Ohio

1kw,DA-D,D
1520 kc



FCC File No. BL-11288
Accepted 5-13-66

Station WINW
Canton, Ohio

1520 kc

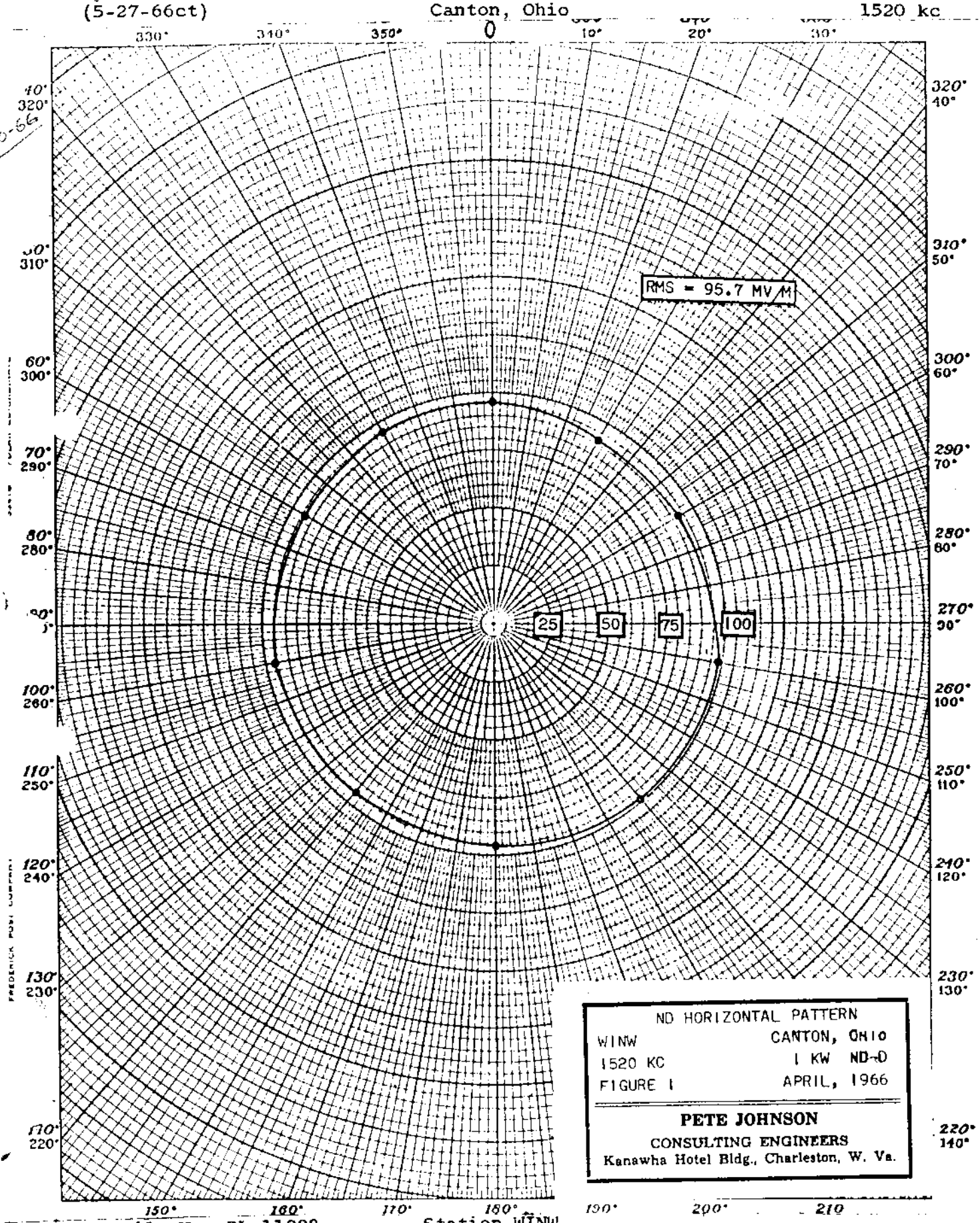
WINW

Measured Non-DA
(5-27-66ct)

Station WINW
Canton, Ohio

1kw,DA-D,D
1520 kc

IC 6-30-66



FCC File No. BL-11288
Accepted 5-13-66

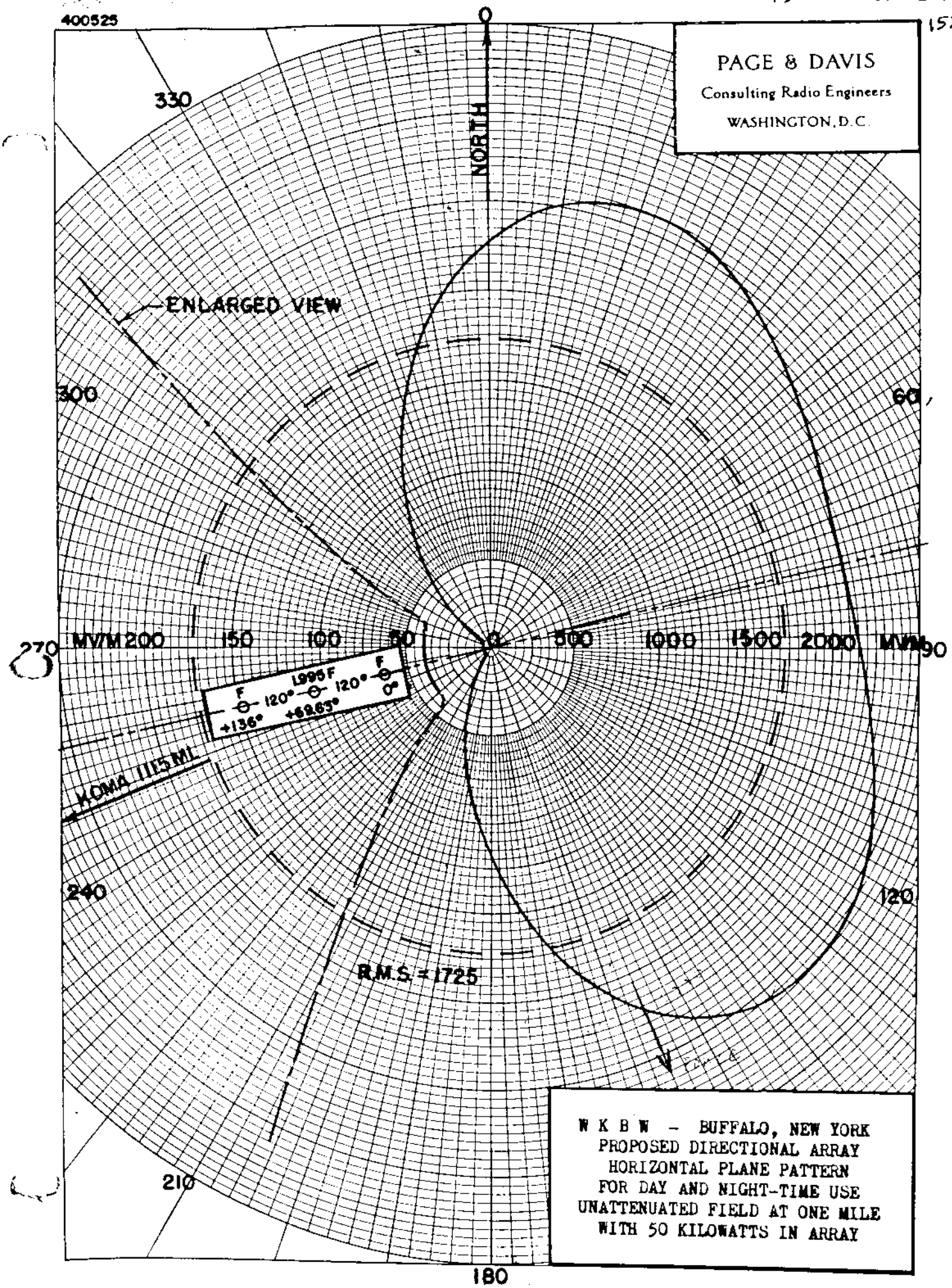
Station WINW
Canton, Ohio

1520 kc

1520 WKBW

400525

1520



W K B W – BUFFALO, NEW YORK
PROPOSED DIRECTIONAL ARRAY
HORIZONTAL PLANE PATTERN
FOR DAY AND NIGHT-TIME USE
UNATTENUATED FIELD AT ONE MILE
WITH 50 KILOWATTS IN ARRAY

VVKBW

Measured Day & Night
(1-30-67ct)

Station WKBW
Buffalo, New York

50kw,DA-1,U
1520 kc

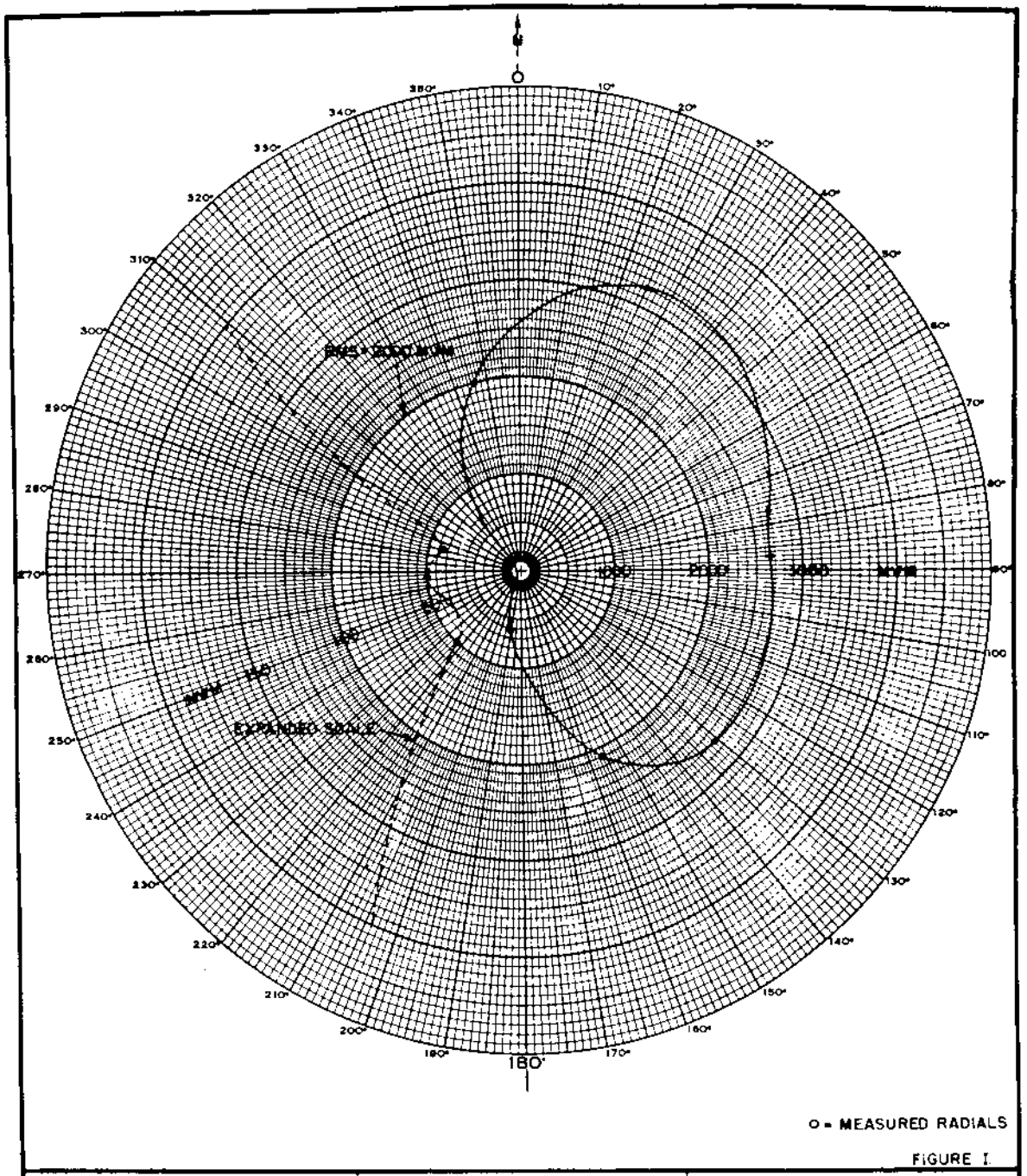
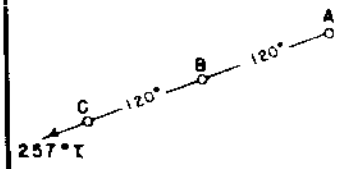


FIGURE I.



G = 195°

LATITUDE 42° 46' 04" N
LONGITUDE 78° 50' 39" W

ANTENNA NUMBER	AZIMUTH DEG	SPACING DEG	PHASING DEG	FIELD RATIO	MV/M FOR 1 KW	HEIGHT DEG
A	–	–	0	1.0	–	195
B	257	120	69.63	1.995	–	195
C	257	240	136	1.0	–	195

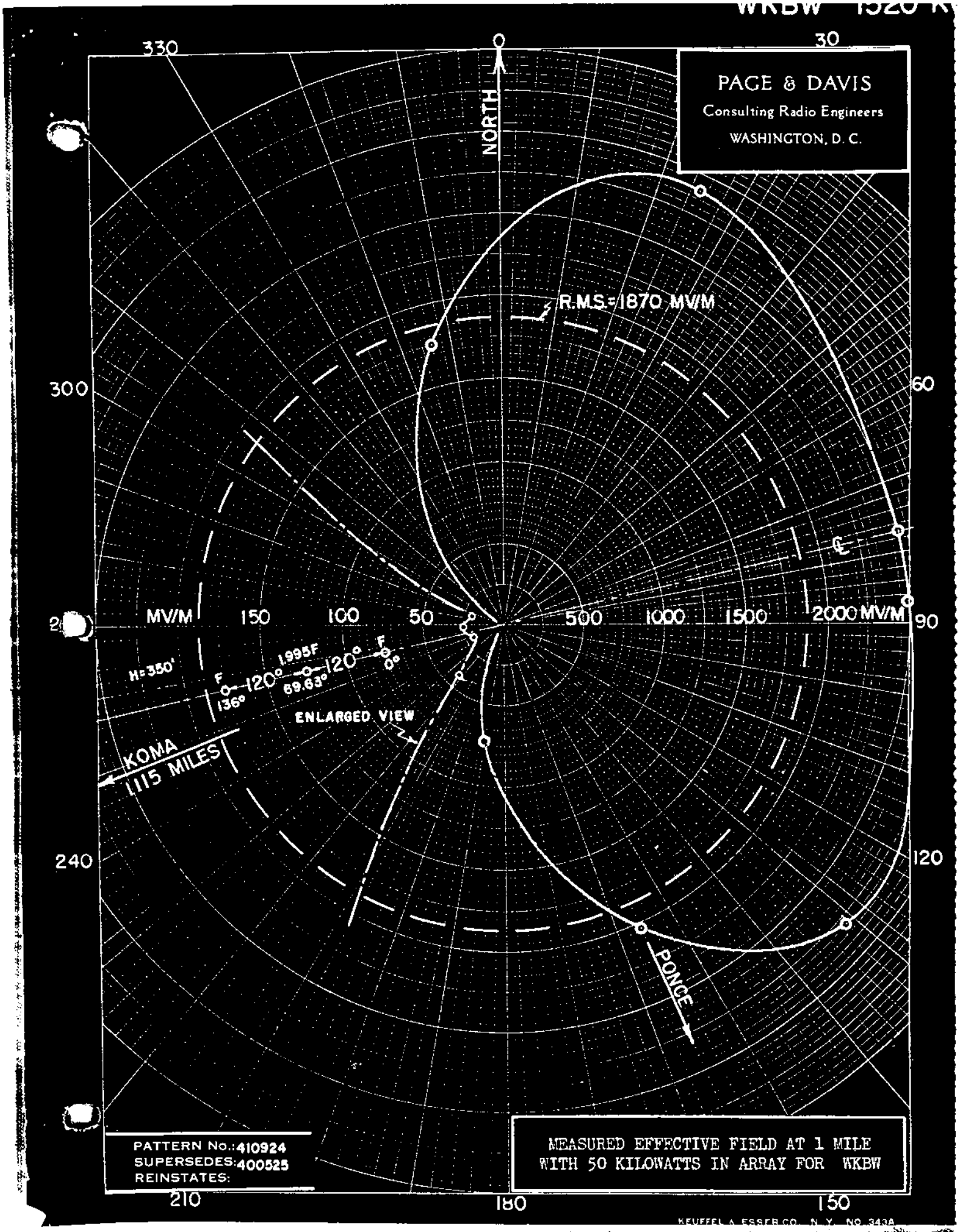
MEASURED HORIZONTAL
PLANE PATTERN
WKBW
BUFFALO, NEW YORK
1520 KC. 50 KW. U, DA-1
631106.

KEAR & KENNEDY
CONSULTING ENGINEERS
WASHINGTON, D. C.

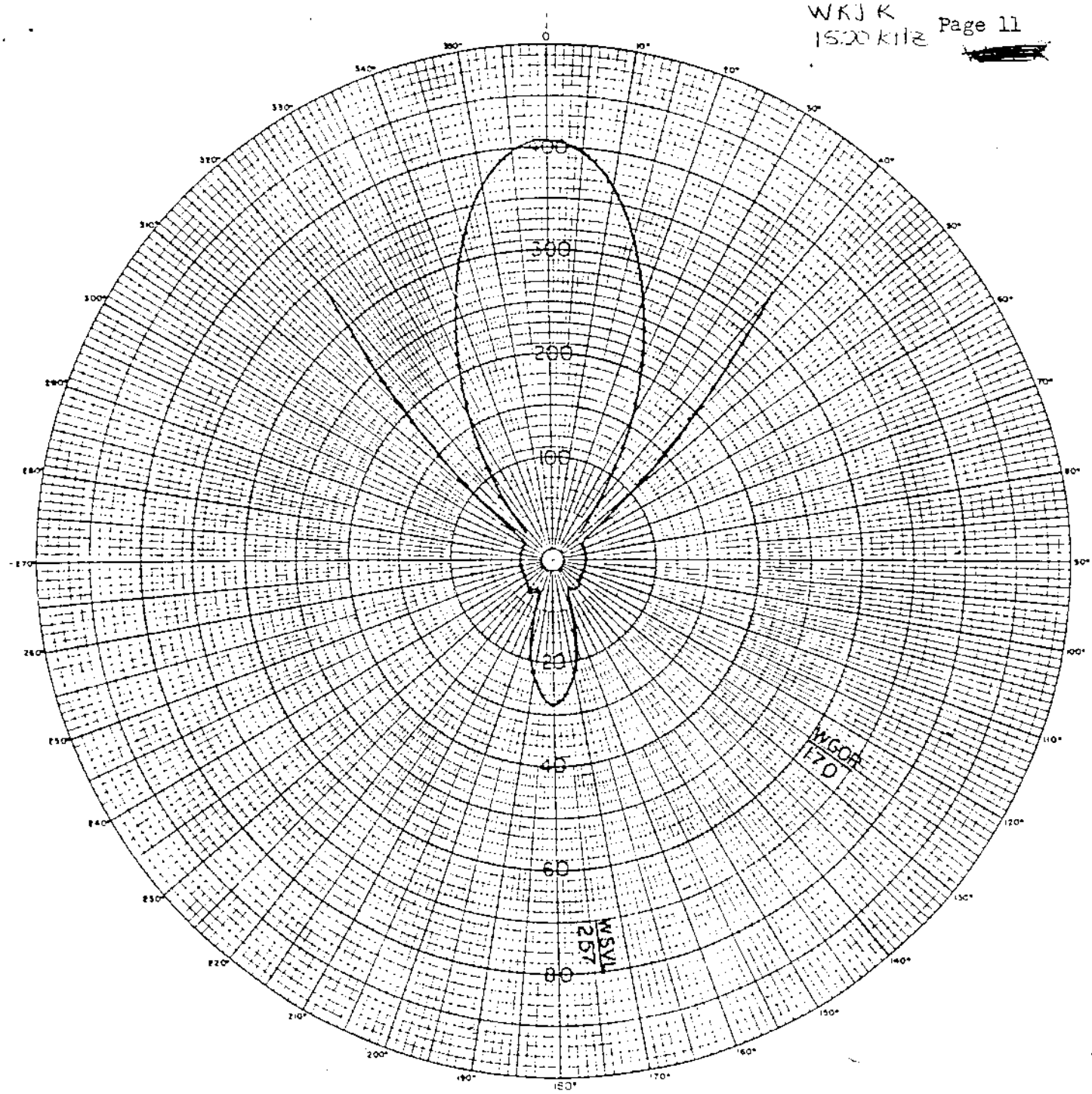
FCC File No.BRC-2229
Granted 11-14-63

Station WKBW
Buffalo, New York

1520 kc

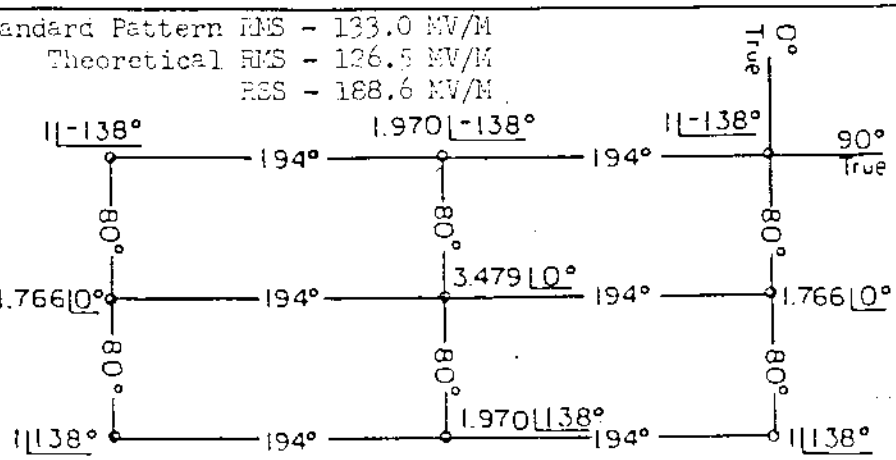

PAGE & DAVIS
Consulting Radio Engineers
WASHINGTON, D. C.
NORTH
330
30
300
60
240
120
210
180
150
90
R.M.S.=1870 MV/M
MV/M
150
100
50
500
1000
1500
2000 MV/M
H=350'
F
136°
120°
1.995F
69.63°
120°
F
0°
ENLARGED VIEW
KOMA
1115 MILES
PONCE
PATTERN No.: 410924
SUPERSEDES: 400525
REINSTATES:
MEASURED EFFECTIVE FIELD AT 1 MILE
WITH 50 KILOWATTS IN ARRAY FOR WKBW
KEUFFEL & ESSER CO. N. Y. NO. 343A

WKJ K
1520 KHz



HORIZONTAL RADIATION PATTERN — 0° STANDARD PATTERN

Standard Pattern RMS - 133.0 MV/M
Theoretical RMS - 126.5 MV/M
RSS - 188.6 MV/M



APPLICANT	WKJR
LOCATION	Muskegon Heights, Mich
FREQUENCY	1520 KC/S
POWER	500 Watts
LATITUDE	43 DEG 08 MIN. 28 SEC.
LONGITUDE	86 DEG 14 MIN 50 SEC.
WHEN USED	Nighttime
RMS FIELD	133.0 MV/M
DATE	August 28th, 1979

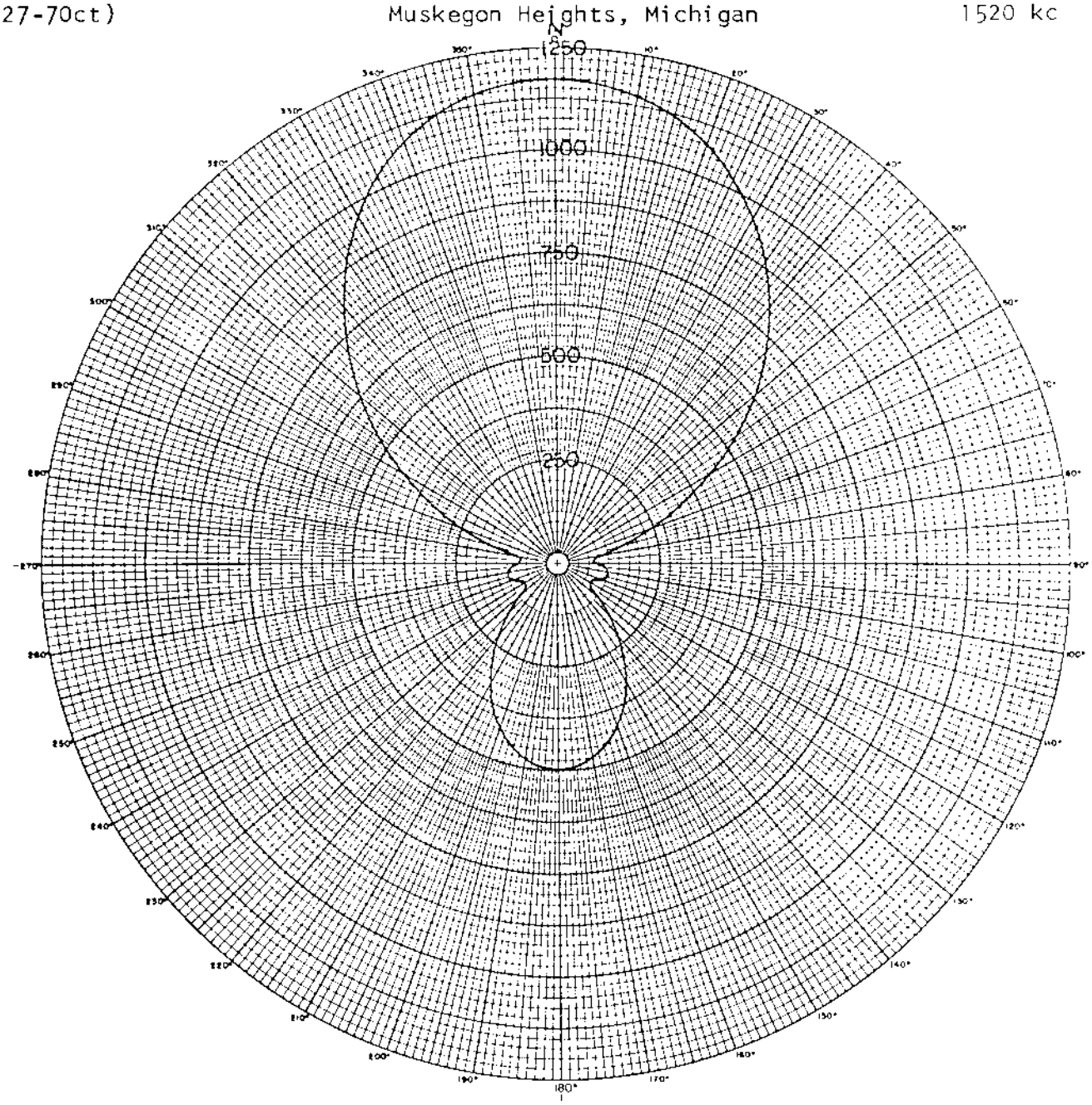
RALPH J. SITZER
CONSULTING RADIO ENGINEERS
ST. LOUIS, MISSOURI

WKJR

Proposed Day
(5-27-70ct)

StationWKJR
Muskegon Heights, Michigan

10kw,DA-D,D
1520 kc



HORIZONTAL RADIATION PATTERN BP-17,961

True 0°
1 -162°
80°
1.528 0°
80°
0.723 162°

A-160'/165' (90°)

APPLICANT WKJR
LOCATION Muskegon Heights,Mich.
FREQUENCY 1520 KC/S
POWER 10 KW
LATITUDE 43 DEG 08 MIN 28 SEC
LONGITUDE 86 DEG 14 MIN 53 SEC
WHEN USED: Daytime
RMS FIELD: 585 MV/M
DATE Sept. 16th, 1969

RALPH J. BITZER
CONSULTING RADIO ENGINEERS

FCC File No.BP-17961
Amended 10-14-69

Station WKJR
Muskegon Heights, Michigan

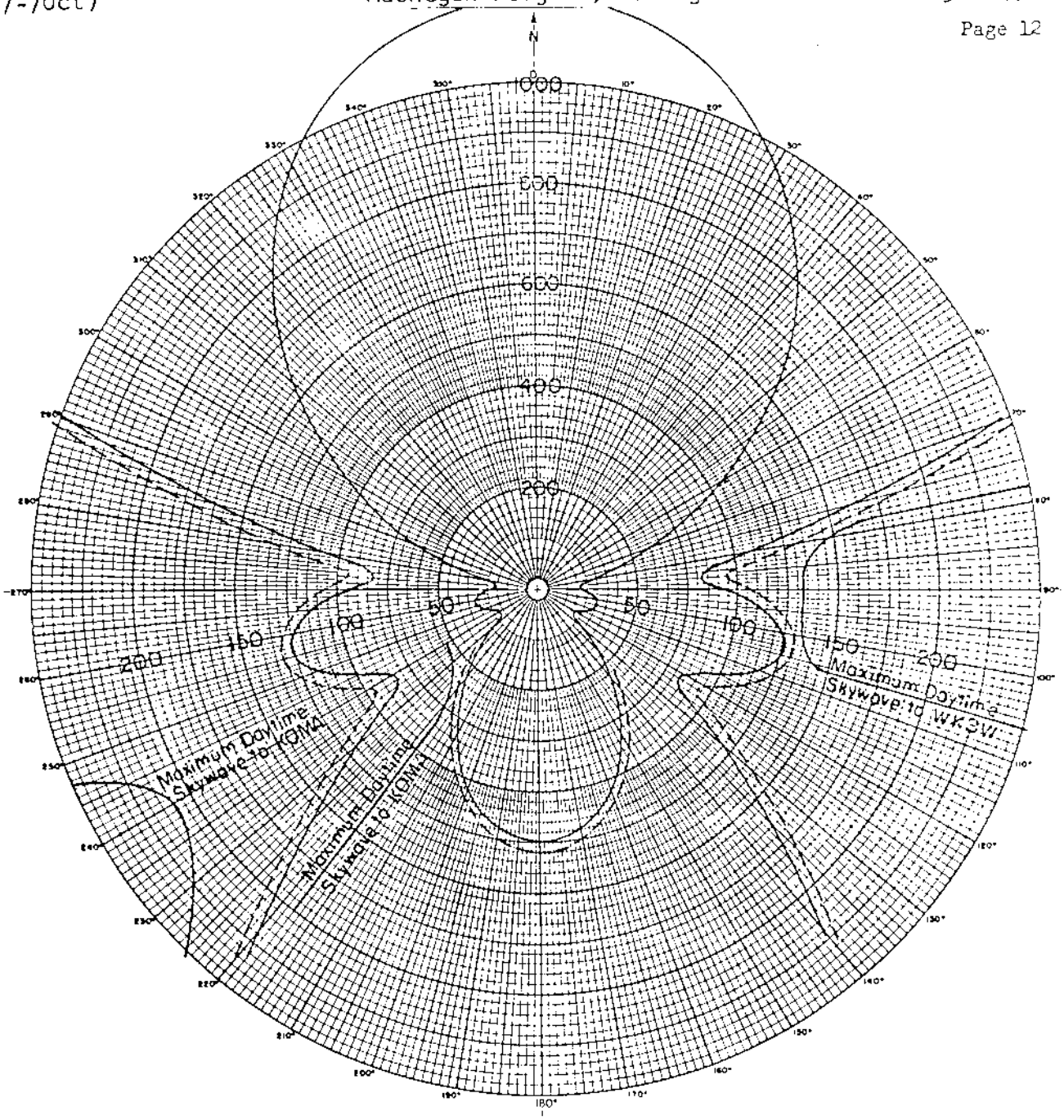
1520 kc

WKJR

Proposed Day Nulls
(5-27-70ct)

Station WKJR
Muskegon Heights, Michigan

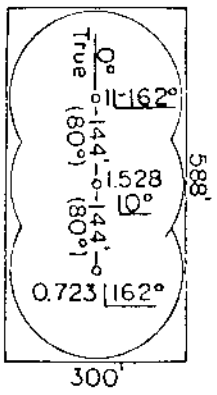
10kw, DA-D, D
1520 kc



HORIZONTAL RADIATION PATTERN

BP-17,961

APPLICANT	WKJR
LOCATION	Muskegon Heights, Mich.
FREQUENCY	1520 KC/S
POWER	10 KW
LATITUDE	43 DEG 08 MIN 28 SEC
LONGITUDE	86 DEG 14 MIN 53 SEC
WHEN USED	Daytime
R.M.S. FIELD	585 MV/M
DATE	Sept. 16th, 1969



A-160'/165' (90°)

RALPH J BITZER
CONSULTING RADIO ENGINEERS
ST. LOUIS, MISSOURI

FCC File No.BP-17961
Amended 10-14-69

Station WKJR
Muskegon Heights, Michigan

1520 kc

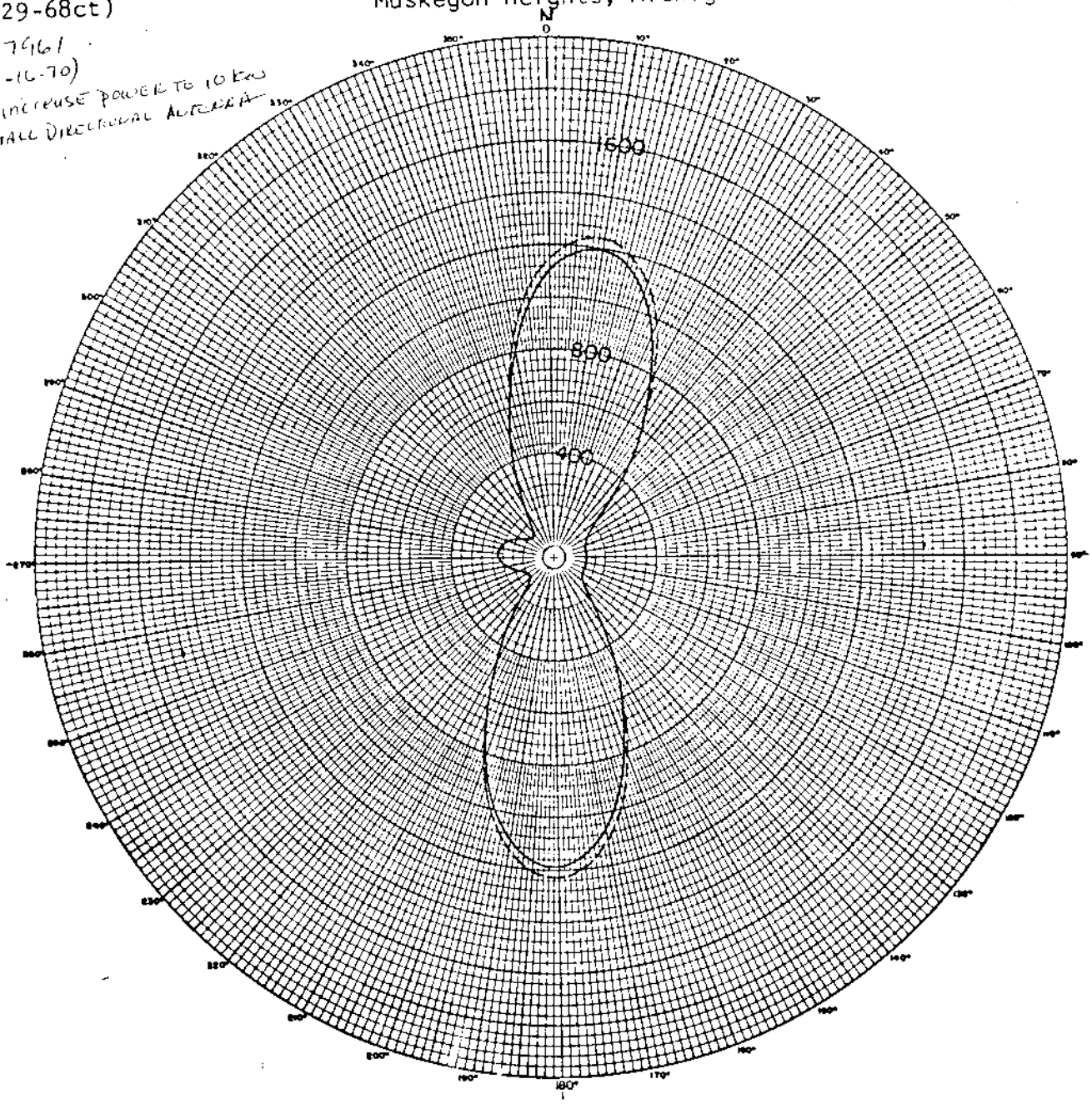
WKJR

10kw, DA-D, D
1520 kc

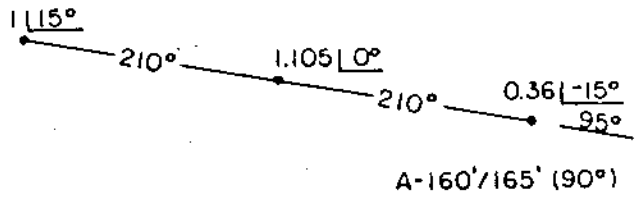
Proposed Day
(11-29-68ct)

BP-17961
GR (4-16-70)
CP TO INCREASE POWER TO 10 KW
ADD INSTALL DIRECTIONAL ANTENNA

Station WKJR
Muskegon Heights, Michigan



HORIZONTAL RADIATION PATTERN BP-17,961



APPLICANT	WKJR
LOCATION	Muskegon Heights, Mich.
FREQUENCY	1520 KC/S
POWER	10 KW
LATITUDE	43 DEG. 08 MIN. 28 SEC.
LONGITUDE	86 DEG. 14 MIN. 53 SEC.
WHEN USED	Daytime
R.M.S. FIELD	563
DATE	Oct. 18th, 1967

RALPH J. BITZER
CONSULTING RADIO ENGINEERS

FCC File No. BP-17961
Accepted 11-1-68 Amended

Station WKJR
Muskegon Heights, Michigan

1520 kc

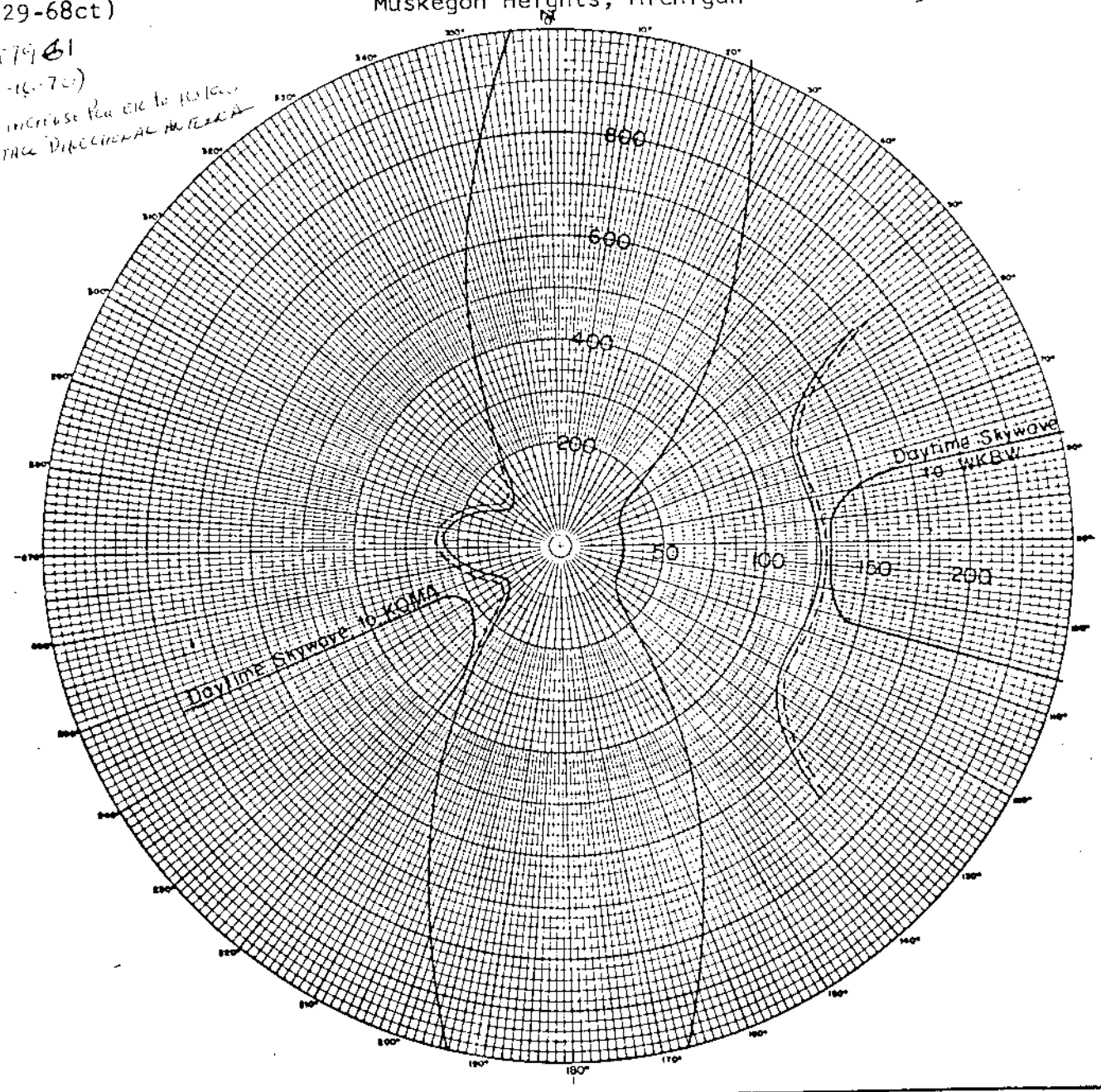
WKJR

Proposed Day Nulls
(11-29-68ct)

Station WKJR
Muskegon Heights, Michigan

10kw, DA-D, D
1520 kc

BP-17961
CP (4-16-70)
CP to increase Pwr to 10 kw
and install Directional Antenna



HORIZONTAL RADIATION PATTERN	Expanded Scale
APPLICANT	: WKJR
LOCATION	: Muskegon Heights, Mich
FREQUENCY	: 1520 KC/S
POWER	: 10 KW
LATITUDE	: 43 DEG. 08 MIN. 28 SEC.
LONGITUDE	: 86 DEG. 14 MIN. 53 SEC.
WHEN USED	: Daytime
R.M.S. FIELD	: 563
DATE	: October 18th, 1967

RALPH J. BITZER
CONSULTING RADIO ENGINEERS

FCC File No. BP-17961
Accepted 11-1-68 Amended

Station WKJR
Muskegon Heights, Michigan

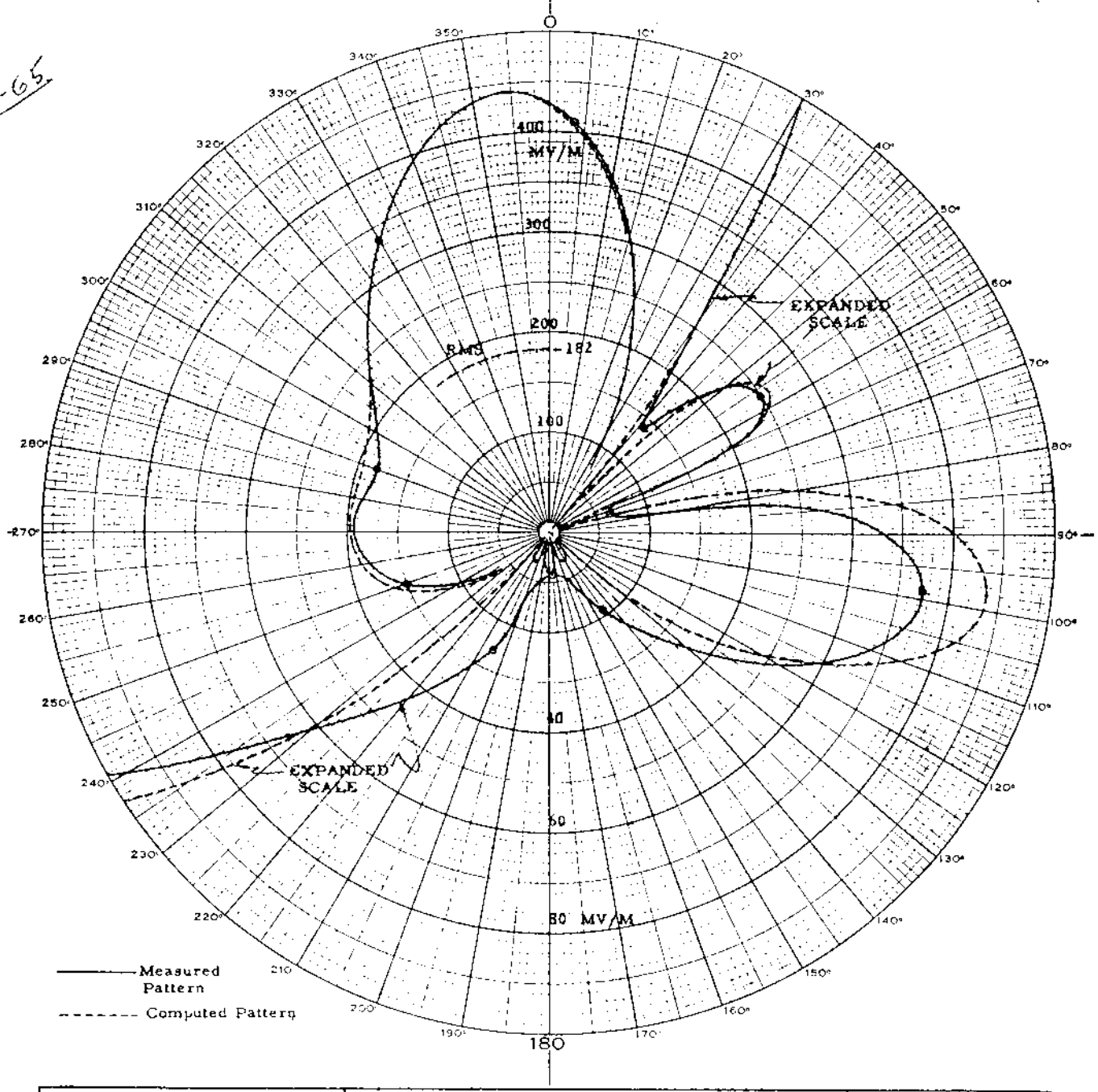
1520 kc

WKNT

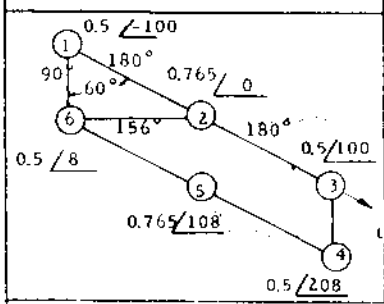
POLAR COORDINATE PAPER — 0.10 LP — CLEVELAND INSTITUTE OF RADIO ELECTRONICS, CLEVELAND, OHIO

Measured Day (7-27-65ct) | Station WKNT Kent, Ohio | 1kw, DA-D, D 1520 kc

LIC. 8-11-65



TOWER PLACEMENT SKETCH



PATTERN PARAMETERS

TOWER No.	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION φ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV. ANGLE θ°	ELEVATION RMS FIELD mv/m Eθ
1	90	0	0	-100	62.6	0.5	0	182
2	90	118	180	0	95.8	0.765	10	
3	90	118	360	100	62.6	0.5	20	
4	90	128.9	412	208	62.6	0.5	30	
5	1.0	137.1	238	108	95.8	0.765	40	
6	90	178	90	8	62.6	0.5	50	
7							60	
8							70	
9							80	
							90	

118° True

Lattice ☒ Other ☐

STATION DATA

CALL: WKNT
FREQUENCY: 1520 kc
POWER: 1 kw
TIME OF OPERATION: DA-D
TYPE OF OPERATION: Class II
DAYTIME TOWERS: 6
NIGHTTIME TOWERS: –
No. RADIALS PER TOWER: 120
LENGTH OF RADIALS: 90' 162 m
GROUND SYSTEM DIMENSION: 24' x 24'
LAT.: 41° 09' 35"
LONG.: 81° 18' 19"
Licensed: 650129
Pattern: 650212

90° = 161.7'
156° = 280'
180° = 323.4'

CARL E. SMITH
Consulting Radio Engineers

FIG. 7.12
WKNT
MEASURED HORIZONTAL PATTERN
KENT, OHIO

FCC File No. BL-10957
Accepted 7-22-65

Station WKNT
Kent, Ohio

1520 kc

WKNT

Measured Non-DA
(7-27-65ct)

Station WKNT
Kent, Ohio

1kw,DA-D,D
1520 kc

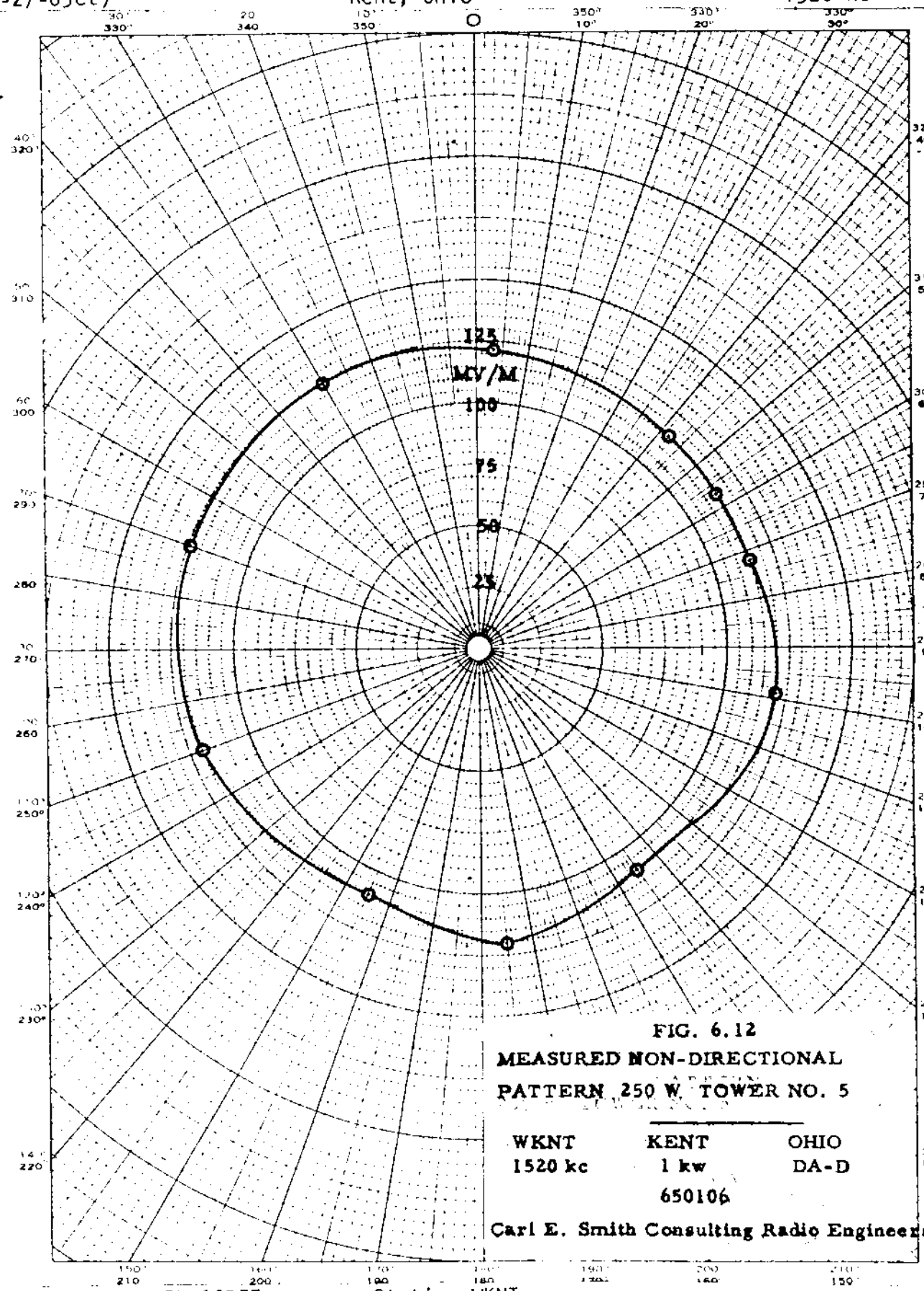


FIG. 6.12
MEASURED NON-DIRECTIONAL
PATTERN 250 W. TOWER NO. 5

WKNT	KENT	OHIO
1520 kc	1 kw	DA-D

650106

Carl E. Smith Consulting Radio Engineers

FCC File No. BL-10957
Accepted 7-22-65

Station WKNT
Kent, Ohio

1520 kc

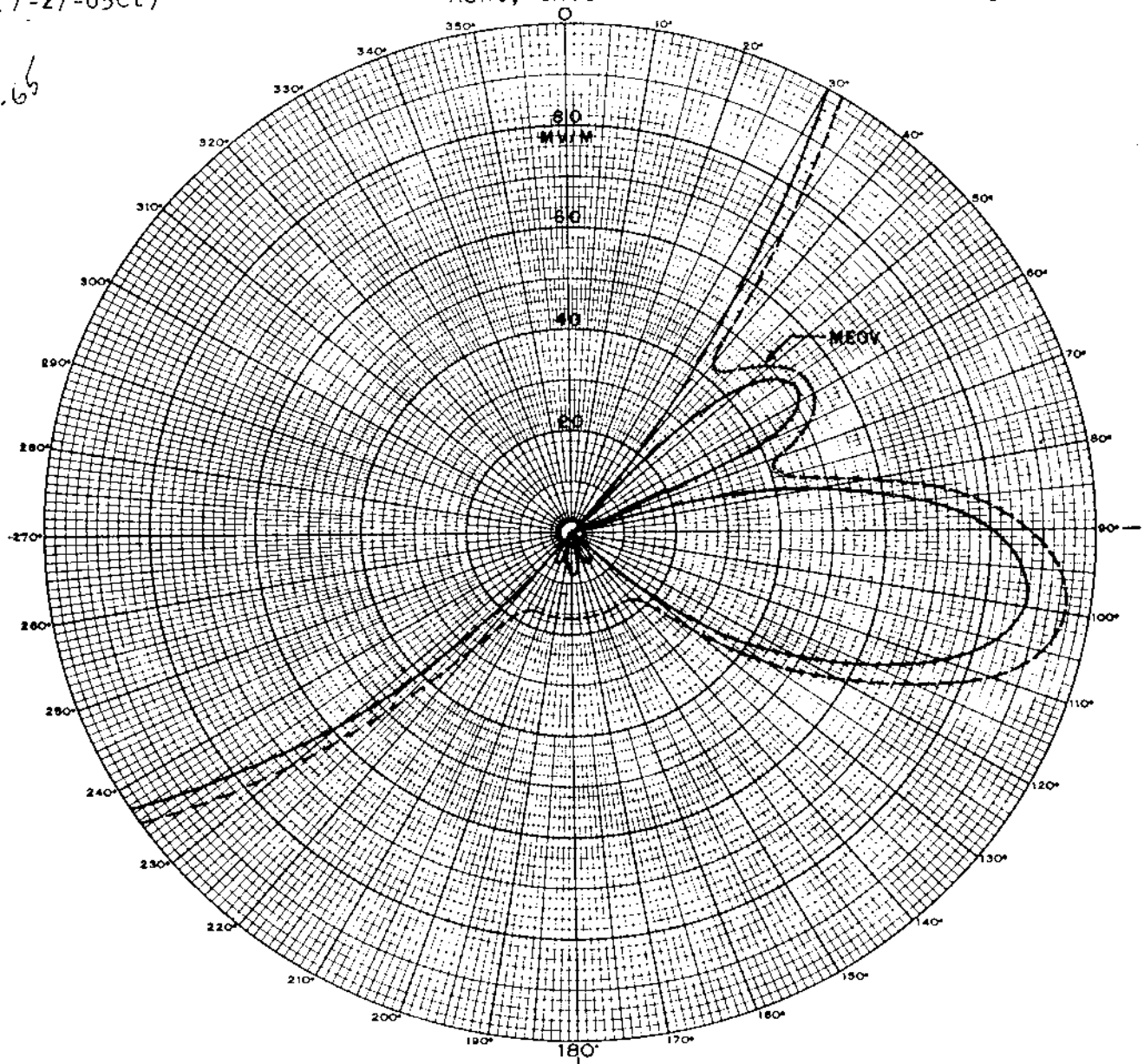
WKNT

Proposed Day Nulls
(7-27-65ct)

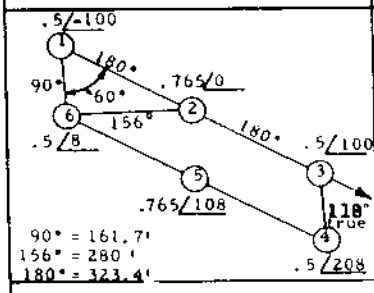
Station WKNT
Kent, Ohio

1kw,DA-D,D
1520 kc

MCP 3-11-65



TOWER PLACEMENT SKETCH



PATTERN PARAMETERS

TOWER No	ELECTRICAL HEIGHT G°	TRUE TOWER ORIENTATION θ°	SPACING S°	PHASING V°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV. ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ
1	90	0	0	-100	62.6	0.5	0	185
2	90	118	180	0	95.8	0.765	10	
3	90	118	360	100	62.6	0.5	20	
4	90	128.9	412	208	62.6	0.5	30	
5	183.6	137.1	238	108	95.8	0.765	40	
6	90	178	90	8	62.6	0.5	50	
7							60	
8							70	
9							80	
10							E_1 =	mv/m
							P_1 =	kw

DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐

STATION DATA

CALL	New
FREQUENCY	1520 kc
POWER	1 kw
TIME OF OPERATION	DA-D
TYPE OF OPERATION	Class II
DAYTIME TOWERS	6
NIGHTTIME TOWERS	-
No RADIALS PER TOWER	120
LENGTH OF RADIALS	90' 162'
GROUND SCREEN DIMENSION	24' x 24
LAT.	41° 09' 35"
LONG.	81° 18' 19"
SUPERSEDES	601003
PATTERN No	650322

CARL E. SMITH
CONSULTING RADIO ENGINEERS

FIG. 3. 2D
EXPANDED HORIZONTAL PATTERN
KENT-RAVENNA B/C CO.
KENT, OHIO

FCC File No. BMP-11428
Accepted 12-29-64

Station WKNT
Kent, Ohio

1520 kc

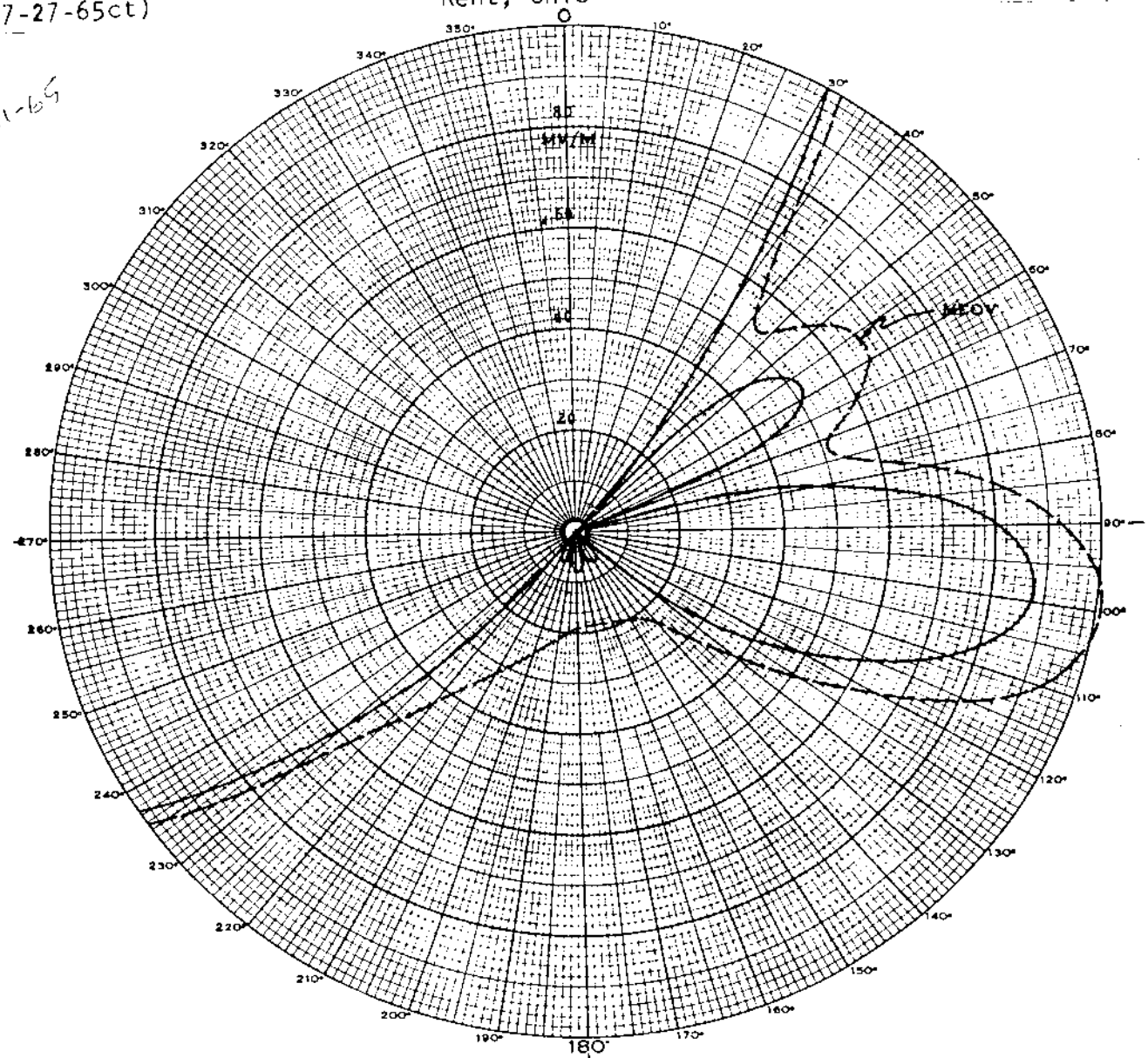
WKNT

Proposed Day Nulls
(7-27-65ct)

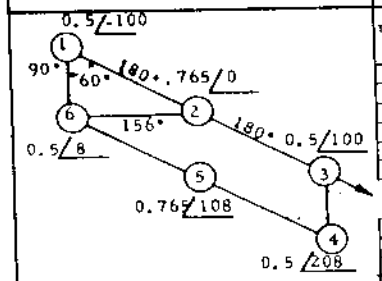
Station WKNT
Kent, Ohio

1kw,DA-D,D
1520 kc

MCP 3-11-65



TOWER PLACEMENT SKETCH



90° = 161.7'
156° = 280'
180° = 323.4'

PATTERN PARAMETERS

TOWER No	ELECTRICAL HEIGHT G°	TRUE TOWER ORIENTATION φ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ
1	90	0	0	-100	62.6	0.5	0	185
2	90	118	180	0	95.8	0.765	10	
3	90	118	360	100	62.6	0.5	20	
4	90	128.9	412	208	62.6	0.5	30	
5	183.6	137.1	238	108	95.8	0.765	40	
6	90	178	90	8	62.6	0.5	50	
118° true							60	
8							70	
10							80	
							F_1°	mv/m
							G_1°	kw

DAYTIME OPERATION ☒ NIGHTTIME OPERATION ☐

STATION DATA

CALL	New
FREQUENCY	1520 kc
POWER	1 kw
TIME OF OPERATION	DA-D
TYPE OF OPERATION	Class II
DAYTIME TOWERS	6
NIGHTTIME TOWERS	-
No RADIALS PER TOWER	120
LENGTH OF RADIALS	90' 162'
GROUND SCREEN DIMENSION	24' x 24'
LAT	41° 09' 35"
LONG	81° 18' 19"
SUPERSEDES	650129
PATTERN No.	650323

FIG. 3.2E

CARL E. SMITH
Consulting Radio Engineers

EXPANDED HORIZONTAL PATTERN
KENT-RAVENNA B/C CO.
KENT, OHIO

FCC File No. BMP-11447
Accepted 2-2-65

Station WKNT
Kent, Ohio

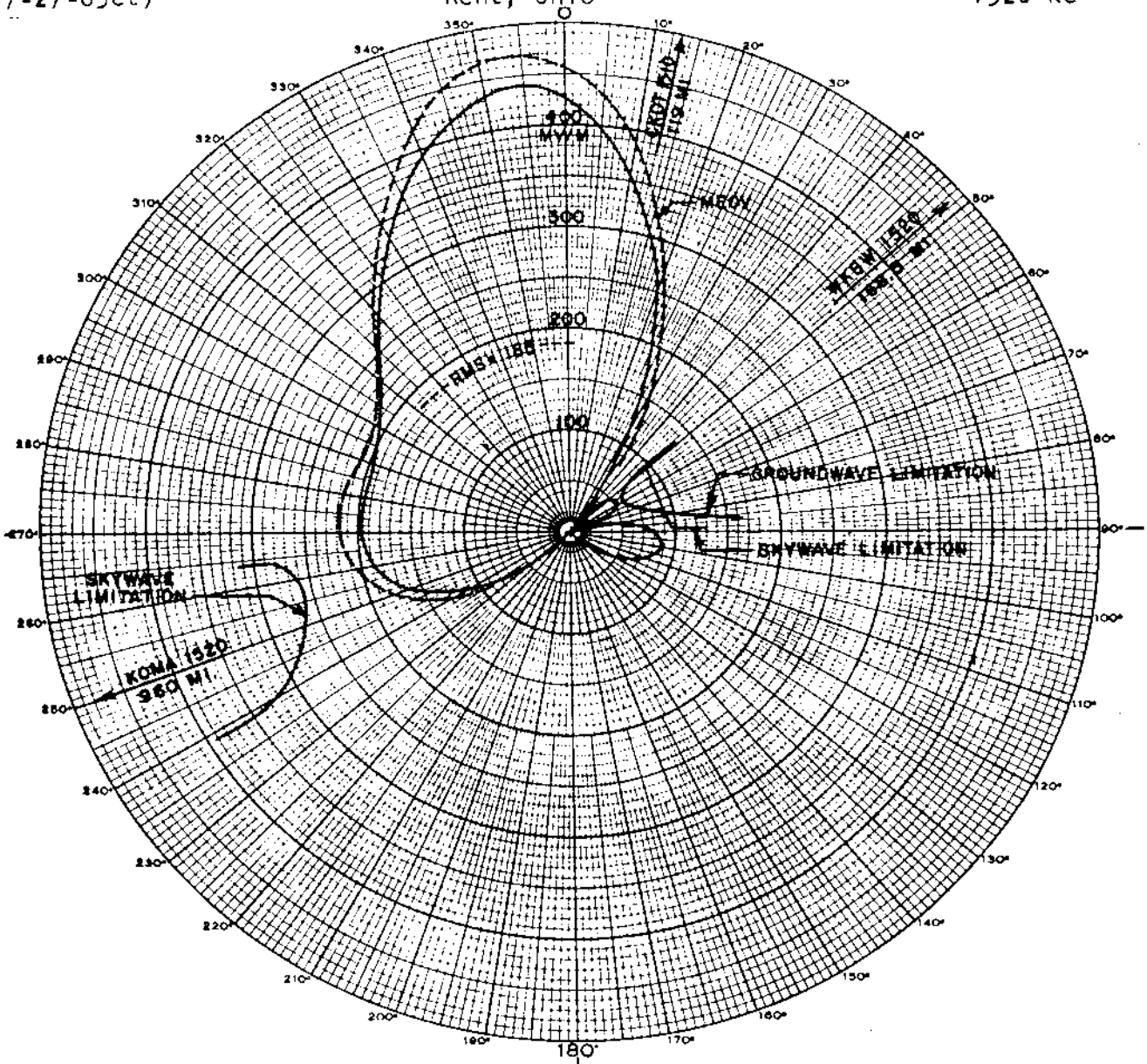
1520 kc

WKNT

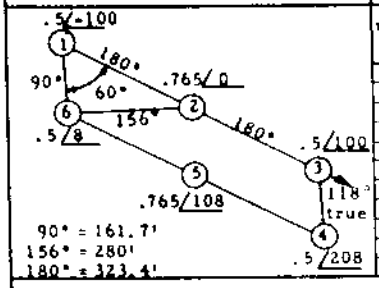
Proposed Day
(7-27-65ct)

Station WKNT
Kent, Ohio

1kw,DA-D,D
1520 kc



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA
	TOWER No.	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION θ°	SPACING ℓ°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV ANGLE θ°	ELEVATION RMS FIELD mv/m E_θ	CALL New
	1	90	0	0	-100	62.6	0.5	0	185	FREQUENCY 1520 kc
	2	90	118	180	0	95.8	0.765	10		POWER 1 kw
	3	90	118	360	100	62.6	0.5	20		TIME OF OPERATION DA-D
	4	90	128.9	412	208	62.6	0.5	30		TYPE OF OPERATION Class II
	5	183.6	137.1	238	108	95.8	0.765	40		DAYTIME TOWERS 6
	6	90	178	90	8	62.6	0.5	50		NIGHTTIME TOWERS -
	7							60		No RADIALS PER TOWER 120
	8							70		LENGTH OF RADIALS 90 · 162 ft
	9							80		GROUND SCREEN DIMENSION 24 x 24
	10							90		LAT. 41° 09' 35"
										LONG 81° 18' 19"
								E_0 =	mv/m	SUPERSEDES 641211
								P_0 =	kw	PATTERN No. 650322
	DAYTIME OPERATION ☒			NIGHTTIME OPERATION ☐						



CARL E. SMITH
CONSULTING RADIO ENGINEERS

Fig. 3.1B

PROPOSED HORIZONTAL PATTERN
KENT-RAVENNA B/C CO.
KENT, OHIO

FCC File No. BMP-11428
Accepted 12-29-64

Station WKNT
Kent, Ohio

1520 kc

NEW-
1520 kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: (NEW)

Main Studio: Greenfield, Massachusetts

Frequency: 1520 kHz

Power 10kw Day

Notification List No. 1783

Date: November 2, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 42° 36' 39"
West Longitude: 72° 38' 45"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 2
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	E(#1)	W(#2)
HEIGHT ABOVE INSULATORS:	130' (72.3°)	130' (72.3°)
DAY PHASING:	0°	109°
DAY FIELD RATIO:	1.0	1.0

SPACING AND ORIENTATION: The towers are spaced 143.8' (80°) on a line bearing 282.5° true.

GROUND SYSTEM: 120 - 162' equally spaced copper radials plus 60 - 50' interspaced radials about each tower.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	596.7 mv/m	661.0 mv/m	626.8 mv/m

NEW
1520 kHz

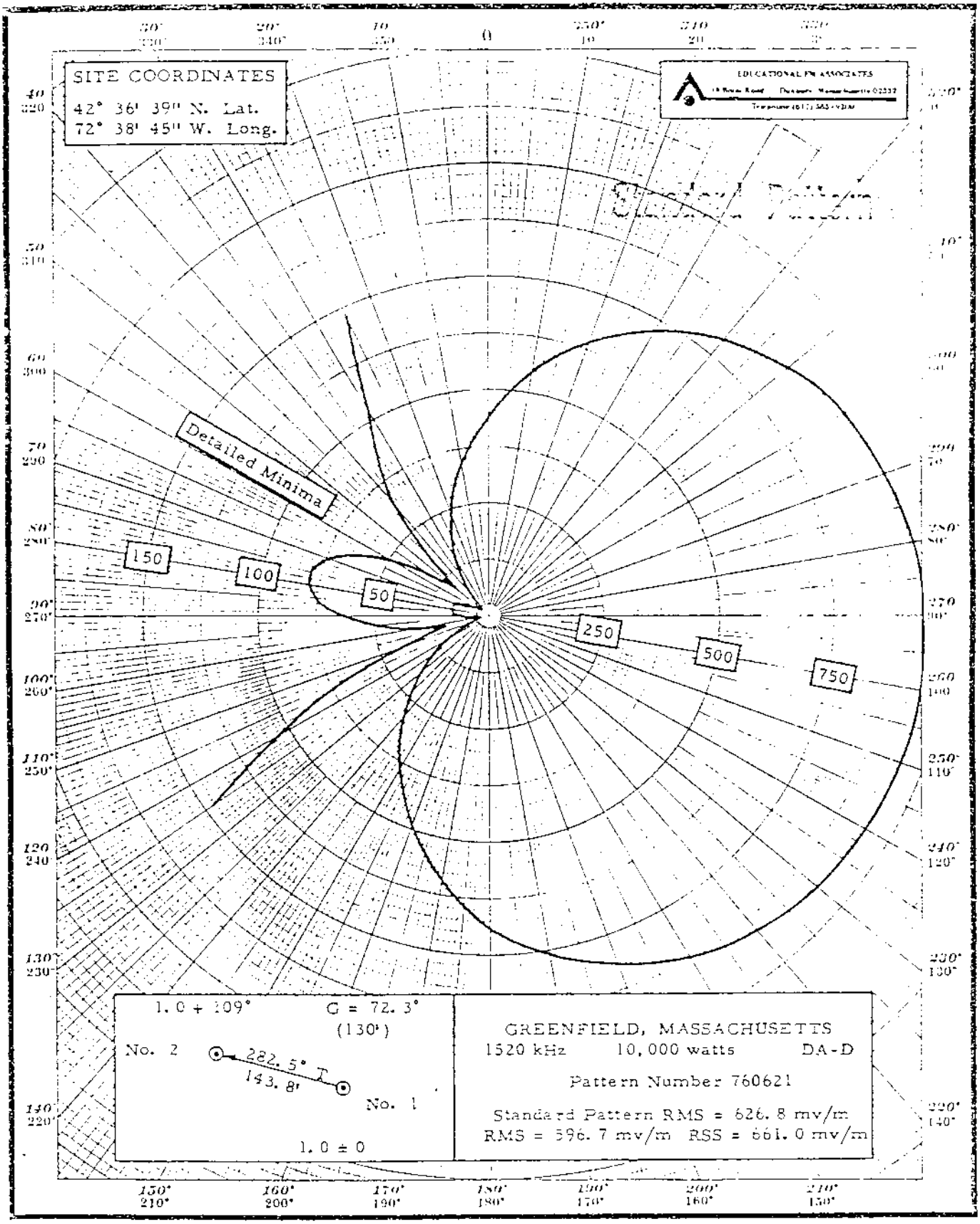


Figure 2-1. Proposed Horizontal Radiation Pattern

WPOE
1520 kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WPOE

Main Studio: Greenfield, Massachusetts

Frequency: 1520 kHz

Power 10kw Day

Notification List No. 1785

Date: November 16, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 42° 36' 12"
West Longitude: 72° 36' 21"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 2
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	W(#2)	E(#1)
HEIGHT ABOVE INSULATORS:	196'	196' (109°)
DAY PHASING:	100°	0°
DAY FIELD RATIO:	0.92	1.0

SPACING AND ORIENTATION: Adjacent towers in a row are spaced 161.8' (90°) on a line bearing 277° true.

GROUND SYSTEM: 120 - 162' equally spaced copper radials plus 60 - 50' interspaced radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of system are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	630.2 mv/m	657.6 mv/m	662.0 mv/m

Figure
2-1

WPOE
1520kHz

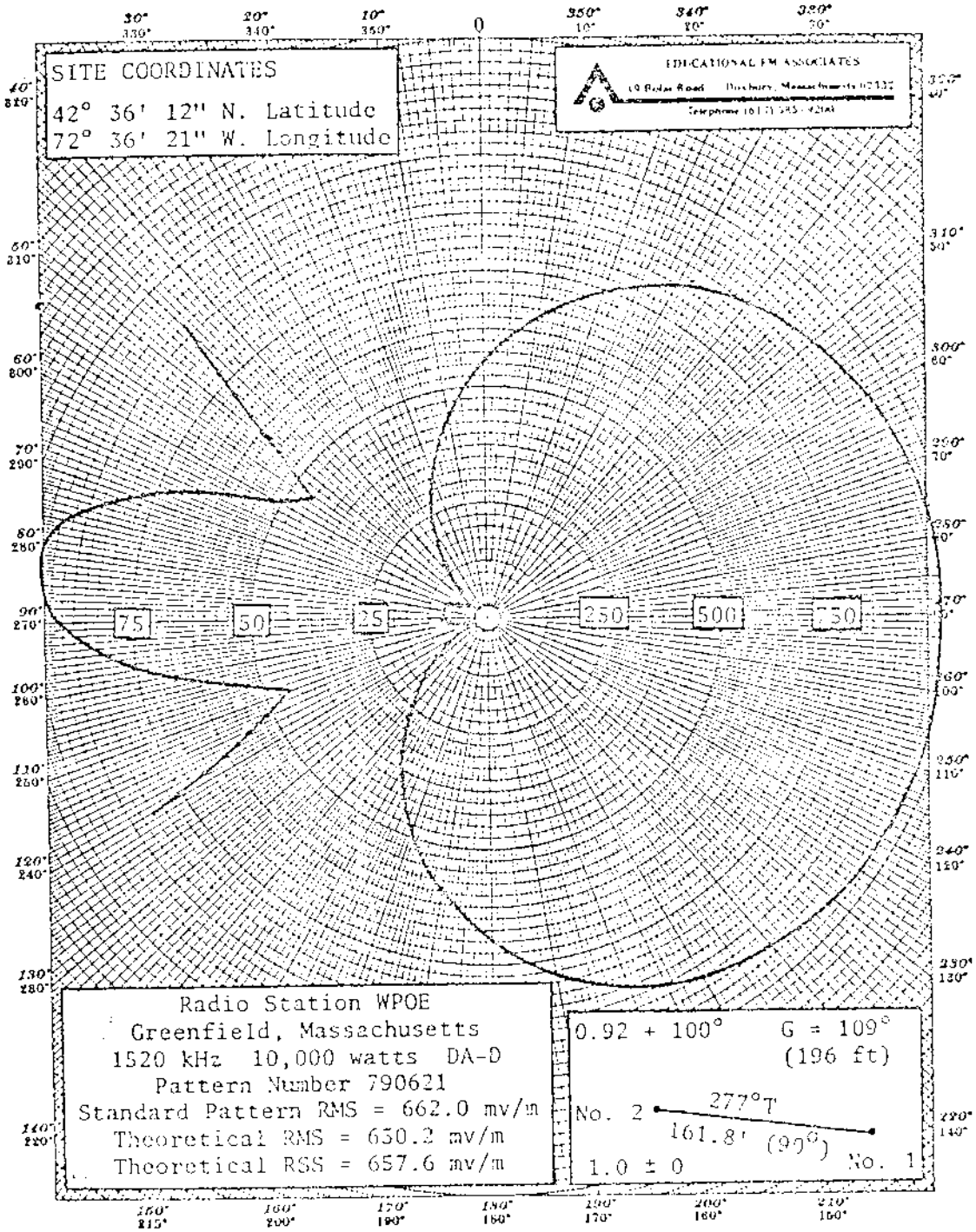
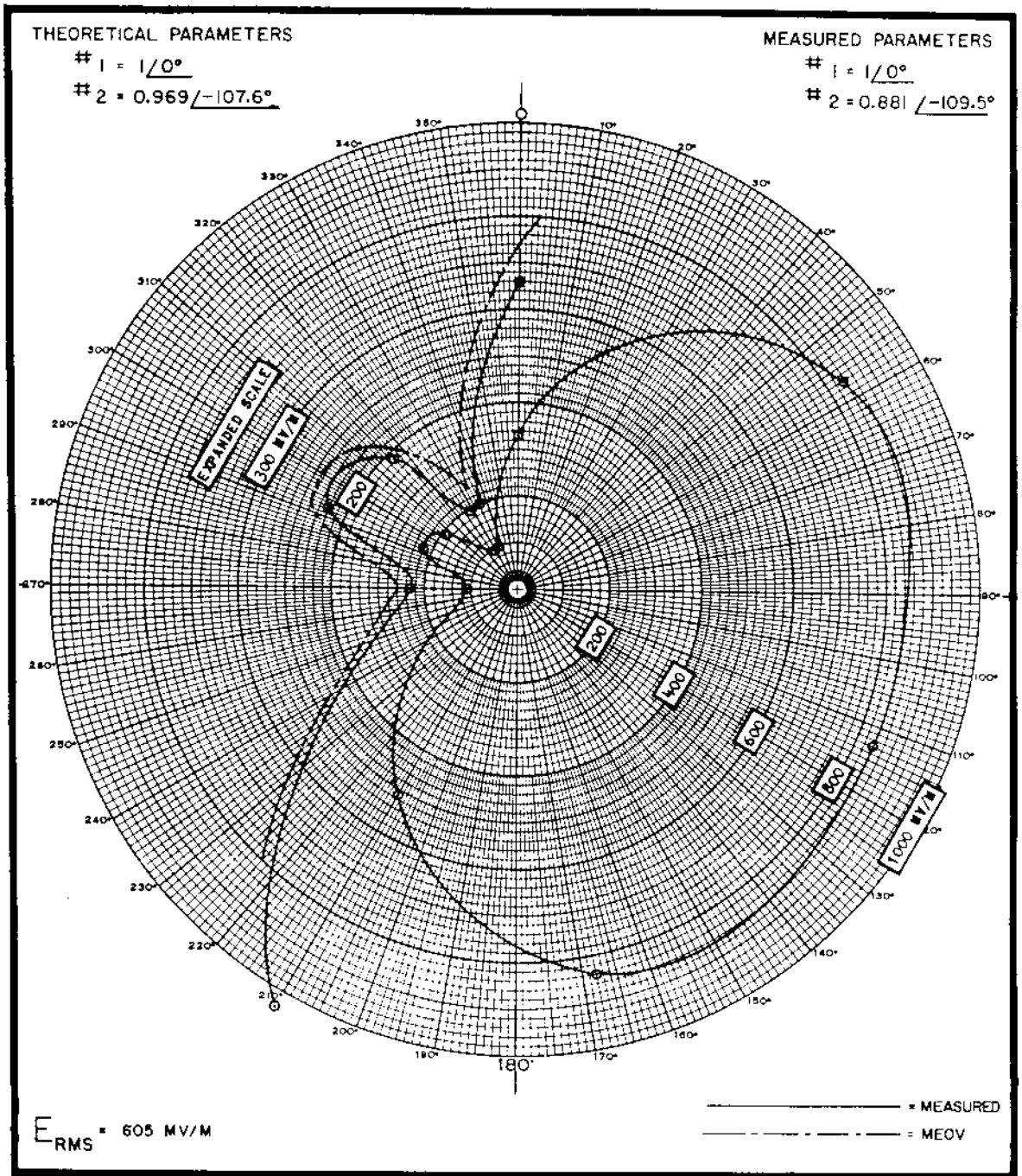


Figure 2-1. Proposed Horizontal Radiation Pattern

Measured Day & Night
(10-26-70ct)

Station WRAI
San Juan, Puerto Rico



LATITUDE: 18° 21' 00"	ANTENNA PARAMETERS	FIGURE 14
LONGITUDE: 66° 09' 25"	#1 80° #2 N-113°-E	MEASURED DIRECTIONAL PATTERN
JOHN H. MULLANEY AND ASSOCIATES	G = 83.4°	RADIO STATION WRAI SAN JUAN, PUERTO RICO
		1520 KHz 10 KW, DA-1, U

FCC File No.BL-12731
Accepted 9-30-70

Station WRAI
San Juan, Puerto Rico

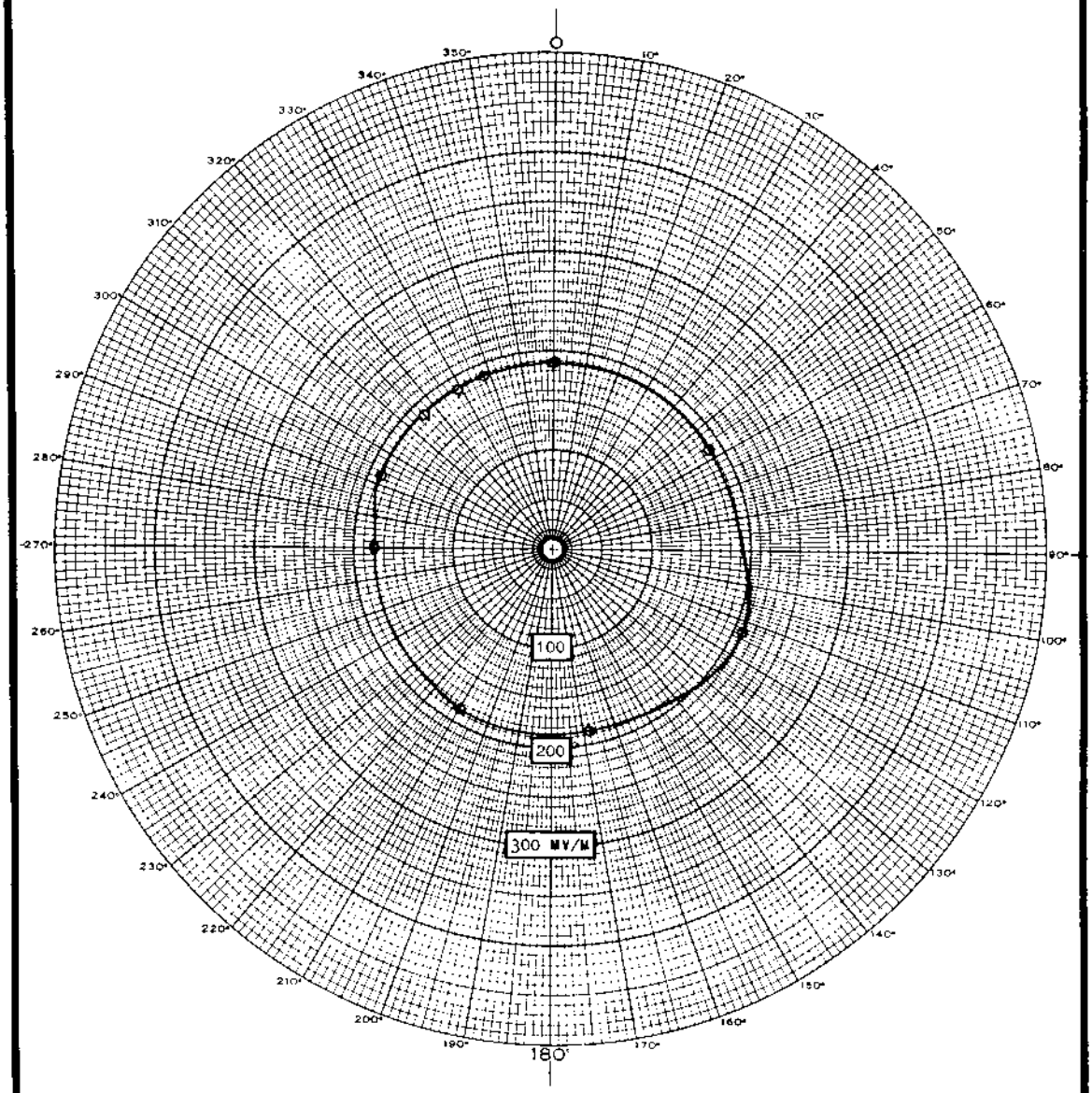
1520 kc

WRAI

Measured Non-DA
(10-26-70ct)

Station WRAI
San Juan, Puerto Rico

10kw,DA-1,U
1520 kc



E_{RMS} = 187 MV/M

LATITUDE: 18° 21' 00" LONGITUDE: 66° 09' 25"	ANTENNA PARAMETERS	FIGURE 13
JOHN H. MULLANEY AND ASSOCIATES	NONDIRECTIONAL TOWER NUMBER 1 (WEST) 1.0 KW	MEASURED NONDIRECTIONAL PATTERN RADIO STATION WRAI SAN JUAN, PUERTO RICO 1520 KHz 10 KW, DA-1, U

FCC File No.BL-12731
Accepted 9-30-70

Station WRAI
San Juan, Puerto Rico

1520 kc

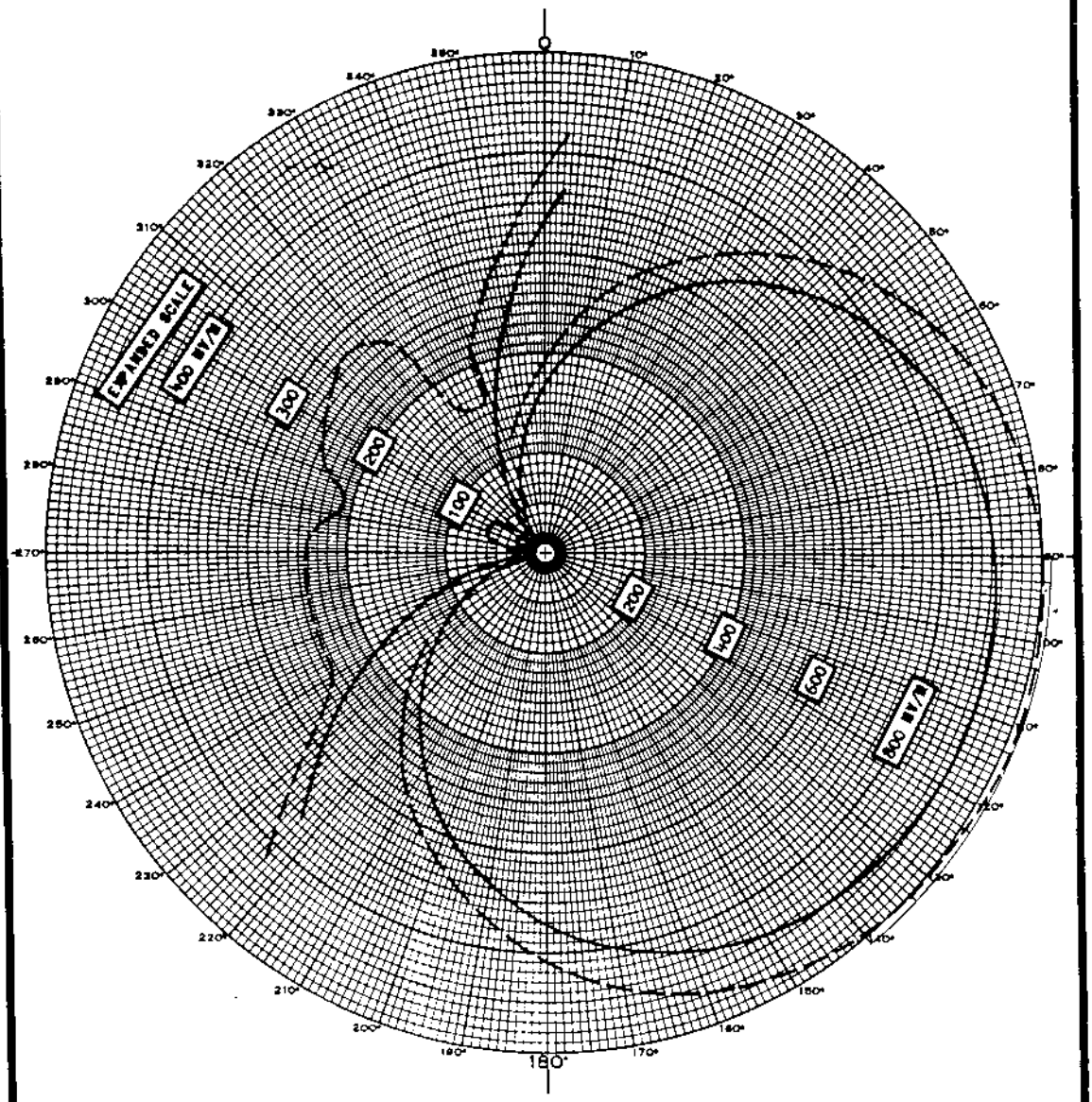
SEE REVERSE SIDE 6/29/70

WRAI

Proposed Day & Night
(6-29-70ct)

Station WRAI
San Juan, Puerto Rico

10kw,DA-1,U
1520 kc



E_{RMS} = 610 MV/M

MEOV = - - - - - -

LATITUDE: 18° 21' 00" LONGITUDE: 66° 09' 25"	ANTENNA PARAMETERS	FIGURE 2 DIRECTIONAL HORIZONTAL POLAR PATTERN
JOHN H. MULLANEY AND ASSOCIATES	1/0° #1 80° .969/-107.6° #2 N-113°-E G = 83.4°	RADIO STATION WRAI SAN JUAN, PUERTO RICO 1520 KHz 10 KW, DA-1, U

FCC File No.BMP-13013
Accepted 6-12-70

Station WRAI
San Juan, Puerto Rico

1520 kc

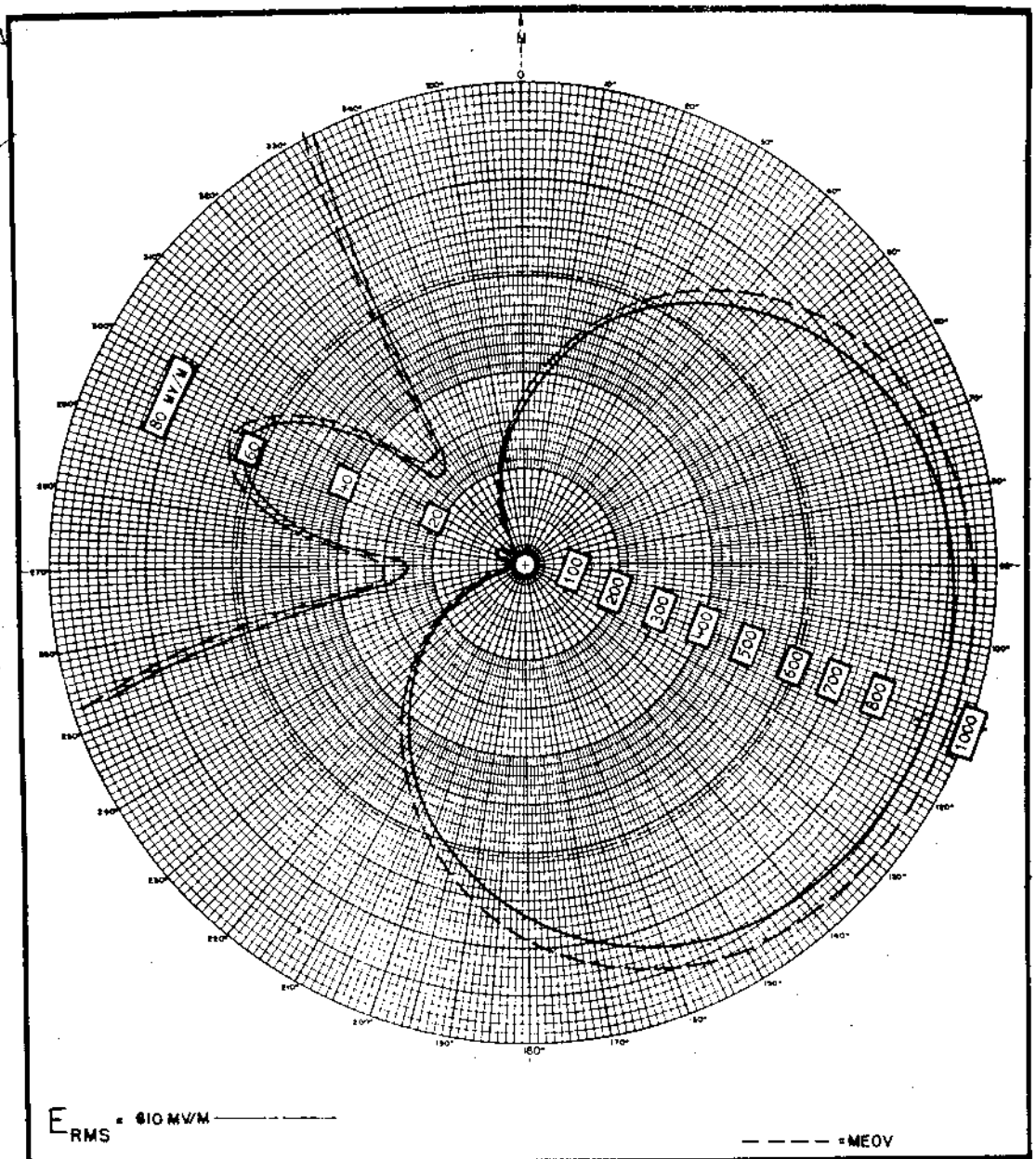
WRAI

Proposed Day & Night
(11-29-66ct)

Station WRAI
Rio Piedras, Puerto Rico

10kw, DA-1, U
1520 kc

12-20-67
GRANTED
APPLICATION
TO CHANGE
LOCATION



E_{RMS} = 610 MV/M ———— ———

— — — — = MEOV

LATITUDE: 18° 20' 47" LONGITUDE: 66° 05' 58"	ANTENNA PARAMETERS 140° #1 60° 184' .968/-101.8 N-130°-E #2 θ = 33.4°	FIGURE 1 DIRECTIONAL HORIZONTAL POLAR PATTERN RADIO STATION WRAI SAN JUAN, PUERTO RICO 1520 KC 10 KW, DA-1, U
JOHN H. MULLANEY AND ASSOCIATES A DIVISION OF MULTRONICS, INC. CONSULTING RADIO ENGINEERS ROCKVILLE, MARYLAND		

FCC File No. BP-17292
Accepted 10-28-66

Station WRAI
Rio Piedras, Puerto Rico

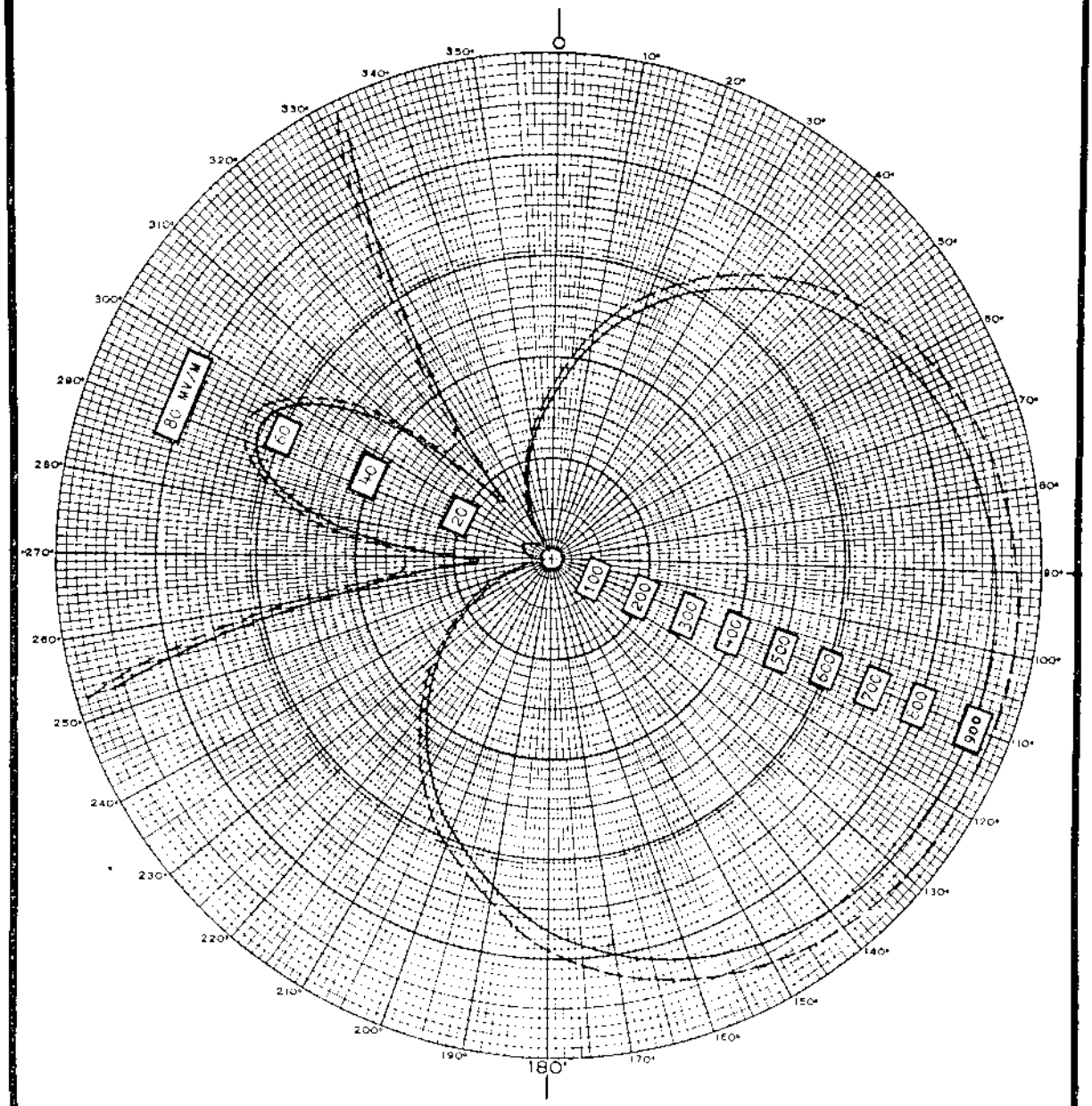
1520 kc

WRAI

Proposed Day & Night
(9-26-68ct)

Station WRAI
San Juan, Puerto Rico

10kw,DA-1,U
1520 kc



E_{RMS} = 610 MV/M _____ ____ = MEOV

LATITUDE 18° 21' 00"
LONGITUDE 66° 09' 25"

JOHN H. MULLANEY
AND
ASSOCIATES

ANTENNA PARAMETERS

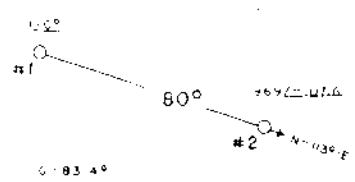


FIGURE 2

DIRECTIONAL HORIZONTAL
POLAR PATTERN

RADIO STATION WRAI
SAN JUAN, PUERTO RICO

1520 KC 10 KW, DA-1,U

FCC File No.BMP-12470
Accepted 8-8-68

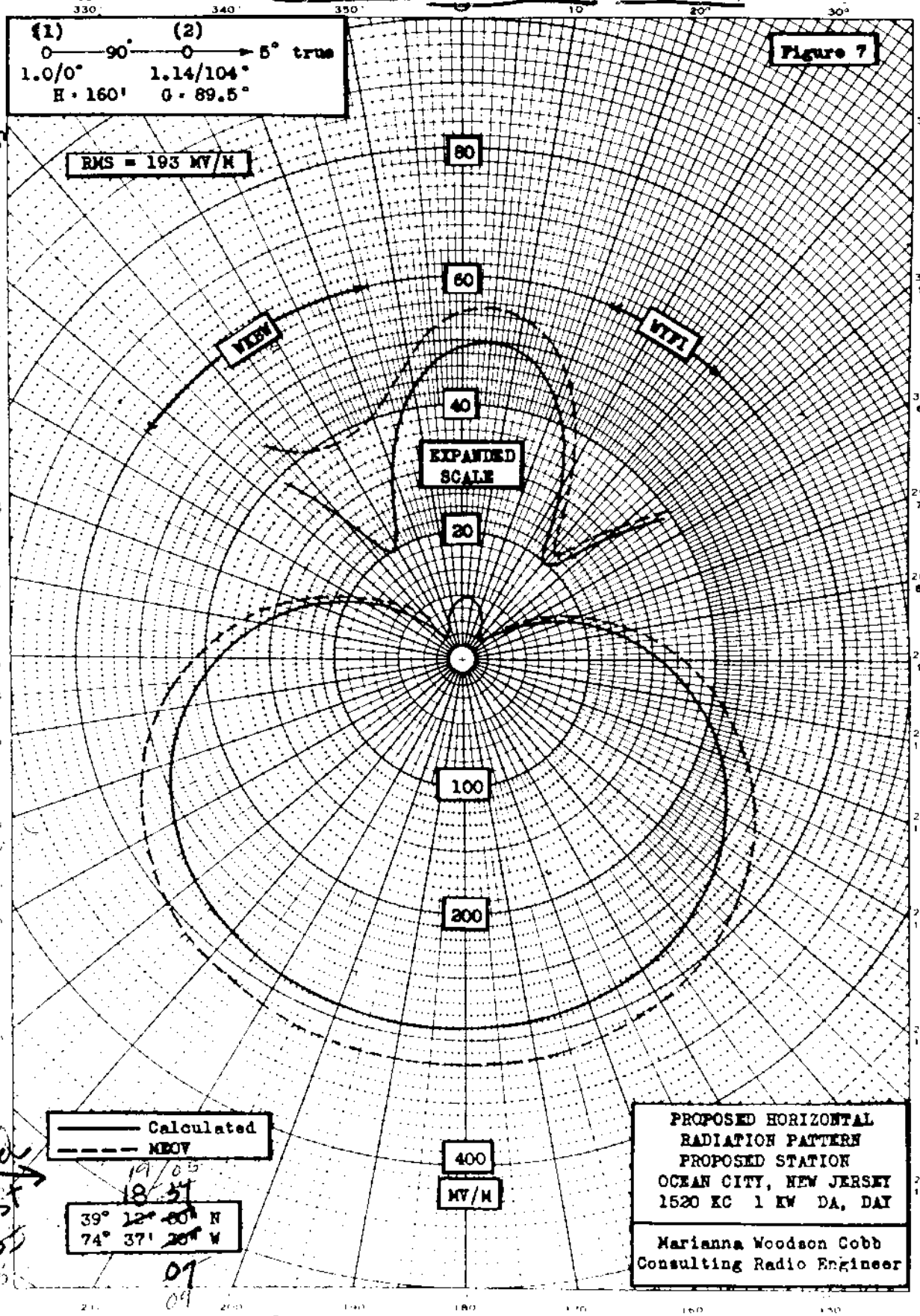
Station WRAI
San Juan, Puerto Rico

1520 kc

WSLT

PROPOSED DAY
(6-14-61g)

New; Bi-States Bcstrs. 1kw, DA-D,D
Ocean City, Sommers Point, New Jersey 1520 KC



8-17-62 granted cp for new station
10-24-63 Mod CP to N 39 18 57 W 74 37 13
11-20-63 Granted MCP
to change transmitter location
3/17/64 Mod of CP to N 39 19 05 W 74 37 09
11/18/64 [illegible]
Amended C.T list #165

FCC File No. BP-14817
Accepted 5-24-61

Bi-States Broadcasters
Ocean City-Sommers Point, New Jersey 1520 KC

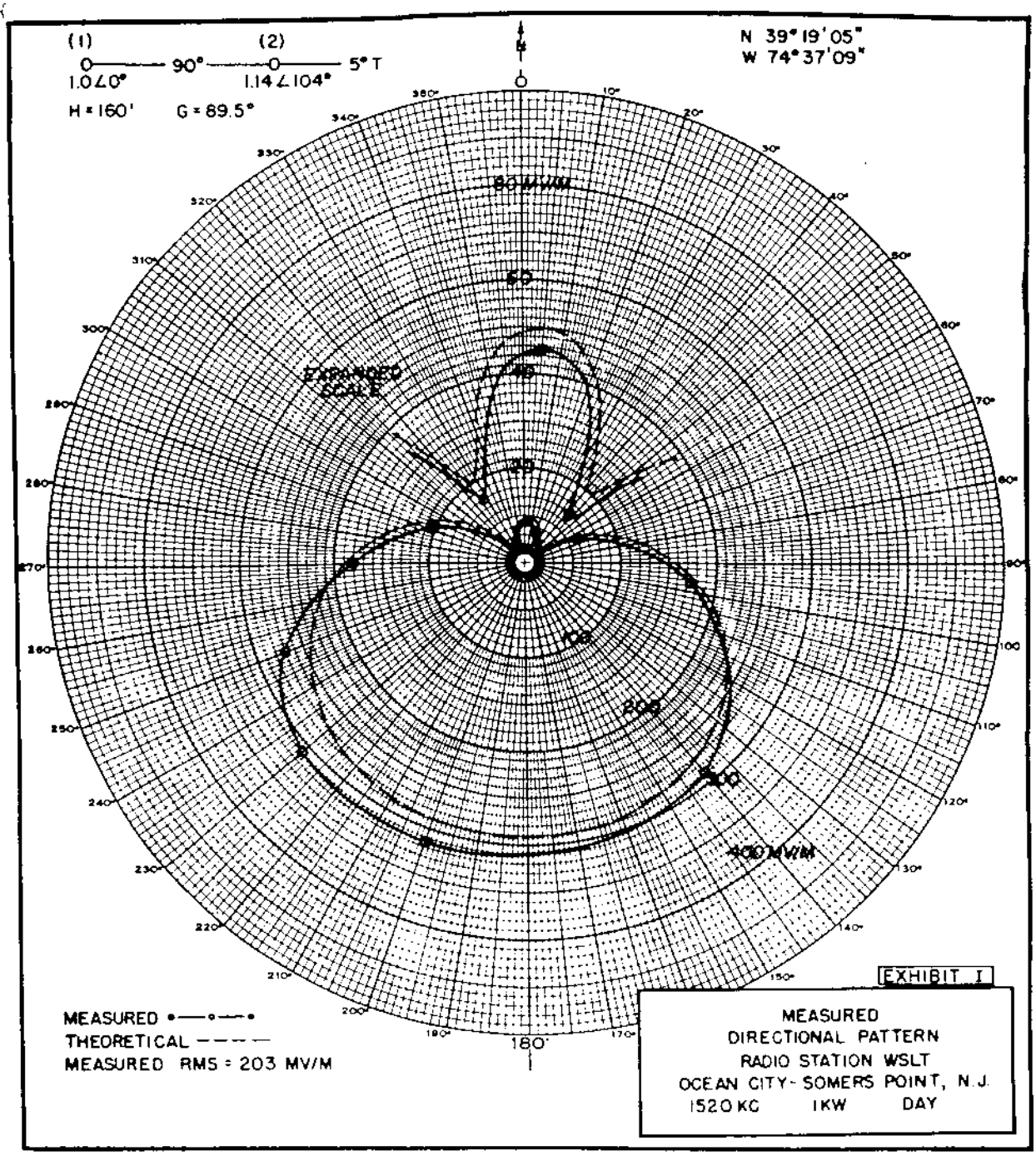
WSLT

Measured Day
(10-26-64ct)

Station WSLT
Ocean City-Somers Point, New Jersey

1kw,DA-D,D
1520 kc

#203
10-30-64
granted L for
new station



FCC File No. BL-10647
Accepted 10-19-64

Station WSLT
Ocean City-Somers Point, New Jersey

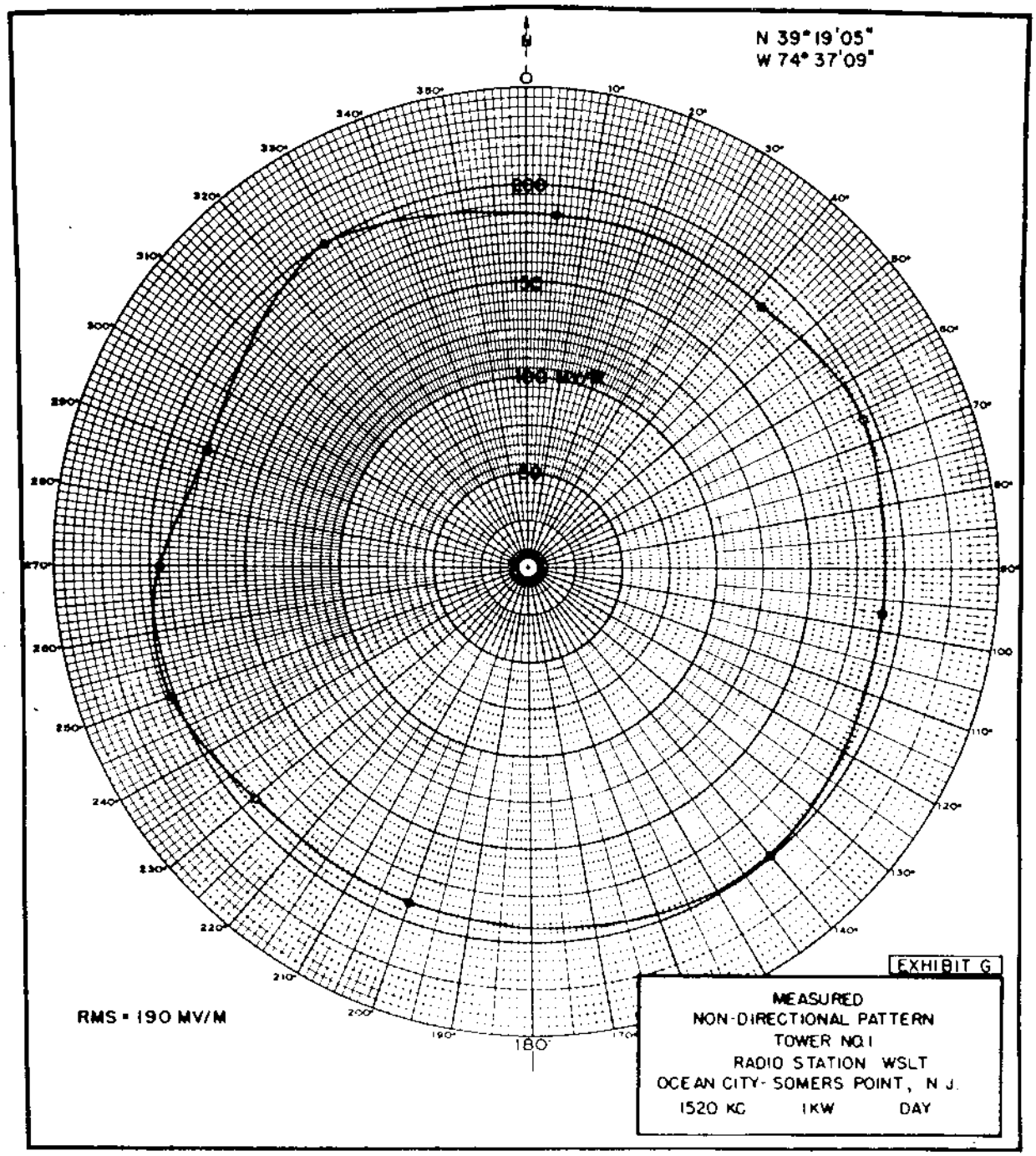
1520 kc

WSLT

Measured Non-DA
(10-26-64ct)

Station WSLT
Ocean City-Somers Point, New Jersey

1kw,DA-D,D
1520 kc



FCC File No. BL-10647
Accepted 10-19-64

Station WSLT
Ocean City-Somers Point, New Jersey

1520 kc

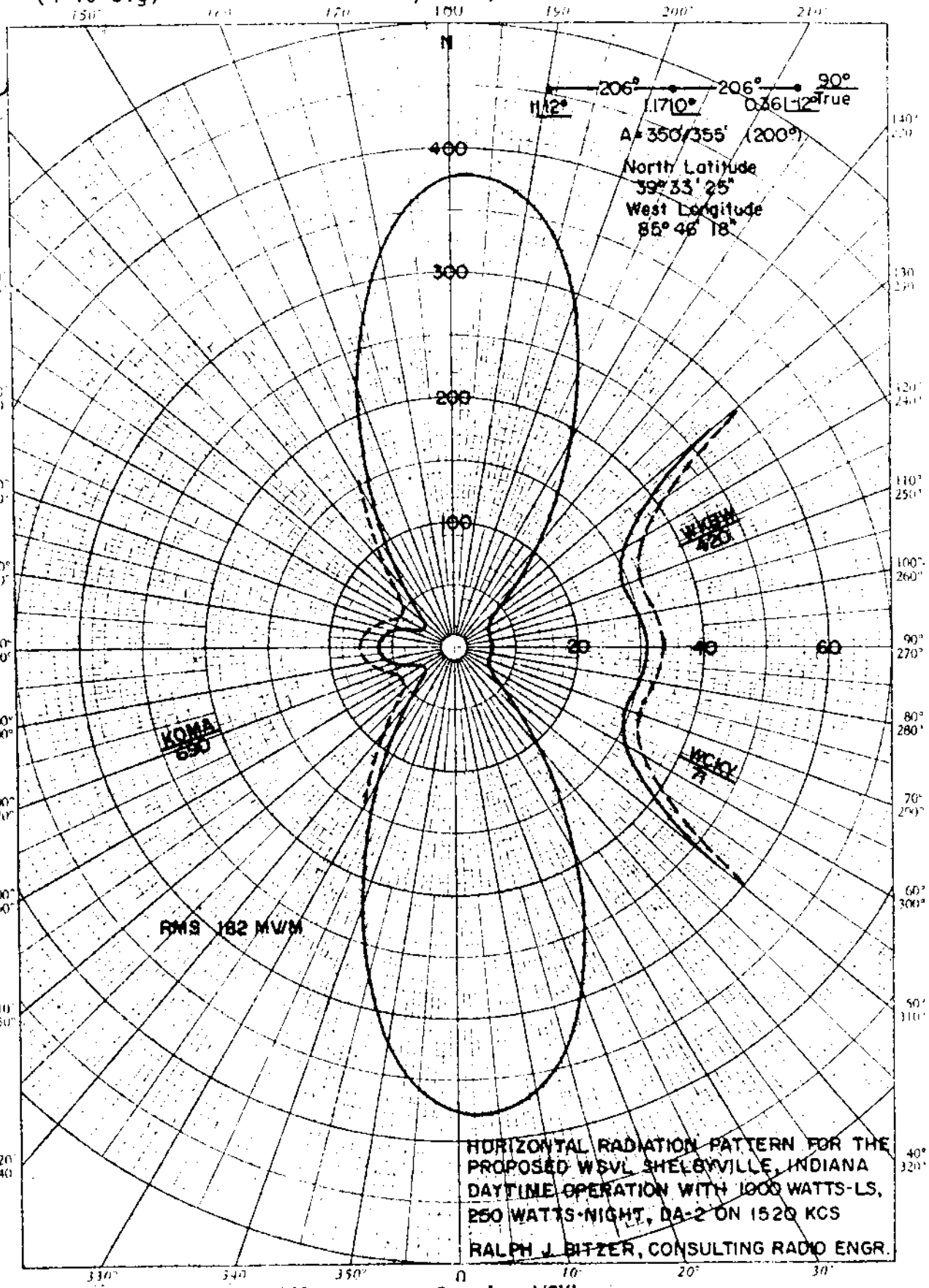
WSVL

PROPOSED DAY
(4-10-61g)

Station WSVL
Shelbyville, Indiana

250w, 1kw-LS, DA-2,U
1520 KC

2-6-62
granted CP for
N Day and DA-2



K+E POLAR CO-ORDINATE 359-31G

FCC File No. BP-14668
Accepted 3-8-61

Station WSVL
Shelbyville, Indiana

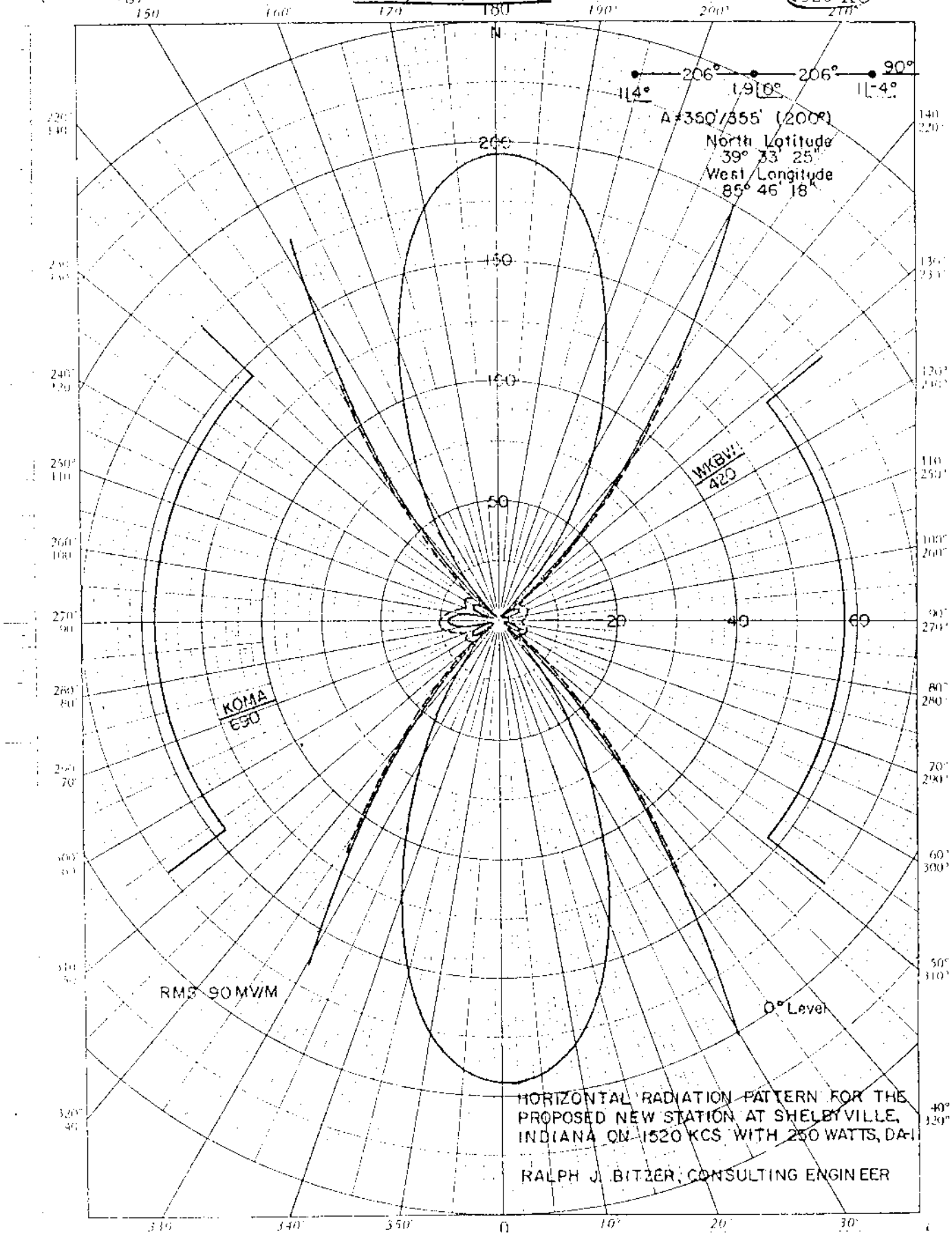
1520 KC

Shelbyville, Ind. WSVL

PROPOSED DAY & NIGHT (3-23-59g)

New; Shelby County B/C Co. Shelbyville, Indiana

250w, DA-1,U 1520 KC



FCC File No. BP-11202
Accepted 2-5-59 (Amended)

Shelby County Broadcasting Company
Shelbyville, Indiana 1520 KC

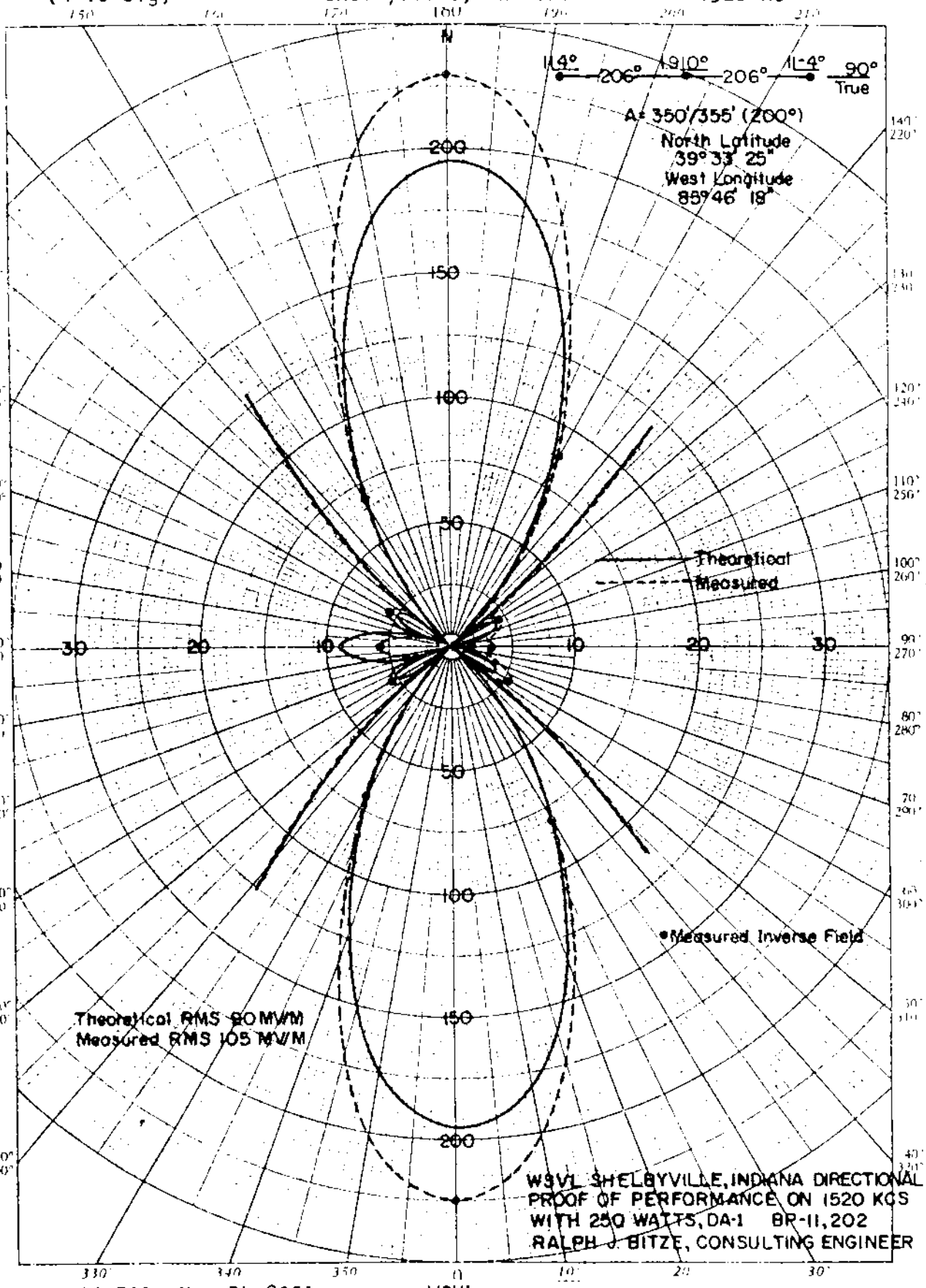
granted CP for new station 6-22-60

WSVL

MEASURED DAY
(4-10-61g)

Station WSVL
Shelbyville, Indiana

250w, DA-1,U
1520 KC



FCC File No. BL-8251
Accepted 3-28-61

WSVL
Shelbyville, Indiana

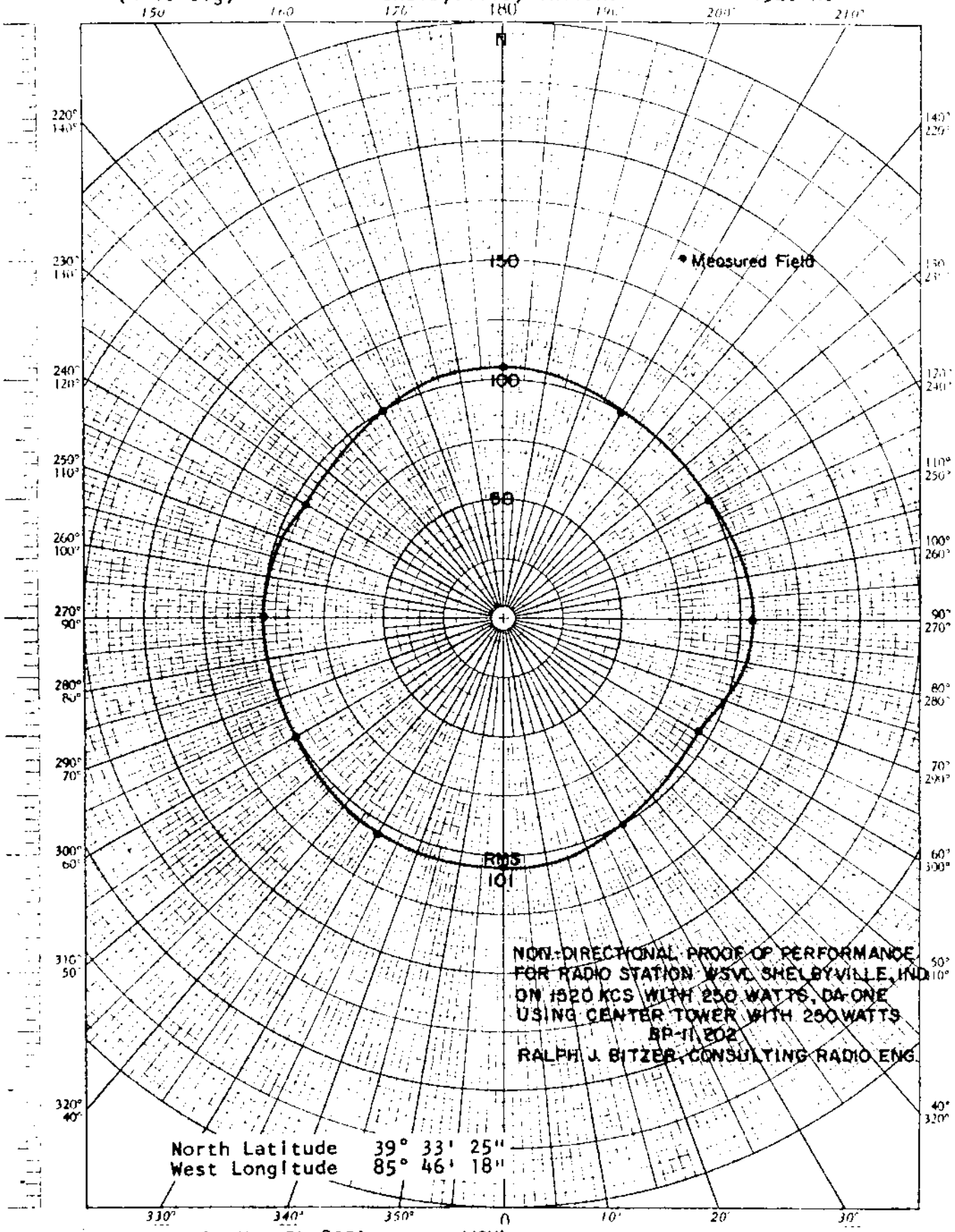
1520 KC

WSVL

MEASURED NON-DA (4-10-61g)

Station WSVL Shelbyville, Indiana

250w, DA-1,U 1520 KC



FCC File No. BL-8251
Accepted 3-28-61

WSVL
Shelbyville, Indiana 1520 KC

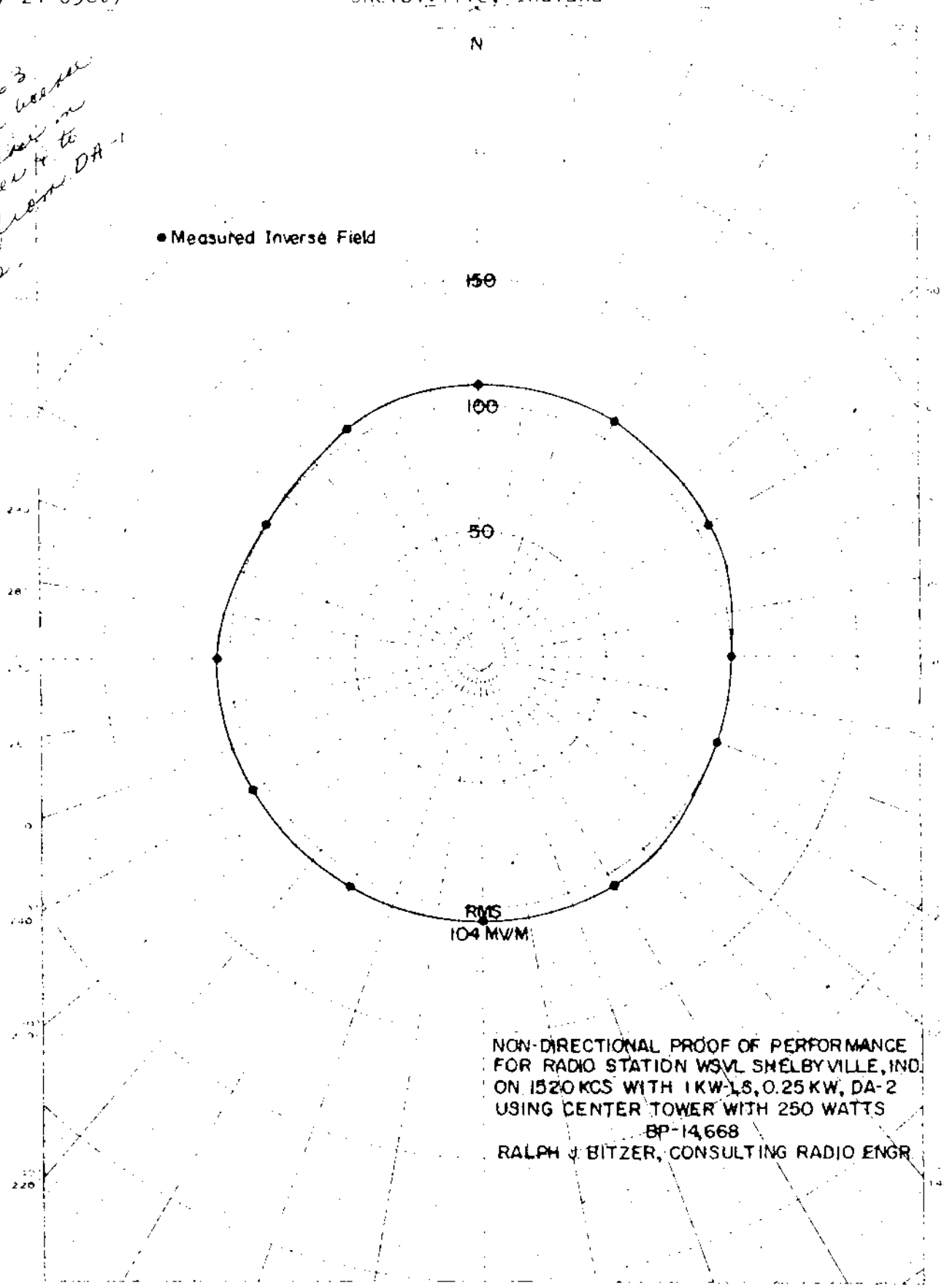
WSVL

Measured Non-DA
(7-24-63ct)

Station WSVL
Shelbyville, Indiana

250w,1kw-LS,DA-2,U
1520 kc

7-27-63
inserted because
increase in
day power to
energy from DA-1
to DA-2.



FCC File No.BL-10122
Accepted 7-2-63

Station WSVL
Shelbyville, Indiana

1520 kc

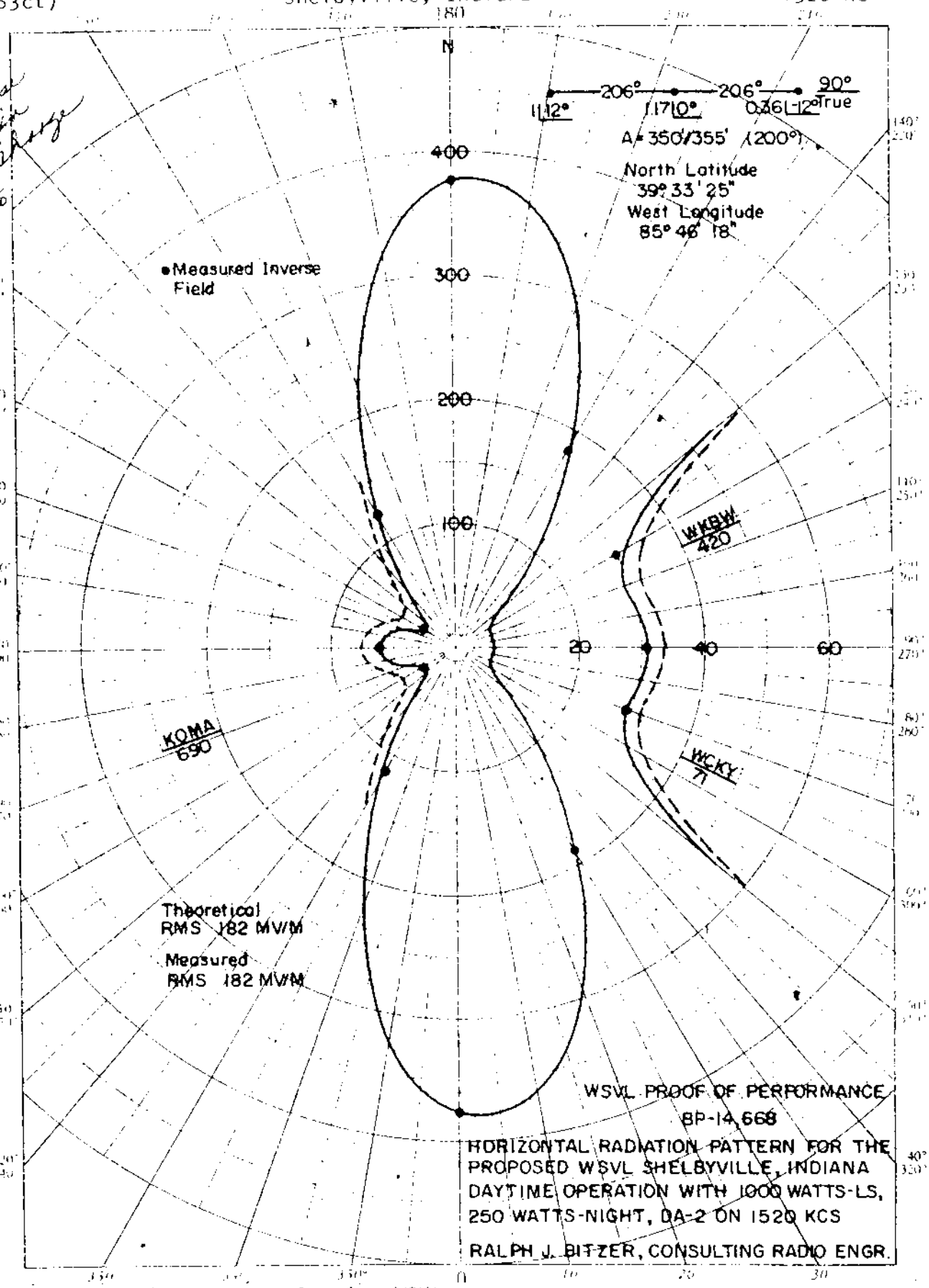
WSVL

Measured Day
(7-24-63ct)

Station WSVL
Shelbyville, Indiana

250w,1kw-LS,DA-2,U
1520 kc

7-27-63
Started beam on increasing power change from DA-1 to DA-2



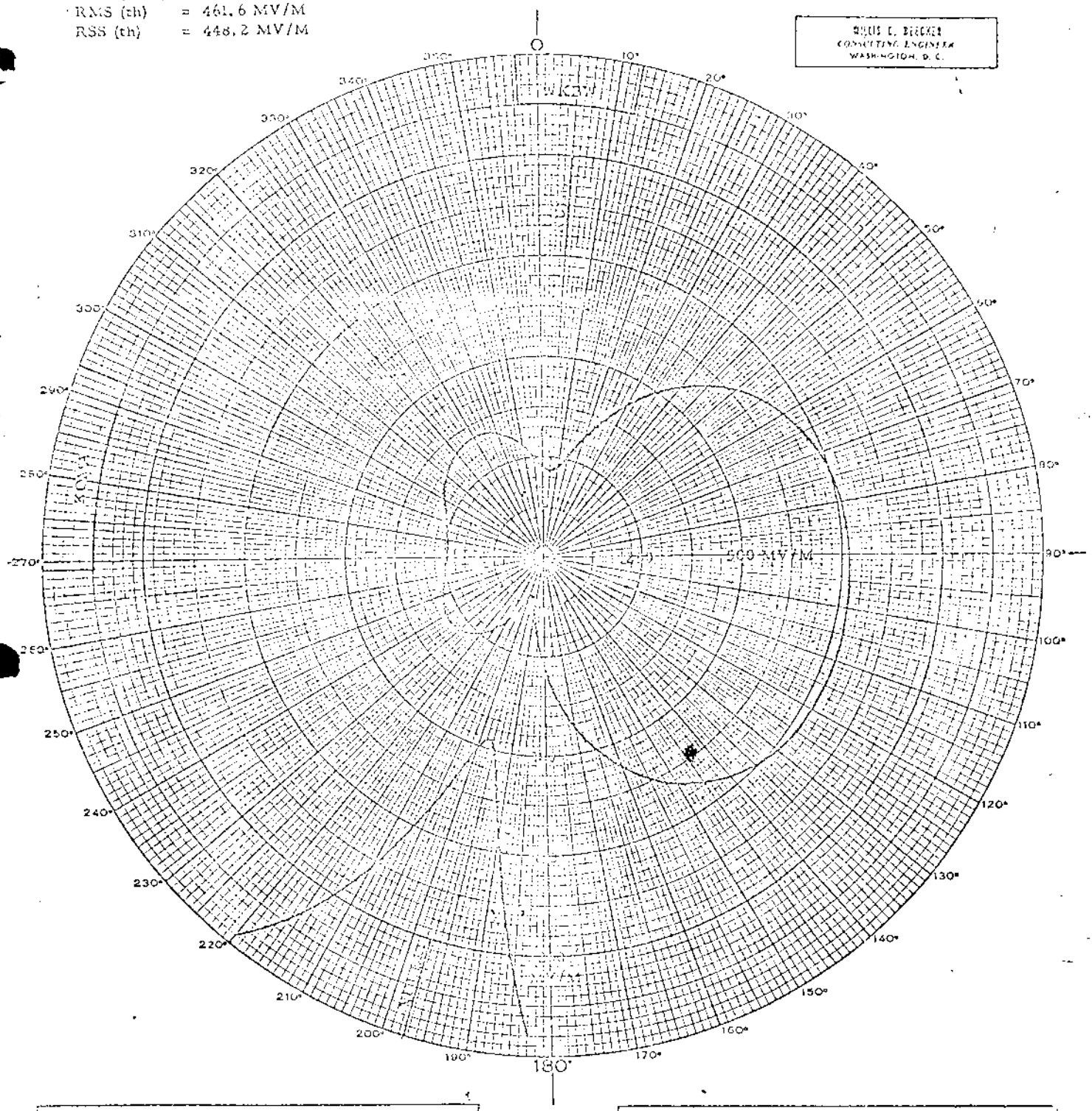
FCC File No.BL-10122
Accepted 7-2-63

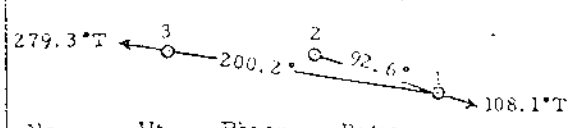
Station WSVL
Shelbyville, Indiana

1520 kc

WTGR

RMS (std.) = 484.9 MV/M
RMS (th) = 461.6 MV/M
RSS (th) = 448.2 MV/M





No.	Ht.	Phase	Ratio
1	89.0°	0.0°	1.00
2	166.8°	134.7°	1.07
3	89.0°	212.0°	1.14

Lat: 33° 42' 20", Long: 78° 53' 23"

FIGURE 6

CALCULATED DAYTIME

STANDARD HORIZONTAL RADIATION PATTERN

GRAND STRAND BROADCASTING CORPORATION

WTGR, MYRTLE BEACH, SOUTH CAROLINA

1520 KHz 5 KW DA-D, D

OCTOBER 1973

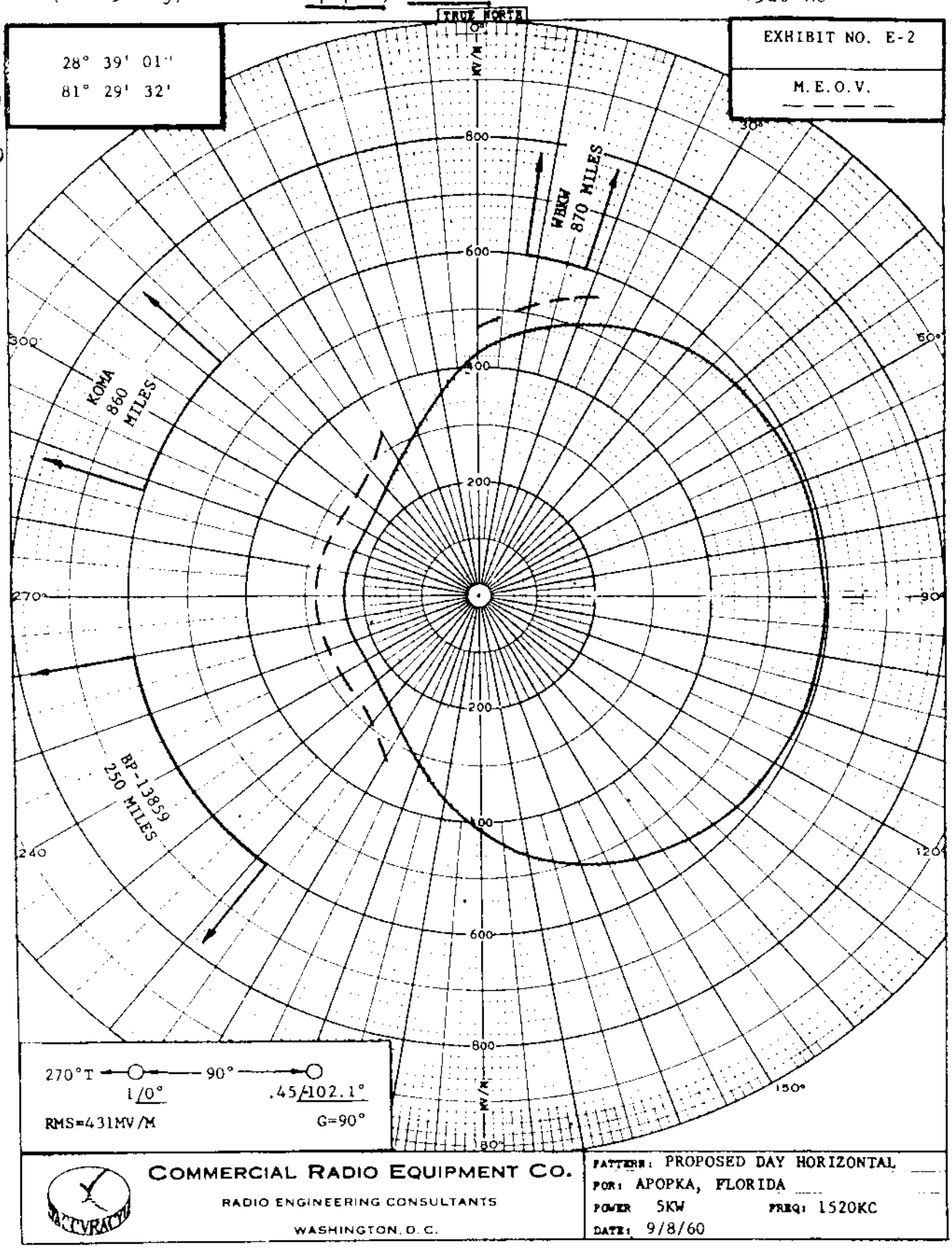
WTLN

PROPOSED DAY
(12-15-60g)

New; Adair Charities, Inc.
Apopka, Florida

5kw, DA-D,D
1520 KC

7-25-62 granted CP for new AM station



COMMERCIAL RADIO EQUIPMENT CO.
RADIO ENGINEERING CONSULTANTS
WASHINGTON, D.C.

PATTERN: PROPOSED DAY HORIZONTAL
FOR: APOPKA, FLORIDA
POWER 5KW FREQ: 1520KC
DATE: 9/8/60

FCC File No. BP-14484
Accepted 12-7-60

Adair Charities, Inc.
Apopka, Florida

1520 KC

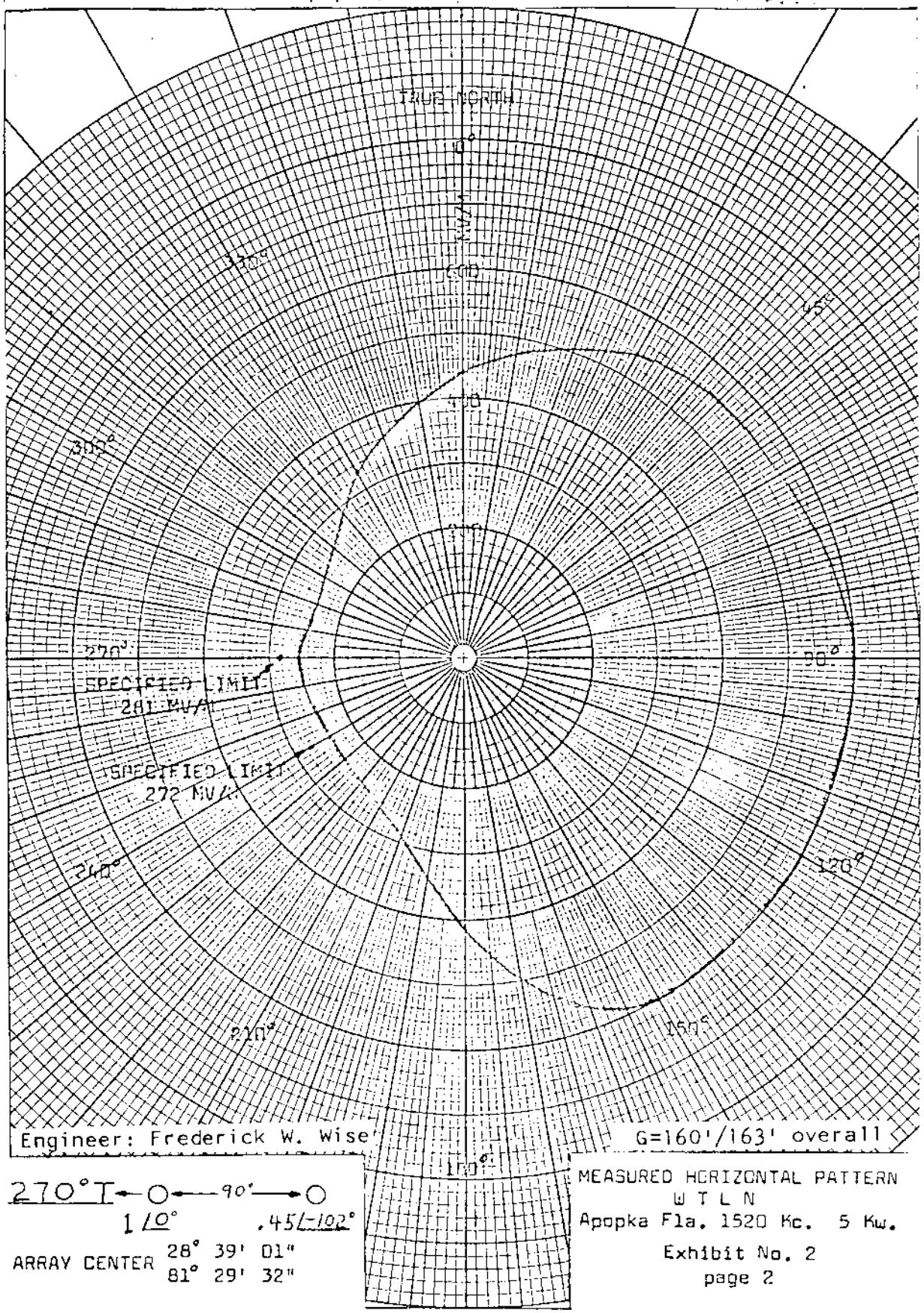
WTLN

Measured Day
(6-29-64

Station WTLN
Apopka, Florida

5kw,DA-D,D
1520 kc

BL-10589
GRANTED
1-13-65



Engineer: Frederick W. Wise

G=160'/163' overall

270°T ← 0 ← 90° → 0
1 /0° .45/-102°

ARRAY CENTER 28° 39' 01"
81° 29' 32"

MEASURED HORIZONTAL PATTERN
W T L N
Apopka Fla. 1520 Kc. 5 Kw.

Exhibit No. 2
page 2

FCC File No.BL-10589
Accepted 5-25-64

Station WTLN
Apopka, Florida

1520 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: XEEG

Main Studio: Panzacola, Tlax.

Frequency: 1520 kHz

Power: 0.5 Kw

Notification List No. 263

Date: May 16, 1970

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 19° 08' 30"
West Longitude: 98° 12' 00"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 2
Type of elements: guyed, vertical steel towers.

TOWER:	NW(#2)	SE(#1)	
HEIGHT ABOVE INSULATORS:	162'	162'	(90°)
PHASING:	+15°	0°	
FIELD RATIO:	1	1	

SPACING AND ORIENTATION: Elements are spaced 297' (165°) on a line bearing 290° true.

GROUND SYSTEM: 120-162' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

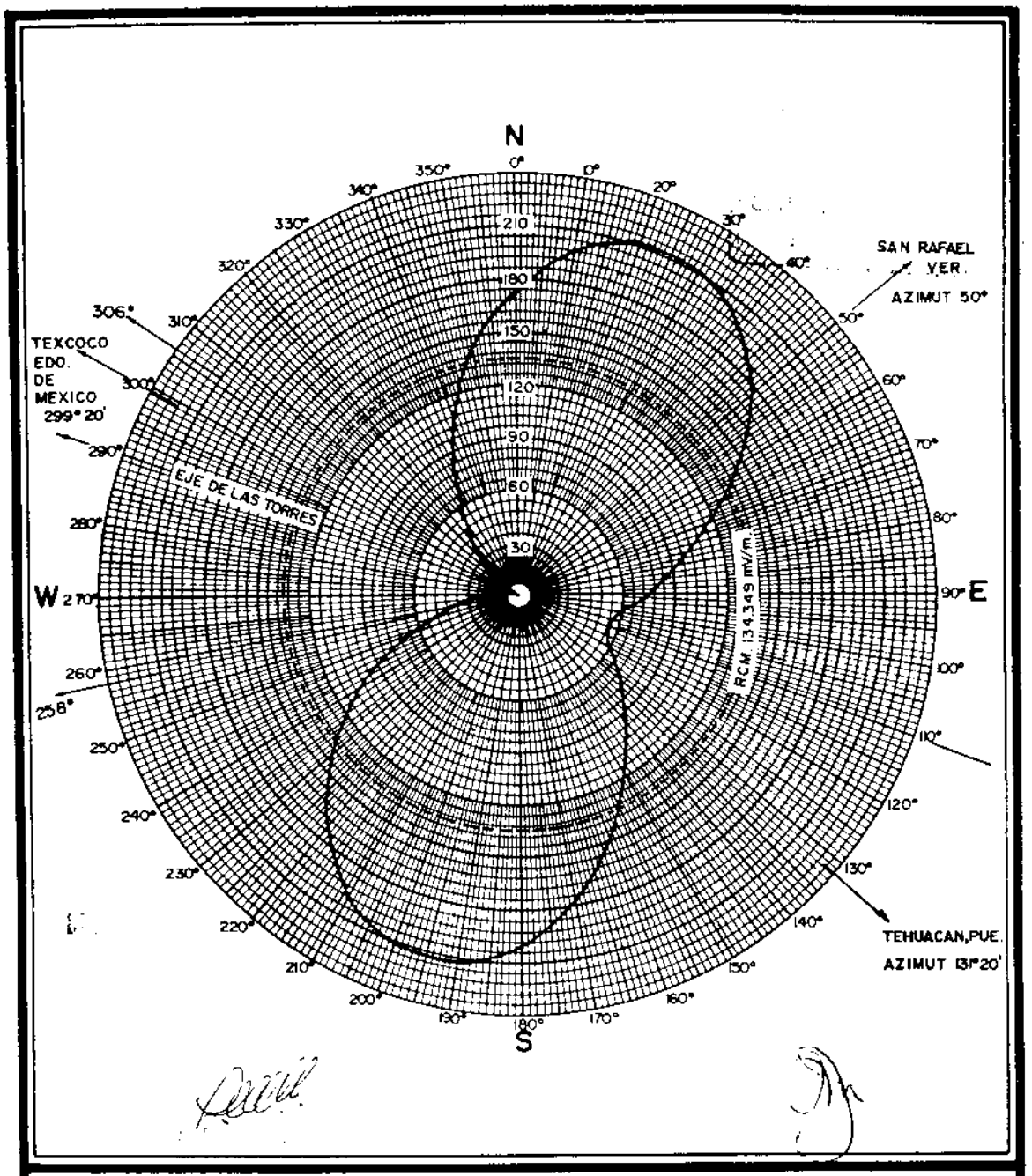
Predicted effective Field: 134.349 mv/m at rated power.

XEEG

Proposed Day
(7-29-70ct)

Station XEEG
Panzacola, Tlax.

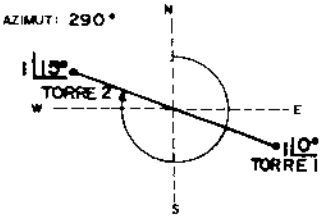
500w,DA-D,D,Class II
1520 kc



PATRON DE RADIACION HORIZONTAL CALCULADO EN mV/m. A 1609M

ESQUEMA DE LAS TORRES Y SU ORIENTACION CON RESPECTO AL NORTE GEOGRAFICO

AZIMUT: 290°



XEEG

PANZACOLA, TLAX.

FRECUENCIA:
1520 KHZ.
0.5 KW. AD-D.

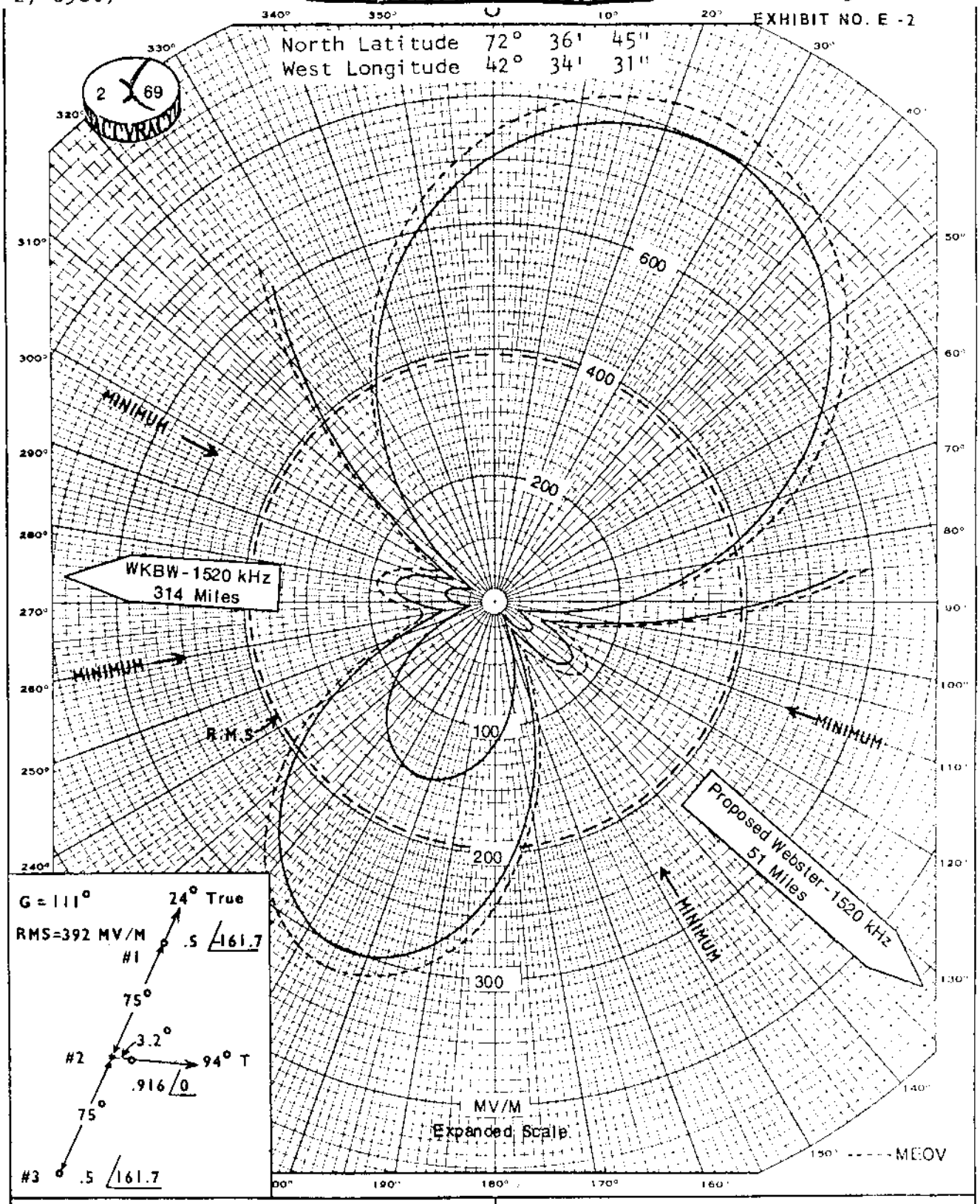
DISEÑO:
JAIME ROBLEDO ROMERO.
RADIOTELEFONISTA DE la. 1010

DIBUJO:
A.P.A.

Proposed Day
(5-27-69ct)

New; Greenfield Broadcasting Corp.
Greenfield, Massachusetts

5kw, DA-D, D
1520 kc



COMMERCIAL RADIO EQUIPMENT CO.
Consulting Radio Engineers
Washington, D.C.

DAYTIME HORIZONTAL RADIATION PATTERN
PROPOSED NEW STATION
GREENFIELD, MASSACHUSETTS
1520 kHz, 5 KW, DA-D
Greenfield Broadcasting Corporation

FCC File No. BP-17945
Accepted 5-9-69 Amended

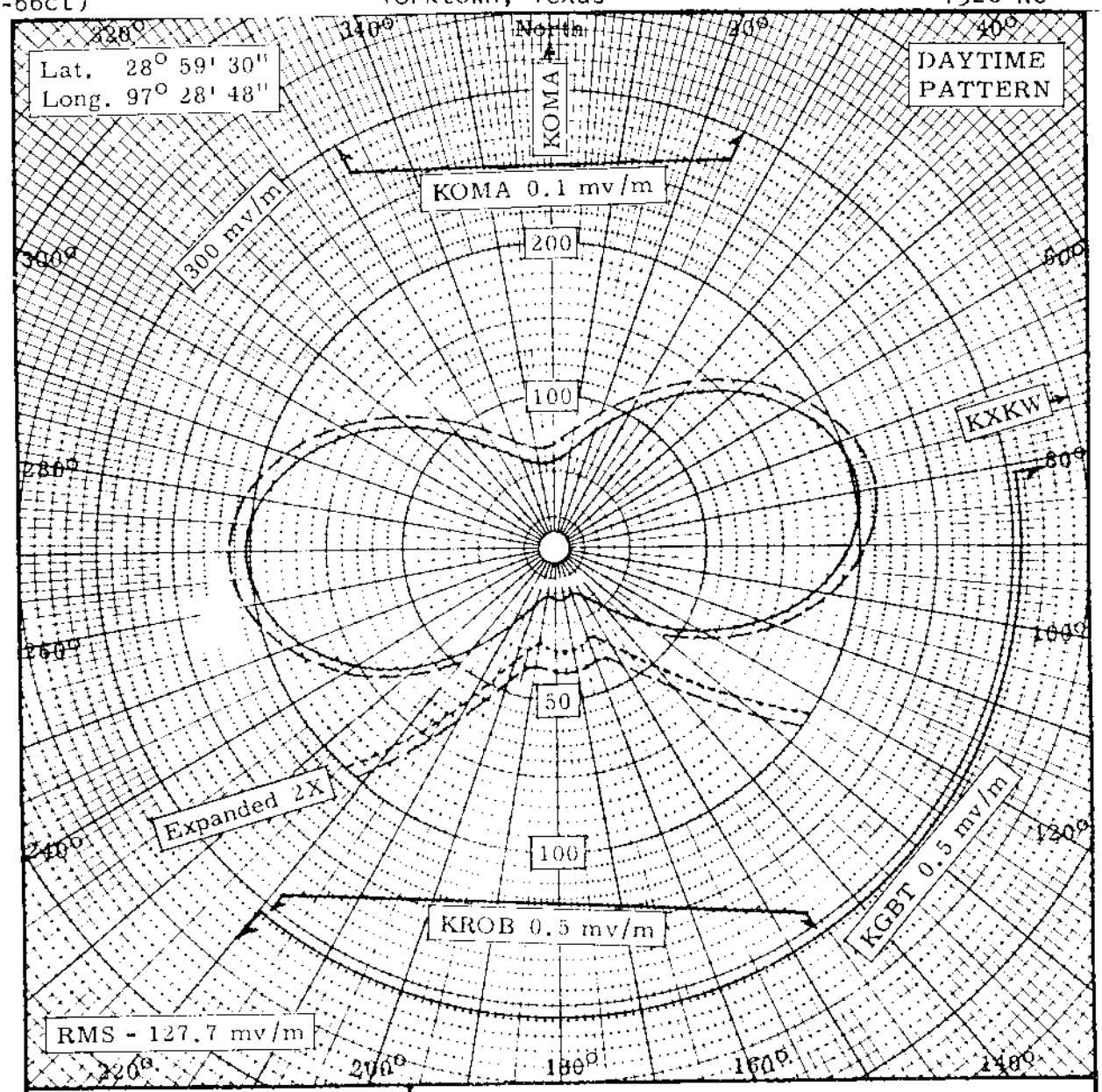
New; Greenfield Broadcasting Corp.
Greenfield, Massachusetts

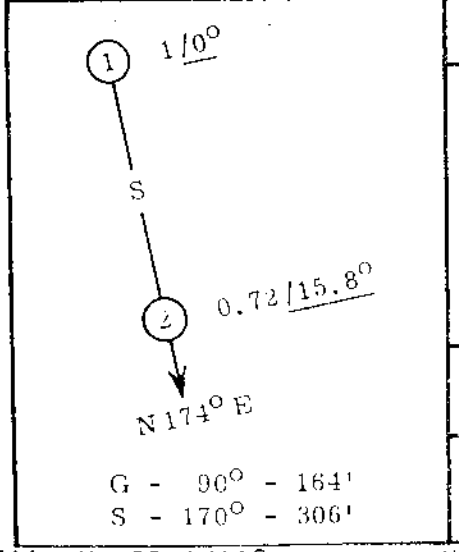
1520 kc

Proposed Day
(9-28-66ct)

New; DeWitt Radio
Yorktown, Texas

500w,DA-D,D
1520 kc





MEOV ——— EXPANDED -----

DE WITT RADIO
YORKTOWN, TEXAS

PROPOSED DAYTIME DIRECTIONAL
HORIZONTAL PLANE RADIATION PATTERN
1520 KC DA-D 500 WATTS

021066

FIGURE B

MERL SAXON
CONSULTING RADIO ENGINEER
LUFKIN, TEXAS

FCC File No.BP-17138
Accepted 9-21-66

New; DeWitt Radio
Yorktown, Texas

1520 kc

NEW
1530

IFRB Serial No. 6359

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 – 1605 kHz

PART I GENERAL INFORMATION

(01) Administration: CANADA Sheet No. 421 Date 830726

Assigned frequency (kHz)		(02)	1530
Transmitting station	Name of the station	(03)	MONCTON NB
	Call sign	(04)	
	Additional Identification	(05)	
	Station class	(06)	B
	Operational Status	(07)	P
Country		(08)	CAN
Geographical coordinates of the transmitting station		(09)	64W470 0 46N0400

(11) a) New assignment [ ] b) Modification of characteristic of an assignment recorded in the plan [X] c) Cancellation of an assignment [ ]

(12) Modification under Section 4.2.14 Yes [ ] No [X]

(13) Date of bringing into service or cessation of operation [ ] Year [ ] Month [ ] Day

STATION PARAMETERS		DAYTIME OPERATION		NIGHT-TIME OPERATION
Station power (kW)	(21)	10.	(31)	5.
r.m.s. value of radiation for station power (mV/m at 1 km)	(25)	978.6	(35)	675.78
Antenna type	(26)	A	(36)	B
Simple vertical antenna electrical height (degrees)	(27)	90.	(37)	.

(44) Remarks

COORDINATION UNDER ARTICLE 4:								
COUNTRY	USA							
IN PROGRESS	X							
ACCEPTANCE OBTAINED								

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT
CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 - 1605 kHz

IFRB Serial No. 6359

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No. 421

Date 830726

(01) MONCTON NB — Name of transmitting station

(02) CAN — Country

(03) N — Hours of operation

(04) 3 — Total number of towers

(05) Tower No.	(06) Tower field ratio	(07) Phase difference of the field (± degrees)	(08) Electrical tower spacing (degrees)	(09) Angular tower orientation (degrees)	(10) Reference tower (yes/no)	(11) Electrical height of tower (degrees)	(12) Tower structure
1	1	0	0	0		90	
2	2	90	90	240		90	
3	1	180	180	240		90	

(14) r.m.s value of radiation	(15) Type of pattern	(16) Special quadrature factor
675.78 mV/m at 1 km	E	mV/m at 1 km

(17) SUPPLEMENTARY INFORMATION

Azimuth	60	157	222	290	355
Angle	0	21	35	0	14
Radiation	1104.3	572.7	33.7	87.6	845.9

NEW 1530

NEW

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

STATION: NEW

MAIN STUDIO: Morden, Manitoba

FREQUENCY: 1530 kHz

POWER: 10 kW Day
1 kW Night

CLASS: II

NOTIFICATION LIST NO: 383

DATE: March 28, 1978

GEOGRAPHICAL LOCATION:

Latitude 49° 07' 16" North
Longitude 98° 04' 01" West

ANTENNA CHARACTERISTICS:

Mode of Operation: DA-2
Number of Elements: 4 (Four)
Type of Elements: Guyed steel towers, uniform cross-section, base insulated for series feed

Tower	#1 (South)	#2 (South-Centre)	#3 (North-Centre)	#4 (North)
Height above base insulator	150' (84°)	150' (84°)	150' (84°)	150' (84°)
Overall height:	155'	155'	155'	155'
Day Field Ratio:	--	1.0	1.0	--
Day Phasing:	--	0°	-68°	--
Night Field Ratio:	0.365	1.0	1.0	0.365
Night Phasing:	+150°	Ref.	-152.4°	+58°
Spacing:	160.8' (90°)	Ref.	160.8' (90°)	321.6' (180°)
Orientation:	175°	Ref.	360°	360°

GROUND SYSTEM: 120 equally spaced radials per tower of No. 10 B & S gauge bare soft copper wire, buried approximately 8". Length of radials 257' (0.4 wavelength) with the exception of those joined along the common chords.

PREDICTED EFFECTIVE FIELD:

Nighttime: 214 mV/m at 1 mile for 1 kW

Daytime: 574 mV/m at 1 mile for 10 kW
182 mV/m at 1 mile for 1 kW

January 9, 1978

NEW

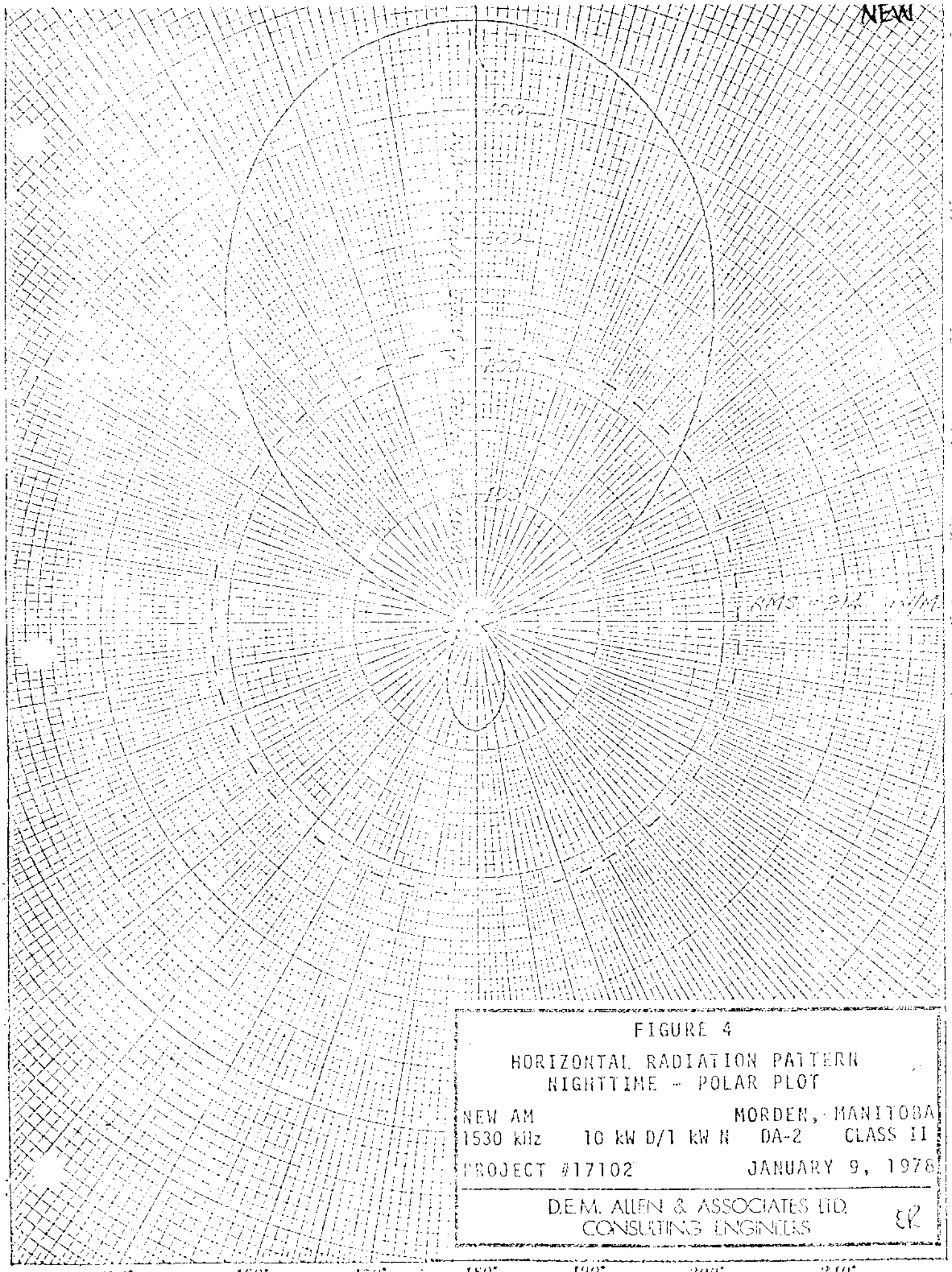


FIGURE 4

HORIZONTAL RADIATION PATTERN
NIGHTTIME - POLAR PLOT

NEW AM — MORDEN, MANITOBA
1530 kHz — 10 kW D/1 kW N — DA-2 — CLASS II

PROJECT #17102 — JANUARY 9, 1978

D.E.M. ALLEN & ASSOCIATES LTD.
CONSULTING ENGINEERS

ER

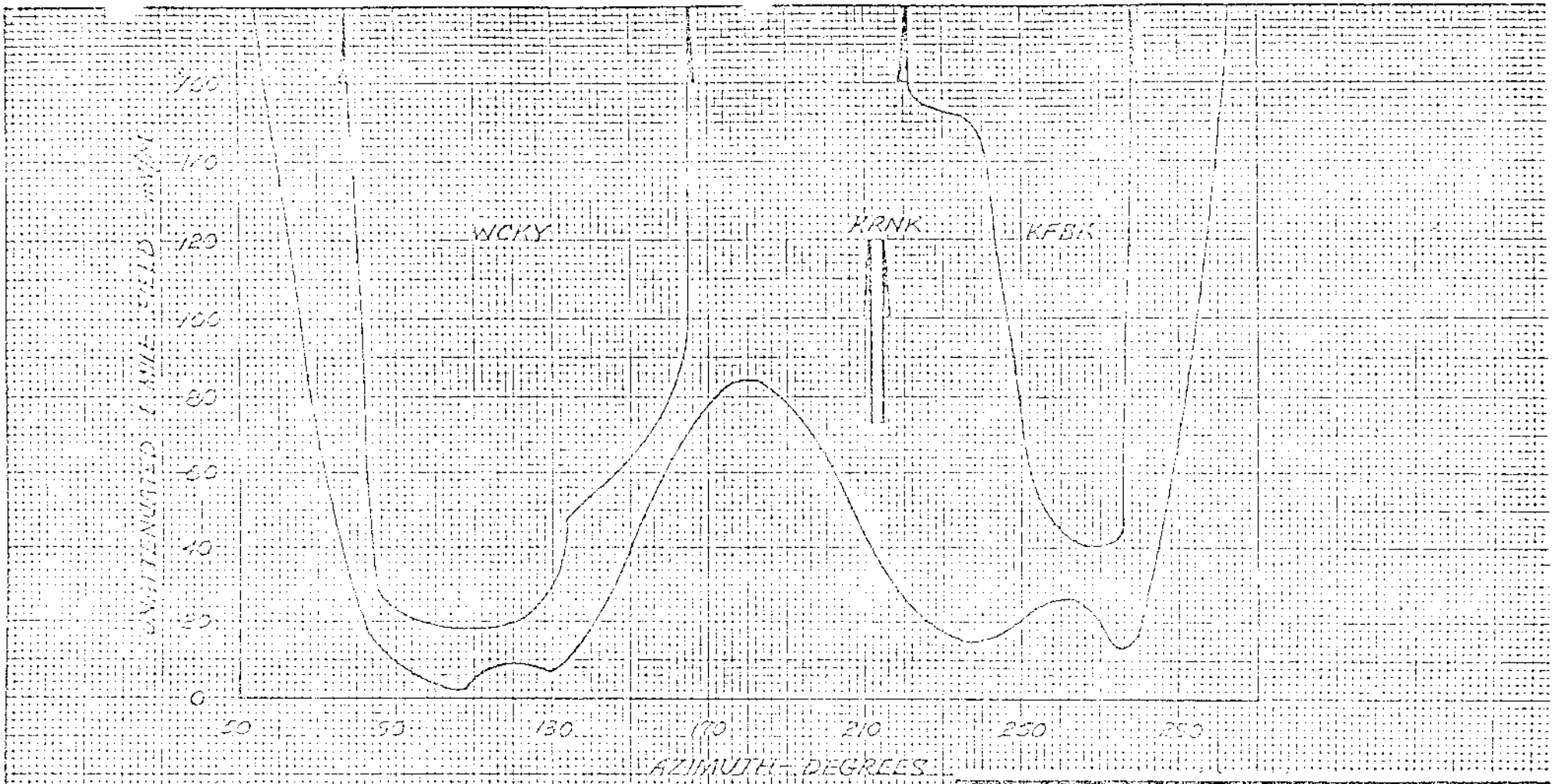


FIGURE 5

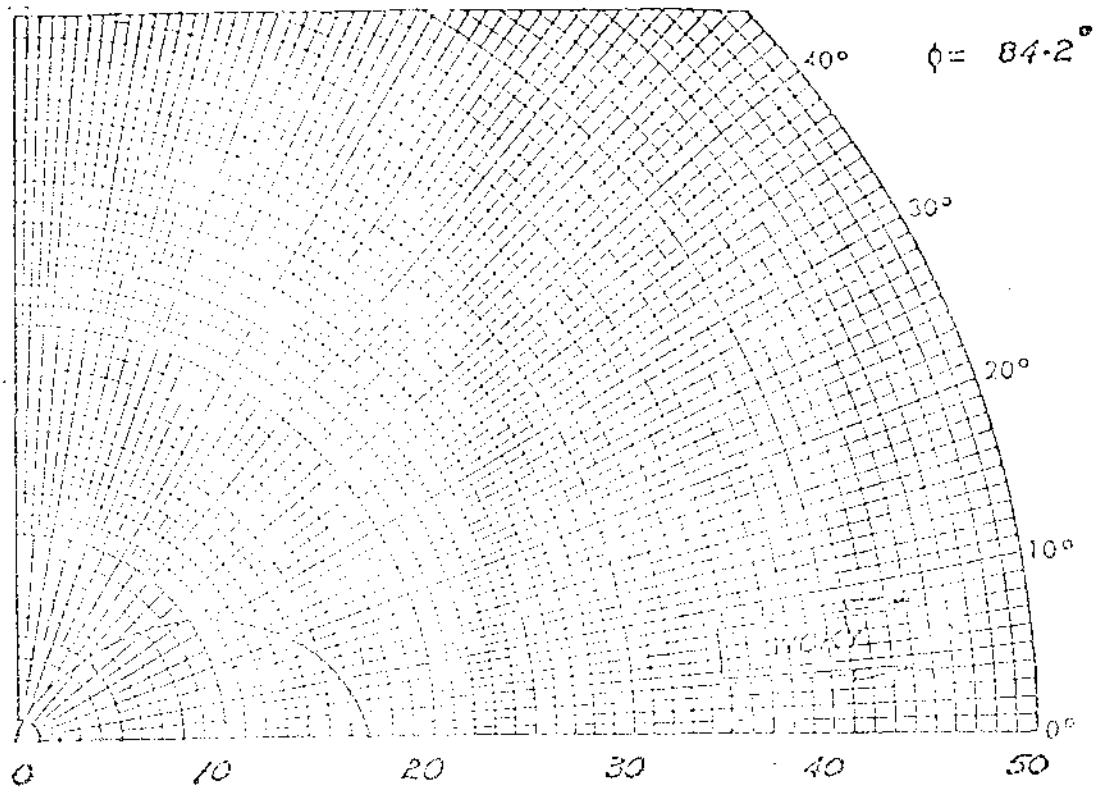
HORIZONTAL RADIATION PATTERN
NIGHTTIME - EXPANDED PLOT

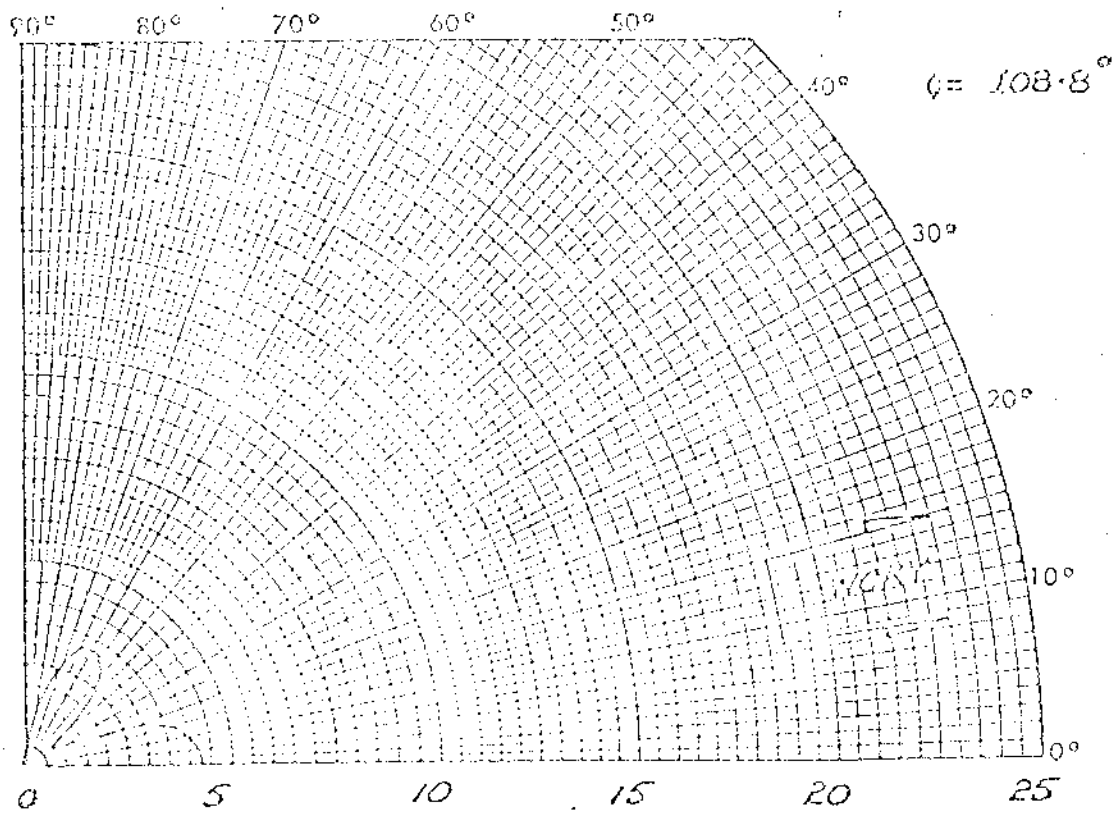
NEW AM — MORDEN, MANITOB
1530 kHz — 10 kW D/1 kW N — DA-2 — CLASS I
PROJECT #17102 — JANUARY 9, 197

D.E.M. ALLEN & ASSOCIATES LTD.
CONSULTING ENGINEERS

NEW

NEW





VERTICAL RADIATION PATTERNS

FIGURE 6

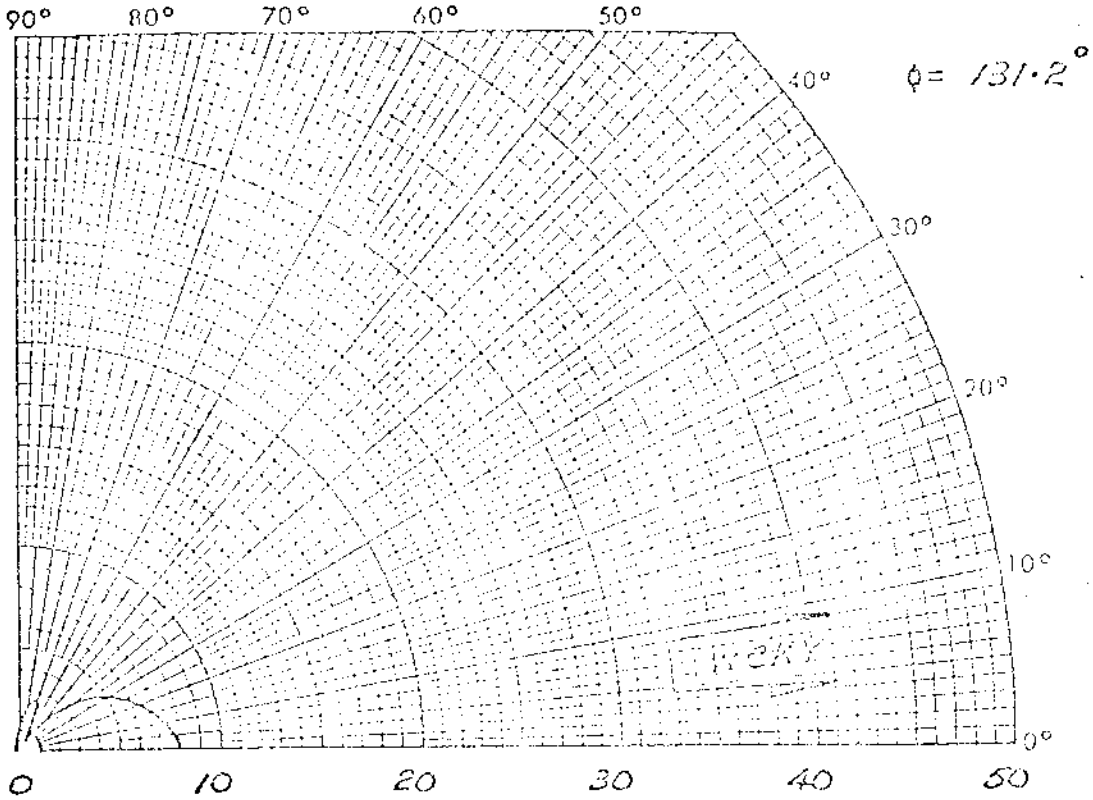
NEW AM
1530 kHz
PROJECT #17102

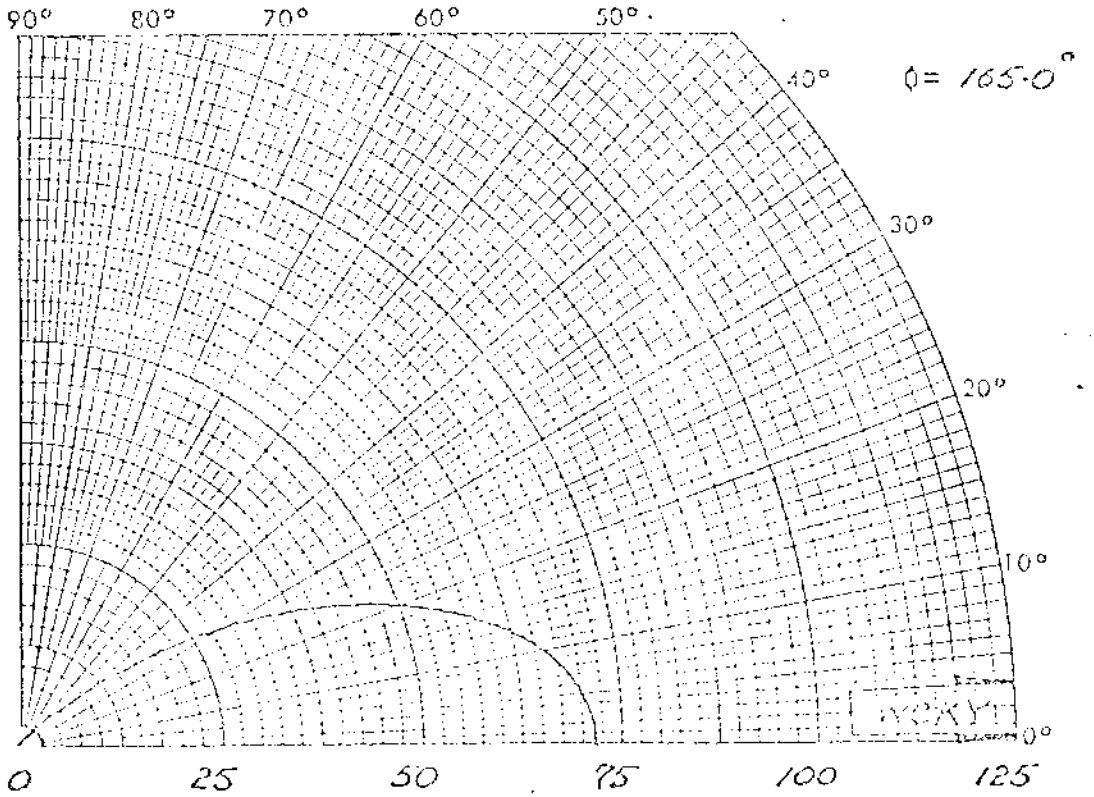
10 kW D/1 kW N DA-2

MORDEN, MANITOBA
CLASS II
JANUARY 9, 1978

D.E.M. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS

NEW





VERTICAL RADIATION PATTERNS

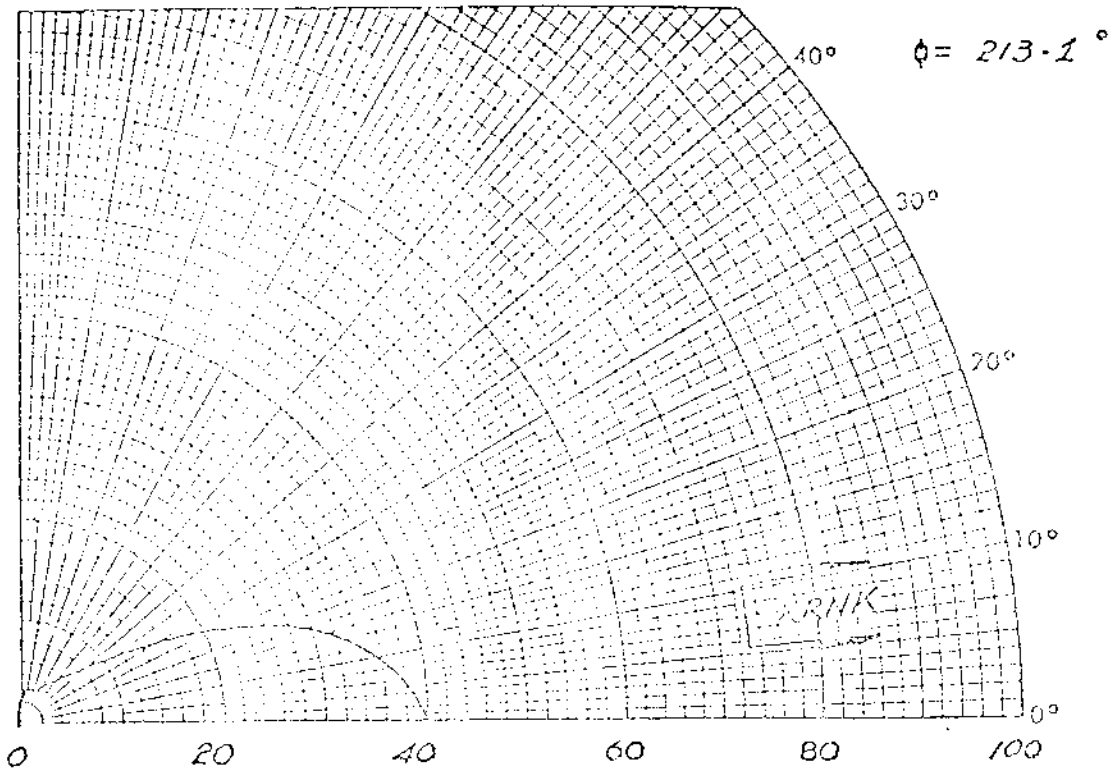
FIGURE 7

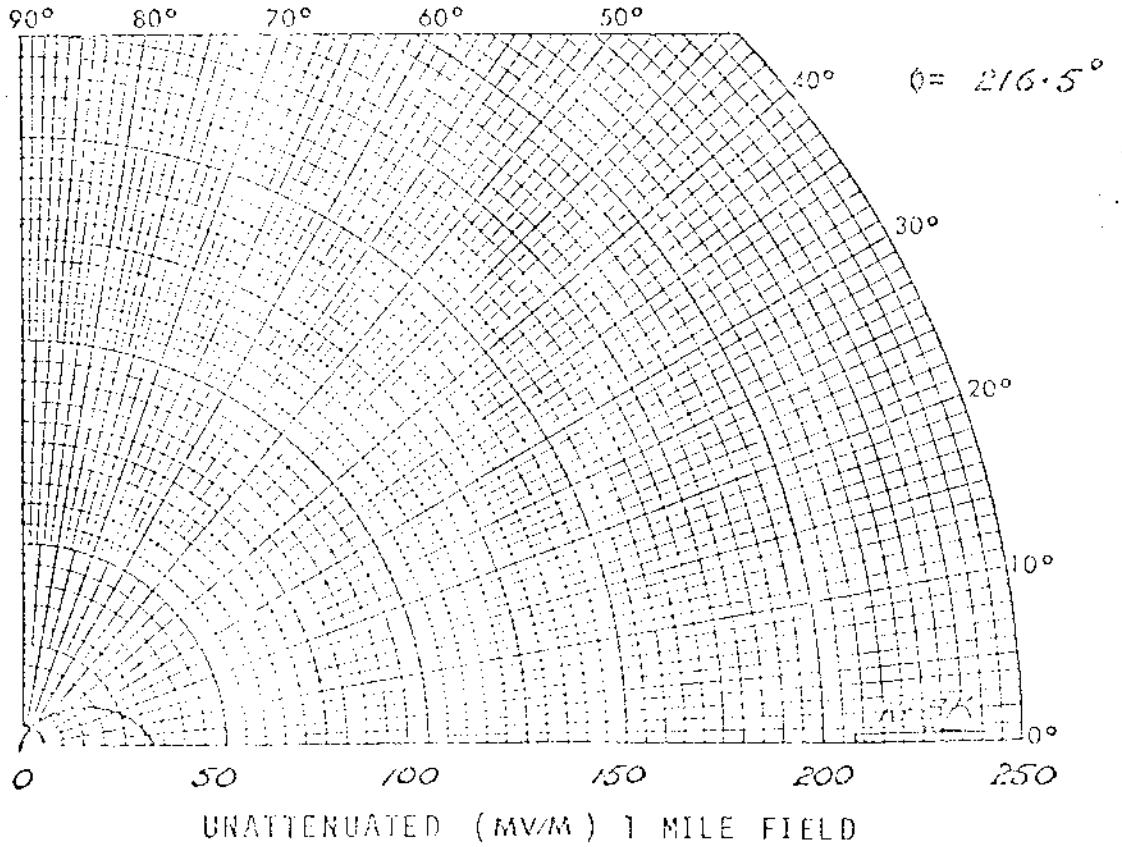
NEW AM
1530 kHz 10 kW D/1 kW N DA-2
PROJECT #17102

MORDEN, MANITOBA
CLASS II
JANUARY 9, 1978

D.E.M. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS

NEW





VERTICAL RADIATION PATTERNS

FIGURE 8

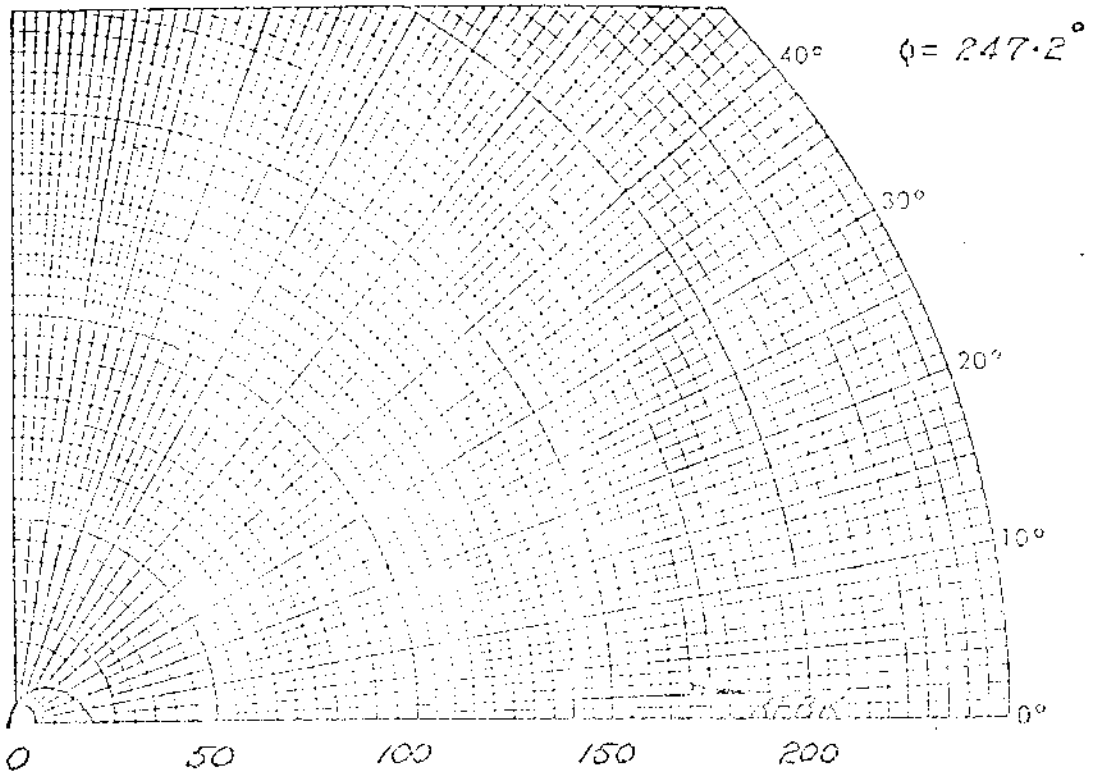
NEW AM
1530 kHz 10 kW D/1 kW N
PROJECT #17102

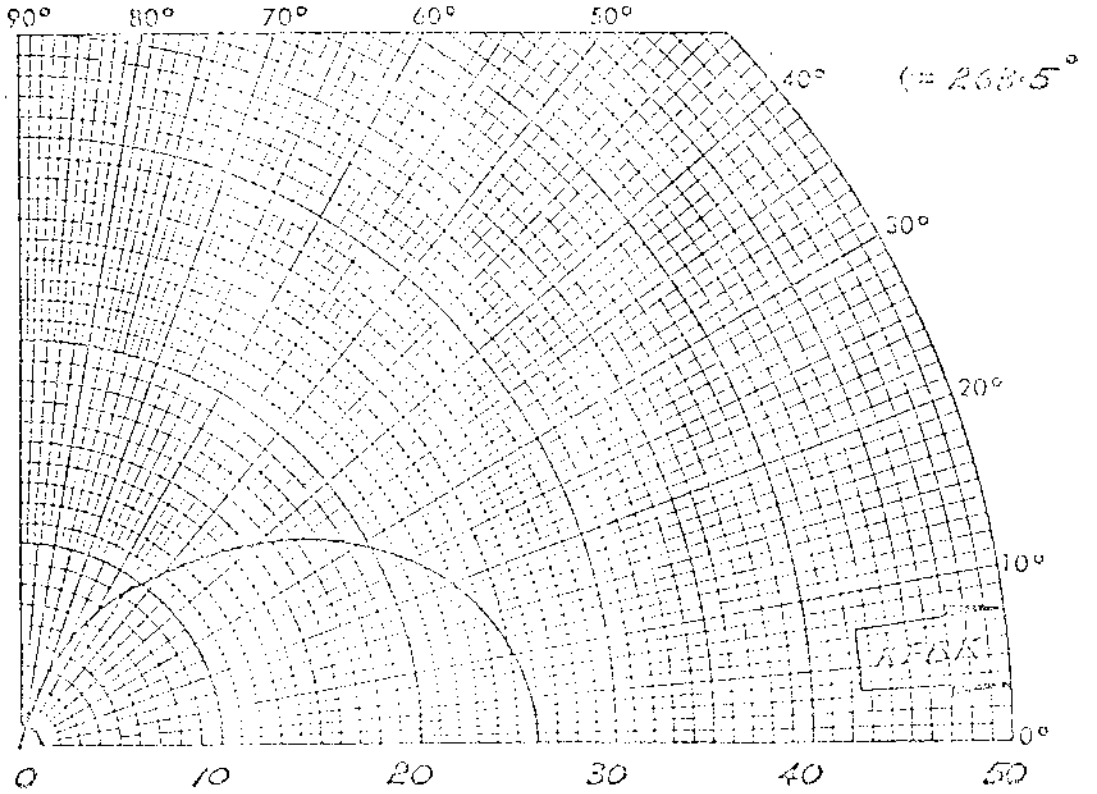
DA-2

MORDEN, MANITOBA
CLASS II
JANUARY 9, 1978

D.E.M. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS E.R

NEW



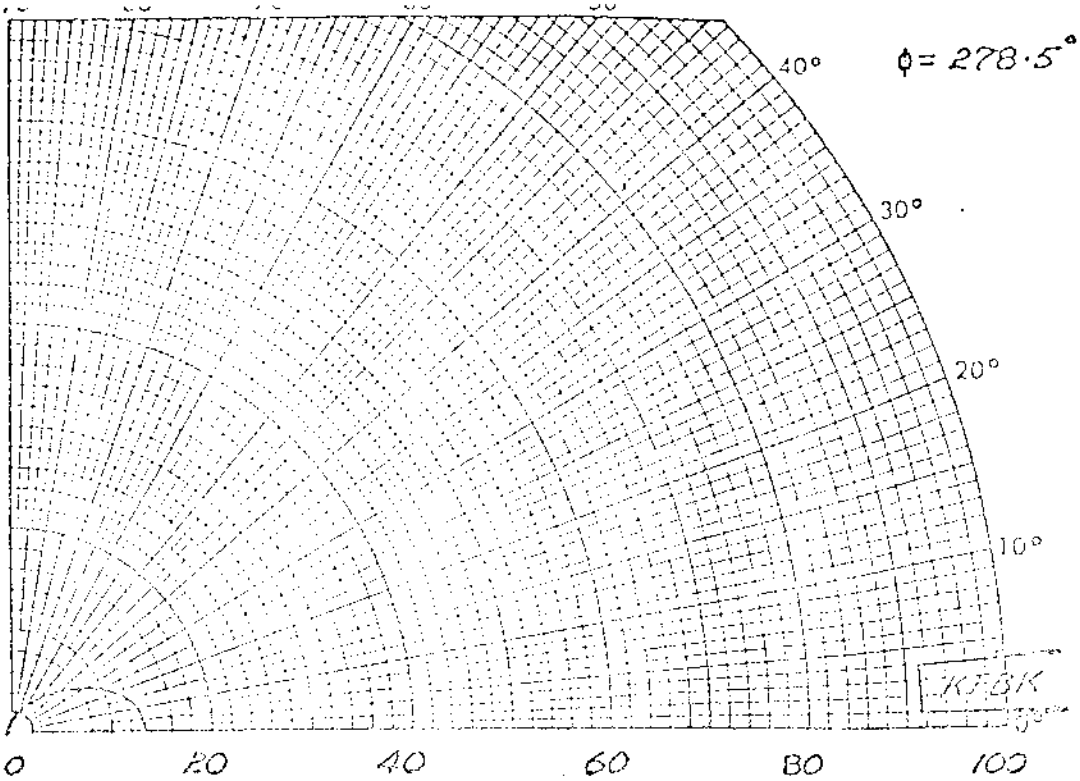


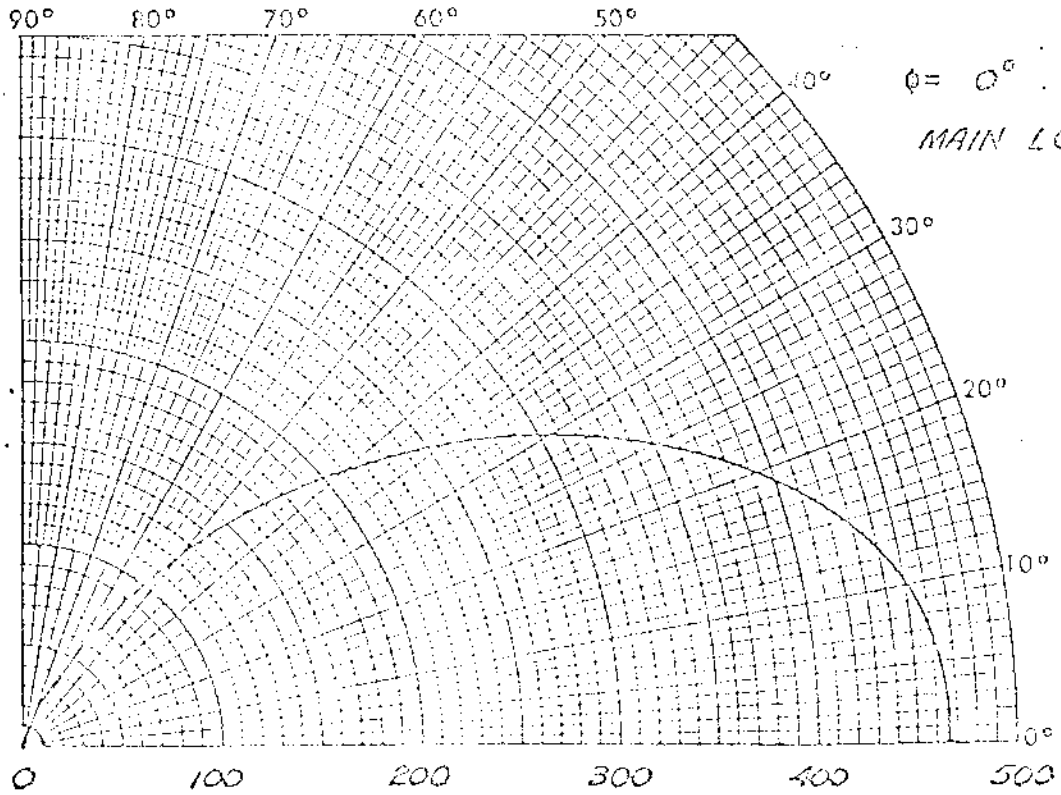
VERTICAL RADIATION PATTERNS

FIGURE 9

NEW AM — MORDEN, MANITOBA
1530 KHz — 10 KW D/1 KW N — DA-2 — CLASS II
PROJECT #17102 — JANUARY 9, 1978
D.E.N. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS

NEW





VERTICAL RADIATION PATTERNS

FIGURE 10

NEW AM — MORDEN, MANITOBA
1530 kHz — 10 kW D/1 kW N — DA-2 — CLASS II
PROJECT #17102 — JANUARY 9, 1978
D.E.M. ALLEN & ASSOCIATES LTD., CONSULTING ENGINEERS

NEW

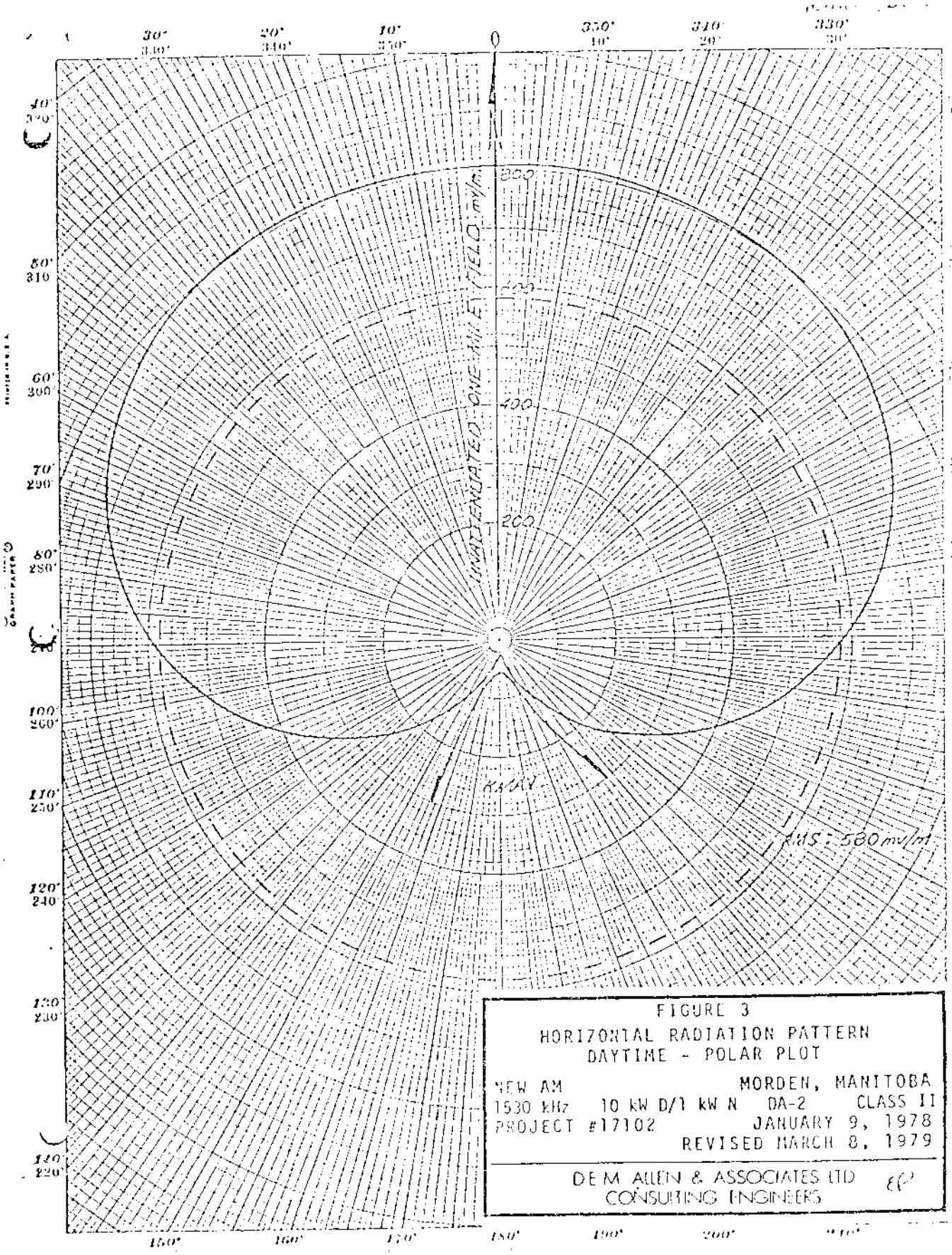


FIGURE 3
HORIZONTAL RADIATION PATTERN
DAYTIME - POLAR PLOT

NEW AM — MORDEN, MANITOBA
1530 kHz — 10 kW D/1 kW N — DA-2 — CLASS II
PROJECT #17102 — JANUARY 9, 1978
REVISED MARCH 8, 1979

DEM ALLEN & ASSOCIATES LTD
CONSULTING ENGINEERS

NEW

PROJECT #17102

DESCRIPTION SHEET - DIRECTIONAL ANTENNA

STATION: NEW

MAIN STUDIO: Morden, Manitoba

FREQUENCY: 1530 kHz

POWER: 10 kW Day
1 kW Night

CLASS: II

NOTIFICATION LIST NO: 383

DATE: March 28, 1979

GEOGRAPHICAL LOCATION:

Latitude 49° 07' 16" North
Longitude 98° 04' 01" West

ANTENNA CHARACTERISTICS:

Mode of Operation: DA-2
Number of Elements: 4 (Four)
Type of Elements: Guyed steel towers, uniform cross-section, base insulated for series feed

Tower	#1 (South)	#2 (South-Centre)	#3 (North-Centre)	#4 (North)
Height above base insulator	150' (84°)	150' (84°)	150' (84°)	150' (84°)
Overall height:	155'	155'	155'	155'
Day Field Ratio:	--	1.0	1.0	--
Day Phasing:	--	0°	-86°	--
Night Field Ratio:	0.365	1.0	1.0	0.365
Night Phasing:	+150°	Ref.	-152.4°	+58°
Spacing:	160.8' (90°)	Ref.	160.8' (90°)	321.6' (180°)
Orientation:	175°	Ref.	360°	360°

GROUND SYSTEM: 120 equally spaced radials per tower of No. 10 B & S gauge bare soft copper wire, buried approximately 8". Length of radials 257' (0.4 wavelength) with the exception of those joined along the common chords.

PREDICTED EFFECTIVE FIELD:

Nighttime: 214 mV/m at 1 mile for 1 kW

Daytime: 580 mV/m at 1 mile for 10 kW
183 mV/m at 1 mile for 1 kW

This Description Sheet is a replacement for that notified in Canadian Change List No. 383, the latter being incorrect with respect to the day-time phasing and RMS. Please retain the notified day-time and night-time radiation patterns.

January 9, 1978
Revised March 8, 1979

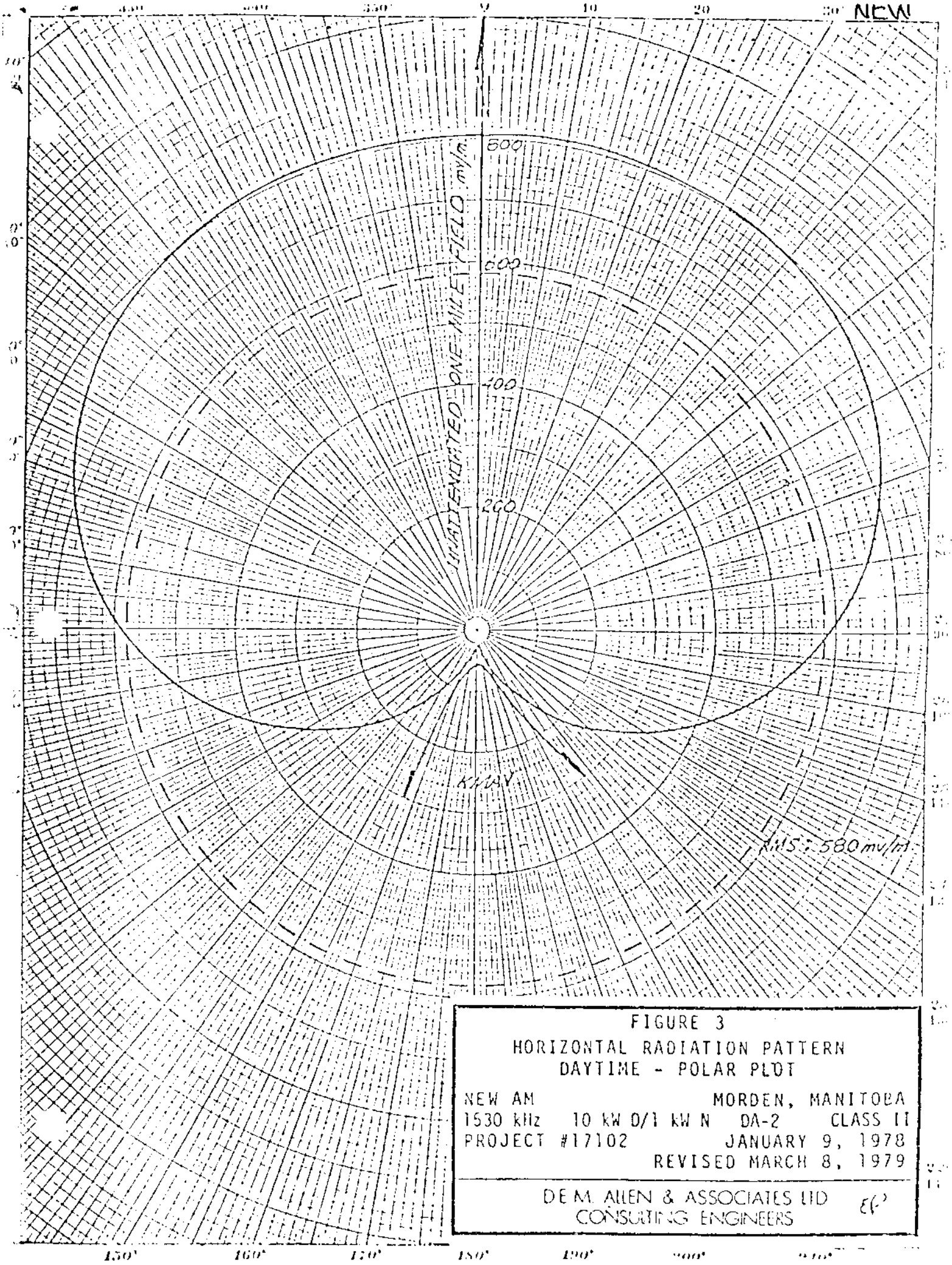


FIGURE 3

HORIZONTAL RADIATION PATTERN
DAYTIME - POLAR PLOT

NEW AM MORDEN, MANITOBA
1530 kHz 10 kW D/1 kW N DA-2 CLASS II
PROJECT #17102 JANUARY 9, 1978
REVISED MARCH 8, 1979

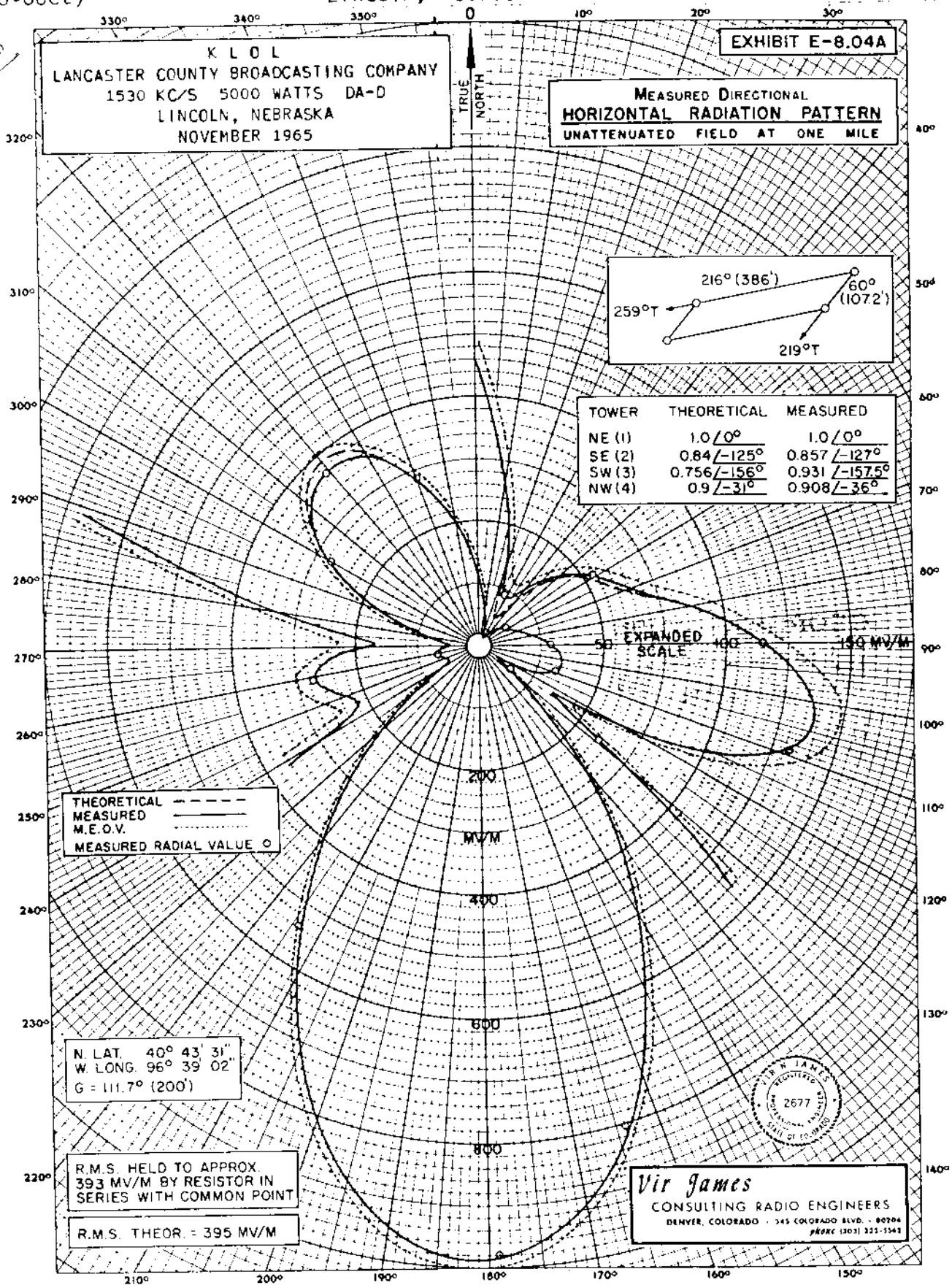
D.E.M. ALLEN & ASSOCIATES LTD
CONSULTING ENGINEERS

~~KLOL~~
KECK
5kw,DA-D,D
1530 kc

Measured Day
(1-28-66ct)

Station KLOL
Lincoln, Nebraska

LIC 2-10-66



FCC File No. BL-11187
Accepted 1-19-66

Station KLOL
Lincoln, Nebraska

1530 kc

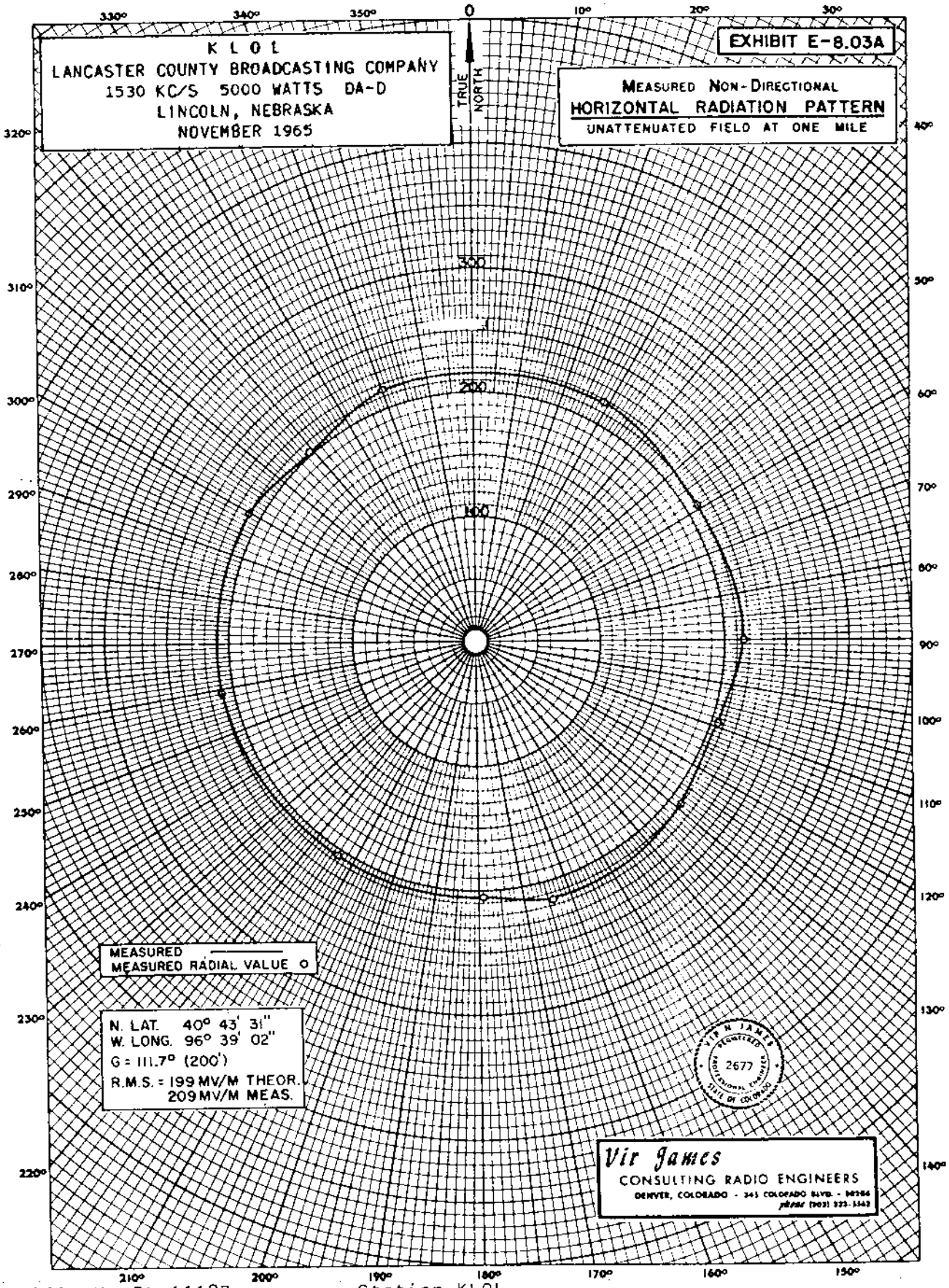
KECK ~~KLOL~~

Measured Non-DA
(1-28-66ct)

Station KLOL
Lincoln, Nebraska

5kw,DA-D,D
1530 kc

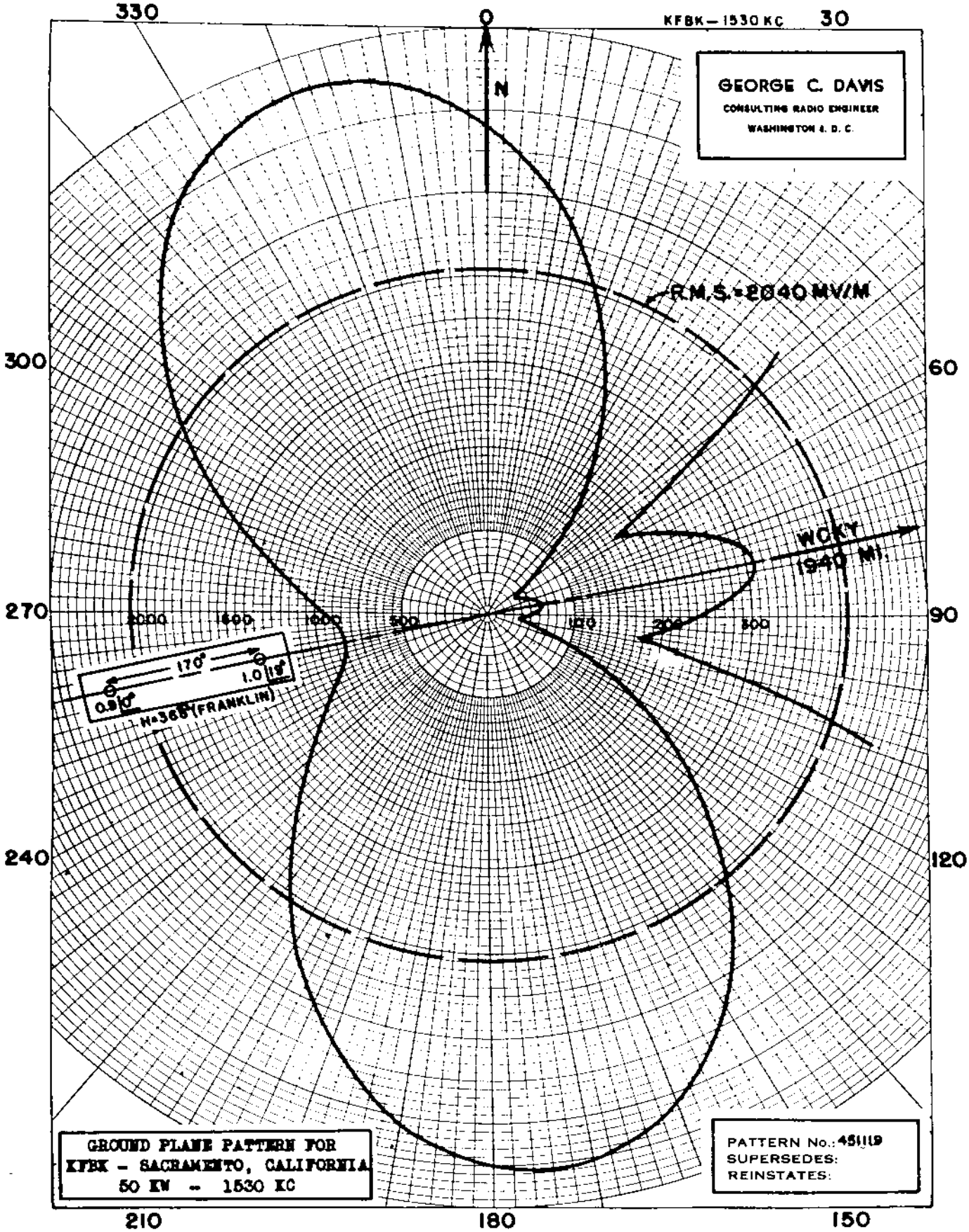
LIC 2-10-66



FCC File No.BL-11187
Accepted 1-19-66

Station KLOL
Lincoln, Nebraska

1530 kc



KEUFFEL & ESSER CO., N. Y. NO. 343 A

KFBK

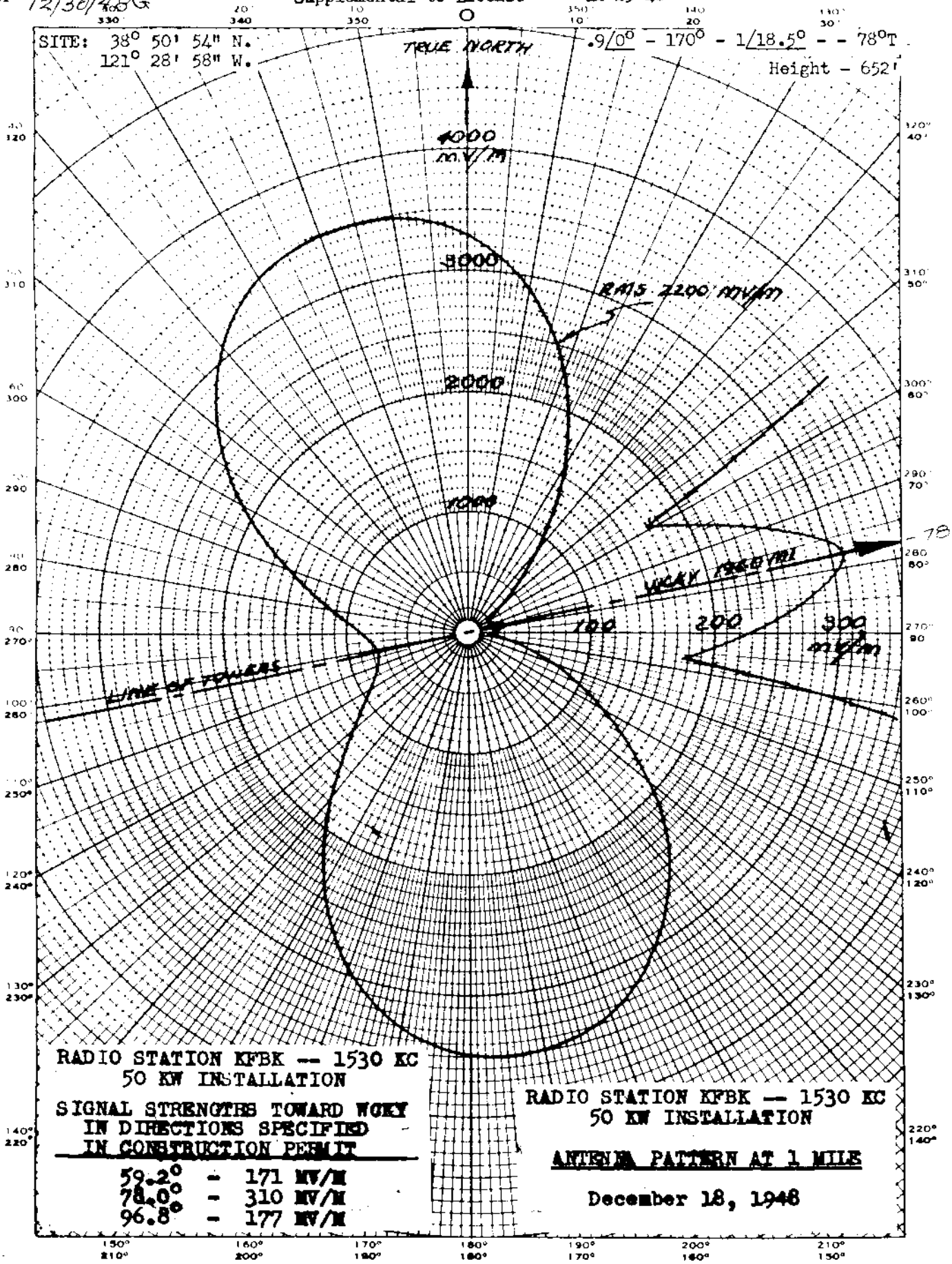
MEASURED
DAY&NIGHT

KFBK, SACRAMENTO, CAL.
Supplemental to License——12-23-48

50kw, DA1

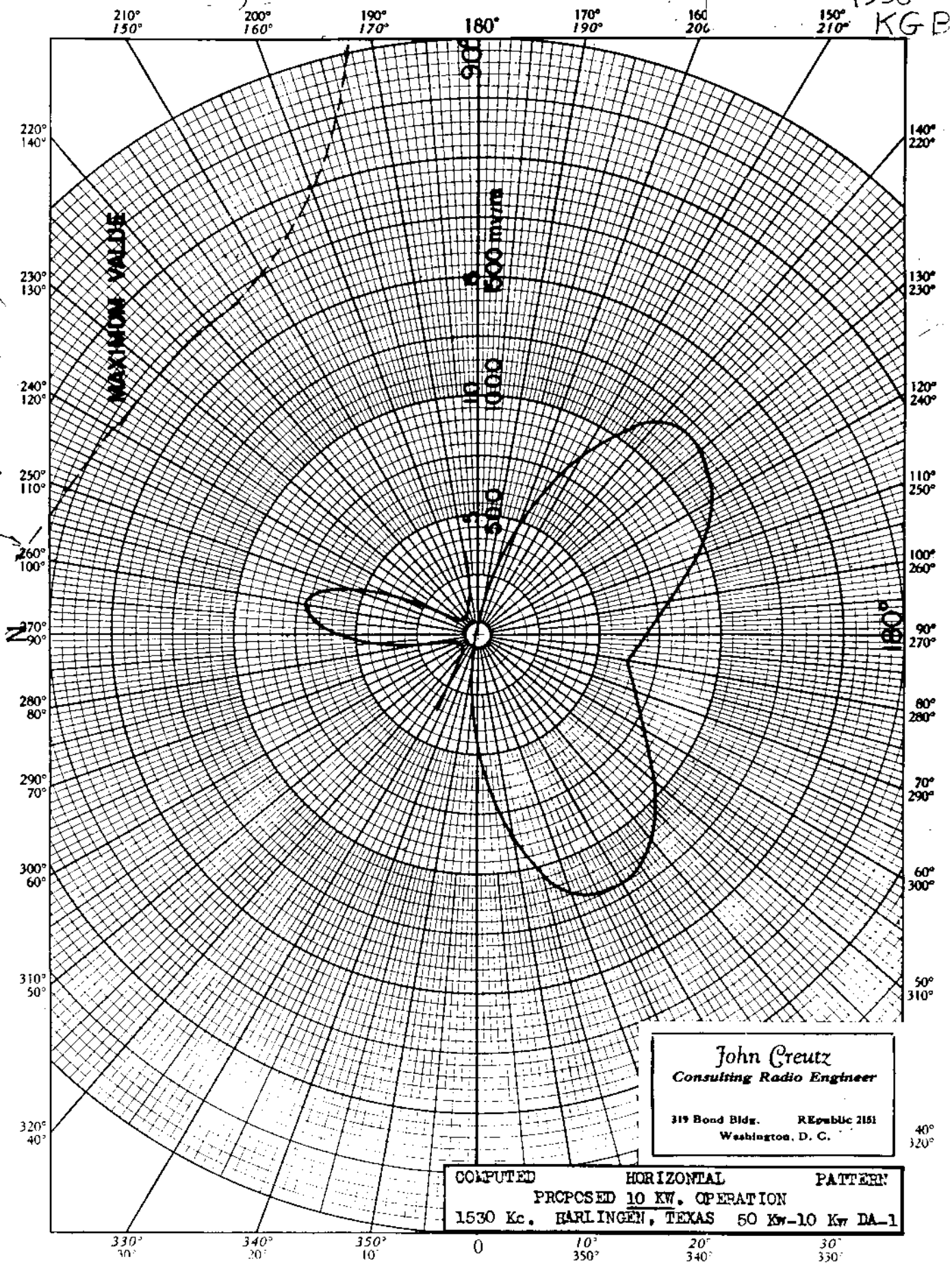
1530 kc

12/30/48G



9/9/486

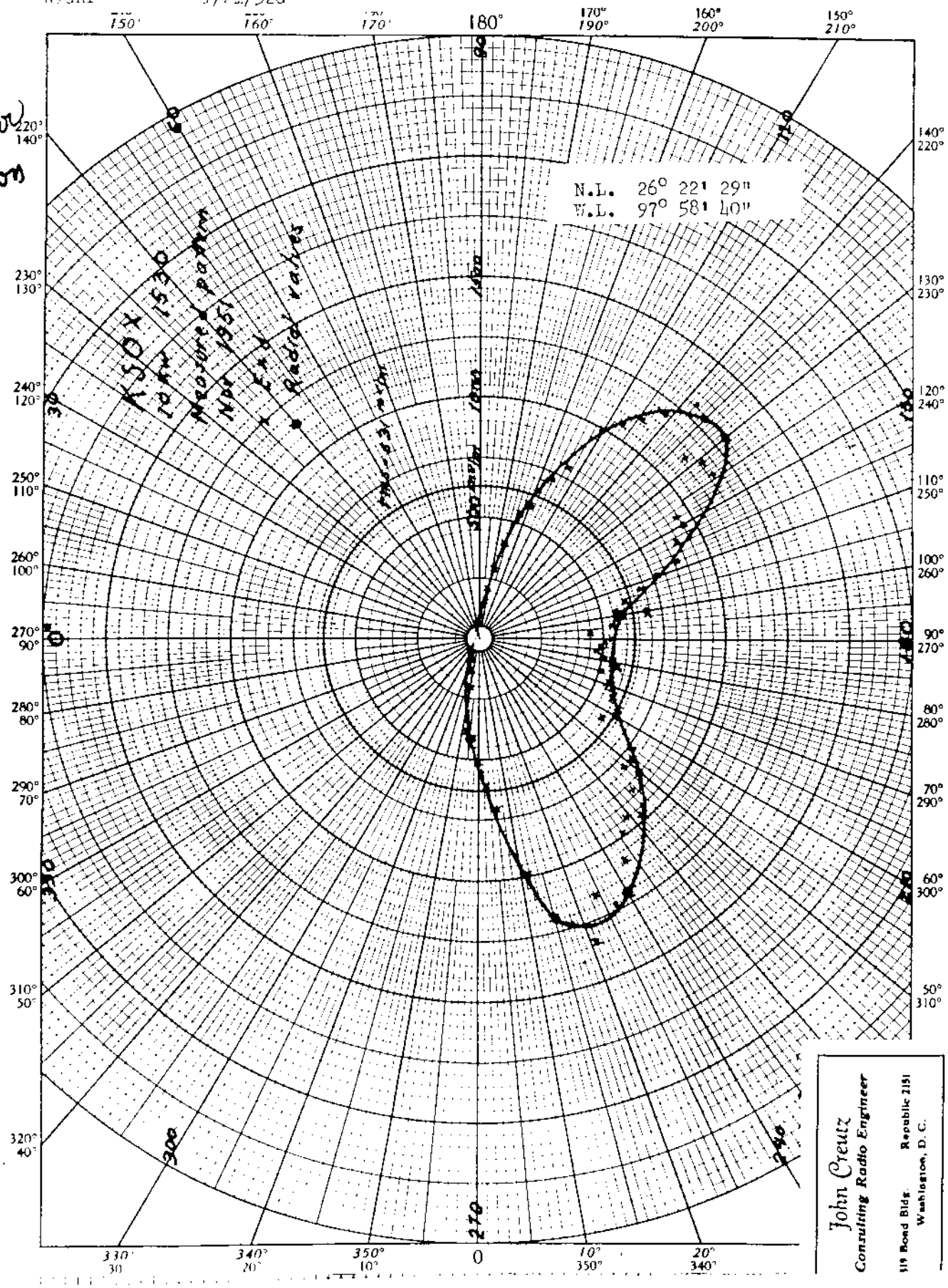
1530 KGB



JUN 1 1970

MEASURED KSOX, HARLINGEN, TEXAS 10KW, 50KW-LS, U, DA-N 1530 KC KGE
NIGHT 3/21/52G

2-21-61 granted for new station



John Creutz
Consulting Radio Engineer
119 Bond Bldg. Republic 2151
Washington, D. C.

APPL RECD 11/21/51 ACC 1/18/52 BL-4649 KSOX, HARLINGEN, TEXAS 1530 KC

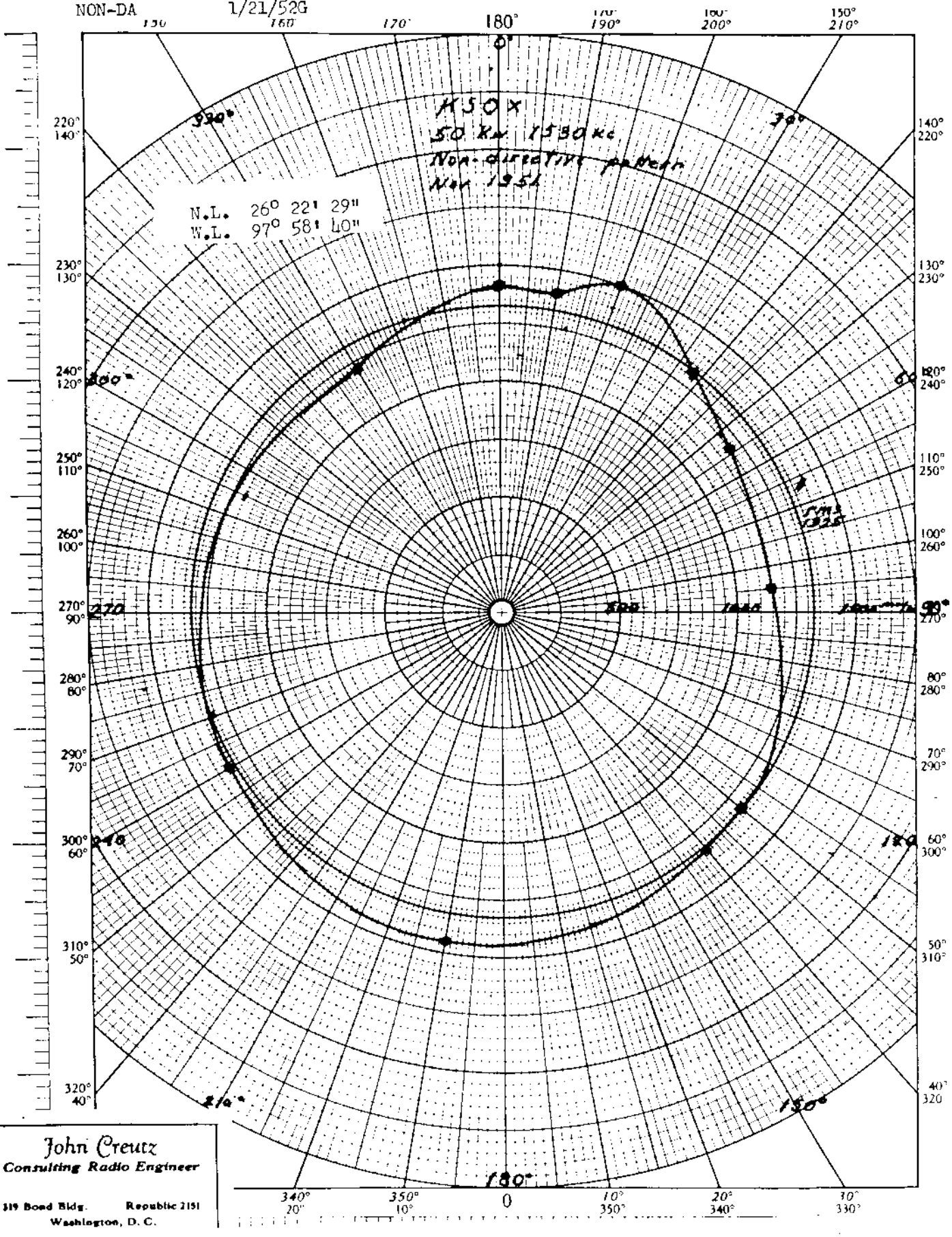
KGBT

MEASURED
NON-DA

KSOX, HARLINGEN, TEXAS
1/21/52G

10 KW, 50KW-LS, U, DA-N

1530 KC



John Creutz
Consulting Radio Engineer
319 Bond Bldg. Republic 2151
Washington, D. C.

APPL RECD 11/21/51 ACC 1/18/52 BL-4649

KSOX, HARLINGEN, TEXAS

1530 KC

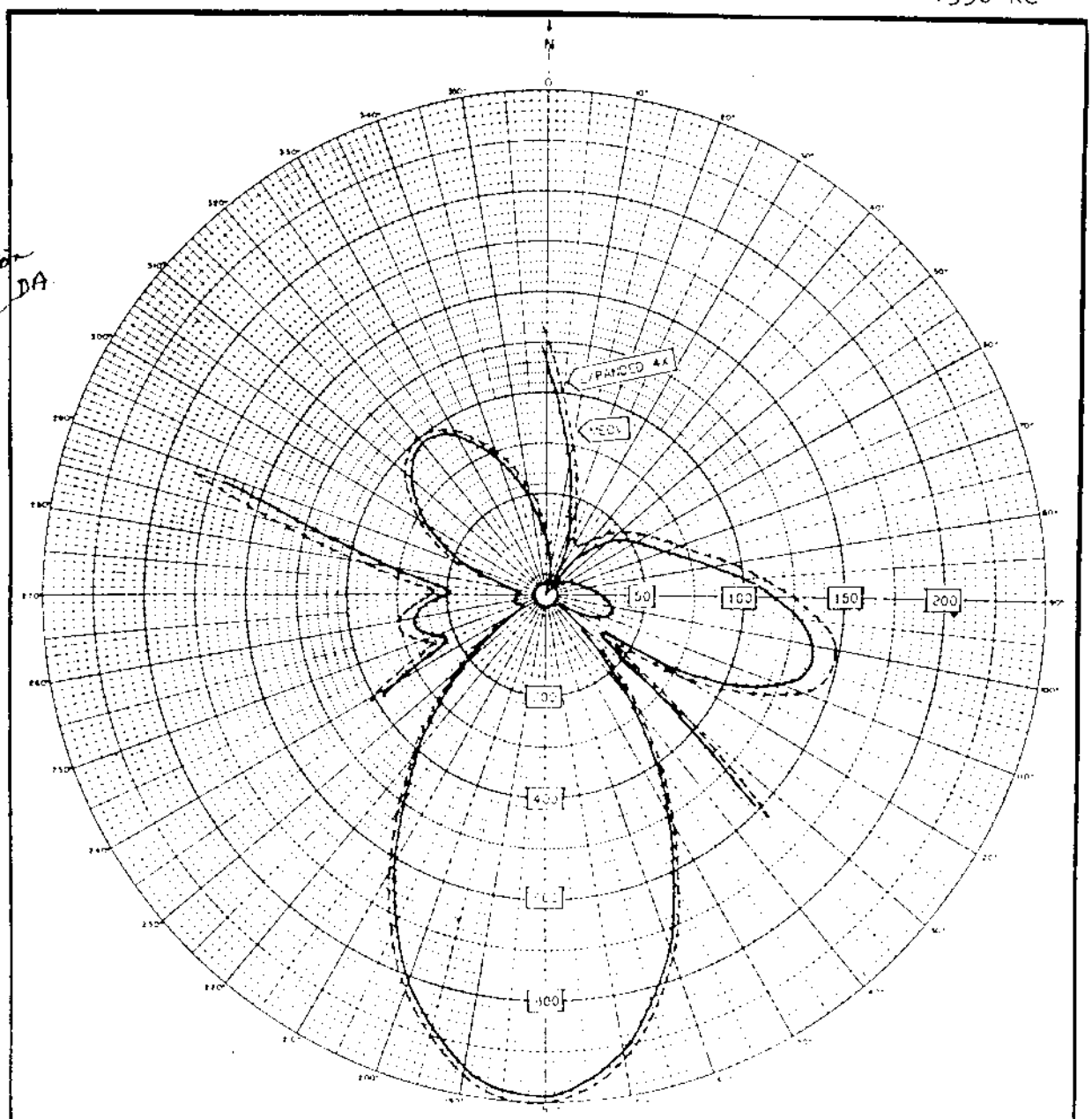
KNBE

Proposed Day
(12-30-63ct)-

Station KNBE
Lincoln, Nebraska

5kw,DA-D,D
1530 kc

1-16-64
Granted
mod of CP
to change
antenna -
trans location
- to change DA



E_{RMS} = 395 mv/m (BY ADJUSTMENT)

AMENDMENT TO BP-15053
KIPERS: DES PATTERN NO. E1061e

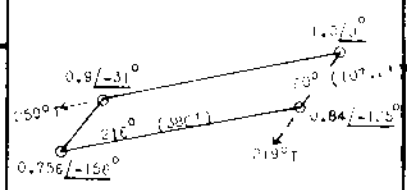
LATITUDE 40° 42' 36"

LONGITUDE 96° 35' 47"

CHARLES E. BRENNAN
CONSULTING RADIO ENGINEERS
MILWAUKEE, WISCONSIN

ANTENNA PARAMETERS

ALL θ'S = 111.7°



KS1084 FIGURE 7
HORIZONTAL RADIATION PATTERN
RADIO STATION KNBE
LANCASTER COUNTY BROADCASTING COMPANY
LINCOLN, NEBRASKA

1530 KC 5000 DA-D

FCC File No.BMP-11102
Accepted 12-6-63

Station KNBE
Lincoln, Nebraska

1530 kc

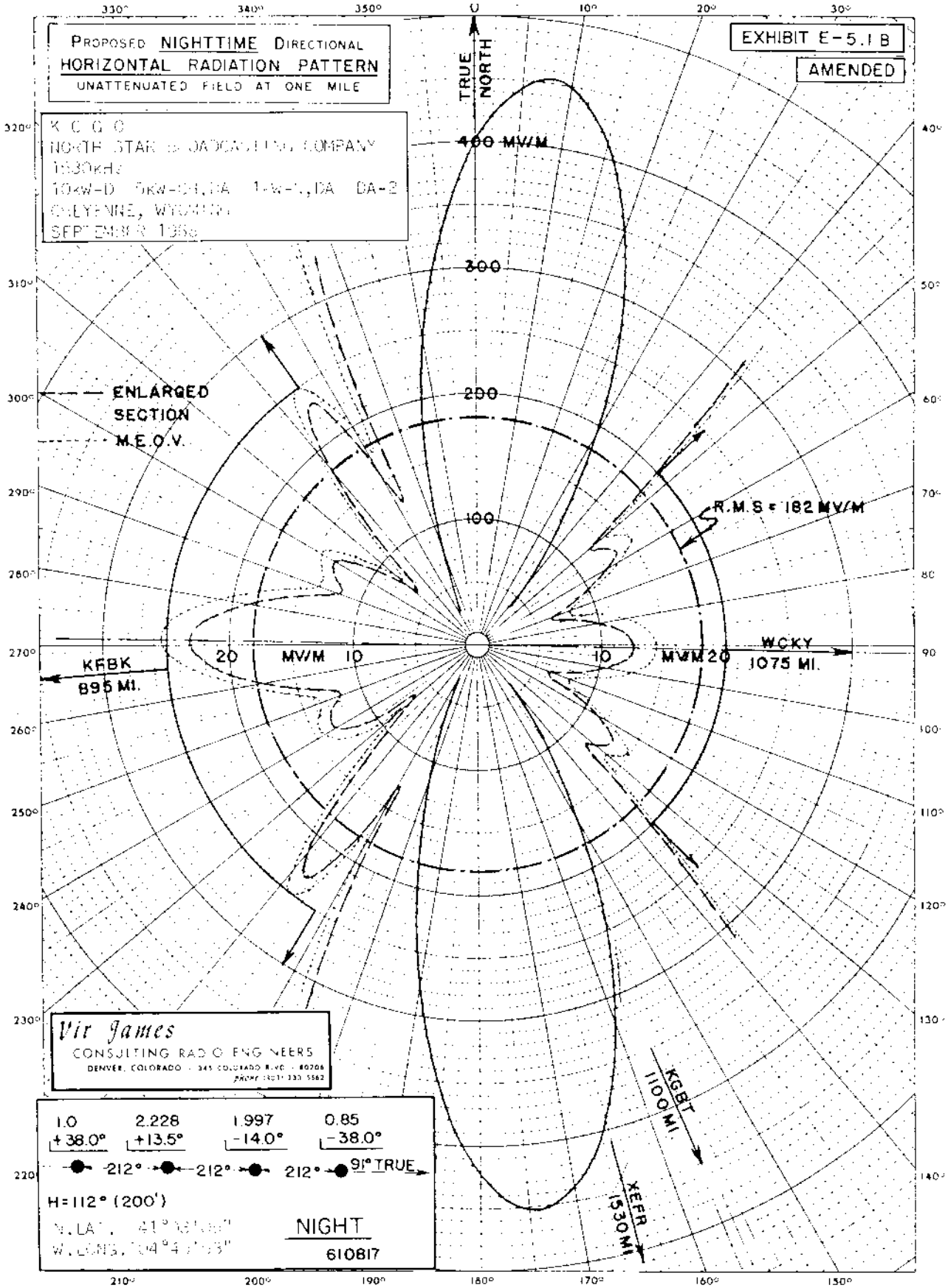
(SEE REVERSE SIDE)

KNIE

Proposed Night
(2-28-69ct)

Station KCGO
Cheyenne, Wyoming

1kw,10kw(5kw-CH)LS,DA-N-CH,U
1530 kc



FCC File No.BMP-12651
Accepted 2-12-69

Station KCGO
Cheyenne, Wyoming

1530 kc

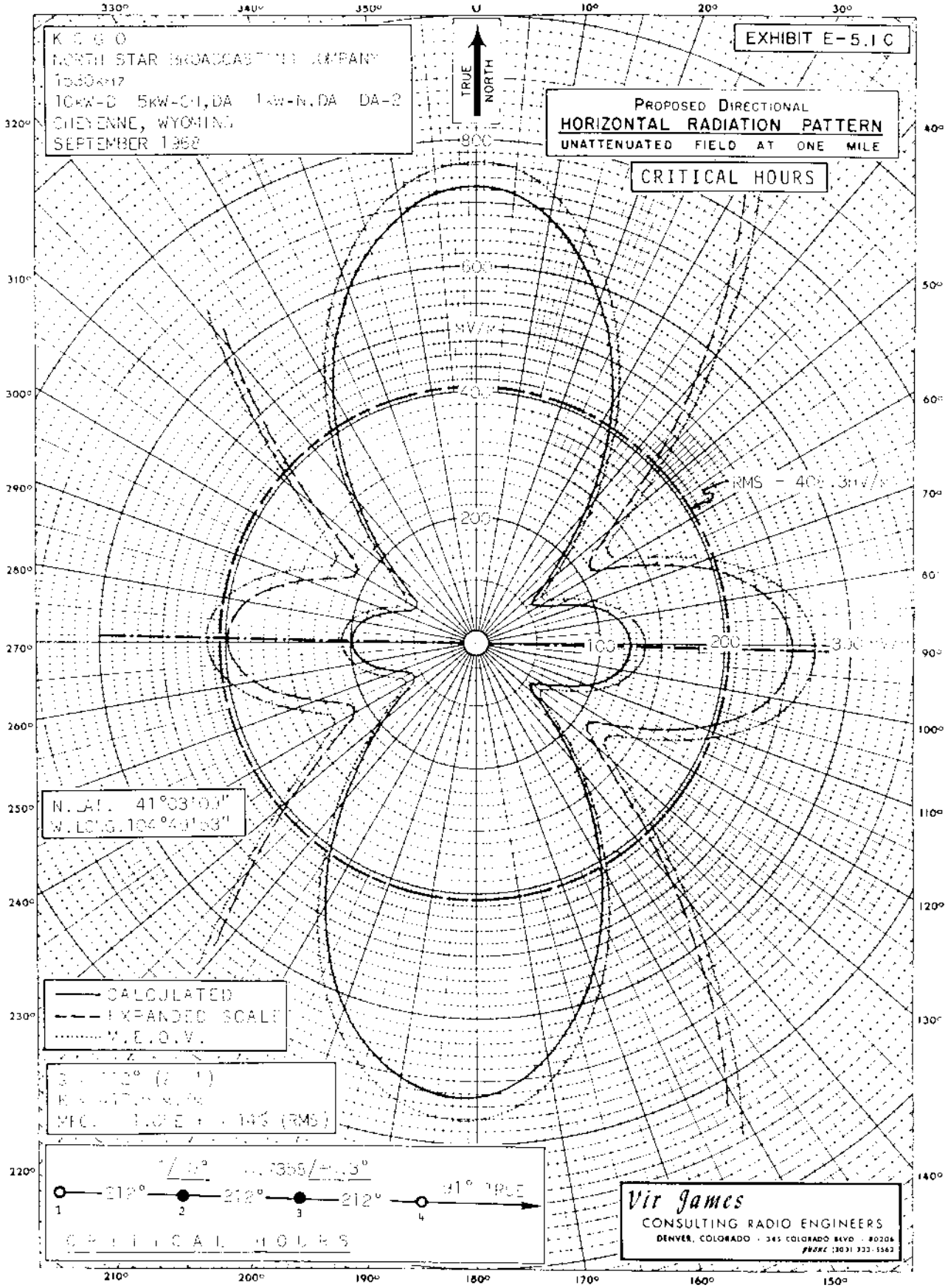
SEE REVERSE SIDE

KNIE

Proposed Day CH
(2-28-69ct)

Station KCGO
Cheyenne, Wyoming

1kw,10kw(5kw-CH)LS,DA-N-CH,U
1530 kc



FCC File No.BMP-12651
Accepted 2-12-69

Station KCGO
Cheyenne, Wyoming

1530 kc

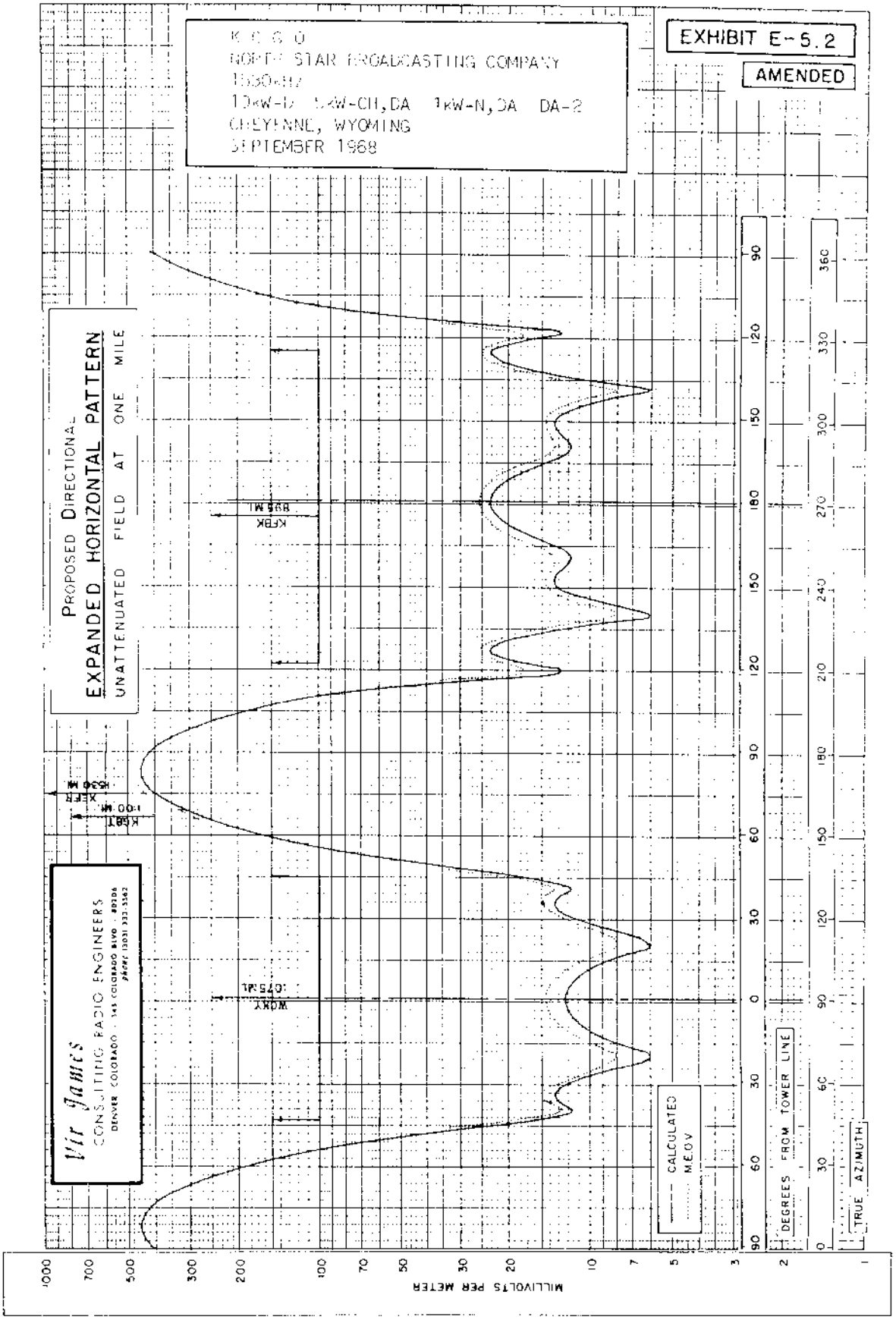
(SEE REVERSE)

KNIE

Proposed Night Nulls
(2-28-69ct)

Station KCGO
Cheyenne, Wyoming

1kw,10kw(5kw-CH)LS,DA-N-CH,U
1530 kc



FCC File No.BMP-12651
Accepted 2-12-69

Station KCGO
Cheyenne, Wyoming

1530 kc

KNIE

EXHIBIT E-8.04A

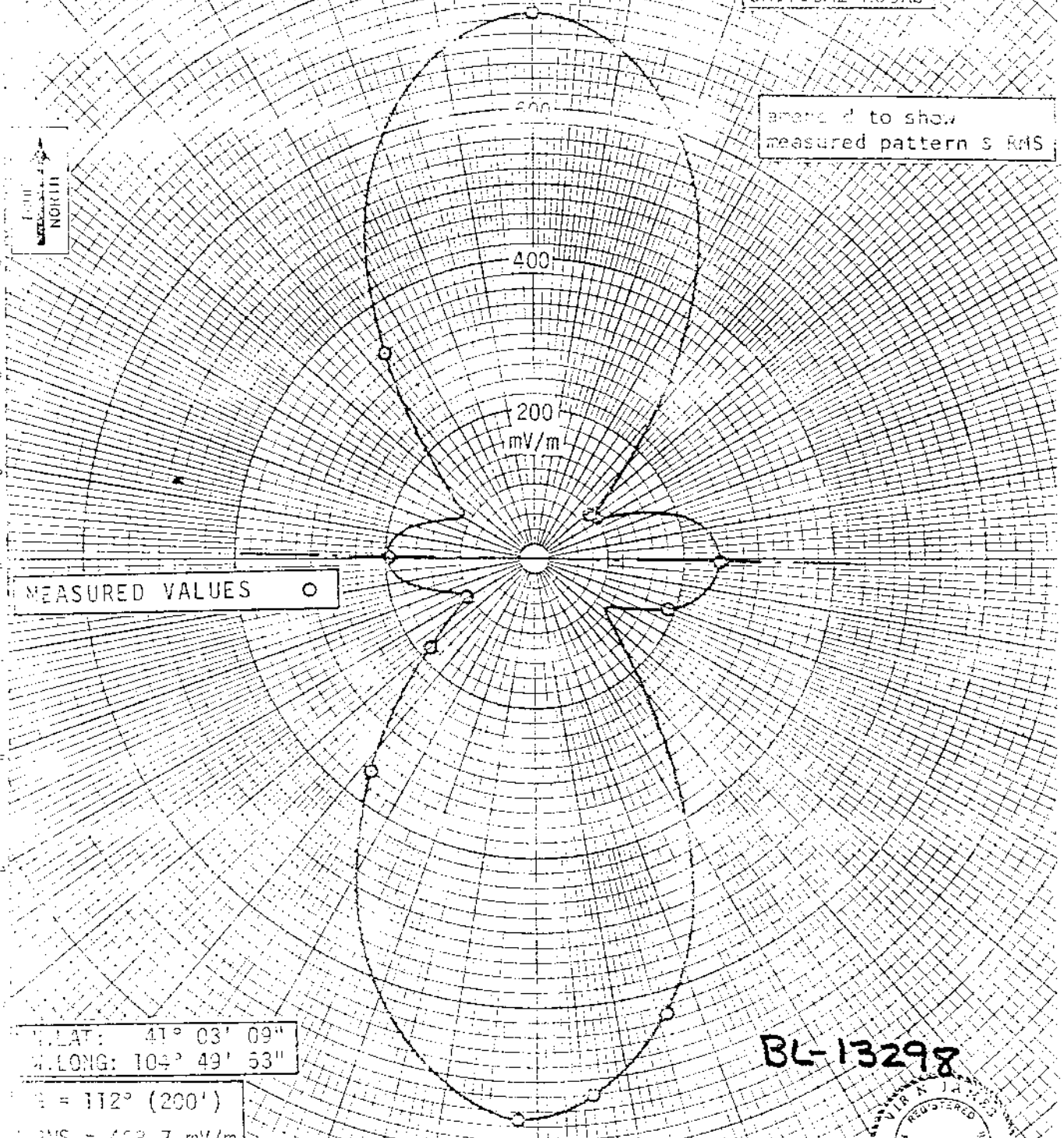
AMENDED

C H Y
NORTHERN STATES BROADCASTING
1530 kHz /CORPORATION
10kW-D 5kW-CH,DA 1kW-N,DA DA-2
CHEYENNE, WYOMING
MARCH 1973

MEASURED DIRECTIONAL
HORIZONTAL RADIATION PATTERN
UNATTENUATED FIELD AT ONE MILE

CRITICAL HOURS

amended to show
measured pattern's RMS



MEASURED VALUES ○

N.LAT: 41° 03' 09"
N.LONG: 104° 49' 53"

θ = 112° (200')
RMS = 403.7 mV/m

THEO: 1/ 0° 0.7358/+5.3°

○—212°—●2—212°—●3—212°—○4 91° TRUE

MEAS: 1/ 0° .896/+7.0°

BL-13298

VIR N. JAMES
REGISTERED PROFESSIONAL ENGINEER
2677
STATE OF COLORADO

VIR JAMES
CONSULTING RADIO ENGINEERS
145 COLORADO BLVD · DENVER, CO · 80206
PHONE (303) 321-5081

KNIE

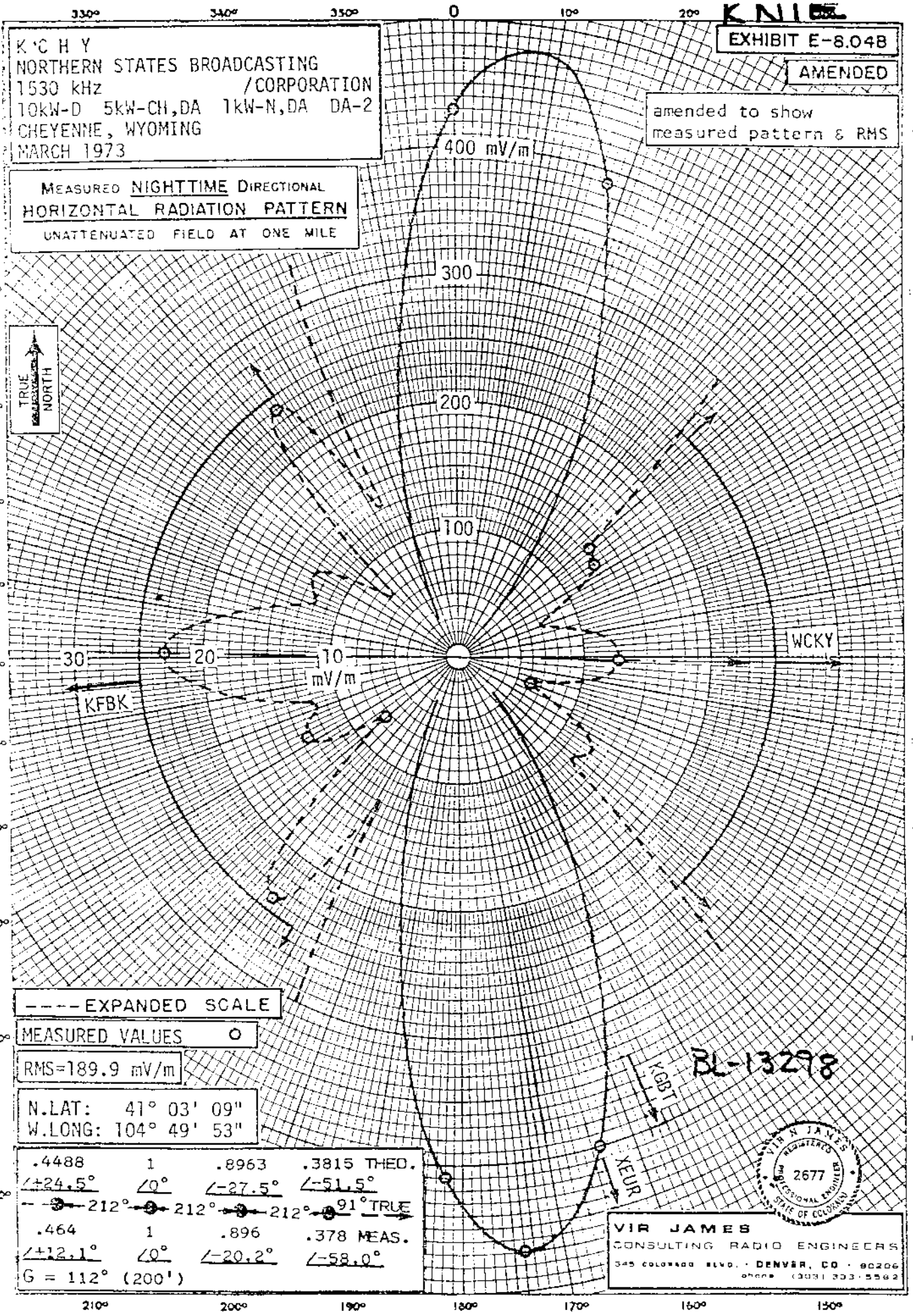
EXHIBIT E-8.048

AMENDED

amended to show measured pattern & RMS

K C H Y
NORTHERN STATES BROADCASTING /CORPORATION
1530 kHz
10kW-D 5kW-CH,DA 1kW-N,DA DA-2
CHEYENNE, WYOMING
MARCH 1973

MEASURED NIGHTTIME DIRECTIONAL
HORIZONTAL RADIATION PATTERN
UNATTENUATED FIELD AT ONE MILE



----EXPANDED SCALE

MEASURED VALUES O

RMS=189.9 mV/m

N.LAT: 41° 03' 09"
W.LONG: 104° 49' 53"

.4488	1	.8963	.3815 THEO.
∠+24.5°	∠0°	∠-27.5°	∠-51.5°
212°	212°	212°	91° TRUE
.464	1	.896	.378 MEAS.
∠+12.1°	∠0°	∠-20.2°	∠-58.0°

G = 112° (200')

BL-13298

VIR N JAMES REGISTERED PROFESSIONAL ENGINEER 2677 STATE OF COLORADO

VIR JAMES
CONSULTING RADIO ENGINEERS
345 COLORADO BLVD. · DENVER, CO · 80206
PHONE (303) 333-5562

WCKY
1530 kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WCKY

Main Studio: Cincinnati, Ohio

Frequency: 1530

Power: 50kw Night 50kw Day

Notification List No. 1783

Date: November 2, 1979 Class: I-B

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 39° 04' 07"
West Longitude: 84° 36' 20"

ANTENNA CHARACTERISTICS

Authorized for Nighttime operation (DA-N)
Number of elements: 3
Type of elements: Series excited, uniform cross-section, guyed, shunt excited, self supporting, tapered, vertical steel towers.

TOWER:	E(#1)	W(#2)	N(#3)
HEIGHT ABOVE INSULATORS	345' (193°)	345' (193°)	350' (196°)
NIGHT PHASING:	0°	40°	145°
NIGHT FIELD RATIO:	1.8	1.0	0.7

SPACING AND ORIENTATION: The west tower (#2) is spaced 123.1° from the East tower (#1) on a line bearing 280° true. The North tower (#3) is spaced 85.2° on a line bearing 322° true.

GROUND SYSTEM: 120-300' equally spaced copper radials plus a 48' X 46' square ground screen under each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	RSS
Day	1781.9 mv/m	
Night	1600 mv/m	

Note: This notification concerns only a change in the Nighttime operation of the station with Daytime operation continued as previously notified.

WCKY
1530 kHz

NORTH LATITUDE: 39° 04' 07"
WEST LONGITUDE: 84° 36' 23"

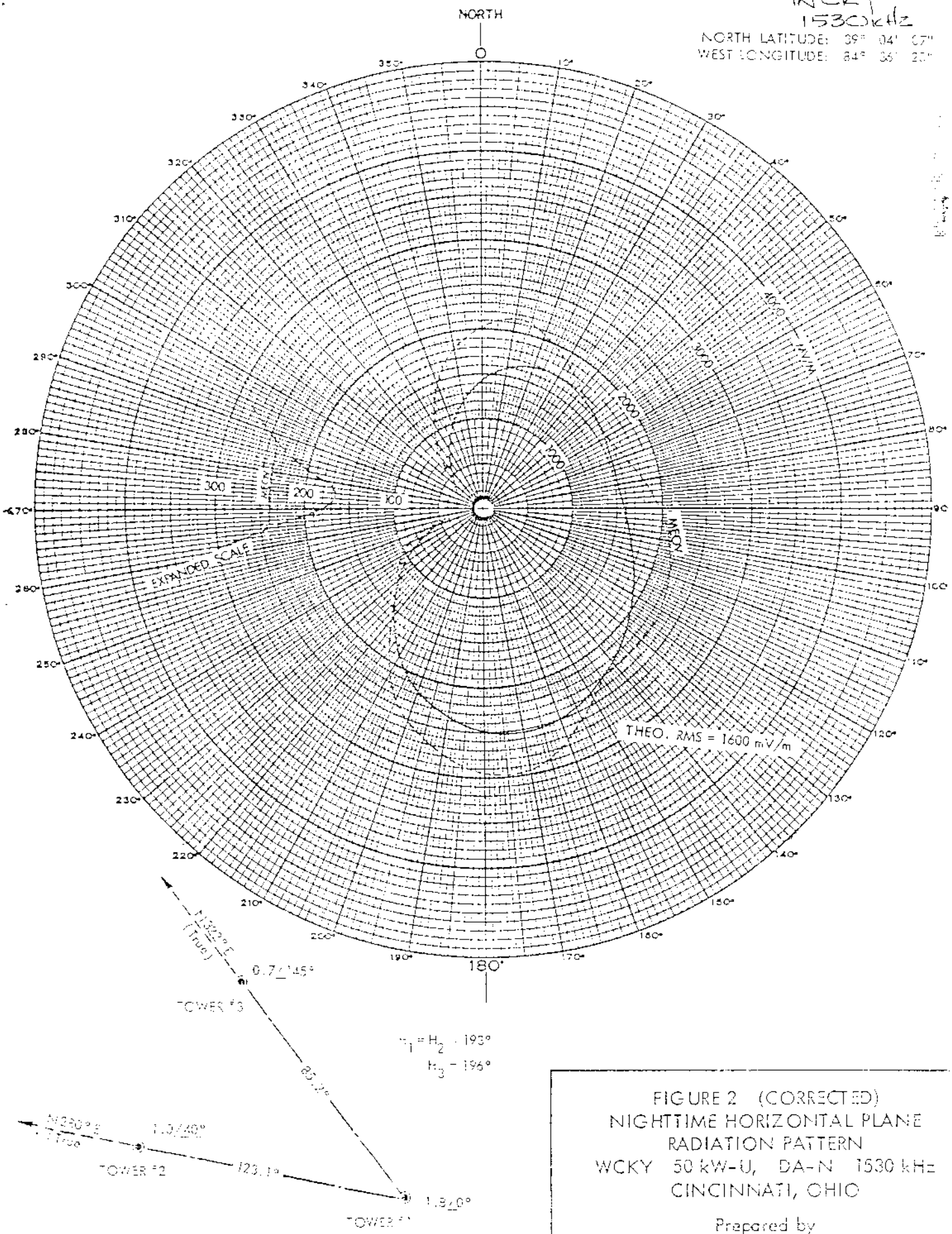
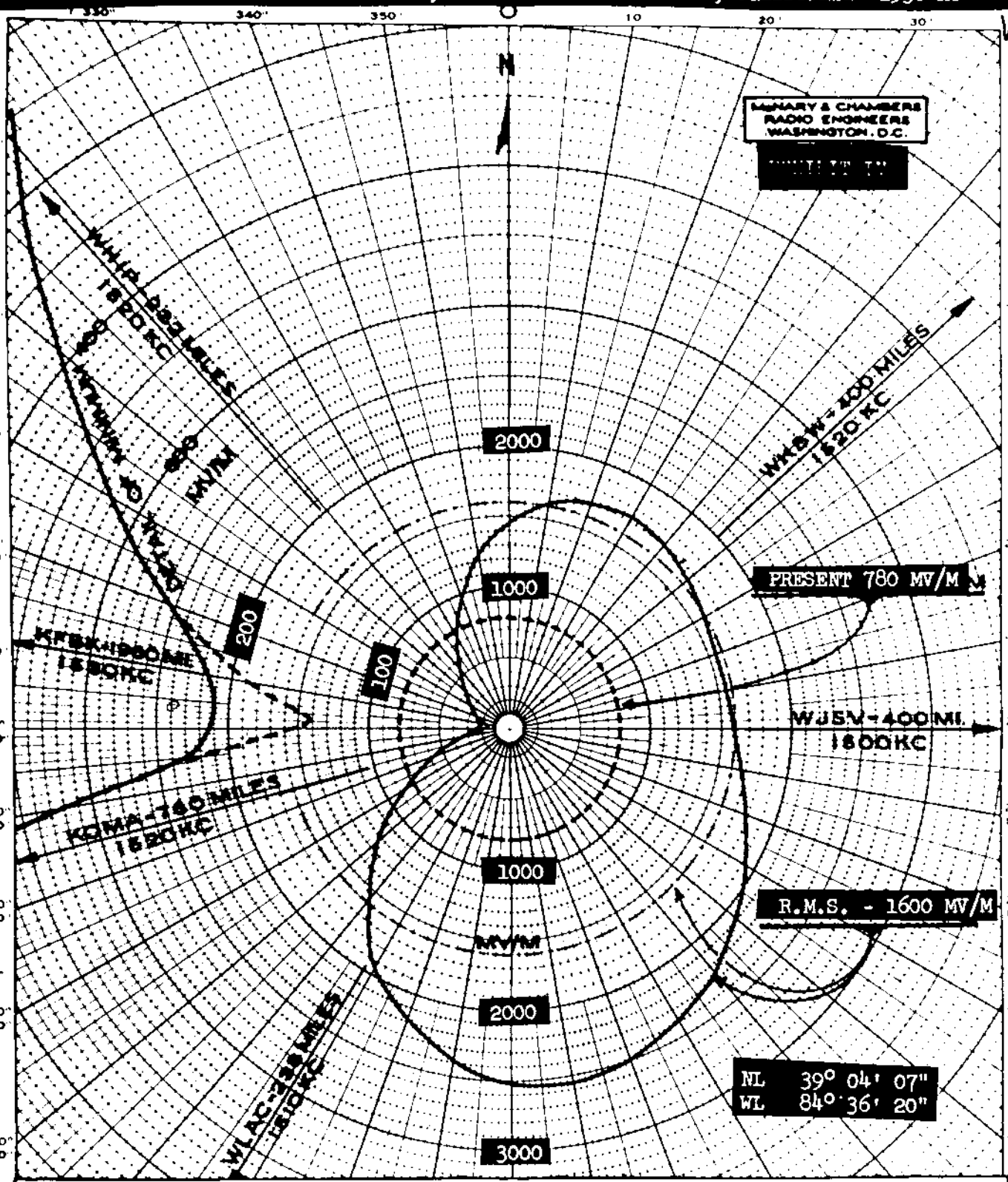


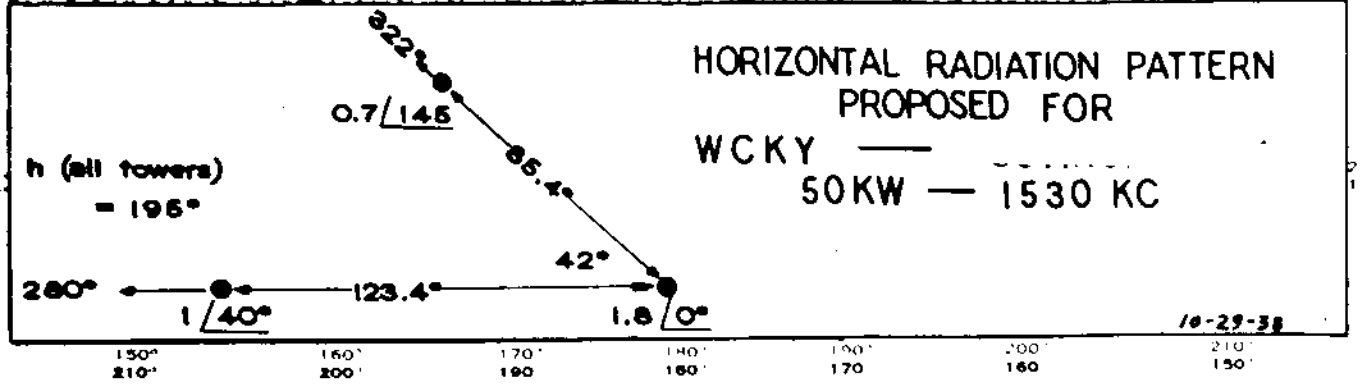
FIGURE 2 (CORRECTED)
NIGHTTIME HORIZONTAL PLANE
RADIATION PATTERN
WCKY 50 kW-U, DA-N 1530 kHz
CINCINNATI, OHIO

Prepared by
Lohnes and Culver Washington, D. C
July, 1978

PROPOSED DAY Station WCKY Cincinatti, Ohio 50kw, DA after LS at Sacramento, California 1530 KC

WCK



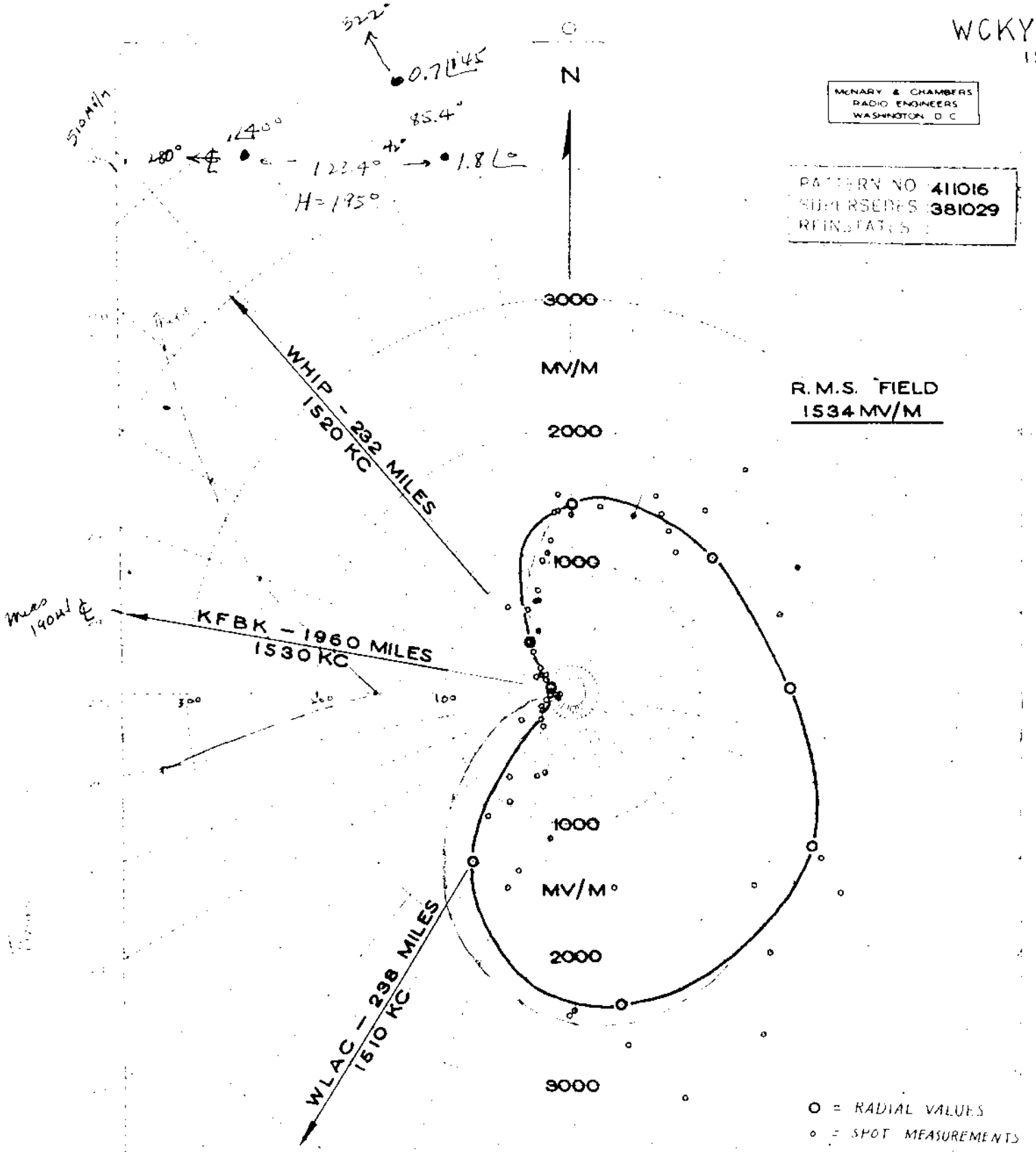


HORIZONTAL RADIATION PATTERN
PROPOSED FOR
WCKY
50KW — 1530 KC

WCKY

McNARY & CHAMBERS
RADIO ENGINEERS
WASHINGTON, D.C.

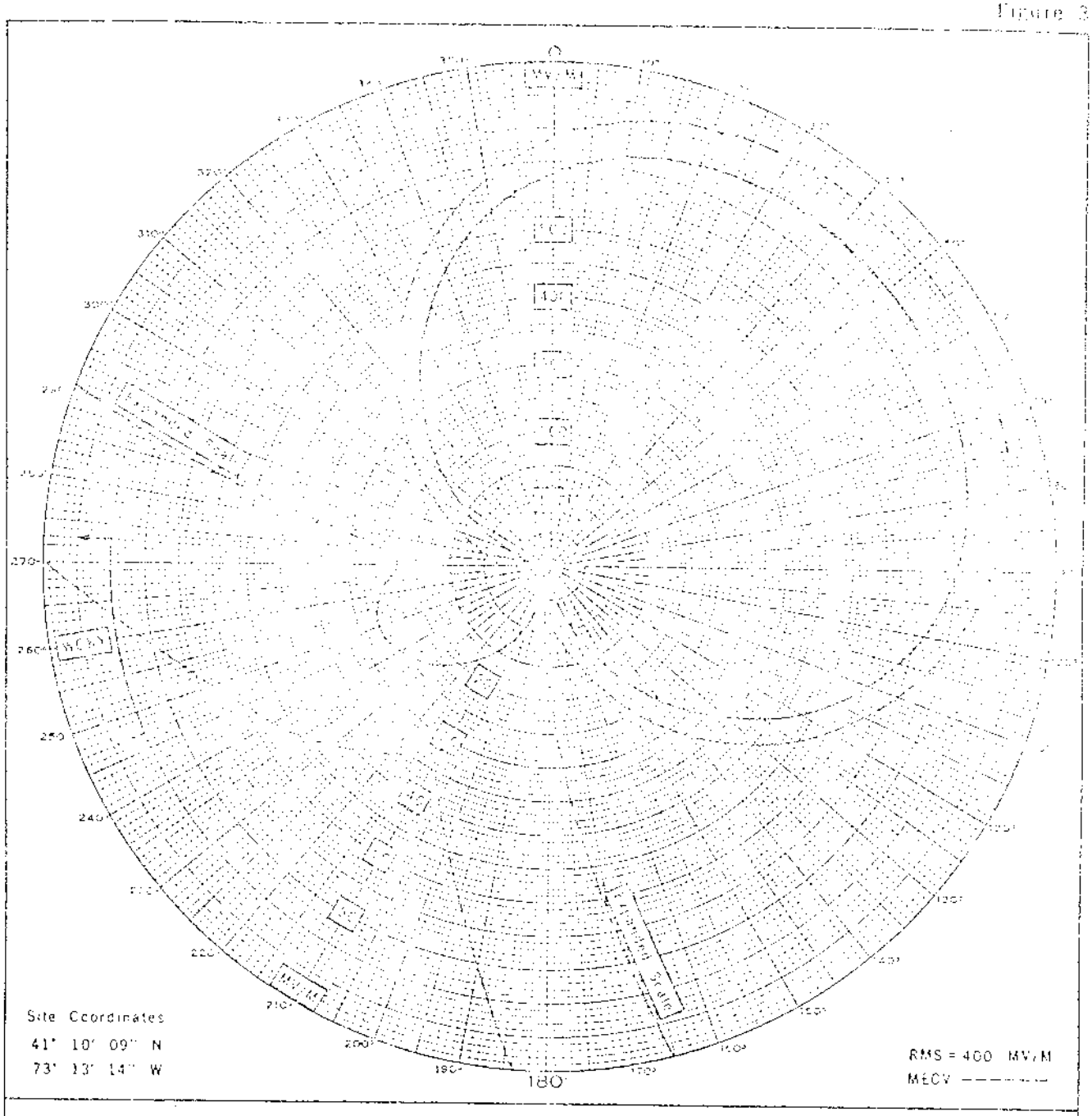
PATTERN NO. 411016
SUPERSEDES 381029
REINSTATES



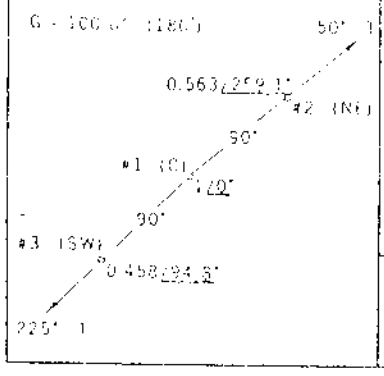
MEASURED HORIZONTAL PLANE PATTERN
WCKY — CINCINNATI, OHIO
1530 KC — 50 KW

WDJZ
1530 kHz

Figure 3



PROPOSED HORIZONTAL PLANE RADIATION PATTERN



RADIO STATION WDJZ

BRIDGEPORT, CONNECTICUT

Jules Cohen & Associates

Consulting Electronics Engineers

PROPOSED OPERATION

1530 KHZ

5 KW D DA

Pattern 770c04

WDJZ
1530kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: W D J Z

Main Studio: Bridgeport, Connecticut

Frequency: 1530 kHz

Power: 5 kW Day

Notification List No. 1784

Date: November 9, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:
North Latitude: 41° 10' 09"
West Longitude: 73° 13' 14"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 3
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	S W(#3)	C (#1)	NE(#2)
HEIGHT ABOVE INSULATORS:	180'	180'	180' (100.3°)
DAY PHASING.	94.8°	0.0°	259.1°
DAY FIELD RATIO:	0.458	1.000	0.565

SPACING AND ORIENTATION: The NE tower (2) is spaced 161;(90°) on a line bearing 50° true from the center tower (1); SW tower (3) is spaced 161(90°) on a line bearing 225° from the center tower.

GROUND SYSTEM: 120-160' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to transverse straps along interconnections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS
Day	400 mV/m

Note: This notification concerns only a reduction in the Daytime power and RMS.

WDJZ

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WDJZ

Main Studio: Bridgeport, Connecticut

Frequency: 1530 kHz

Power: 10 kW

Notification List No. 1729

Date: April 13, 1977

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 41° 10' 09"
West Longitude: 73° 13' 14"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 3
Type of elements: Series-excited, Self-supporting, tapered, vertical steel towers.

TOWER:	SW(#3)	C(#1)	NE(#2)
HEIGHT ABOVE INSULATORS:	180'	180'	180' (100.8°)
PHASING:	+94.8°	0°	+259.1°
FIELD RATIO:	0.458	1.0°	0.563

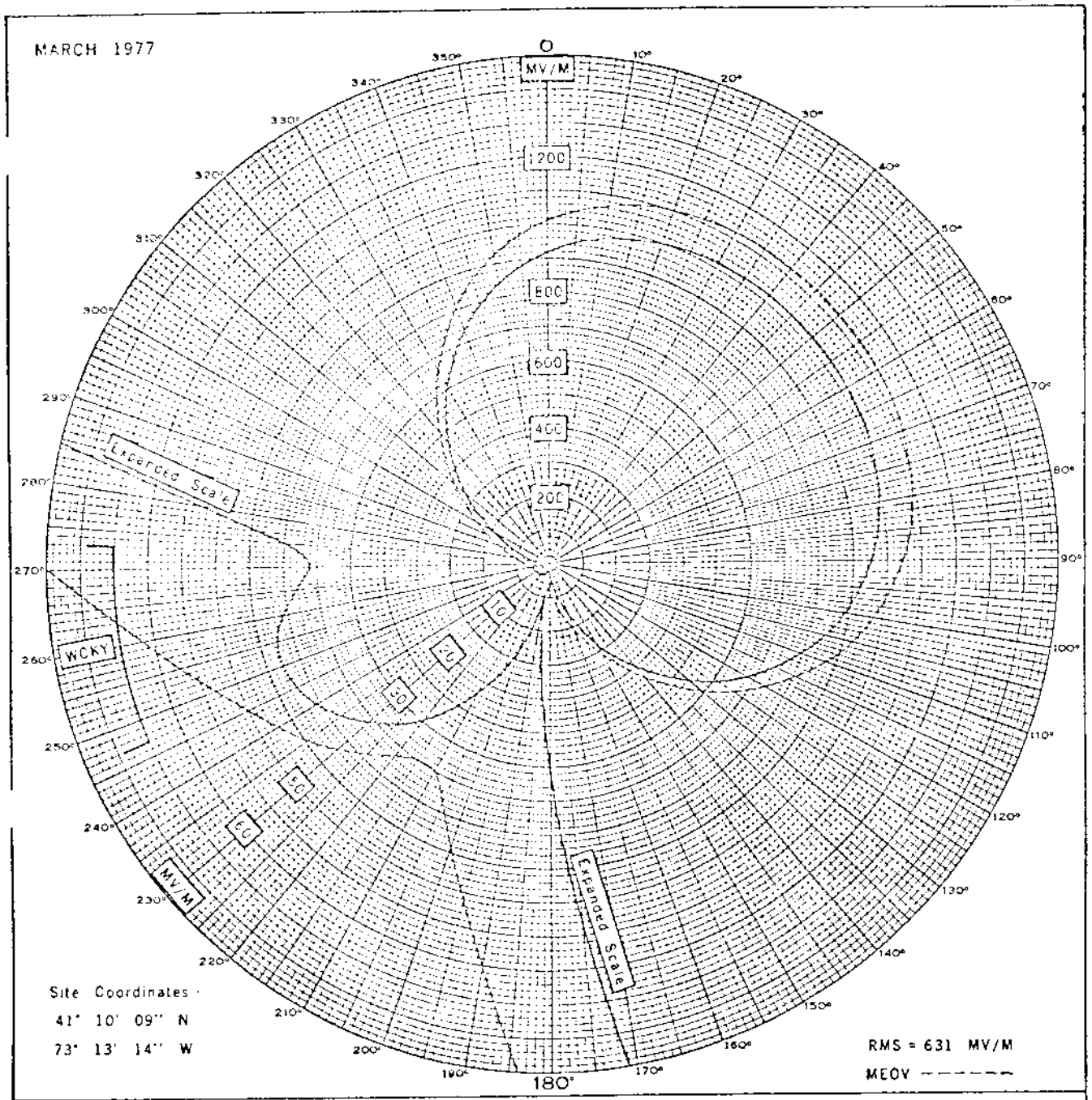
SPACING AND ORIENTATION: From the center reference tower #1; tower #2 is spaced 161' (90°) on a line bearing 50° true, and tower #3 is spaced 161' (90°) on a line bearing 225° true.

GROUND SYSTEM: 120-160' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of systems are bonded together.

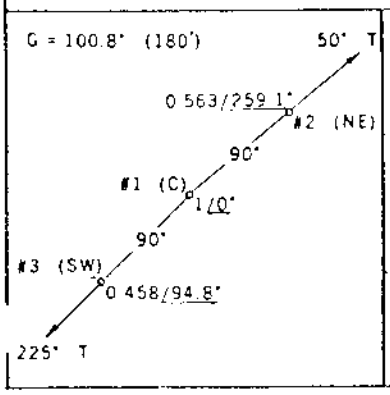
Predicted effective Field: 631 mv/m at rated power.

Note: This notification concerns changes in transmitter location and directional antenna system and radiation pattern.

Figure 1 WDJZ



PROPOSED HORIZONTAL PLANE RADIATION PATTERN



RADIO STATION WDJZ

BRIDGEPORT, CONNECTICUT

Jules Cohen & Associates

Consulting Electronics Engineers

PROPOSED OPERATION

1530 KHZ

10 KW D DA

Pattern 730306A

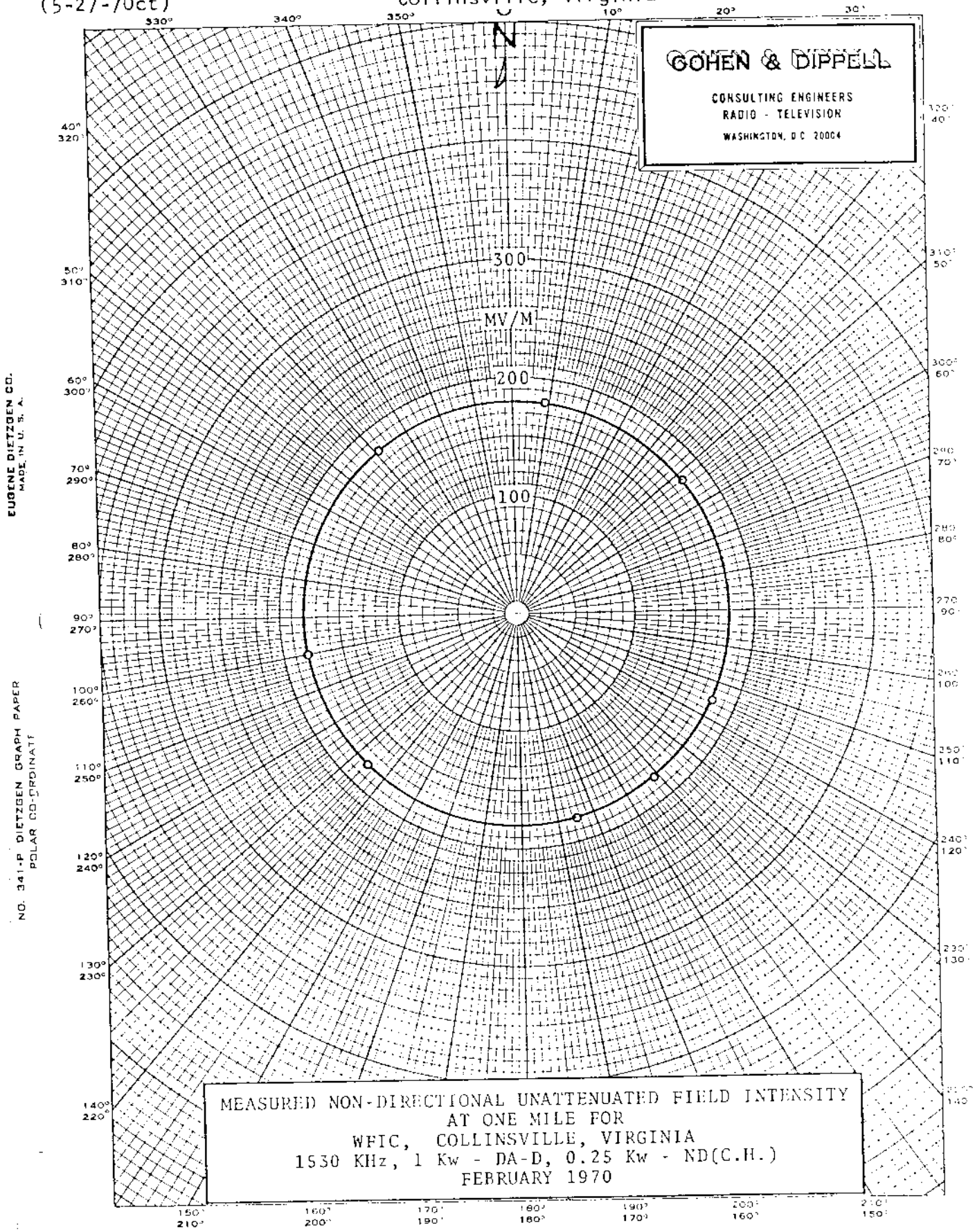
SEE REVERSE SIDE 6/24/70

WFIC

Measured Non-DA
(5-27-70ct)

Station WFIC
Collinsville, Virginia

1kw,DA-D/250w-ND (CH),D
1530 kc



FCC File No.BL-12613
Accepted

Station WFIC
Collinsville, Virginia

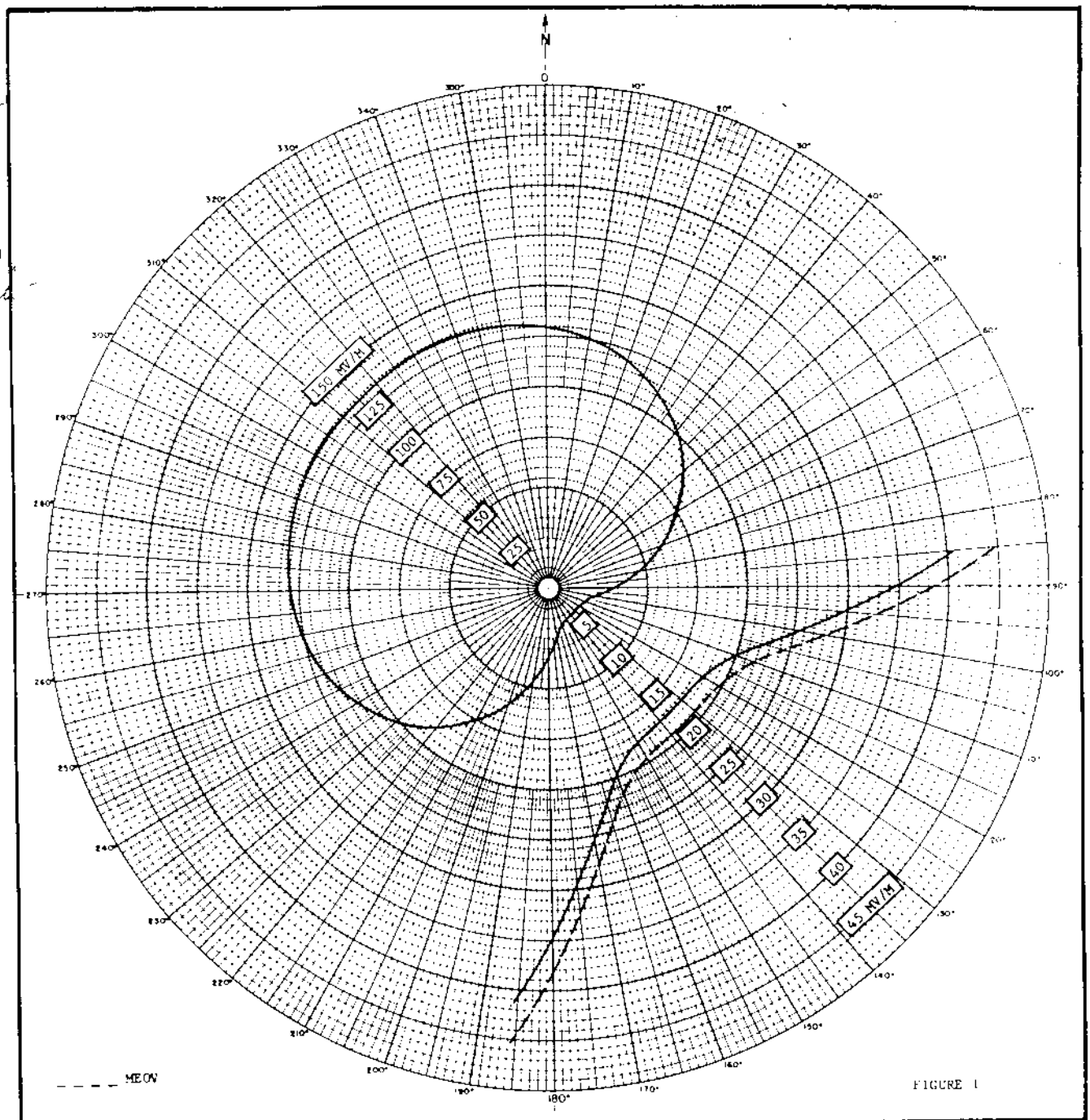
1530 kc

Proposed Day
(9-28-67ct)

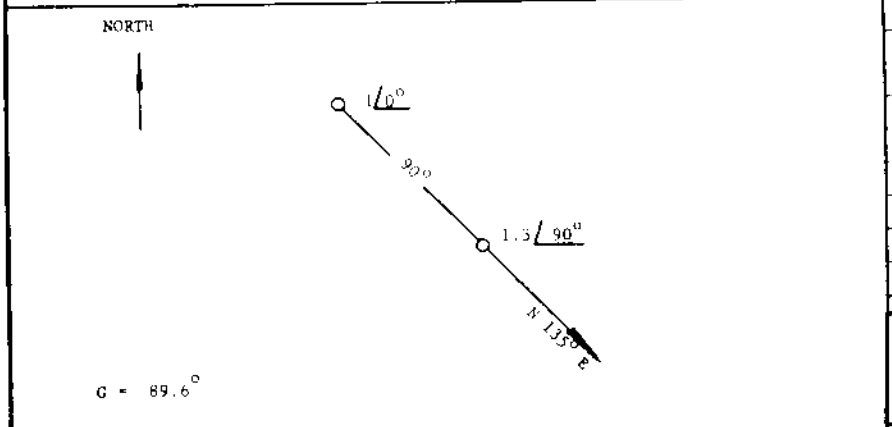
New; Du Page County Bcstg., Inc.
Elmhurst, Illinois

WKDC
250w,DA-D,D
1530 kc

BP-16292
Granted
12/5/69
Appl
for new
FM station
at
Elmhurst



HORIZONTAL RADIATION PATTERN



APPLICANT	Du Page County Broadcasting, Inc.
LOCATION	Elmhurst, Illinois
FREQUENCY	1530 KC/S
POWER	.25 KW
LATITUDE	41° DEG 51' MIN 50' SEC
LONGITUDE	87° DEG 56' MIN 49' SEC
WHEN USED	Daytime
RMS FIELD	95 MV/M
DATE	August 1967

WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON, D. C.

FCC File No.BP-16292
Accepted 9-15-67 Amended

New; Du Page County Bcstg., Inc.
Elmhurst, Illinois

1530 kc

A. D. RING & ASSOCIATES - 5/67 - 500

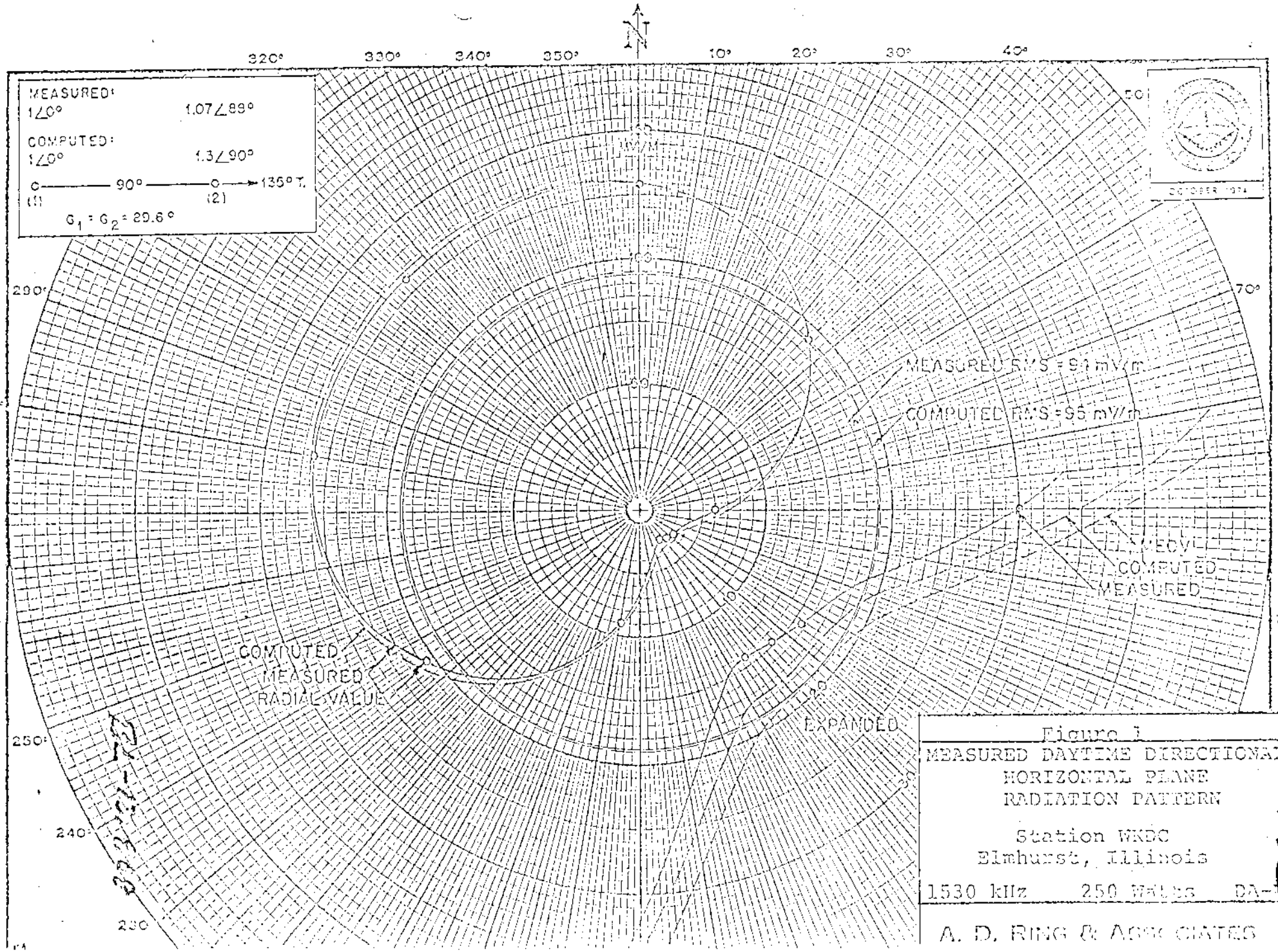


Figure 1

MEASURED DAYTIME DIRECTIONAL HORIZONTAL PLANE RADIATION PATTERN

Station WKDC
Elmhurst, Illinois

1530 kHz 250 Watts DA-

A. D. RING & ASSOCIATES

WPNO

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WPNO

Main Studio: Auburn, Maine

Frequency: 1530 kHz

Power: 10 kW

Notification List No. 1609

Date: December 4, 1974

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 44° 04' 39"
West Longitude: 70° 16' 54"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D) STANDARD PATTERN
Number of elements: 2
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	W(#2)	E(#1)
HEIGHT ABOVE INSULATORS:	214.4'	214.4' (120°)
PHASING:	+53.14°	0°
FIELD RATIO:	0.67	1.00

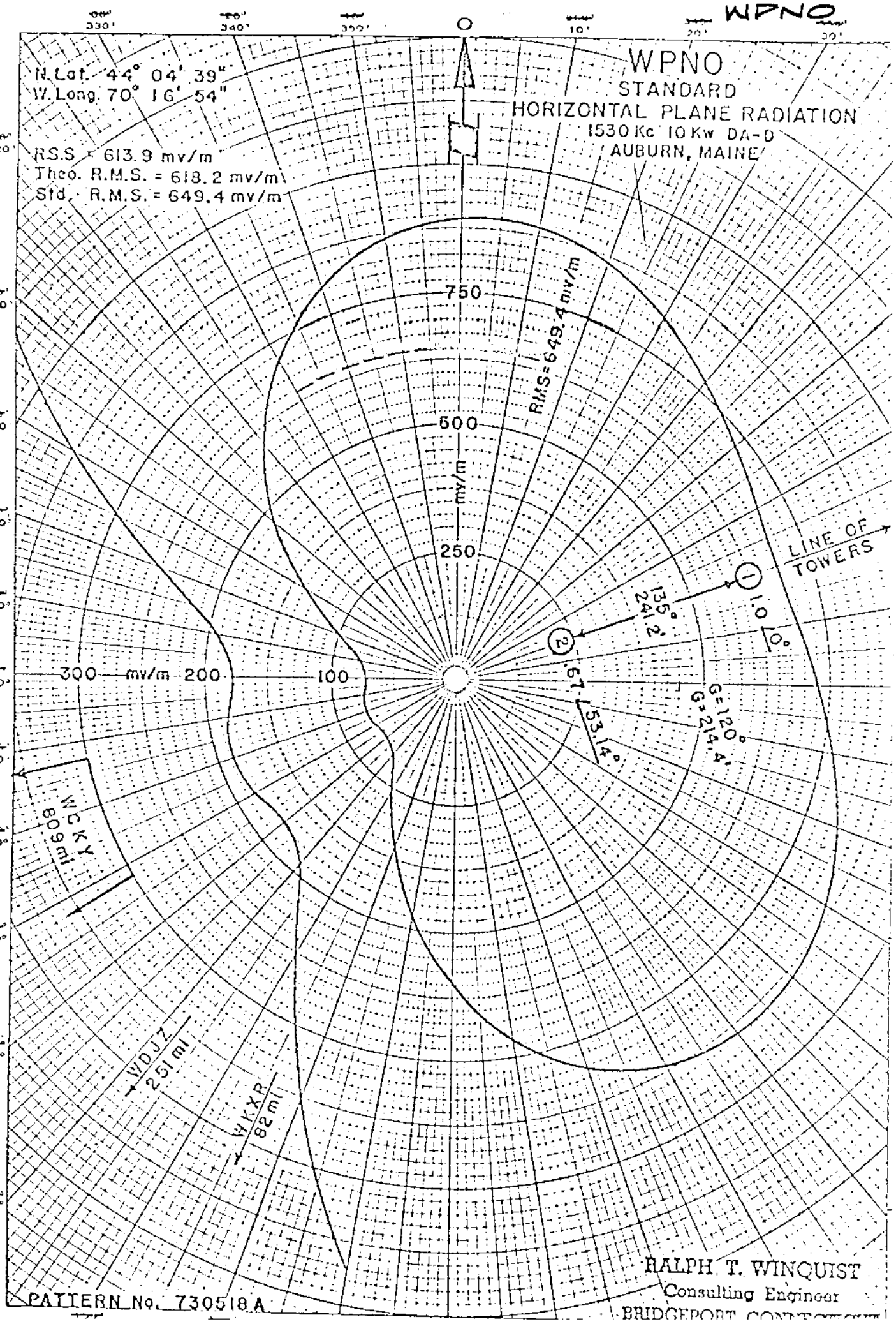
SPACING AND ORIENTATION: Elements are spaced 241.2' (135°) on a line bearing 70° true.

GROUND SYSTEM: 120-160' equally spaced copper radials plus 120-50' inter-spaced radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers. Centers of systems are bonded together.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL		STANDARD
RMS	RSS	RMS
618.2 mv/m	613.9 mv/m	649.4 mv/m

WPNO


WPNO
STANDARD
HORIZONTAL PLANE RADIATION
1530 Kc 10 Kw DA-D
AUBURN, MAINE
N. Lat. 44° 04' 39"
W. Long. 70° 16' 54"
R.S.S. = 613.9 mv/m
Theo. R.M.S. = 618.2 mv/m
Std. R.M.S. = 649.4 mv/m
RMS=649.4 mv/m
750
500
250
mv/m
300 mv/m 200
100
LINE OF TOWERS
1
1.0 ∠0°
135°
241.2'
2
.67 ∠53.14°
G=120°
G=214.4'
WCKY
80.9 mi
WDJZ
251 mi
WKXR
82 mi
PATTERN No. 730518A
RALPH T. WINQUIST
Consulting Engineer
BRIDGEPORT, CONNECTICUT
EUGENE DIETZGEN CO.
MADE IN U.S.A.
NO. 340-P DIETZGEN GRAPH PAPER
POLAR CO-ORDINATE

FLORA, ILLINOIS WQLW

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: (new) Main Studio: Flora, Illinois

Frequency: 1530 kHz Power: 1kw

Notification List No. 1423 Date: May 5, 1971 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM: North Latitude: 38° 41' 37"
West Longitude: 88° 28' 52"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 4
Type of elements: Series-excited, uniform cross-section, guyed vertical steel towers.

TOWER:	SW(#1)	NW(#2)	NE(#3)	SE(#4)	
HEIGHT ABOVE INSULATORS:	160'	160'	160'	160'	(90°)
PHASING:	0°	+149°	+249°	+100°	
FIELD RATIO:	1.0	1.4	1.4	1.0	

SPACING AND ORIENTATION: The towers are located at the vertices of a parallelogram the sides of which are 160' (90°) in length, on lines bearing 12° true and 82° true.

GROUND SYSTEM: 120 - 80' to 160' equally spaced copper radials plus 120 - 50 interspaced radials about each tower. Centers of systems are bonded together.

Predicted effective Field: 190 mv/m at rated power.

WQLW

Proposed Day
(4-29-69ct)

New; The Virginia Broadcasting Corp.
Flora, Illinois

1kw,DA-D,D
1530 kc

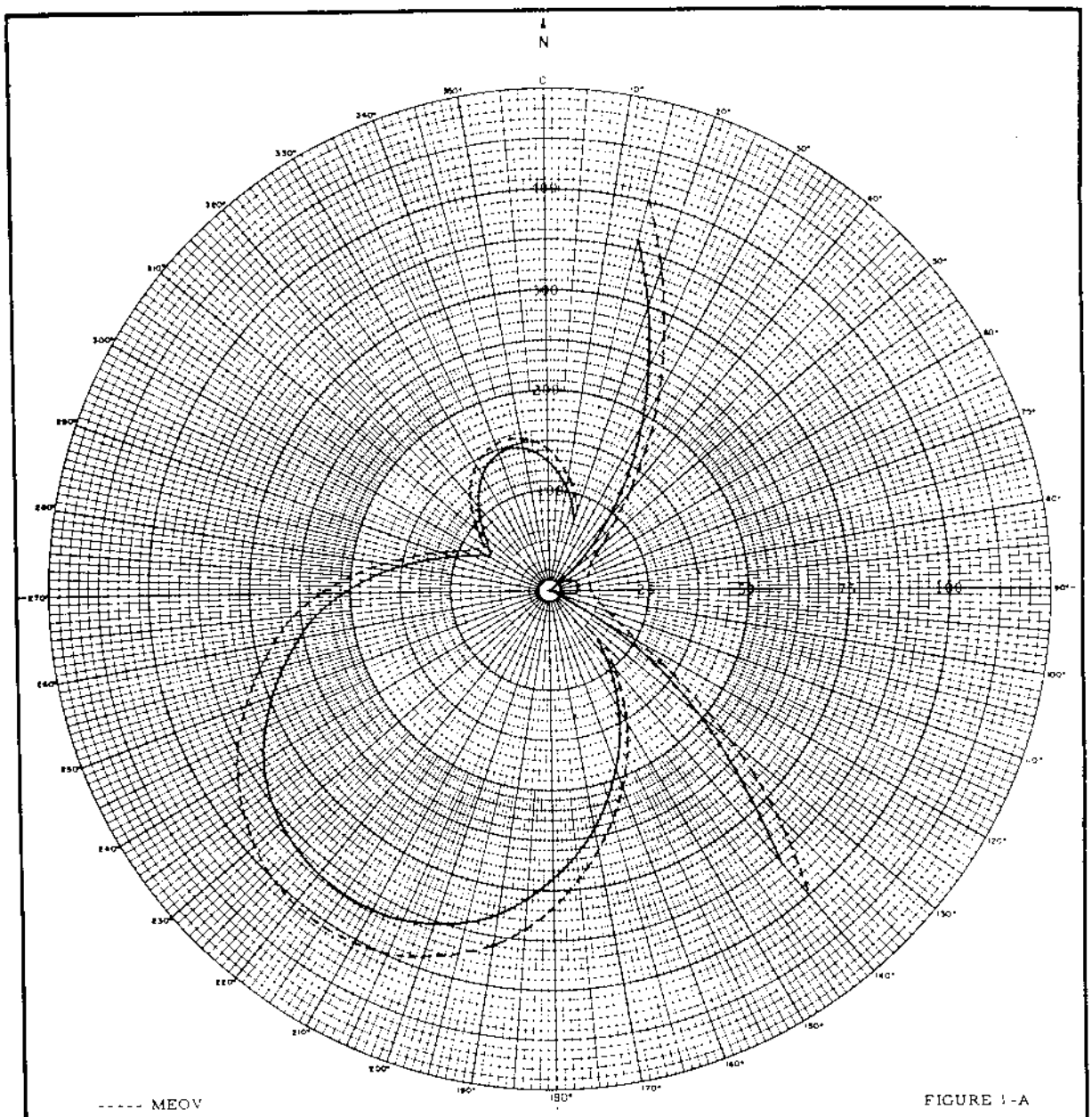
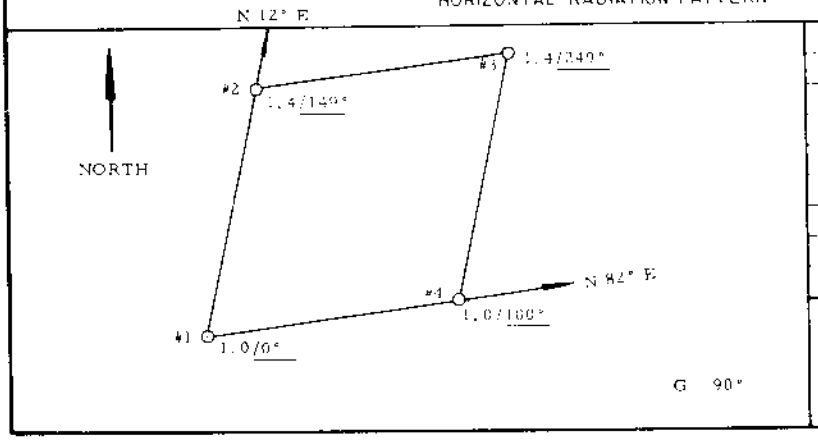


FIGURE 1-A

HORIZONTAL RADIATION PATTERN



APPLICANT	Virginia Broadcasting Corp.
LOCATION	Flora, Illinois
FREQUENCY	1530 KC/S
POWER	1.0Kw
LATITUDE	38 DEG 41 MIN 37 SEC
LONGITUDE	88 DEG 28 MIN 52 SEC
WHEN USED	Daytime
R.M.S. FIELD	190 mv/m
DATE	February 1969

ROBERT L. PURCELL

WASHINGTON, D. C.

FCC File No.18498
Accepted 4-2-69

New; The Virginia Broadcasting Corp.
Flora, Illinois

1530 kc

WQLW

FLORA, ILLINOIS

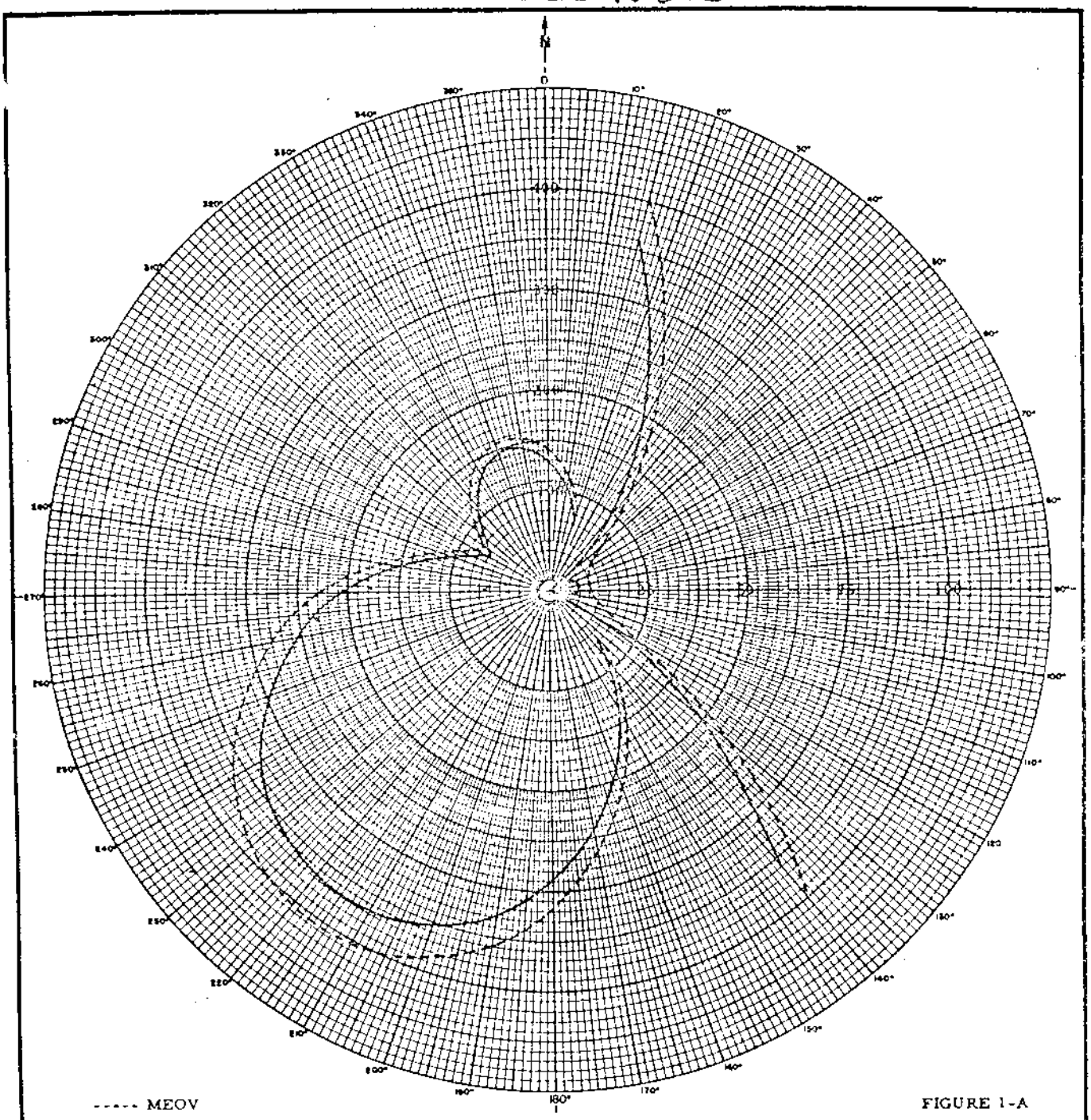
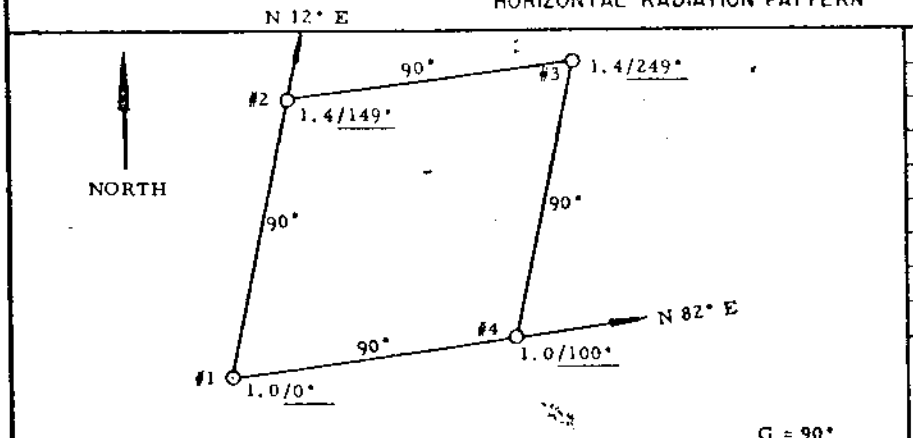


FIGURE 1-A

HORIZONTAL RADIATION PATTERN



APPLICANT :	Virginia Broadcasting Corp.
LOCATION :	Flora, Illinois
FREQUENCY :	1530 KC/S
POWER :	1.0Kw
LATITUDE :	38 DEG. 41 MIN. 37 SEC.
LONGITUDE :	88 DEG. 28 MIN. 52 SEC.
WHEN USED:	Daytime
R.M.S. FIELD:	190 mv/m
DATE :	February 1969

ROBERT L. PURCELL

WASHINGTON, D. C.

WRBX

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WRBX

Main Studio: Chapel Hill, North Carolina

Frequency: 1530 kHz

Power: 5 kW

Notification List No. 1731

Date: April 27, 1977

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 35° 58' 07"
West Longitude: 79° 00' 10"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 2
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers, 109.2 degrees in electrical height, plus 14.0 degrees of top loading by upper sections of guy wires.

TOWER:	N(#2)	S(#1)
HEIGHT ABOVE INSULATORS:	195'	195' (*)
PHASING:	+50°	0°
FIELD RATIO:	0.850	1

SPACING AND ORIENTATION: Towers are spaced 250'(140°) on a line bearing 310° true.

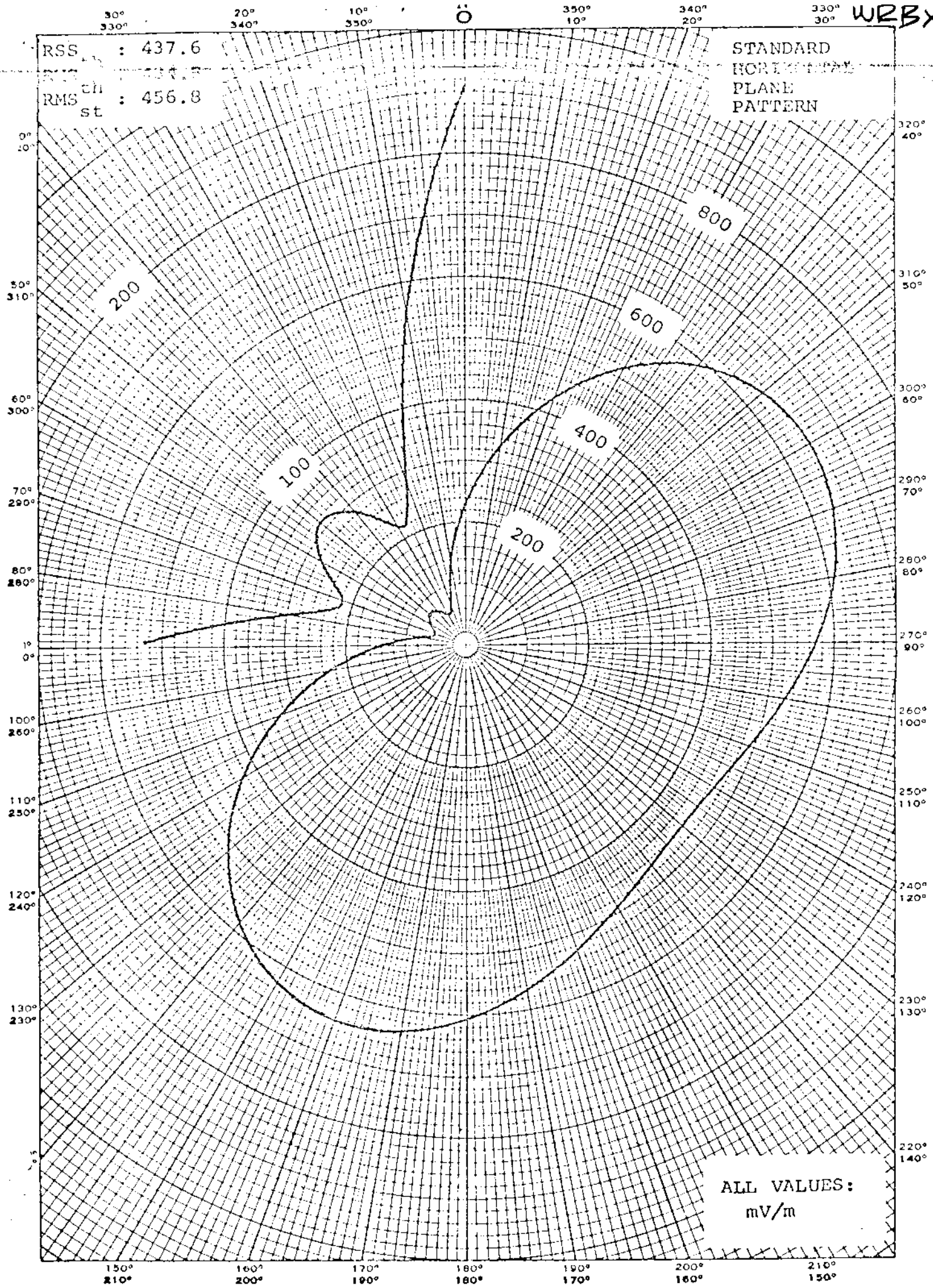
GROUND SYSTEM: 120-161' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL		STANDARD
RMS	RSS	RMS
434.8 mv/m	437.6 mv/m	456.8 mv/m

Note: This notification concerns changes in the directional antenna system and radiation pattern and in the transmitter location.

WRBX



WRBX 1530 kHz Chapel Hill NC

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WBBX

Main Studio: Chapel Hill, North Carolina

Frequency: 1530 kHz

Power: 10kw

Notification List No. 1760

Date: February 8, 1978 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North latitude: 35° 58' 07"
West longitude: 79° 00' 10"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. DA-D
Number of elements: 2
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers, top loaded to an effective electrical height of 123.2°. (*)

TOWER:	NW	SE
HEIGHT ABOVE INSULATORS:	195'	195' (*)
PHASING:	+50°	0°
FIELD RATIO:	1	1

SPACING AND ORIENTATION: Towers are spaced 250' (140°) on a line bearing 310° true.

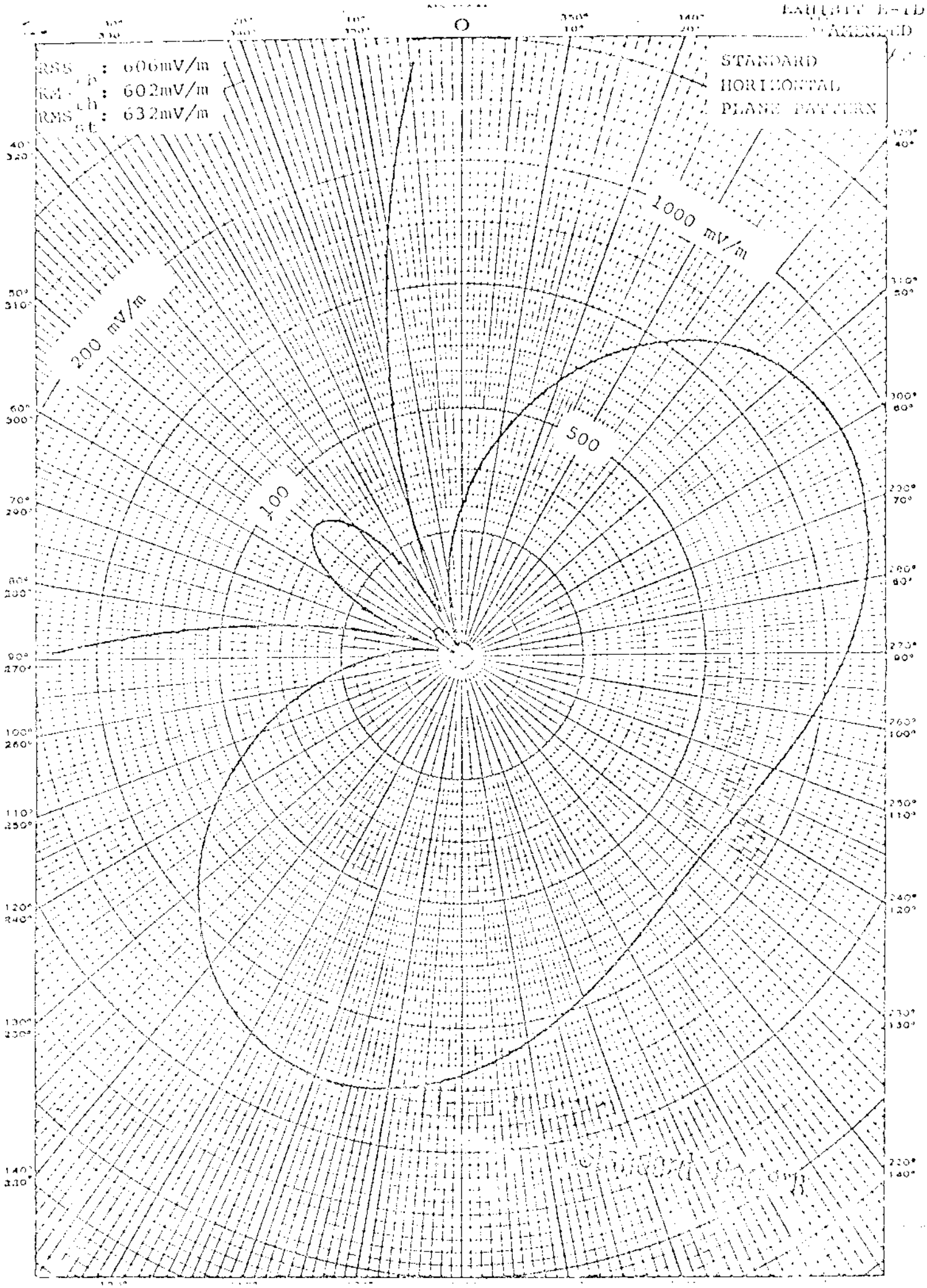
GROUND SYSTEMS: 120 - 161' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersecti ns between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
1/ 602 mv/m	606 mv/m	632 mv/m

1/ By adjustment of input power.

This notification concerns a power increase from 5kw.


RMS : 606mV/m
RMS : 602mV/m
RMS : 632mV/m
STANDARD
HORIZONTAL
PLANE PATTERN
1000 mV/m
500
200 mV/m
100
O

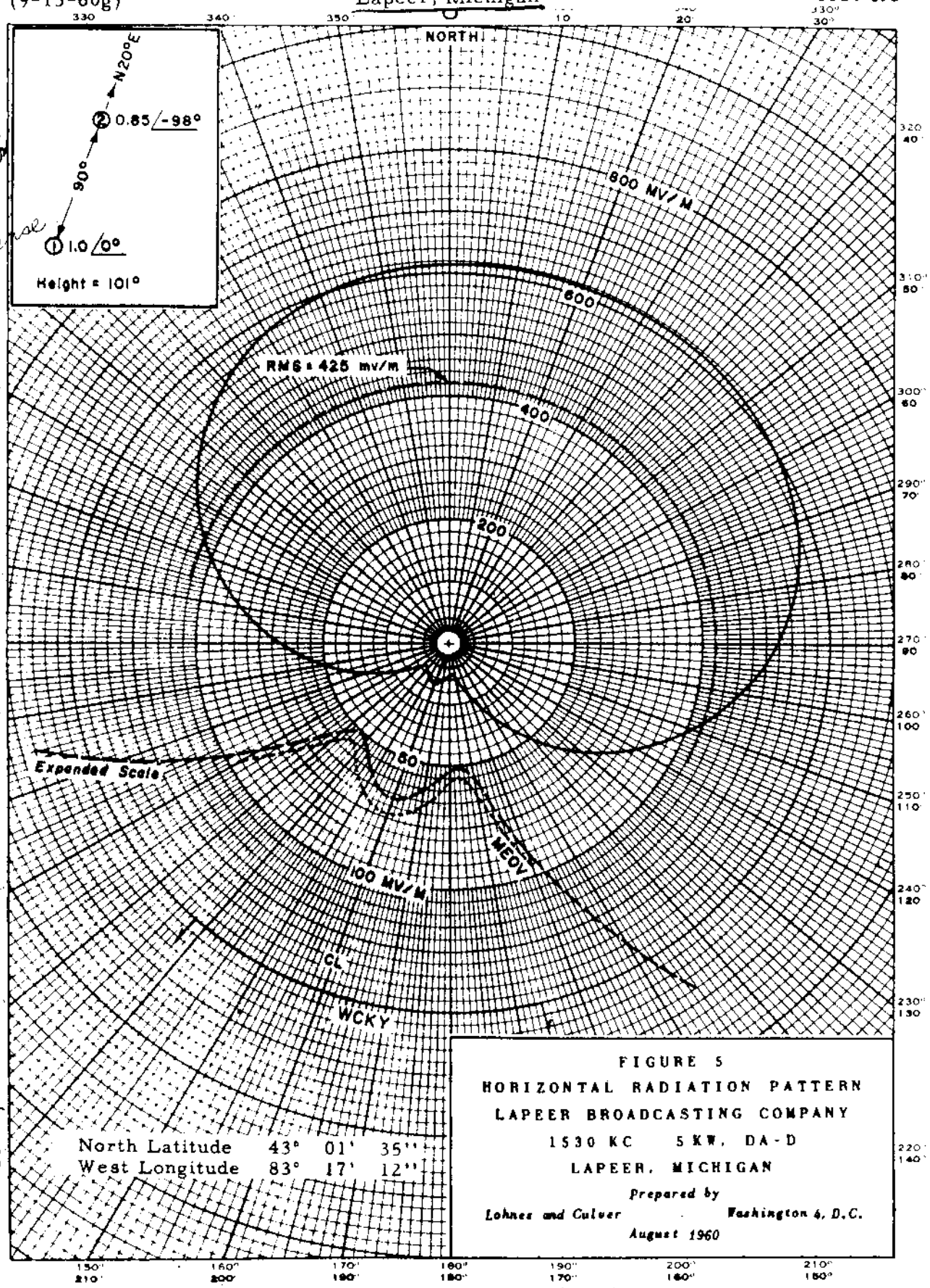
WTHM

PROPOSED DAY
(9-13-60g)

New; Lapeer Bcstng. Co.
Lapeer, Michigan

5kw, DA-D,D
1530 KC

-22-62
granted CP
r new station
4-29-63
ranted license



FCC File No. BP-14304
Accepted 9-2-60

Lapeer Broadcasting Company
Lapeer, Michigan

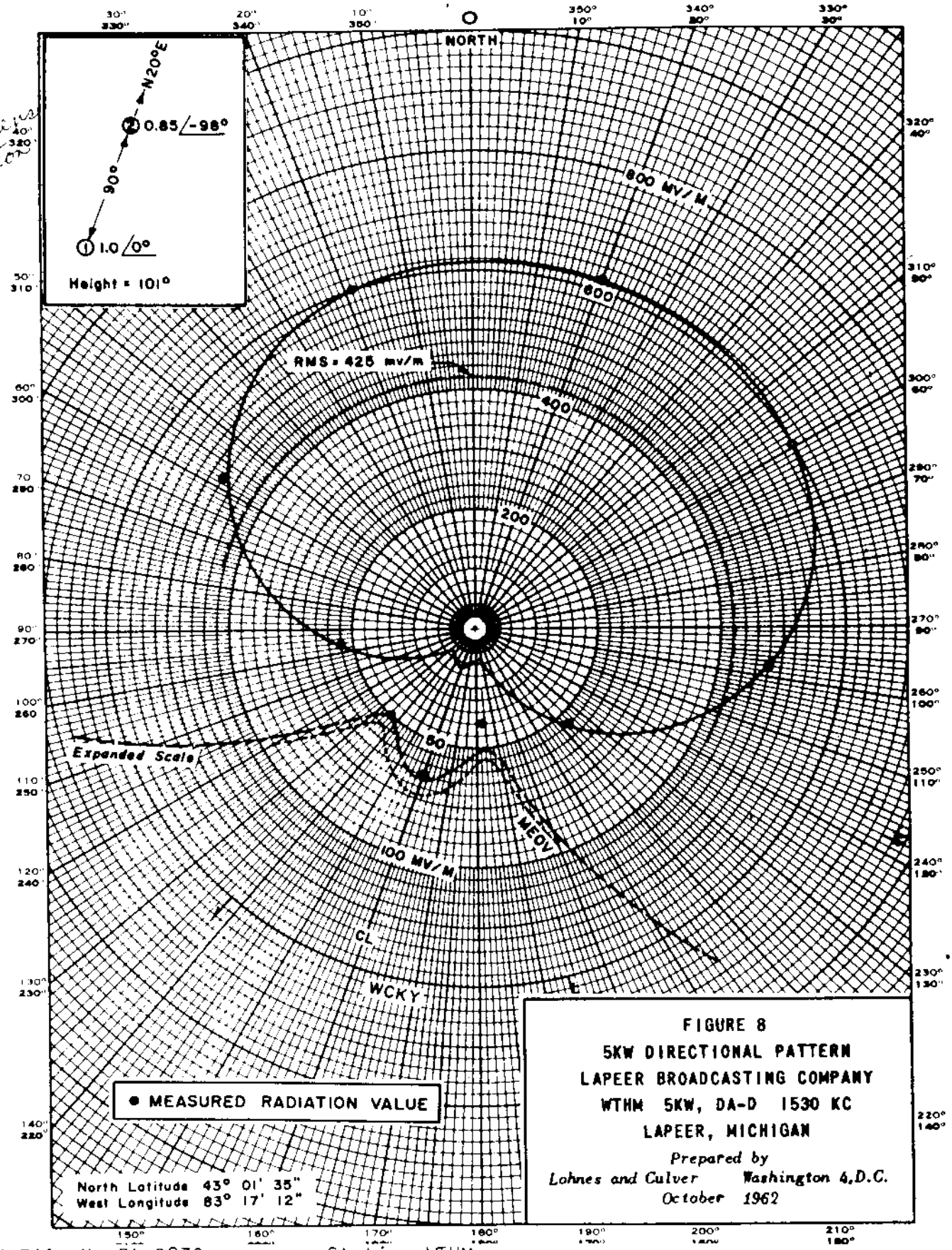
1530 KC

WTHM

Measured Day
(5-28-63ct)

Station WTHM
Lapeer, Michigan

5kw,DA-D,D
1530 kc



FCC File No.BL-9872
Accepted

Station WTHM
Lapeer, Michigan

1530 kc

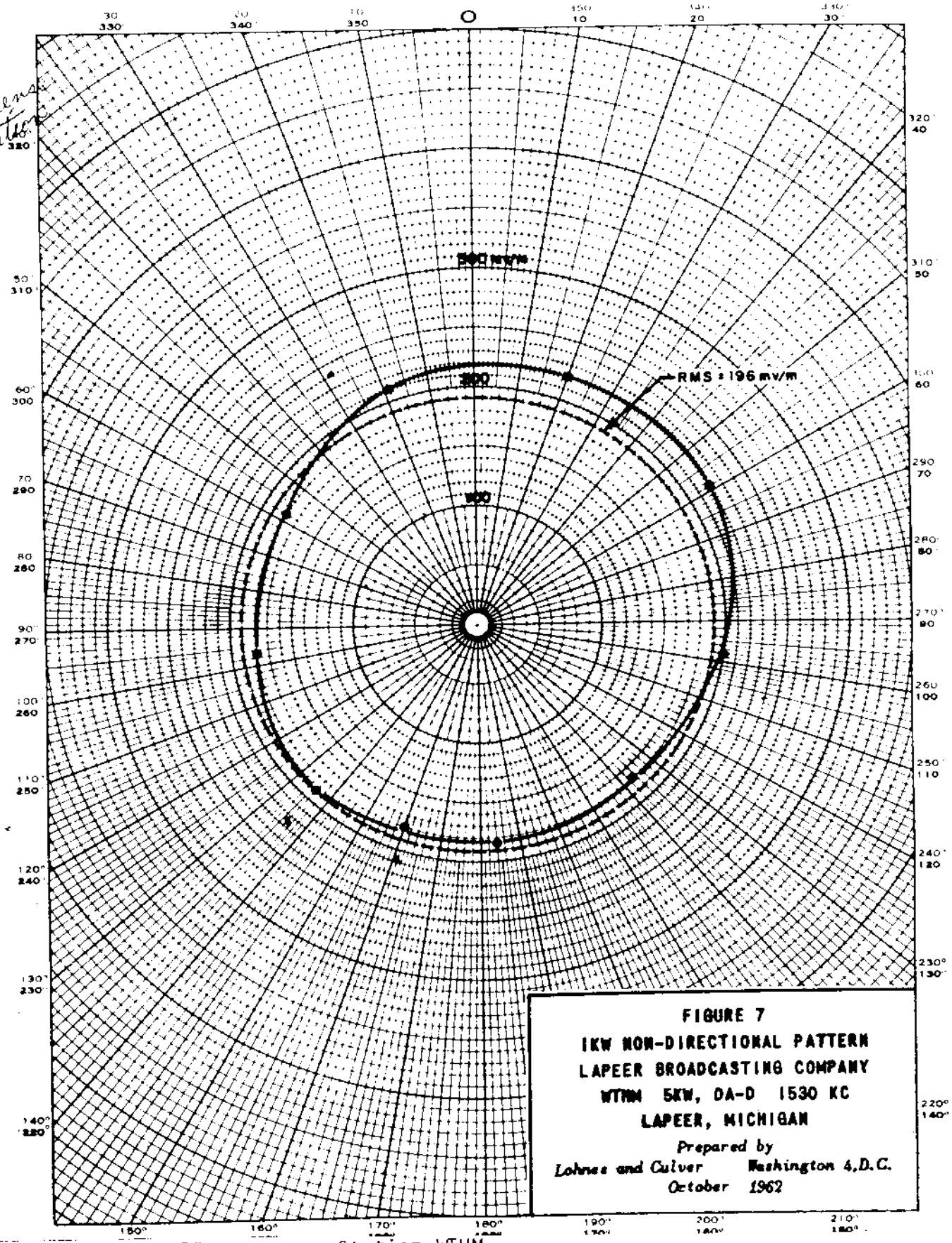
WTHM

Measured Non-DA
(5-28-63ct)

Station WTHM
Lapeer, Michigan

5kw, DA-D, D
1530 kc

4-29-63
granted license
on new station



FCC File No. BL-9872
Accepted

Station WTHM
Lapeer, Michigan

1530 kc

WTTI

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WTTI

Main Studio: Dalton, Georgia

Frequency: 1530 kHz

Power: 10 kW

Notification List No. 1583

Date: June 5, 1974

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 34° 47' 09"
West Longitude: 85° 02' 40"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 3
Type of elements: Series-excited, uniform cross-section, guyed vertical steel towers.

TOWER:	NW(#3)	N(#2)	S(#1)	
HEIGHT ABOVE INSULATORS:	161'	161'	161'	(90°)
PHASING:	+201.94°	+119.04°	0°	
FIELD RATIO:	0.096	0.863	1	

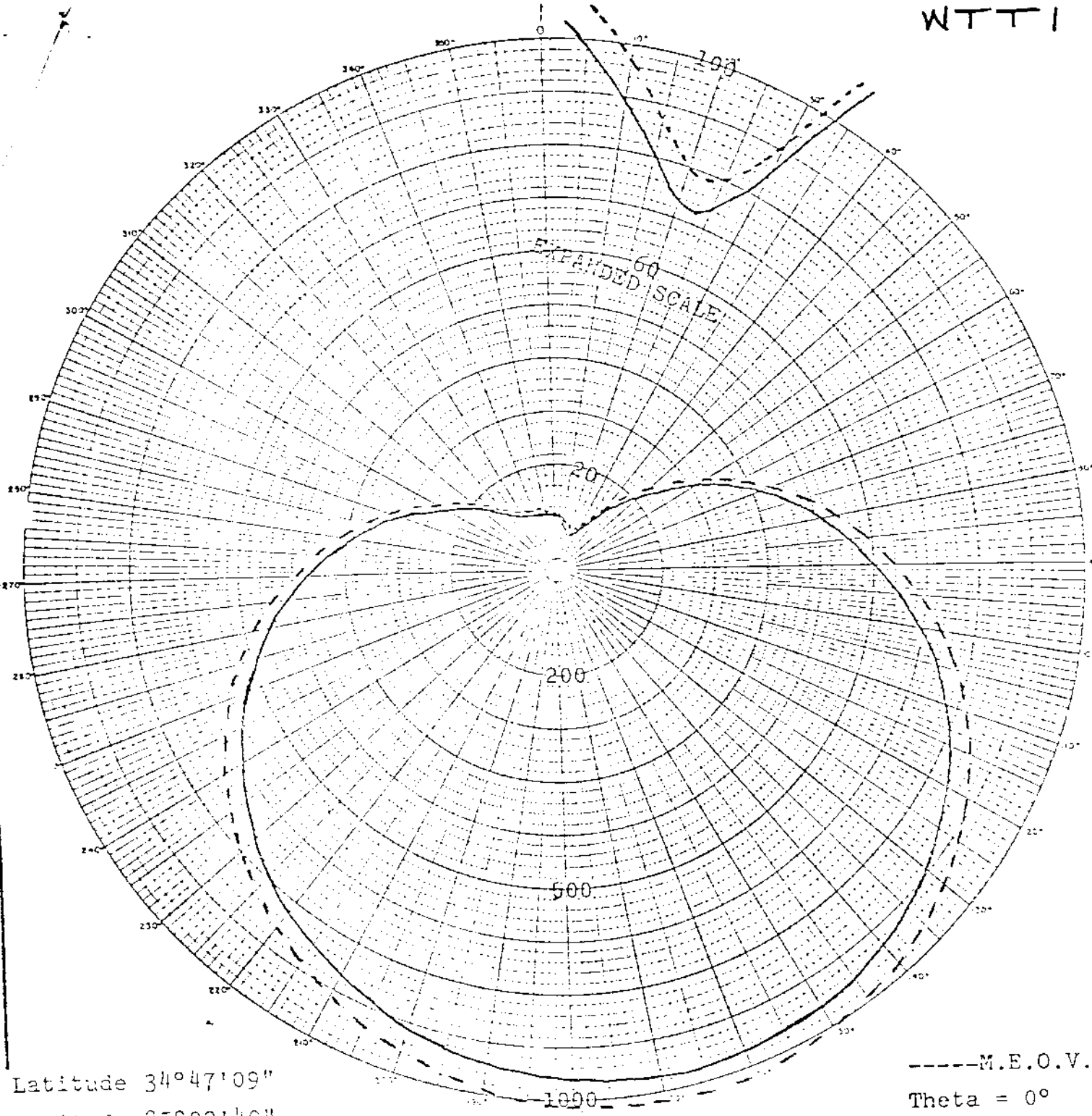
SPACING AND ORIENTATION: From reference tower #1: Tower #2 is spaced 107.14' (60°) on a line bearing 355° true, and tower #3 is spaced 189.29' (106°) on a line bearing 322° true.

GROUND SYSTEM: 120-88' to 160' equally spaced copper radials about each tow Radials are shortened and bonded to transverse straps along intersections between towers. Centers of systems are bonded together.

Predicted effective Field: 618.1 mv/m at rated power.

Note: This notification concerns changes in the antenna system and radiation pattern.

WTTI



Latitude 34°47'09"

Longitude 85°02'40"

-----M.E.O.V.

Theta = 0°

E_{RMS}= 618.105

E_{RSS}= 784.194

RSS/RMS=1.269

N-322°-E

N-355°-E

$G_1=G_2=G_3=90°$

S= 106°

S=60°

T1= 1/0°

T2= .86/ 119.04°

T3=.096/ 201.94°

HORIZONTAL PLANE PATTERN
WTTI BROADCASTERS, INC.
RADIO STATION WTTI
DALTON, GEORGIA

1530 KHZ

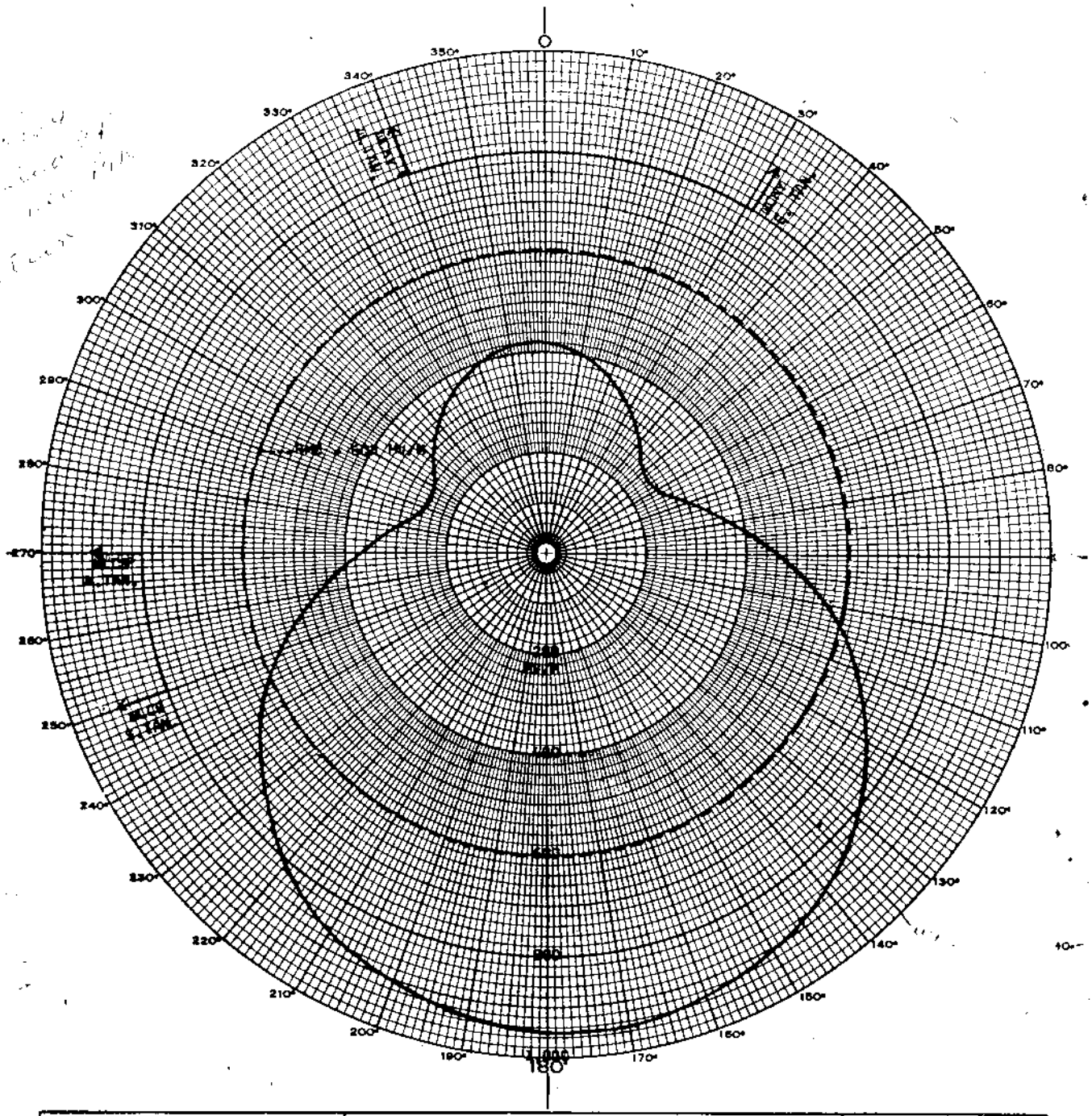
JOHN H. MULLANEY

CONSULTING
RADIO ENGINEER

FIGURE 5

(CH)?

WTTI



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA
	TOWER No.	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION φ°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV. ANGLE φ°	ELEVATION RMS FIELD mv/m E_ϕ	CALL NEW-DALTON, GA.
	1	90°	0°	0°	0°		1.0	0		FREQUENCY 1530 kc
	2	90°	N355°E	60°	-150°		0.68	10		POWER 10 kw
	3							20		TIME OF OPERATION MID-DAY
	4							30		TYPE OF OPERATION DA-2
	5							40		DAYTIME TOWERS 1 & 2
	6							50		NIGHTTIME TOWERS -----
	7							60		No. RADIALS PER TOWER 120
	8							70		LENGTH OF RADIALS 160 ft.
	9							80		GROUND SCREEN DIMENSION ---
	10							E_1 =	mv/m	LAT. 34° 47' 09"
	DAYTIME OPERATION ☒			NIGHTTIME OPERATION ☐				P_1 =	kw	LONG. 85° 02' 40"
										SUPERSEDES B1963
										PATTERN No. 121863

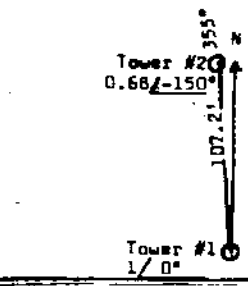


FIGURE 4-8
HORIZONTAL PLANE PATTERN
DAYTIME NON-CRITICAL HOURS OPERATION
CHEROKEE BROADCASTERS DALTON, GA.
NEW STANDARD STATION 1530KC 10KW-D(DA-2)

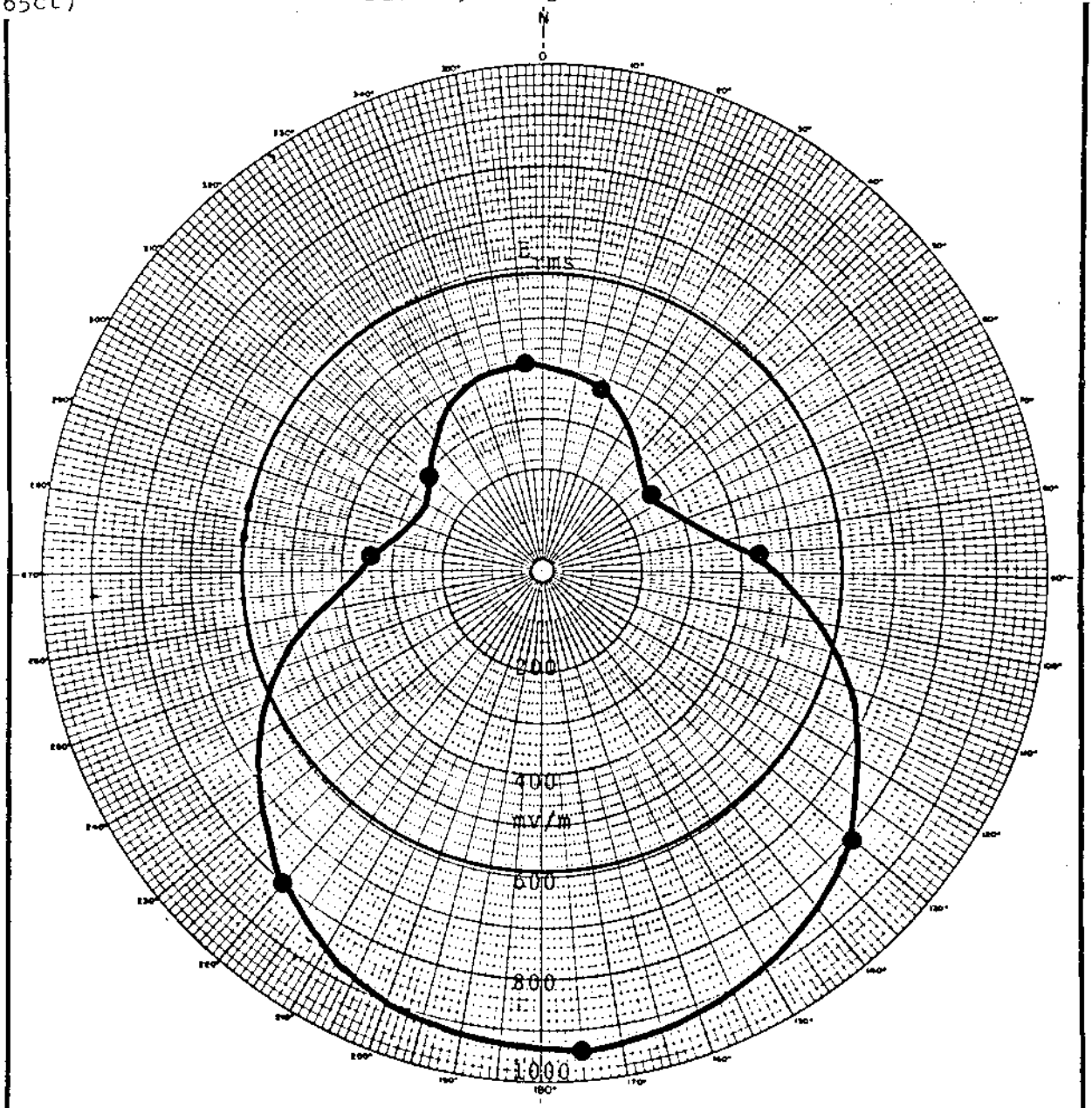
WTTI

Measured Day
(9-28-65ct)

IC 10-19-65

Station WTTI
Dalton, Georgia

10kw, DA-2, D
1530 kc



E_{RMS} = 599 mv/m

O= MEASURED RADIALS

LATITUDE: 34°47'09"
LONGITUDE: 85°02'40"

AMBROSE W. KRAMER
CONSULTING RADIO ENGINEER
WASHINGTON, D. C.

ANTENNA PARAMETERS

N355°E

#2 0.703 / 150°

G=90°
S=60°

#1 1.00 / 0°

FIGURE-31
HORIZONTAL POLAR PATTERN
DAY, D.A.10 kw. DA-2
WTTI, BP-15105, DALTON
1530 kc/s.
June 1, 1965

FCC File No. BL-11037
Accepted 9-20-65

Station WTTI
Dalton, Georgia

1530 kc

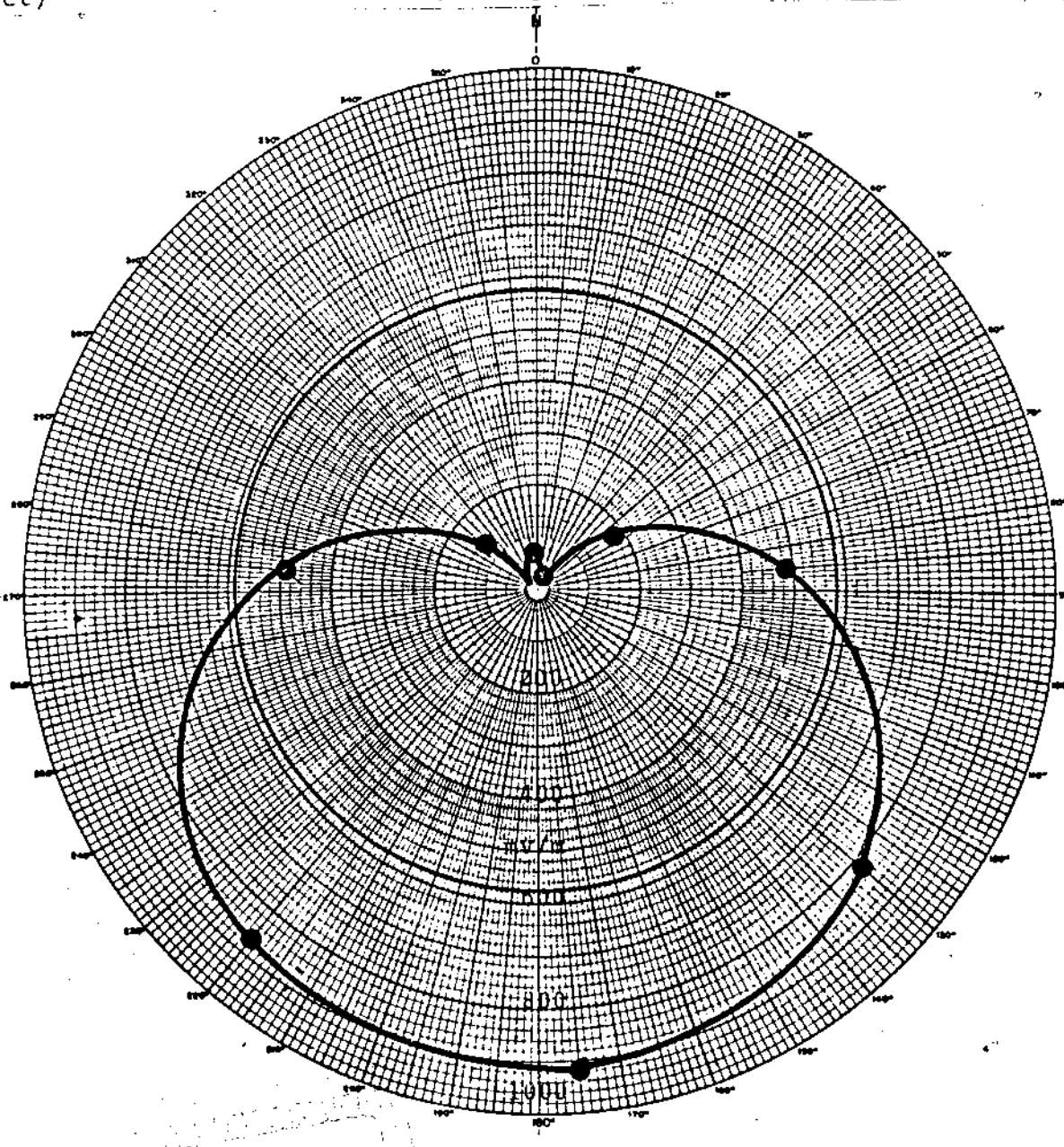
WTTI

Measured Day (CH)
(9-28-65ct)

Station WTTI
Dalton, Georgia

10kw,DA-2,D
1530 kc

10-10-19-65



O= MEASURED RADIALS

E_{RMS} = 583 mv/m

LATITUDE: 34°47'09"
LONGITUDE: 85°02'40"

AMBROSE W. KRAMER
CONSULTING RADIO ENGINEER
WASHINGTON, D. C.

ANTENNA PARAMETERS

N355°e
#2 0.973 / 125°
G=90°
S=60°

#1 1.00 / 0°

FIGURE-33
HORIZONTAL POLAR PATTERN
CRITICAL HOURS, D.A.
WTTI,BP-15105,DALTON
1530 kc/s, 10 kw.DA-2
June 1, 1965

FCC File No. BL-11037
Accepted 9-20-65

Station WTTI
Dalton, Georgia

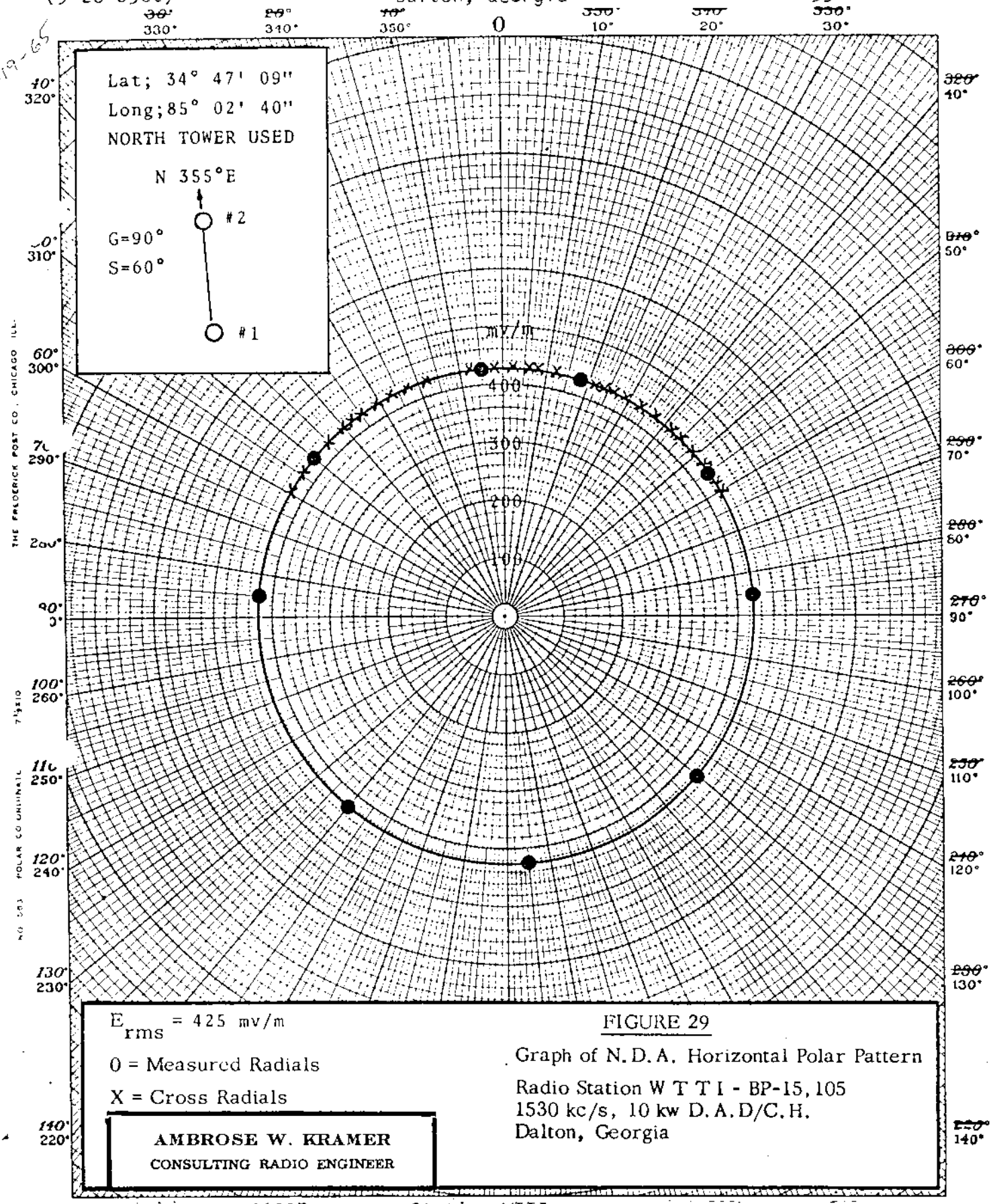
1530 kc

WTTI

Measured Non-DA
(9-28-65ct)

Station WTTI
Dalton, Georgia

10kw, DA-2, D
1530 kc



E_{rms} = 425 mv/m

0 = Measured Radials

X = Cross Radials

AMBROSE W. KRAMER
CONSULTING RADIO ENGINEER

FIGURE 29

Graph of N.D.A. Horizontal Polar Pattern

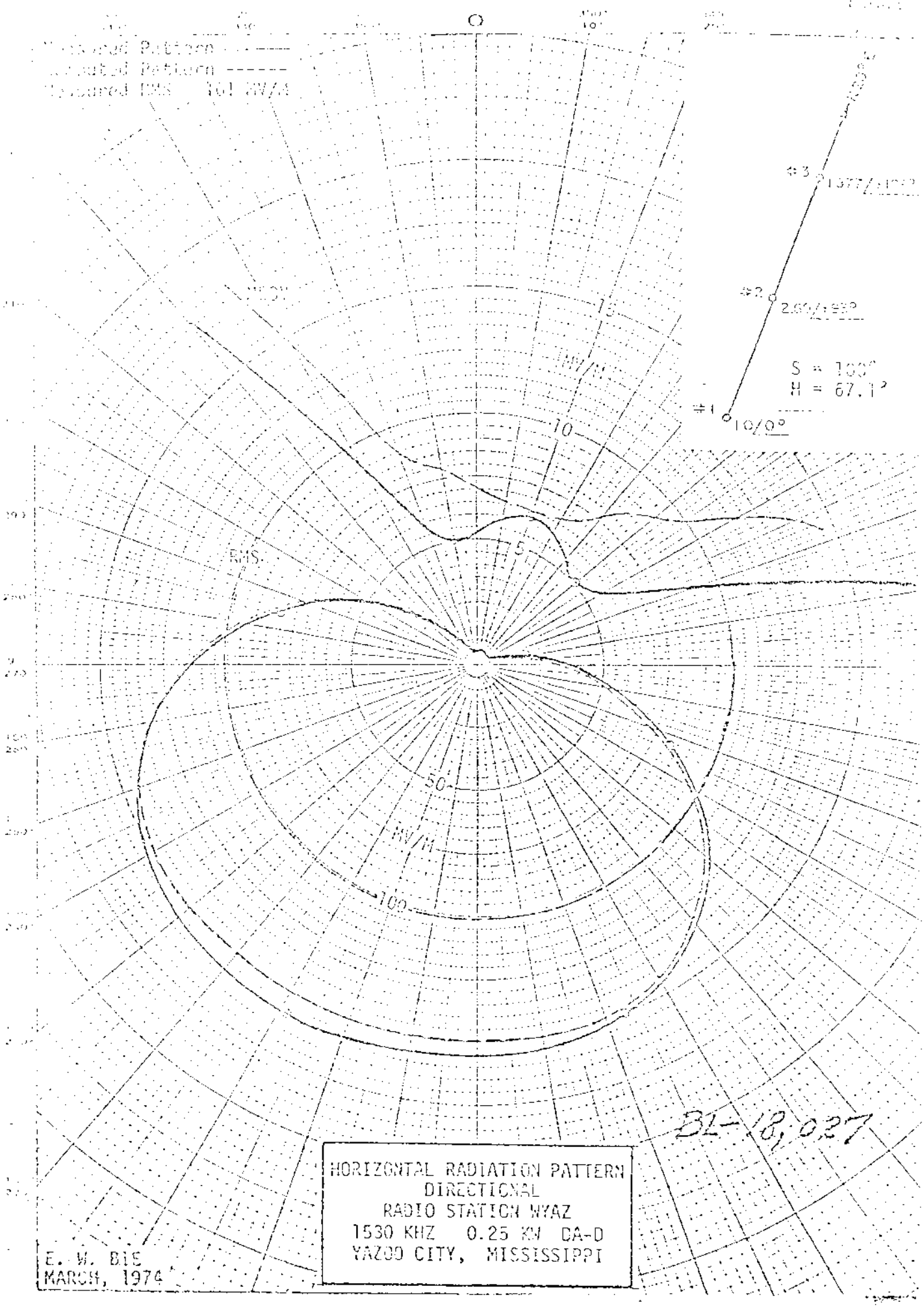
Radio Station W T T I - BP-15,105
1530 kc/s, 10 kw D.A.D/C.H.
Dalton, Georgia

FCC File No. BL-11037
Accepted 9-20-65

Station WTTI
Dalton, Georgia

1530 kc

WYAZ



HORIZONTAL RADIATION PATTERN
DIRECTIONAL
RADIO STATION WYAZ
1530 KHZ 0.25 KW DA-D
YAZOO CITY, MISSISSIPPI

E. W. BIE
MARCH, 1974

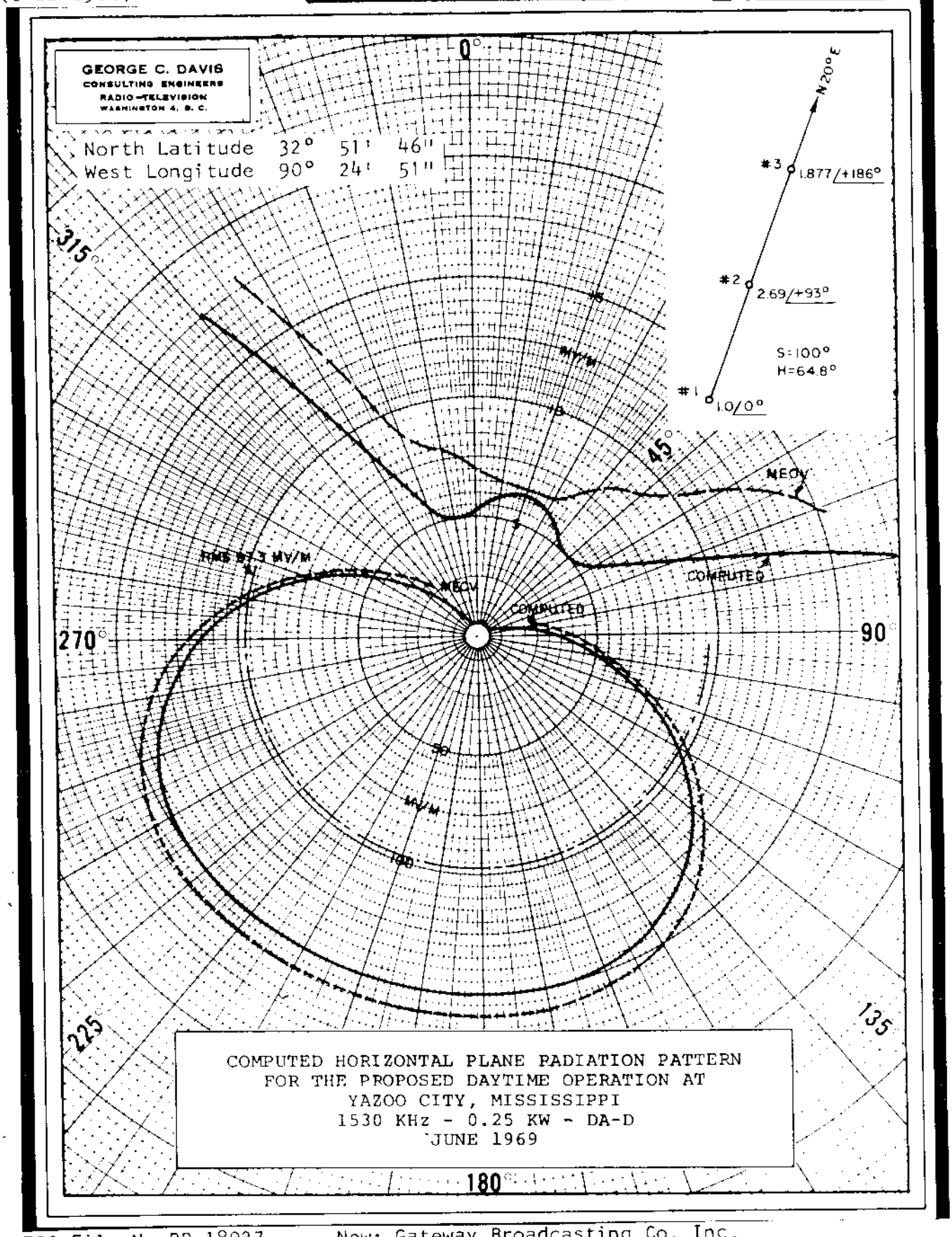
B2-18,027

WYAZ

Proposed Day
(8-22-69ct)

New; Gateway Broadcasting Co., Inc.
Yazoo City, Mississippi

250w,DA-D,D
1530 kc



FCC File No.BP-18027
Accepted 8-1-69 Amended

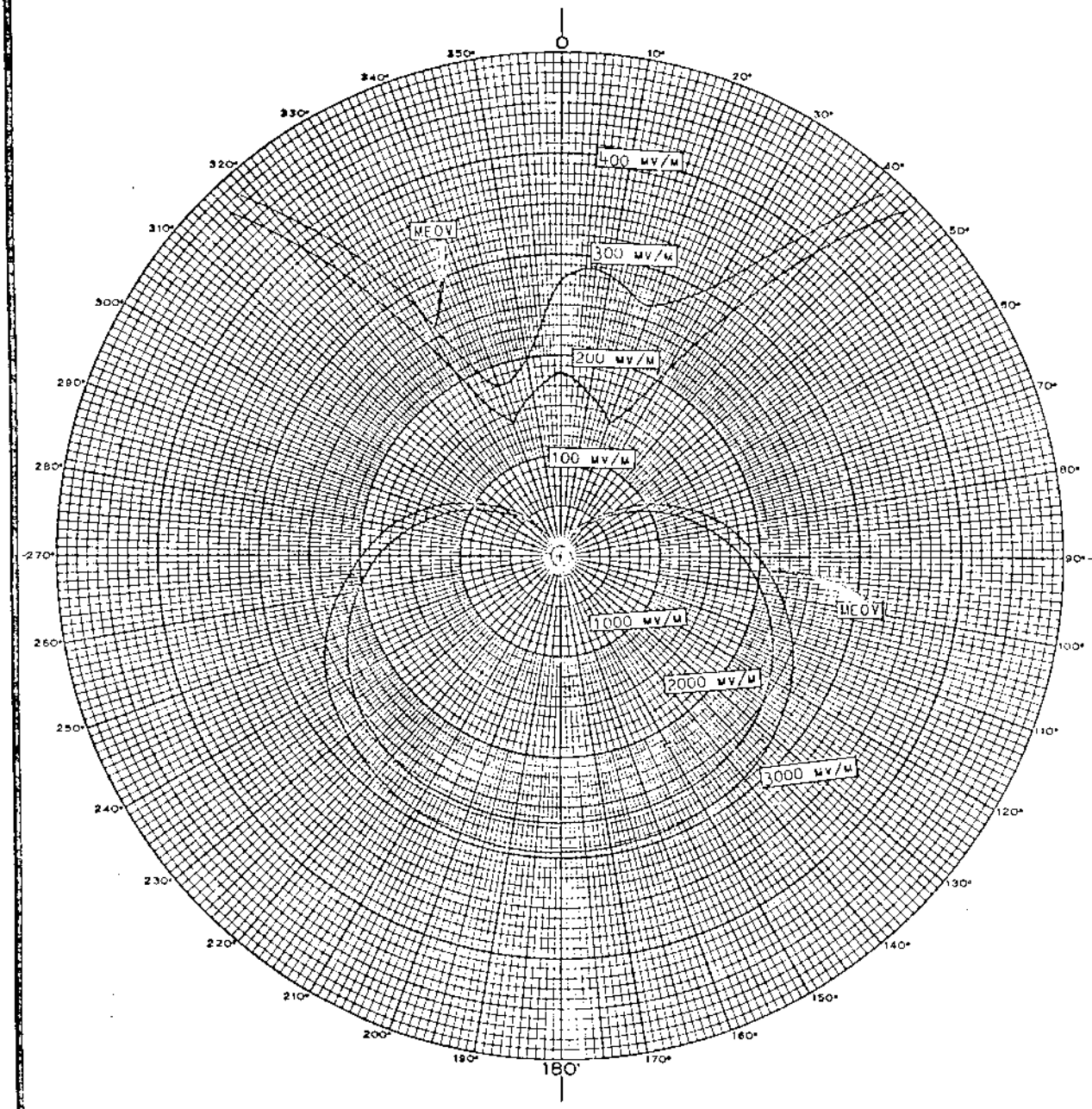
New; Gateway Broadcasting Co. Inc.
Yazoo City, Mississippi

1530 kc

Proposed Day
(5-27-69ct)

New; Integrated Broadcasting Co., Inc.
Jacksonville, Florida

50kw,DA-D,D
1530 kc



E_{RMS} = 1850

Engineer: Robert A. Benns

LATITUDE: 30° 21' 47.6"

LONGITUDE: 81° 45' 8.6"

ANTENNA PARAMETERS

NO. 1	1.0	∠0°	S = 90°
NO. 2	.9	∠95°	G = 210°

N-0°-E
NO. 2
S
NO. 1

FIGURE 5

PROPOSED HORIZONTAL PATTERN

INTEGRATED BROADCASTING

JACKSONVILLE FLORIDA

FCC File No.BP-18493
Accepted 5-20-69

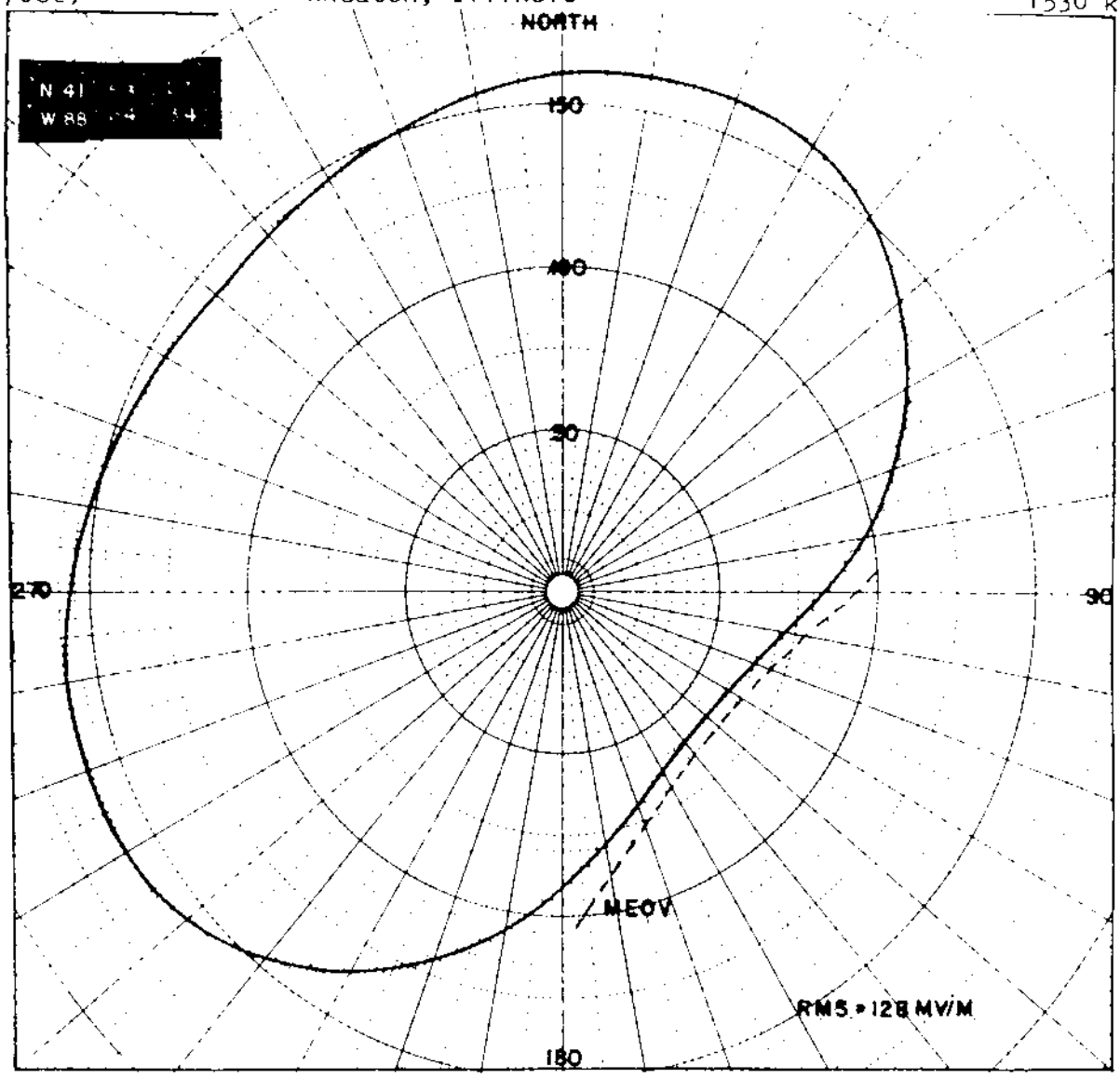
New; Integrated Broadcasting Co., Inc.
Jacksonville, Florida

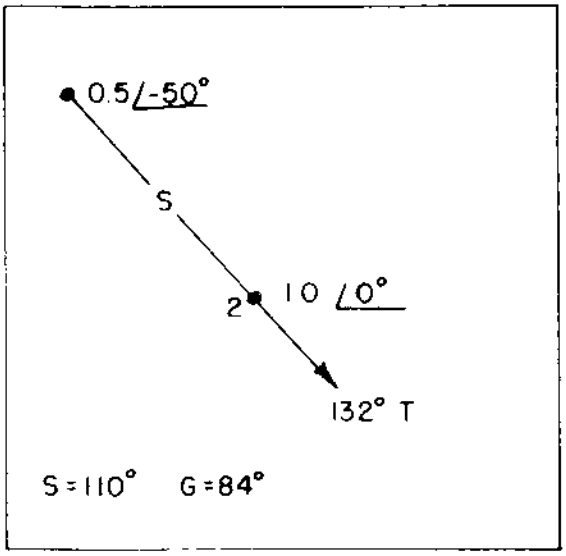
1530 kc

Proposed Day
(4-29-70ct)

New; Central Dupage County Bcstg Co.
Wheaton, Illinois

500w,DA-D,D
1530 kc





PROPOSED RADIATION PATTERN
CENTRAL DUPAGE COUNTY B/C

1530 KC 0.5 KW DA-D
WHEATON, ILLINOIS

JULY, 1967

ROBERT A. JONES
CONSULTING ENGINEERS
LA GRANGE ILLINOIS

FCC File No.BP-16465
Hearing Reopened 2-11-70

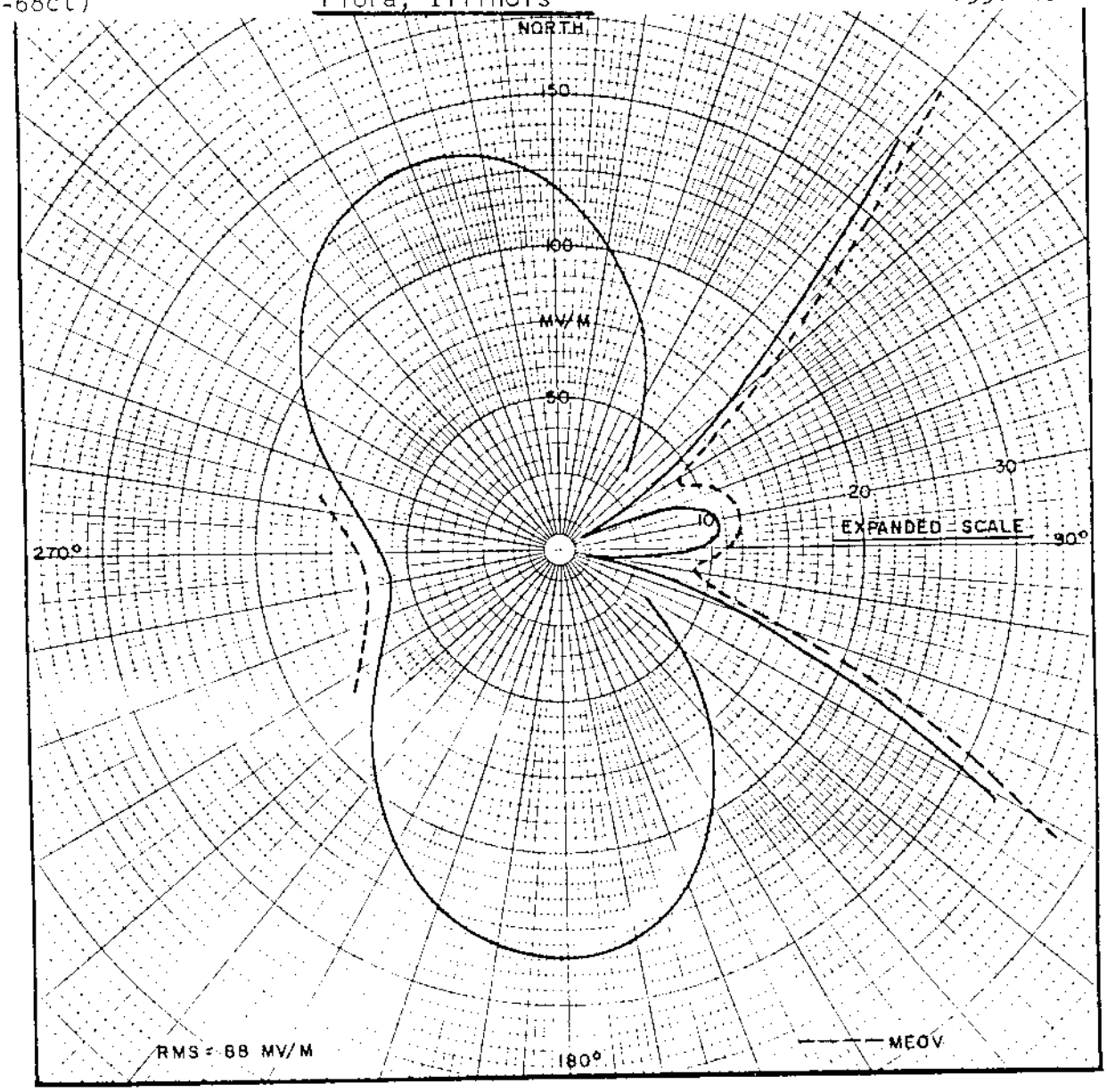
New; Central Dupage County Bcstg Co.
Wheaton, Illinois

1530 kc

Proposed Day
(4-29-68ct)

New; Doyle Ray Flurry
Flora, Illinois

250w,DA-D,D
1530 kc



PATTERN PARAMETERS
1=1.000/ 0°
2=1.000/-29°
G=90°
1. 2. 160° 261°T

DIRECTIONAL
RADIATION PATTERN
Doyle Flurry

☐ MEASURED ☒ PROPOSED

FREQ. 1530 (KHZ) POWER 0.25 (KW) ☒ DA-D

N. LAT. 38° 40' 59" ☐ DA-N

W. LONG. 88° 29' 01" ☐ N-D

LOCATION: Flora, Illinois

DATE: March, 1968

ROBERT A. JONES
CONSULTING ENGINEERS
LA GRANGE, ILLINOIS

FCC File No.BP-18076
Accepted 4-17-68

New; Doyle Ray Flurry
Flora, Illinois

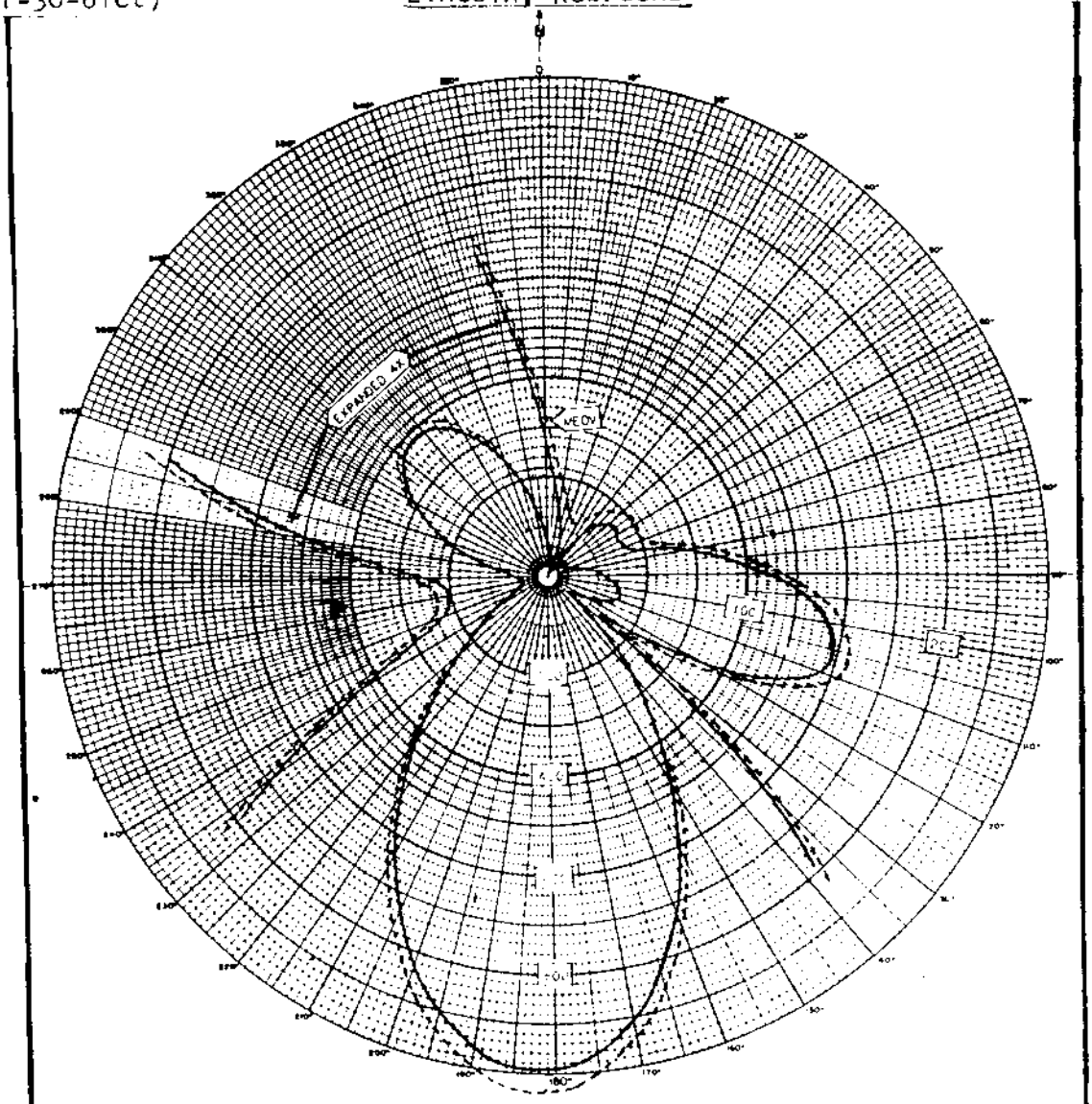
1530 kc

Proposed Day
(11-30-61ct)

New; Lancaster County B/C Co. 5kw,DA-D,D
Lincoln, Nebraska 1530 kc

5-1-63
granted CP
for new station

8-1-63
A D



E_{RMS} = 395 mv/m

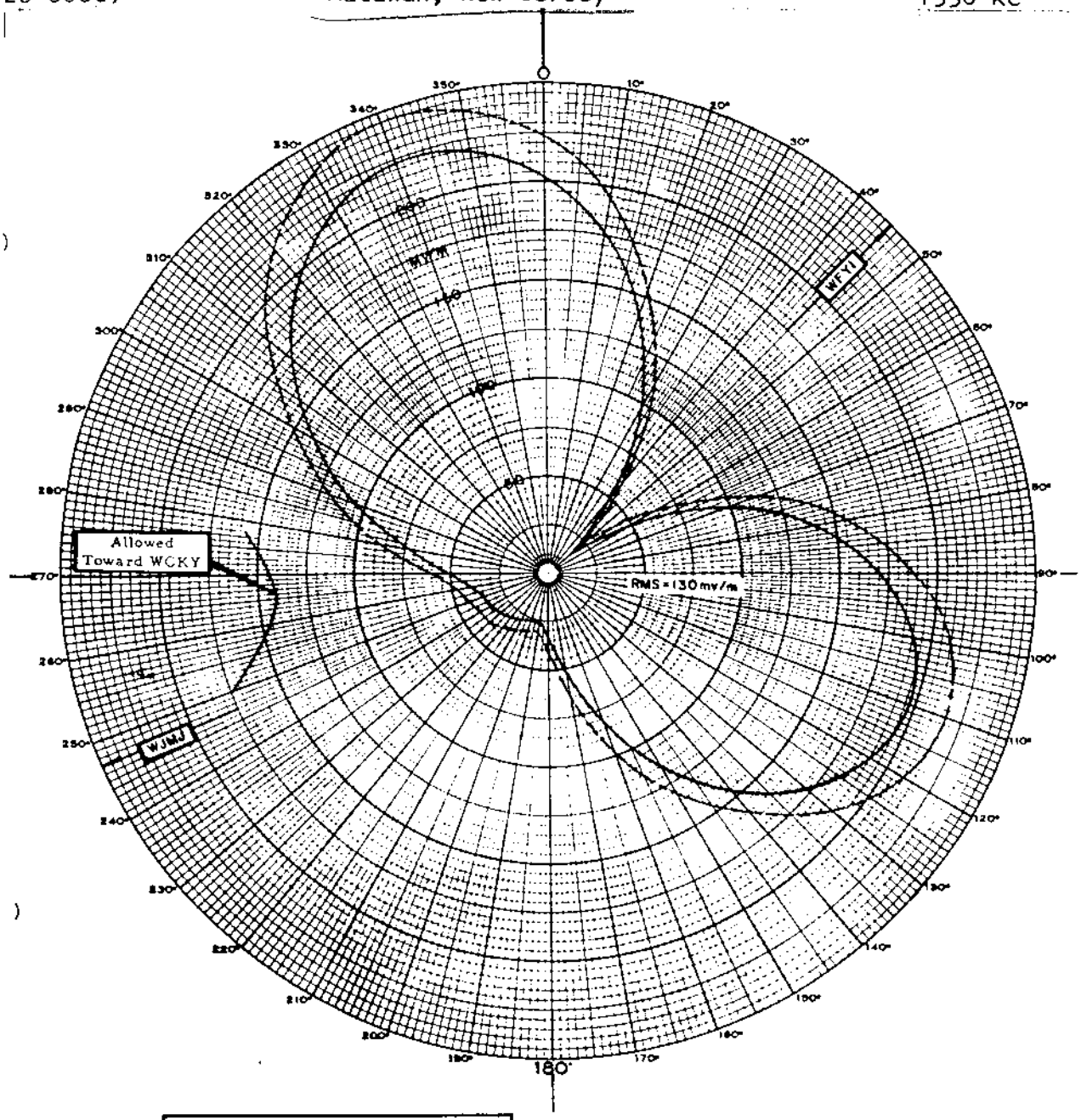
LATITUDE: 40° 49' 00"	ANTENNA PARAMETERS	HORIZONTAL RADIATION PATTERN LANCASTER BROADCASTING COMPANY LINCOLN, NEBRASKA
LONGITUDE: 96° 33' 56"	1.0/0° 0.9/-38° 218° 80° N258° 0.9/-127° 0.81/-165° N216°E	1530 KC 5000 DA-D
CHARLES E. BRENNAN CONSULTING RADIO ENGINEERS MILWAUKEE, WISCONSIN		610816 FIGURE 7

FCC File No. BP-15083
Accepted 9-20-61

New; Lancaster County B/C Co.
Lincoln, Nebraska 1530 kc

Proposed Day
(8-26-66ct)

New; Jupiter Associates, Inc. PA - 500w,DA-D,D
Matawan, New Jersey 1530 kc



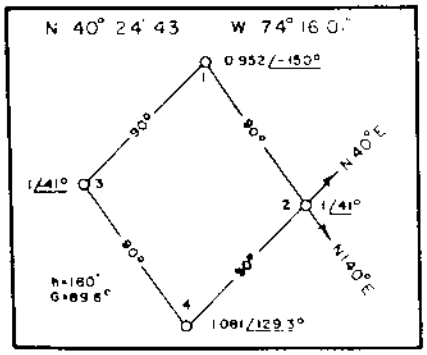


FIGURE 4

CALCULATED HORIZONTAL PLANE PATTERN

JUPITER ASSOCIATES, INC.

MATAWAN, NEW JERSEY

1530KC	0.5KW	D, DA-D
BP-14178		DOC. 14755

MAY 1966

WILLIS C. BEECHER
CONSULTING ENGINEER
WASHINGTON, D.C.

FCC File No. BP-14178
Accepted 8-2-66 Amended

New; Jupiter Associates, Inc.
Matawan, New Jersey

1530 kc

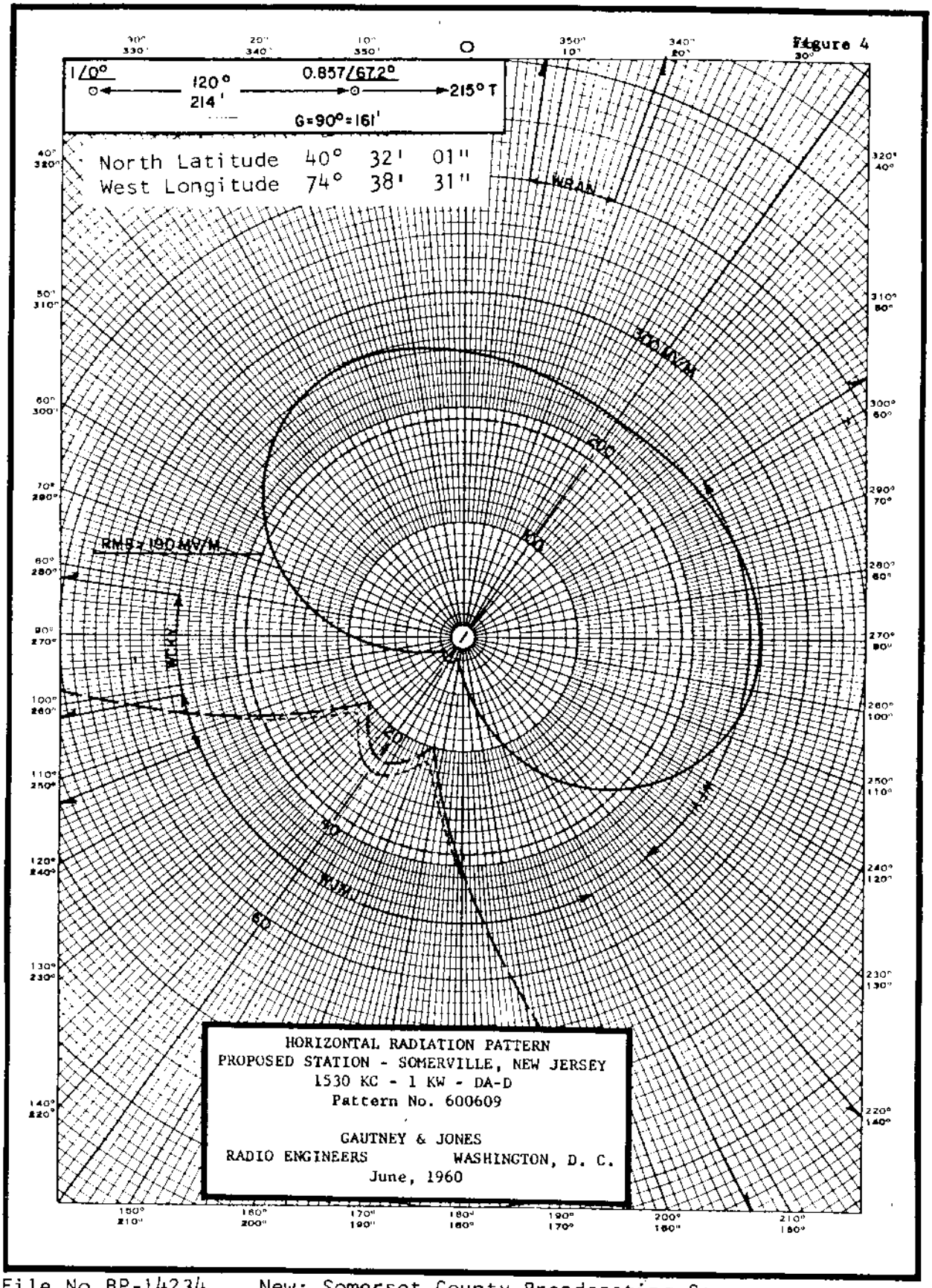


Figure 4
1/0°
120°
214'
0.857/67.2°
215° T
G=90°=161'
North Latitude 40° 32' 01"
West Longitude 74° 38' 31"
WBAB
300 MV/M
20
10
RMS=190 MV/M
WCKR
50
WJM
60
HORIZONTAL RADIATION PATTERN
PROPOSED STATION - SOMERVILLE, NEW JERSEY
1530 KC - 1 KW - DA-D
Pattern No. 600609
GAUTNEY & JONES
RADIO ENGINEERS WASHINGTON, D. C.
June, 1960

XEUR

Description Sheet
(3-22-71ct)

Station XEUR
Texcoco, Edo. de Mexico

5kw,DA-1,U,Class II
1530 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET
(Issued: March 22, 1971)

Station: XEUR

Main Studio: Texcoco, Edo. de Mexico

Frequency: 1530 kHz

Power: 5kw

Notification List No. (*)

Date: (*)

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 19° 25' 45"
West Longitude: 98° 56' 57"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-1)
Number of elements: 4
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	SW(#1)	NW(#2)	SE(#3)	NE(#4)	
HEIGHT ABOVE INSULATORS:	179'	179'	179'	179'	(100°)
PHASING:	0°	+84°	+67°	+122°	
FIELD RATIO:	1	1	1	1	

SPACING AND ORIENTATION: The towers are located at the vertices of a parallelogram the long sides of which are 304' (170°) in length on a line bearing 15.865° true. The short sides are 214' (120°) in length on a line bearing 55.865° true.

GROUND SYSTEM: 90 equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

Predicted effective Field: 413.021 mv/m at rated power.

(*) FCC Note: Notification of basic information for this change in a Notification List has not been received as of this issue date. Supplementary information was transmitted by letter of March 10, 1971, in accordance with provisional procedures for exchange of notifications established in a Memorandum of Understanding between the Delegations of the United States and Mexico signed in Washington on November 27, 1968.

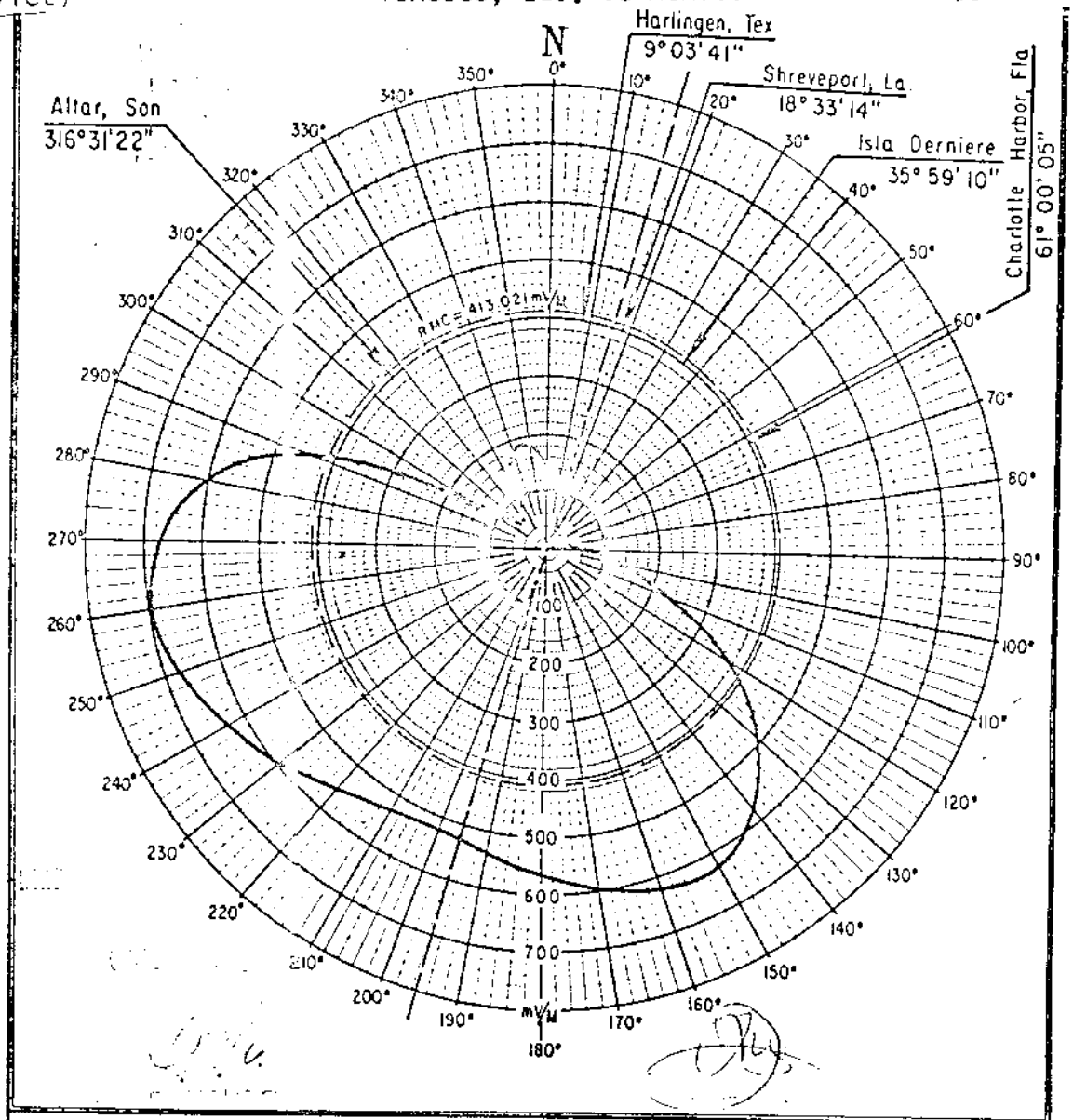
CTR NO 20630A3

XEUR

Proposed Day & Night
(3-22-71ct)

Station XEUR
Texcoco, Edo. de Mexico

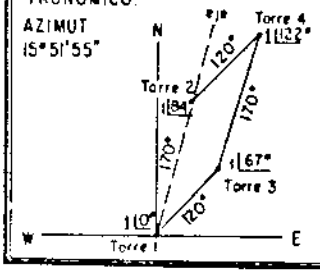
5kw, DA-1, U, Class II
1530 kc



PATRON DE RADIACION HORIZONTAL CALCULADO EN mV/M A 1609 Mts.

ESQUEMA DE LAS TORRES Y SU ORIENTACION CON RESPECTO AL NORTE ASTRONOMICO.

AZIMUT
15°51'55"



RADIODIFUSORA

XEUR

TEXCOCO, Edo. Méx.

5,000 Wattz.
1530 KHz.

DISEÑO:
Cia. DYCE, S. de R. L.
Ing. Felipe Ruiz Gutierrez
Alberto Torres Soto

DIBUJO E S E S M A

XEUR

DESCRIPTION SHEET
(2-24-65ct)

Station XEUR
Mexico, D.F.

5kw,DA-1,U,Class II
1530 kc

DIRECTIONAL ANTENNA DESCRIPTION SHEET
(Issued January 11, 1965)

Station: XEUR

Main Studio: Mexico, D.F.

Frequency: 1530 kc/s

Power: 5kw

Notification List No. (*)

North Latitude: 19° 25' 45"

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

West Longitude: 98° 56' 57"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-1)
Number of elements: 4
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

Tower:	#1(SW)	#2(NW)	#3(SE)	#4(NE)
Height above insulators:	178.81'	178.81'	178.81'	178.81'(100°)
Phasing:	0°	+50°	+72°	+122°
Field Ratio:	1	1	1	1

Spacing and Orientation: The towers are located at the vertices of a parallelogram the long sides of which are 303.66'(170°) in length on a line bearing 355.867° true. The short sides are 214.35'(120°) in length on a line bearing 35.867° true.

Ground System: 90' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of systems are bonded together.

Predicted effective Field: 402.234 mv/m at rated power.

---

*FCC Note: This "supplementary information" as defined in Annex VI of the U.S.-Mexico bilateral agreement was neither accompanied nor preceded by "basic information" as defined in Annex VI at the time it was received on January 11, 1965. In addition, the call letters and location specified involve conflicts with previous notifications. Pending clarification, therefore, this information is being issued for information purposes only.

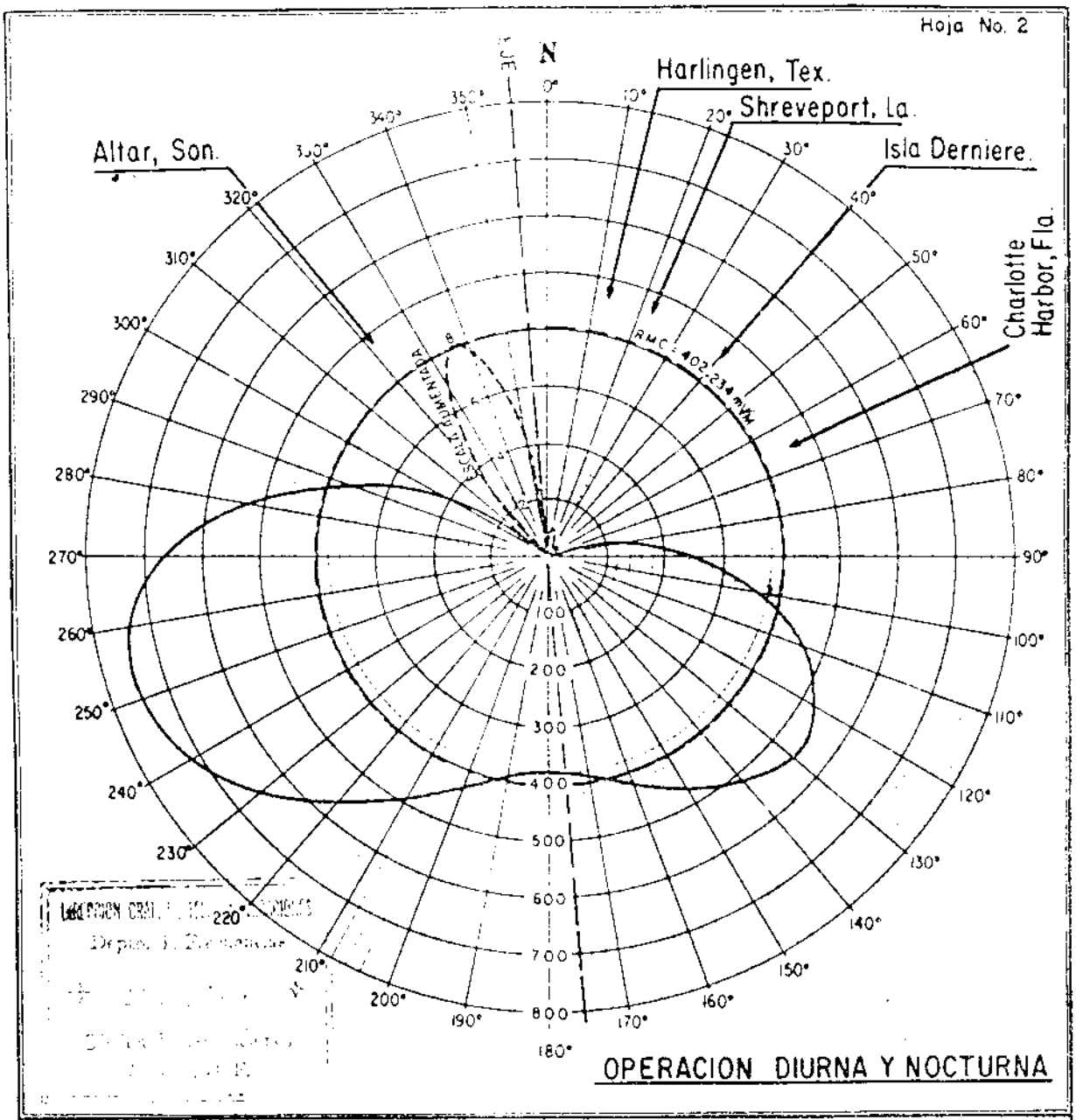
XEUR

Proposed Day & Night
(2-24-65ct)

Station XEUR
Mexico, D.F.

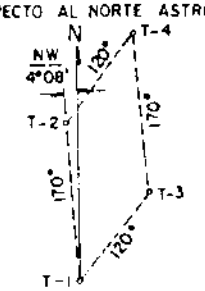
5kw,DA-1,U,Class II
1530 kc

Hoja No. 2



PATRON DE RADIACION HORIZONTAL CALCULADO EN mV/M A 1609 Mts

ESQUEMA DE LAS TORRES Y SU ORIENTACION CON RESPECTO AL NORTE ASTRONOMICO.



RADIODIFUSORA

XEUR

TEXCOCO, Edo. de Méx.

1530 KHz.
5,000 Watts.

DISEÑO:
Cia. DYCE S. de R.L.
Ing. Felipe Ruiz Gutierrez.
Alberto Torres Soto.

DIBUJÓ: E. SESMA.

#169

CHFI

Description Sheet
(7-27-62ct)

Station CHFI
Toronto, Ontario, Canada

50kw,DA-D,D,Class II
1540 kc

CORRECTED
DIRECTIONAL ANTENNA
DESCRIPTION SHEET

STATION: CHFI

MAIN STUDIO: Toronto, Ontario

FREQUENCY: 1540 KCS

POWER: 50 KW CLASS: II

Notification List No: 169

DATE: March 23, 1962.

Geographical Location of the Antenna System:

North Latitude: 43° 35' 27"
West Longitude: 79° 39' 14"

ANTENNA CHARACTERISTICS

Mode of Operation:	DA/D	
Number of Elements:	2	
Type of Elements:	guyed, uniform cross-section, series fed, no top loading	
TOWERS:	NE	SW
HEIGHT OVER INSULATORS:	200' (115°)	200' (115°)
OVERALL HEIGHT:	205'	205'
SPACING	106.5' (60°)	
PHASING:	-130°	+0
RATIO:	0.820	1.00
GROUND SYSTEM:	120 radials per tower 0.4 wavelengths long, spaced 3° around tower base. Radials bonded to common chord.	
PREDICTED EFFECTIVE FIELD:	220 MV/M for 1 KW 1555 MV/M for 50 KW	
ORIENTATION:	055° True	

NOTE: Please retain the antenna radiation pattern notified for station CHFI in Canadian Change List No. 169, dated March 23, 1962 and attach to this corrected description sheet. This only concerns corrections in the phasing and field ratio from that previously shown.

June 6, 1962.

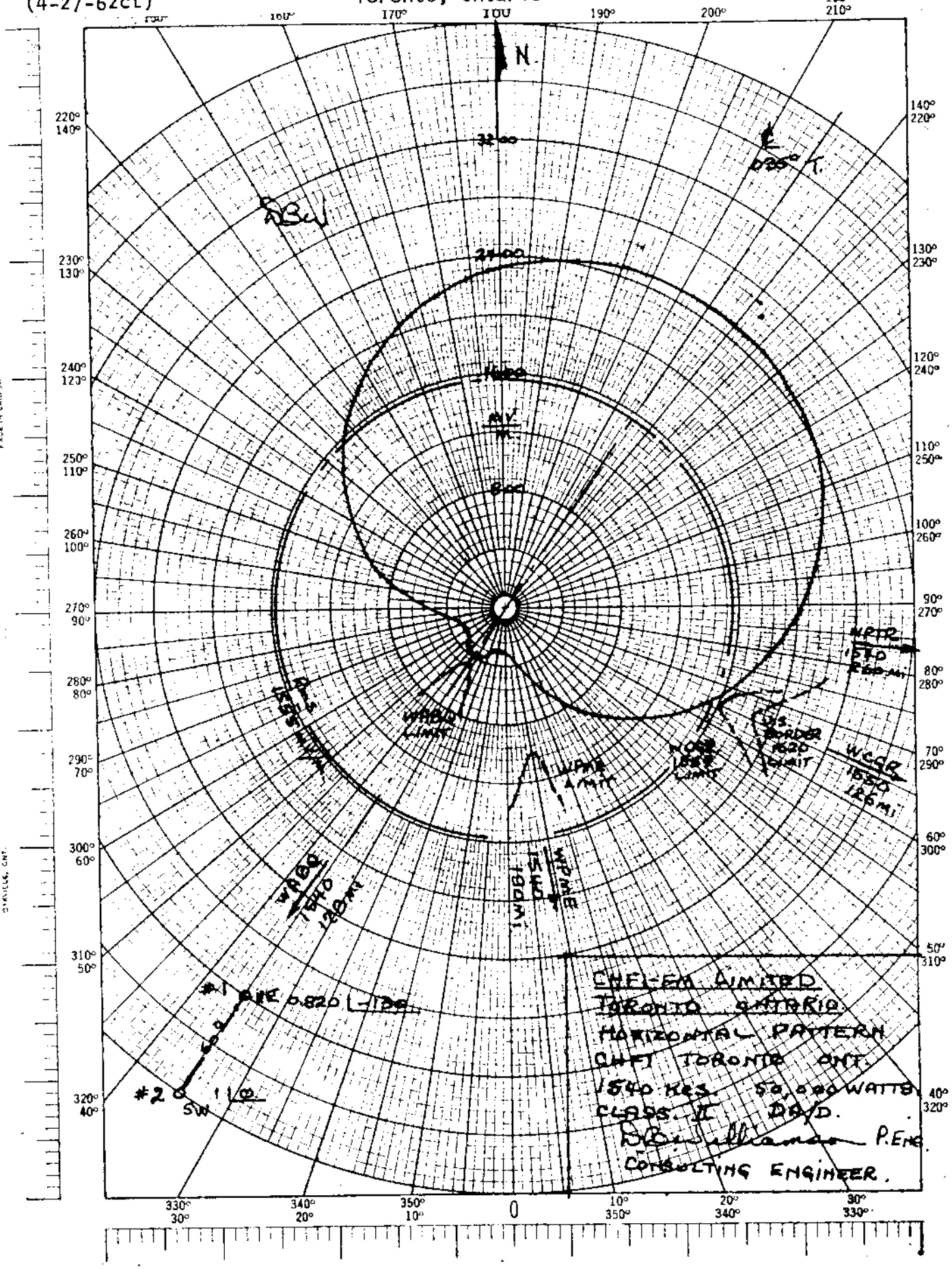
#169

CHFI

Proposed Day
(4-27-62ct)

Station CHFI
Toronto, Ontario

50kw,DA-D,D,Class II
1540 kc



CHIN
1540

IFRB Serial No. 1 2 4 24

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 – 1605 kHz

PART I GENERAL INFORMATION

(01) Administration: CANADA Sheet No. 422 Date 830824

Assigned frequency (kHz)		(02)	1540
Transmitting station	Name of the station	(03)	TORONTO ON
	Call sign	(04)	CHIN
	Additional identification	(05)	
	Station class	(06)	B
	Operational Status	(07)	P
Country		(08)	CAN
Geographical coordinates of the transmitting station		(09)	79 W 22 50 43 N 36 55

(11) a) New assignment [ ] b) Modification of characteristic of an assignment recorded in the plan [X] c) Cancellation of an assignment [ ]

(12) Modification under Section 4.2.14 Yes [ ] No [X]

(13) Date of bringing into service or cessation of operation [ ] Year Month Day

STATION PARAMETERS		DAYTIME OPERATION		NIGHT-TIME OPERATION
Station power (kW)	(21)	50.	(31)	
r.m.s. value of radiation for station power (mV/m at 1km)	(25)	2178.25	(35)	
Antenna type	(26)	B	(36)	
Simple vertical antenna electrical height (degrees)	(27)		(37)	

(44) Remarks

COORDINATION UNDER ARTICLE 4:								
COUNTRY	USA							
IN PROGRESS	X							
ACCEPTANCE OBTAINED								

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT
CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 - 1605 kHz

IFRB Serial No. 1 2 4 24

PART II Section I

Description of a directional antenna consisting of vertical conductors

Sheet No. 422

Date 830824

(01) TORONTO ON — Name of transmitting station

(02) CAN — Country

(03) D — Hours of operation

(04) 2 — Total number of towers

(05) Tower No.	(06) Tower field ratio	(07) Phase difference of the field (± degrees)	(08) Electrical tower spacing (degrees)	(09) Angular tower orientation (degrees)	(10) Reference tower indicator	(11) Electrical height of tower (degrees)	(12) Tower structure
1	1.	0.	0.	0.		.	1
2	.65	-100.	110.	344.		.	1
	.	.	.	.		.	
	.	.	.	.		.	
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	.	.	.	.		.	
	.	.	.	.		.	

(14) r.m.s value of radiation: 2178.25 mV/m at 1 km

(15) Type of pattern: E

(16) Special quadrature factor: . mV/m at 1 km

(17) SUPPLEMENTARY INFORMATION

CAN 1540

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT
CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 - 1605 kHz

PART IV

1242 4
IFRB Serial No.

Description of the top-loaded or sectionalized towers used for :

A) Directional antenna systems for towers entered in Part II Section I as top-loaded or sectionalized (column 12), or

B) Non-directional antenna towers entered in Part 1 as top-loaded or sectionalized (column 26 or 36)

(01) TORONTO ON
Name of transmitting station

(02) CAN
Country

422
Sheet No.

(03) D
Hours of Operation

(04) TOWER NUMBER	(05) A	(06) B	(07) C	(08) D
1	81.7	8.3		
2	81.7	8.3		

CHIR
1540

CHIN
1540

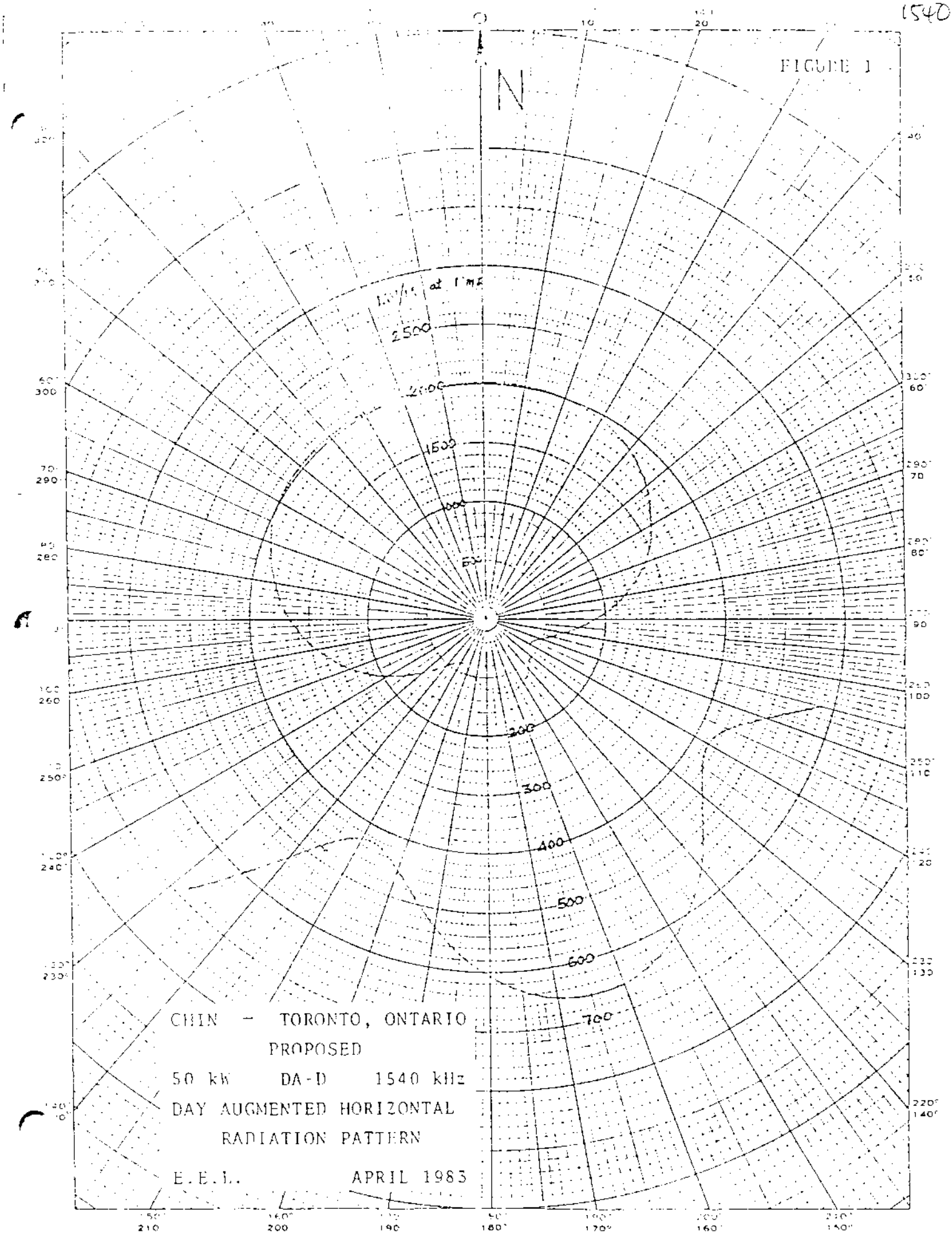


FIGURE 1
N
2500
2000
1500
1000
500
200
300
400
500
600
700
CHIN - TORONTO, ONTARIO
PROPOSED
50 kW DA-D 1540 kHz
DAY AUGMENTED HORIZONTAL
RADIATION PATTERN
E.E.L. APRIL 1983

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

CHARACTERISTICS OF A REGION 2 BROADCASTING STATION IN THE BAND 535 – 1605 kHz

1,2,4,2,4

CHIN 1540

PART I GENERAL INFORMATION

(a) Administration: CANADA Sheet No. 412 Date 820504

	Assigned frequency (kHz)	(02)	1,540
Transmitting station	Name of the station	(03)	TORONTO ON
	Call sign	(04)	CHIN
	Additional Identification	(05)	
	Station class	(06)	
	Operational Status	(07)	
	Country	(08)	CAN
	Geographical coordinates of the transmitting station	(09)	79W39'14" 43N35'27"

(11) a) New assignment [ ] b) Modification of characteristic of an assignment recorded in the plan [✓] c) Cancellation of an assignment [ ]

(12) Modification under Section 4.2.14 Yes [ ] No [✓]

(13) Date of bringing into service or cessation of operation Year Month Day

STATION PARAMETERS	DAYTIME OPERATION	NIGHT-TIME OPERATION
Station power (kW)	(21)	(31)
r.m.s. value of radiation for station power (mV/m at 1 km)	(25)	(35)
Antenna type	(26)	(36)
Simple vertical antenna electrical height (degrees)	(27)	(37)

(44) Remarks

COORDINATION UNDER ARTICLE 4							
COUNTRY	USA						
IN PROGRESS							
ACCEPTANCE OBTAINED	X						

FORM FOR THE APPLICATION OF ARTICLE 4 OF THE AGREEMENT

IFRB Circ. Nº

Description of the antenna system: Directional Coupling of Vertical Towers

Sheet No. 4/2

Date 820504

(01) TORONTO ON
Name of transmitting station

(02) CA
Country

(03) HJ
Hours of operation

(04) 2
Total number of towers

(05) Tower No.	(06) Tower field ratio	(07) Phase difference of the field (± degrees)	(08) Electrical tower spacing (degrees)	(09) Angular tower orientation (degrees)	(10) Reference tower indicator	(11) Electrical height of tower (degrees)	(12) Tower structure
1	1	0	0	0		115	
2	8.21	213.01	61.01	315		115	

(14) r.m.s value of radiation: 3.5012 mV/m at 1 km

(15) Type of pattern: E

(16) Special quadrature factor: mV/m at 1 km

(17) SUPPLEMENTARY INFORMATION

Existing day operation. Planned night operation in Rio de Janeiro Plan is at different site.

CHIN 1540

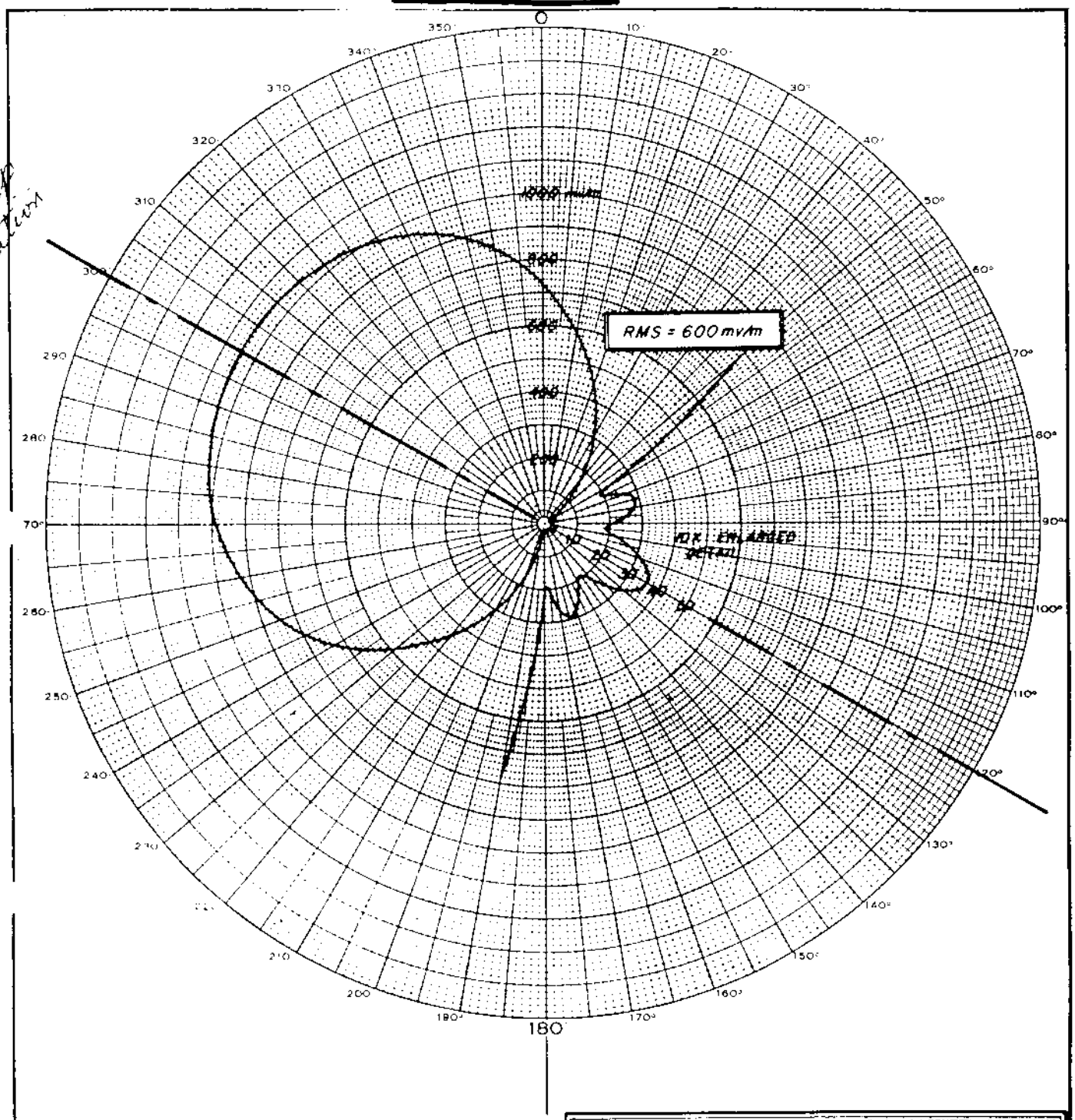
KASA

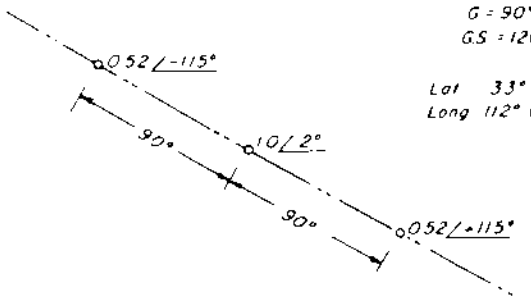
PROPOSED DAY
(9-20-61ct)

New; Eastside Broadcasting Co.
Phoenix, Arizona

10kw,DA-D,D
1540 kc

#200
8-13-64
Granted CP
for new station





G = 90°
GS = 120 x 90°

Lat 33° 22' 36"
Long 112° 05' 25"

EXHIBIT E-2

PROPOSED NEW STATION
1540 kc 10 kw DA-D
PHOENIX, ARIZONA

ARCHER S. TAYLOR
CONSULTING RADIO ENGINEER
POST OFFICE BOX 1479
MISSOULA, MONTANA

JUNE 1961

FCC File No.BP-15022
Accepted 8-23-61

New; Eastside Broadcasting Co.
Phoenix, Arizona

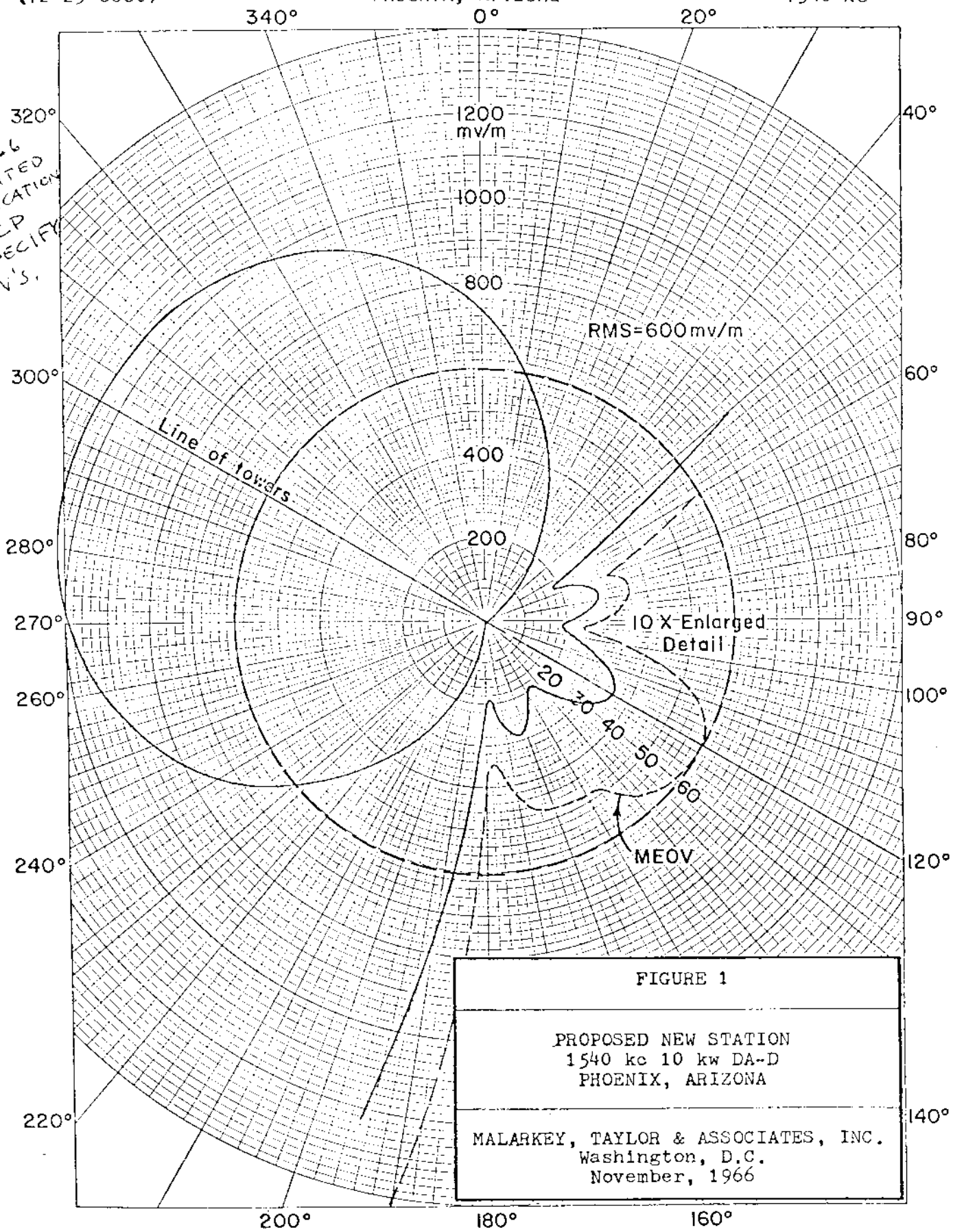
1540 kc

KAS

Proposed Day Nulls
(12-29-66ct)

Station KASA
Phoenix, Arizona

10kw,DA-D,D
1540 kc



12-21-66 GRANTED MODIFICATION OF CP TO SPECIFY MEOV'S.

FIGURE 1

PROPOSED NEW STATION
1540 kc 10 kw DA-D
PHOENIX, ARIZONA

MALARKEY, TAYLOR & ASSOCIATES, INC.
Washington, D.C.
November, 1966

FCC File No.BMP-11937
Accepted 12-5-66

Station KASA
Phoenix, Arizona

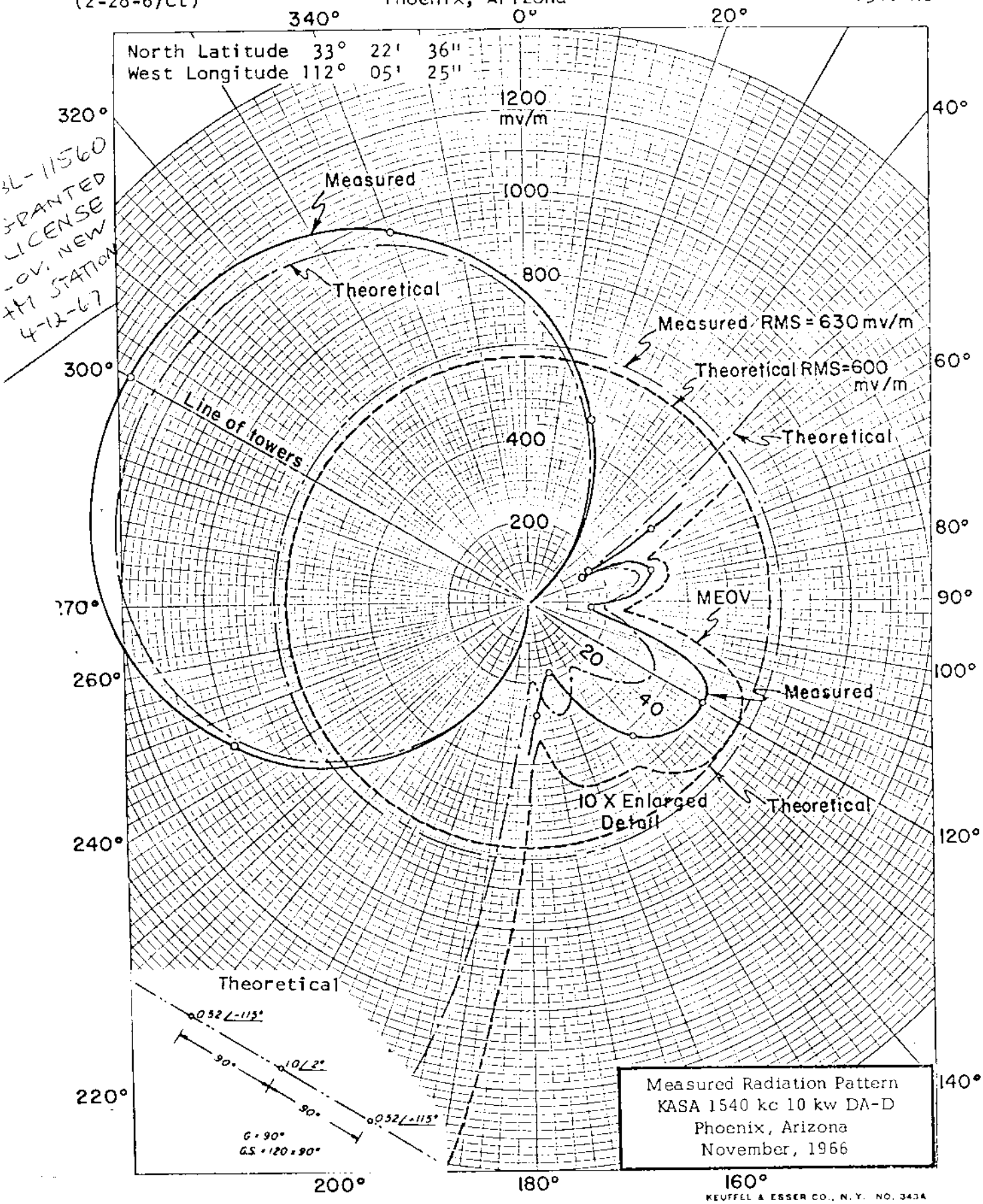
1540 kc

KASA

Measured Day
(2-28-67ct)

Station KASA
Phoenix, Arizona

10kw, DA-D, D
1540 kc



BL-11560
GRANTED
LICENSE
COV. NEW
AM STATION
4-12-67

MALARKEY, TAYLOR & ASSOCIATES

FCC File No. BL-11560
Accepted 2-20-67

Station KASA
Phoenix, Arizona

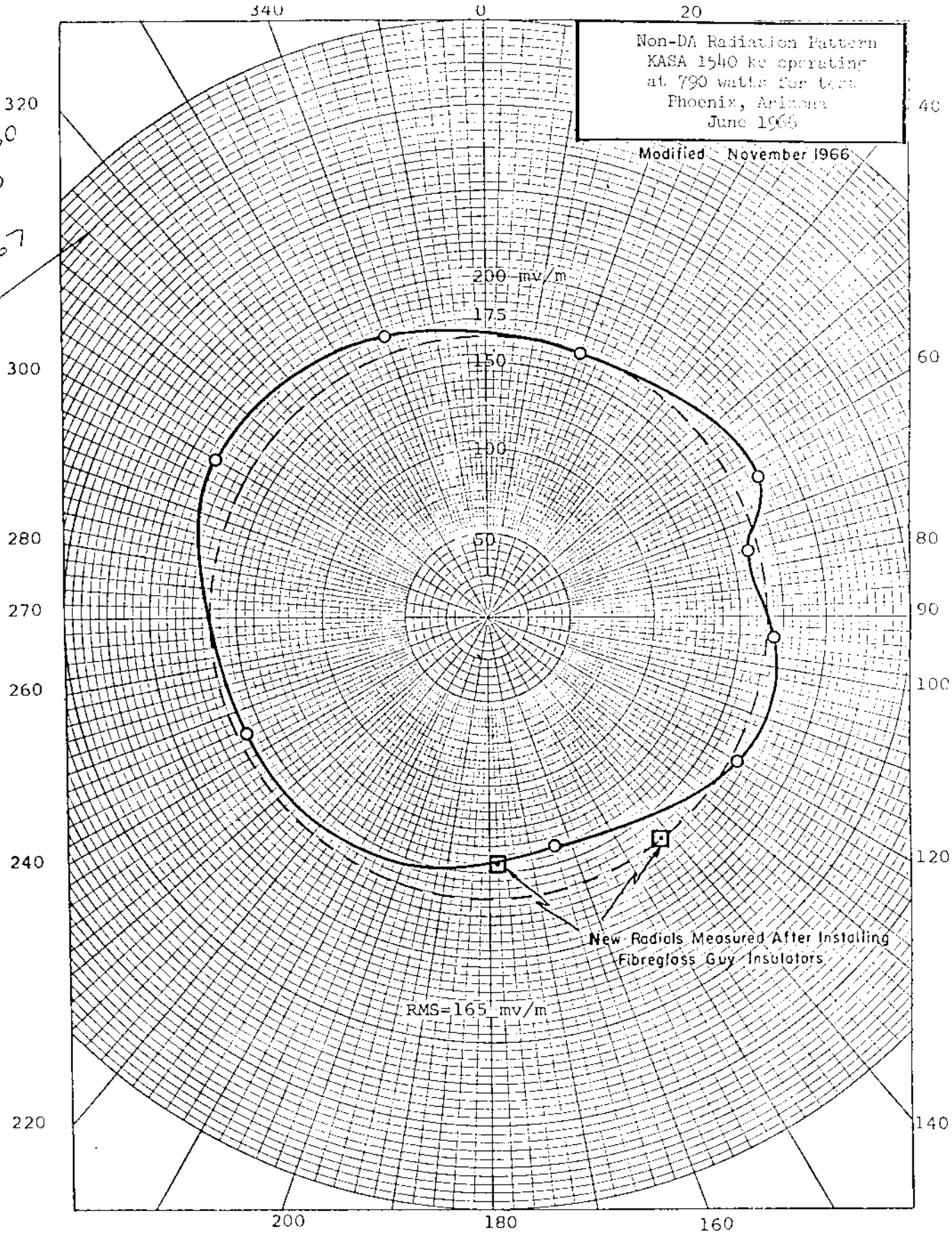
1540 kc

KASA

Measured Non-DA
(2-28-67ct)

Station KASA
Phoenix, Arizona

10kw,DA-D,D
1540 kc



BL-11560
GRANTED
LICENSE
4-12-67

KEUFFEL & ESSER CO., N.Y. NO. 343A
POLAR COORDINATE

MALARKEY, TAYLOR & ASSOCIATES

FCC File No.BL-11560
Accepted 2-20-67

Station KASA
Phoenix, Arizona

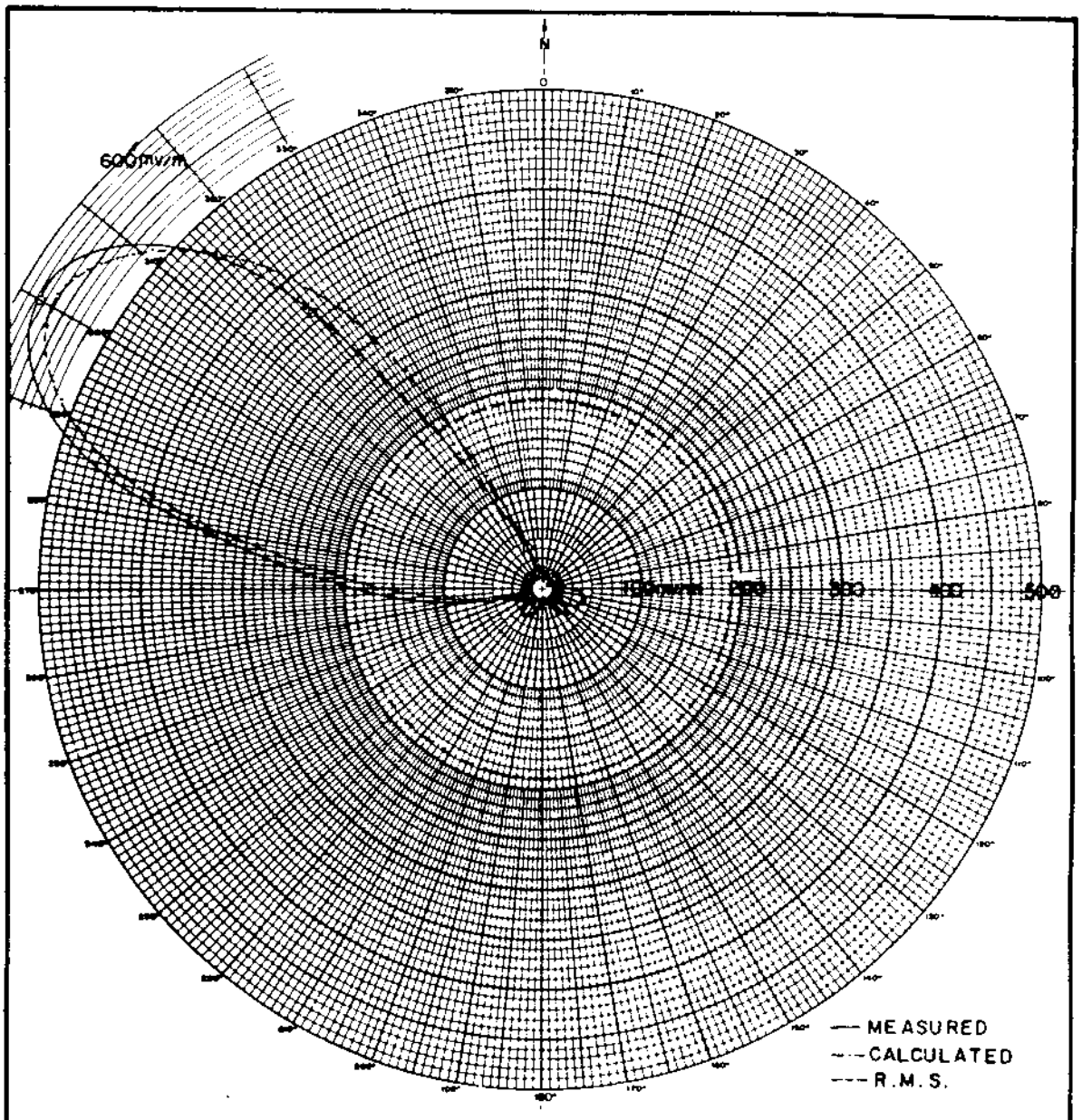
1540 kc

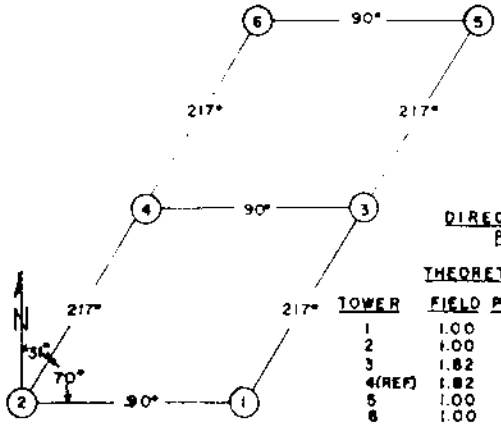
KBUY ~~KCUL~~

Measured Night
(9-28-66ct)

Station KCUL
Fort Worth, Texas

1kw,50kw-LS,DA-2,U
1540 kc





DIRECTIONAL ANTENNA PARAMETERS

TOWER	THEORETICAL FIELD	THEORETICAL PHASE	MEASURED FIELD	MEASURED PHASE
1	1.00	108°	1.013	98°
2	1.00	0°	1.013	1°
3	1.82	100°	1.594	94°
4(REF)	1.82	0°	1.820	0°
5	1.00	100°	1.032	92°
6	1.00	0°	1.032	3°

APPLICANT	RADIO STATION KCUL
LOCATION	FORT WORTH, TEXAS
FREQUENCY	1540 KC/S
POWER	1.0 KW
LATITUDE	32° 39' 05"
LONGITUDE	97° 11' 38"
WHEN USED	NIGHTTIME
R.M.S. FIELD	189 MV/M
DATE	6/6/66

William B. Carr
CONSULTING ENGINEER
FORT WORTH, TEXAS

FCC File No.BZ-6059
Accepted 8-31-66

Station KCUL
Fort Worth, Texas

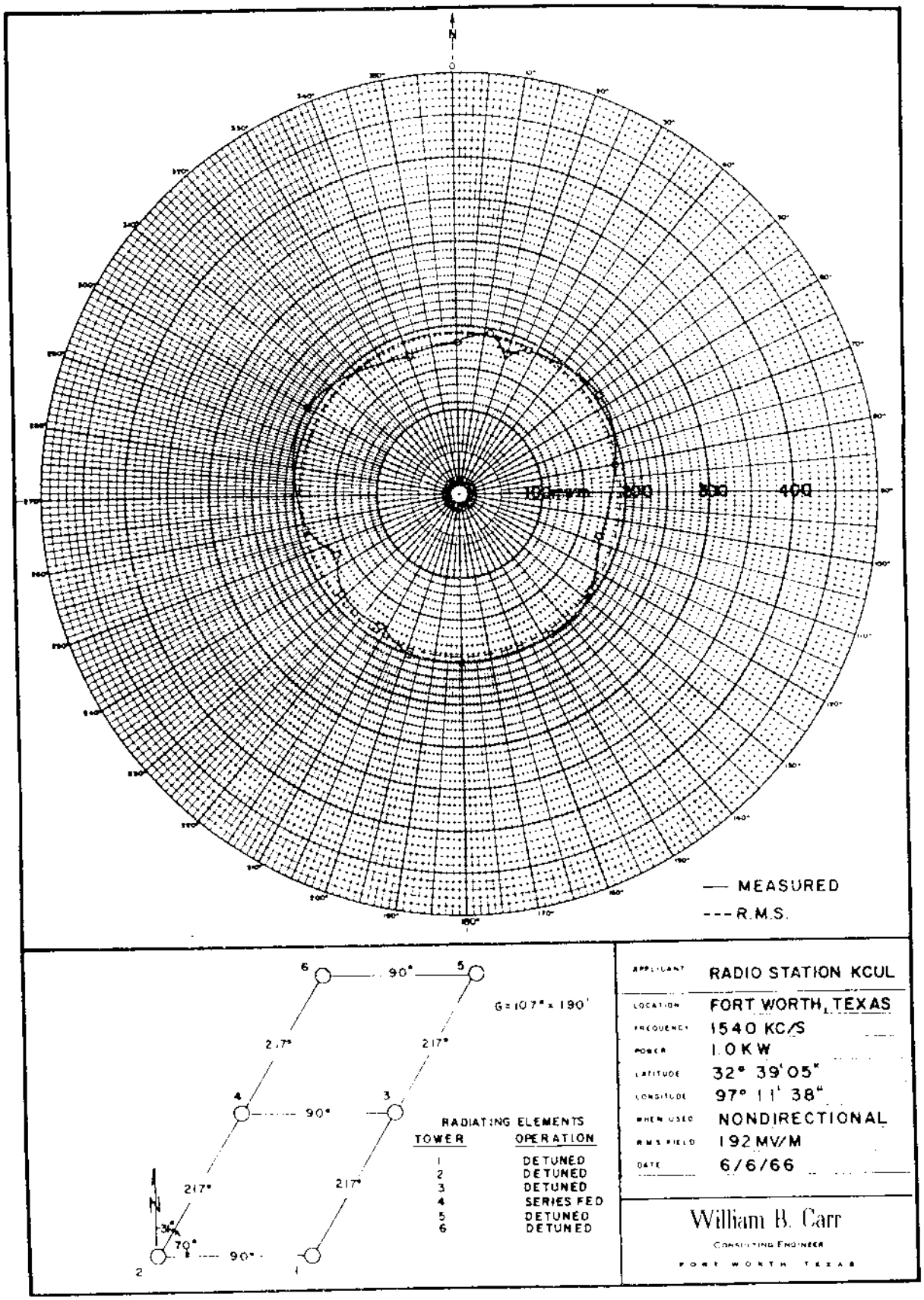
FIGURE 2B
1540 kc

KBUY ~~KCUL~~

Measured Non-DA
(9-28-66ct)

Station KCUL
Fort Worth, Texas

1kw,50kw-LS,DA-2,U
1540 kc



FCC File No.BZ-6059
Accepted 8-31-66

Station KCUL
Fort Worth, Texas

FIGURE 2A
1540 kc

KBUY ~~KCUL~~

Measured Night Nulls
(9-28-66ct)

Station KCUL
Fort Worth, Texas

1kw,50kw-LS,DA-2,U
1540 kc

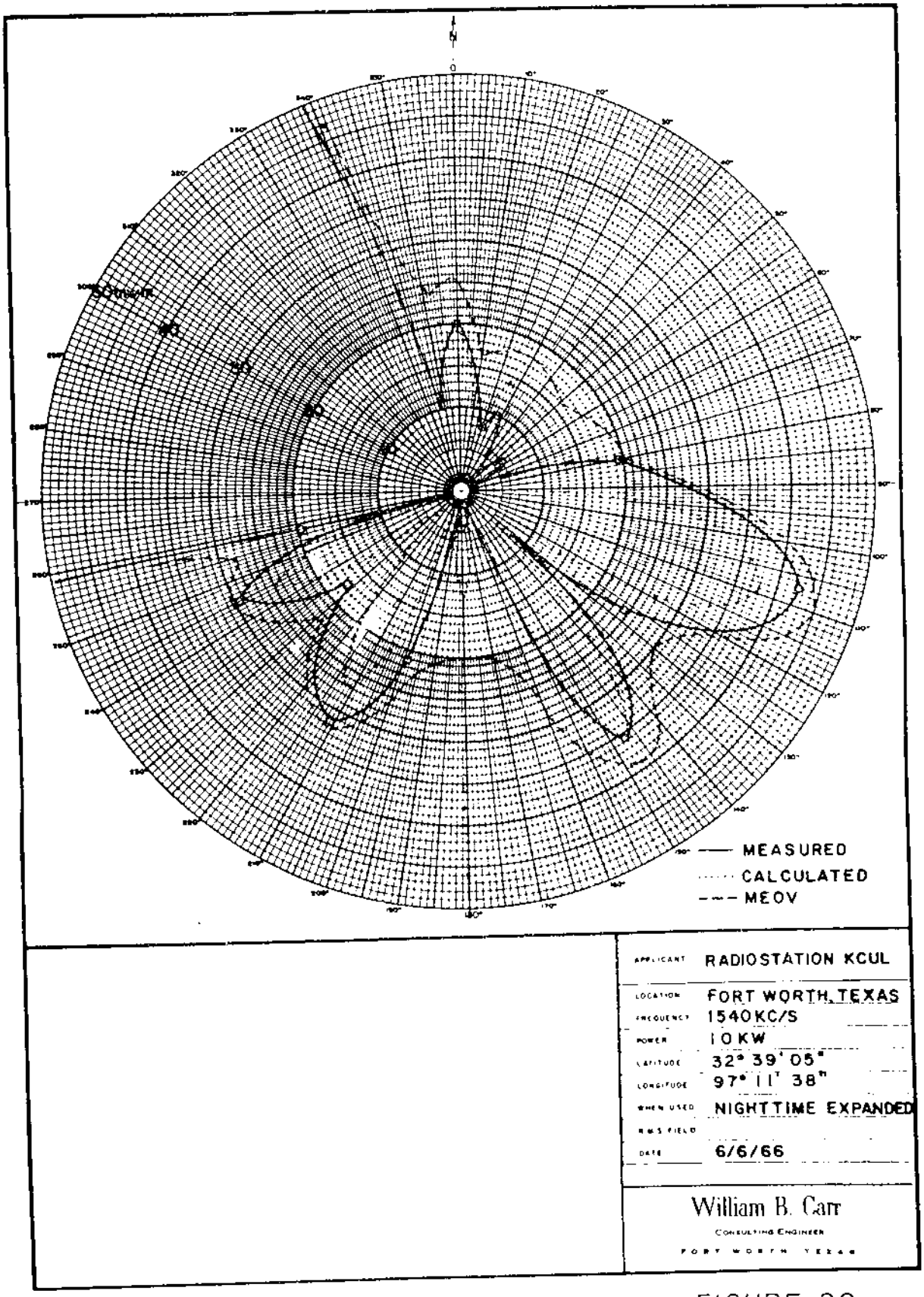


FIGURE 2C

FCC File No.BZ-6059
Accepted 8-31-66

Station KCUL
Fort Worth, Texas

1540 kc

KBUY ~~KCUL~~

MEASURED DAY (5-8-61g)

Station KCUL
Fort Worth, Texas

1kw, 50kw-LS, DA-2, U
1540 KC

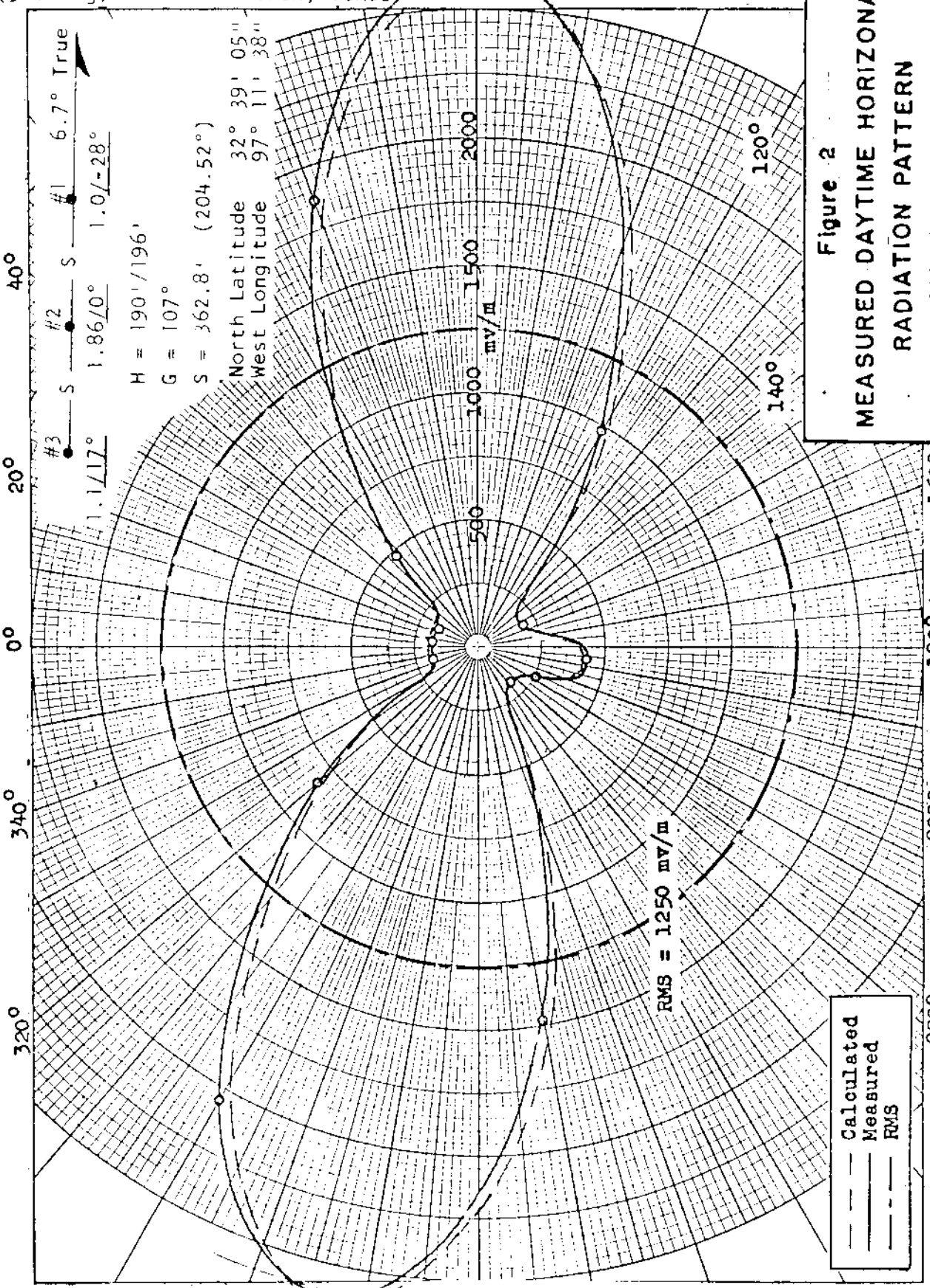


Figure 2
MEASURED DAYTIME HORIZONAL RADIATION PATTERN
KCUL 1540 KC Ft. Worth, Texas

FCC File No. BL-8318
Accepted 5-1-61

KCUL
Fort Worth, Texas

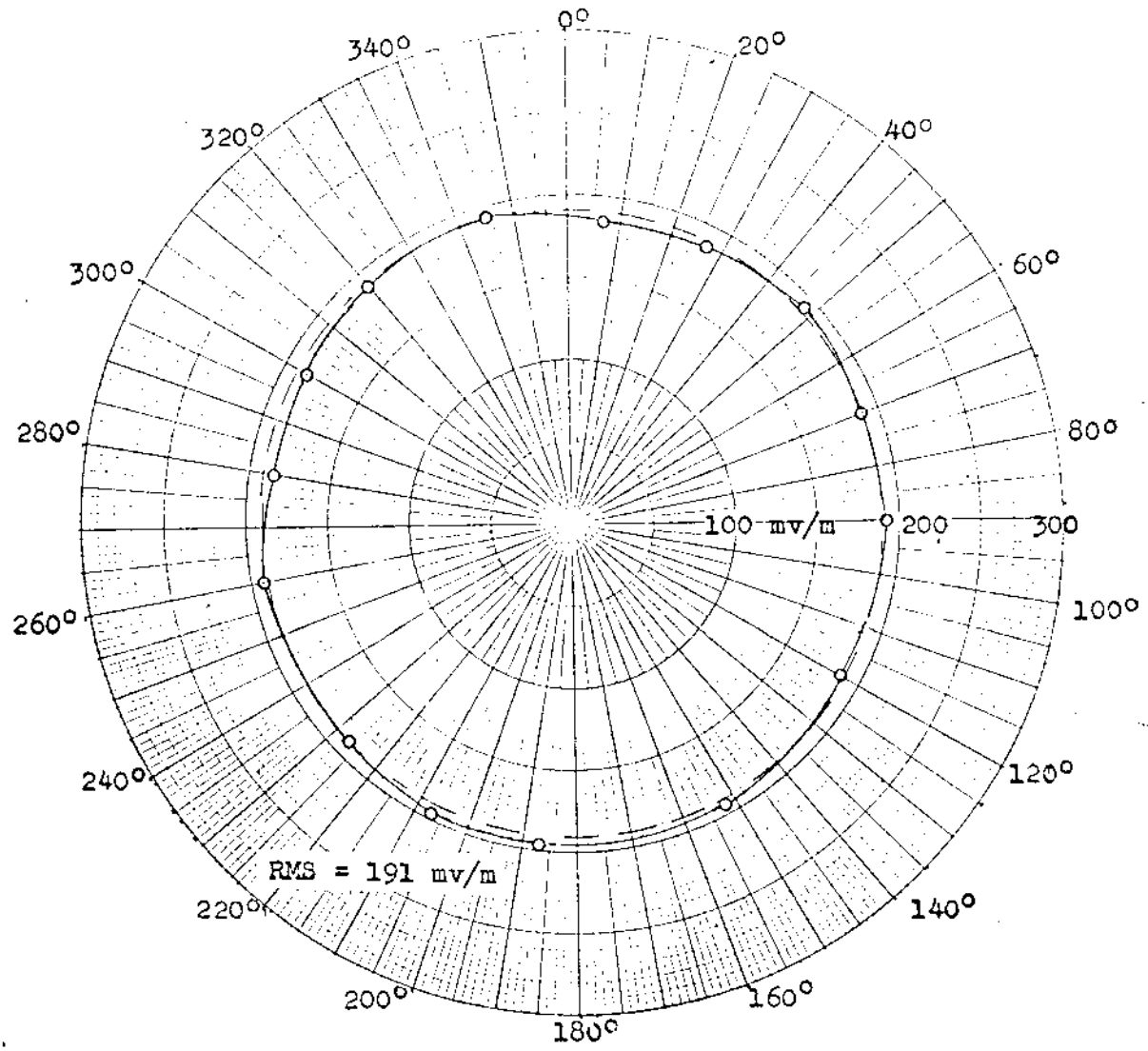
1540 KC

KBUY ~~KCUL~~

MEASURED NON-DA
(5-8-61g)

Station KCUL
Fort Worth, Texas

1kw,50kw-LS,DA-2,U
1540 KC



North Latitude 32° 39' 05"
West Longitude 97° 11' 38"

Figure 3

MEASURED ONE KILOWATT NON-DIRECTIONAL HORIZONAL RADIATION PATTERN

KCUL 1540 KC Ft. Worth, Texas

50,000 Watts Day 1,000 Watts Night

DA 2

FCC File No. BL-8318
Accepted 5-1-61

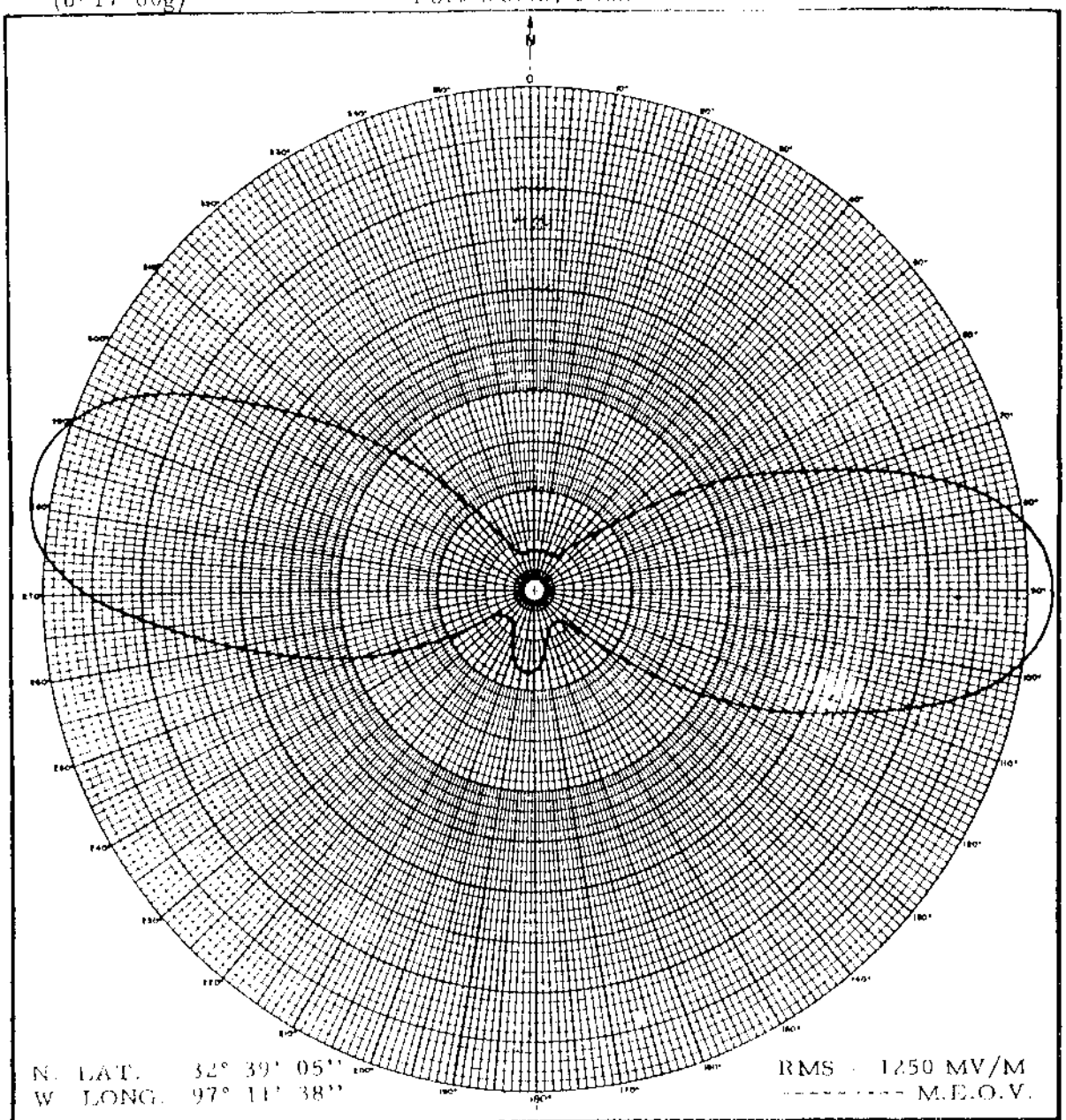
KCUL
Fort Worth, Texas 1540 KC

KBUY ~~KCUL~~

PROPOSED DAY
(6-17-60g)

Station KCUL
Fort Worth, Texas

1kw,50kw-LS, DA-2,U
1540 KC



N 6.7° E

1.0/-22°

1.96/8.2°

1.0/+22°

EXHIBIT IV
LATTICE HORIZONTAL RADIATION PATTERN
MAGNOLIA BROADCASTING COMPANY, INC. KCUL 1540 KC 1 KW-E, 50 KW-DAY, DA-2 FORT WORTH, TEXAS

WILLIAM L. FOSS, INC.
Electronic Consultants
WASHINGTON 6, D. C.
[illegible] Street, N.W. [illegible]

PATTERN NO
SUPERSEDES
APP.

FCC File No. BMP-9011
Accepted 6-13-60

KCUL
Fort Worth, Texas

1540 KC

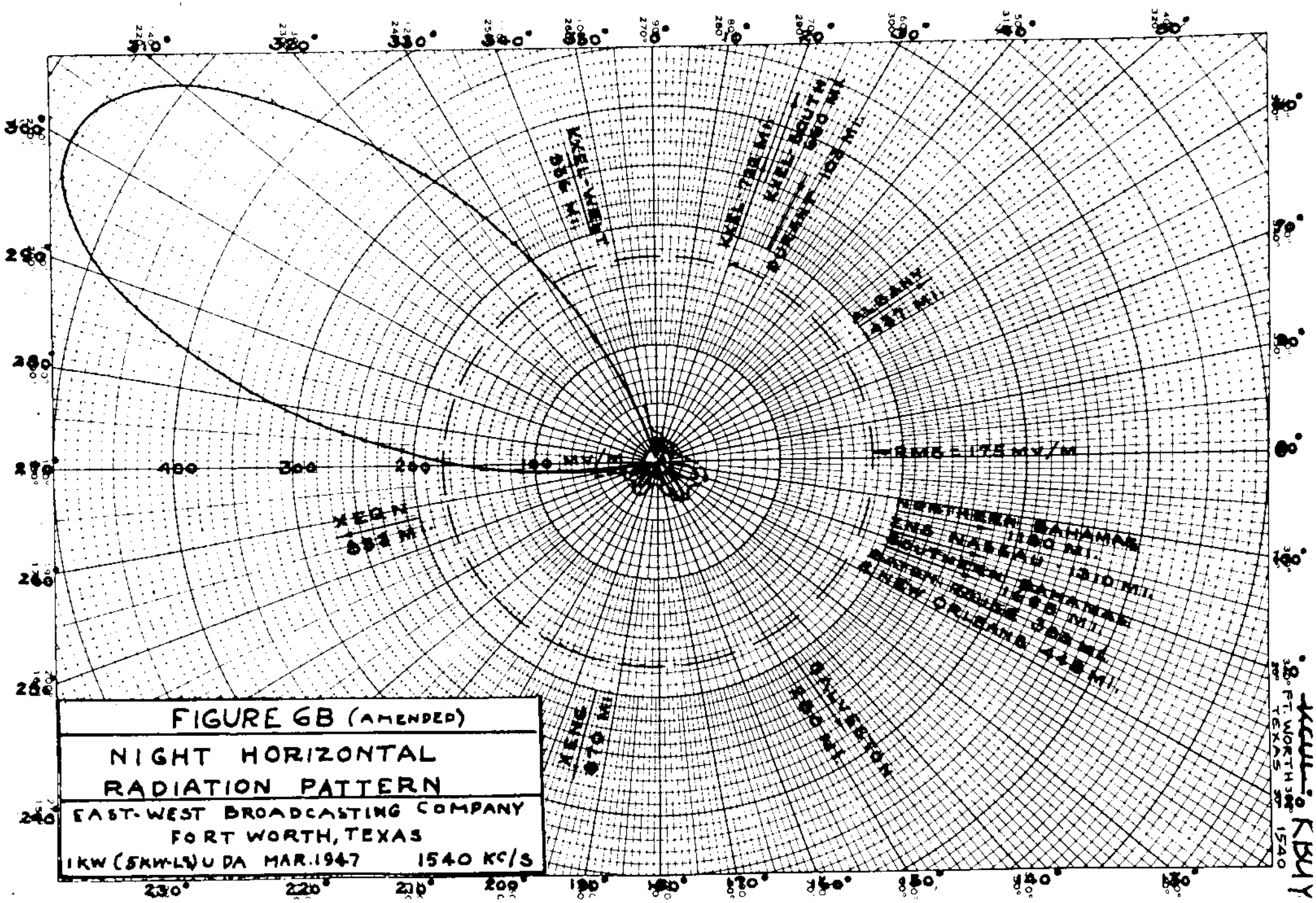


FIGURE 6B (AMENDED)

NIGHT HORIZONTAL RADIATION PATTERN

EAST-WEST BROADCASTING COMPANY
FORT WORTH, TEXAS

1KW (5KW-LS) U DA MAR. 1947 1540 KC/S

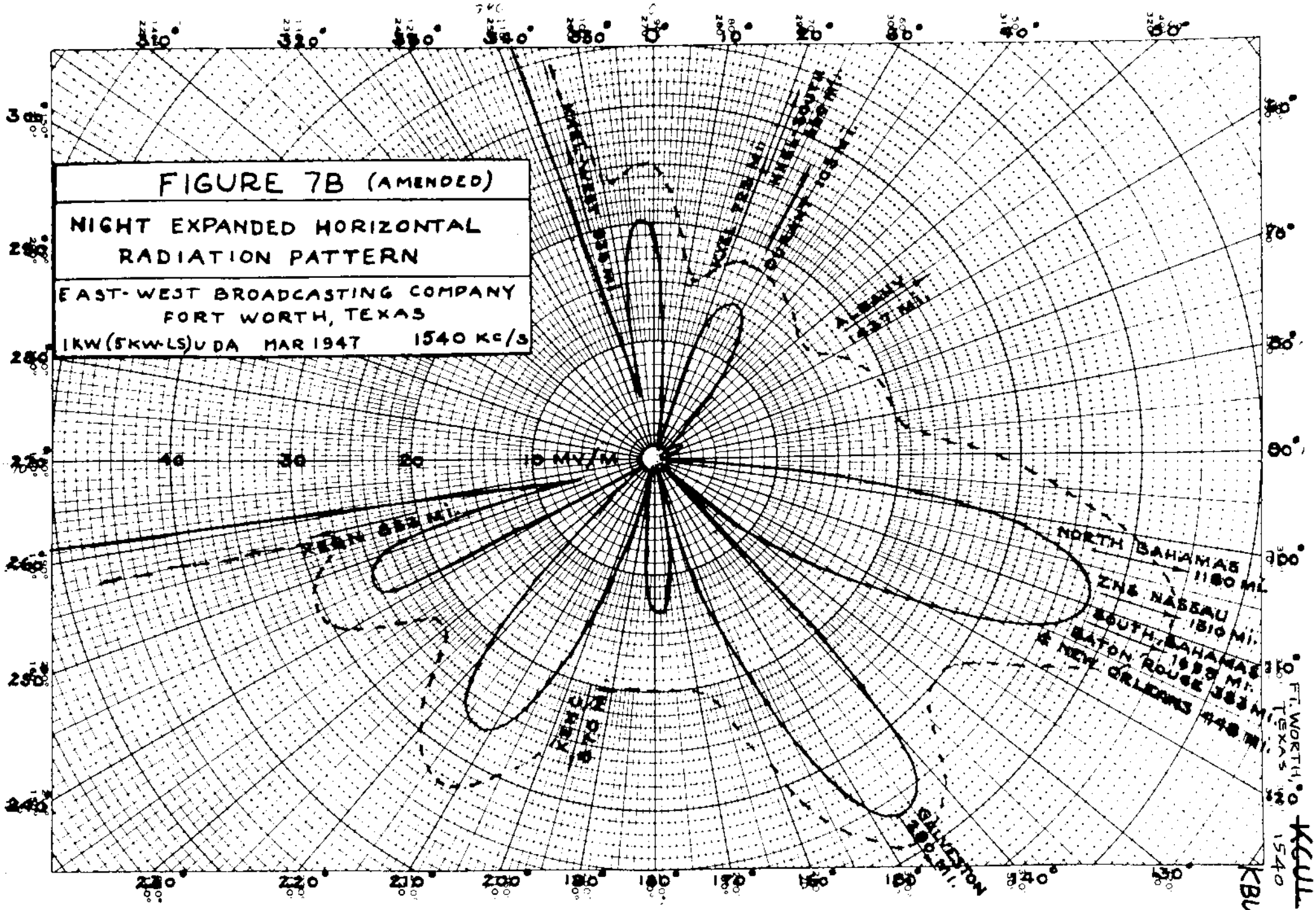
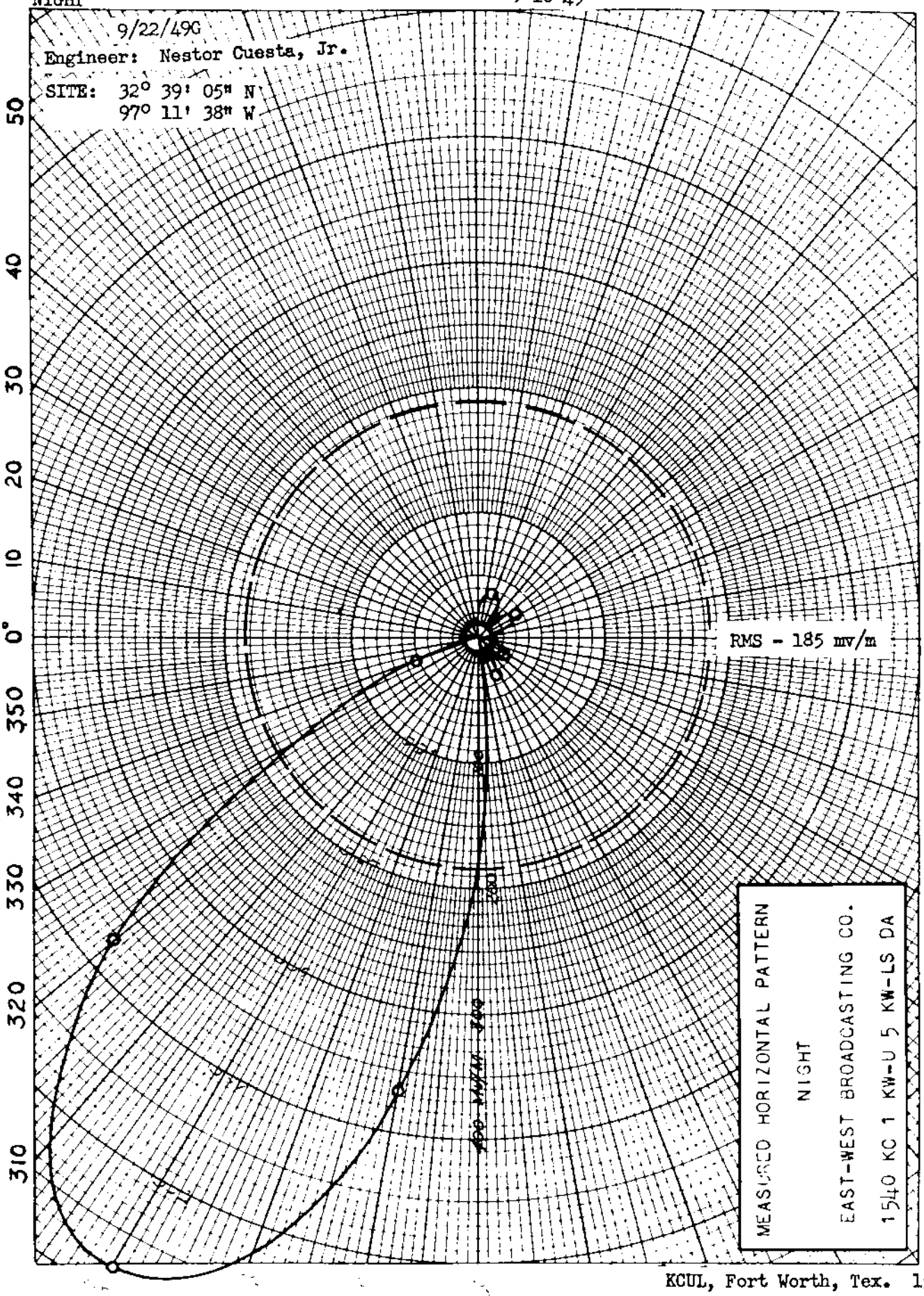


FIGURE 7B (AMENDED)
NIGHT EXPANDED HORIZONTAL RADIATION PATTERN
EAST-WEST BROADCASTING COMPANY
FORT WORTH, TEXAS
1KW (5KW-LS) U DA MAR 1947 1540 KC/S
10 MV/M
20
30
40
NORTH BAHAMAS 1180 MI.
ZNS NASSAU 1810 MI.
SOUTH BAHAMAS
BATON ROUGE 353 MI.
NEW ORLEANS 448 MI.
GALVESTON 290 MI.
ALBANY 437 MI.
FT. WORTH, TEXAS
KGUL 1540
KBU

KBUY ~~KCUL~~

MEASURED
NIGHT

KCUL, FORT WORTH, TEXAS 9-16-49 1kw,5kw-LS,DA1 1540 kc



KCUL, Fort Worth, Tex. 1540 kc

OVER

KBUY ~~KCUL~~

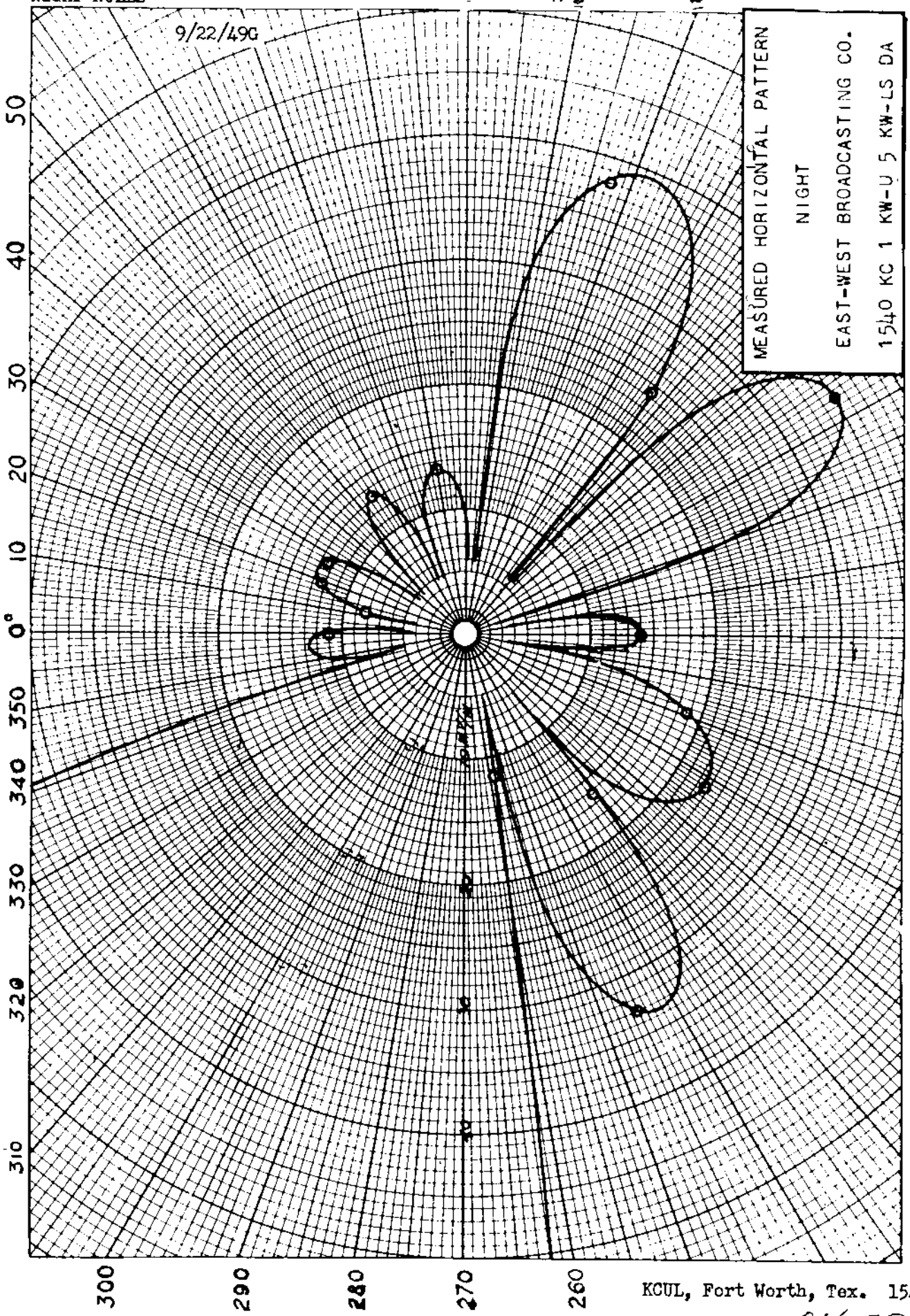
MEASURED
NIGHT NULLS

KCUL, FORT WORTH, TEXAS

9-16-49

1kw,5kw-LS,DA1

1540 kc



KCUL, Fort Worth, Tex. 1540 kc

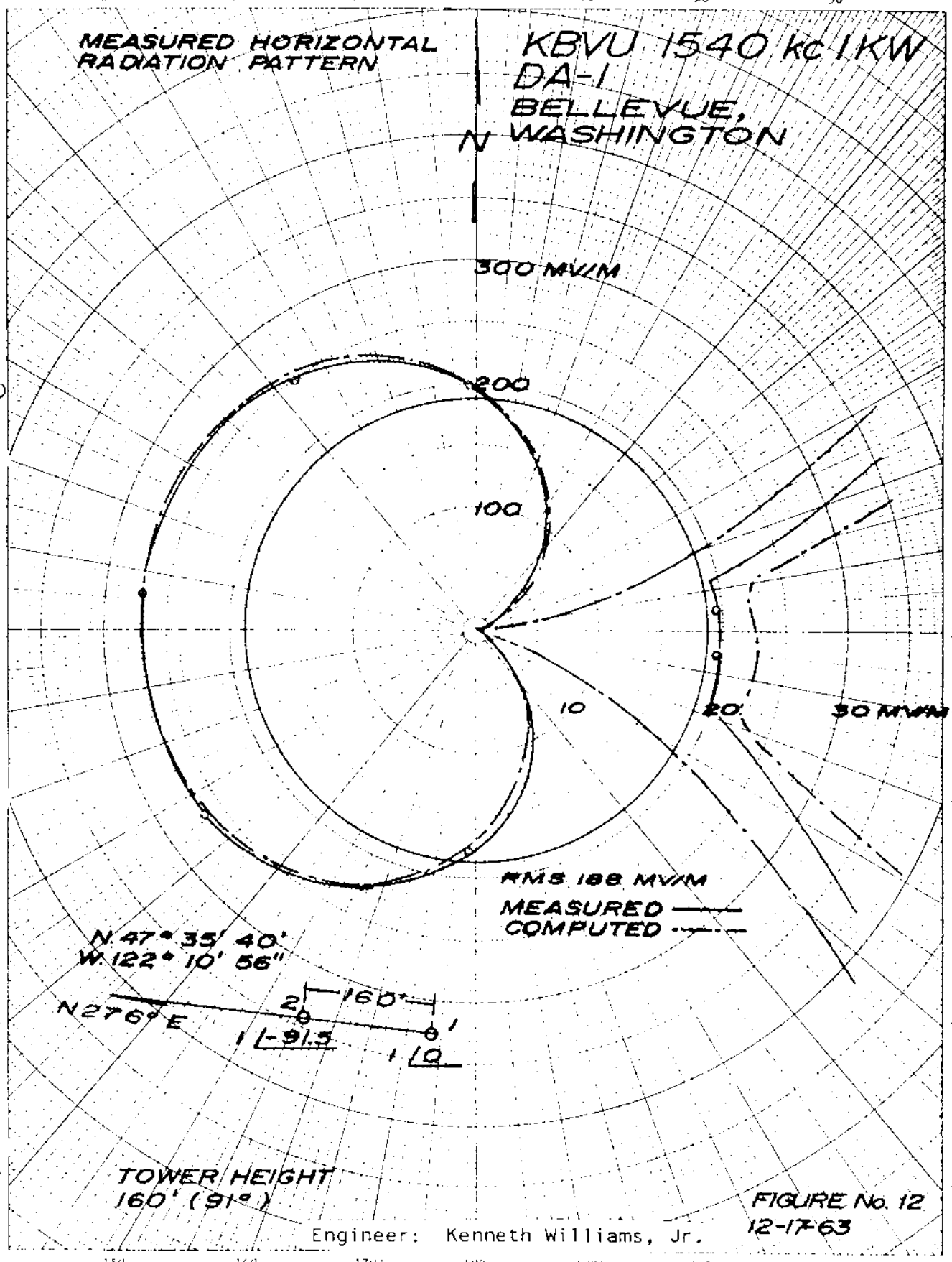
OVER

KBVU

Measured Day & Night
(4-24-64ct)

Station KBVU
Bellevue, Washington

1kw,DA-1,U
1540 kc



FCC File No. BL-10466
Accepted 3-26-64

Station KBVU
Bellevue, Washington

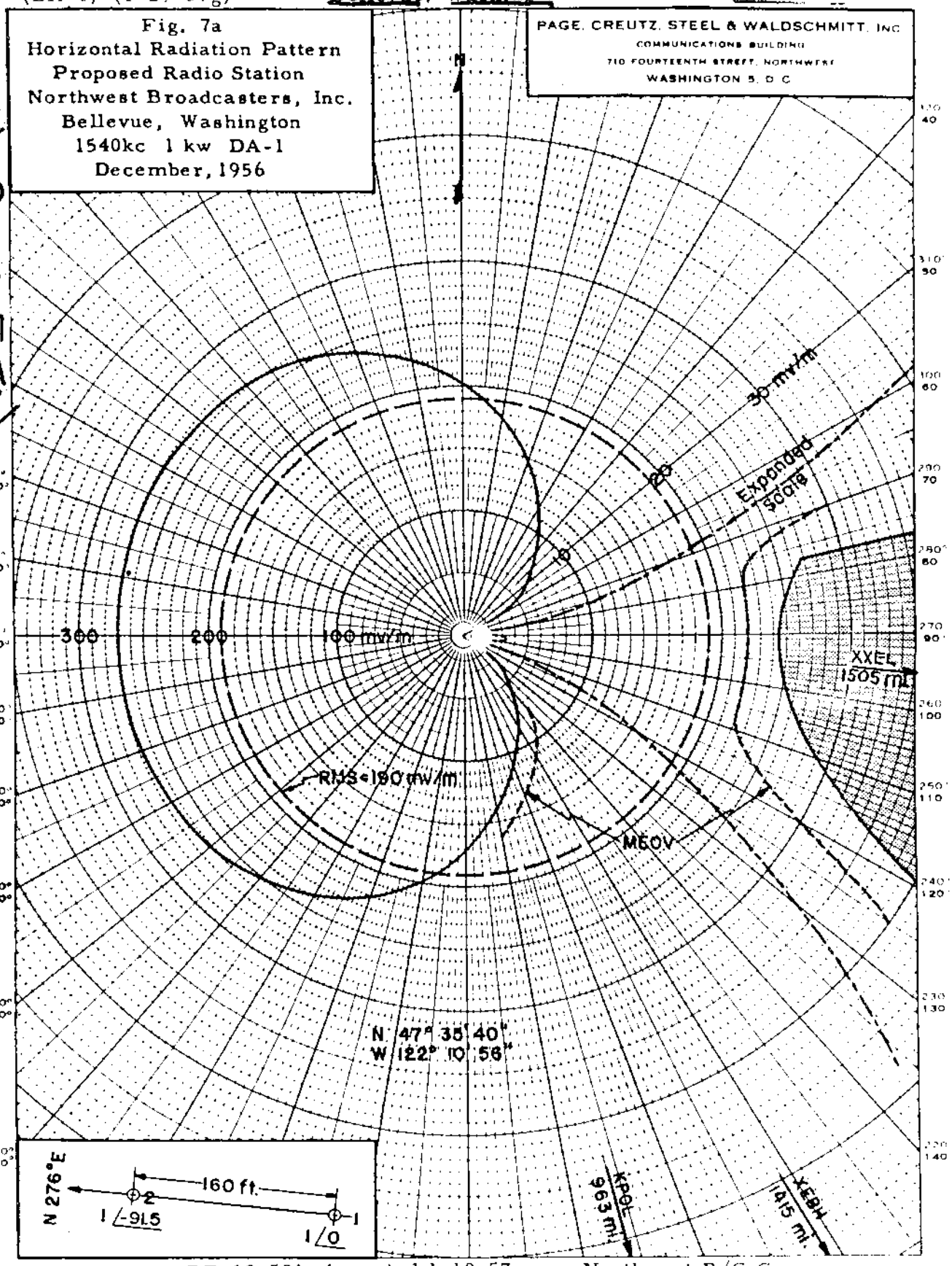
1540 kc

KBVU

PROPOSED NIGHT & DAY Northwest B/C, Inc. 1 KW, DA-1
(DA-1) (1-29-57g) Bellevue, Washington 1540 K C

6-21-61 granted CP for new station
MP10819
3-13-63 MCP granted for
L: 47-35-57
WL: 122-11-17

8-12-63 mod. of CP dismissed



FCC File No. BP-10,521 Accepted 1-10-57

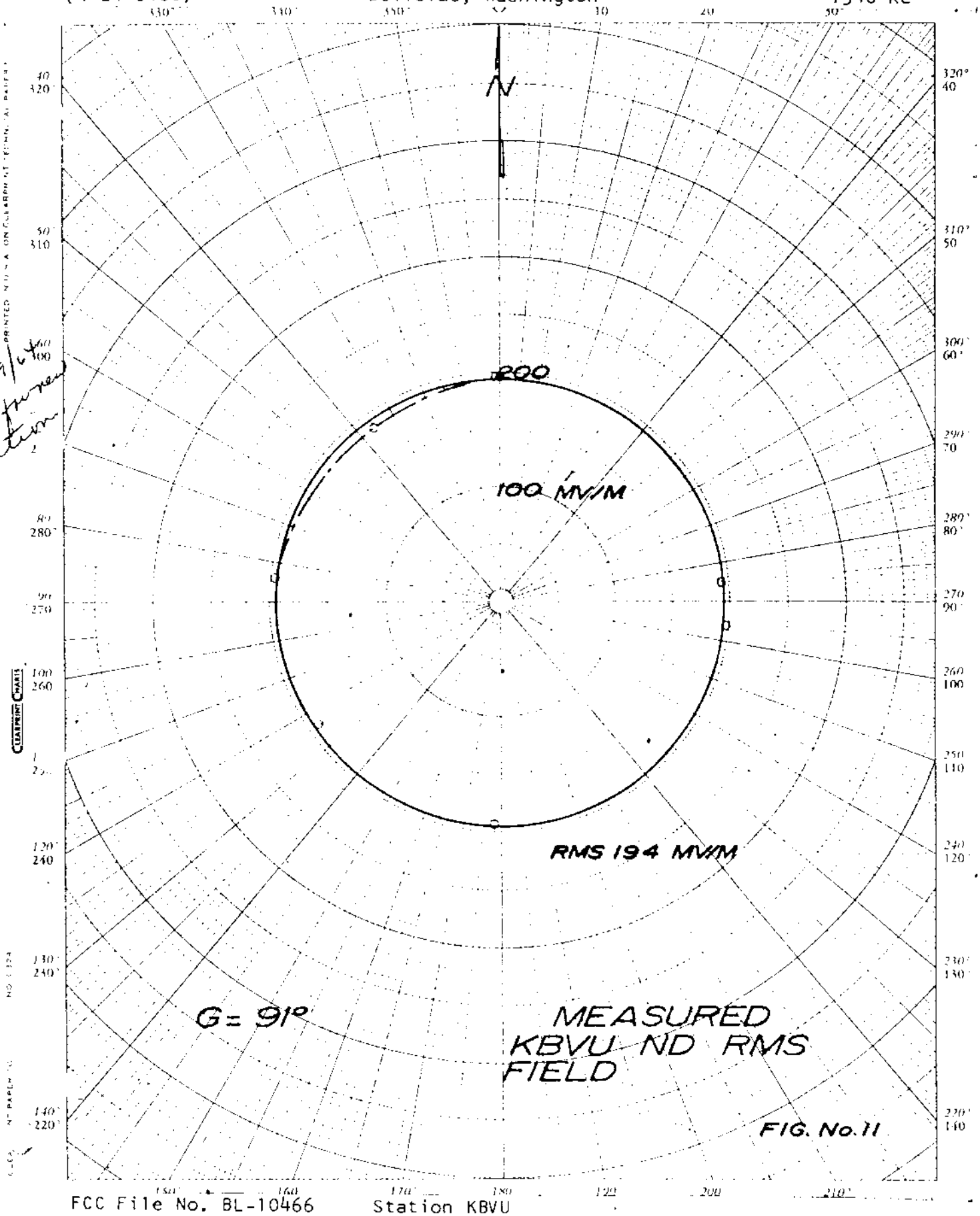
Northwest B/C Co.
Bellevue, Washington 1540KC

KBVU

Measured Non-DA-
(4-24-64ct)

Station KBVU
Bellevue, Washington

1kw,DA-1,U
1540 kc



FCC File No. BL-10466
Accepted 3-26-64

Station KBVU
Bellevue, Washington

1540 kc

KEDA
1540 kHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KEDA

Main Studio: San Antonio, Texas

Frequency: 1540

Power: 1kw Night 5kw Day

Notification List No. 1783

Date: November 2, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM: ,

North Latitude: 29° 21' 30"
West Longitude: 98° 21' 05"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 6
Type of elements: Series excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	SE(#1)	EC(#2)	NE(#3)	SW(#4)	WC(#5)	NW(#6)
HEIGHT ABOVE INSULATORS:	160'	160'	160'	160'	160'	160' (90.2°)
NIGHT PHASING:	102.5°	0.0°	-101.4°	-19.5°	-122°	136.6°
NIGHT FIELD RATIO:	0.65	1.0	0.45	0.57	0.87	0.39
DAY PHASING:	---	100°	---	140°	0.0°	---
DAY FIELD RATIO:	---	0.9	---	0.4	1.0	---

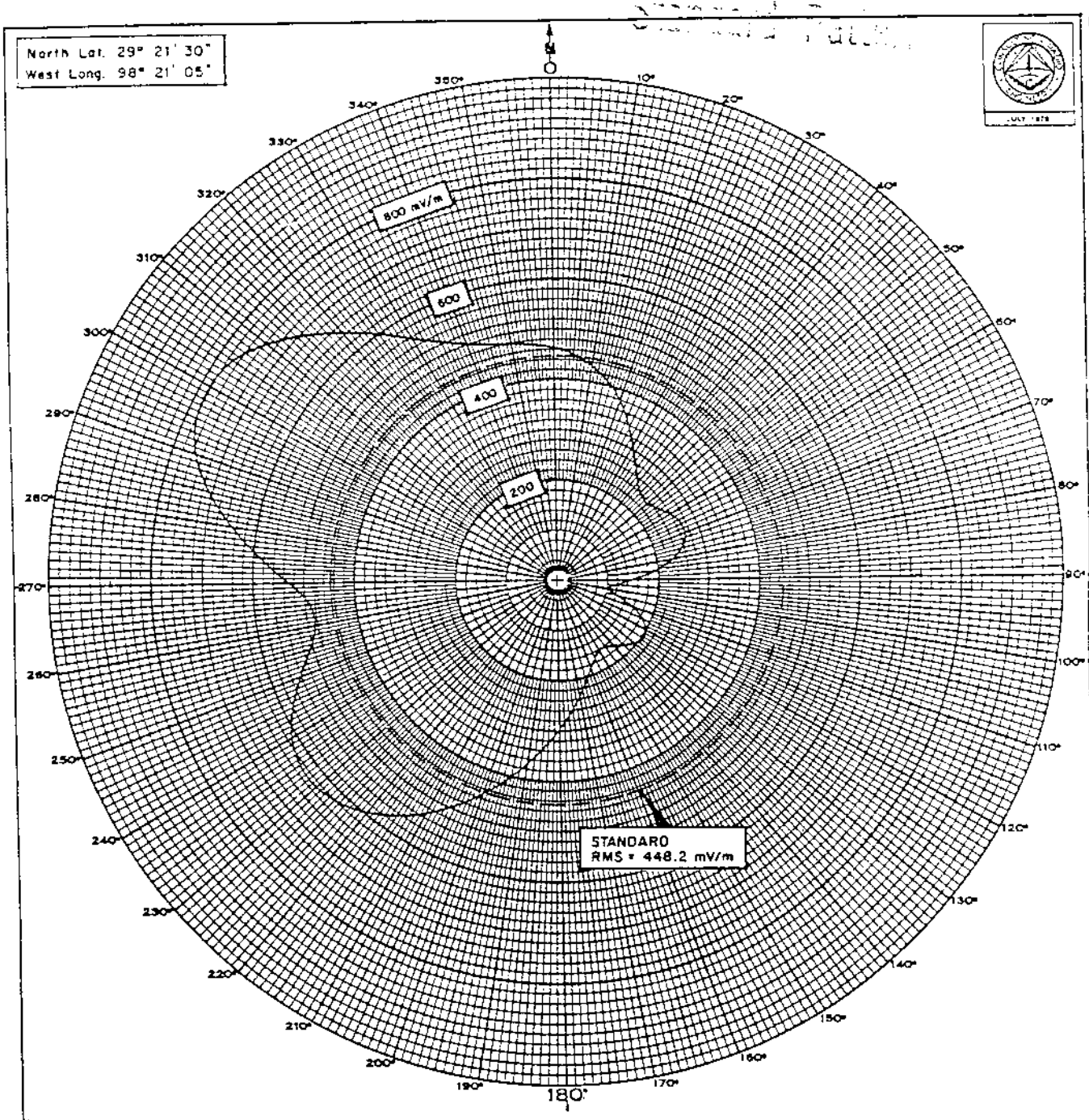
SPACING AND ORIENTATION: The towers are located in two parallel rows with 3 towers per row. Adjacent towers in a row are spaced 558.85' (315°) on a line bearing 3° true. End towers forming a side of the parallelogram are spaced 159.67' (90°) on a line bearing 304° true.

GROUND SYSTEM: 120-160' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day	426.6 mv/m	458.2 mv/m	448.2 mv/m
Night	188.6 mv/m	254.3 mv/m	198.1 mv/m

KEDA
1540kHz
DA-D



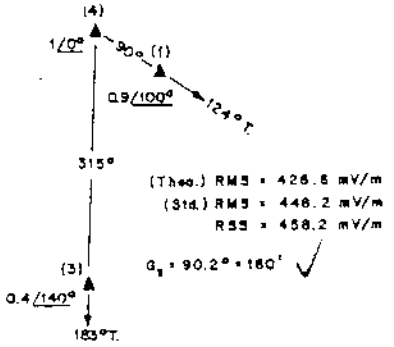


FIGURE 1

PROPOSED DAYTIME HORIZONTAL PLANE
STANDARD RADIATION PATTERN

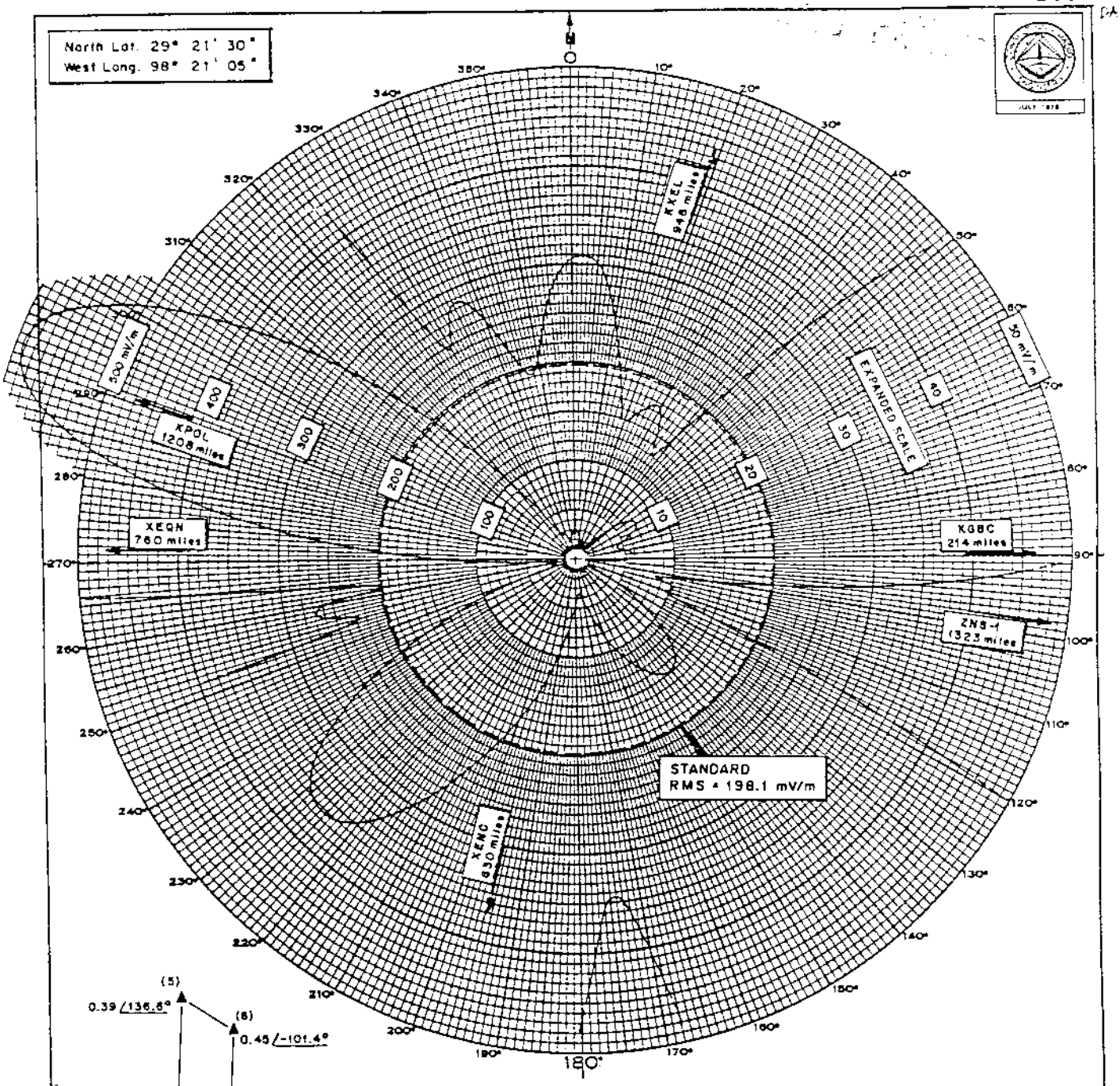
STATION KEDA
D & E BROADCASTING CO., INC.
SAN ANTONIO, TEXAS

Pres. 1540 kHz	1 kW	DAY
Prop. 1540 kHz	5 kW-D ; 1 kW-N	DA-2

A. D. RING & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

1540 kHz

North Lat. 29° 21' 30"
West Long. 98° 21' 05"



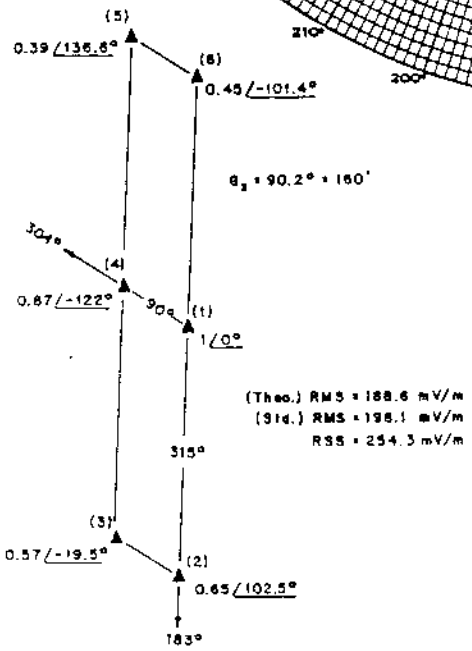


FIGURE 2

PROPOSED NIGHTTIME HORIZONTAL PLANE
STANDARD RADIATION PATTERN

STATION KEDA
O & E BROADCASTING CO., INC.
SAN ANTONIO, TEXAS

Pres. 1540 kHz	1 kW	DAY
Prop. 1540 kHz	5 kW-D ; 1 kW-N	DA-2

A. D. RING & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

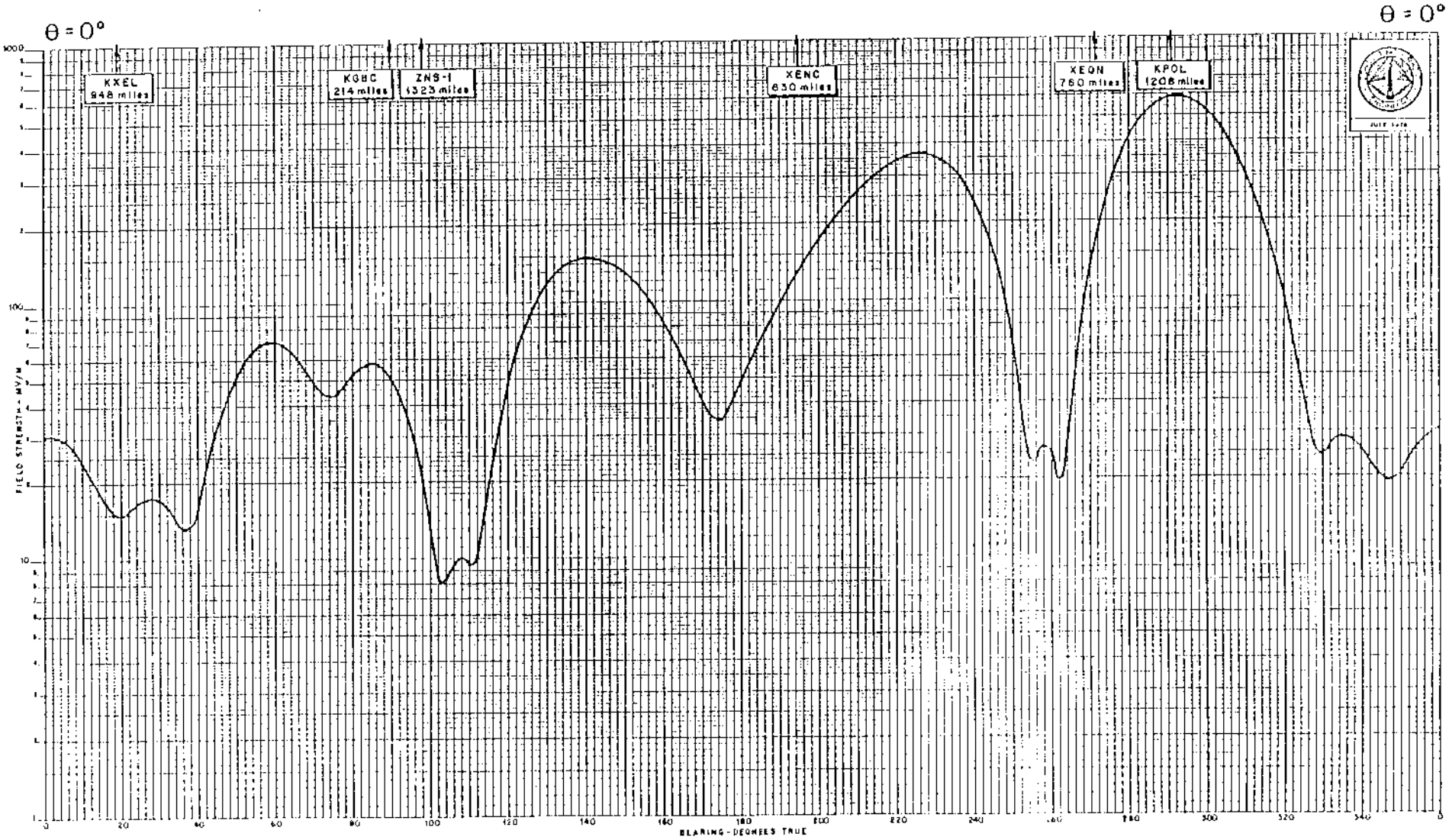


FIGURE 3-A

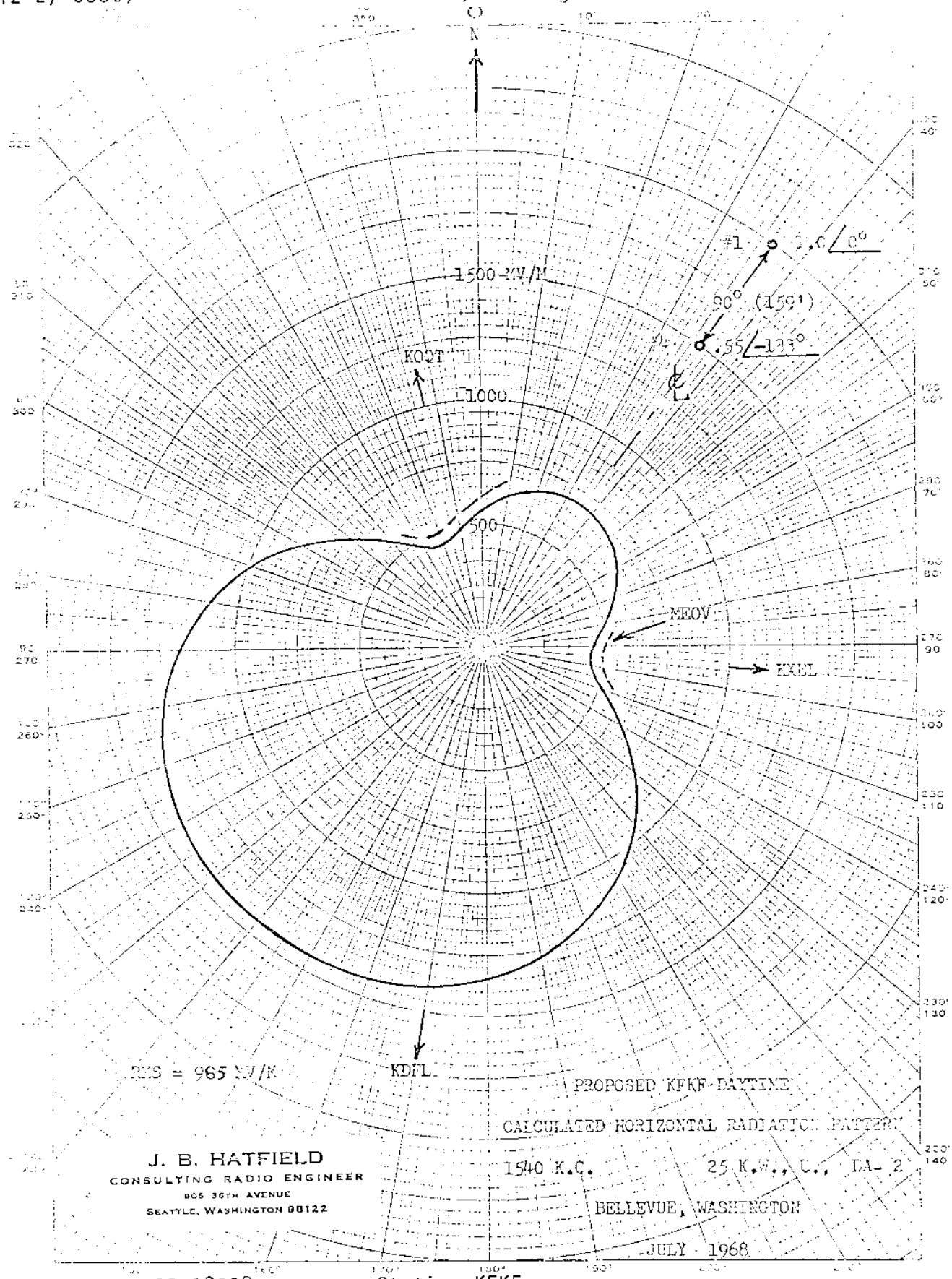
KHLAT
1540 KHZ
DA-N

KFKF

Proposed Day
(12-27-68ct)

Station KFKF
Bellevue, Washington

25kw,DA-2,U
1540 kc



FCC File No.BP-18308
Accepted 12-11-68

Station KFKF
Bellevue, Washington

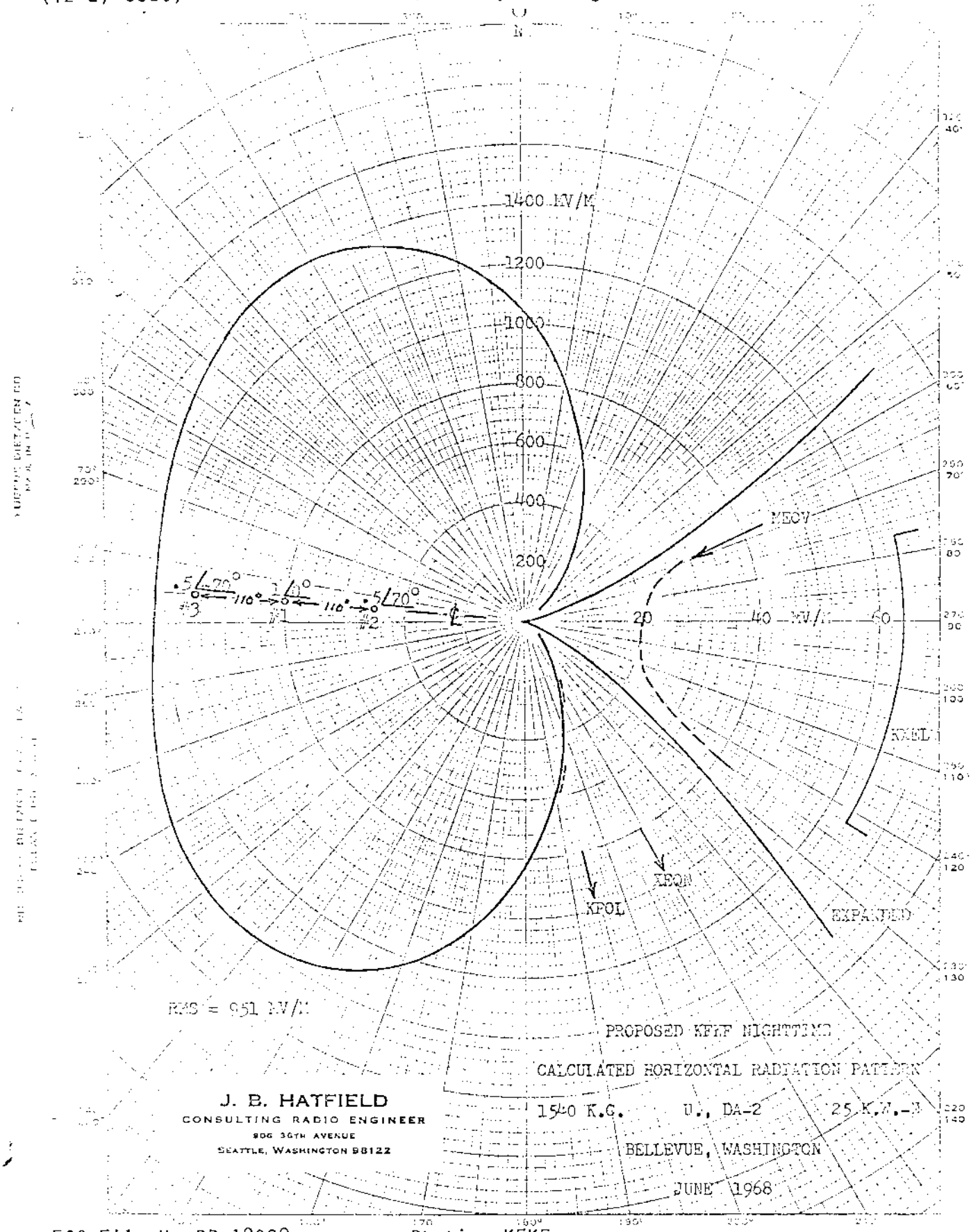
1540 kc

KFKF

Proposed Night
(12-27-68ct)

Station KFKF
Bellevue, Washington

25kw,DA-2,U
1540 kc



FCC File No.BP-18308
Accepted 12-11-68

Station KFKF
Bellevue, Washington

1540 kc

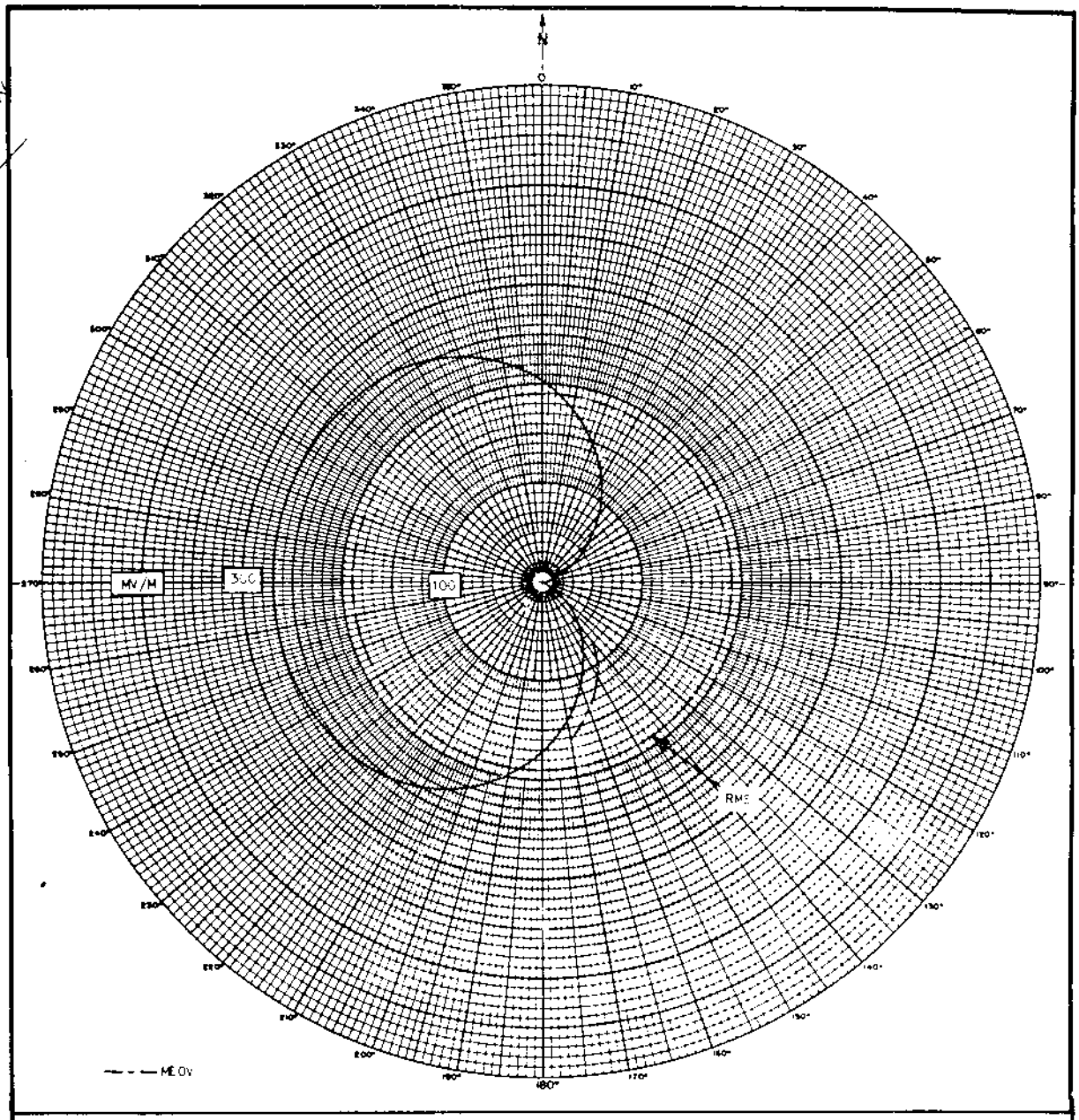
KFKF

Proposed Day & Night
(2-28-66ct)

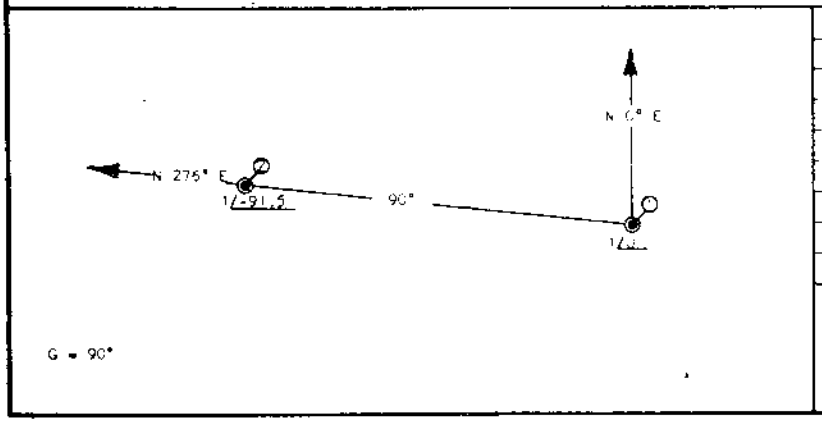
Station KFKF
Bellevue, Washington

1kw,DA-1,U
1540 kc

8-8-67 GRANTED CP FOR A STANDARD BROADCAST STATION



HORIZONTAL RADIATION PATTERN



APPLICANT	BELLEVUE BROADCASTERS
LOCATION	BELLEVUE, WASHINGTON
FREQUENCY	1540 KC/S
POWER	1 KW, DA-1
LATITUDE	47 DEG 35 MIN 40 SEC.
LONGITUDE	122 DEG 10 MIN 56 SEC.
WHEN USED	UNLIMITED
RMS FIELD	190 MV/M
DATE	DECEMBER 1965

SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No.BP-17059
Accepted 2-7-66

Station KFKF
Bellevue, Washington

1540 kc

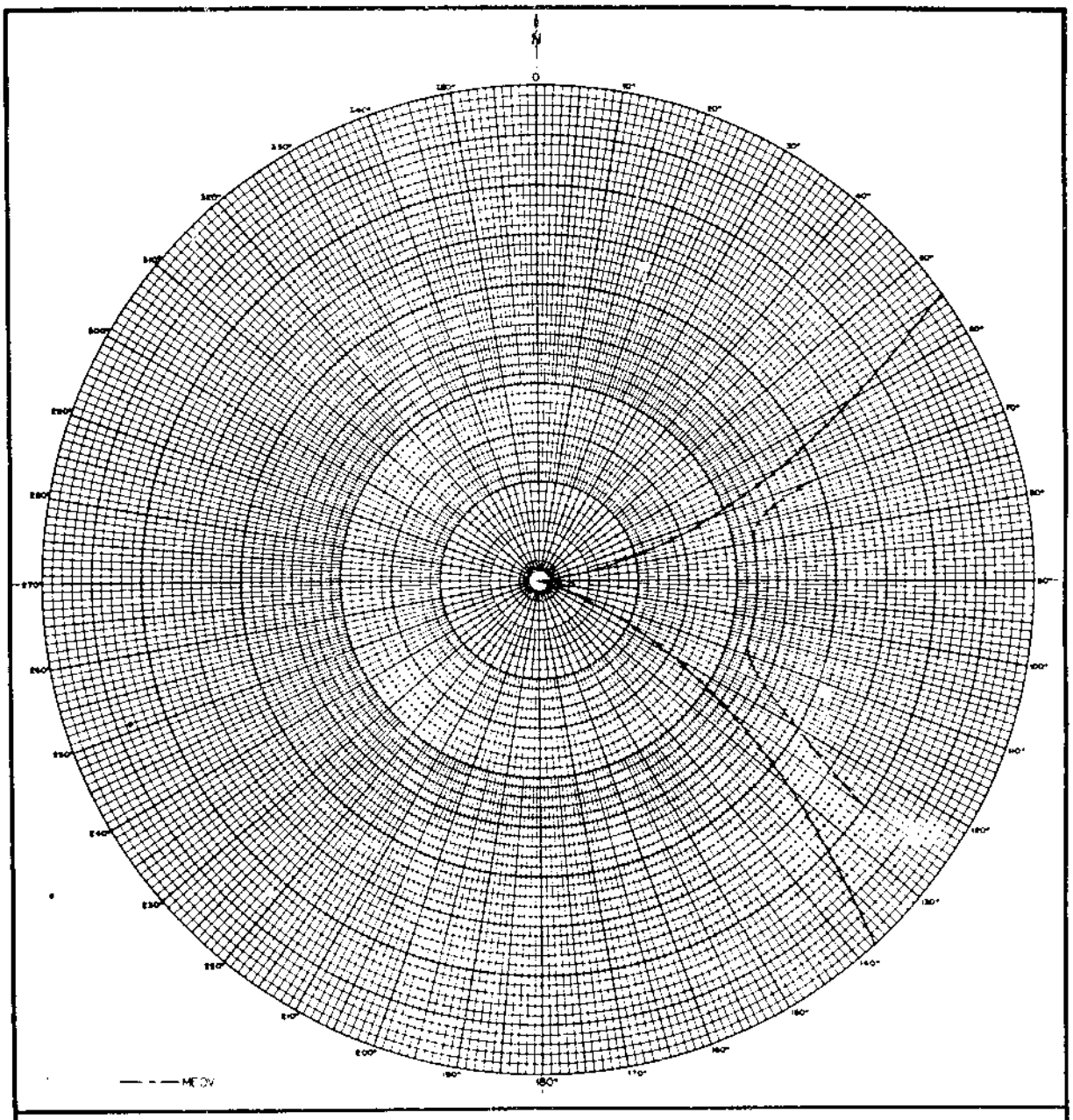
KFKF

Proposed Day & Night Nulls
(2-28-66ct)

Station KFKF
Bellevue, Washington

1kw, DA-1, U
1540 kc

8-8-67
GRANTED CP
FOR A STANDARD
BROADCAST
STATION



EXPANDED VIEW

SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No. BP-17059
Accepted 2-7-66

Station KFKF
Bellevue, Washington

1540 kc

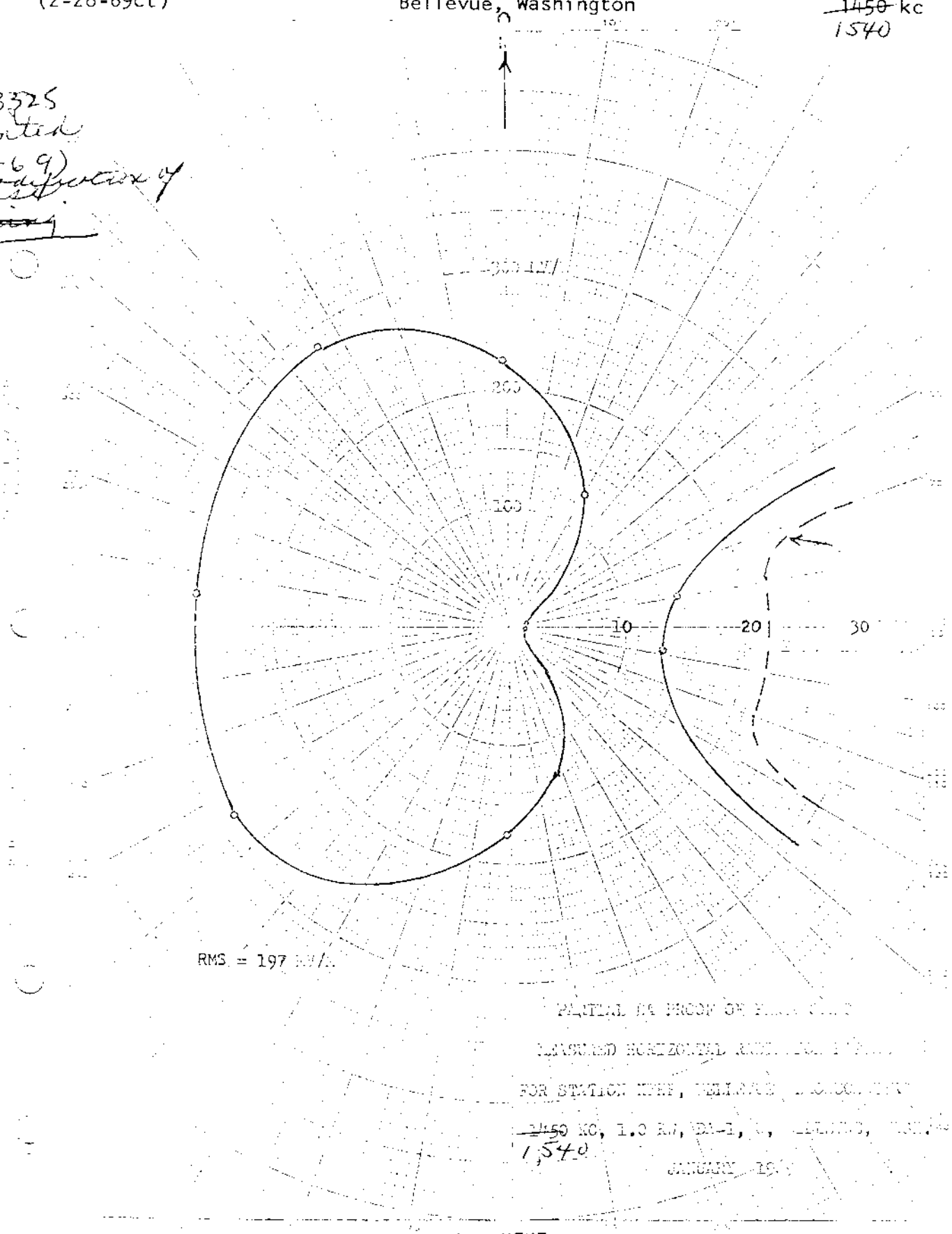
KFKF

Measured Day & Night
(2-28-69ct)

Station KFKF
Bellevue, Washington

1kw, DA-1, U
~~1450~~ kc
1540

BRC-3325
Granted
(6-9-69)
modification of
license



FCC File No.BRC-3325
Accepted 2-24-69

Station KFKF
Bellevue, Washington

~~1450 kc~~
1540

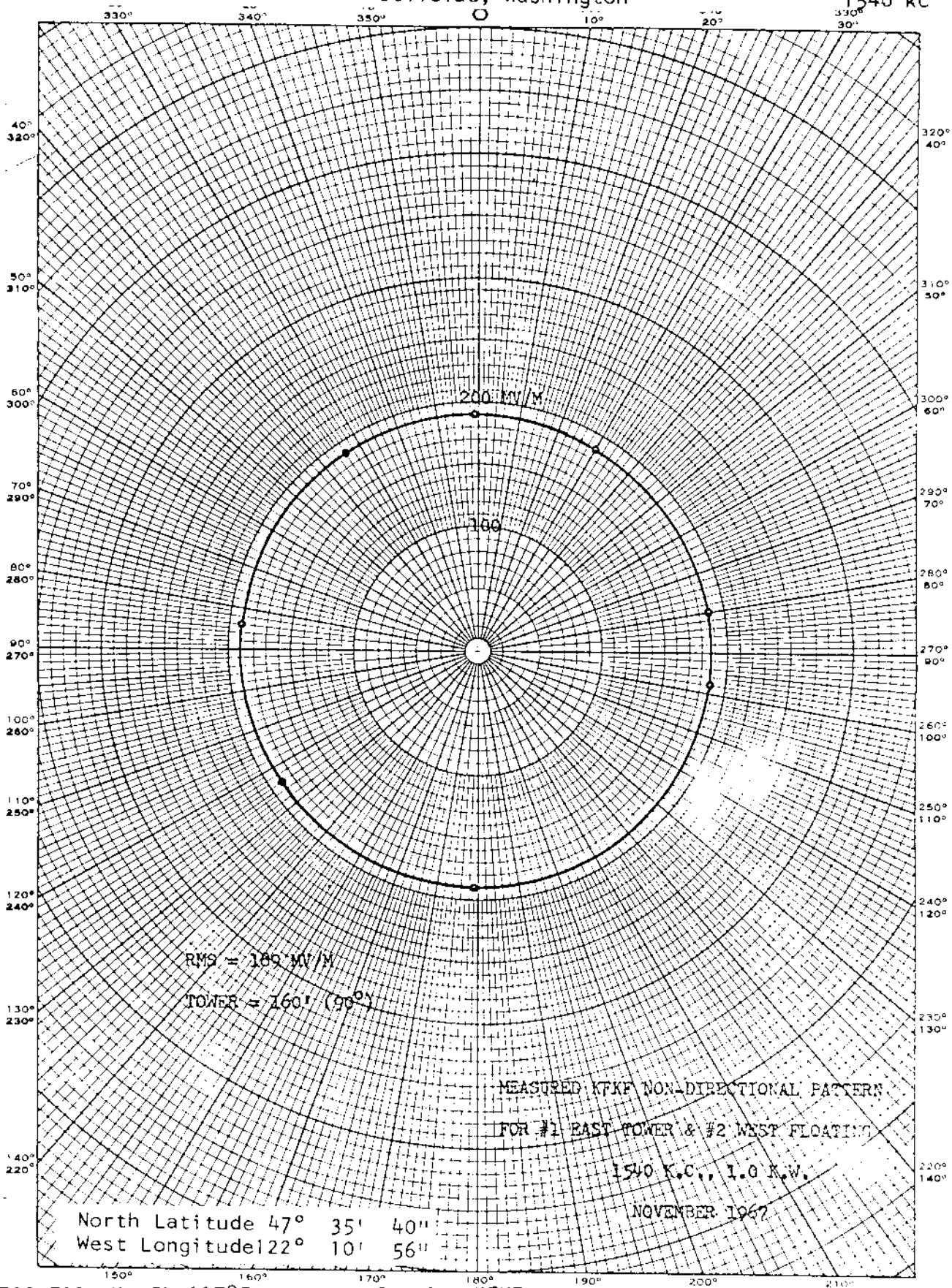
KFKF

Measured Non-DA
(1-29-68ct)

Station KFKF
Bellevue, Washington

1kw,DA-1,U
1540 kc

OVER

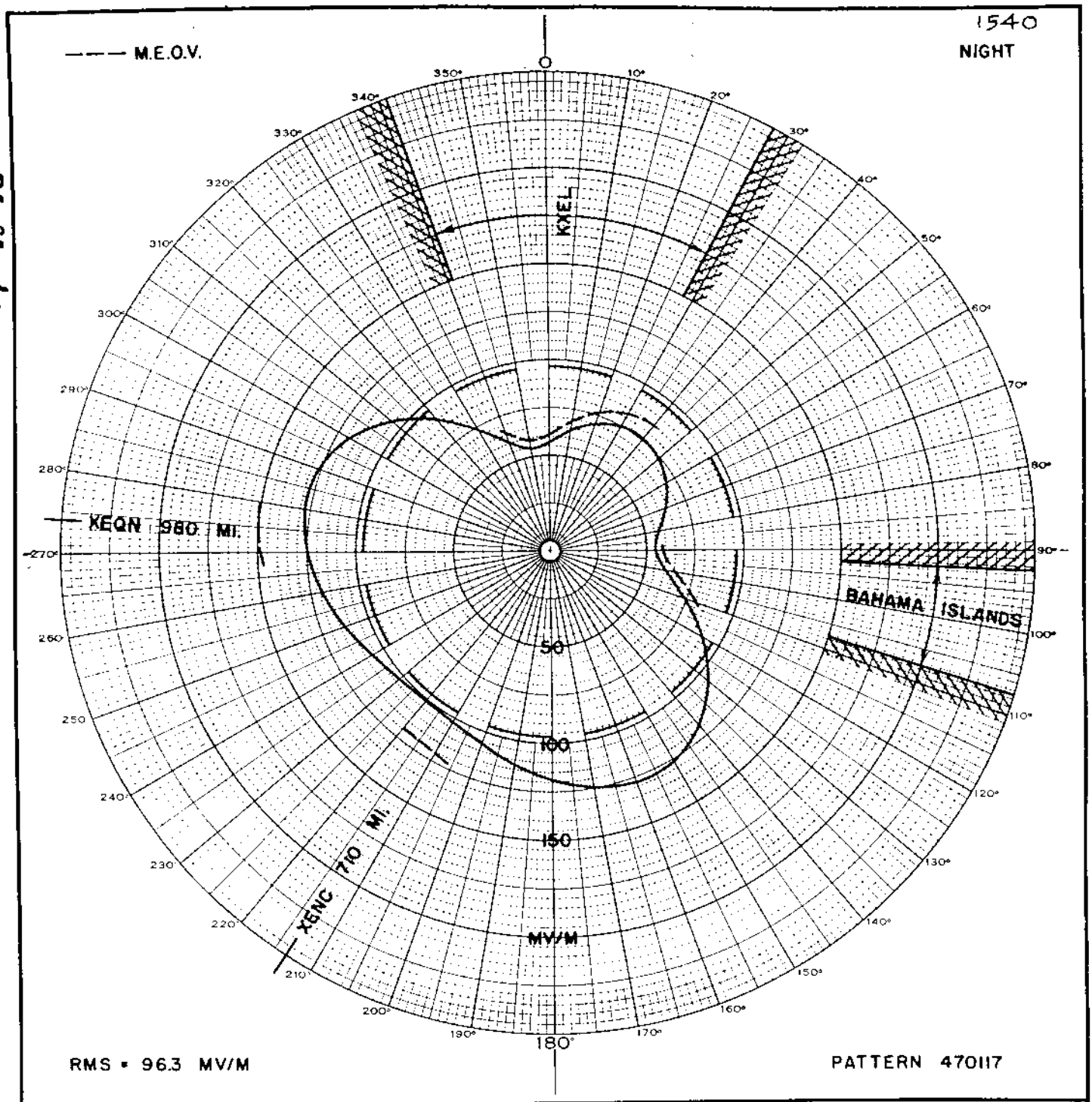


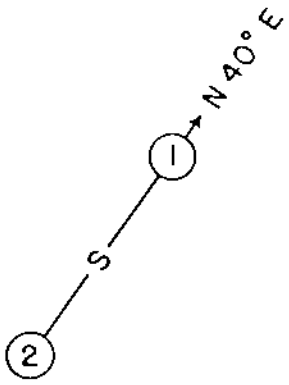
FCC File No.BL-11785
Accepted 1-16-68

Station KFKF
Bellevue, Washington

1540 kc

KGBC





TOWER	FIELD	PHASE
1	1.0	0°
2	0.4	-75°

S = 160° OR 284'

G = 117°

A. EARL CULLUM, JR.

CONSULTING RADIO ENGINEERS

DALLAS TEXAS

RADIO STATION KGBC

1540 KC 250 WATTS DA

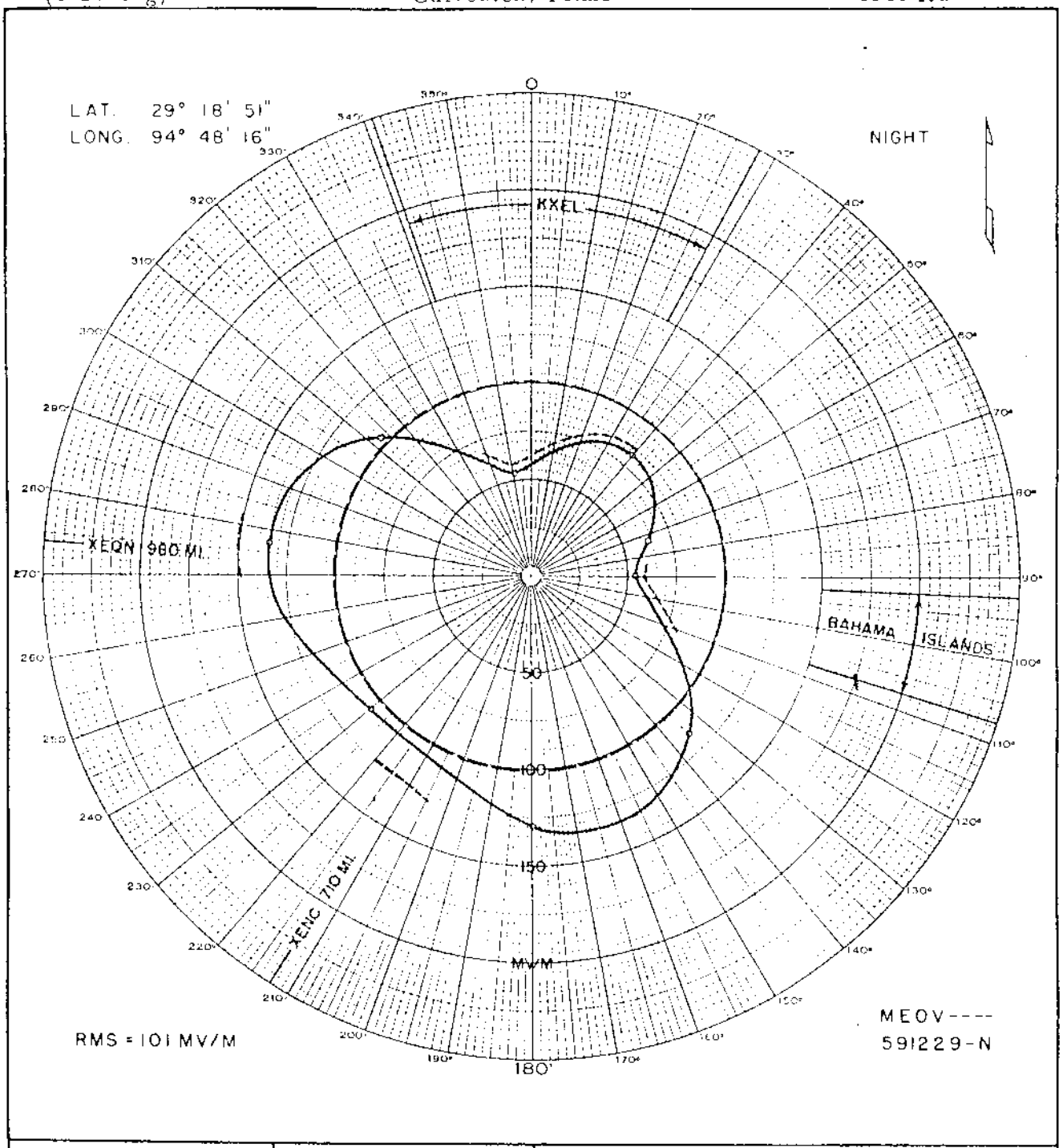
FIGURE 5 A

KG-BC

MEASURED NIGHT
(4-22-60g)

Station KGBC
Galveston, Texas

250w, 1kw-LS, DA-N,U
1540 KC



TOWER	FIELD	PHASE
1	1.0	0
2	0.4	-75

G = 113°
S = 160°

PATTERN BASED ON MEASUREMENTS

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

RADIO STATION KGBC
GALVESTON, TEXAS
591229 FIGURE 2B

FCC File No. BL-7865
Accepted 3-30-60

KGBC
Galveston, Texas

1540 KC

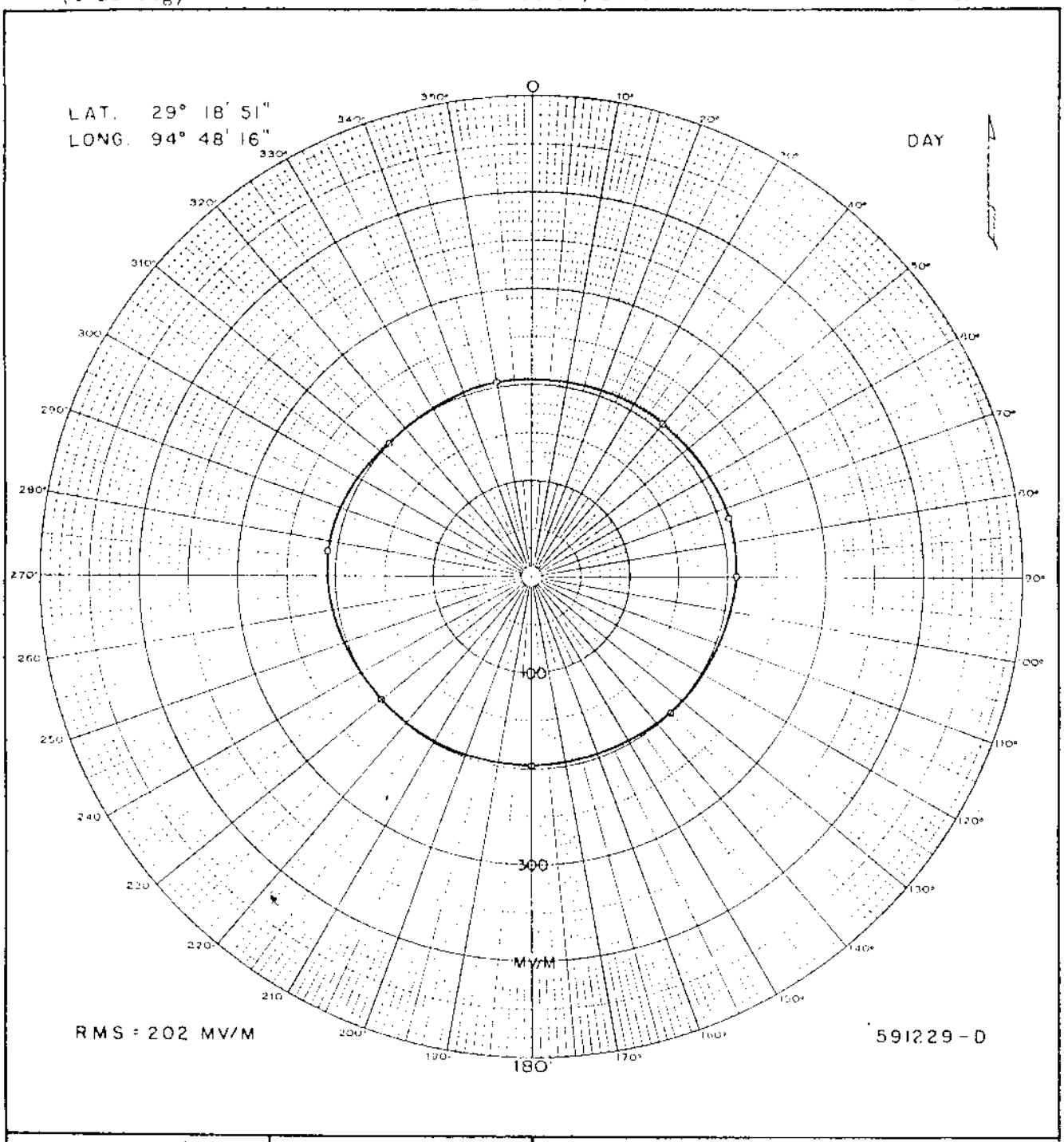
1-14-60 signature of for change in antenna & mfr studies. Wilson

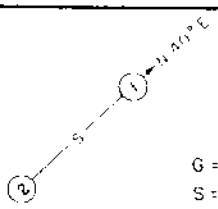
KGBC

MEASURED NON-DA
(4-22-60g)

Station KGBC
Galveston, Texas

250w, 1kw-LS, DA-N,U
1540 KC





TOWER	OPERATION
1	DETUNED
2	SERIES FED

PATTERN BASED ON MEASUREMENTS

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

RADIO STATION KGBC
GALVESTON, TEXAS
591229 FIGURE 2 A

FCC File No. BL-7865
Accepted 3-30-60

KGBC
Galveston, Texas

1540 KC

7-14-60 Indicates K for change in antenna & use of shielded station

KKAP
1540KHz

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: K K A P

Main Studio: Aptos-Capitola, California

Frequency: 1540 kHz

Power 10 kW Day

Notification List No. 1784

Date: November 9, 1979 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM: North Latitude: 36° 58' 50"
West Longitude: 121° 54" 43"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 2
Type of elements: Series excited, guyed, tapered, vertical steel towers.

TOWER:	S (#1)	N (#2)
HEIGHT ABOVE INSULATORS:	162' (91.3°)	162'
DAY PHASING:	0°	60°
DAY FIELD RATIO:	1.000	1.863

SPACING AND ORIENTATION: The towers are spaced 223.9' (126.2°) on a line bearing 25° true.

GROUND SYSTEM: 120-150' equally spaced copper radials about each tower. Radials are shortened and bonded to a transverse strap along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Day 1/	594/78 mV/m	581.73 mV/m	624.84 mV/m

1/ By adjustment of input power.

KKAP
1540 KHz

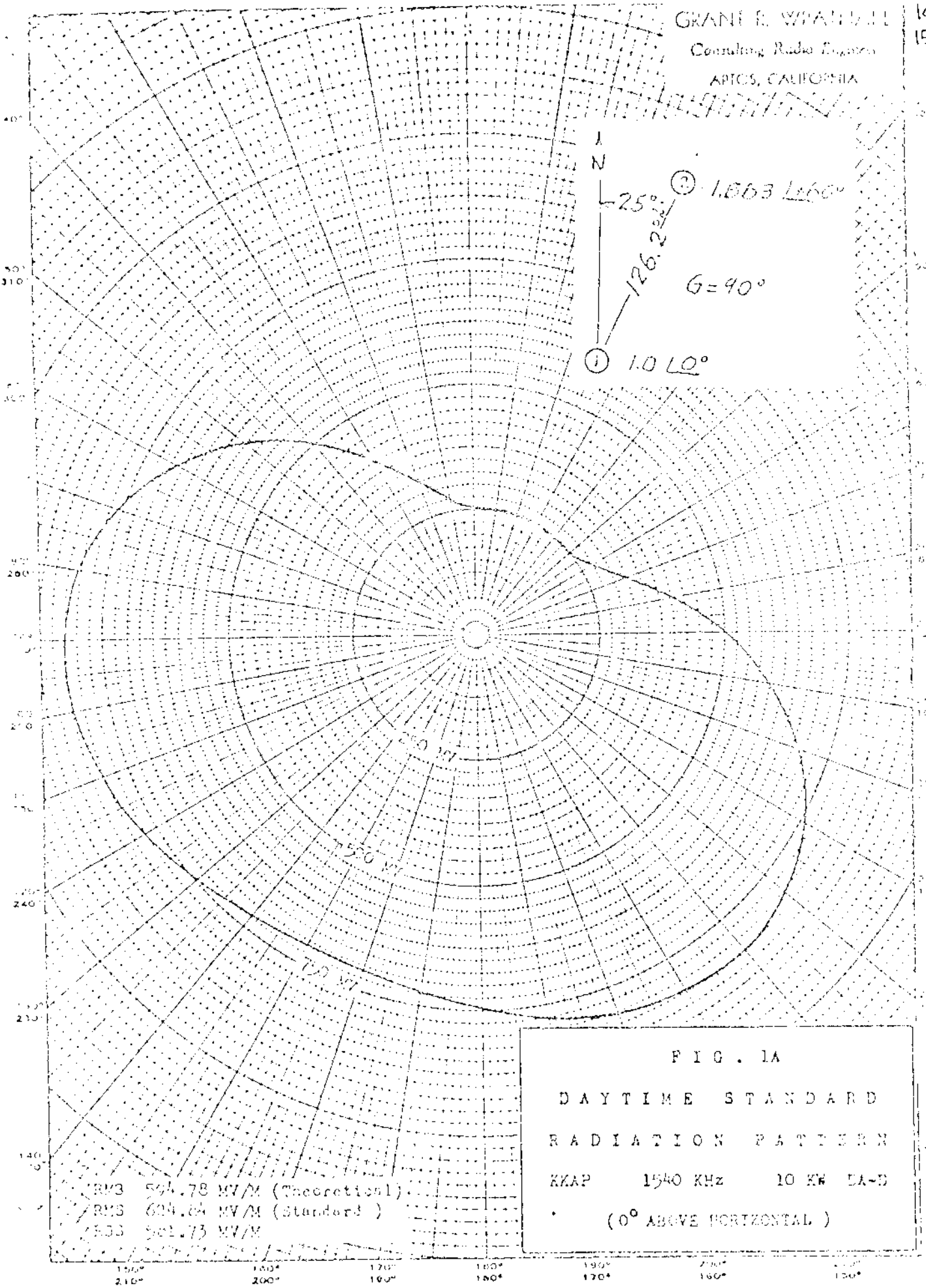


FIG. 1A

DAYTIME STANDARD

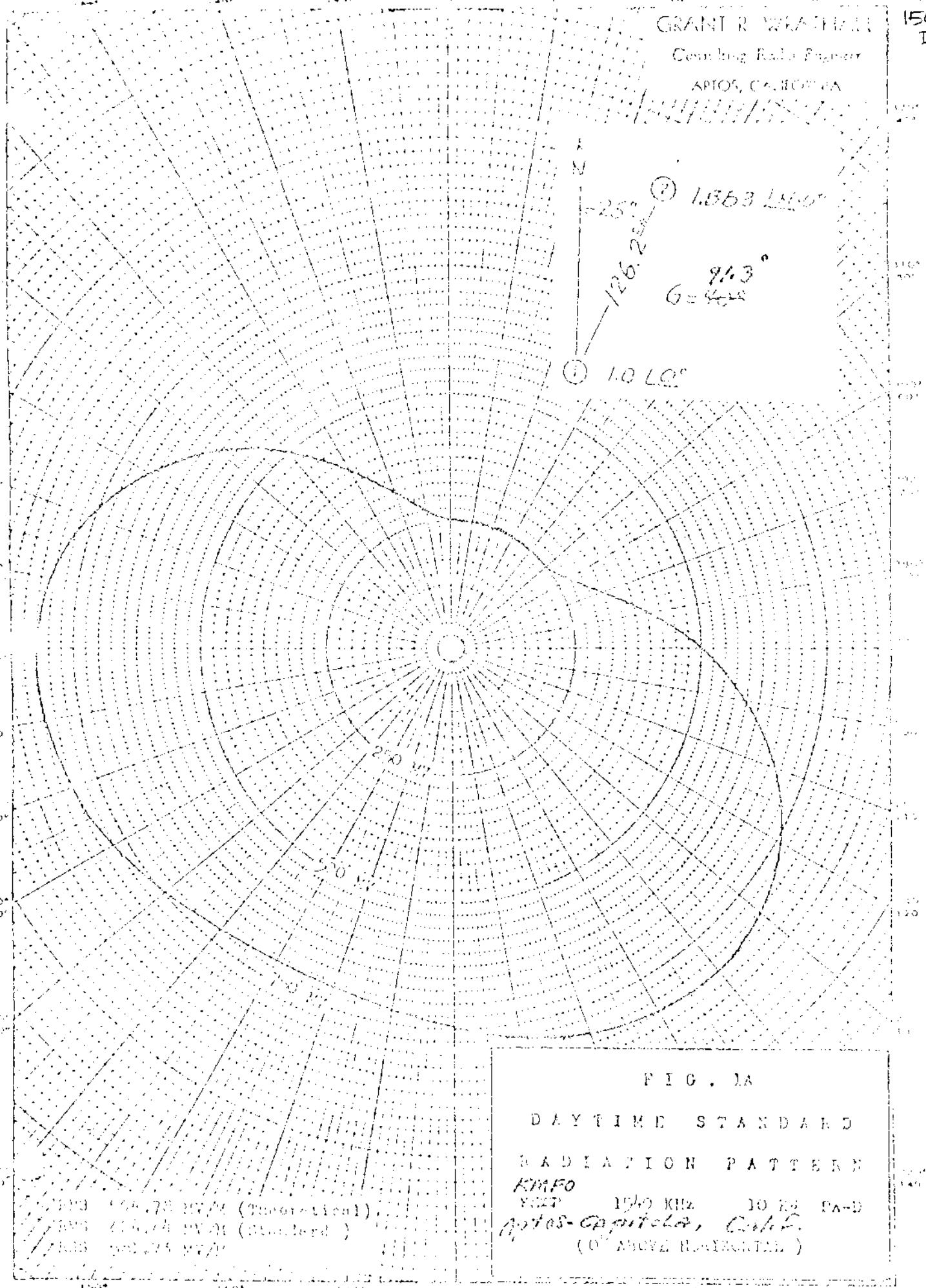
RADIATION PATTERN

KKAP 1540 KHz 10 KW DA-D

(0° ABOVE HORIZONTAL)

FIG

KMFO
1540 KHz
DA-D



KMPG

Proposed Day
(9-26-68ct)

Station KMPG
Hollister, California

5kw,DA-D,D
1540 kc

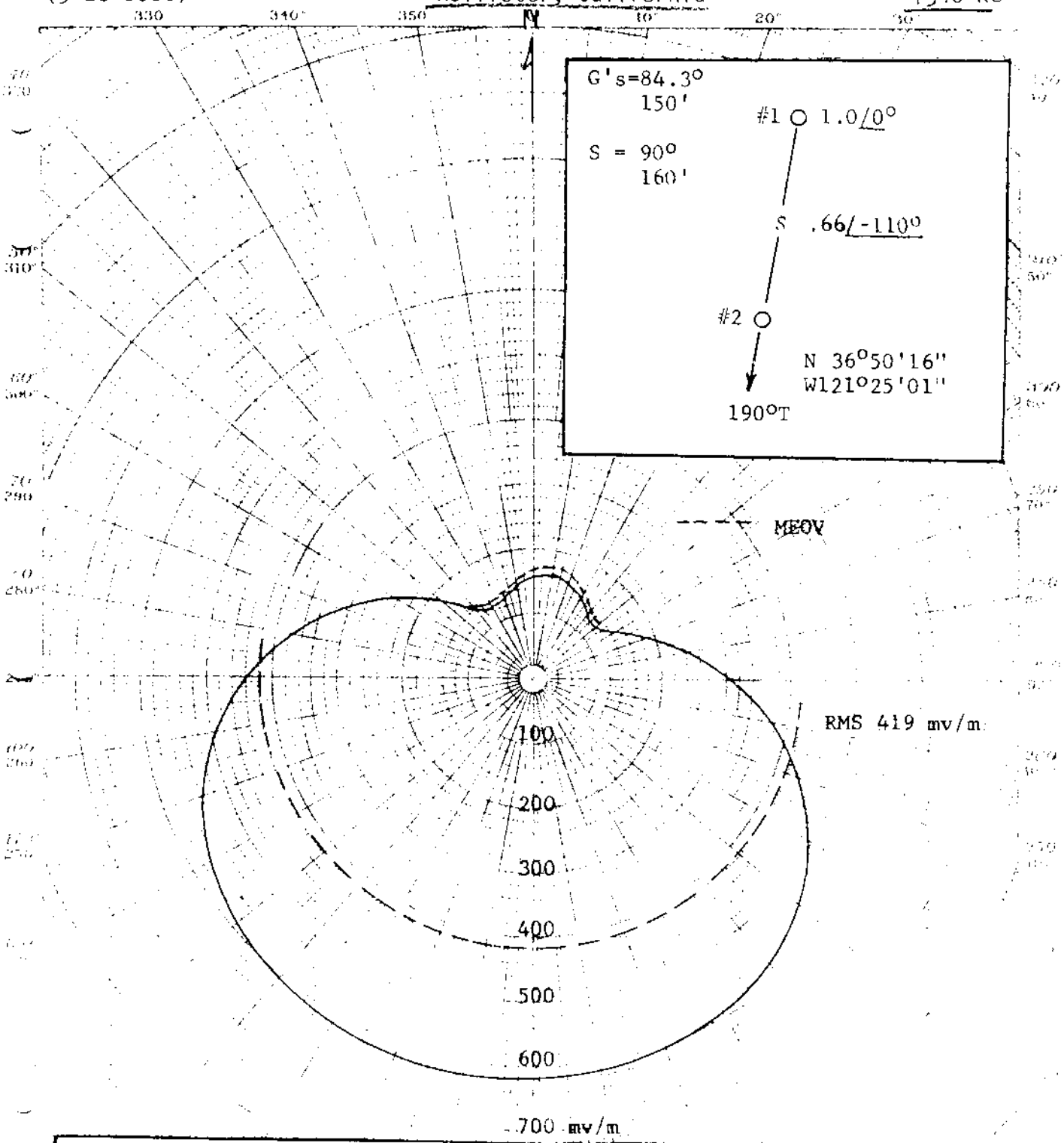


FIG.1

PROPOSED HORIZONTAL RADIATION
KMPG HOLLISTER, CALIFORNIA
1540 KC 5.0 KW DA-D

A.E.Towne Associates Inc.,Consulting Engineers,SanCarlos,California

FCC File No.BP-18218
Accepted 9-20-68

Station KMPG
Hollister, California

1540 kc

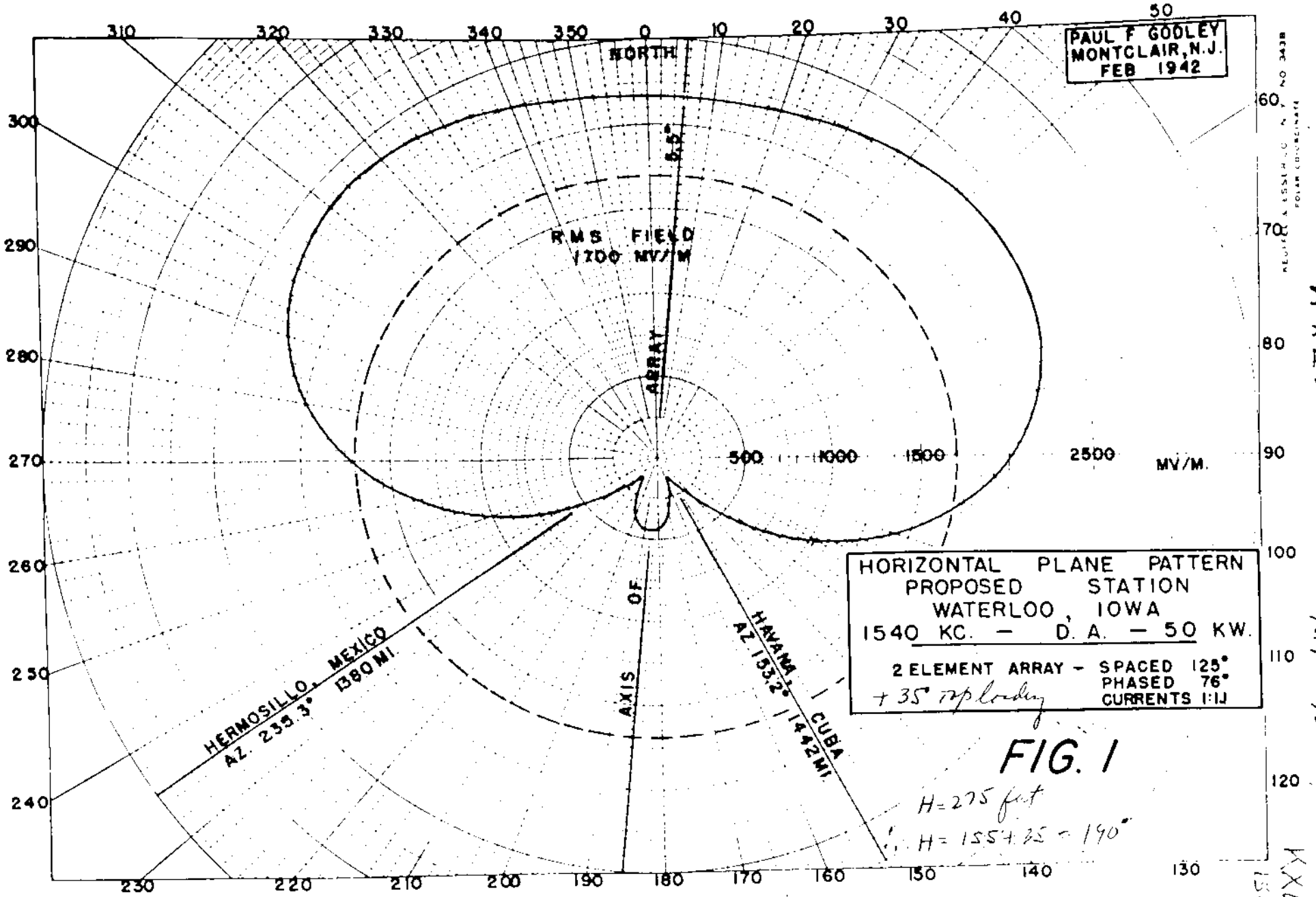


FIG. 1

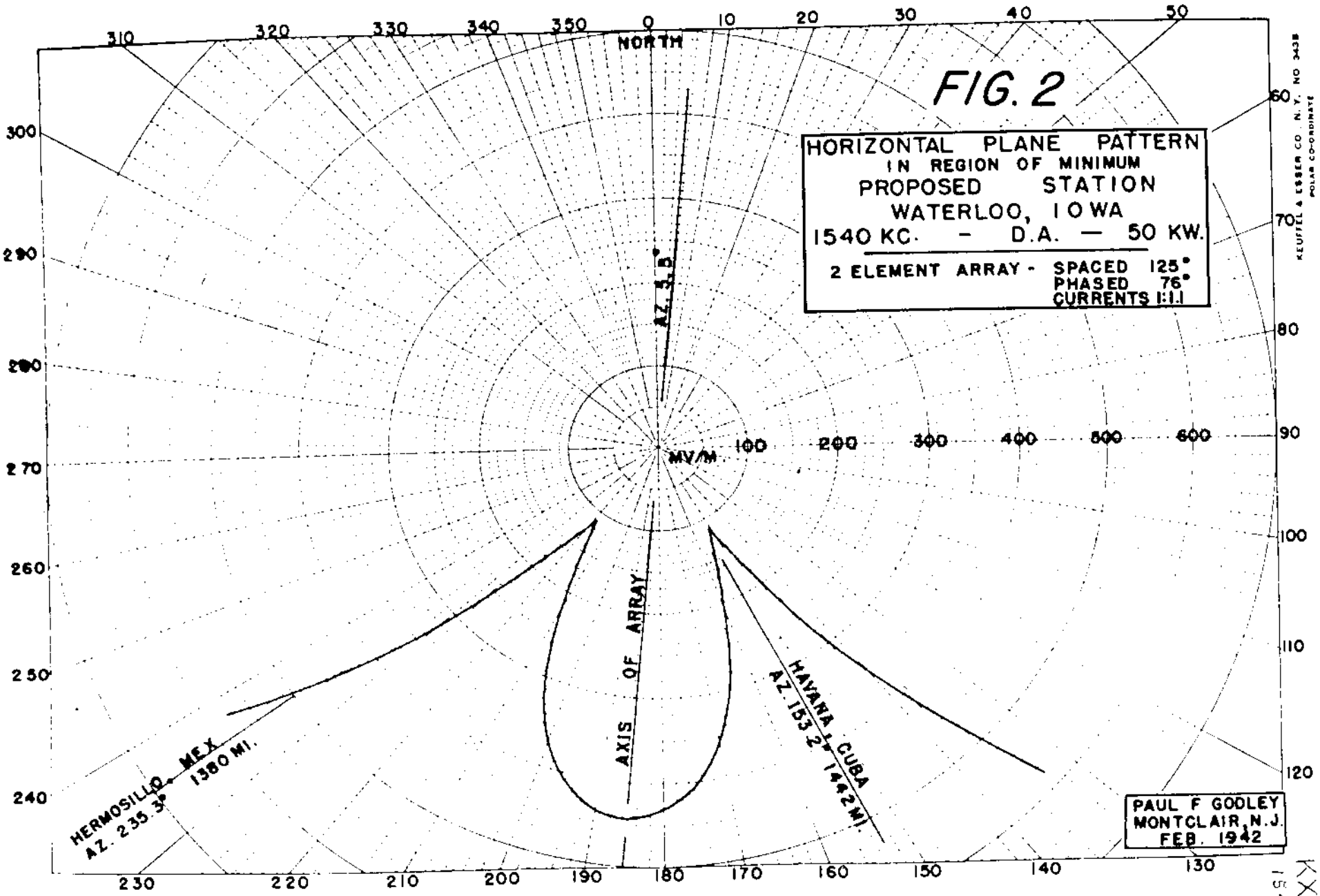
H=275 feet

∴ H = 155+35 = 190°

KXEL

MP-1524

KXEL 1540



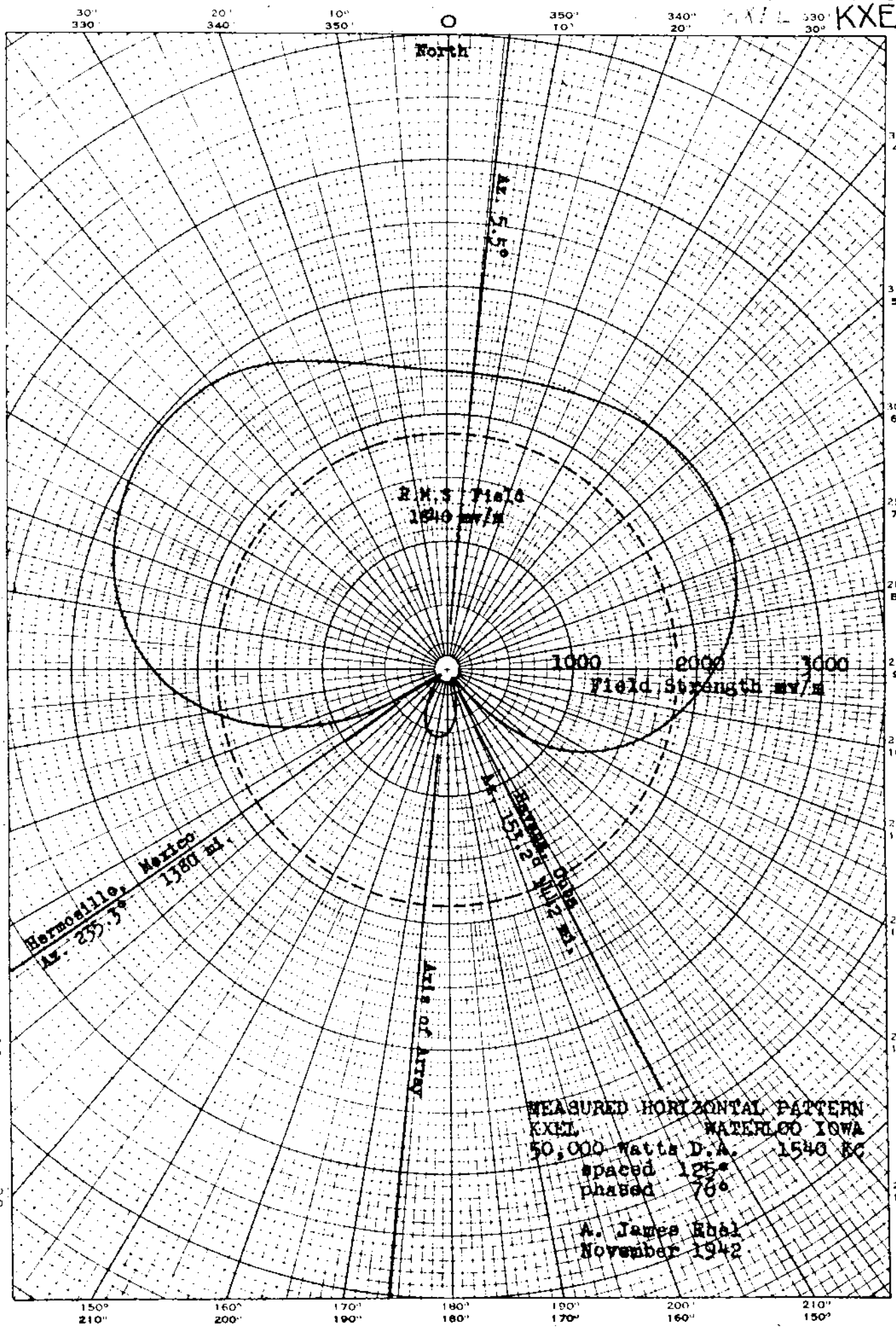
KXEL

MP-1532

KXEL 1540

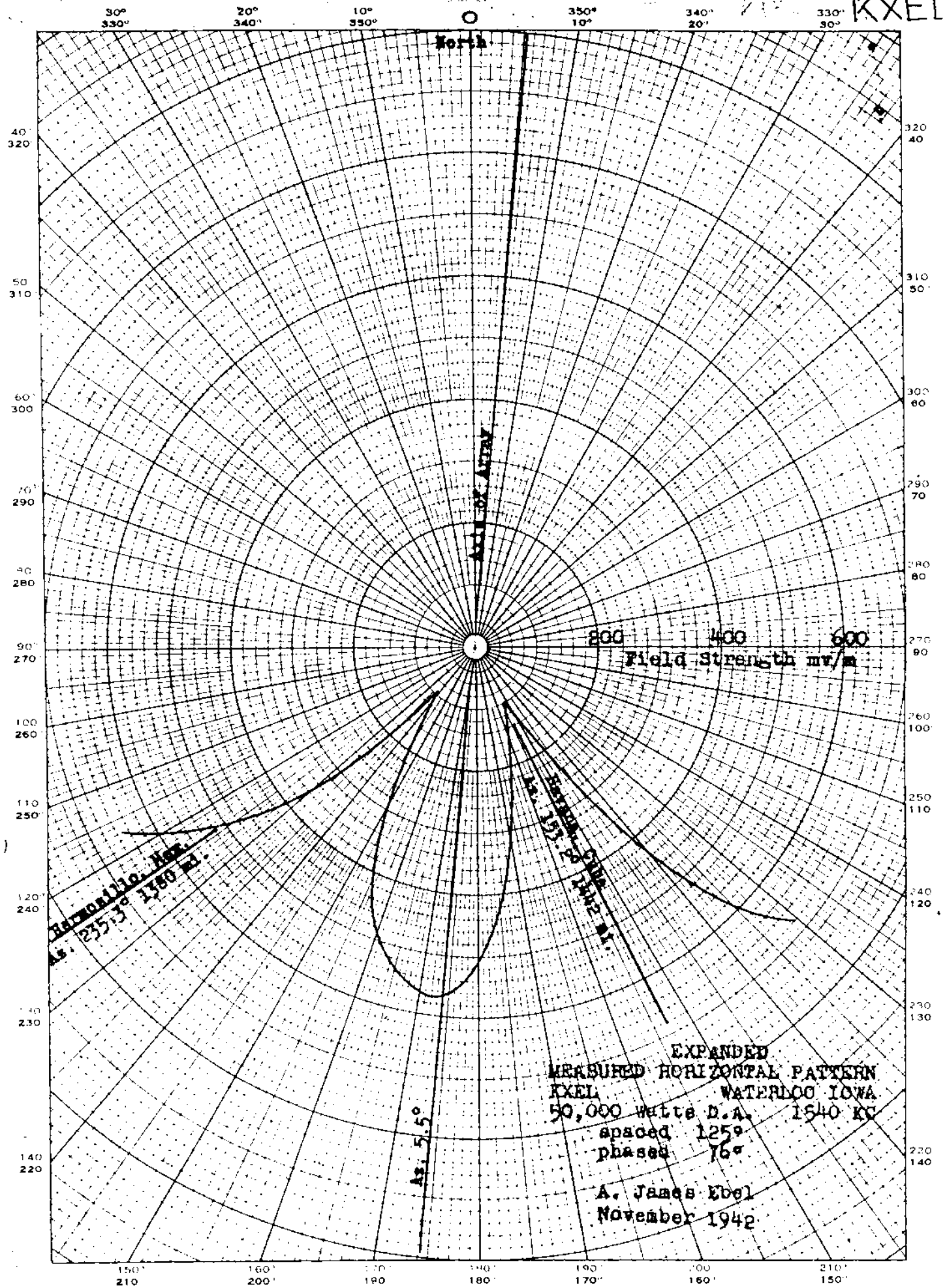
1540 KC

KXEL



10

1540 KC
KXEL


North
Axis of Array
800
400
600
Field Strength mv/m
Hermosillo, Mex.
Az. 235.3° 1380 mi.
Az. 153.2° 1442 mi.
Az. 5.5°
EXPANDED
MEASURED HORIZONTAL PATTERN
KXEL WATERLOO IOWA
50,000 watts D.A. 1540 KC
spaced 125°
phased 76°
A. James Ebel
November 1942

KZAM

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KZAM

Main Studio: Bellevue, Washington

Frequency: 1540 kHz

Power: 5 kW

Notification List No. 1637

Date: June 18, 1975

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 47° 35' 28"
West Longitude: 122° 10' 56"

ANTENNA CHARACTERISTICS

Authorized for Nighttime operation. (DA-N) MODIFIED STANDARD PATTERN
Number of elements: 3
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	W(#1)	C(#2)	E(#3)
HEIGHT ABOVE INSULATORS:	160'	160'	160' (90°)
PHASING:	-90°	0°	+90°
FIELD RATIO:	0.5	1	0.5

SPACING AND ORIENTATION: Adjacent elements are spaced 160' (90°) on a line bearing 276° true.

GROUND SYSTEM: 120-160' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

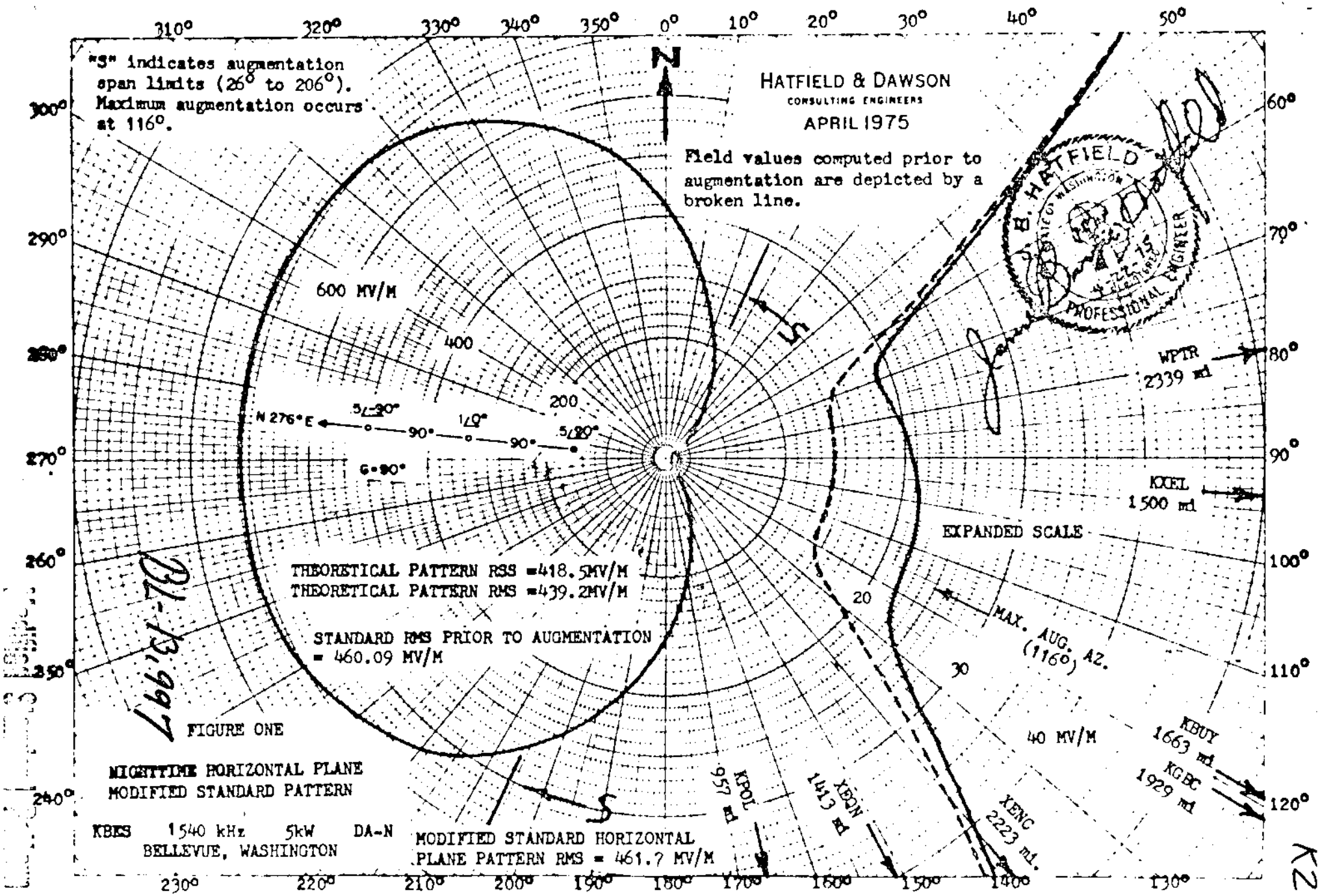
	THEORETICAL RMS	THEORETICAL RSS	STANDARD RMS
Daytime	426 mv/m	---	---
Nighttime	439.2 mv/m	418.5 mv/m	460.09 mv/m

MODIFIED PATTERN AUGMENTATION:

Azimuth of Maximum Augmentation	Augmented Radiation E_2	Span of Augmentation From	To
116°	22.0 mv/m	26°	206°

Note: This notification concerns a change to augment the standard pattern.

CTR NO 30390A4



DL-13,997

K2AM

KZAM 3

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KBES

Main Studio: Bellevue, Washington

Frequency: 1540 kHz

Power: 5 kW

Notification List No. 1567

Date: February 13, 1974

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 47° 35' 28"
West Longitude: 122° 10' 56"

ANTENNA CHARACTERISTICS

Authorized for Nighttime operation. (DA-N)
Number of elements: 3
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	W(#1)	C(#2)	E(#3)
HEIGHT ABOVE INSULATORS:	160'	160'	160' (90°)
PHASING:	-90°	0°	+90°
FIELD RATIO:	0.5	1	0.5

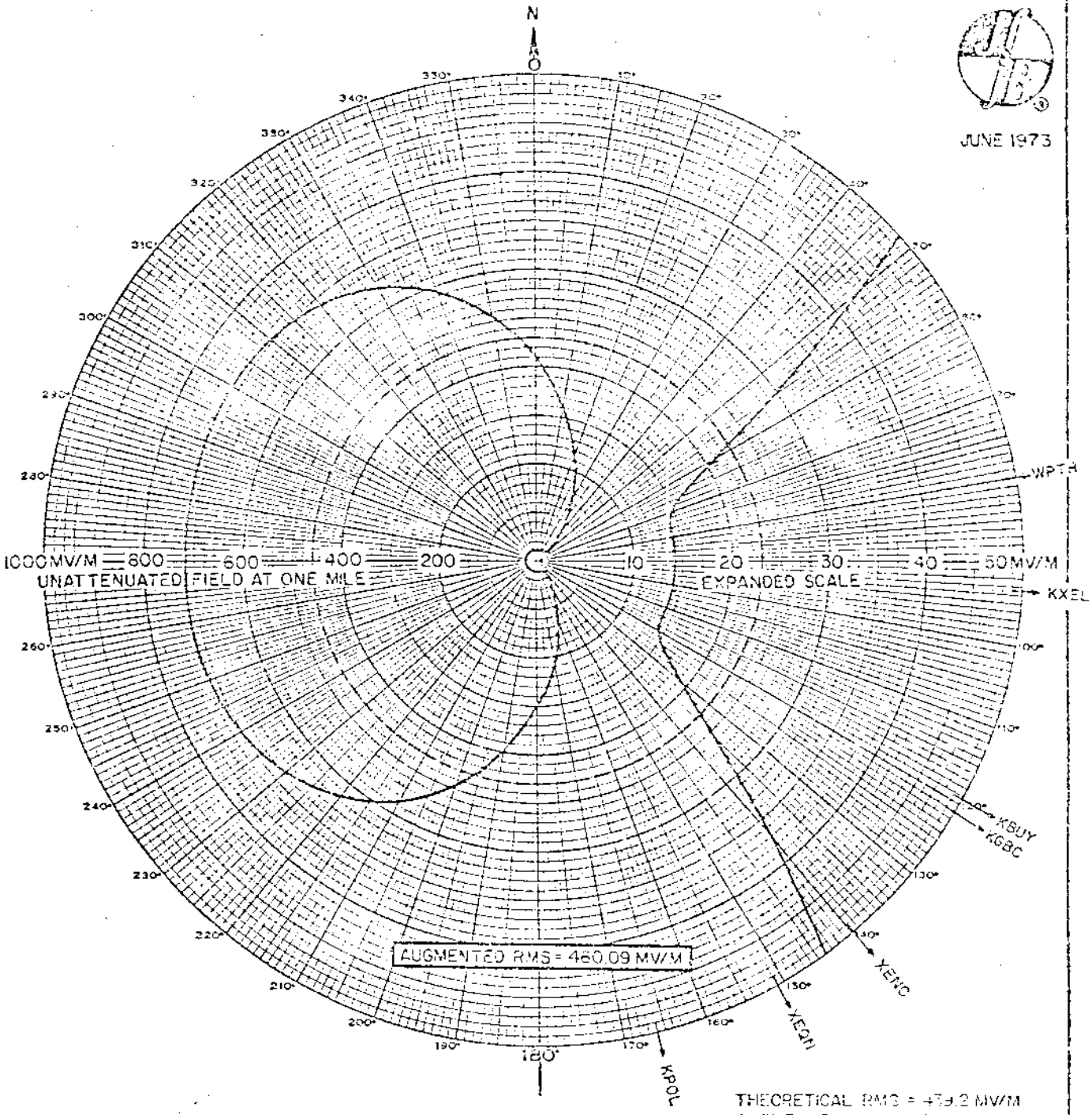
SPACING AND ORIENTATION: Adjacent elements are spaced 160' (90°) on a line bearing 276° true.

GROUND SYSTEM: 120-160' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

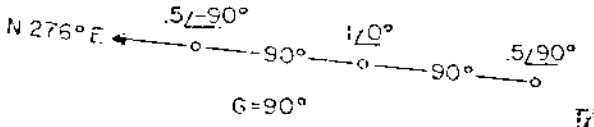
	THEORETICAL		STANDARD
	RMS	RSS	RMS
Daytime	426 mv/m	---	---
Nighttime	439.2 mv/m	418.5 mv/m	460.09 mv/m

CTR NO 30390A3

Standard Pattern KZAM



THEORETICAL RMS = 479.2 MV/M
AUGMENTED RMS = 460.09 MV/M
RSS = 418.5 MV/M



LAT. 47°35'28.5"
LONG. 122°10'56"

FIG. 2-A

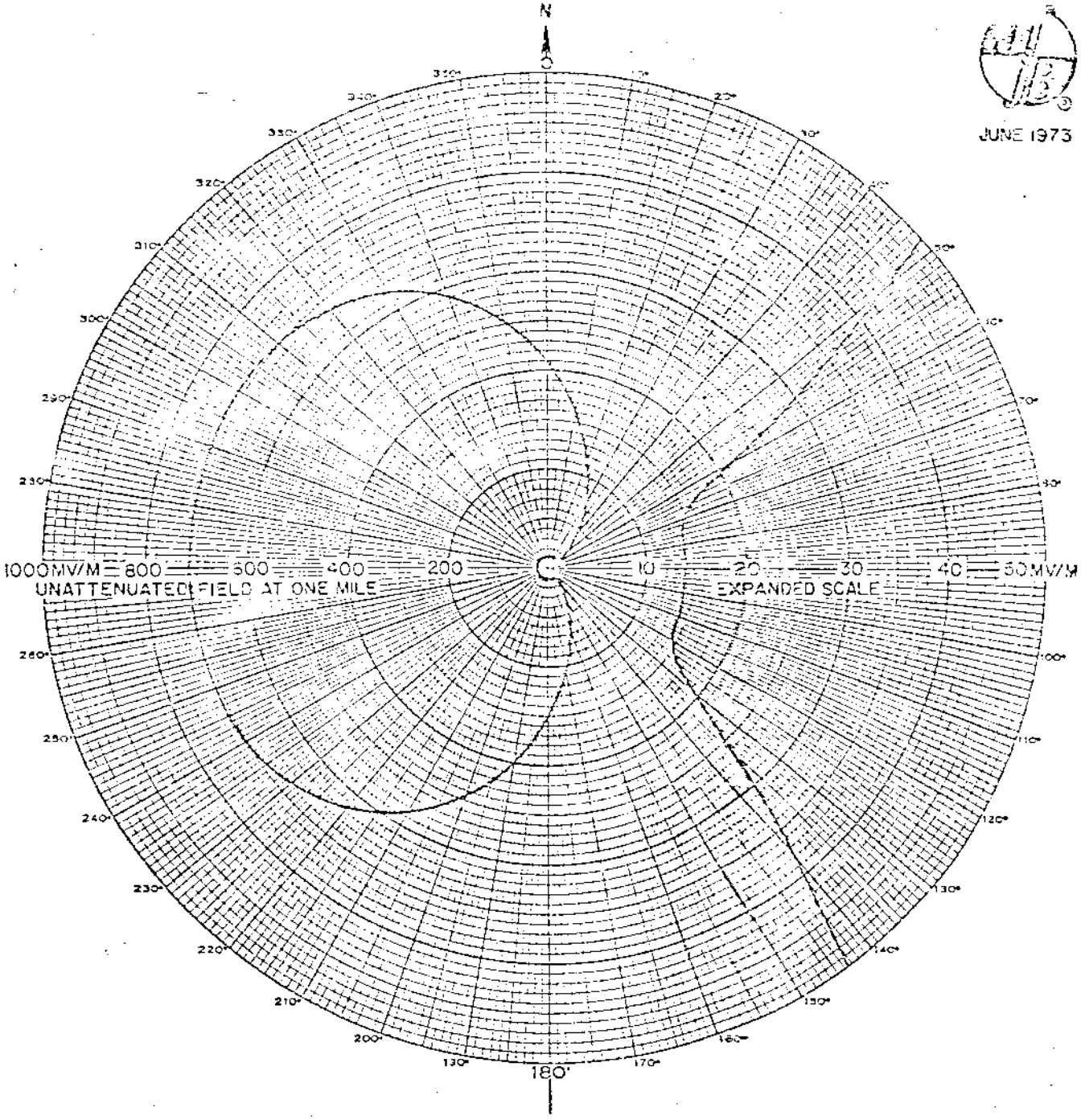
PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (HORIZONTAL PLANE)

KBES 1540 KHz 5 KW DA-N

BELLEVUE EASTSIDE RADIO, LTD
BELLEVUE, WASHINGTON

KZAM

JUNE 1973



N 276° E .5/-90° 90° 1/0° 90° .5/90°

G=90°

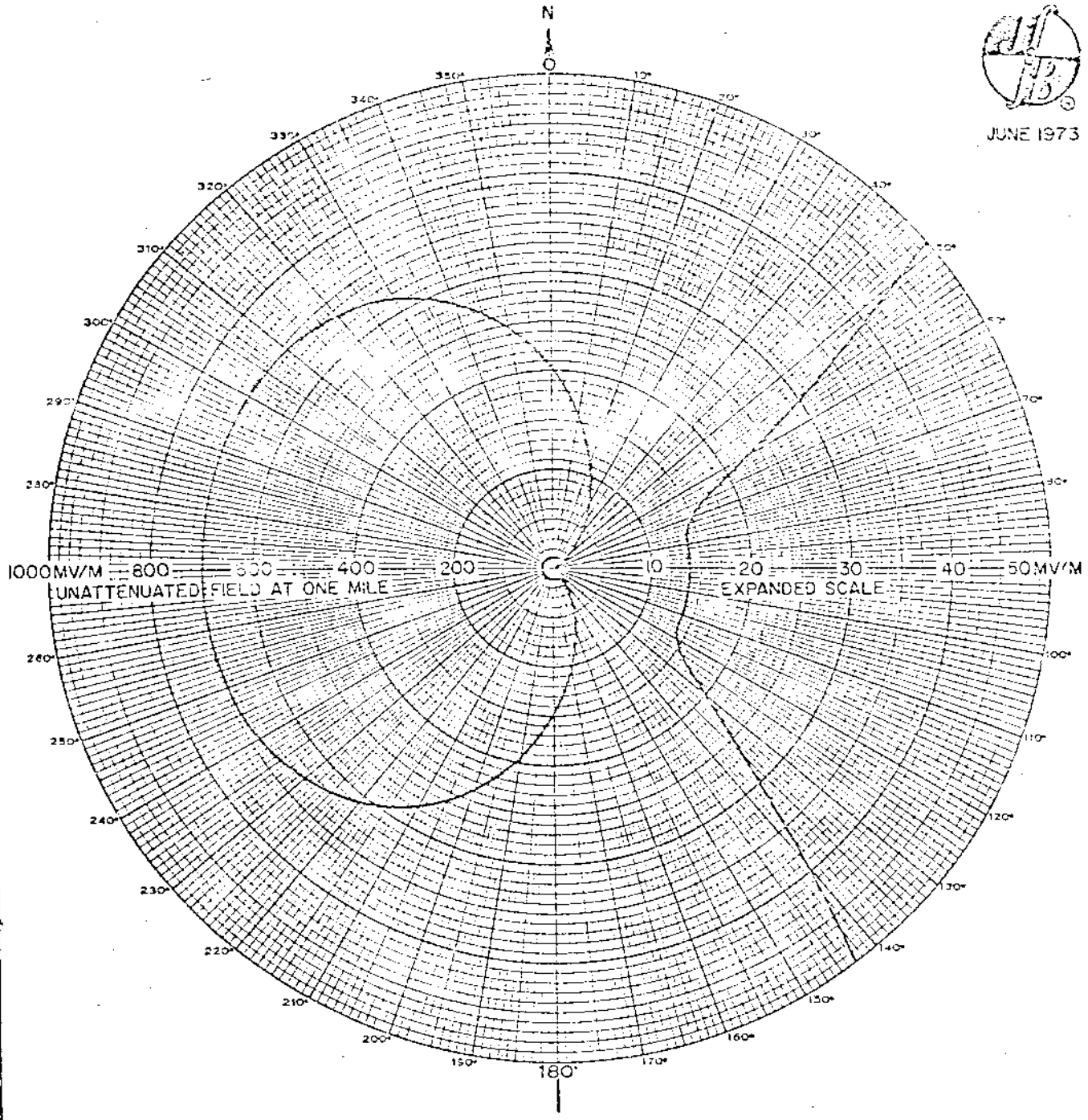
FIG. 2--8

PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (5° ABOVE HORIZONTAL)

KBES 1540KHz 5KW DA-N

BELLEVUE EASTSIDE RADIO, LTD.
BELLEVUE, WASHINGTON

Standard Pattern KZAM



N 276° E .5/-90° 90° 1/0° 90° .5/90°

G=90°

FIG. 2-C

PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (10° ABOVE HORIZONTAL)

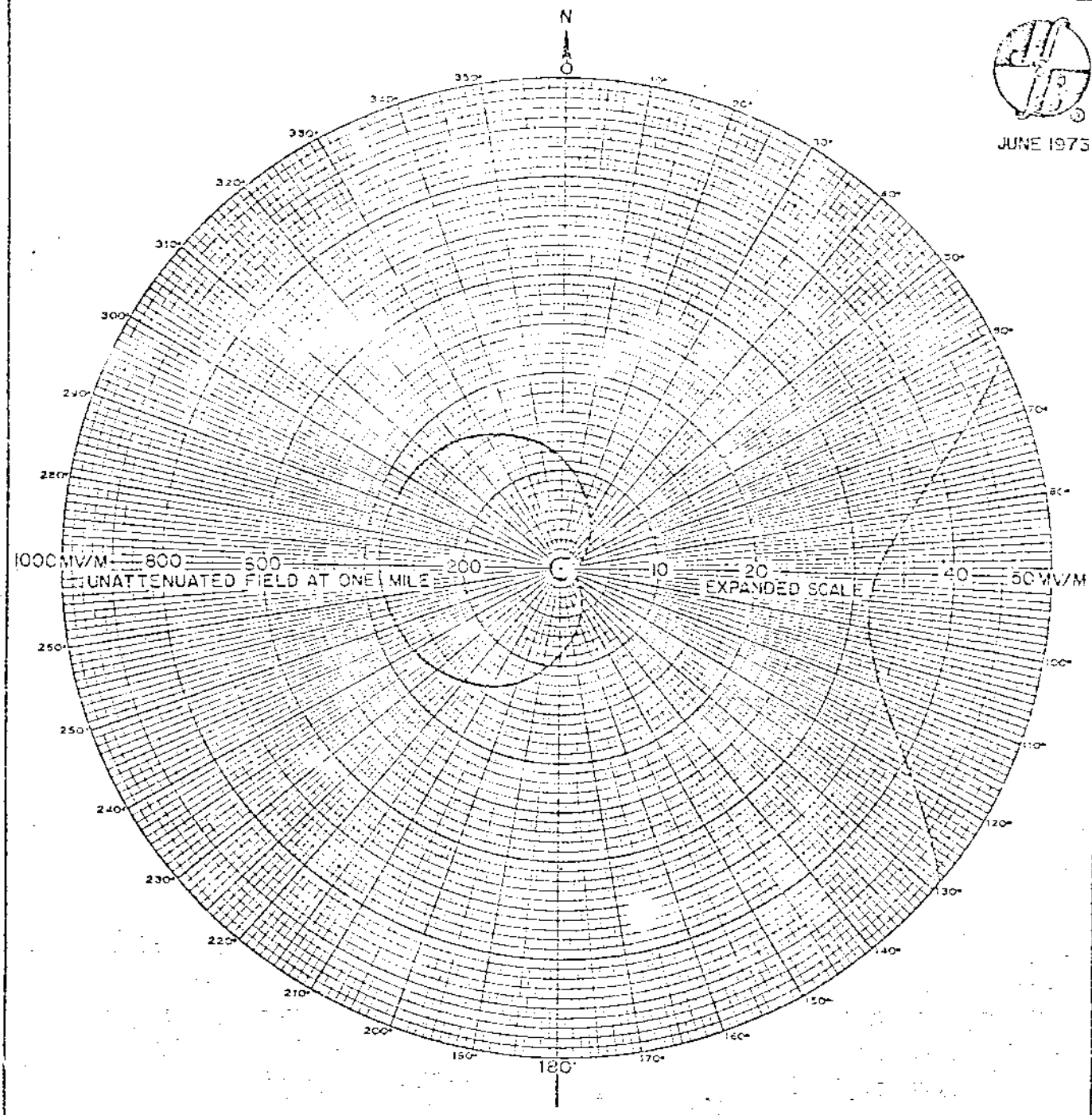
KBES 1540 KHz 5 KW DA-N

BELLEVUE EASTSIDE RADIO, LTD.
BELLEVUE, WASHINGTON

Standard Pattern

KZAM

JUNE 1975



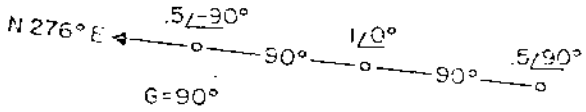
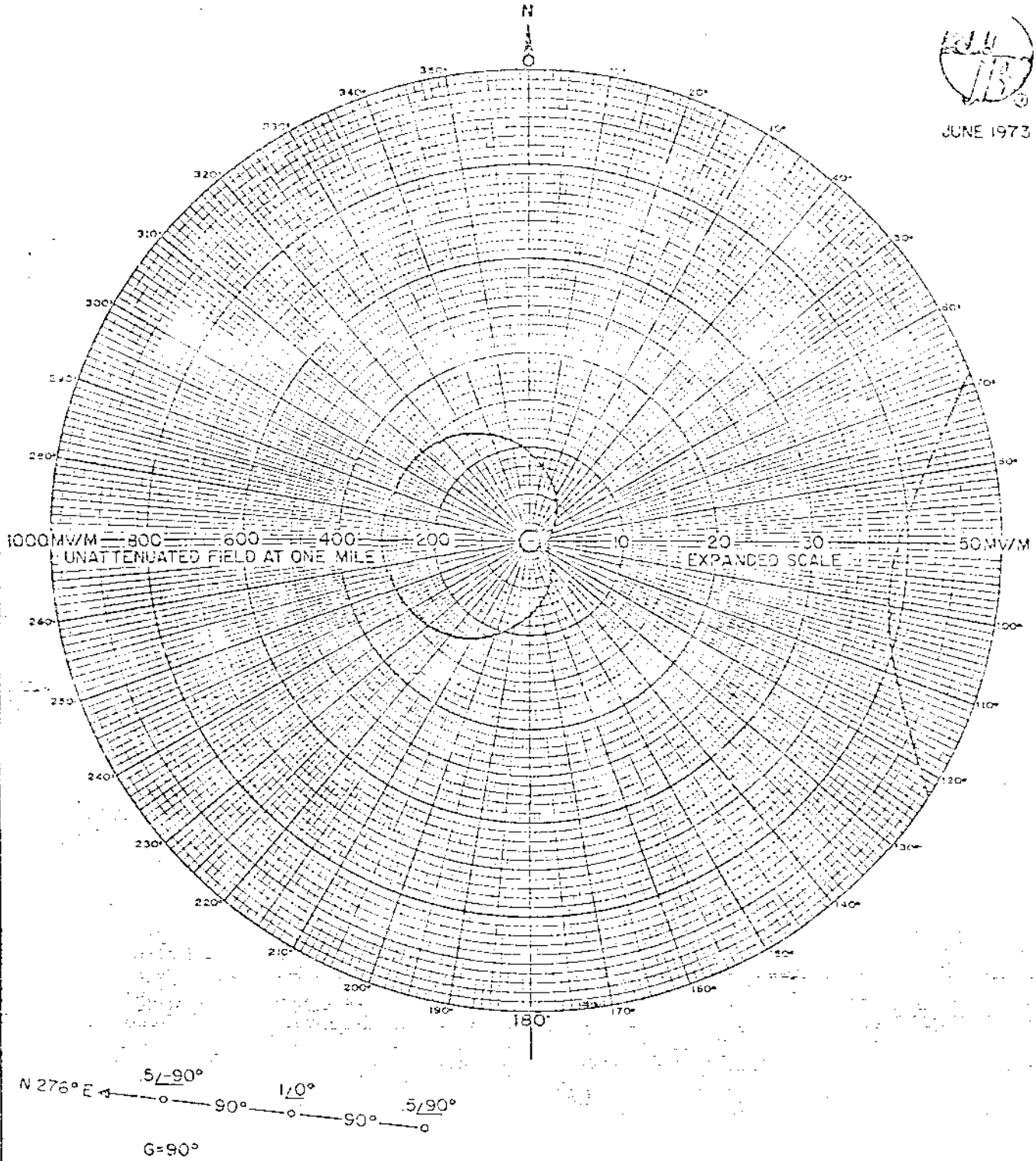


FIG. 2-K

PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (50° ABOVE HORIZONTAL)

KBES 1540KHz 5KW DA-N

BELLEVUE EASTSIDE RADIO, LTD
BELLEVUE, WASHINGTON



JUNE 1973

FIG. 2-L

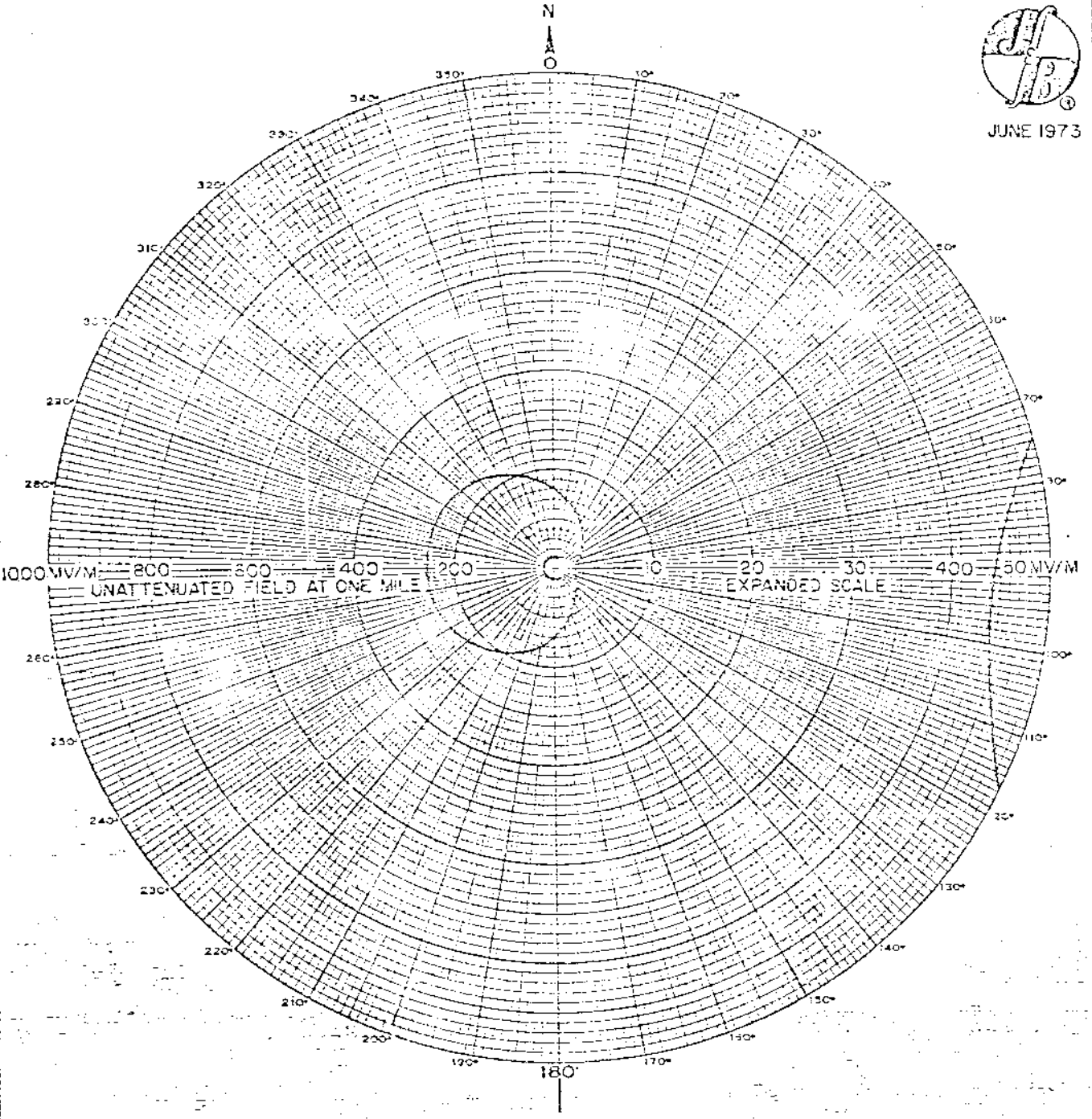
PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (55° ABOVE HORIZONTAL)

KBES 1540KHz 5KW DA-N

BELLEVUE EASTSIDE RADIO, LTD
BELLEVUE, WASHINGTON

Standard Pattern

KZAM



N 276° E ← .5/-90° —o— 90° —o— 1/0° —o— 90° —o— .5/90°

G = 90°

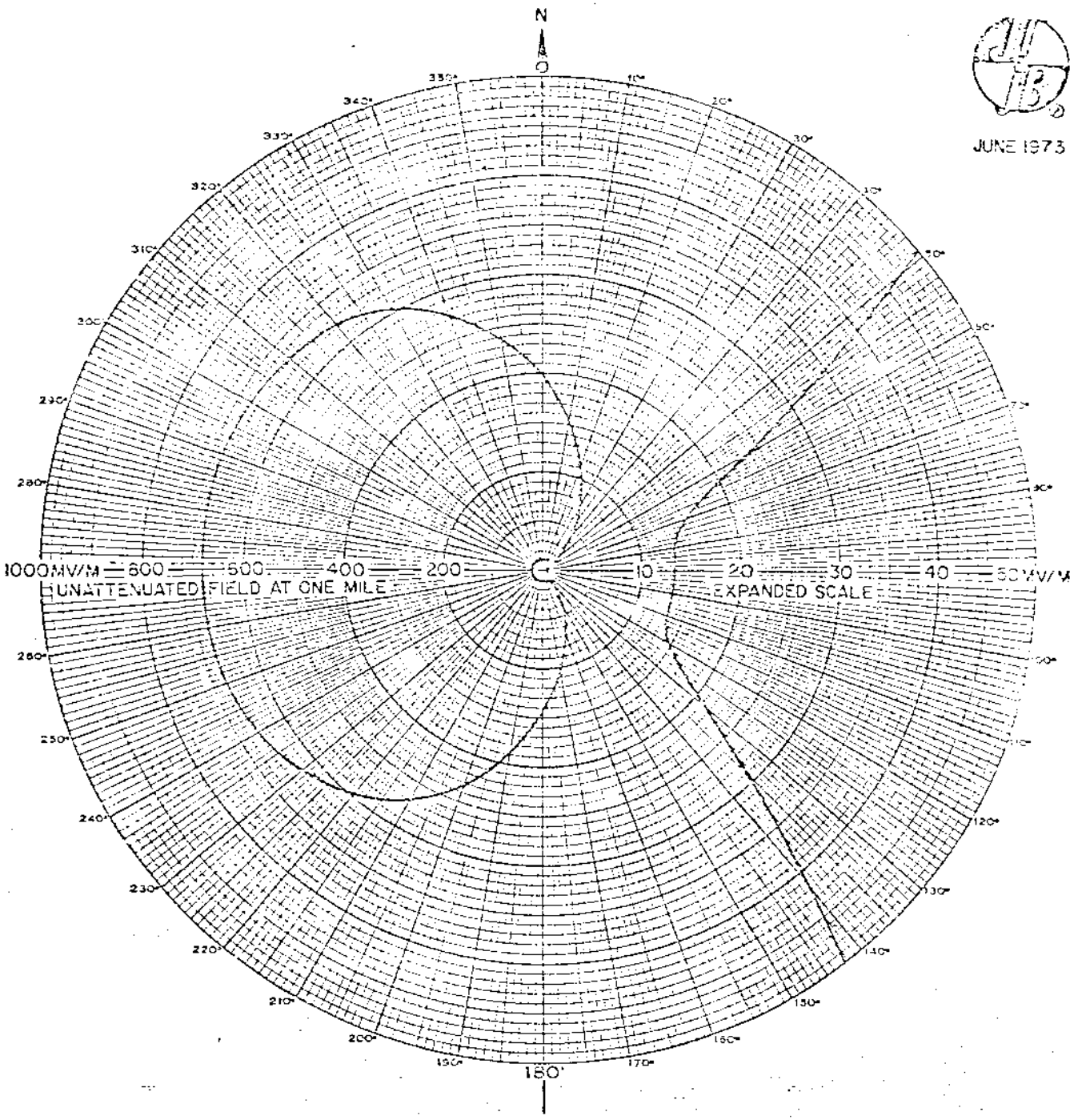
FIG. 2–M

PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (60° ABOVE HORIZONTAL)

KBES 1540 KHz 5 KW DA-N

BELLEVUE EASTSIDE RADIO, LTD.
BELLEVUE, WASHINGTON

Standard Pattern KZAM



JUNE 1973

N 276° E .5/-90° 1/0° .5/90°
90° 90°
G=90°

FIG. 2-D
PROPOSED NIGHTTIME STANDARD RADIATION PATTERN
(15° ABOVE HORIZONTAL)

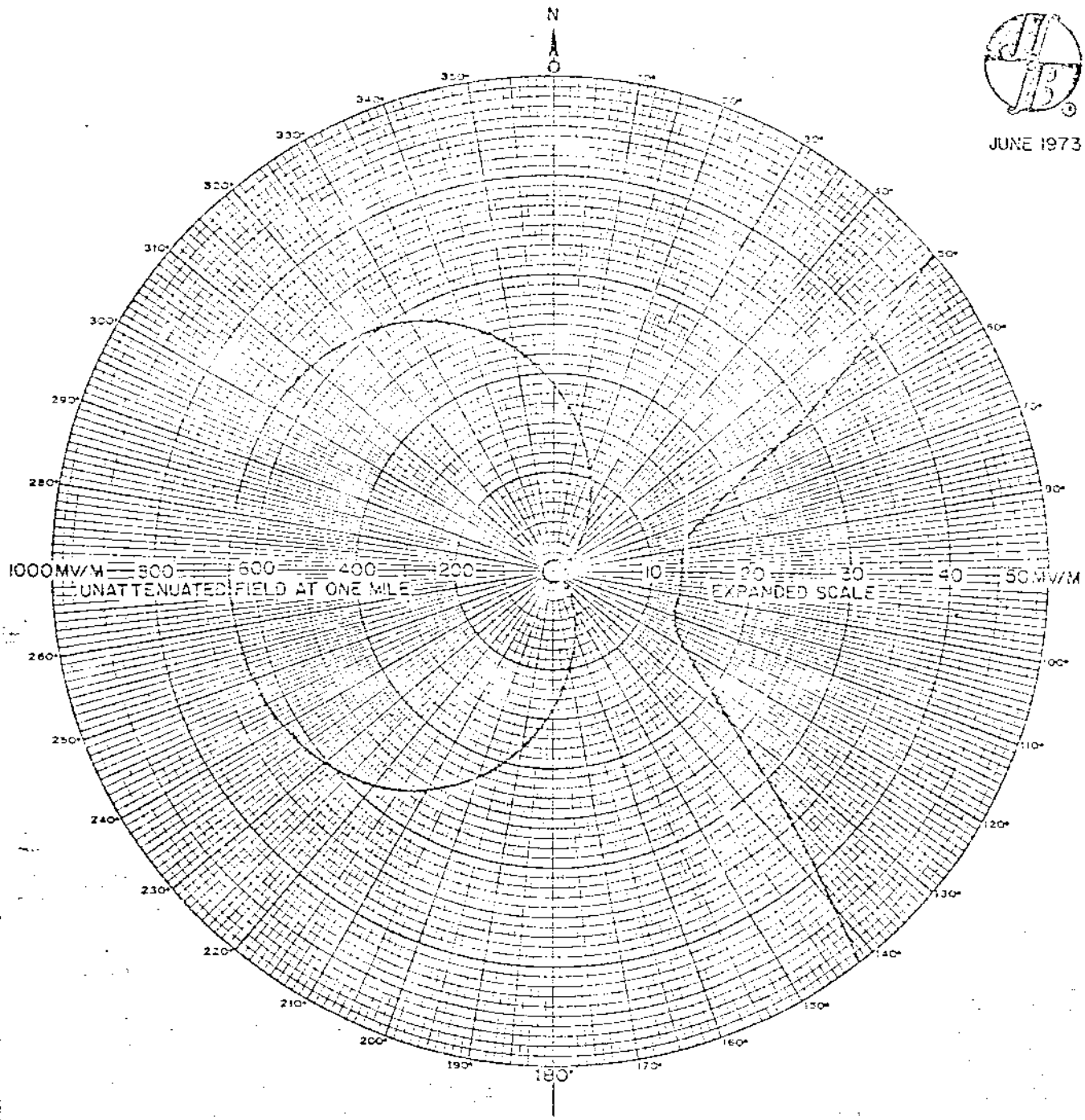
KBES 1540KHz 5KW DA-N

BELLEVUE EASTSIDE RADIO, LTD
BELLEVUE, WASHINGTON

Standard Pattern

KZAM.

JUNE 1973



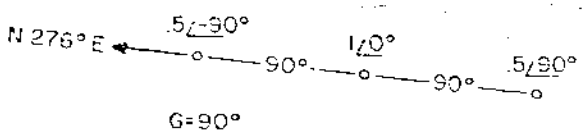


FIG. 2-E

PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (20° ABOVE HORIZONTAL)

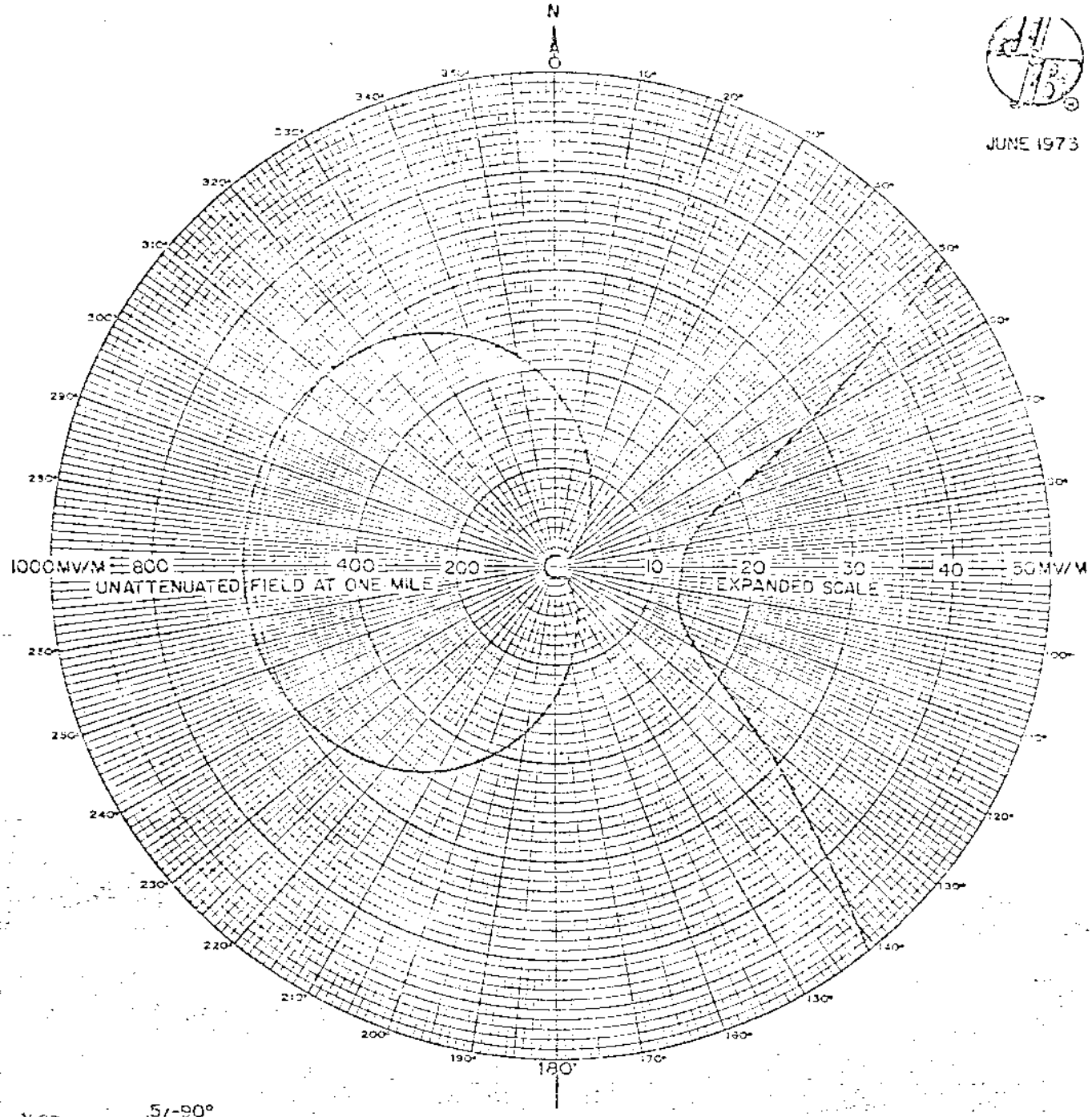
KBES 1540KHz 5KW DA-N

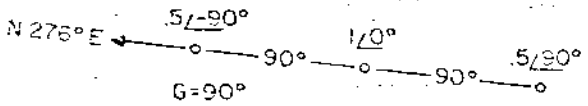
BELLEVUE EASTSIDE RADIO, LTD.
BELLEVUE WASHINGTON

Standard Edition

KZAM

JUNE 1973





LAT. 47° 35' 40"
LONG. 122° 10' 56"

FIG. 2-F

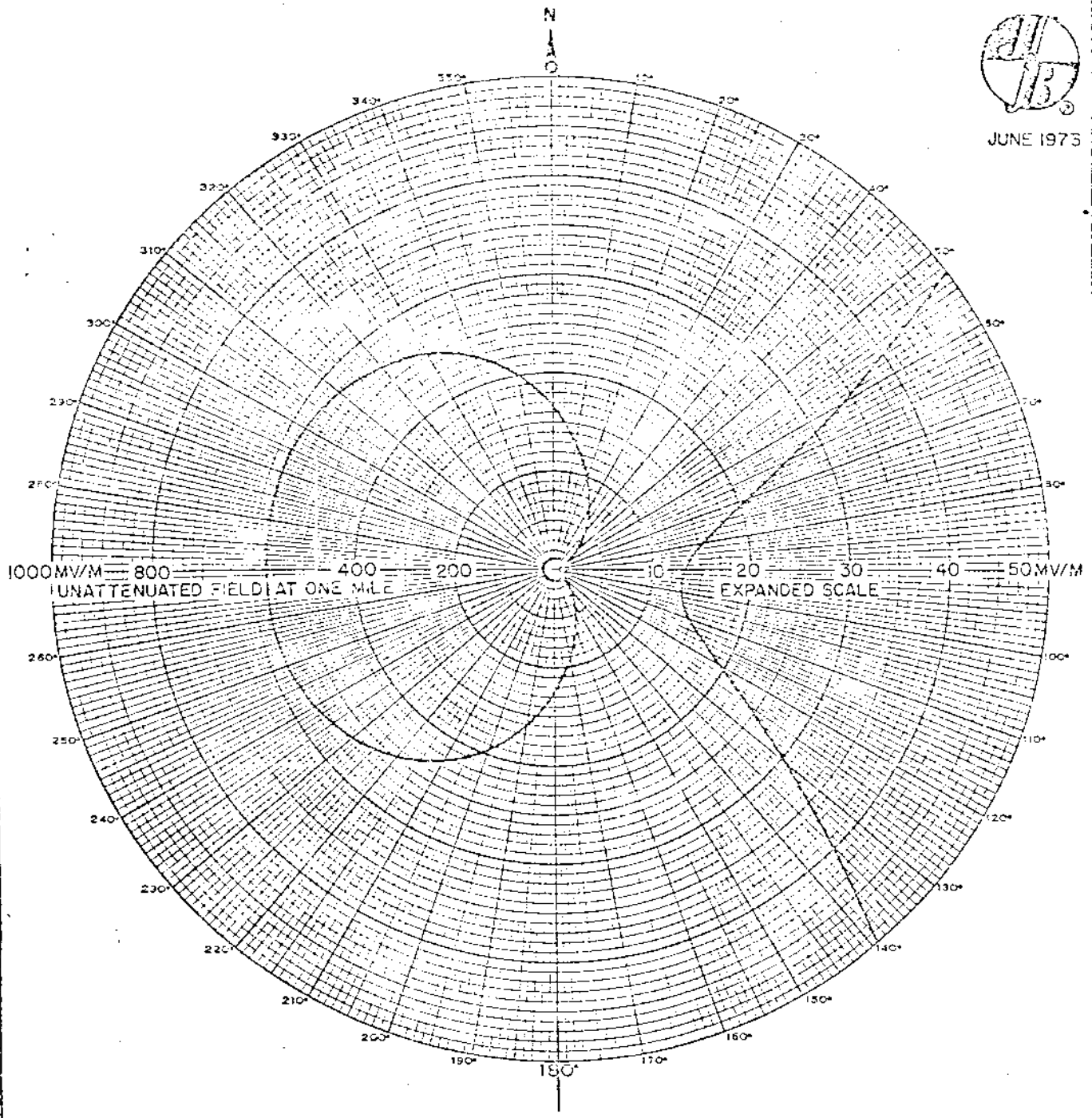
PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (25° ABOVE HORIZONTAL)

KBES 1540KHz 5KW DA-N

BELLEVUE EASTSIDE RADIO, LTD.
BELLEVUE, WASHINGTON

Standard Pattern

KZAM



JUNE 1973

N 276° E .5/-90° 1/0° .5/90°

90° 90°

G=90°

FIG. 2-G

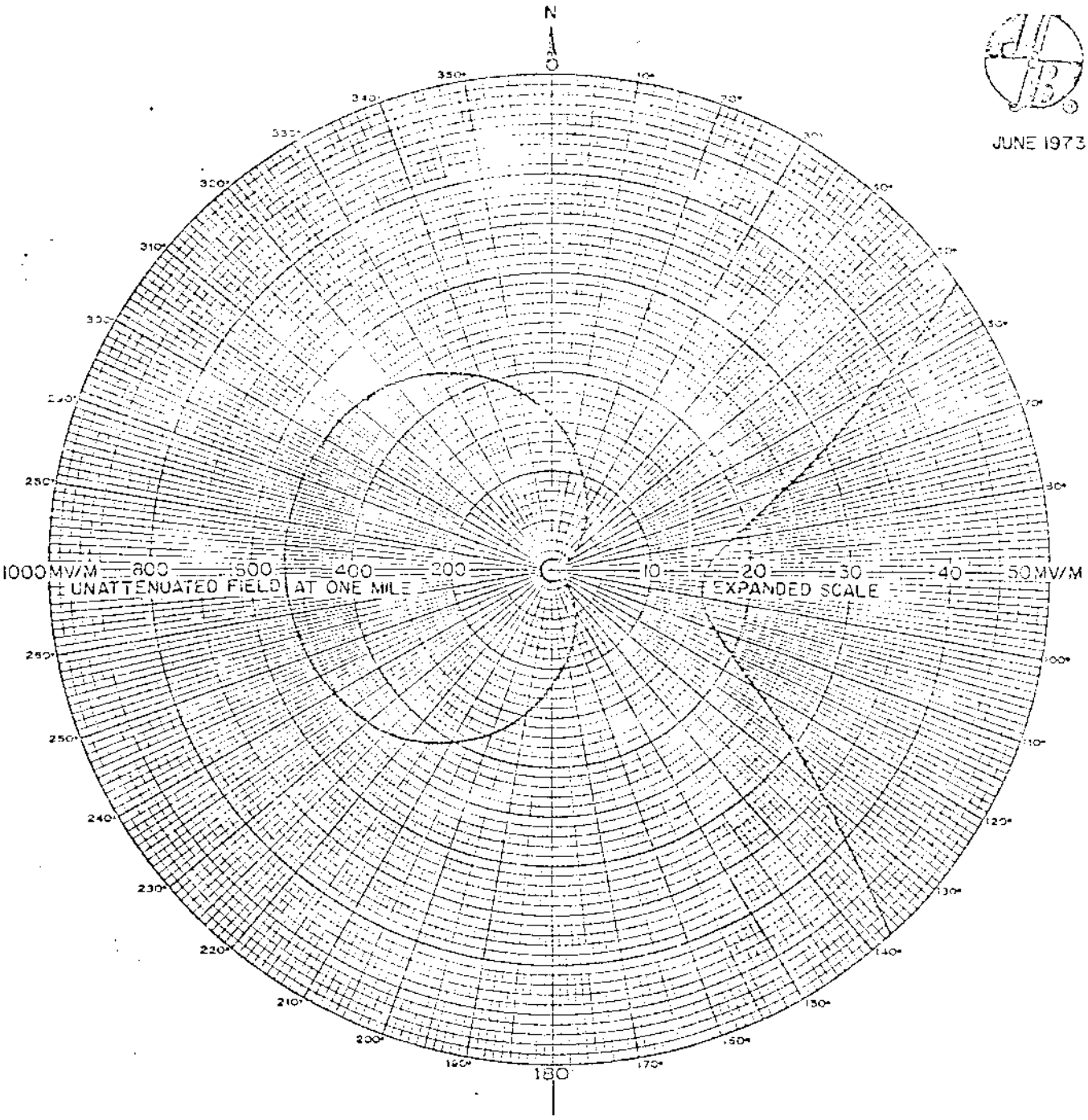
PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (30° ABOVE HORIZONTAL)

KBES 1540KHz 5KW DA-N

BELLEVUE EASTSIDE RADIO, LTD.
BELLEVUE, WASHINGTON

KZAM

JUNE 1973



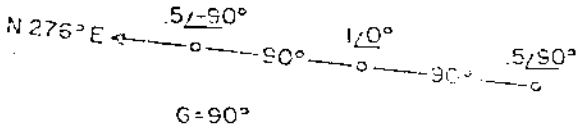


FIG. 2-H

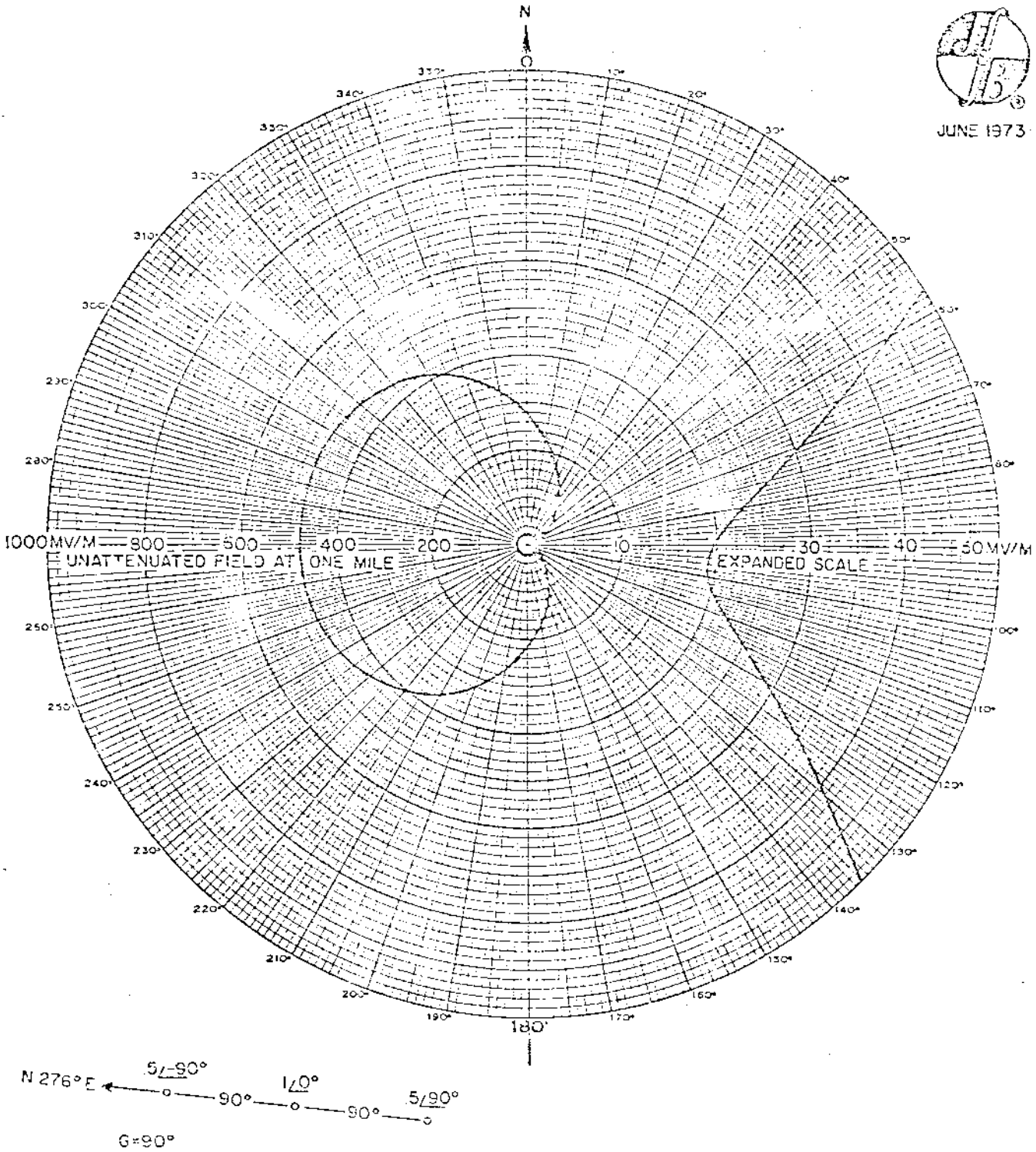
PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (35° ABOVE HORIZONTAL)

KBES 1540KHz 5KW DA-N

BELLEVUE EASTSIDE RADIO, LTD
BELLEVUE, WASHINGTON

Standard Pattern

KZAM



JUNE 1973

FIG. 2-I

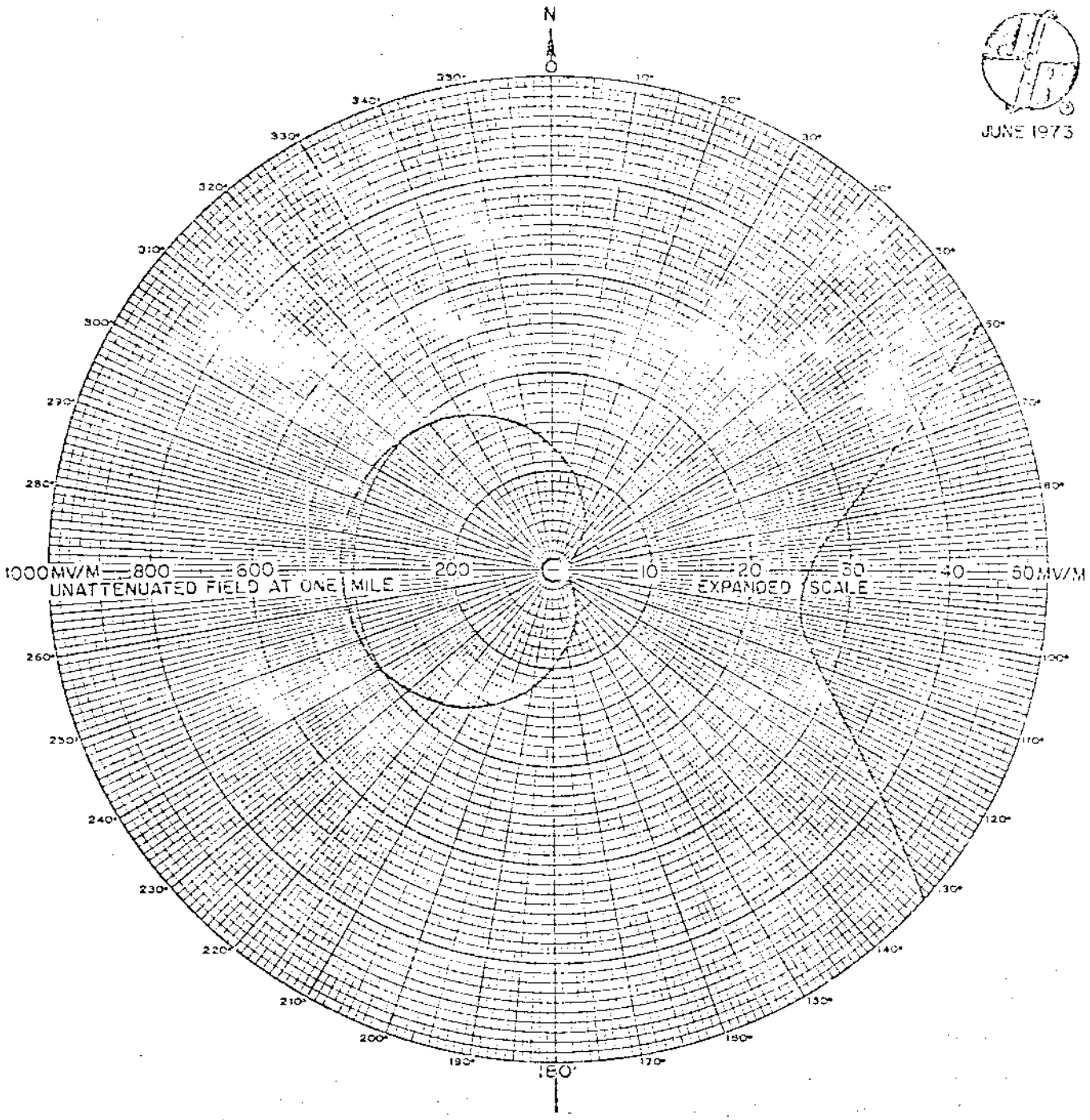
PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (40° ABOVE HORIZONTAL)

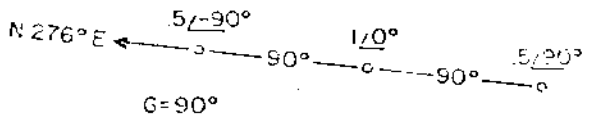
KBES 1540KHz 5KW DA-N

BELLEVUE EASTSIDE RADIO, LTD
BELLEVUE, WASHINGTON

Standard Pattern

KLAM





JUNE 1973

FIG. 2-J

PROPOSED NIGHTTIME STANDARD RADIATION PATTERN (45° ABOVE HORIZONTAL)

KBES 1540KHz 5KW DA-N

BELLEVUE EASTSIDE RADIO, LTD.
BELLEVUE, WASHINGTON

KZLA ~~KPOL~~

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: KPOL

Main Studio: Los Angeles, California

Frequency: 1540 kHz

Power: 10 kW Night 50 kW Day

Notification List No. 1676

Date: March 19, 1976

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 34° 04' 43"
West Longitude: 118° 11' 05"

ANTENNA CHARACTERISTICS

Authorized for Daytime and Nighttime operation. (DA-2)
Number of elements: 3
Type of elements: Series-excited, uniform cross-section, guyed vertical steel towers.

TOWER:	W(#3)	C(#2)	E(#1)
HEIGHT ABOVE INSULATORS:	250'	250'	250' (141°)
NIGHT PHASING:	-105°	0°	+105°
NIGHT FIELD RATIO:	0.49	1.0	0.49
DAY PHASING:	-122°	0°	+135°
DAY FIELD RATIO:	0.325	1.0	0.325

SPACING AND ORIENTATION: Adjacent elements are spaced 159.5' (90°) on a line bearing 255° true.

GROUND SYSTEM: 120-200' equally spaced copper radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers.

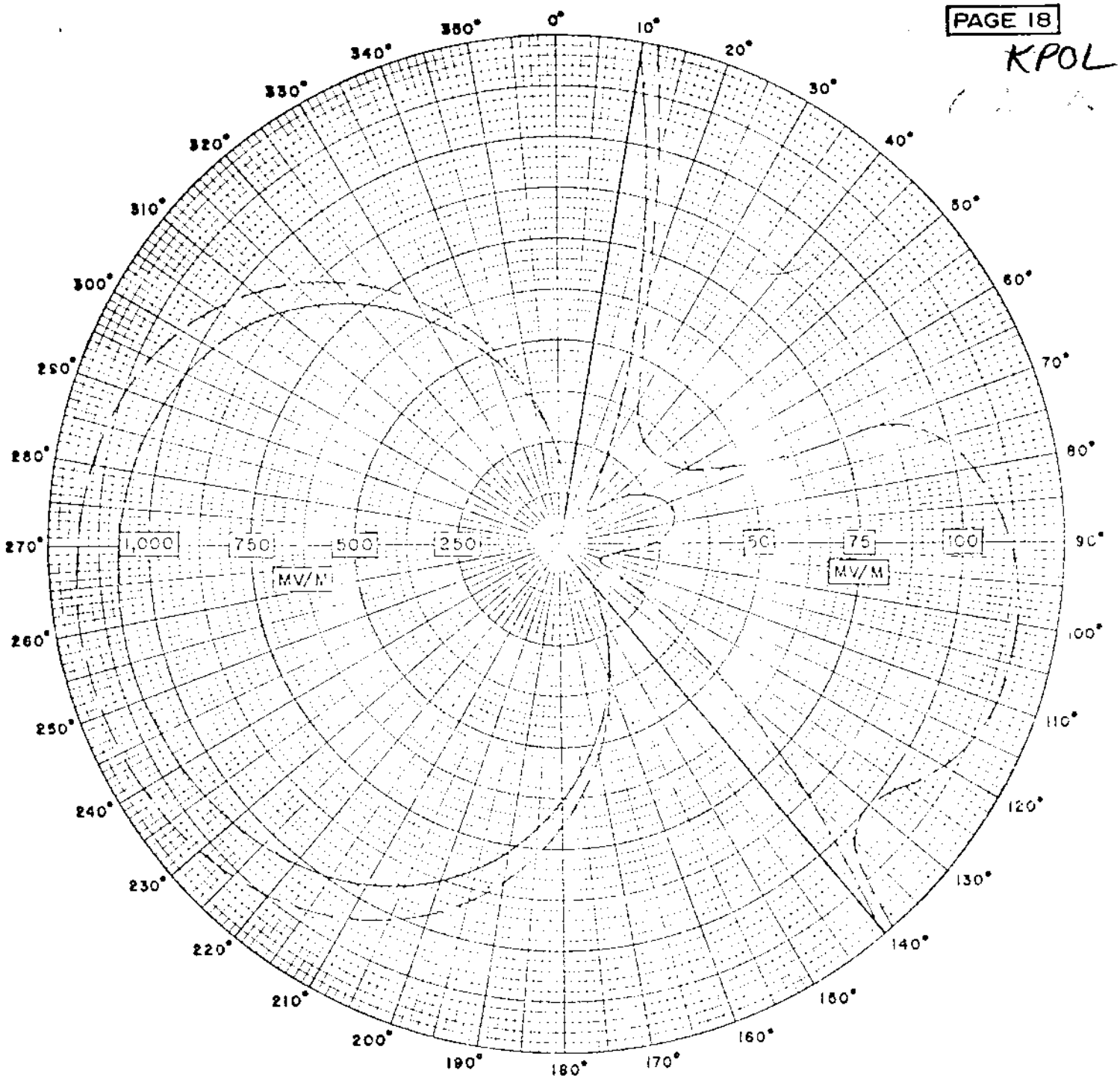
Predicted effective Night Field: 552 mv/m at rated power.

Predicted effective Day Field: 1425.5 mv/m at rated power.

Note: Please retain the Daytime directional antenna radiation pattern notifi for station KPOL in United States Change List Number 895 dated February 8, 1961, and attach to this Revised Description Sheet and Nighttime patterns. This notification concerns only a change in the Nighttime operation of the station with Daytime operation continued as previously notified.

CTR NO 31212A4

KPOL



ANTENNA NO.	1	2	3
FIELD	0.49	1.0	0.49
PHASE	105°	0°	-105°
SPACING	0°	90°	180°
ORIENTATION	0°	255°	255°
HEIGHT	141°	141°	141°

N. LAT.	34°	4′	43″
W. LONG.	118°	11′	5″
RMS STD			mv/m
RMS Th		650	mv/m

NIGHTTIME HORIZONTAL PATTERN

KPOL - LOS ANGELES, CALIFORNIA

1540 kHz - 10 N / 50 D - DA-2

SEPTEMBER 1975

GAUTNEY & JONES—CONSULTING ENGINEERS

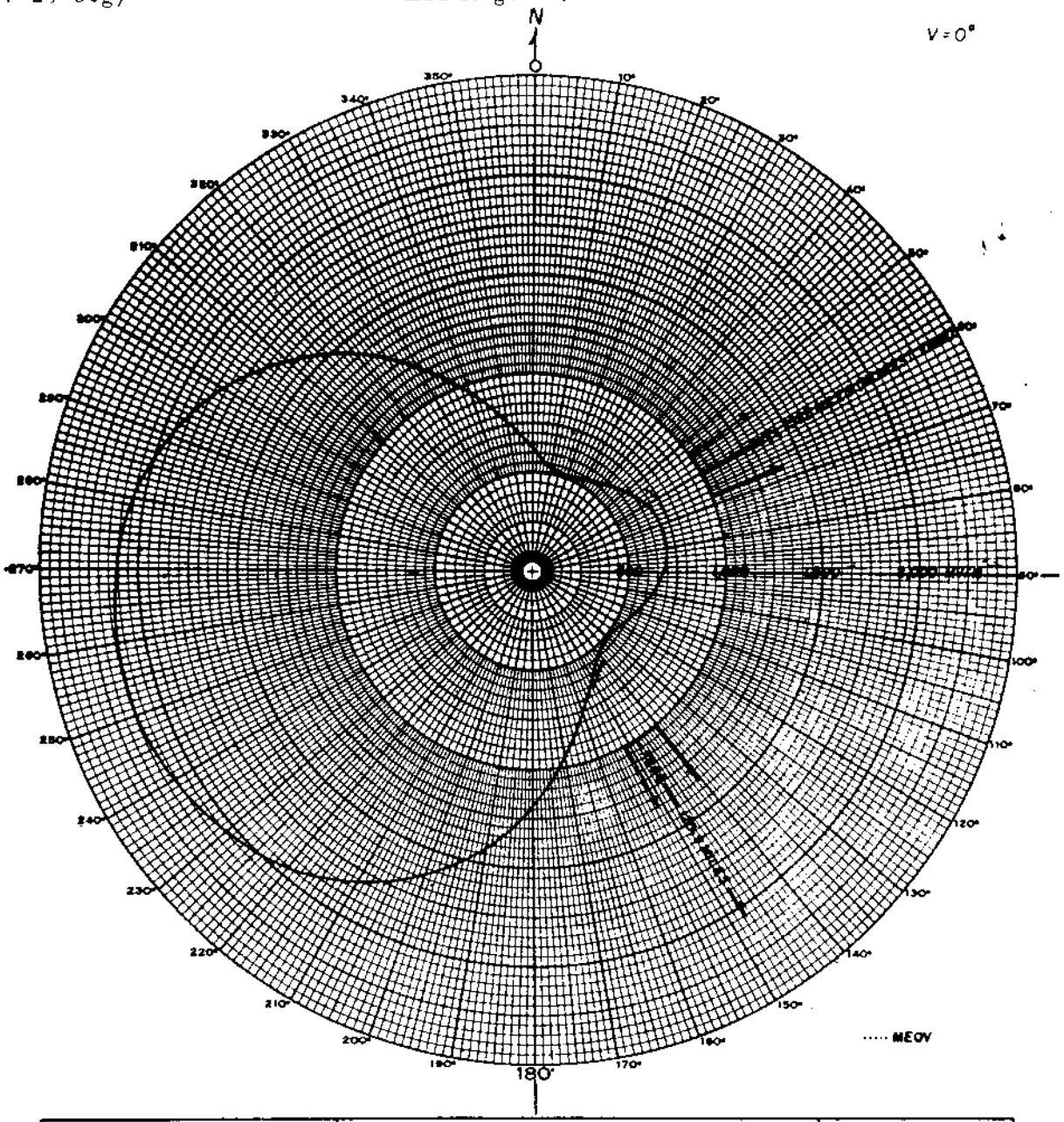
K2LA ~~KPOL~~

PROPOSED DAY
(7-29-60g)

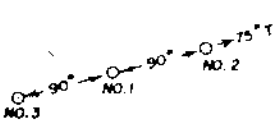
Station KPOL
Los Angeles, California

10kw,50kw-LS, DA-2,U
1540 kc

2-8-61 granted CP mod. power to DA-2



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA
	TOWER No.	ELECTRICAL HEIGHT θ°	TRUE TOWER ORIENTATION θ''	SPACING δ°	PHASING ψ°	HORIZONTAL FIELD mv/m ε	FIELD RATIO r	ELEV ANGLE θ°	ELEVATION RMS FIELD mv/m ε_θ	CALL KPOL
	1	141	0	0	0	1425.5	1.0	0	1316	FREQUENCY 1540 kc
	2	141	75	90	+135		0.325	10		POWER 50 kw
	3	141	255	90	-122		0.325	20		TIME OF OPERATION UNLIMITED
	4							30		TYPE OF OPERATION DA-2
	5							40		DAYTIME TOWERS 3
	6							50		NIGHTTIME TOWERS 3
	7							60		No RADIALS PER TOWER 120
	8							70		LENGTH OF RADIALS 112 - 200 ft
	9							80		GROUND SCREEN DIMENSION
	10							ε_θ =	mv/m	LAT 34° 04' 43"
	DAYTIME OPERATION ☒			NIGHTTIME OPERATION ☐				P_k =	kw	LONG 118° 11' 06"
										SUPERSEDES NOVEMBER, 1958
										PATTERN No



90° = 159.5' AT 1540 KC.

EXHIBIT NO. 1
(AMENDED)

RADIO STATION KPOL — LOS ANGELES
PROPOSED 50 KW — DA-DAY — 1540 KC

JUNE 1960

FCC File No. BP-12770
Accepted 7-21-60 (Amended)

KPOL
Los Angeles, California

1540 kc

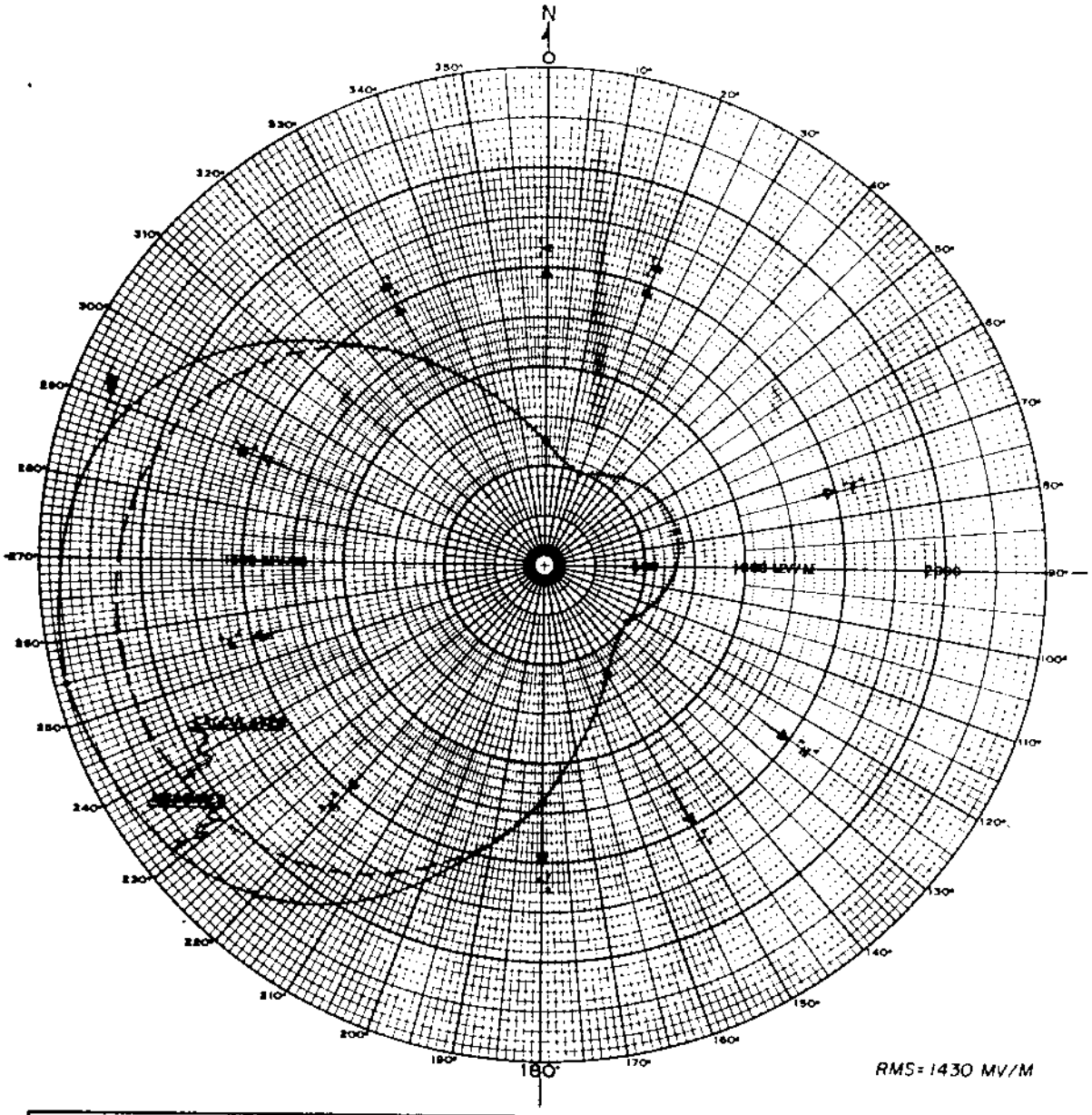
KPOL

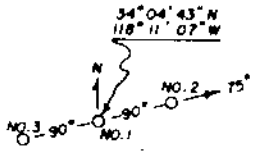
Measured Day
(4-27-62ct)

Station KPOL
Los Angeles, California

10kw,50kw-LS,DA-2,U
1540 kc

5.17.62
granted L covering
increase in day power
and change to DA-2



TOWER PLACEMENT SKETCH	
 90°=159.5'	FIGURE NO. 15 DAY TIME DIRECTIONAL RADIATION PATTERN BASED ON FIELD INTENSITY MEASUREMENTS STATION KPOL — LOS ANGELES, CALIFORNIA
NO.1 = 1.0 0° NO.2 = 0.325 +135° NO.3 = 0.325 -122° H=141°	1540 KC • 50 KW-DAY • DA-2 NOVEMBER / 1961 KPOL- BL-

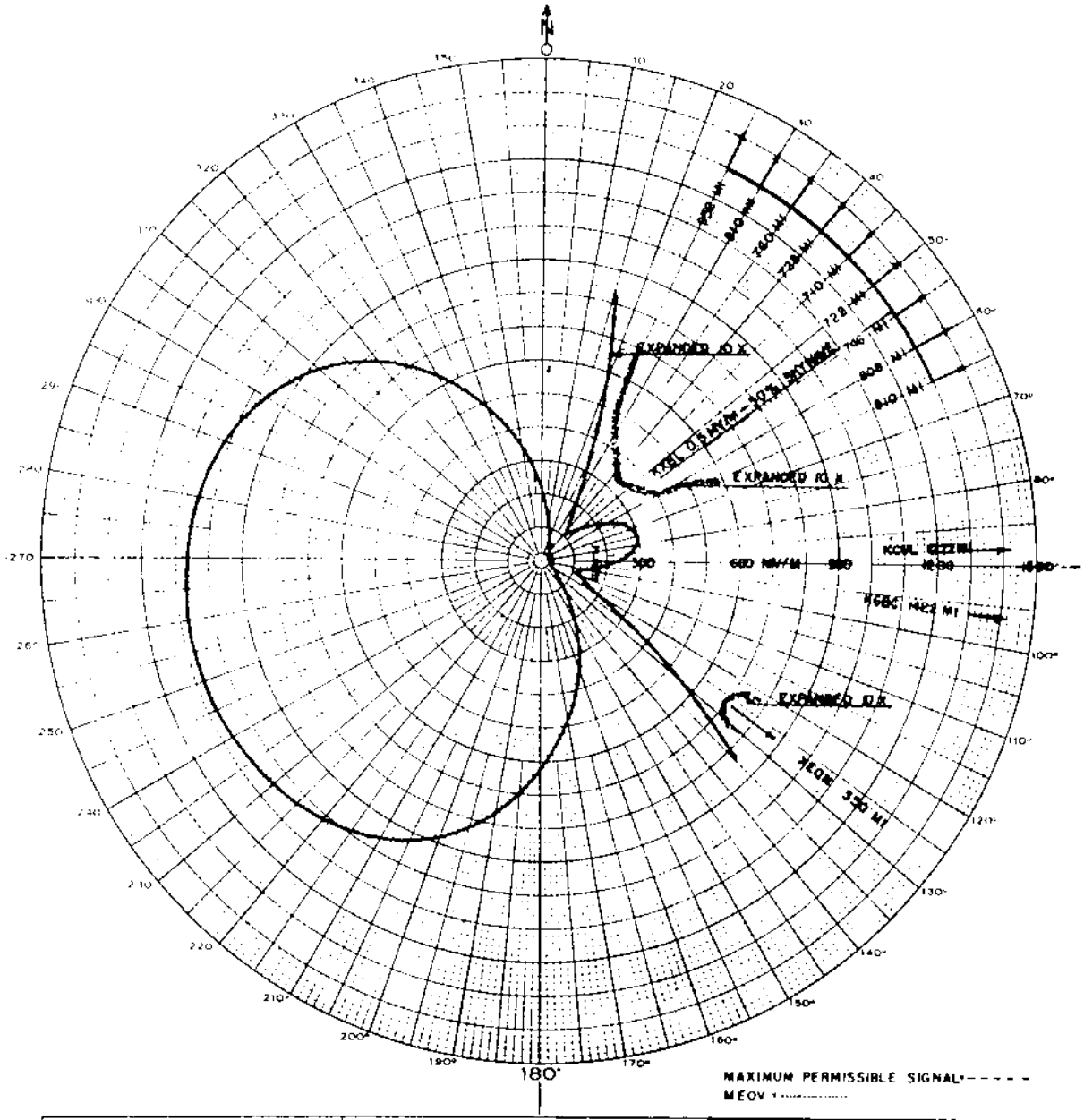
FCC File No.BL-9083
Accepted 4-6-62

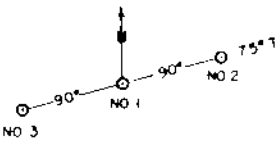
Station KPOL
Los Angeles, California

1540 kc

KPOL
KSLA

PROPOSED NIGHT (3/22/55G) | STATION KPOL LOS ANGELES, CALIFORNIA | 10 KW DA-N, U | 1540 KC



TOWER PLACEMENT SKETCH	PATTERN PARAMETERS								STATION DATA
	Tower	Electrical Height	True Tower Orientation	Spacing	Phasing	Horizontal Field	Field Ratio	Elev. Angle	Elevation RMS Field
	1	.41	0	0	0	552	1.0	0	650
	2	.41	75	90	+105		0.49	10	
	3	.41	250	90	-105		0.49	20	
	4							30	
	5							40	
	6							50	
	7							60	
	8							70	
	9							80	
								Avg.	
								Max.	

Call: KPOL
Frequency: 1540 kc
Power: 10 kw
Time of Operation: NIGHT
Type of Operation: DA
Daytime Towers: 1
Nighttime Towers: 3
No. Radials per Tower: 120
Length of Radials: 112 ft 200 ft
Ground Rib Dimension:
Lat. 34° 04' 43"
Long. 118° 11' 06"
Supersedes:
Pattern No.

NO 1 — NO 2 — NO 3 — 90° — 90° — 75°

EXHIBIT NO. I-A

RADIO STATION KPOL LOS ANGELES
PROPOSED 10 KW-DA-NIGHT — 1540 KC

OCTOBER — 1954

FILE BP-9678 | Accepted 2/18/55 FCC | KPOL, Los Angeles, Calif. | 1540 KC

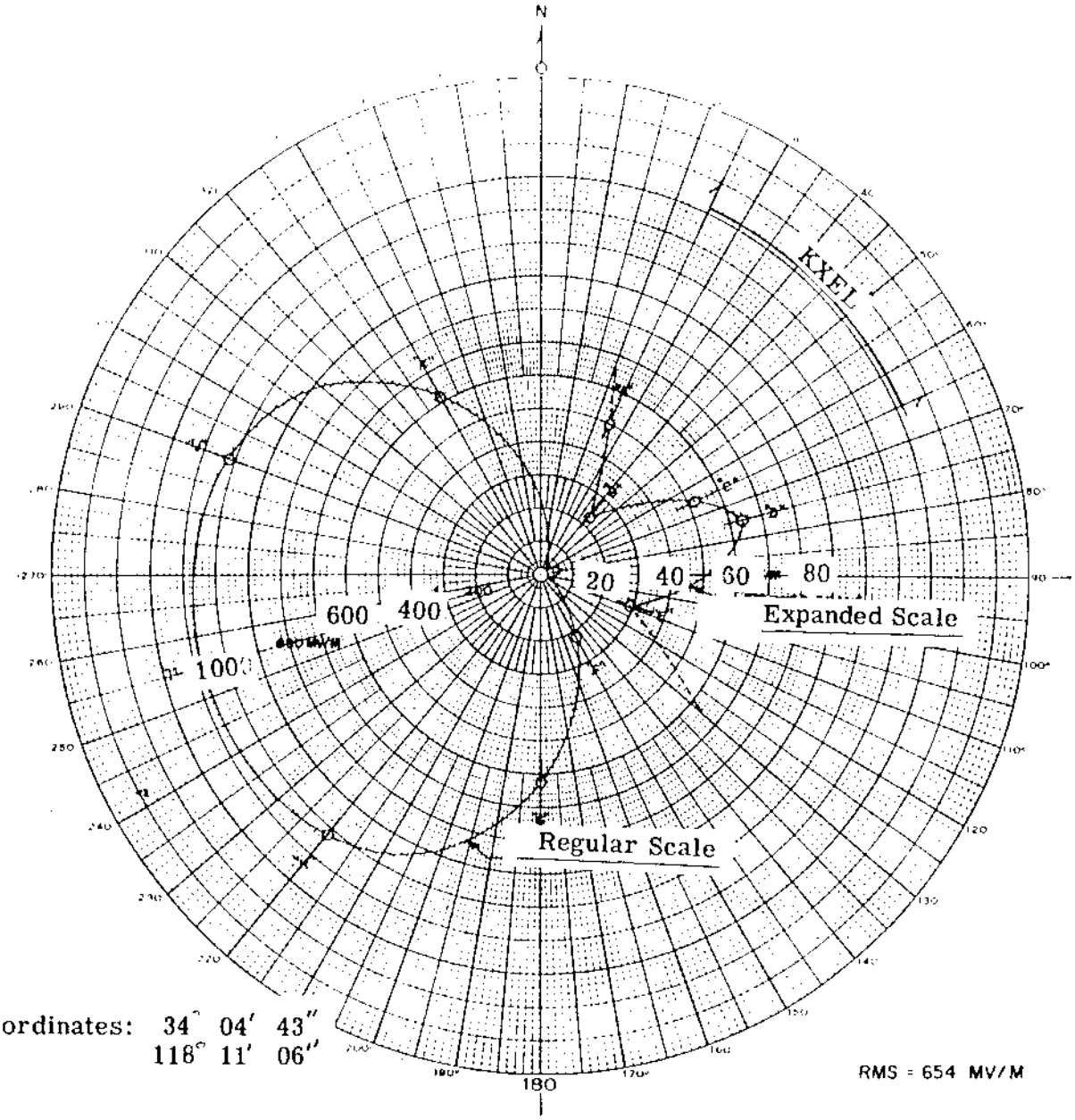
KPOL

MEASURED NIGHT
(4/24/57g)

Station KPOL
Los Angeles, California

10kw, DA-N,U
1540 KC

Granted license 6/10/57 for DA-N



Coordinates: 34° 04′ 43″
118° 11′ 06″

RMS = 654 MV/M

FIGURE NO. 13

PATTERN BASED ON FIELD INTENSITY MEASUREMENTS
STATION KPOL 1540 KC — 10 KW - NIGHTTIME - DA-N
LOS ANGELES, CALIFORNIA
SEPTEMBER — 1956

T & T RADIO MEASUREMENTS CO.
FIRST ATLANTIC AVENUE
LONG BEACH 8, CALIFORNIA
Radio Engineering Consultants

FCC File No. BL-6588
Accepted 4/15/57

KPOL
Los Angeles, California

1540 KC

KZLA KPOL

Measured Non-DA
(4-27-62ct)

Station KPOL
Los Angeles, California

10kw,50kw-LS,DA-2,U
1540 kc

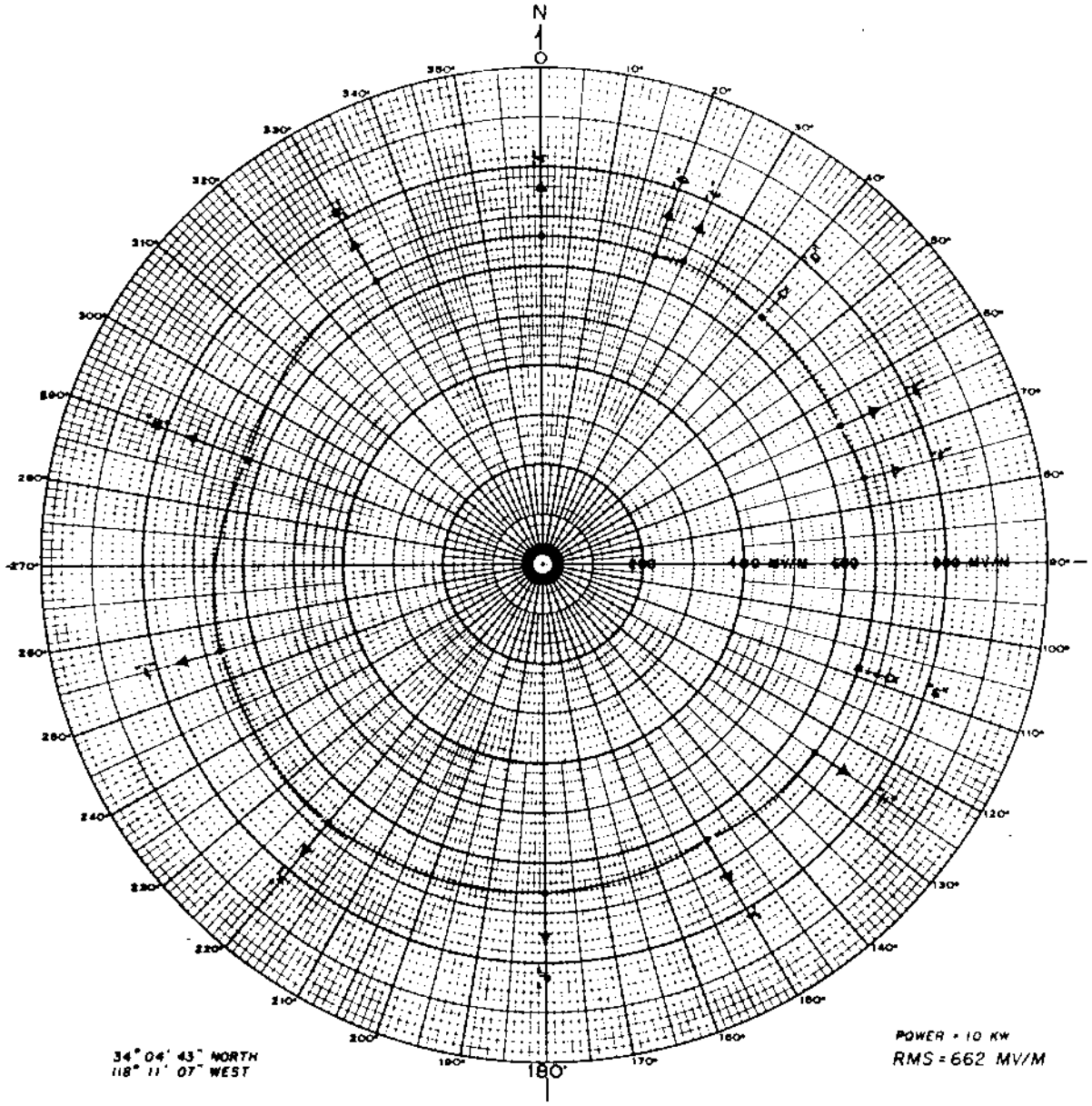


FIGURE NO. 14

NON-DIRECTIONAL RADIATION PATTERN

BASED ON FIELD INTENSITY MEASUREMENTS

1540 KC • 50/10 KW • DA-2

STATION KPOL — LOS ANGELES, CALIFORNIA

NOVEMBER — 1961

FCC File No.BL-9083
Accepted 4-6-62

Station KPOL
Los Angeles, California

1540 kc

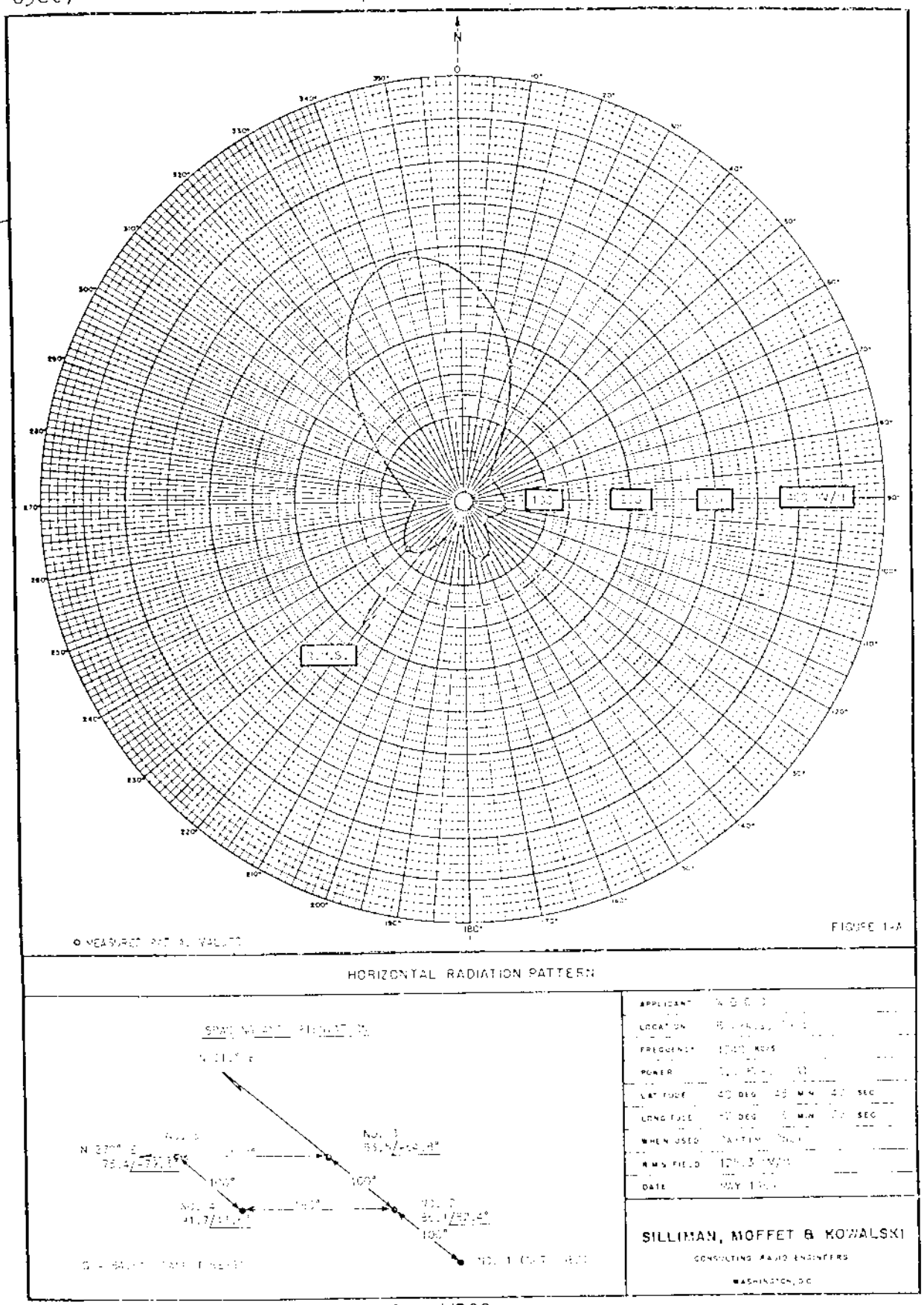
WBCO

Measured Day
(6-27-69ct)

Station WBCO
Bucyrus, Ohio

500w,DA-D,D
1540 kc

BL-12383
Granted
1/2/69
License
covering
changes



FCC File No.BL-12383
Accepted 6-16-69

Station WBCO
Bucyrus, Ohio

1540 kc

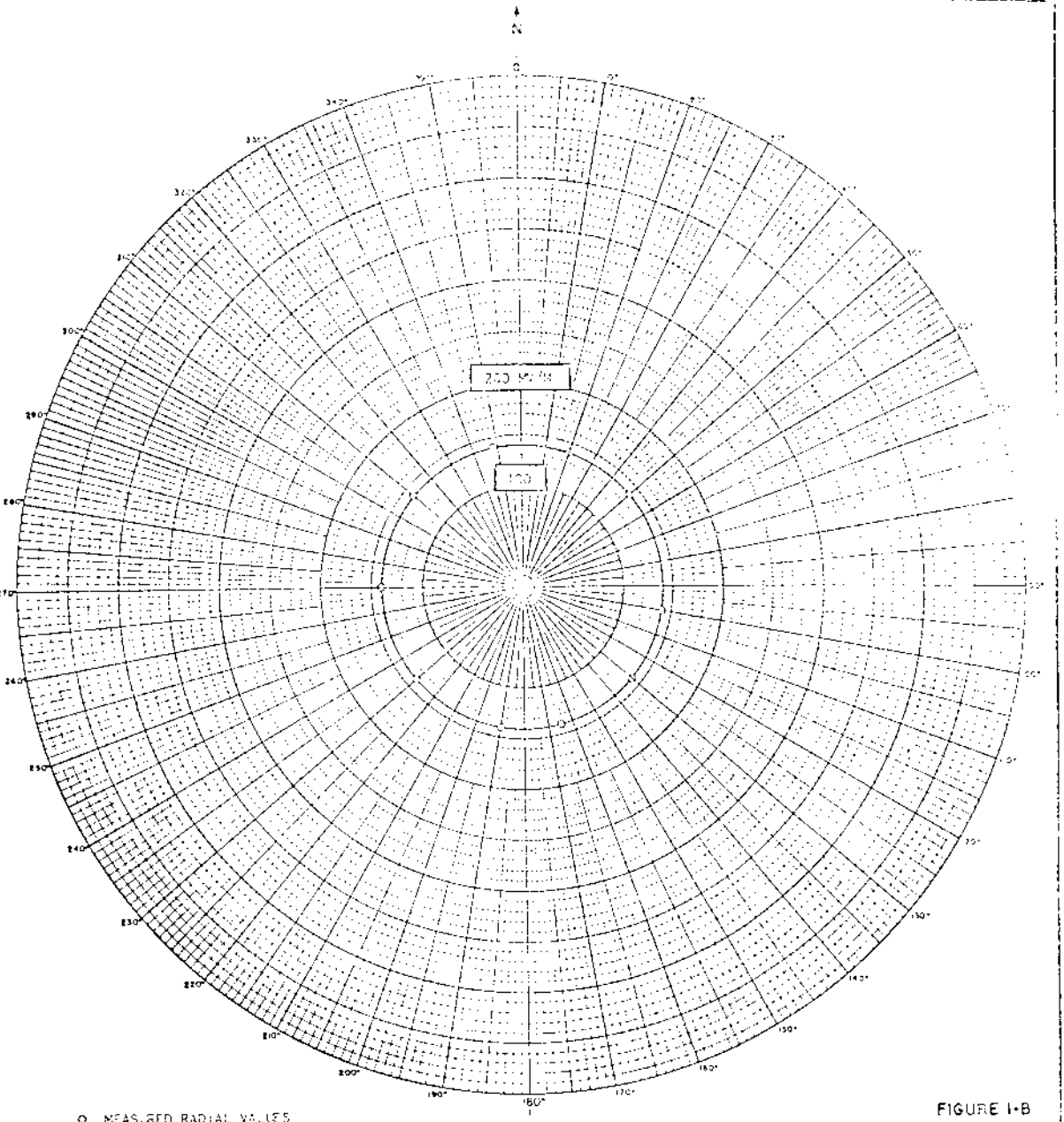
WBCO

Measured Non-DA
(6-27-69ct)

Station WBCO
Bucyrus, Ohio

500w,DA-D,D
1540 kc

BL-12383
Granted
8/12/69
licence
covering
changes



O MEASURED RADIAL VALUES

FIGURE 1-B

HORIZONTAL RADIATION PATTERN

NON-DIRECTIONAL SURVEY

APPLICANT	WBCO
LOCATION	BUCYRUS, OHIO
FREQUENCY	1540 KCS
POWER	0.5 KW-D (DA)
LATITUDE	40 DEG 48 MIN 37 SEC
LONGITUDE	82 DEG 58 MIN 05 SEC
WHEN USED	NON-DIRECTIONAL SURVEY
RMS FIELD	100 MV/M
DATE	MAY, 1969

SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No.BL-12383
Accepted 6-16-69

Station WBCO
Bucyrus, Ohio

1540 kc

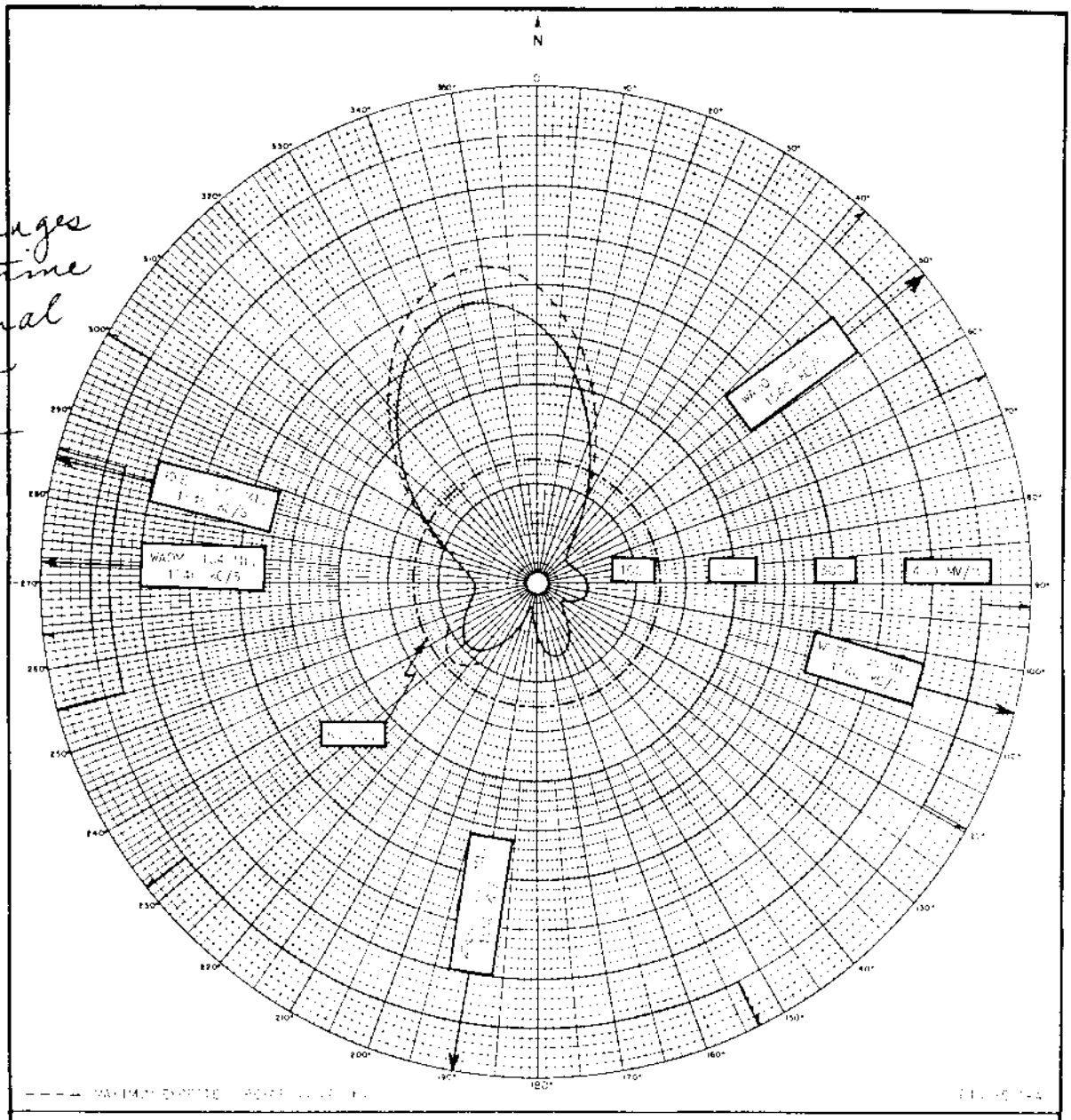
WBCO

Proposed Day
(2-28-69ct)

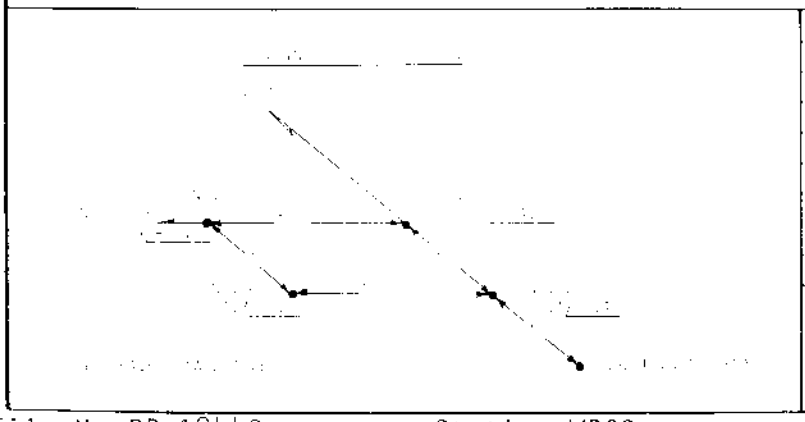
Station WBCO
Bucyrus, Ohio

500w,DA-D,D
1540 kc

BP-18440
Granted
2-11-69
CP to
make changes
in daytime
directional
antenna
system



HORIZONTAL RADIATION PATTERN



APPLICANT
LOCATION
FREQUENCY kc/s
POWER
LATITUDE DEG MIN SEC
LONGITUDE DEG MIN SEC
WHEN USED
DATE

SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON D.C.

FCC File No.BP-18440
Accepted 2-7-69

Station WBCO
Bucyrus, Ohio

1540 kc

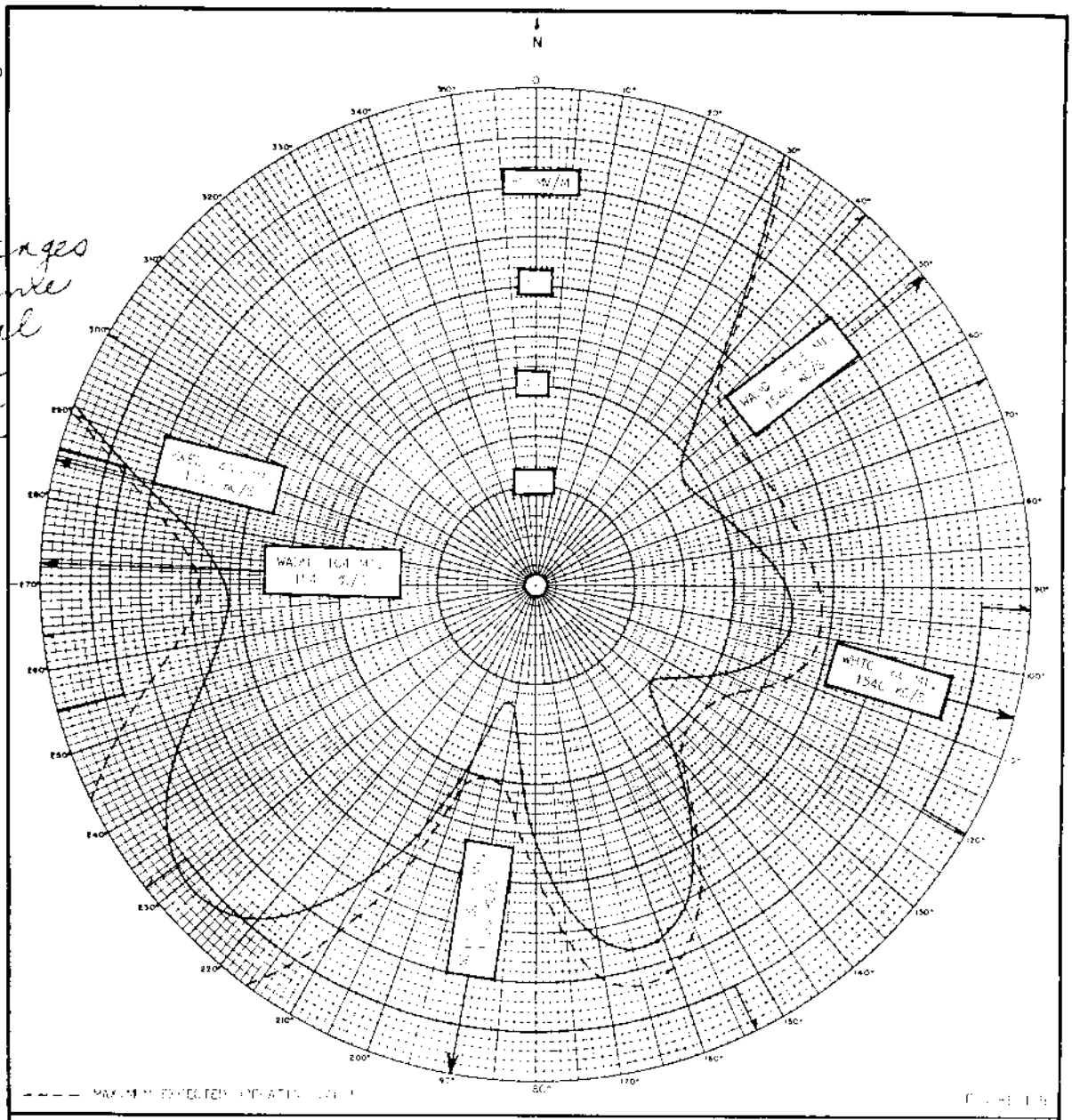
WBCO

Proposed Day Nulls
(2-28-69ct)

Station WBCO
Bucyrus, Ohio

500w,DA-D,D
1540 kc

BP-18440
Granted
2-11-69
up to
make changes
in daytime
directional
antenna
system



EXPANDED VIEW

SILLIMAN, MOFFET & KOWALSKI
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No.BP-18440
Accepted 2-7-69

Station WBCO
Bucyrus, Ohio

1540 kc

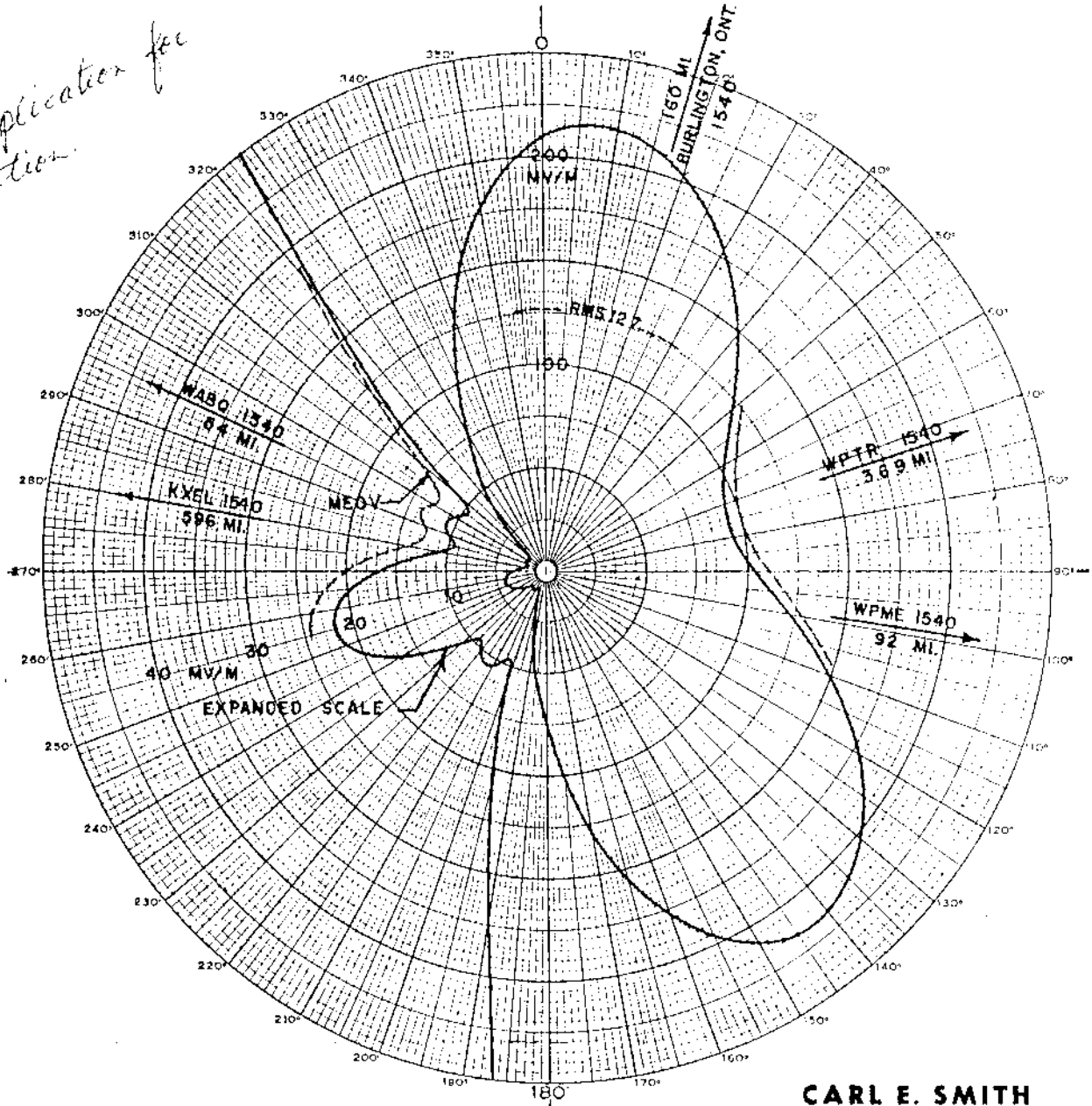
Niles, Ohio WNIO

PROPOSED DAY
(4-22-60R)

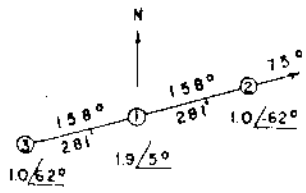
New: The Niles B/C Co.
Niles, Ohio

500w, DA-D,D
1540 KC

4-11-63
granted application for
new AM station.



CARL E. SMITH
CONSULTING RADIO ENGINEERS

TOWER PLACEMENT SKETCH	PATTERN PARAMETERS									STATION DATA
	TOWER No	ELECTRICAL HEIGHT G°	TRUE TOWER ORIENTATION β°	SPACING S°	PHASING ψ°	HORIZONTAL FIELD mv/m E	FIELD RATIO F	ELEV ANGLE θ°	ELEVATION FIELD mv/m E_θ	CALL NEW
	1	90	0	0	5	105.9	1.9	0	127	FREQUENCY 1540 kc
	2	90	75	158	-62	55.7	1.0	10		POWER 0.5 kw
	3	90	255	158	62	55.7	1.0	20		TIME OF OPERATION DA-D
	4							30		TYPE OF OPERATION CLASS II
	5							40		DAYTIME TOWERS 3
	6							50		NIGHTTIME TOWERS —
	7							60		NO RADIALS PER TOWER 120
	8							70		LENGTH OF RADIALS 90' 160'
	9							80		GROUND SCREEN DIMENSION 24'X24'
	10							E_θ	mv/m	LAT 41° 07' 56"
								E_θ	mv/m	LONG 80° 45' 40"
	DAYTIME OPERATION ☒			NIGHTTIME OPERATION ☐						SUPERSEDES
										PATTERN No 600130

THE NILES B/C CO.
NILES, OHIO

FIG. 3
HORIZONTAL PATTERN

FCC File No. BP-13993
Accepted 4-5-60

The Niles Broadcasting Company
Niles, Ohio

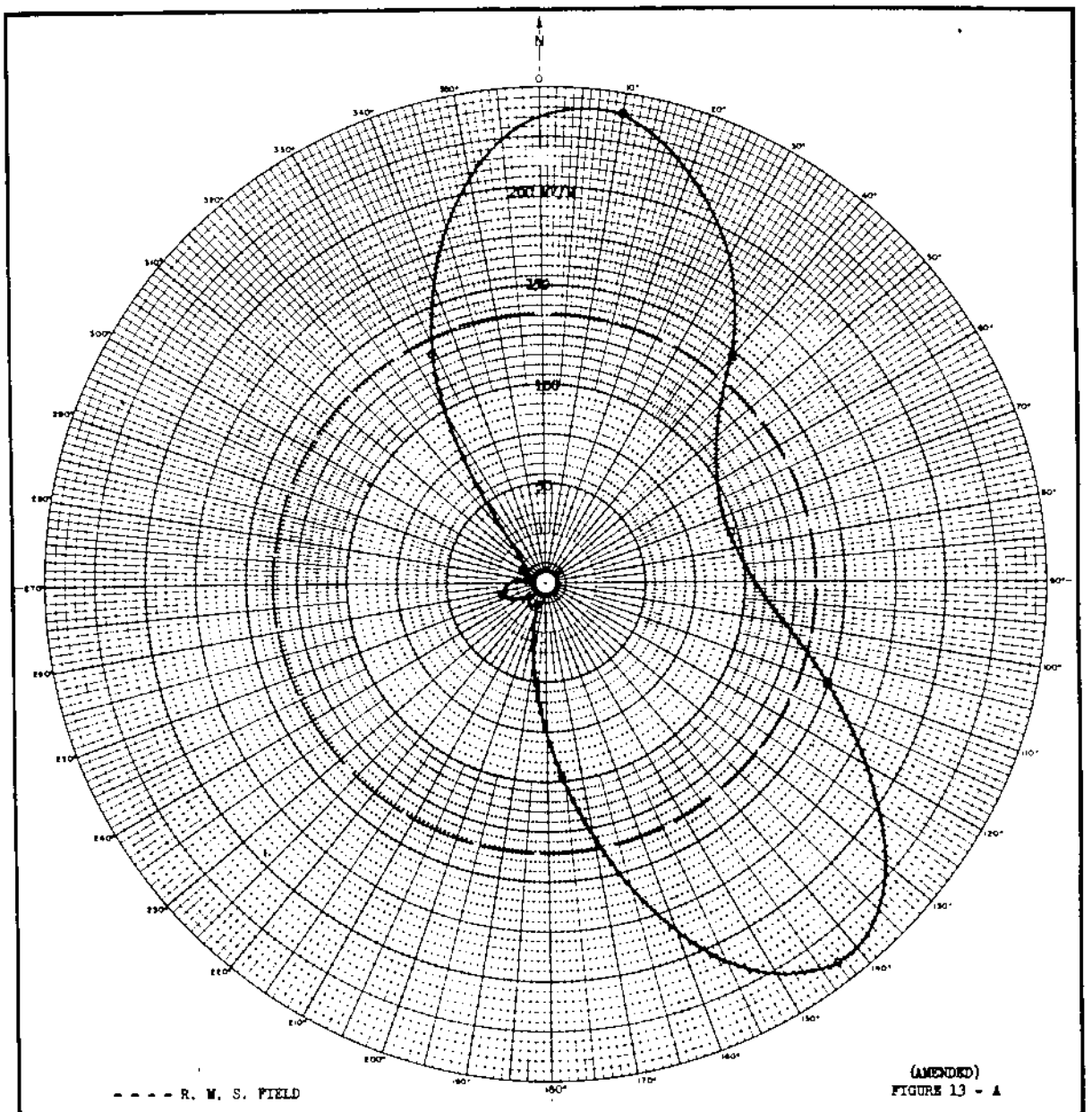
1540 KC

WNIO

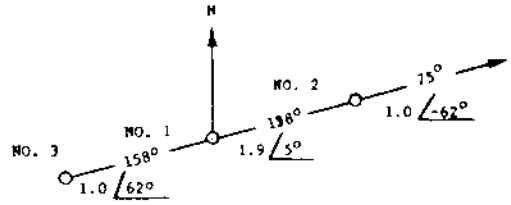
Measured Day
(2-28-64ct)

Station WNIO
Niles, Ohio

500w,DA-D,D
1540 kc



HORIZONTAL RADIATION PATTERN



APPLICANT	WNIO
LOCATION	NILES, OHIO
FREQUENCY	1540 KC/S
POWER	0.5 KW DA-D
LATITUDE	41 DEG 07 MIN 56 SEC.
LONGITUDE	80 DEG 45 MIN 40 SEC.
WHEN USED	DIRECTIONAL DAYTIME
R M S FIELD	136.2 MV/M
DATE	OCTOBER 1963

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

FCC File No.BL-10380
Accepted 2-12-64

Station WNIO
Niles, Ohio

1540 kc

WNIC

Measured Day Nulls
(2-28-64ct)

Station WNIO
Niles, Ohio

500w,DA-D,D
1540 kc

4/6/64
Granted
license for
new AM
station

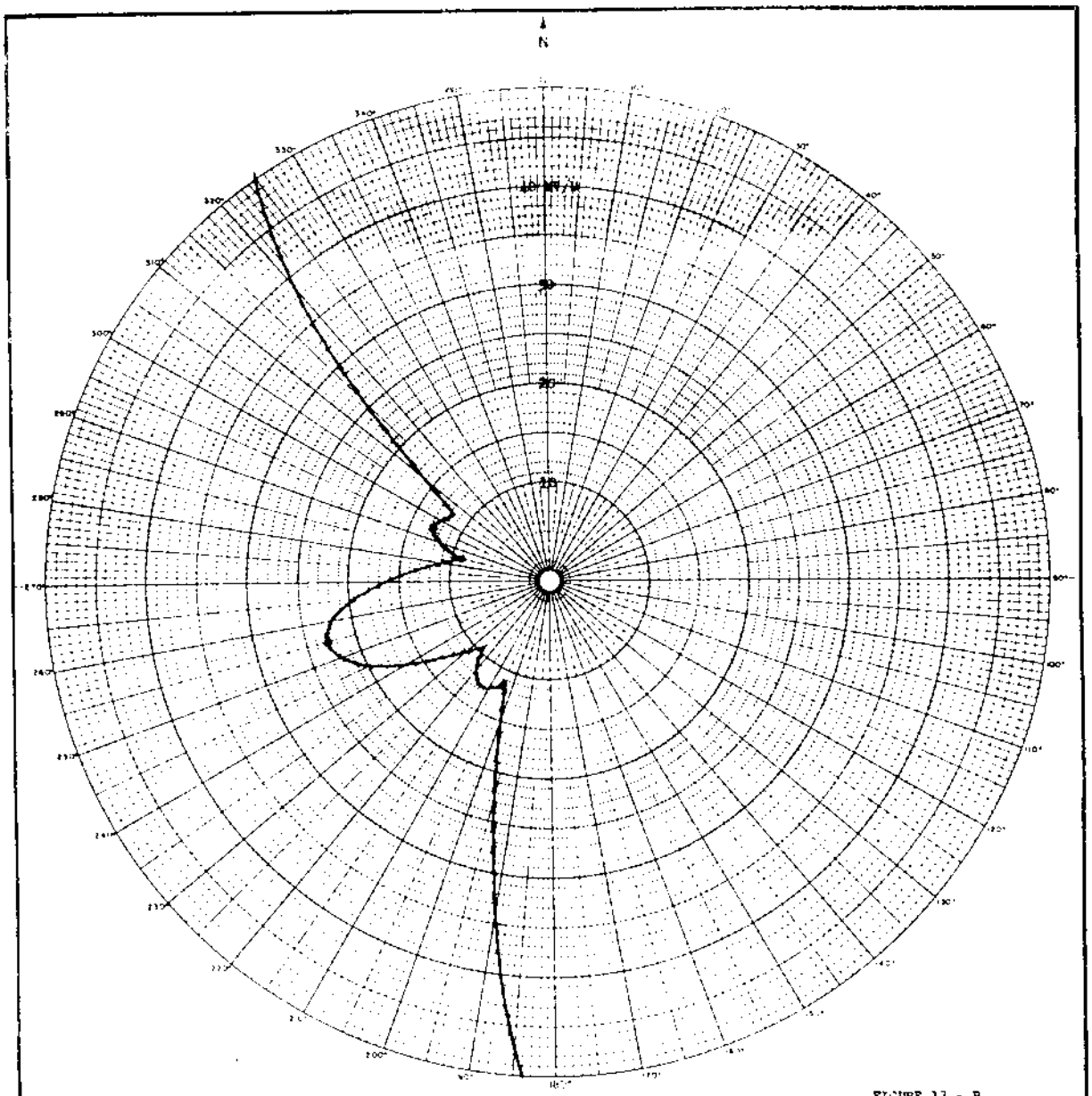


FIGURE 13 - B

EXPANDED VIEW

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C

FCC File No.BL-10380
Accepted 2-12-64

Station WNIO
Niles, Ohio

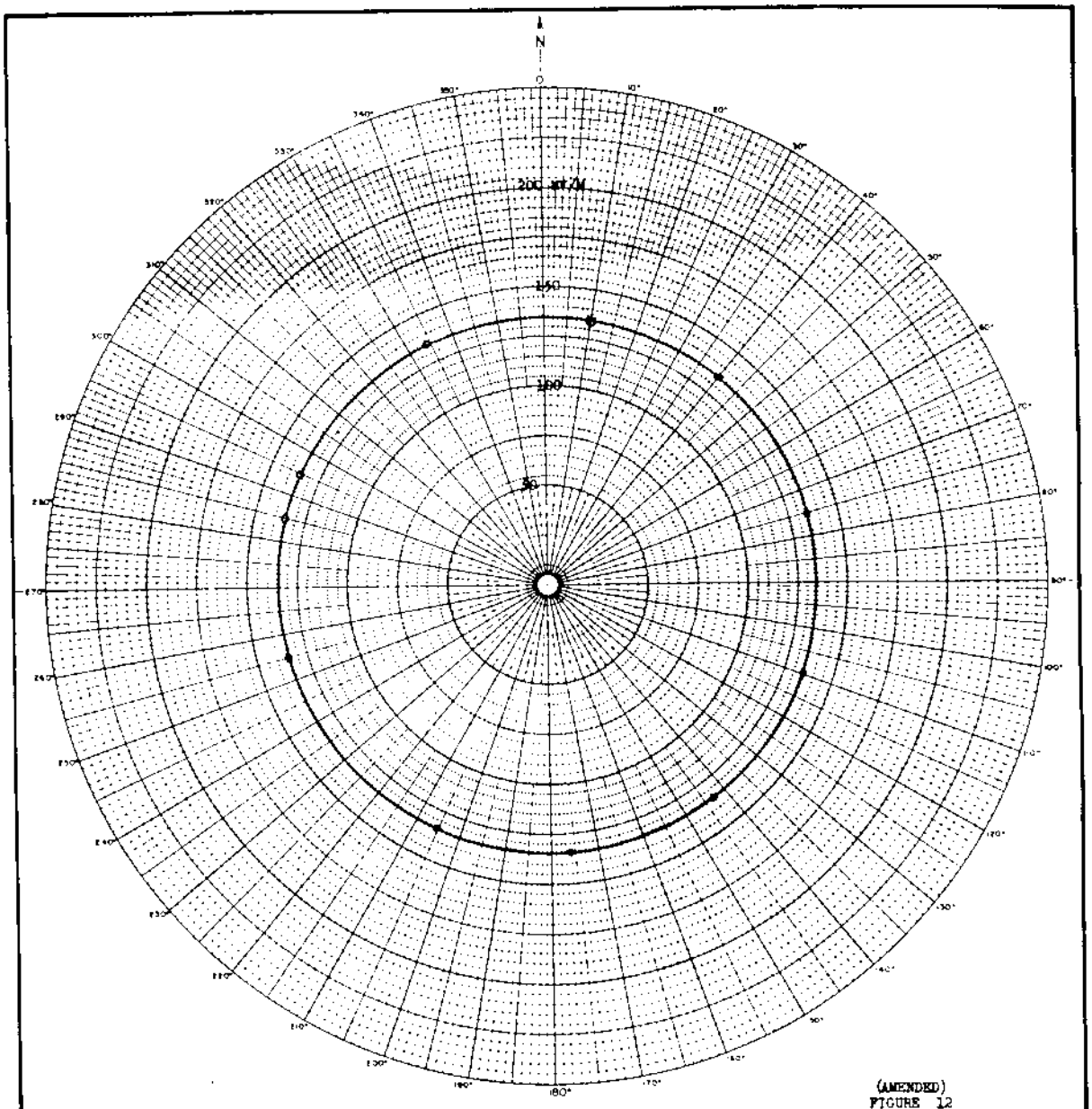
1540 kc

WNIO

Measured Non-DA
(2-28-64ct)

Station WNIO
Niles, Ohio

500w,DA-D,D
1540 kc



(AMENDED)
FIGURE 12

HORIZONTAL RADIATION PATTERN

NON-DIRECTIONAL FIELD SURVEY

APPLICANT	WNIO
LOCATION	NILES, OHIO
FREQUENCY	1540 KC/S
POWER	0.5 KW DA-D
LATITUDE	41 DEG 07 MIN 56 SEC
LONGITUDE	80 DEG 45 MIN 40 SEC.
WHEN USED	NON-DIRECTIONAL PROOF
R.M.S. FIELD	135 MV/M
DATE	OCTOBER 1963

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

FCC File No.BL-10380
Accepted 2-12-64

Station WNIO
Niles, Ohio

1540 kc

WNRE

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station: WNRE

Main Studio: Circleville, Ohio

Frequency: 1540 kHz

Power: 1 kW

Notification List No. 1609

Date: December 4, 1974

Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude: 39° 38' 21"
West Longitude: 82° 57' 30"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation. (DA-D)
Number of elements: 4
Type of elements: Series-excited, uniform cross-section, guyed, vertical steel towers.

TOWER:	NW(#4)	NC(#3)	SC(#2)	SE(#1)
HEIGHT ABOVE INSULATORS:	180'	180'	180'	180' (101°)
PHASING:	+138°	0°	-140°	+79°
FIELD RATIO:	0.55	1.0	0.78	0.25

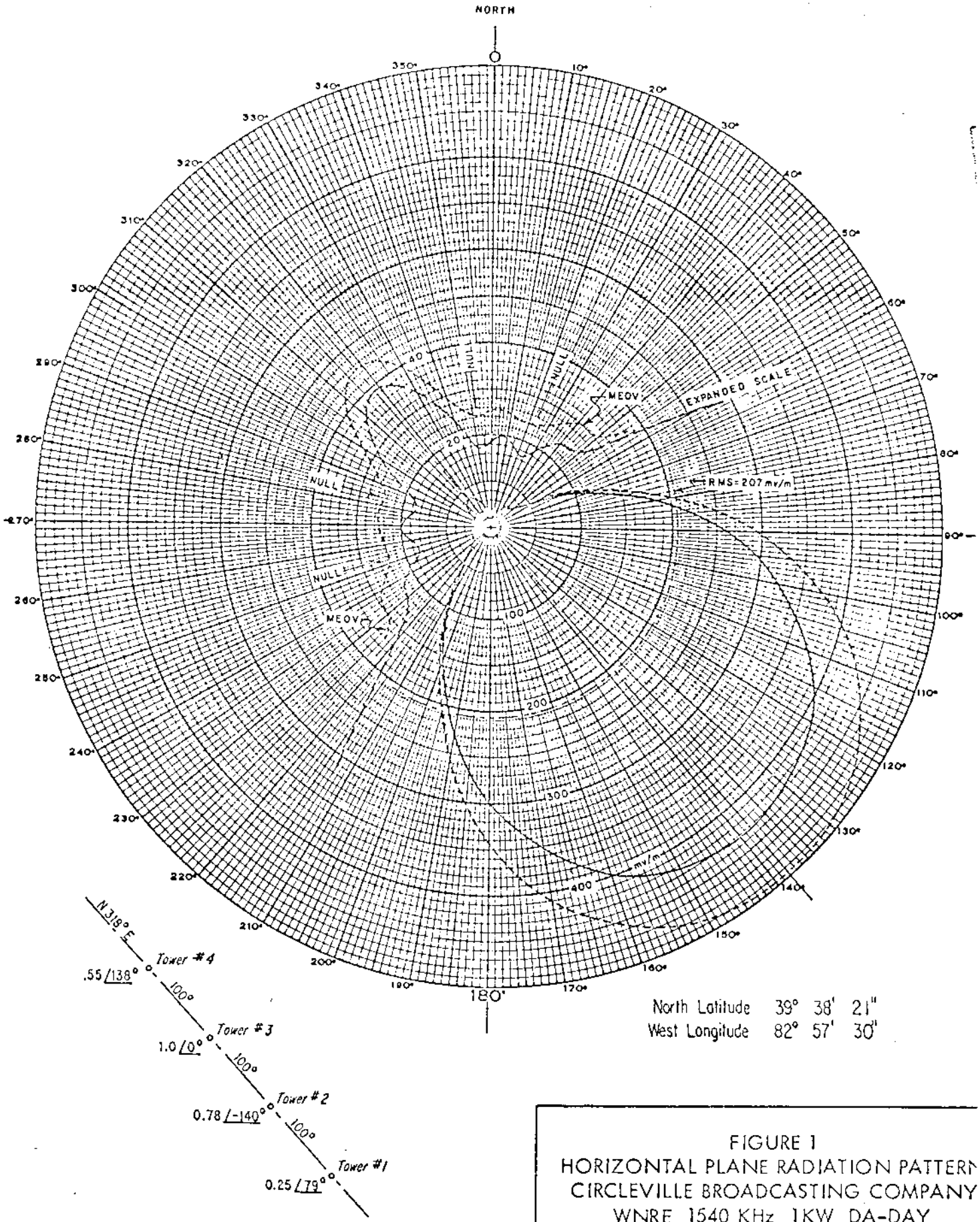
SPACING AND ORIENTATION: Adjacent elements are spaced 177.5' (100°) on a line bearing 318° true.

GROUND SYSTEM: 120-160' equally spaced copper radials plus 120-50' interspaced radials about each tower. Radials are shortened and bonded to transverse straps along intersections between towers. Centers of systems are bonded together.

Predicted effective Field: 207 mv/m at rated power.

Note: This notification concerns only a change to add meovs of radiation to the directional antenna pattern.

WNRE



$h_1 = h_2 = h_3 = h_4 = 101°$

FIGURE 1
HORIZONTAL PLANE RADIATION PATTERN
CIRCLEVILLE BROADCASTING COMPANY
WNRE 1540 KHz 1KW DA-DAY
CIRCLEVILLE, OHIO

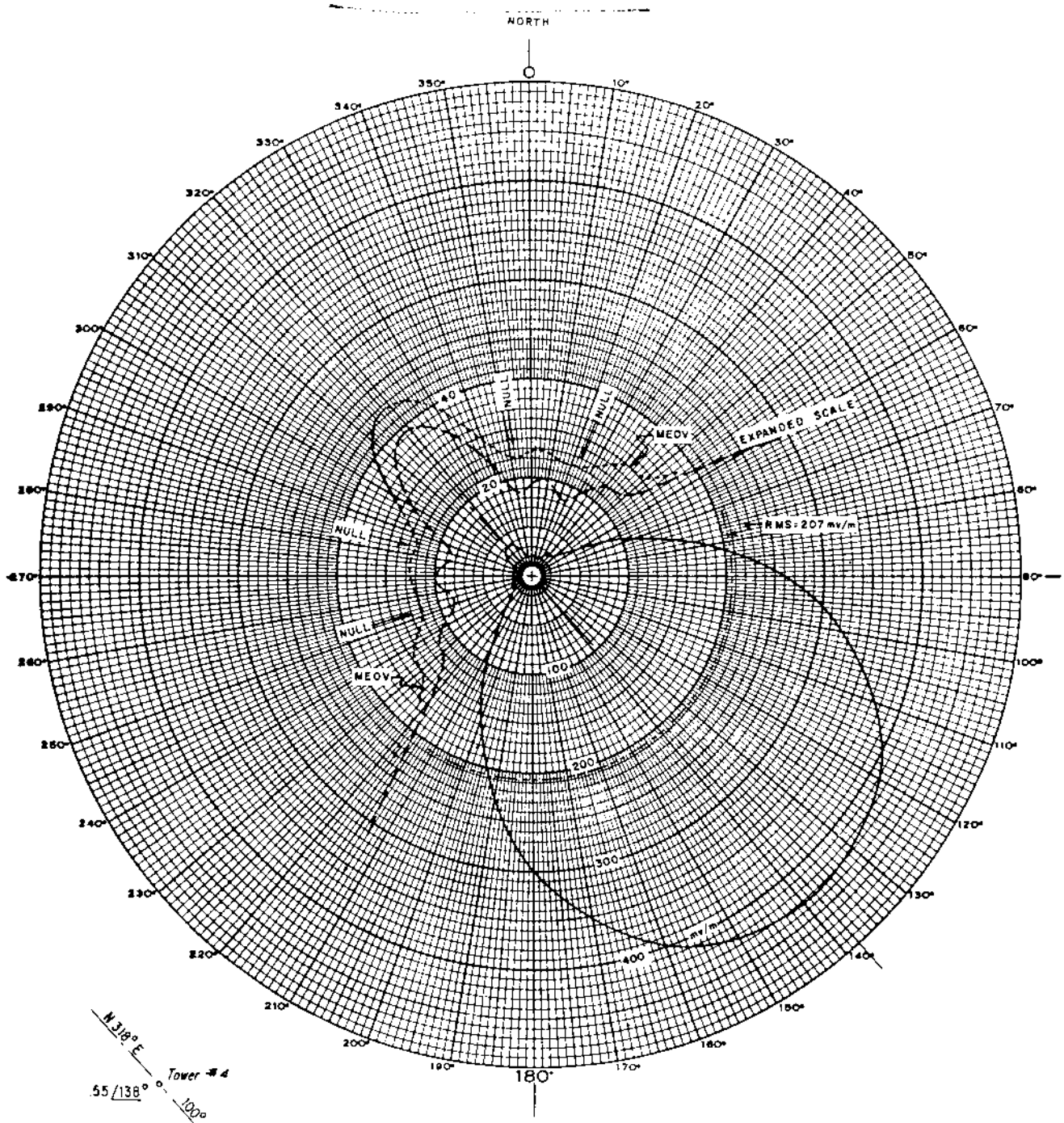
Prepared by
Lohnes and Culver Washington, D.
October, 1974

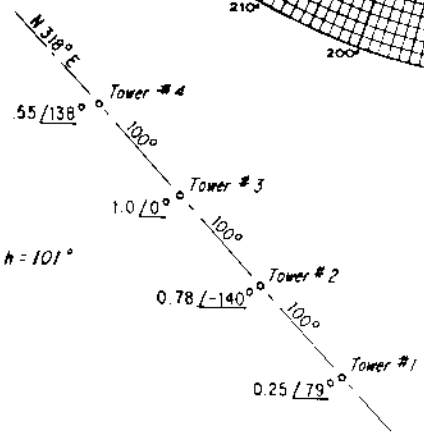
WNRE

Proposed Day
(11-28-67ct)

New; Circleville Bcstg. Co.
Circleville, Ohio

1kw,DA-D,D
1540 kc





North Latitude 39° 38' 21"
West Longitude 82° 57' 30"

FIGURE 5 AMENDED
HORIZONTAL PLANE RADIATION PATTERN
CIRCLEVILLE BROADCASTING COMPANY
1540 KC 1 KW, DA-DAY
CIRCLEVILLE, OHIO

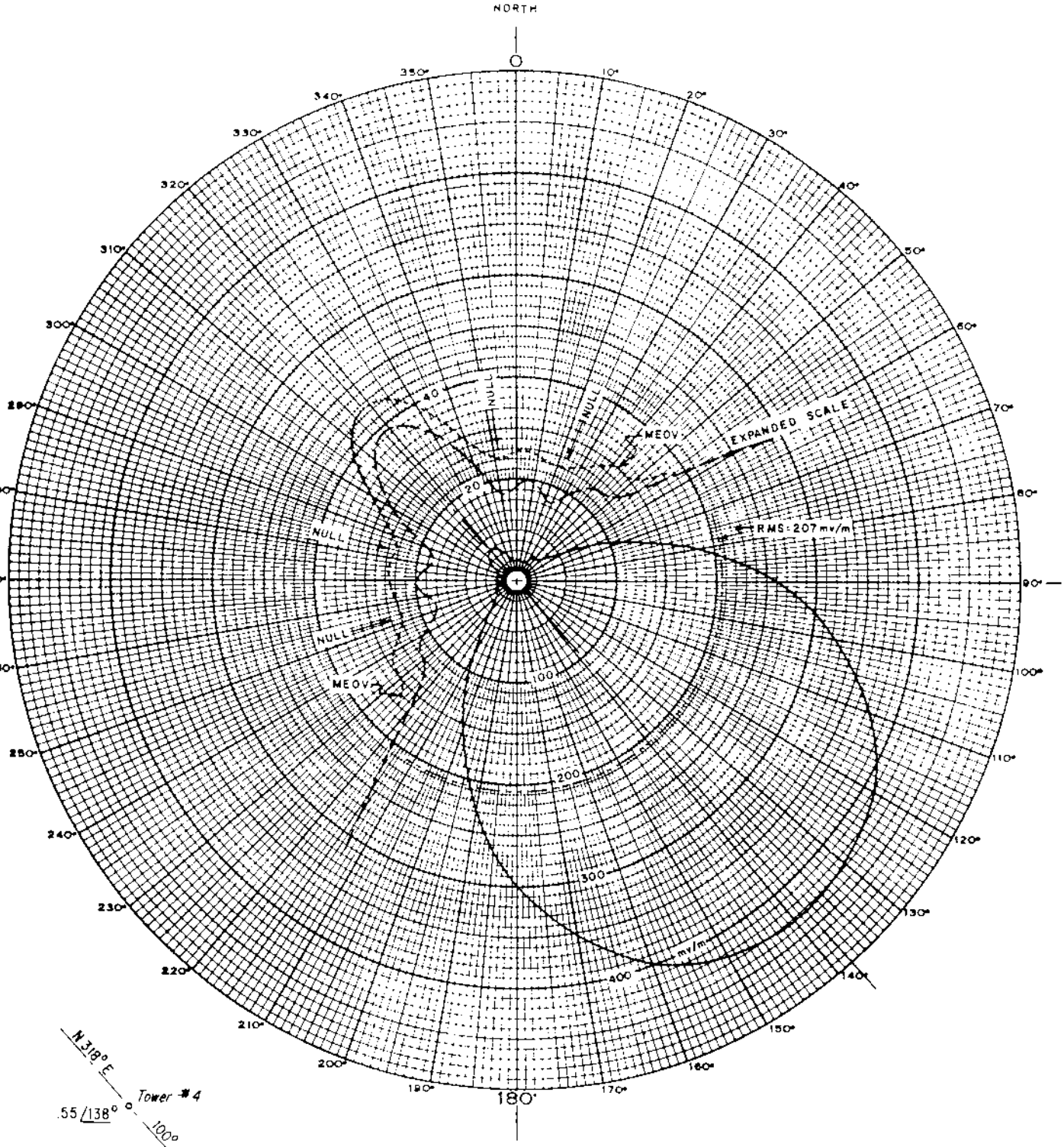
Prepared by
Lohnes and Culver Washington, D. C.
September, 1967

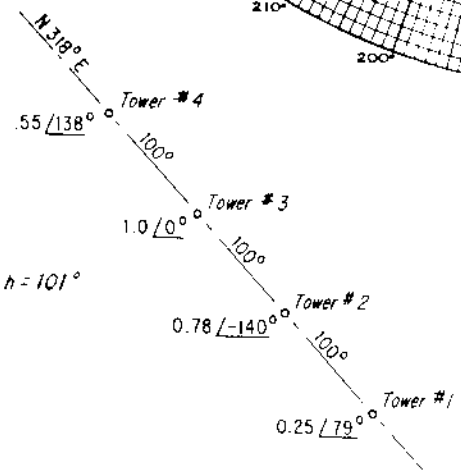
FCC File No.BP-17868 New; Circleville Bcstg. Co.
Accepted 10-25-67 Amended Circleville, Ohio 1540 kc

Proposed Day
(9-28-67ct)

New; Circleville Bcstg. Co.
Circleville, Ohio

WNKE
1kw,DA-D,D
1540 kc





NORTH LATITUDE 39° 38' 08"
WEST LONGITUDE 82° 58' 34"

FIGURE 5
HORIZONTAL PLANE RADIATION PATTERN
CIRCLEVILLE BROADCASTING COMPANY
1540 KC 1 KW, DA-DAY
CIRCLEVILLE, OHIO

Prepared by
Lohnes and Culver Washington, D. C.
August, 1967

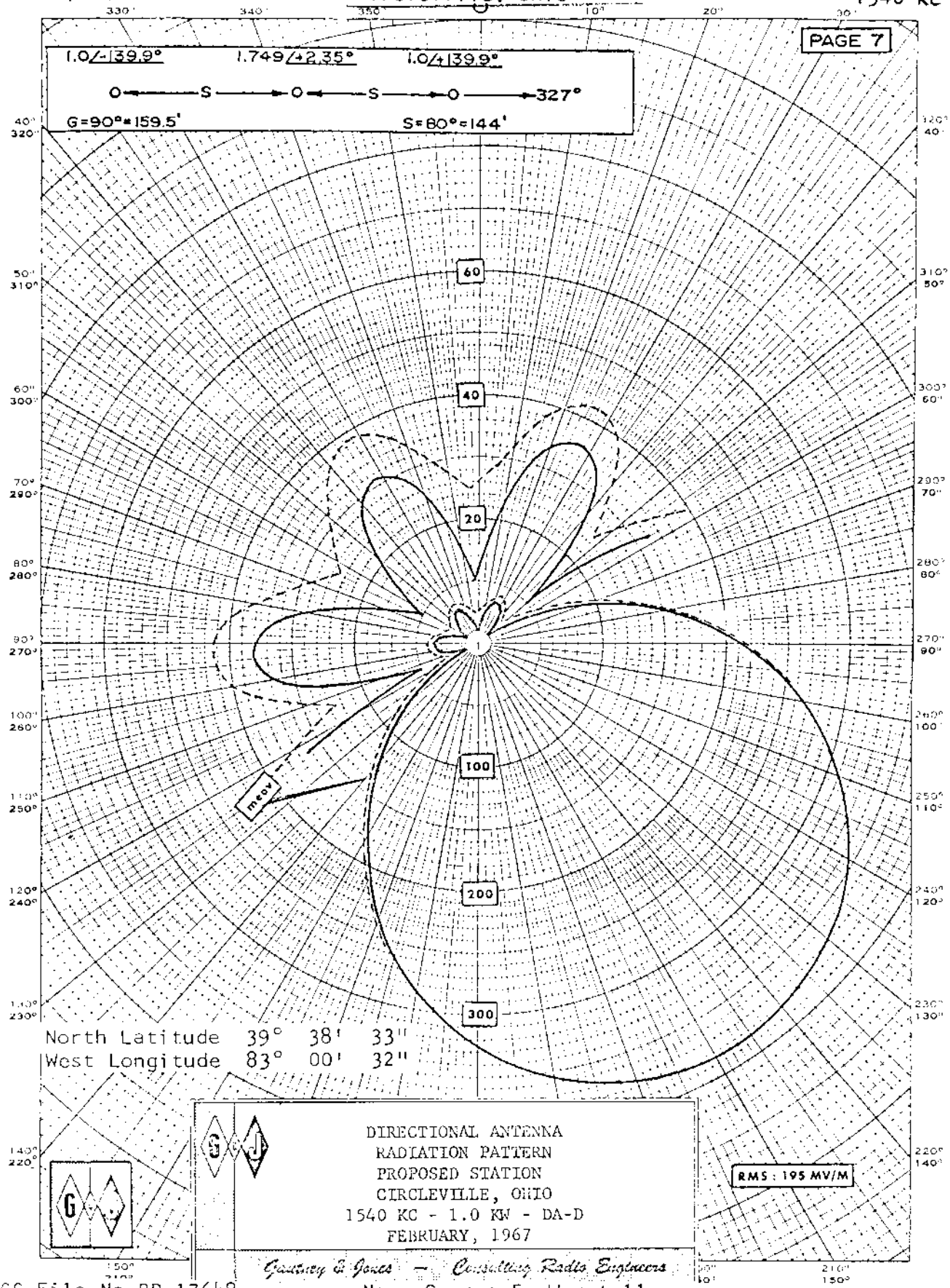
FCC File No. BP-17868 New; Circleville Bcstg. Co.

WNRE

Proposed Day
(6-28-67ct)

New; George E. Worstell
Circleville, Ohio

1kw, DA-D, D
1540 kc



North Latitude 39° 38' 33"
West Longitude 83° 00' 32"

DIRECTIONAL ANTENNA
RADIATION PATTERN
PROPOSED STATION
CIRCLEVILLE, OHIO
1540 KC - 1.0 KW - DA-D
FEBRUARY, 1967

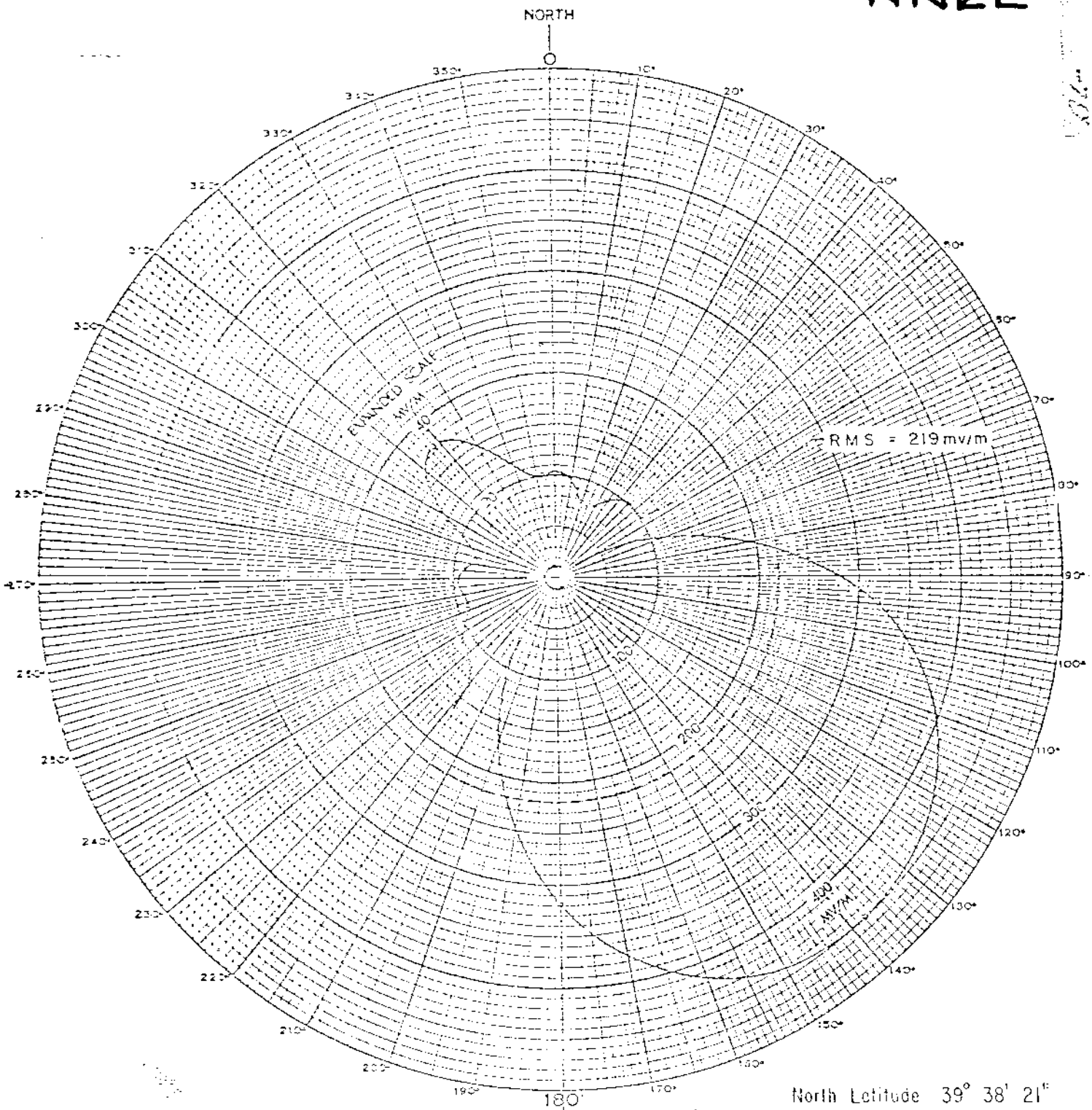
Gautney & Jones — Consulting Radio Engineers

FCC File No.BP-17648
Accepted 6-2-67

New; George E. Worstell
Circleville, Ohio

1540 kc

WNRE



North Latitude 39° 38' 21"
West Longitude 82° 57' 30"

BL-13,858

FIGURE 8
MEASURED HORIZONTAL RADIATION PATTERN
DA-D OPERATION
WNRE 1KW-D, DA 1540 KHz
CIRCLEVILLE BROADCASTING COMPANY
CIRCLEVILLE, OHIO

Prepared by
Lohnes and Culver Washington, D. C
October, 1974

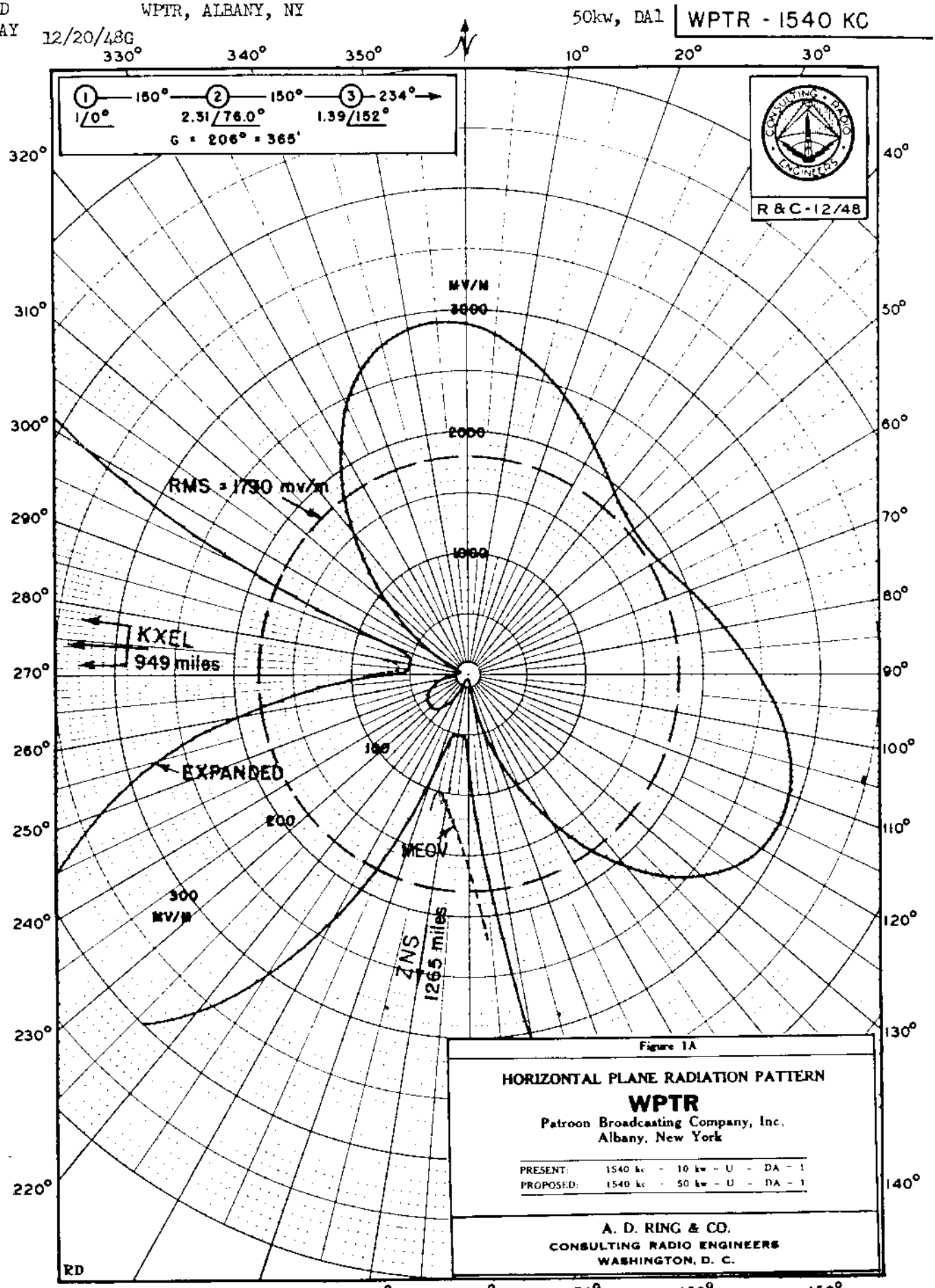
WPTR

SED
f&DAY

WPTR, ALBANY, NY

12/20/48G

50kw, DA1 | WPTR - 1540 KC



AMENDMENT RECD 12-15-48 BP-6920

BP-6920

WPTR

MEASURED NIGHT&DAY

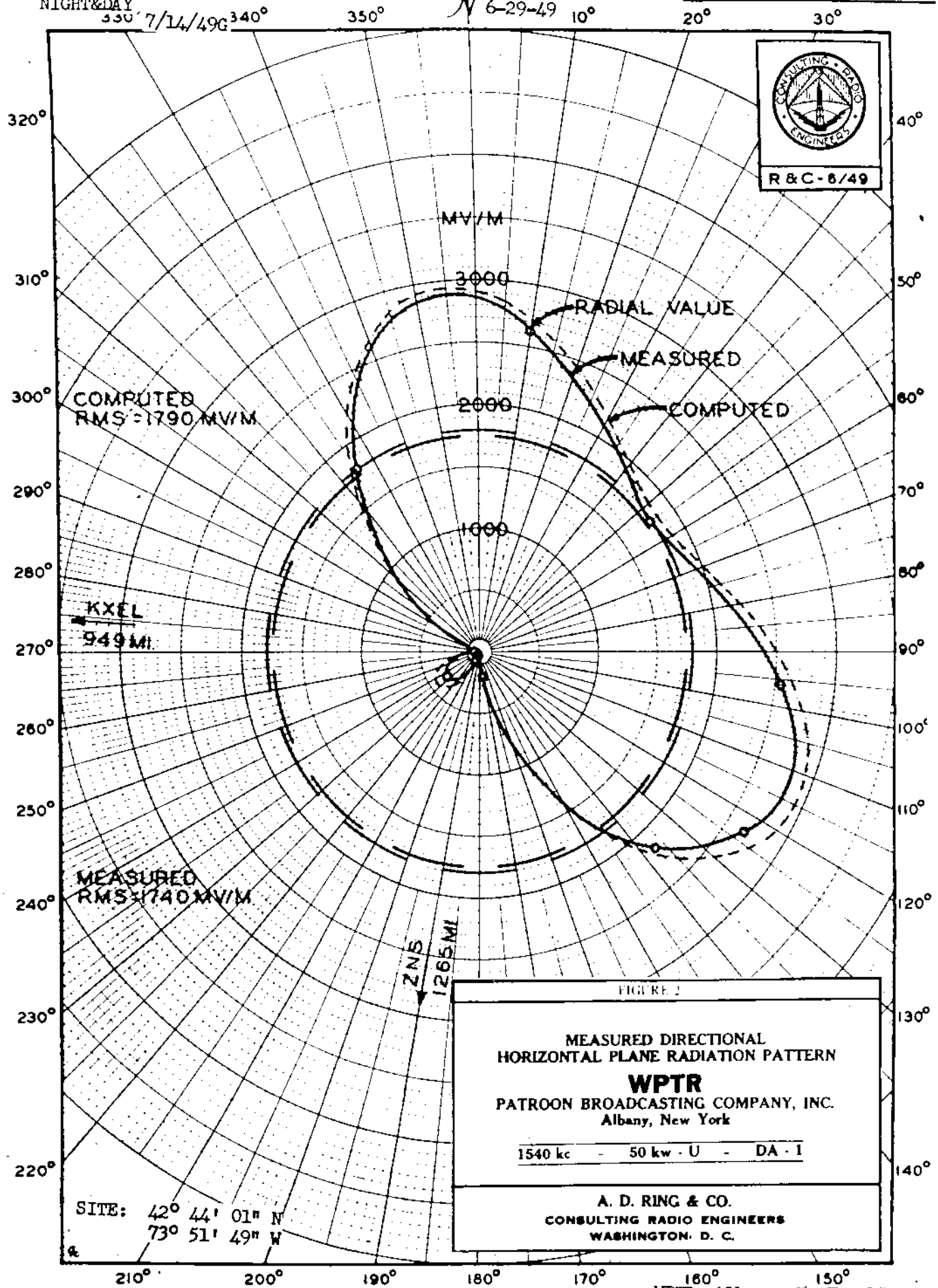
WPTR, ALBANY, N. Y.

50kw, DA-1

WPTR-1540KC

7/14/49G

6-29-49



WPTR, Albany, N. Y. 1540 kc

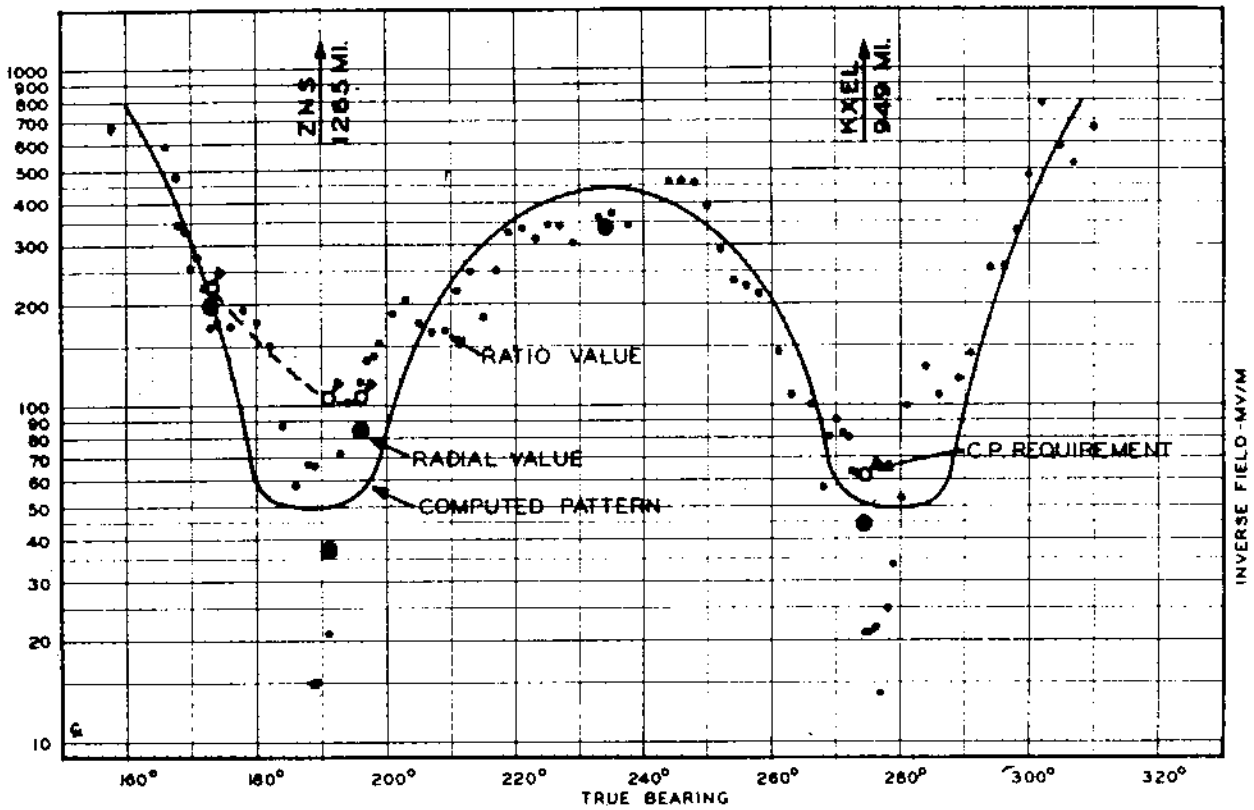
WPTR

50kw, DA-1

1540 kc

MEASURED WPTR, ALBANY, N. Y. 6-29-49
NIGHT&DAY NULLS
7/14/49G

R & C - 6/49



SITE: 42° 44' 01" N
73° 51' 49" W

FIGURE 4

DETAILS OF MINIMA

WPTR
PATROON BROADCASTING COMPANY, INC.
Albany, New York

1540 kc - 50 kw - U - DA - 1

A. D. RING & CO.
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

WPTR, Albany, N. Y. 1540 kc

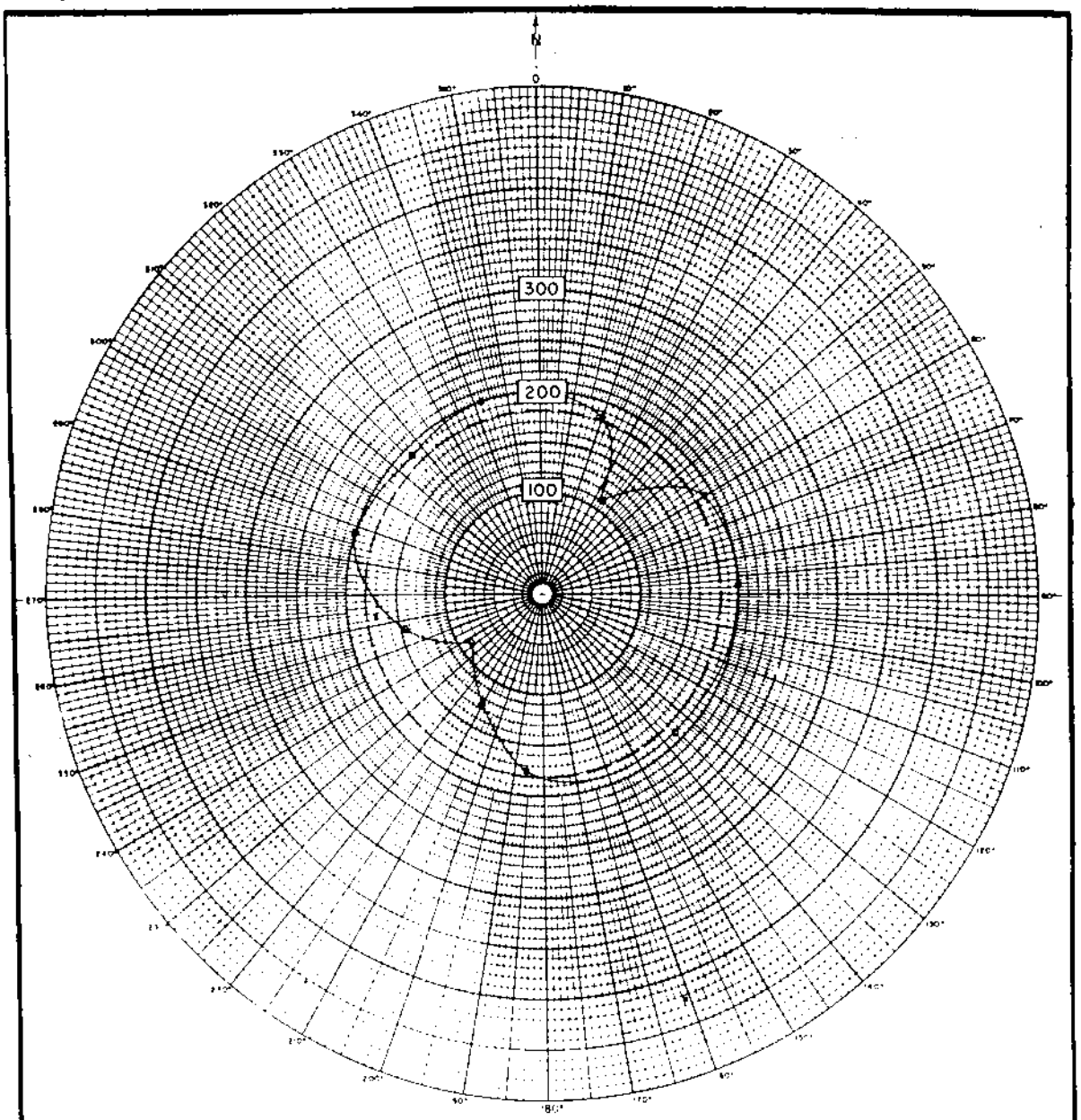
WRCP

granted to install DA-D 11-18-59

MEASURED NON-DA
(7-8-59g)

Station WJMJ
Philadelphia, Pennsylvania

50kw, DA-D, D
1540 KC



E_{RMS} = 181.0 MV/M (MEASURED)

o = MEASURED RADIALS

LATITUDE 40° 02' 46"
LONGITUDE 75° 14' 15"

JOHN H. MULLANEY
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

ANTENNA PARAMETERS

G = 81.7° + T.L.

FIGURE 18

MEASURED NON-DA
HORIZONTAL POLAR PATTERN
RADIO STATION WJMJ
PHILADELPHIA, PENN.

1540 KC 50 KW, DA-D

FCC File No. BL-7529
Accepted 7-2-59

WJMJ
Philadelphia, Pennsylvania

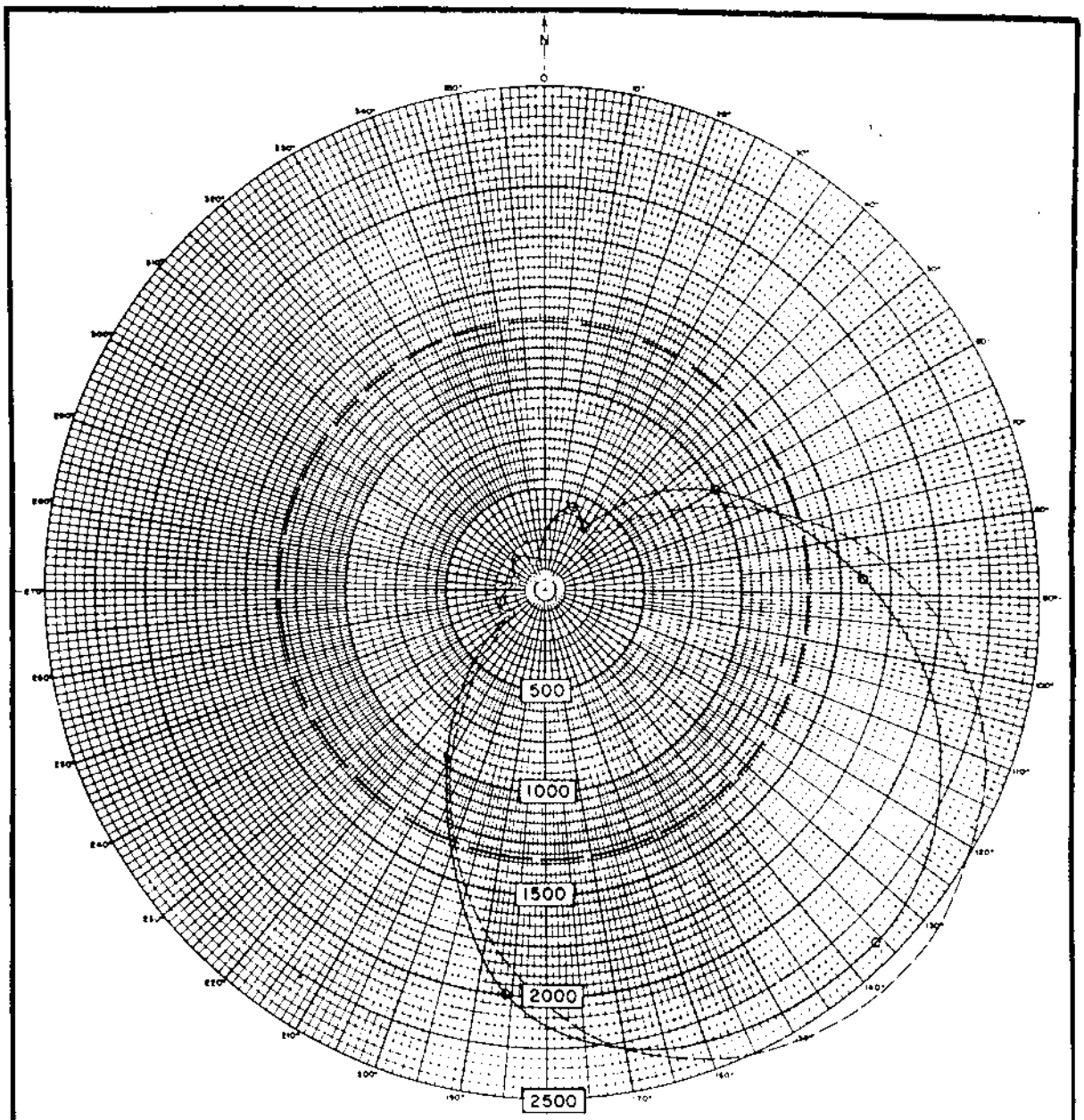
1540 KC

WRCP

MEASURED DAY
(7-8-59g)

Station WJMJ 50kw, DA-D, D
Philadelphia, Pennsylvania 1540 KC

granted CP to install DA-D 11-18-59



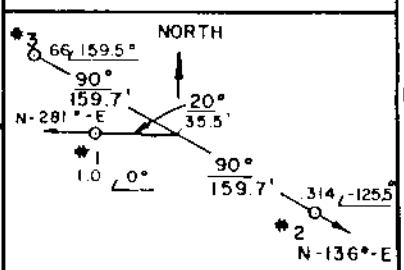
E_{RMS} = 1335.0 MV/M (MEASURED)

○ = MEASURED RADIALS
----- COMPUTED PATTERN
——— MEASURED PATTERN

LATITUDE: 40° 02' 46"
LONGITUDE: 75° 14' 15"

JOHN H. MULLANEY
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

ANTENNA PARAMETERS



G = 81.7° + T.L.

FIGURE 20

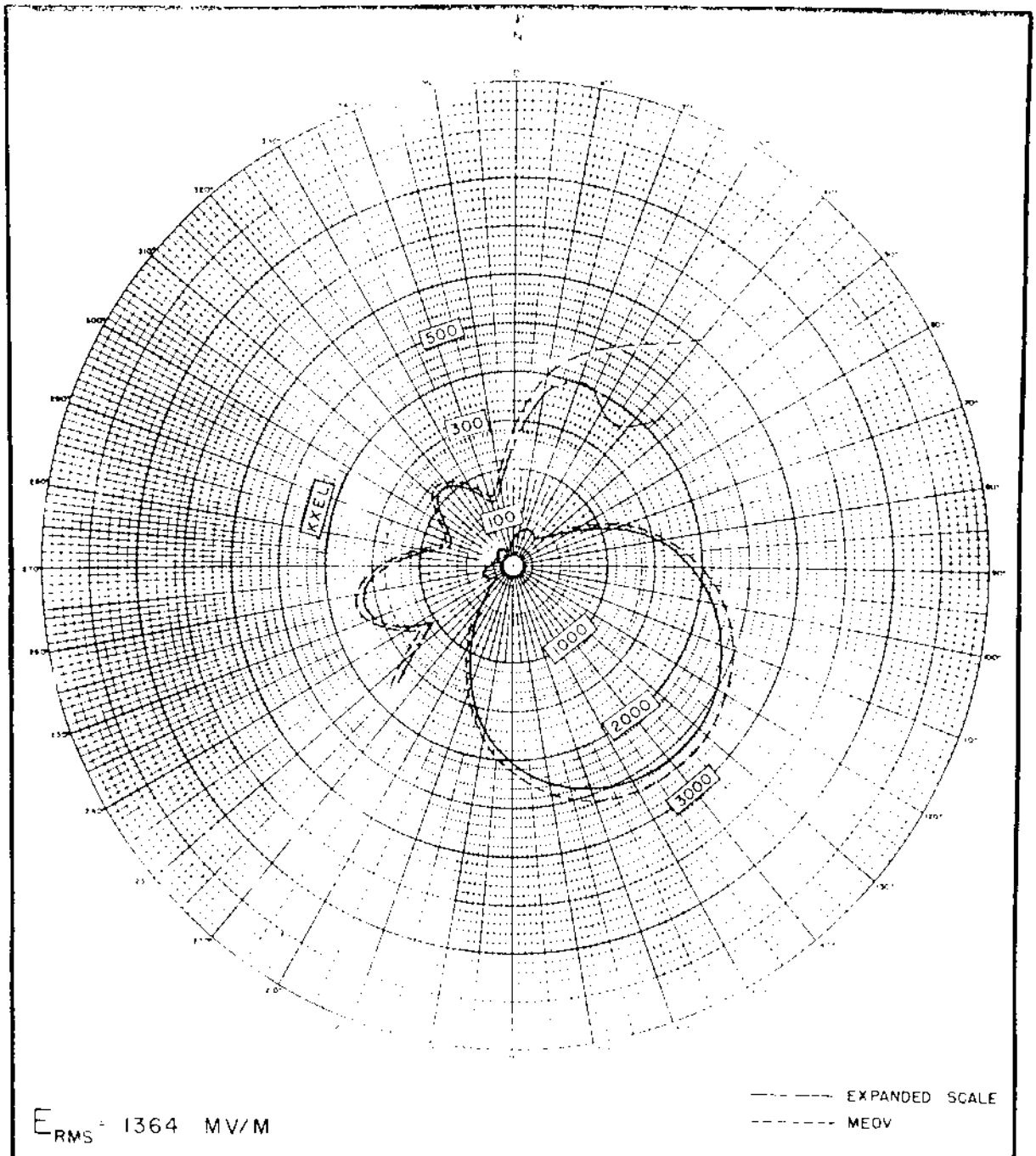
MEASURED DAYTIME DIRECTIONAL HORIZONTAL POLAR PATTERN
RADIO STATION WJMJ
PHILADELPHIA, PENN.

1540 KC 50KW,DA-D

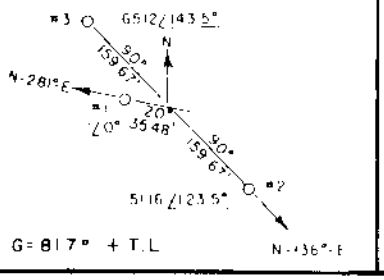
FCC File No. BL-7529
Accepted 7-2-59

WJMJ
Philadelphia, Pennsylvania 1540 KC

WRCP



E_{RMS} = 1364 MV/M

LATITUDE 40° 02' 46" LONGITUDE 75° 14' 15"	ANTENNA PARAMETERS	FIGURE 4
JOHN H. MULLANEY Consulting Radio Engineer Washington, D. C.		DAYTIME HORIZONTAL POLAR PATTERN RADIO STATION WJMJ PHILADELPHIA, PA 1540 KC 50 KW-DA-D

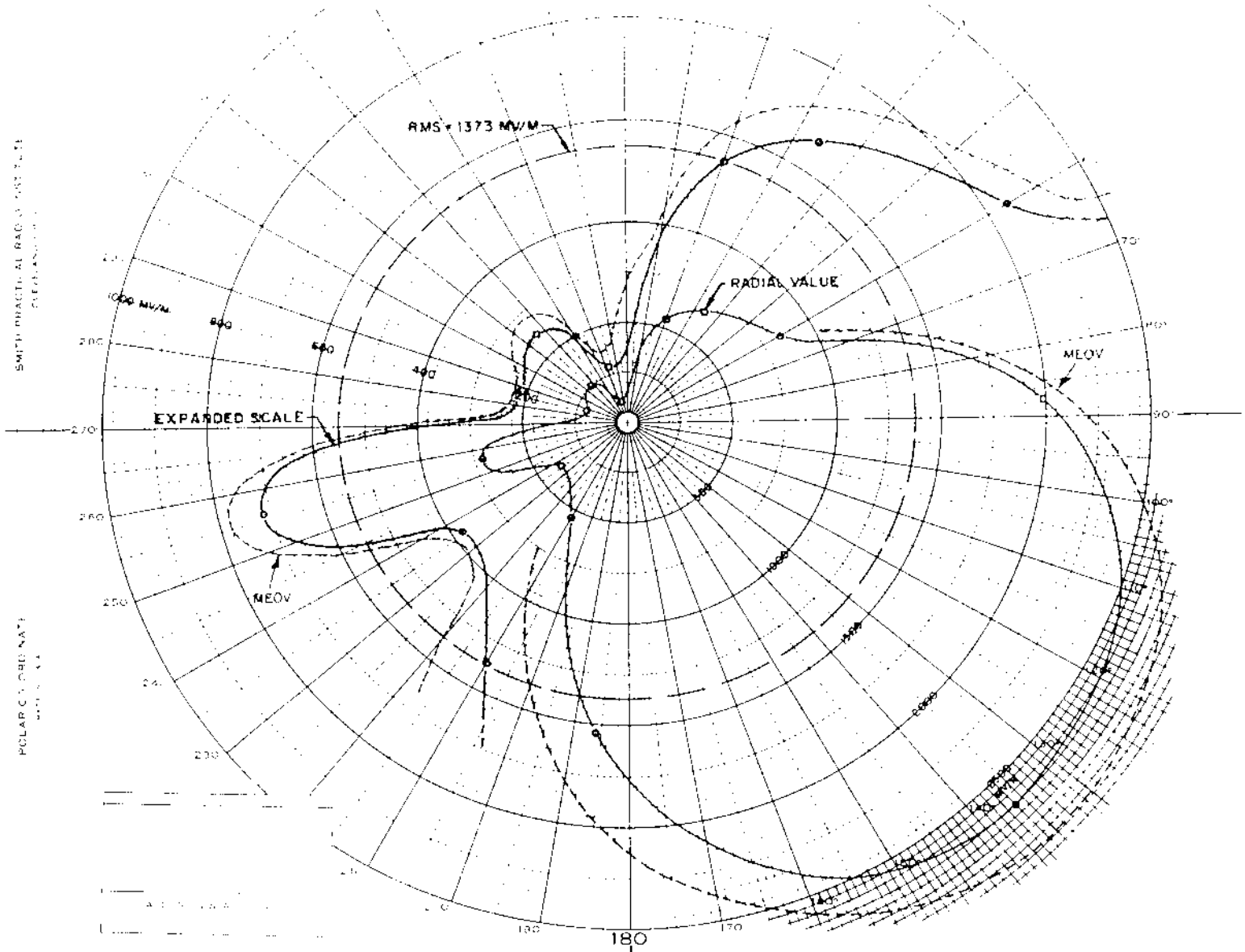
granted m. c P make changes in DA system

Measured Day
(1-28-70ct)

Station WRCP
Philadelphia, nnsylvania

50kw, DA-D, D
1540 kc

North Latitude 40° 02' 46"
West Longitude 75° 14' 15"



FCC File No.BL-12466
Accepted 1-21-70

Station WRCP
Philadelphia, Pennsylvania

1540 kc

BL 12466
File (2-6 70) Loc. of perimeters

WRCP

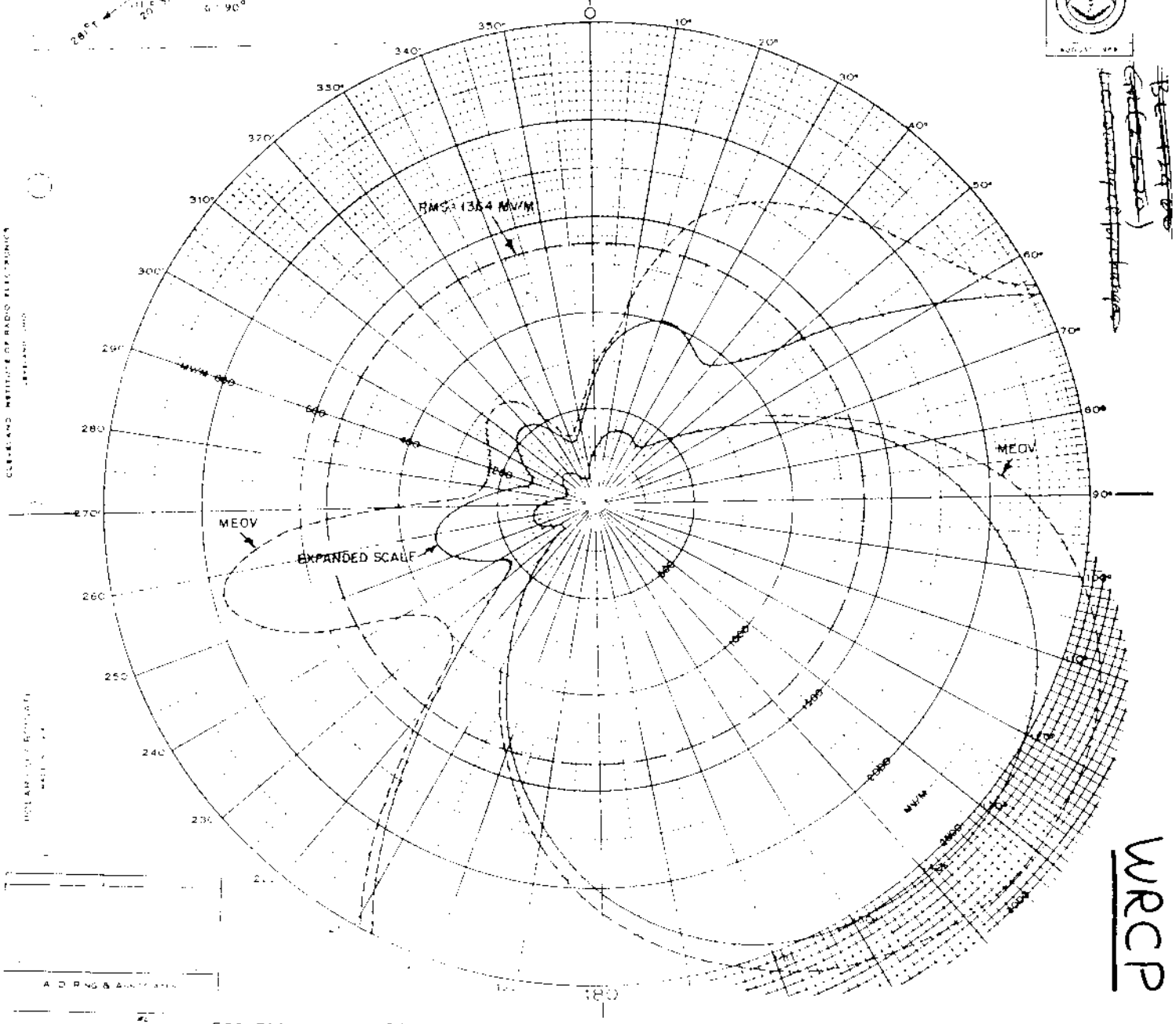
BP-18639 Granted 9-24-69 CP for Changes

Proposed Day
(9-26-69ct)

Station WRCP
Philadelphia, Pennsylvania

50kw, [illegible]-D,S
1540 kc

North Latitude 40° 02' 46"
West Longitude 75° 14' 15"



WRCP

FCC File No. BP-18639
Accepted 9-24-69

Station WRCP
Philadelphia, Pennsylvania

1540 kc

BP-18639 Granted
9-24-69 CP for
Changes.

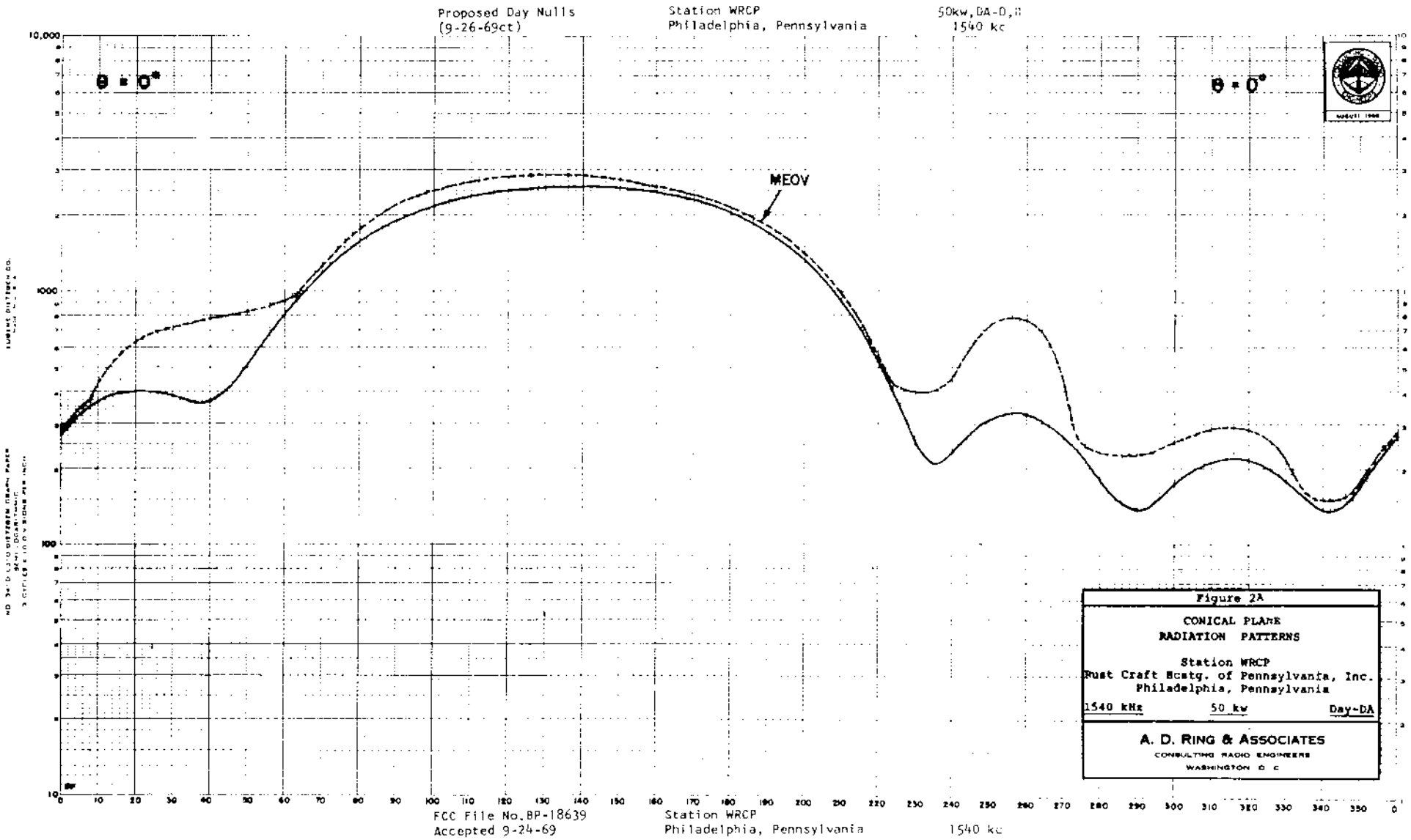


Figure 2A

CONICAL PLANE
RADIATION PATTERNS

Station WRCP
Rust Craft Bcstg. of Pennsylvania, Inc.
Philadelphia, Pennsylvania

1540 kHz 50 kw Day-DA

A. D. RING & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON D. C.

WRCF

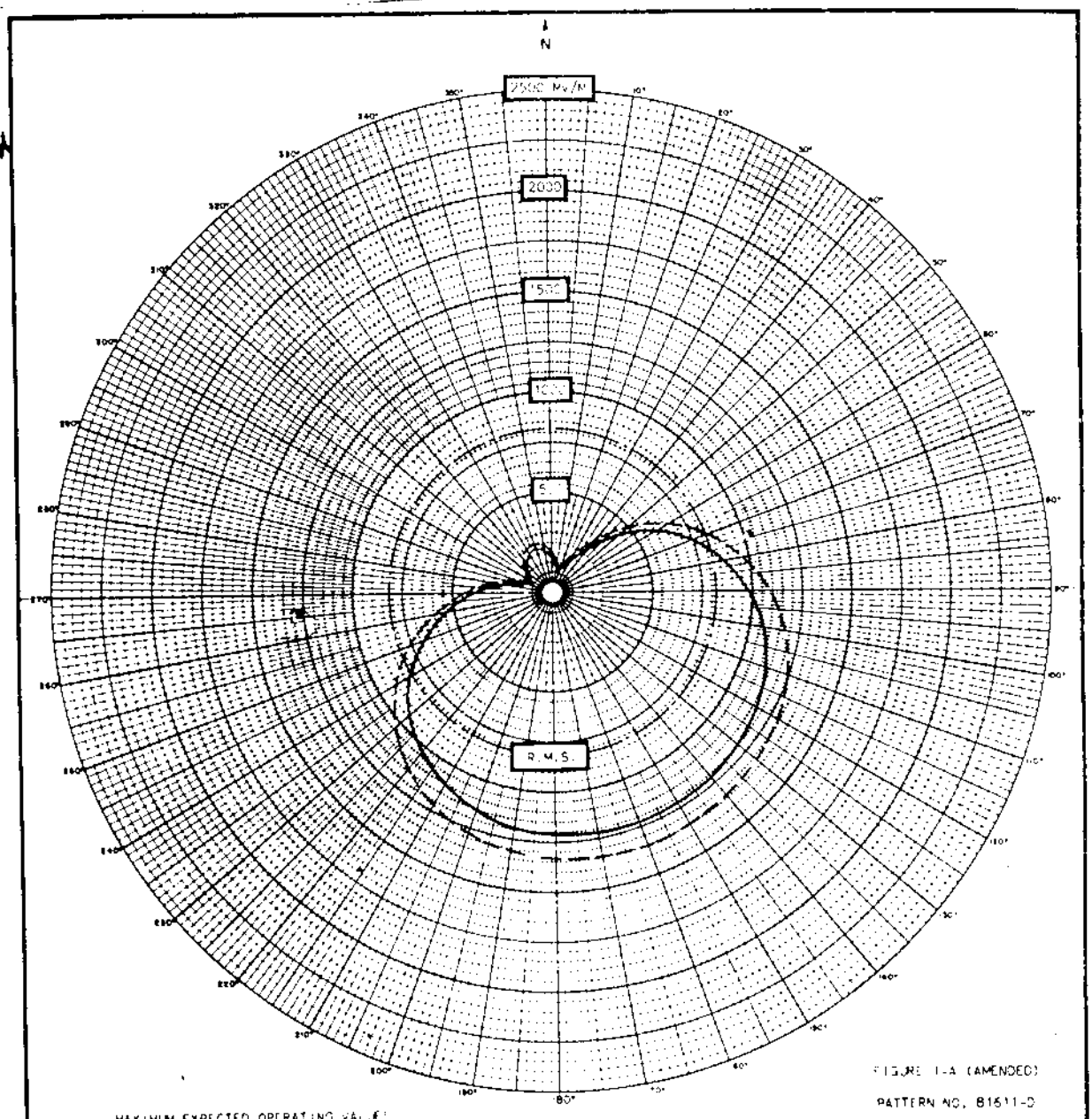
WRGM

PROPOSED DAY
(10-25-61ct)

New; 1540 Radio, Inc.
Richmond, Virginia

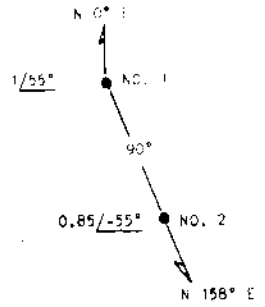
10kw,DA-D,D
1540 kc

3-7-63 granted for new station



HORIZONTAL RADIATION PATTERN

SPACING AND ORIENTATION



G = 300 FEET = 169° (PLUS TOP LOADING)

APPLICANT	1540 RADIO INCORPORATED
LOCATION	RICHMOND, VIRGINIA
FREQUENCY	1540 KC/S
POWER	10 Kw
LATITUDE	37 DEG. 37 MIN. 10 SEC
LONGITUDE	77 DEG. 25 MIN. 24 SEC.
WHEN USED	DAYTIME
R.M.S. FIELD	810.7 Mv/M
DATE	AUGUST 1961

SILLIMAN, MOFFET & ROHRER
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No. BP-14813 Amended
Accepted 9-18-61

New; 1540 Radio, Inc.
Richmond, Virginia

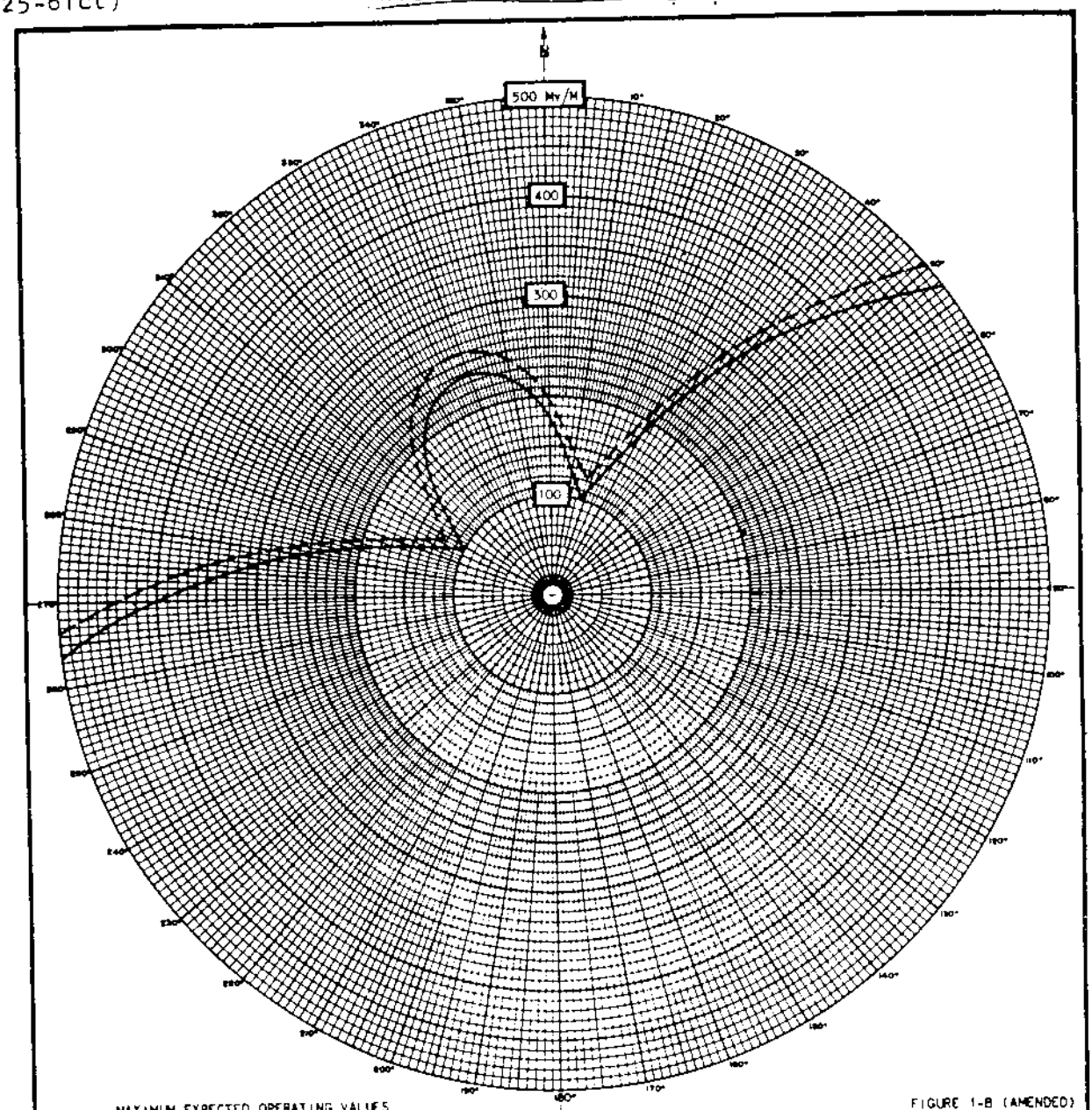
1540 kc

WRGN

PROPOSED DAY NULLS
(10-25-61ct)

New; 1540 Radio, Inc.
Richmond, Virginia

10kw,DA-D,D
1540 kc



EXPANDED VIEW

SILLIMAN, MOFFET & ROHRER
CONSULTING RADIO ENGINEERS
WASHINGTON, D.C.

FCC File No. BP-14813 Amended
Accepted 9-18-61

New; 1540 Radio, Inc.
Richmond, Virginia

1540 kc

WR & M

Measured Day
(6-29-64ct)

Station WRGM
Richmond, Virginia

10kw,DA-D,D
1540 kc

LIC. 8-19-64

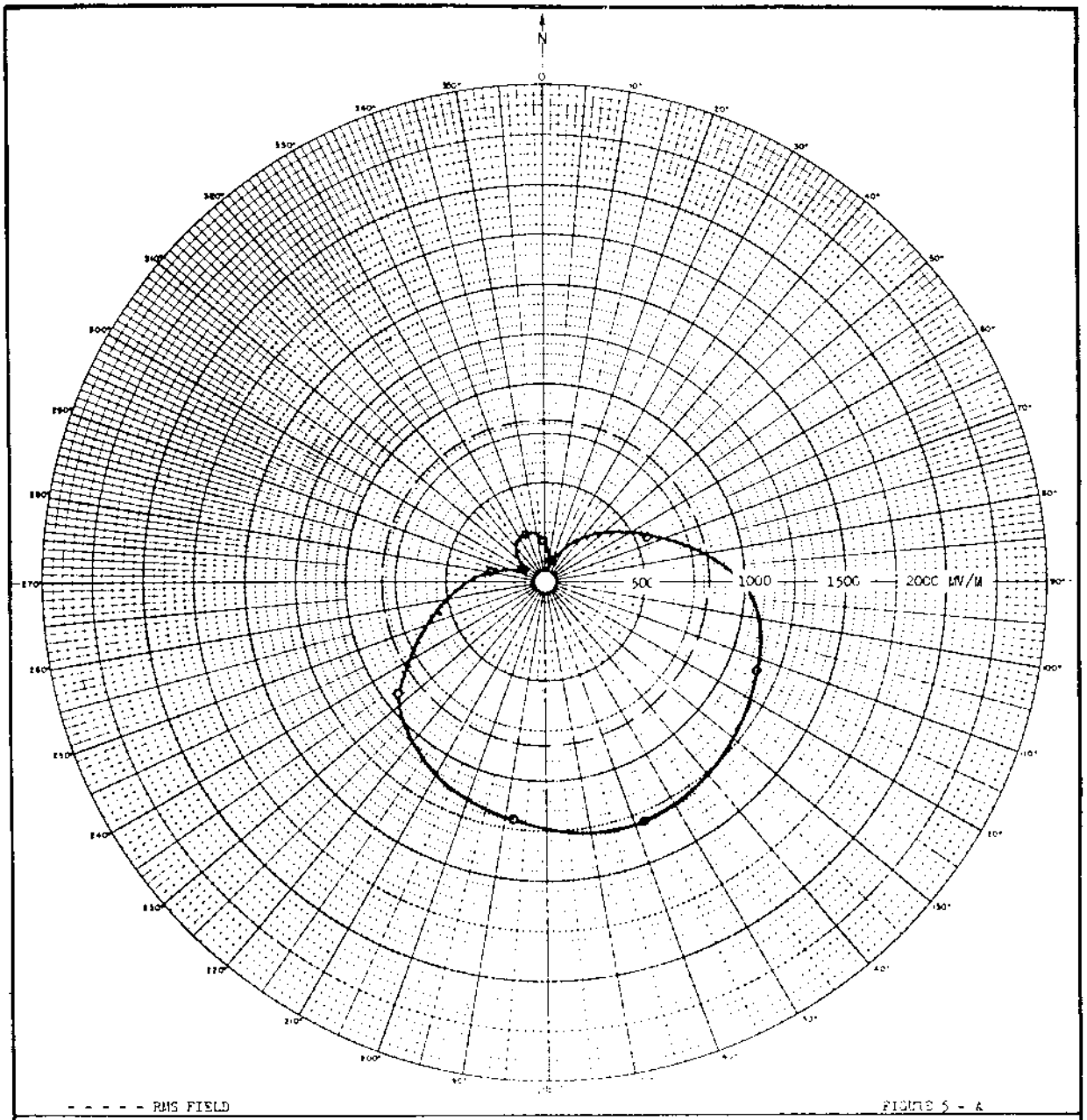
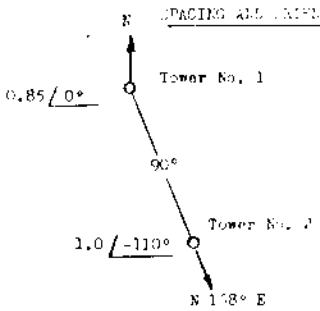


FIGURE 5 - A

HORIZONTAL RADIATION PATTERN

SPACING AND AMPLITUDE OF ARRAY



G = 300 Feet = 169° (PLUS TOP LOADING)

APPLICANT	WRGM
LOCATION	RICHMOND, VIRGINIA
FREQUENCY	1540 KCS
POWER	10 KW, DA-D
LATITUDE	37 DEG 27 MIN 10 SEC
LONGITUDE	77 DEG 25 MIN 24 SEC
WHEN USED	DAYTIME
RMS FIELD	819 MV/M
DATE	APRIL 1964

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

FCC File No.BL-10600
Accepted 6-1-64

Station WRGM
Richmond, Virginia

1540 kc

WRGM

Measured Day Nulls
(6-29-64ct)

Station WRGM
Richmond, Virginia

10kw,DA-D,D
1540 kc

LIC. 8-19-64

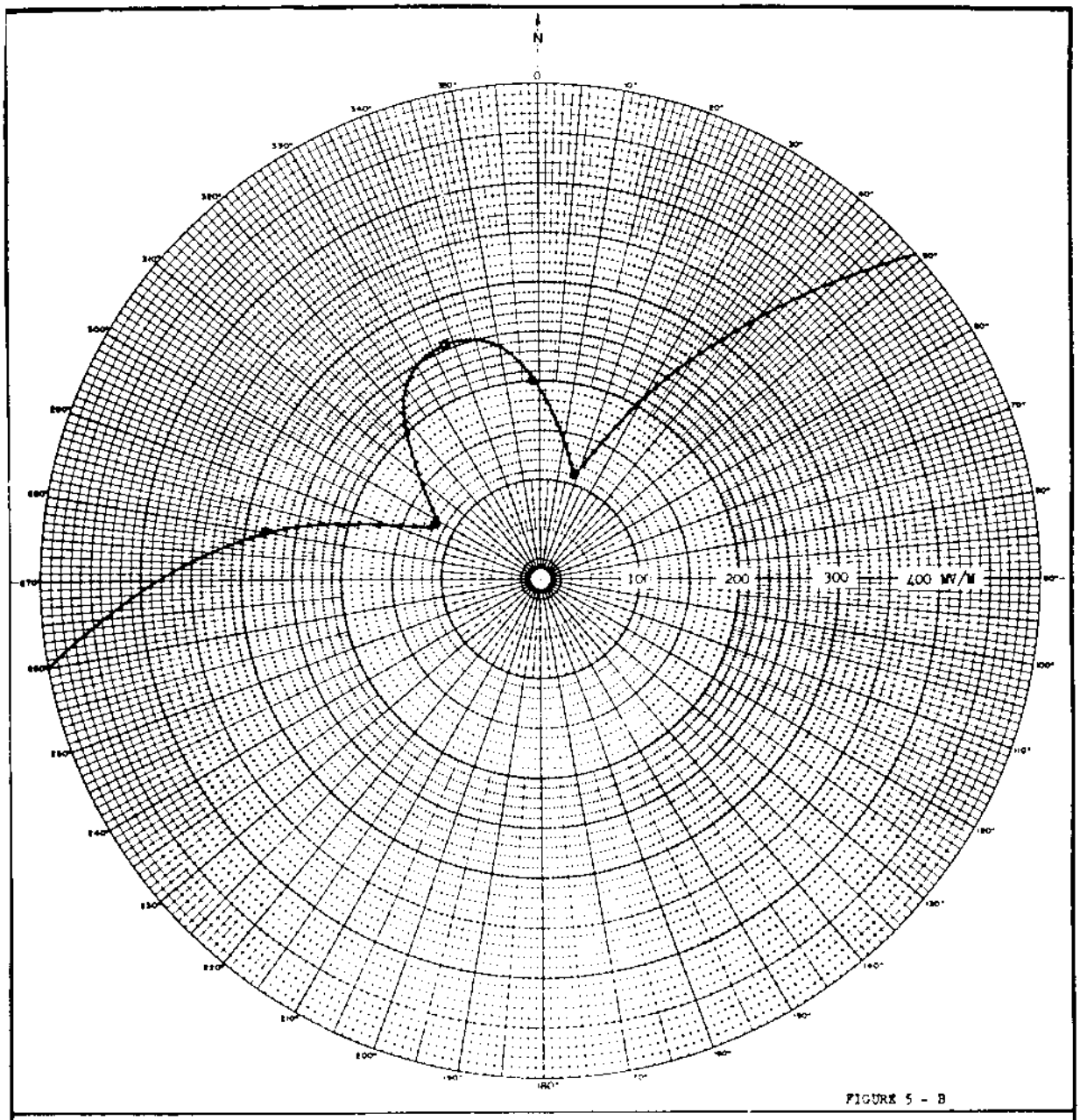


FIGURE 5 - B

EXPANDED VIEW

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

FCC File No.BL-10600
Accepted 6-1-64

Station WRGM
Richmond, Virginia

1540 kc

WRGM

Measured Non-DA
(6-29-64ct)

Station WRGM
Richmond, Virginia

10kw,DA-D,D
1540 kc

LIC. 8-19-64

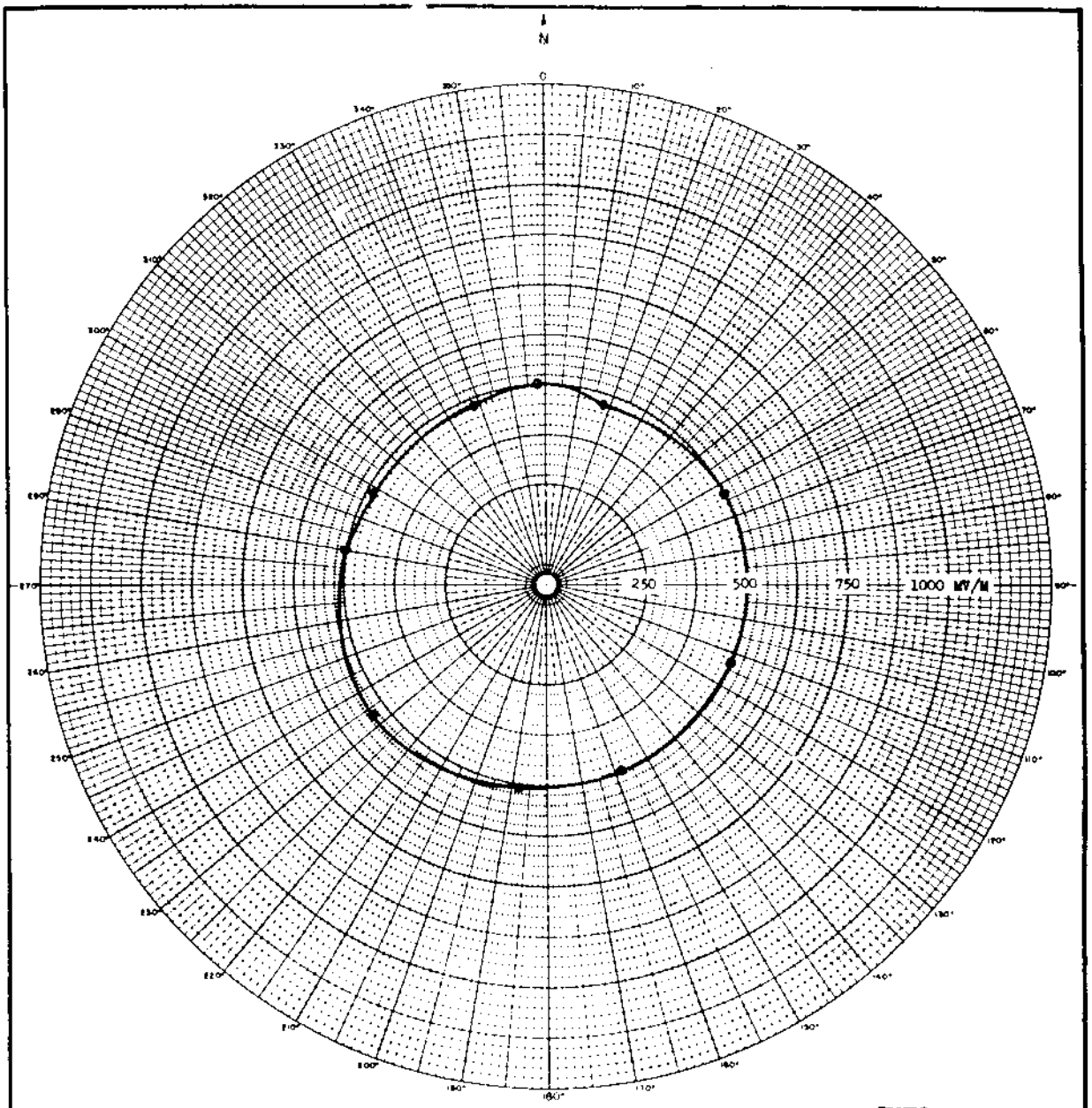


FIGURE 4

HORIZONTAL RADIATION PATTERN

NON-DIRECTIONAL PATTERN

APPLICANT	WRGM
LOCATION	RICHMOND, VIRGINIA
FREQUENCY	1540 KC/S
POWER	10 KW, DA-D
LATITUDE	37 DEG 37 MIN 10 SEC
LONGITUDE	77 DEG 25 MIN 24 SEC
WHEN USED	NON-DIRECTIONAL SURVEY
RMS FIELD	501 MV/M
DATE	APRIL 1964

RAYMOND E. ROHRER & ASSOCIATES
CONSULTING RADIO ENGINEERS
WASHINGTON, D. C.

FCC File No.BL-10600
Accepted 6-1-64

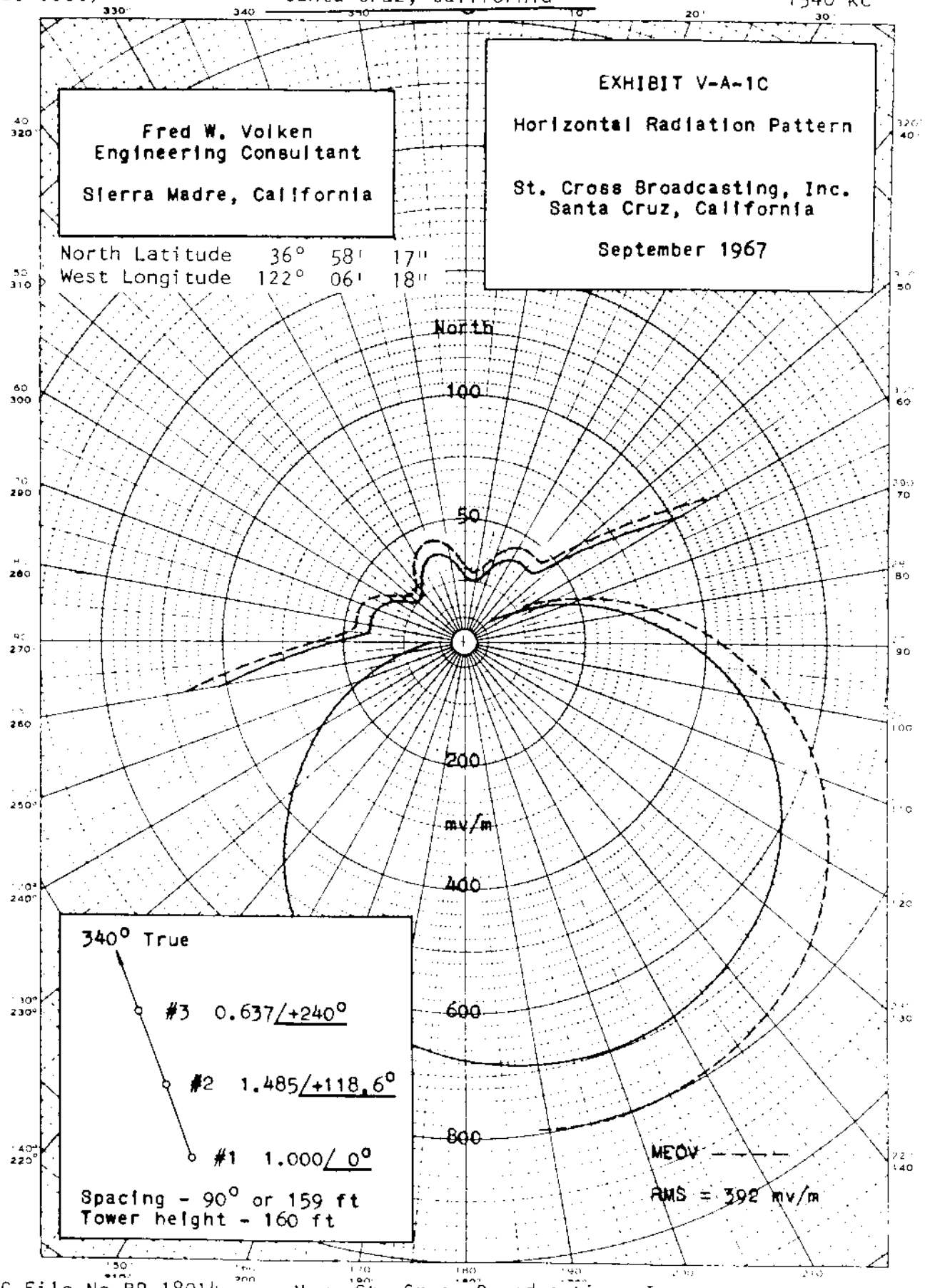
Station WRGM
Richmond, Virginia

1540 kc

Proposed Day
(3-28-68ct)

New; St. Cross Broadcasting, Inc.
Santa Cruz, California

5kw,DA-D,D
1540 kc

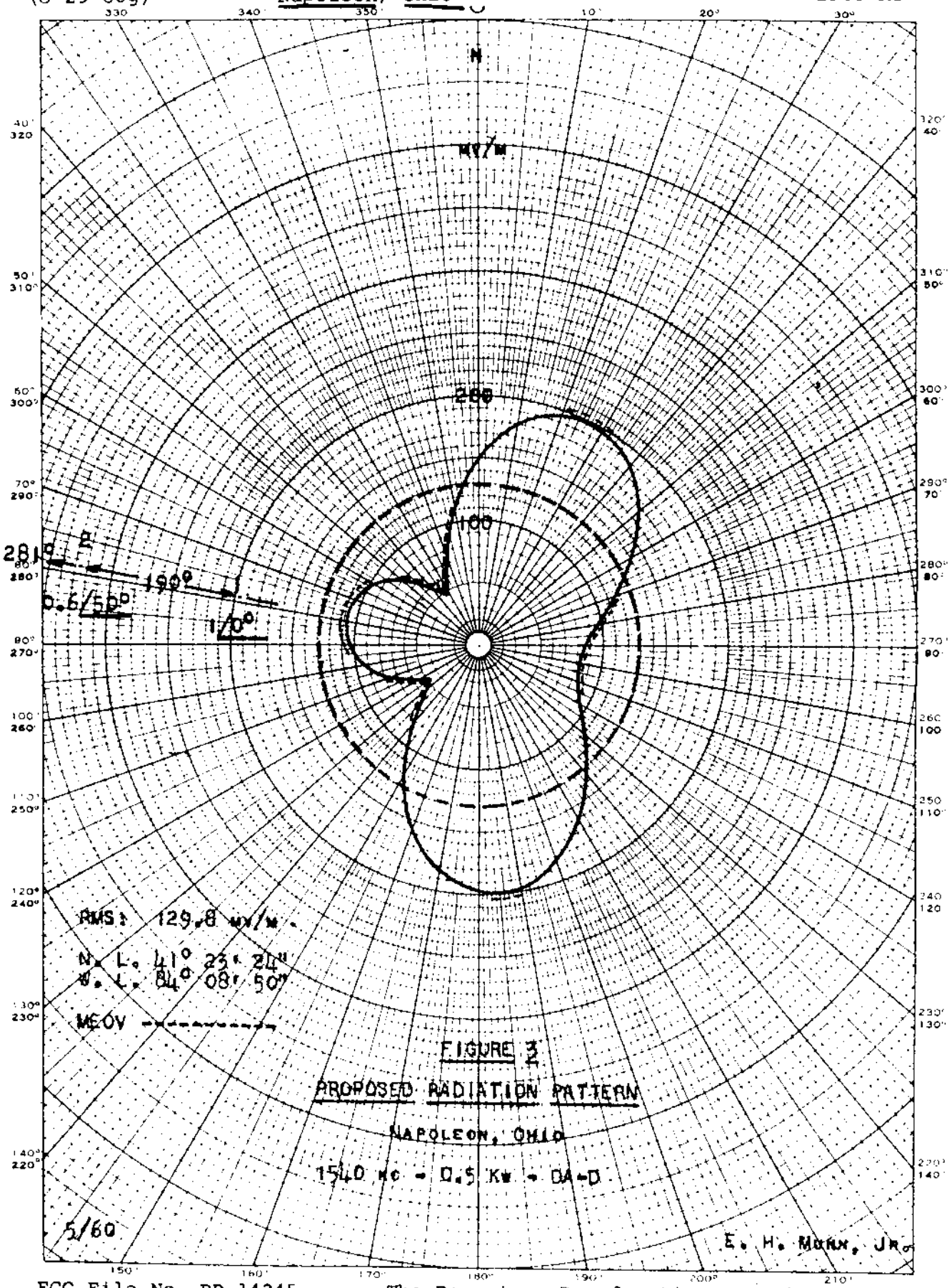


FCC File No.BP-18014
Accepted 3-19-68

New; St. Cross Broadcasting, Inc.
Santa Cruz, California

1540 kc

PROPOSED DAY (8-29-60g) | New; The Downriver Bcstng. Assn. Napoleon, Ohio | 500w, DA-D,D 1540 KC



FCC File No. BP-14245
Accepted 8-8-60

The Downriver Broadcasting Association
Napoleon, Ohio

1540 KC

WRPL

DIRECTIONAL ANTENNA DESCRIPTION SHEET

Station : WRPL Main Studio: Charlotte, North Carolina

Frequency : 1540 KHz Power : -- Night 10 kW Day

Notification: 1779 Date : September 27, 1978 Class: II

GEOGRAPHICAL LOCATION OF THE CENTER OF THE ANTENNA SYSTEM:

North Latitude:	35°	12'	12"
West Longitude:	80°	48'	44"

ANTENNA CHARACTERISTICS

Authorized for Daytime operation (DA-D)
Number of elements: 3
Type of elements: Uniform cross-section, guyed, Shunt excited, vertical steel towers.

TOWER :	S(#3)	C(#2)	N(#1)			
HEIGHT ABOVE INSULATORS :	150'	150'	150'(85°)			
PHASING :	+71.0°	-136.14°	0°			
FIELD RATIO:	1.008	1.919	1.000			

SPACING AND ORIENTATION: Adjacent towers in a row are spaced 106.4' (60°) on a line bearing 175° true.

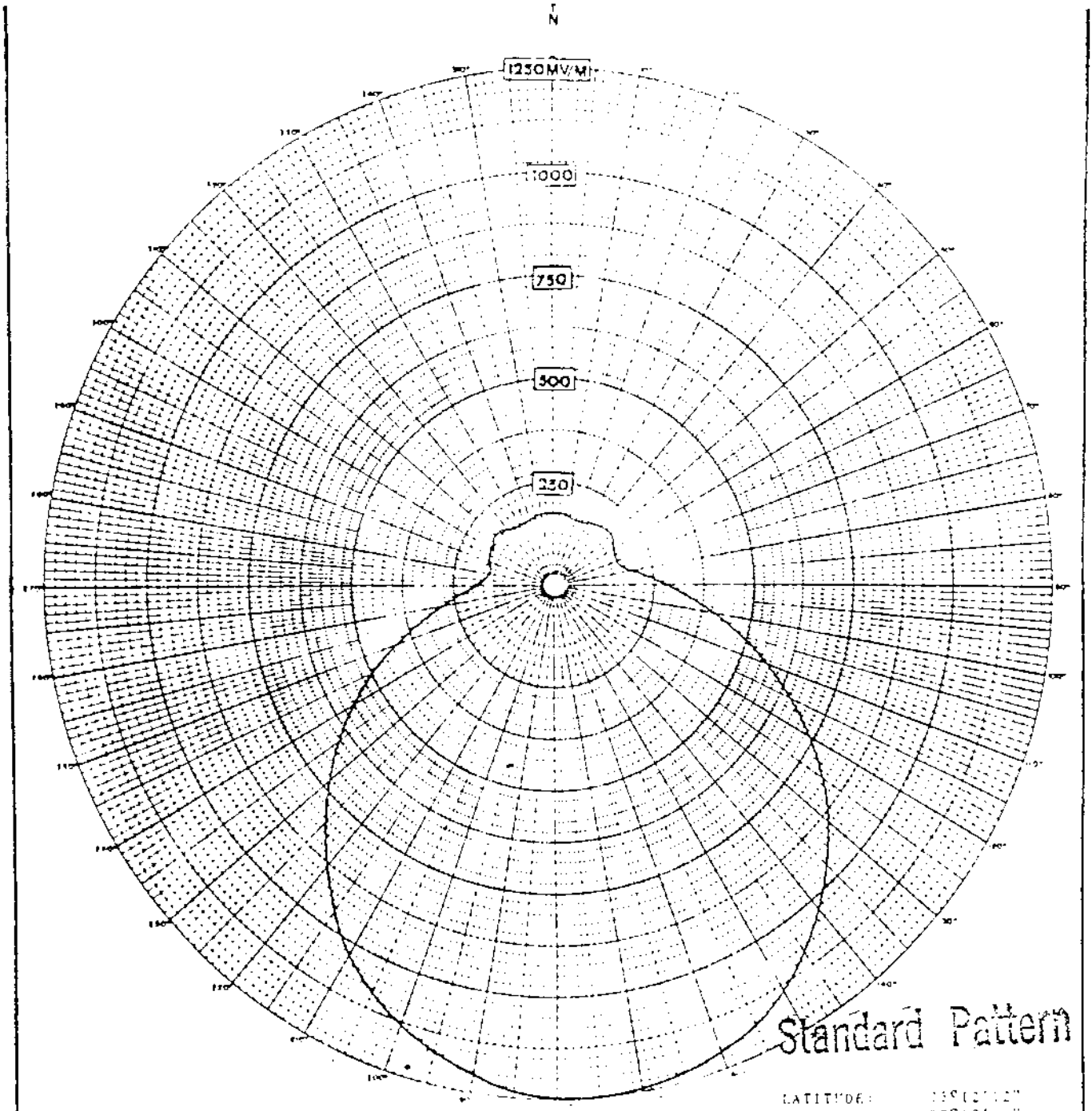
GROUND SYSTEM: 120-85' to 240' equally spaced copper radials plus a 24' square ground screen about each tower. Radials are shortened and bonded to transverse along intersections between towers. Centers of system are bonded together.

WRPL

PREDICTED EFFECTIVE FIELDS AT RATED POWER:

	THEORETICAL		STANDARD
	RMS	RSS	RMS
Day	615.570 mV/m	1347.446 mV/m	646.348 mV/m

WRPL



LATITUDE: [illegible]
LONGITUDE: [illegible]

LBA

LAWRENCE BEHR ASSOCIATES, INC.
GREENVILLE, N.C. [illegible]

ANTENNA PARAMETERS

#1 1/0°

S_1

#2 1.919/-136.14°

S_2

#3 1.008/71.0°

175°T

$S_1=S_2$ =60°
$G_1=G_2=G_3=85°$

RSS_{th}/RMS_{th} = [illegible]
RSS_{th} = [illegible]
RSS_{xcd} = [illegible]
RMS_{th} = [illegible]
RMS_{xcd} = [illegible]

FIGURE 17

PROPOSED STANDARD DAYTIME HORIZONTAL PATTERN

RADIO STATION WRPL
CHARLOTTE, NORTH CAROLINA

1340 KHZ 10 KW, DA-2

12-75